Integration of Pharmaceutical Care in rural Public Health: A case study in Ugu and Umzinyathi districts in KwaZulu-Natal

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AUTHORS DECLARATION

I hereby confirm that the work presented in this dissertation is composed by myself, and has not been submitted for any other degree or diploma at any other university or other higher education institute, except where appropriate credit has been given to the work of others.

The research was conducted at the Public Primary and Community Health Care Facilities, based in the Ugu and Umzinyathi Districts. Professor J. K. Adam (IREC: Chairperson): Research and Postgraduate Support, at the Durban University of Technology provided academic supervision.

SIGNED: ... . Date..28/04/2020

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I hereby certify that the above statement is correct.

SIGNED..... ..... Date..29 April 2020.....

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DEDICATION

“You Can and You Will”, I live by these motivational and inspirational words of my late mum.

This doctoral thesis is dedicated to my parents; my late mother, Leelavathi Naidu, my father, Thavarajaloo Naidu, my late Father-in-law, Gopal Permal, my late Mother-in-law, Radie Permal, my late Grandparents, Ruthenasamy Naidoo and Govindamah Naidoo. The research study would not have been, without the support and love of my family. I thank you for affording me the time and space to attain this academic achievement and performance; to my husband, Inbanathan Pillay for his encouragement and un-doubting faith and confidence in me and my daughters, Kiara and Thenuja, for their patience and understanding. And last but not least this would not have been possible without The Almighty Lord Ganesha, remover of all obstacles, who is my spiritual guidance and has blessed me throughout my life, studies and career.

“All labour that uplifts humanity has dignity and importance and should be undertaken with painstaking excellence.” Martin Luther King, Jr

ABSTRACT

South Africa's Healthcare system being in transitional phase presented opportunity for pharmaceutical service development within the public sector, however, strong leadership with visionary advocacy and stewardship is indispensable. The National Health Insurance (NHI) mandate and the growing emphasis on primary healthcare (PHC) re-engineering, further strengthens the prominence of many healthcare professionals and processes towards equitable and quality healthcare service delivery, among them pharmaceutical services. This research sought to identify the gap in the provision of pharmaceutical care services within the rural public context.

There are several reasons why an investigation into the role of the pharmacist in PHC facilities is warranted. Firstly, several pharmaceutical processes within the public sector have and are contributing to a void in the pharmacist primary role and responsibility, thereby promoting their expansion into PHC, which at present is limited. Secondly, the growing incidence of communicable and non-communicable diseases (NCDs) by the lack of clinical governance questions the quality of patient-centred care and outcomes. Thirdly, the absence of antibiotic and anti-retroviral clinical stewardship and the World Health Organization calling for professional collaboration in managing NCDs highlights the need for pharmaceutical care (PhC) intergration. Therefore, the study focus aimed to guide the development of a collaborative pharmaceutical care model, within the rural domain, by applying a mixed methodology to describe the roles and responsibilities of the Primary Care Drug Therapy (PCDT) pharmacist; identifying enabling and disenabling factors to consider in developing a collaborative health care team through the perceptions of key informants, authorized nurse prescribers, visiting doctors and pharmacists working at the public primary healthcare clinics, and by conducting the South African Pharmacy Council (SAPC) legislative assessment of the 'ideal' clinics.

The basis of the argument encompassed philosophical perspectives, legislation, role and collaborative advantage theory including moral theory of Ubuntu and care ethics related to rules and regulations of pharmaceutical care practice. The study harnessed healthy discussions among public healthcare professionals. The outcome supported unanimously a need to integrate pharmaceutical care and that a Pharmacist can add a meaningful role to the delivery of optimal

patient care. A role of collaborative practice was preferred, citing conclusively themes of role clarity, resources & location and drug supply management by 100% of the respondents. An inter-professional team of doctor, authorized nurse prescriber and pharmacist at facility level to ensure a public health, primary care, clinical patient outcome focus was favoured by 97% of the respondents. Continued training of nursing staff and pharmacists was advocated by 94% and 62% of respondents respectively. Further themes of patient safety (82%) and quality of care (76%) were highlighted. The Kruskal Wallis test ($p<0.05$), illustrated statistically significant differences for doctors and authorized nurse prescribers in four medication related processes, diagnosis & prescribing; administration/documentation; education & training and medication review, with nurses moreover monitoring patient safety. Pharmacists instead placed more emphasis on monitoring compliance, educating patients about chronic medication, providing drug information to prescribers and identifying prescribing errors than over prescribing rights.

The barriers identified were transport unavailability for outreach services, language deficiencies, scarce resource equipment and the shortage of doctors and authorized nurse prescribers.The pharmacist advocacy in these under-resourced rural communities that was demonstrated beneficial is one that drives pharmacovigilance in adverse drug reporting, antibiotic stewardship, clinical governance with continuous prescription audits followed by structured training for PHC authorized nurse prescribers, patient engagement and interaction to ensure optimal patient outcomes and safety. The factors to be considered for such an intergration rely on facility infrastructure, co-location, SAPC legislative compliance standards among them, role clarity building on relationship and trust, leadership, principles of Ubuntu and care, a culture of accountability and responsibility, implementation time, and local context.

Encounterted limitations of time, distance and challenging terrain confined the research study to two rural districts wherein selective sampling further narrowed the clinics to ideal status. Future action research of a larger sample across more rural health districts and primary healthcare clinics is hence recommended to validate and expand the findings of the study which commits to apprise significant role players in Sub-Saharan Africa that may wish to pursue similar practice within a rural context, in the hope of changing “Africa’s health care landscape”.

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LIST OF ABBREVIATIONS

ADEs	**ADVERSE DRUG EVENTS**
AIDS	**ACQUIRED IMMUNODIFFICIENCY SYNDROME**
AHRQ	**AGENCY OF HEALTHCARE RESEARCH AND QUALITY**
APHA	**AMERICAN PUBLIC HEALTH ASSOCIATION**
APhA	**AMERICAN PHARMACISTS ASSOCIATION**
ASHP	**AMERICAN SOCIETY OF HEALTH SYSTEMS PHARMACISTS**
ARV	**ANTIRETROVIRAL**
CCMDD	**CENTRAL CHRONIC MEDICINE DISPENSING AND DISTRIBUTION**
CP	**COLLABORATIVE PRACTICE**
CPD	**CONTINUOUS PROFESSIONAL DEVELOPMENT**
DEFRA	**DEPARTMENT OF ENVIRONMENT, FOOD & RURAL AFFAIRS**
EDL	**ESSENTIAL DRUG LIST**
EML	**ESSENTIAL MEDICINE LIST**
EPI	**EXPANDED PROGRAMME ON IMMUNIZATION**
FIP	**INTERNATIONAL PHARMACEUTICAL FEDERATION**
GPP	**GOOD PHARMACY PRACTICE**
HAQ	**HEALTHCARE ACCESS AND QUALITY**
HPCSA	**HEALTH PROFESSIONALS COUNCIL OF SOUTH AFRICA**
HSS	**HEALTH SYSTEM STRENGTENING**
HST	**HEALTH SYSTEMS TRUST**
ICDM	**INTEGRATED CHRONIC DISEASE MANAGEMENT MODEL**
ICRM	**IDEAL CLINIC REALIZATION AND MAINTENANCE**
IOM	**INSTITUTE OF MEDICINE**
ISHP	**INTEGRATED SCHOOL HEALTH PROGRAMME**
ITHPCSA	**INTERIM TRADITIONAL HEALTH PRACTITIONERS COUNCIL OF SOUTH AFRICA**

KZN	**KWA-ZULU NATAL**
LOS	**LENGTH OF STAY**
MCC	**MEDICINE CONTROL COUNCIL**
MDG	**MILLENIUM DEVELOPMENT GOAL**
M&E	**MONITORING AND EVALUATION**
MSF	**MEDECINS SANS FRONTIERES(Spanish: Doctors Without Borders: humanitarian group**
MSM	**MEDICINE SUPPLY MANAGEMENT**
MTEF	**MEDIUM-TERM EXPENDITURE FRAMEWORK**
MUR	**MEDICINE USE REVIEW**
NCS	**NATIONAL CORE STANDARD**
NCCMERP	**NATIONAL COORDINATING COUNCIL FOR MEDICATION ERROR REPORTING AND PREVENTION**
NCD	**NON-COMMUNICABLE DISEASES**
NCS	**NATIONAL CORE STANDARD**
NDOH	**NATIONAL DEPARTMENT OF HEALTH**
NDP	**NATIONAL DRUG POLICY**
NDP	**NATIONAL DEVEOLPMENT PLAN**
NHI	**NATIONAL HEALTH INSURANCE**
NHPCSO	**THE NATIONAL HOSPICE AND PALLIATIVE CARE ORGANIZATION**
NRLS	**NATIONAL REPORTING AND LEARNING SYSTEM**
OHSC	**OFFICE OF HEALTH STANDARDS COMPLIANCE**
OM	**OPERATIONAL MANAGER**
PAHO	**PAN AMERICAN HEALTH ORGANIZATION**
PCDT	**PRIMARY CARE DRUG THERAPY**
PH	**PUBLIC HEALTH**
PhC	**PHARMACEUTICAL CARE**

PHC	**PRIMARY HEALTH CARE**
PN	**PROFESSIONAL NURSE**
PSI	**PUBLIC SAFETY INCIDENTS**
PSSA	**PHARMACEUTICAL SOCIETY OF SOUTH AFRICA**
PTC	**PHARMACEUTICAL AND THERAPEUTICS COMMITTEE**
PuPs	**PICK UP POINTS**
PV	**PHARMACOVIGILIANCE**
RHAP	**RURAL HEALTH ADVOCACY PROJECT**
SAHPRA	**SOUTH AFRICAN HEALTH PRODUCTS REGULATORY AUTHORITY**
SAPC	**SOUTH AFRICAN PHARMACY COUNCIL**
STGs	**STANDARD TREATMENT GUIDELINES**
SVS	**STOCK VISIBILITY SOLUTION**
TB	**TUBERCULOSIS**
THE	**TOTAL HEALTH EXPENDITURE**
UHC	**UNIVERSAL HEALTH COVERAGE**
WHO	**WORLD HEALTH ORGANIZATION**

CHAPTER ONE

OVERVIEW OF THE RESEARCH STUDY

CHAPTER ONE: OVERVIEW OF THE RESEARCH STUDY

1.1 INTRODUCTION

Chapter one provides the premise for this research by explaining the evolution of the pharmacy profession from the typical ‘count and pour, lick and stick’ function to a pharmaceutical care approach of improving the patients’ quality of life to influence health care delivery. It then explores the extent of public health care in relation to pharmaceutical service delivery at rural primary healthcare clinics in which the research was conducted. Furthermore, it states the motivation for this research, highlighting literature related to quality pharmaceutical service provision as a fundamental need in the implementation of NHI and PHC re-engineering reform strategy for better patient outcomes and notably the methods used to gather information. This chapter concludes with an outline of the subsequent chapters in the research.

1.2 BACKGROUND

In 1990, South Africa began widespread transformation of its health system to one that achieves an equitable, efficient and effective service based on the principles of the Primary Health Care model (World Health Organization, 1997). The South African public primary health system supports over 50 million people in 9 provinces and 52 districts at around 3500 clinics and health centres. In addition, reports showed that almost 70,5% of households’ in need of healthcare primarily access public clinics and hospitals of which 19.8% of South Africa’s total population and 24% KZN population endure chronic diseases (Statistics South Africa- General Household survey, 2015). Hence, the access and delivery of healthcare at the point of public clinic facility, being the PHC clinics is the first point of a patients’ health call and forms the fundamental focus within which Primary Health Care in South Africa can be realized. The purpose of any health facility, stated by the Director-General of Health- Ms. Matsoso in the National Department of Health publication on Primary Care Re-engineering in Kwa-Zulu Natal (2015), is to “promote health and to prevent illness and further complications through health promotion, early detection, treatment and appropriate referral” (Republic of South Africa: the Department of Health, Primary Health Care Re-engineering in Kwa-Zulu Natal, 2015).

Further, one of the National Health policy resolutions of 1994 saw the fundamental shift towards a nurse-driven PHC approach with the Health District System (DHS) as the main locus of implementation with monitoring guided by the National Health Act 61 of 2003 section 29, 30 and 31. Nevertheless, “There is consensus that South Africa’s health system produces low value for money and that there is a large gap between good health policies and their implementation” (Schneider et al. 2008). Equally suggestive by the Operation Phakisa, Ideal Clinic Realisation and Maintenance task teams’ final lab report (2015), is that the present curative approach to health care delivery is embedded in vertical programmes with limited capacity and resources for health prevention and health promotion practices. In addition, it was identified that such a PHC approach is limited in, addressing the primary causes of health and disease, developing intervention strategies for the high preventable disease burden, addressing overcrowded PHC dispensing facilities and the causes of high morbidity and mortality (Operation Phakisa, Ideal clinic realisation and maintenance final lab report, 2015). By the same token, the organizational structure was found to be disproportionately higher at a District level than at a PHC level with a managerial culture that “PHC is the step child”. Furthermore, Governance systems, roles and responsibilities were also identified as unclear (Operation Phakisa, Ideal clinic realisation and maintenance final lab report, 2015). Hence, such a DHS approach proves unworthy to successfully implement PHC principles and sustain the provision of a quality service delivery at a progressive rate. To further support implementation failures, in the South African Health Review, Rispel (2016), contributed to the perspective on public health sector transformation, highlighting that even though progressive initiatives in health policy, legislation and resource allocation was invested in since democracy in SA; “tolerance to ineptitude, failures in leadership, management and governance, an inadequate district system to drive the primary health system and unresolved health workforce crisis” has resulted in poor performance of the healthcare system. She further allotted that consequently these reasons are delaying improved health for the nation and threatening the feasibility of the NHI (Rispel, 2016).

On a more positive stance though, South Africa has in recent years made significant strides to improve the public health system. The introduction of National Health Insurance (Republic of South Africa: The Department of Health, National Health Insurance - Healthcare for all South Africans, 2012), displays the concerted efforts towards entrenching the constitutional right to

health (Constitution, 1996). It also realized a number of ongoing activities to derive equitable access to medicines and to improve patient care (Meyer et al. 2017). Initiatives further included the acknowledgement of the increasing weight of non-communicable diseases; attempts in reducing medicine costs within the public healthcare, mainly for antiretroviral therapy; programmes to improve patients' access to chronic medicines and activities to improve care in hospitals, including pharmacovigilance (Meyer et al. 2017).

Therefore, considering an era of rapid change in delivering health care, the pharmacy profession like others finds itself in transition of significant growth and development, positioning itself with an array of possibilities. This embodies comprehensive pharmaceutical services, which is defined by a "set of actions in the healthcare system that seeks to guarantee comprehensive, integrated and continuous care for responding to the health needs and problems of the population, both individual and collective; having medicines as one of the essential elements, contributing to their equitable access and rational use at health facilities. These actions, developed by the pharmacist or under his/her coordination, as part of a healthcare team, with community participation, aim to achieve defined health outcomes leading to improvement of the quality of life of the population" (PAHO/WHO, 1989). Following this thread, Pharmacists belong to an established profession of healthcare which tracks the evolution from 1900's to 1950's of the roles of apothecary, compounding, dispensing and labelling of manufactured products, to the mid-1960s where the pharmacists role experienced a paradigm shift toward a more patient-oriented practice and developed the concept of pharmaceutical care (Helper & Strand, 1989; Pearson, 2007).

The application of the pharmaceutical care model defined by Helper and Strand (1989), propelled the pharmacists' 'new role' towards a more responsible delivery of drug therapy for the purpose of achieving definite outcomes to improve a patient's quality of life. This definition was further amended in 1998 by the International Pharmaceutical Federation (FIP) as "achieving definite outcomes that improve or maintain a patient's quality of life" (WHO, 2006). It is both patient-centred and outcome-oriented pharmacy practice requiring Pharmacists' to work together with other Healthcare providers and patients for health promotion, disease prevention,

and for assessing, monitoring, initiating and modifying the use of medicine ensuring safe and effective drug treatments (Mason, 2001; APHA, 2016).

The pharmaceutical care concept has been integrated into many Primary Care Trusts in the United Kingdom, primary care teams in North America and similar practice settings around the world (Bernsten et al. 2001; Isettse et al. 2003; Silcock et al. 2004; Dolovich et al. 2008; Bradely et al. 2008 cited in Jorgenson et al. 2013; Farrell et al. 2008), acknowledging the potential benefits on the quality of healthcare delivery. South Africa is no exception, i.e., in attempting to expand the role of community pharmacy (Gilbert 1998 a, b, c; Gilbert, 1999), and moving towards "re-professionalization" of the pharmacist (Birenbaum, 1982; Williams, 1999; Kendall & Lissauer, 2003 cited Gilbert, 1999; Bronkhorst et al. 2014) with clear roles, responsibilities and inter professional collaboration (WHO, 1998), dominating all decisions made towards implementation of primary healthcare. However, there remains paucity in literature and practice on the expansion of the role of the public pharmacist into the rural primary healthcare context, where similarly the need for re-classification of public pharmacist function rapidly grows to address the challenging needs of the greater part of the South African communities. There are many factors that define the need to expand the public pharmacist's role into rural primary healthcare clinics. These include: -

- The Central Chronic Medicine Dispensing and Distribution (CCMDD) program afforded by a National pharmacy service provider, which is decanting the majority of stable chronic patients from hospitals and primary health care clinics to be remotely dispensed by the service provider pharmacist, questioning adherence and imposing stringent management and quality concerns of the provision of chronic patient care (Republic of South Africa: the Department of Health-KZN, 2016 a, b; Rampamba et al. 2017);
- Medicine Supply Management (MSM) responsibility at the clinics, which has been extended to the Pharmacist Assistant and strengthened in monitoring and evaluation by the ideal clinic concept to ensure availability of medication (Republic of South Africa: The Department of Health, 2018);

- The World Health Organisation (2014), call for professional collaboration in managing non-communicable diseases, given it being the rising global cause of death and further concern of increased deaths of 17-24% in the African region by 2022 (WHO, 2012).
- The lack of Antibiotic stewardship resulting in alarming resistance patterns (Republic of South Africa: the Department of Health, 2015 a, b) and the plea for a multidisciplinary team approach with a skills mix to support pharmacists in improving antibiotic prescribing practices;
- The concomitant use of conventional medication with herbal medication (FIP, 2016);
- Lack of adequate pain management in chronic terminally-ill patients (Republic of South Africa: the Deparment of Health, 2018);
- Increasing numbers of non-adherence in ARV patients, who are virally unsuppressed, requiring a switch to secondary and even tertiary treatment (Rampamba et al. 2017);
- Concern over the paediatric ARV patients managed at PHC level with lack of dose alterations with weight band changes (PSSA, 2012);
- Challenges of, maintenance in care rates deteriorating, poor patient adherence and programme functioning leading to inclines in drug resistance (Awolola et al. 2014; Baloyi et al. 2014; Ramdas et al. 2015; Vagiri et al. 2015, cited in Meyer et al. 2017);
- Increasing number of adverse drug reactions with ARV treatment management reported for PHC managed patients and the non-reporting of adverse drug reactions or lack of pharmacovigilance (Meyer et al. 2017);
- The enormity of the burden of AIDS giving rise to undetected Cryptococcal meningitis despite the availability of the algorithm (WHO, 2018)
- The high number of ‘A items’ presented on the ABC analysis report for PHC clinics, showing high cost drivers, thereby impacting on the scarce pharmaceutical budget and most importantly questioning EDL adherence and rational prescribing (Ugu- PHC, ABC report- March, 2018).

Having presented the above opportunities and imperatives for the exploration of the pharmacist intervention at PHC level, a closer evaluation of the sub-district model will bear reference. The PHC sub-district model mandated is the active call of the NDOH to decentralize the PHC management to the Hospital level (Republic of South Africa: the Department of Health, 2015).

The new model has the District remaining as the main locus of strategic and operational leadership, while decentralizing the planning, and delivery of health services to that of the 'Mother Hospital'. Having this approach in place, and challenged by the Alma- Ata guiding principles of a comprehensive provision of basic healthcare with Primary Healthcare (PHC) in mind, the South African Pharmacy Council (SAPC) advocated to optimally utilize pharmaceutical services and pharmacist's expertise, by the advent of the new cadre of health care professional, the Primary Care Drug Therapy Pharmacist (PCDT). The main goal being the improvement of patient treatment alongside patient safety, increasing availability of healthcare services, increasing patient options, worthier utilization of health professional proficiencies, and contributing to the launch of a more adaptable team in PHC environments (Republic of South Africa: Government Gazette, 2011). However, the qualified PCDT pharmacist, under specific conditions would be issued a permit as per Section 22A (15) of the Medicines and Related Substances Act 101 of 1965, as amended (the Medicines Act) to make a diagnosis and initiate treatment for patients from a specified list of Schedule 3 and Schedule 4 medication (Republic of South Africa: Government Gazette, 2011). Such an independent prescribing pharmacist, once in possession of the permit may practice within a rural setting community pharmacy. This study, however arguments the possibility of integrating the PCDT pharmacist into the rural public PHC clinics that is currently predominately managed by the nursing personnel, and which has not been afforded the attention it warrants.

The current model at PHC is a nurse driven service, with visiting Doctors, Pharmacist Assistants, Pharmacists, allied health care professionals and Dentists providing health care services. Presently, pharmaceutical support service at PHC is one of Medicine Supply Management (MSM) and lacks clinical patient care. Furthermore, the ICDM model of care introduced at PHC, lends opportunities for Pharmaceutical engagement in collaborative patient care and management. Further, an Ideal Clinic realization and maintenance manual provides guidance on how to achieve and maintain Ideal Clinic status (Republic of South Africa: the Department of Health, 2016). The manual is also a tool to assist with continuous discipline. However, the pharmaceutical elements therein address only Medicine Supply Management criteria. The ultimate compliance allows for improvement in quality of medicine access and un-interrupted availability of medication. This tool embodies all aspects of MSM and stock control monitoring

and evaluation, but lacks clinical pharmaceutical patient care tracer indicators, highlighting the need for a revised model for collaborative patient-centred care.

Equally important is the “Operation Sukuma Sakhe” (OSS-stand up and build) and the War Room concept, which is a call for the people of KwaZulu-Natal to collectively conquer the concerns of unemployment, crime, poverty, HIV and tuberculosis, and substance abuse that is engulfing our communities. Therefore, through partnership with community, stakeholders and government, integrated services can be afforded. Social mobilization and Ward engagement are encouraged where communities have a role, in the delivery of government services in a more integrated way (Republic of South Africa: the Department of Health, 2014). OSS is not fully functional and lacks Pharmaceutical support and participation at community level, further supporting the need for the introduction of collaborative Pharmaceutical care model at PHC.

This research study, grounded by philosophical perspectives, theory of Role Clarity and Collaborative Advantage, Ubuntu and Care moral principles, hence seeks to fill a void in literature from a rural contextual perspective and public pharmacy practice with respect to pharmacist’s clinical activities, paving its way to inform NHI and PHC re-engineering strategy of the ‘ideal’ clinic concept. The development of a public pharmaceutical care framework or model will focus on defining the roles and responsibilities of the PCDT pharmacist in their integration into the rural PHC facilities to make a salient contribution to the improvement of pharmaceutical care and clinical patient centred outcomes.

The justification for the argument above, hence provides the backdrop and opportunity for exploration of the integration of pharmaceutical care into the current District Health, revitalization Primary Health Care and Integrated Chronic Disease Management Models in efforts to present strategically evidence based actions to utilize the availability of the skills mix in scarce human resources to address the most crucial 21st century health and its development challenges, facing the South African rural populations accessing healthcare.

1.3 RESEARCH PROBLEM

Primary Healthcare in South Africa is undergoing re-engineering of its processes, as promulgated by the National Health Insurance (NHI), release of the White Paper (Republic of South Africa, the Department of Health, 2015). Aligned to NHI plans and the subsequent PHC re-engineering strategies, for reformation in primary healthcare, community pharmaceutical services have been given the focus of attention by the South African Pharmacy Council. There is, however, paucity in practice and literature to address pharmaceutical care in the existing public rural clinics. Rural healthcare facilities are perceived to be riddled with challenges of infrastructure, transportation, long queues and waiting times, frequent stock outs, severe healthcare workers' shortages, growing burden of disease, with developing communicable and non-communicable epidemics, poor patient health outcomes to infectious diseases, maternal health, cancers, impeding patients' trust in the healthcare system. (WHO, 2003; Kautsky & Tollman, 2008; Gaede & Versteeg, 2011; NDOH- ICRM, 2015; Jakovljevic & Milovanovic, 2015; Rispel, 2016; Barber et al. 2017; Meyer et al. 2017).

The justification of the efforts to expand the pharmacists' role into community pharmacy transpired to satisfy a void in the pharmacists' scope of activities, thereby utilizing their proficiency (Gilbert, 1997; 1998 a, b, c; 1999; Bradley, 2008). Gilbert's studies of the pharmacist's expanded roles informed that of the community pharmacist and the perceptions of General Practitioners' and nurses in community practice. The findings made in these studies recommended that the PCDT pharmacist, once qualified and acquiring the permit be allowed to independently prescribe PHC EML medication, based on a community pharmacy scenario in rural areas. This did not address the need for a pharmacist within the public rural context. Stemming from Gilbert's recommendations of healthcare centres being the ideal model for integration of pharmaceutical care, the assumption derived for this study is that the "ideal" clinics in a rural area be eventually converted to healthcare centres. This avenue of the pharmacy profession in rural primary healthcare, however, has not expanded its scope and widely adopted the concept of quality improvement in the clinical realm. To further support the need for this research to address the clinical gap in pharmaceutical service delivery in the public sector is the advent of NHI; 'ideal' clinic concept; expanded role of the Pharmacist Assistant in PHC for MSM; Central Chronic Medicine Dispensing and Distribution managed by a designated service

provider; the increasing number of ARV adverse events; the absence of antibiotic stewardship and the rise in non-communicable deaths. The above enunciated the call to fill the void and expand the expertise of the public pharmacist activities into the rural Primary healthcare clinics. Hence, the integration of PCDT pharmacist with clear roles and responsibilities in delivering collaborative quality patient care at rural PHC clinics needs to be defined. Prospective inter-professional collaboration with the emerging primary healthcare pharmaceutical model of delivery of care design will aim to achieve best practice within the available resources in a rural domain.

1.4 AIM AND FOCUS OF THE RESEARCH STUDY

The purpose of this research was to investigate factors influencing pharmaceutical Care services and their relation to the delivery of quality patient care in rural public primary healthcare clinics. This was achieved by identifying the legislative requirements by the South African Pharmacy Council and by engaging the authorized nurse prescribers, visiting doctors and pharmacists that support PHC within the public sector, affording them an opportunity to distinguish the rules, positions, relationships and tasks of the PCDT pharmacist. Thereby, crafting a collaborative pharmaceutical care practice model that will permit them to deliver quality pharmaceutical services to achieve quality patient care. This approach serves as a novel pharmaceutical strategy that will guide The National Health Insurance plan and the PHC re-engineering strategies towards achieving equitable healthcare (including pharmaceutical care) for all, with improved health outcomes especially in patients treated at clinics in under resourced and under privileged areas.

1.5 RESEARCH OBJECTIVES

The Objectives of the study were:

- To evaluate the South African Pharmacy Council (SAPC) inspection for Primary Health Care (PHC) clinics and identify gaps to be addressed to pave the way for the new cadre of professional
- To identify factors to consider in devising a rural public PHC Collaborative Pharmaceutical Care Model (CPCM)

- To establish healthcare professional's perceptions of the roles and responsibilities of the PCDT pharmacist in Rural Primary Healthcare Clinics

1.6 RESEARCH QUESTIONS

The Research questions included the following:

- What are the Pharmaceutical legislative gaps that need to be addressed to allow for an ideal clinic concept of the PCDT pharmacist at Primary Health Care Clinics?
- What are the factors to consider when developing a Collaborative Pharmaceutical Care Model for public PHC Clinics within a rural context?
- What are the perceptions of the roles and responsibilities of the PCDT pharmacist in rural PHC to guide the development of a Collaborative Pharmaceutical Care Model?

1.7 BENEFITS OF THE RESEARCH

The research findings will be disclosed to all the stakeholders, in an organized meeting to add an element of stakeholder engagement and revive the 'Ubuntu' and the 'Care' concepts. The outcomes of the research will firstly, impact on the enhancement of the rural society that the public healthcare worker serves. It will allow for rural pharmaceutical development and expansion of the public pharmacist role towards the clinical practice realm, of which the findings will be benchmarked with the pharmacy profession at Pharmacy Conference. In addition, the study once published will gain recognition to assist pharmaceutical healthcare development in the Sub-Saharan regions, of rural context, aiming to change 'Africa's Health Care Landscape' by addressing 'African problems with African Solutions'.

1.8 RATIONALE FOR THIS STUDY

This research is focused to identify the gap in the provision of healthcare services, more importantly pharmaceutical care services within the rural public context. The premise is an appreciation of the recognition that health care is universally recognised as a basic human right (People's Health Movement, 1978), protected by the Constitution of the Republic of South Africa (Constitution, 1996). The SAPC in advocating optimal utilization of pharmaceutical services and pharmacist's expertise by the advent of the PCDT pharmacist, envisioned extending the services

within a retail community context. The argumentative focus with implementation thereof is that the greater part of South Africa's people seeking healthcare will remain both financially and logistically challenged by transport to access this care offered. Hence, resulting in a divide in healthcare service provision between the rural and urban communities, defeating the purpose of NHI and universal health coverage (UHC). Therefore, to narrow this divide, the rationale of the study encapsulates firstly, filling a void in pharmaceutical care at rural public clinics. Secondly, not only do public pharmacists find themselves over qualified and under-utilized, calling for re-professionalization, but the need for utilization of their skills set is paramount to collaboratively assisting in improving patient outcomes and optimizing healthcare delivery as alluded to above. In support thereof, there is emerging evidence that availability of high-quality healthcare considerably enhances patients' health outcomes, as well as those with infectious diseases, maternal health, cancers and NCDs (Barber et al., 2017). Why not utilize the expertise available in the PCDT pharmacist scope of practice within the public healthcare sector? Therefore, to integrate pharmaceutical care in rural PHC clinics will provide clinical care with improved patient outcomes and reduced medicine adverse events, affording a high quality of healthcare service. The outcome will certainly build trust and confidence of the healthcare system among the communities. In conclusion, this study approach will ultimately prove beneficial in reducing the overall costs to patient, the health care system and advertently impact positively on the Country's economy.

1.9 RESEARCH AREA

The research was conducted in Ugu and Umzinyathi, which are amongst the most rural Districts' primary and community healthcare clinic pharmacies of a public health care context in KwaZulu-Natal. The study covered five facilities in the Ugu District and ten facilities in Umzinyathi District. The socio-economic indicators by StatsSA Community Household Survey, 2016, revealed the Districts to be equally comparable in terms of intensity of poverty (43% vs 43.7%); uninsured population (92.7% vs 93%) and illiteracy rate (22% vs 21.1%) for Ugu and Umzinyathi respectively. The Umzinyathi district, was also favoured for its status as an NHI pilot, anticipating a novel approach by the participants towards the topic under investigation.

1.10 RESEARCH POPULATION

The research population for this study included only health care professionals, namely, authorized nurse prescribers, i.e. professional nurses; medical doctors and pharmacists employed within the public sector. The perceptions of customers, as patients receiving healthcare services, were excluded in this study, as creating a new specific quaestionnaire in appropriate language for the patients, including intereptation would have been time consuming. The thrust of this research, due to time limitations was to appreciate, from the perception of the health care professionals only, their understanding of collaborative quality pharmaceutical service provision. Therefore, the views of professional nurses, doctors and pharmacists were sought from the PHC and CHC facilities of Ugu and Umzinyathi rural districts within the public healthcare context.

1.11 ASSUMPTIONS ON WHICH THE RESEARCH PROJECT RESTED

Primary healthcare services are provided at Primary Healthcare clinics, Community healthcare centres and within District hospitals. The research was conducted in KwaZulu-Natal rural Primary and Community healthcare clinics. The authorized nurse prescribers at the clinics; medical doctors and pharmacists from the hospital that support the PHC and CHC clinics chosen were included in the study. Whilst information gathered was not projected to the entire group, it served as an indicator of services rendered by the group. The research study is based on the assumption that within the rural public healthcare context, patients' outcomes can be improved by the integration of pharmaceutical care services offered in collaboration with a pharmacist and that pharmaceutical care is not a 'pharmacist-only' activity.

1.12 CONCLUSION

The premise for the study set the tone of the research approach. The gap in literature and within the public healthcare sector in South Africa, emphasized the need to further explore the possibility of embracing a pharmacist within the context a rural setting and NHI roll-out. Hence, the factors highlighting the need for pharmacist intervention in a collaborative approach within public primary healthcare teams provided sufficient motivation and opportunity to address the problems with structured research questions. In chapter one the reader is introduced to the

research and made to understand what will be presented and why, offered the background of the study, the problem statement and the purpose of the study, with crafted research questions, and an engagement in a discussion on the significance and the rationale of the thesis.

Chapter two and Chapter three aims to display the uniqueness of the thesis by encompassing an extensive review of the literature in a three pronged approach. Firstly, chapter two covers a narrative review of the literature into healthcare concepts in SA, NHI, the ideal clinic concept and a Pharmacists' role therein. Medicine use in public health is examined with a closer look at healthcare expenditure. The chapter closes with discussions over rural health and health advocacy to set the tone for continuation of the literature review in Chapter 3.

Chapter three demonstrated secondly, the role of the pharmacist and defined pharmaceutical care examining evidenced based applications thereof by previous relevant contributors to the field. Limitations to the implementation of PhC gives the reader more insight into the daunting task that lies ahead for the researcher. The role of the pharmacist in healthcare with a clinical focus emphasised the vital skill base that awaits intervention. Therefter, healthcare risk management, exploring patient safety, collaborative focus of patient healthcare delivery and the role of the patient was comprehensively reviewed. The final approach to the literature review studied the theoretical and conceptual frameworks that underpinned the research, with a review of the research structured variables and themes to expand previous work done. The chapter culminated with a proposed pharmaceutical care model and theories adopted in this study.

Chapter four walked the reader through the epistemological basis of the study, enabling an evaluation of the appropriateness and validity by an in depth understanding of the methodology chosen; the research design to answer the research questions; the setting; the sample choice, and how data was collected and analysed for interpretation.

Chapter five illustrated in detail the interpretation of the study results by relating them to existing literature and the research questions.

Chapter six articulated with clarity, the contributions made to existing literature, highlighting the limitations of the study, and the possible recommendations and opportunities for future research.

CHAPTER 2

LITERATURE REVIEW

HEALTHCARE CONCEPTS IN SOUTH AFRICA

CHAPTER TWO: LITERATURE REVIEW- NARRATIVE APPROACH TO HEALTHCARE IN SOUTH AFRICA

2.1 INTRODUCTION

This chapter provides an extensive narrative of the literature pertaining to the study. A substantial theoretical discussion of healthcare management in South Africa explores the concepts of NHI, ideal clinic and the role of a pharmacist therein. Medicine use in Public health explores healthcare expenditure. Thereafter, the demonstration of pharmacy management at length looked at quality pharmaceutical care service delivery. Further discussions meticulously covered the districts under study drawing attention to Rural health and the importance of health advocacy within the present SA health context.

"*If you want different results do not do the same thing*" A. Einstein

2.2 HEALTHCARE IN SOUTH AFRICA

"Health is a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity." (WHO, 1946).

South Africa's healthcare system, finds itself in a stage of profound revolution where changes in global health and human development, as well as political and economic challenges calling for solidarity amongst health care workers to realize the 17 Sustainable Development Goals that was launched in 2015. This is said to encompass a health vision that speaks to the social, economic, and environmental factors with a "new agenda to uplift and protect people, planet, prosperity, peace and partnership" according to Health Systems Trust, Chairperson- Shuping (HST, 2016). In addition, citizens' right of health care access is embedded in South Africa's post-apartheid Constitution (Constitution, 1996). Furthermore, efforts regarding universal health coverage (UHC) is structured around a unified health system that strives for equitable access of medicines for the entire population (Republic of South Africa,the Department of Health, 2012; 2015; Sekhejane, 2013; Jakovljevic & Milovanovic, 2015). However, the caveat that this came

with, was that “critical socioeconomic right” is to be gradually realised within the scarcity of accessible resources (Gray et al. 2016). However, equity and access for all can be achieved by a shift to primary health care delivery approach. According to Chopra et al. (2009), accessibility to healthcare for all South Africans rests in addressing the rural and underserved communities through the strategic vehicle of building new primary health care clinics.

South Africa’s health is a two-tiered system running parallel to one another. It consists of a large public sector that are unable to pay for healthcare provision, of which government subsidizes almost 40% of all health spending, while being challenged to provide services to about 80% of its people (Stats SA, 2015). This austerity finds the public sector strained and under-resourced in some areas. The private sector, on the other hand, is largely commercially run, providing health to the middle and high-income earners, commonly referred to as the socio-economic elite group, who enjoy the luxury of medical aid. They also poach most of the health professionals, resulting in an uneven distribution of healthcare service delivery between the public and private sectors. Consequently, many of South Africa’s public health facilities are in ‘bad shape’. Huge health and healthcare disparities are also cited in the rural and urban areas within the nine provinces (Rispel, 2016). Rural PHC clinics, however, are challenged by staff shortages due to the lack of social and financial incentives to attract and retain doctors and nurses. Most often the reality is that one professional nurse and a nursing assistant is required to manage the patient numbers resulting in excessive workloads and poor performance (Rispel, 2016). This has contributed to the loss of faith and trust in the quality of healthcare service offered by the state. Today, this image still remains a challenge to eradicate from the communities that solely depend on public health.

The SA health system, besides being inequitable, finds itself also inaccessible to a large proportion of the poorest of its people, with public sector organizations having experienced ineptitude, inadequate managers, under funding, insufficient and declining infrastructure, shortages of skilled healthcare workers and crucial medicines with inferior systems of procurement and distribution resulting in inadequate treatment access. More disturbing is that these communities often are in need of the essential health factors, such as sterile water, electricity, ablution and suitable nourishment (Economist Intelligence Unit, 2011; Rispel, 2016).

While interventions to better access have begun, health care delivery quality comes under the radar. Therefore, to attain an acceptable delivery of value care concurring with the Institute of Medicine (IOM), (2001), requires the following six specific aims for improvement in Health Care. Hence, healthcare must be:

- Safe—averting injuries
- Effective—evidence-founded to prevent misuse
- Patient-centred—clinical decisions governed by patients' preferences, needs, and values
- Timely—decrease waiting times and unsafe delays for the patients and providers of care
- Efficient—preventing inappropriate use of supplies, equipment, energy and ideas
- Equitable—quality of care with non-discrimination to gender, ethnic group, geographic location, and socioeconomic status.

Similarly, the WHO (2006), in response to the most urgent and key implementation challenges experienced by global health systems and their workforce, advocated the following focus from a 'Working together for health' and a 'Quality of care' approach to include:

- Working up interventions to achieve the health-related MDGs;
- Shifting the healthcare focus to community-based and patient-centred models in management of chronic diseases;
- Addressing disaster and outbreak related challenges
- Preserving health services in conflict and post-conflict states (WHO, 2006).

The above recommendations were aligned to the Health System Strengthening (HSS) strategies as defined by the WHO (2011), to entail the following:

- Procedure to identify and implement changes to health system policy and practice in a country to foster better reaction towards its challenges
- Initiatives and strategies that improves health system functioning- deliver improved access, coverage, quality or efficiency

Hence, the advent of the WHO framework for HSS, with six building blocks is as follows (WHO, 2011):

- Service delivery- that is effective, safe, of quality, available at and when required with optimal use of resources
- Health workforce- that are sufficient in numbers, responsive, fairly distributed, competent, and productive for appropriate health results, with the existing resources and conditions
- Health data system- that yields, examines, distributes and uses dependable and timeous information regarding health (determining factors, system performance and condition)
- Fair and just availability of prerequisites (medicines, vaccines and technologies) that are reliable, of acceptable quality, safe, efficient, evidence based and cost-effective in use
- Health finance system- that pools sufficient money to assure populations receive the required services, preventing financial hardship, provides motivation for providers and users to drive efficiency
- Leadership and governance principles- sound policy structures alongside fostering of partnerships, control, strategic system-design, accountability and responsibility

The winning formula hence lies in a ‘systems approach to healthcare’ delivery, which is defined as "one that applies scientific insights to understand the elements that influence health outcomes; models the relationships between those elements; and alters design, processes or policies based on the resultant knowledge in order to produce better health at lower cost" (Kaplan et al. 2013).

Having highlighted the WHO aims for improvement in health care, South Africa has displayed concerted efforts in recent years of noteworthy developments in the public health approach while focusing on present system disparities (Meyer et al. 2017). However, these efforts are slow and health care providers are at the ‘cold face ‘of patients and find themselves in an “unsupportive environment, with staff shortages and health system deficiencies”, challenging their code of professional ethics and the delivery of quality continuum of patient care (Rispel, 2016). Alongside this is a situation that is compounded by the beleaguering public health challenges. South Africa’s growing “quadruple burden of disease” is overwhelming the current health practice. It is under pressure of a fatal concoction of developing and developed nation health problems. In addition, the widespread of HIV/AIDS and tuberculosis; maternal and child mortality shows similarity with some of the poorest African nations; exploding occurrence of non-

communicable diseases; and chronically high-rates of violence and injuries continue to plague the lives of many South Africans (Jakovljevic & Milovanovic, 2015; Rispel, 2016; KPMG, 2017; Rampamba et al. 2017; Meyer et al. 2017). The high incidence of sexually transmitted infections (STIs) among women and the global growth of antimicrobial resistance (AMR) is of grave concern (Meyer et al. 2017). It is noted that the growing rates of chronic illness of obesity and heart disease are "looming as the greater threat", and are predicted to surpass communicable diseases as "Africa's biggest health challenge by 2030" (Rispel, 2016) and "in many ways, South Africa is a microcosm of the healthcare woes facing African countries" (Economist Intelligence Unit, 2011). Sadly, of note, is that 78% of people from age 50 or above suffer from hypertension in South Africa, making hypertension the seventh cause of death and the main contributory factor for cardiovascular disease in SA (Stats SA, General Household survey, 2015). Further, up to 70% of women and a third of men are currently overweight or obese (Cois and Day 2015 cited in Meyer et al., 2017). Therefore, the low performance for indicators of NCDs, childhood obesity, harmful alcohol use, and mortality due to self-harm and interpersonal violence, advocate further interventions to improve the care of patients in the public healthcare system (Lim et al. 2016; Fullman et al. 2017 cited in Meyer et al. 2017).

Thus, Africa, as a continent, with the world's most impoverished population, has to confront the multiple epidemiological crises simultaneously with impetus. The challenges cited have an insightful effect on the health of South Africans in the move towards the goal of universal and equitable access to healthcare for all citizens (Republic of South Africa, the Department of Health, 2012; 2015). Guidance from The Economist Intelligence Unit (2011), advocated the following reform strategies for Africa to overhaul its Healthcare system. These include:

- Changing healthcare delivery focus from curative to preventive care and sustaining healthy people, while allowing community control and say regarding healthcare resources
- Expanding healthcare availability via mobile technologies
- Instilling stringent management over medicines, medical devices, and their delivery
- Decreasing global aid and promoting more reliable local supplies
- Expanding universal health insurance coverage for the neediest Africans

In addition, Healthcare providers, aid organizations and entrepreneurs cite structural insufficiency as the major contributor besetting Africa's proficiency to address its compounded health challenges. The continent's healthcare systems focus is on curing illness through acute, short-term treatment, fighting infectious and tropical diseases, diarrhoea, maternal and child mortality, instead of preserving health through a preventative approach. However, the growing of chronic illnesses and the rise in populations living longer with HIV/AIDS diseases is now propelling a new paradigm, which demands shifts in healthcare delivery towards good health preservation and broadening the current approach to primary healthcare (The Economist Intelligence Unit, 2011). These experts further emphasize that for such an evolution to materialize, it must be accompanied by a supportive mind set, organizational structure and human resources. Darkoh's, (founding partner of BroadReach Healthcare, an African healthcare services company), perspective on a functional health care system, is that a desirable end result should be expressed as no one needing to ever view the inside of a hospital. He further elaborated that the on-going desire to construct more hospitals and clinics measures a sign of failure. He comments from a standpoint that "we must make disease unacceptable instead of building ever larger infrastructure to accommodate it". He further remarked that violence, road accidents and poor living conditions, plays just as an important role in health outcomes as does lifestyle. Darkoh contends that improved focused education is critical to avert the emergence of chronic diseases among African populations, while highlighting that empowering those with chronic conditions with knowledge regarding management of their health will sit at the core in avoidance of over-reliance on costly and overburdened health workers and facilities (Darkoh, 2010).

Dr Karunakara of MSF supports Darkoh in the evolution of healthcare strategies, emphasizing that such strategies must consider the realities of African life, "We need to develop new models of care to treat people in rural remote areas," (The Economist Intelligence Unit, 2011). Hence, Darkoh advocates a model of healthcare to embrace taking its services to the people rather than having a hospital and clinic-based model wherein patients, themselves, reach out for healthcare, which he defines as a reactive model.

Having said that, in response to the many research interventions of renown experts in various professional roles within the healthcare sector: academics, clinicians, healthcare providers, policymakers, medical suppliers, and think tanks, the SA leadership has pledged a visionary revitalizing and reform plan to restructure its health care provision to close the chasm of inequality, and like many governments, now proclaims the importance of a preventative and community empowering approach. The development of a Ten Point Plan and the National Service Delivery Agreement that was signed with the President in 2010- The National Development Plan (NDP, 2030) established nine long-term health goals for South Africa. Of these, five address the strategies for improving the health and well-being of the citizens. Hence, by 2030, South Africa should have:

- Raised the life expectancy of South Africans to at least 70 years
- Progressively improved TB prevention and cure
- Reduced maternal, infant and child mortality
- Significantly reduced the prevalence of non-communicable disease
- Reduce injury, accidents and violence by 50% from 2010 levels.

While health systems strengthening is addressed by the four remaining goals, geared towards:

- Completing health system reforms
- Primary health care teams providing care to families and communities
- Universal health care coverage
- Posts with skilled, committed and competent individuals

However, Rispel (2016), questions whether the “health policies and NDP strategically posit the health transformation to achieve NHI and what can be done to allow inclusive coalition of all health care role players?”. She calls for a “metaphorical repair of the fault lines to ensure the success of the proposed National Health Insurance system”. Rispel (2016), cites these “fault lines” around:

- Acceptance of incompetence
- Failures in management guidance and governance
- Absence of an efficient and effective district health system, driving primary healthcare
- Incapacity to positively address the crisis in the health workforce

Arguing in tandem with Rispel (2016), is Serfontein (2017), who is affiliated to the 'Free Market Foundation's health policy unit', who elucidated the dire need in timeous addressing of the value public health initiatives can deliver. He further announced that the endeavours for re-engineering demands prompt focus and not to be deluded by NHI expectations. He proposes that in order for the public health system to be repaired, the current resources available require skilful management. He went on to explain that "staff is willing to take responsibility for improving quality, but the system is failing them." He attributes the systemic failures in the public sector not to clinicians but to the administrators (Serfontein, 2017). Coovadia, head of healthcare for Africa at KPMG, concurs with this argument, citing the need for vertical programmes to be scaled and incubated into system-wide benefits, and for capacity-building of workforce and infrastructure, attributing management and leadership capacity as factors behind the sector's uneven effectiveness (KPMG, 2017).

The discussion, hence, leans towards a need for a strengthened PHC system, entrenched in an equitable, community, collaborative and preventative health care delivery, simply put, led by strong leadership with a public Health focus approach.

2.3 NATIONAL HEALTH INSURANCE

"It is time to walk the talk and the whole world is asking for that - health as a rights issue, an end in itself, and also health as a means to development. All roads should lead to universal health coverage..." – Dr Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (2017).

South Africa finds itself at the threshold of achieving momentous and necessary variations in health financing mechanisms. This relates to universal health care coverage taking the form of the National Health Insurance, which is primarily geared towards bridging the divide between health systems of public and private orientation (Keeton, 2010; Republic of South Africa, the Department of Health- NHI, 2012; 2015). These principles are based on the "right to health for all", imbedding equity, social cohesion, efficiency and value of the health system structure, thereby effecting universal health coverage. A health financing method that enables shared funds to deliver inexpensive and excellent need-based services for South Africans, defines the

National Health Insurance. NHI implementation is consistent with the Constitutional commitment. Government, hence, within its available resources, has to realize and achieve this right for its people to have access to health care services, thereby contributing to the populations' well-being that ultimately advances the whole country (Republic of South Africa, the Department of Health, 2015).

Therefore, to achieve this vision, Government has proposed the 10-point plan or 10 key priorities of the National Health System (South African Pharmaceutical Journal, 2010), which details the following:

- Providing Strategic leadership and creation of social contract for better health outcomes
- Implementation of a National Health Insurance Plan
- Quality Services improvement
- Human Resources Management improvement
- Health care system repair with management improvement
- Revitalization of physical infrastructure
- HIV/AIDS Plan implementation and reduction of mortality of TB and associated diseases
- Mass mobilization for better health for the population
- Drug Policy Review
- Research and Development strengthening

Therefore, NHI is intended to strive towards UHC, whose mandate is to ensure that individuals and their families who wish to access health services are not financially challenged. It must include a full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care (WHO, 2017). Therefore, NHI necessitates a substantial policy shift resulting in a massive reorganization of the current public and private health care system, thereby addressing poverty reduction. NHI is hence aimed to deliver a society based on the values of justice, fairness and social solidarity (Republic of South Africa, the Deaprtment of Health, 2015), sharing similarities with the Ubuntu philosophy.

This means that health care services will be brought closest to where people live, echoing many leaders' sentiments. The health care services will also be accessible at the suitable level of care with the aid of the NHI card, gaining entry to certified and accredited public and private providers. NHI also promises a more reactive and accountable health system. Furthermore, it is intended to enhance customer satisfaction, ensure improved quality of life and improved health outcomes embracing all socio-economic categories. In turn, this will constitute improved human capital, labour productivity, economic growth, social stability and cohesion (Republic of South Africa, the Deaprtment of Health, 2015). Hence, NHI implementation will span three phases over a fourteen-year period, started in 2012. The first five-year phase, focussed on strengthening service delivery and the overall quality in the public health sector. Stemming from lessons learnt on world UHC, Coovadia advises that by "having patience does not mean taking your foot off the accelerator, or accepting a lack of progress. It means understanding that this is a large and daunting task and that we must all work together to see it through successfully" (KPMG, 2017).

Of grave concern, for this study, is the forecast that NHI has for Primary Health Care (PHC). What is envisaged is re-engineering through four streams to timely improve access and to promote health and prevent disease. The streams include, Municipal Ward based Primary Health Care Outreach Teams (WBPHCOTs); Integrated School Health Programme (ISHP); District Clinical Specialist Teams (DCSTs); Contracting of non-specialist Health Professionals. Despite the extensive management and governance improvement initiatives of health facilities at PHC and hospital levels, further strengthening of structure, powers, delegations, financial management and accountability will ensue (Republic of South Africa, the Deaprtment of Health, 2015). Self-reflection by The Office of Health Standards Compliance (OHSC), serves as a dashboard to assure quality health services through compliance to norms and standards and remains instrumental in certifying health establishments around the country. The Ombudsman will ensure accountability with corrective behaviour. In addition, the implementation of Operation Phakisa Ideal Clinic Realization Programme is aimed at improving the performance and quality of health services in the PHC facilities. Operation Phakisa will later be extended to public hospitals and their quality strengthened. However, this initiative at present is seen as a means of compliance, rather than an avenue for improvement. However, a need for committed

sustainable intervention is paramount for its intended success (Republic of South Africa, the Department of health, 2015).

For NHI, to function effectively, patients and health workers require a safe and conducive environment. A call for good quality public health infrastructure with electricity, water supply, sanitation and waste management, reinforced by effective transport and communication systems is imperative. To ensure sustainability, a comprehensive and reliable maintenance plan must be established (Republic of South Africa, the Deaprtment of Health, 2015). In order for 'buy in' of NHI by the public at large, improvement in management and governance of health facilities is essential, "to position them as providers of choice" for highly specialized and reasonable services for the citizens (Republic of South Africa, the Department of Health, 2015). This compels central hospitals to develop new governance structures. Hence, government and the funding model must encourage participation of academia, and the public towards promotion of good governance, academic excellence and support to the lower levels of care (Republic of South Africa, the Deaprtment of Health, 2015).

The second phase of NHI implementation, started in 2018, is forecasted over five years, commenced with registering of the population and issuing of NHI Card at nominated public facilities using the "unique identifier linked to the Department of Home Affairs". Priority will be afforded to vulnerable categories: children, orphans, the aged, adolescents, and people with disabilities, women and rural communities. Hence, accreditation of the public hospitals, Emergency Medical Services (EMS) and National Laboratory Health Services (NHLS) will be through the Office of Health Standards Compliance (Republic of South Africa, the Department of Health, 2015).

The health workforce, being the key pillar of the health system, will necessitate planning, development, provisioning, distribution and management of human resources to meet the needs of the population. At primary health care level, contracts with private practitioners, including GPs audiologists, speech therapists, oral hygienists, occupational therapists, psychologists, physiotherapists and optometrists for school going children will be strengthened. The transition phase will amend the Medical Schemes Act to provide complementary cover until NHI is fully

implemented (Republic of South Africa, the Department of Health- National Health Insurance for South Africa, 2015). Finally, the third phase of implementation will ensue over the last four years, focusing on NHI Fund functionality. Health facilities deemed eligible would require OHSC certification and accreditation by the NHI Fund. This will also apply to private hospitals and specialists. Furthermore, added revenue for the NHI fund will occur through mandatory prepayment from those eligible (Republic of South Africa, the Department of Health-National Health Insurance for South Africa, 2015).

However, recent criticism and gaps of the National Health Insurance White paper, was interrogated by the UKZN panel, (Matiwane, 2017). The key issues addressed were in relation to a rights-based orientation to health care. This entails the state's responsibility to create a plan and budget, factoring in human resources and their participation in the health system. Experts from the private, public health and education sectors identified disparities with the proposed and implemented strategies of NHI lacking in such commitment to fulfil the rights-based approach to a health care system. Mr. Vally, deputy director -Foundation for Human Rights, cited that the poor and vulnerable will only be prioritized to receive NHI cards, and not in relation to the service offered. Concerns over the lower socio-economic brackets receiving below average health care and rural populations challenged to access health facilities, was echoed by Prof- London. He further alluded to the lack of information that NHI is affording communities and the language barriers of the many health care providers. A patient having to bring their own interpreter, infringes on privacy, stifles valuable communication and impedes the probability of good clinical outcomes. The panel further criticized the lucidity of the White paper on how non-discrimination, might result in victimizing in practice against rural populations that rely on inferior quality of state services. This panel concluded to recommend NHI to create effective mediums for collaborative decision-making (Matiwane, 2017). Further to this, it is cited by Zweigenthal and colleagues in the South African Health Review, (2016), that the promulgation of the White Paper on NHI, emphasizes the national health service financing options. This underlines the health system changes essential to effect an equitable, cost-effective needs-based approach to health. However, the HST has criticised the White Paper in respect of its weak strategies in making PHC the core of the NHI and an associated prominence on prevention (HST, 2016).

Reviewing the document for pharmaceutical implementation strategies under NHI draws attention to the contracting for pharmaceutical services, to facilitate improved access for stable patients. The attainment thereof will be firstly through the following approved medicine collection points within the community; schools, churches and community pharmacies. Secondly, pharmaceutical services access for Chronic stable patients in the public sector will improve to include the use of chronic medicine pre-dispensing and delivery to a point closest to the patient, thereby assisting with decongesting of public clinics, by way of the Centralized Chronic Medication Dispensing and Distribution (CCMDD) programme. The programme components are Central Chronic Medicine Dispensing and Distribution (CCMDD) and Pick-Up Points (PuPs) for both ARV and general chronic medication (Republic of Southn Africa, the Department of Health, 2015). In addition, the PSSA (2012), identified a neglected element of the district specialist support team- that being, the pharmacist. The society maintains that for improved therapeutic outcomes, appropriate use of medicines, specifically paediatric alike is crucial. Further motivation to support such an inclusion is the need to strengthen pharmacovigilance at all levels, but most importantly is the monitoring of patient outcomes of prescribing professionals other than medical practitioners (PSSA, 2012).

This study, likened to the above concerns raised, aims to highlight in addition, the pharmaceutical care clinical gap in the NHI strategies to serve the socio- economically deprived rural populations.

2.3.1 NHI in relation to the Pharmacy Profession

The implementation of NHI is anticipated over 14 years. Although the initial process has prolonged, the progression towards a financing system will influence substantial challenges for the pharmacy processes related to selection, procurement, distribution, and use of medicines, wherein “pharmacists will play a central role” (Gray et al. 2016). Of importance to note is that there is synergy between the responsibilities of the OHSC and those of the statutory councils that establish, maintain and control professional standards of education and practice. In the pharmacy profession this function is performed by the South African Pharmacy Council, which is established in terms of the Pharmacy Act, Act 53 of 1974 (PSSA, 2012). It is unique among the other health care professions, in that the premises and facilities, from which pharmacists

deliver their services, are diligently controlled and monitored by the SAPC. Compliance to minimum standards is detailed in the good pharmacy practice (GPP) rules and regulations, in relation to the Pharmacy Act. In order to maintain such pharmacy standards, aligned with NHI processes, given the scarcity of resources, the PSSA (2012), advocate that close co-operation between OHSC and the statutory councils would allow for efficiency and effectiveness of optimal compliance, without wasteful duplication.

In addition, the Society explains that the OHSC, being the responsible body for health establishments compliance certification with the prescribed norms and standards, should recognize the current licensing of pharmacies by the DOH and inspection and recording with SAPC, following compliance standards to GPP. Having accepted this, OHSC can delegate such certification to the SAPC. Given that regular inspections are carried out by SAPC, to ensure on-going GPP compliance is adhered to, would not necessitate the need for OHSC to conduct additional inspections. In relation to investigating and addressing of complaints, the SAPC has a mechanism in place. Therefore, PSSA (2012), advocate that knowing that the OHSC is mandated with this function, duplication must be guarded against (PSSA, 2012). In light of pharmacy practice transformation, within this new model, Gray et al. (2016), further reinforces that specialist clinical pharmacists and pharmacy policy specialists will form an essential dimension in the “new health system design and its operation”. Gray and colleagues (2016), brought to focus that the options of collaborative practice have not been given much attention as it deserved. He affirms that “this is not merely a question of task shifting, making do with what resources are available, but an option that could deliver both efficiency gains as well as effective solutions to the challenges of improving the responsible use of medicines” (Gray et al. 2016). Therefore, as SA transforms its health care delivery, “pharmacists will need to play a crucial role in managing system and policy development, to ensure the provision of equitable patient care and access to essential medicines across all sectors” (Gray et al. 2016).

Furthermore, in this study, compliance of the PHC and CHC facilities being under investigation is crucial for allowance of the proposed integration of the PCDT pharmacist into the context.

2.4 NATIONAL CORE STANDARDS

The National Core Standards forms the foundation upon which quality can be achieved. Therefore, in defining quality means getting the best results possible within the available resources (Republic of South Africa, the Department of Health, 2007); and to achieve health systems basic goals of health development and receptiveness towards population expectations (WHO, 2006). Quality has six elements as regulated by the World Health Organization (WHO, 2006). Hence quality must be:

- Effective
- Efficient
- Accessible
- Acceptable/patient-centred
- Equitable and
- Safe

Hence, for quality to be achieved, it must firstly be defined; secondly, standards for achieving quality must be developed and implemented; thirdly, indicators must be crafted to measure quality and performance; and fourthly, a body must be instituted to ensure that compliance is monitored and sustained. A standard is viewed as an expected level of quality delivery. Therefore, standards reflect the “ideal performance level of a health establishment in providing quality care” (Republic of South Africa, the Department of Health, 2011). Hence, National Core Standards are derived from the South African policy context. These embrace existing legislation, policies, guidelines and protocols specific to the Department of Health, Treasury, Department of Public Service Administration or the King guidelines on corporate governance (Republic of South Africa, the Department of Health, 2011).

Achieving compliance to these standards will proactively position systems to avert and reduce the impact of the vital risks to quality care. In Primary Health Care where some features of care are managed and supported either by district, province, national, or company corporate level, these have been included (Repiblic of South Africa, the Department of Health, 2011).

The National Core Standards encompass seven domains that spans over one another. The first three: patient rights; safety, clinical governance and care; and clinical support services, talks to the core business of the healthcare system. The remaining domains: public health; leadership and corporate governance; operational management; facilities and infrastructure, serve as the support structures, where their delivery relies on health care employees (Sekhejane, 2013).

The patient rights domain covers what a hospital or clinic must practice to respect the rights of patients, in line with Batho Pele principles and the Patient Rights Charter. In respect of the patient safety, clinical governance and clinical care domain, the quality of nursing, clinical care and ethical health practice is addressed. This speaks of mechanisms to lessen clinical risk related to unintended harm to patients; to avert or manage adverse events; and to give support to those affected patients or staff. In addition, the domain of clinical support services ensures efficient provision of clinical care related to suitable availability of medicines; diagnostic, therapeutic and other clinical support services; medical technology with monitoring systems for healthcare. The domain on public health talks to ways health facilities should engage with non-government organizations and local community stakeholders. This approach is guided in ways of health promotion, prevention, to decrease any health complications and disasters, thereby, ensuring that integrated quality care is afforded to populations (Republic of South Africa, the Department of Health, 2011).

Furthermore, leadership and governance domain guides strategic planning, proactive leadership, communication, quality improvement, and risk for senior management. The public voice is heard through support from the hospital board, and clinic committees. Further, day-to-day responsibilities of support, assurance of safe and effective patient care, human resource management, finances, assets, consumables and patient information records is monitored through the hospital management domain. Lastly, and by no means of least importance remains the facilities and infrastructure domain that speaks to the one major challenge facing the public sector currently. This covers elements of well-managed safe, clean, secure buildings, plant and machinery, equipment, hotel services, including disposal of waste (Republic of South Africa, the Department of Health, 2011).

NDOH, in instituting the NCS, has the vision of good governance. However, this demands being maintained and sustained for quality assurance. Bearing in mind that the study was conducted within the PHC context, much attention is devoted to explaining the concerted efforts of the SA Government in detailing the processes to achieve such quality healthcare delivery to be constitutionally, morally and ethically worthy of public acceptance. The pharmaceutical care model approach envisaged, too, will only add to the moral obligation towards quality of patient care keeping its mainstay in line with the seven domains aligned to the PHC context as discussed above.

2.5 IDEAL CLINIC CONCEPT

"The people of South Africa deserve much better from all of us. Through Operation Phakisa and all our other key strategic interventions to achieve the goals of the National Development Plan, we must work tirelessly to move our country forward and build a better life for all, especially the poor and the working class." (Former President of SA-Jacob Zuma, 2014).

To ensure quality healthcare service provision, optimal clinic performance requires a set of constituents to be available and functional to render it an 'Ideal Clinic' (Republic of South Africa, the Department of Health, 2017). An Ideal Clinic is characterised by good infrastructure, adequate staff, adequate medicine and supplies, good administrative processes, and sufficient adequate bulk supplies. It implements the required clinical policies, protocols and guidelines, and embraces partner and stakeholder support. Collaboration over the social determinants of health with other government and non-government departments, and the private sector is expected. Within the Ideal Clinic concept, the delivery of clinical services focuses on more integrated approach in management, requiring the on-going burden of chronic diseases to be addressed proficiently and cost effectively (Republic of South Africa, the Department of Health, 2010). The fundamentals of this study will bring to light the pharmaceutical aspect of clinical patient care, which is lacking in the 'ideal clinic' concept.

Operation Phakisa seen as an innovative and pioneering results-driven approach aims for sound compliance by staff committed to optimal and collaborative delivery of healthcare services. "Phakisa" translates to "hurry up" in Sesotho highlighting "government's urgency to deliver".

Through Operation Phakisa, Government aims to accelerate the implementation of priority programmes better, faster and more effectively. The National Health Council's directive was that all Primary Health Care facilities must attain 'ideal' status by 2018. With this mandate every province was required to develop a scale-up plan, in which a Perfect Permanent Team for Ideal Clinic Realization and Maintenance was appointed. The teams are responsible to conduct status audits at all the clinics and assist to improve the quality of care delivered. Given the PHC context of the study, the attainment of ideal clinic status of the facilities need to be understood and investigated alongside the attempts to propose and develop a collaborative pharmaceutical care model.

2.5.1 Ideal Clinic Status

The Ideal Clinic dashboard is used to determine the operational status of a clinic. Version 18 is currently in use (Republic of South Africa, the Deparment of Health, 2018). This manual is a working document, having ideal clinic definitions, components and checklists, which are annually modified and updated. The new release included two new Important elements; under Infection prevention and control - the indicator for the availability of Green waste receptacles for pharmaceutical waste; and under Medicines and supplies, the indicator for monitoring expired medicine on the shelves. The dashboard comprises of 212 elements, categorized into 10 components and 32 Sub-components. Developing and sustaining the 'ideal' PHC clinic requires the 10 components to be positioned and functional. These components include:

- Administration
- Integrated Clinical Services Management
- Medicines, Supplies and Laboratory Services
- Human Resources for Health
- Support Services
- Infrastructure
- Health Information Management
- Communication
- District Health System Support
- Implementing Partners and Stakeholders

Each of the elements on the dashboard is weighted as follows (Republic of South Africa, the Department of Health, 2011):

- Vital elements- extremely important that demands immediate and complete remediation. These impact direct patient service delivery and clinical care, with immediate and long-term adverse effects on population health
- Essential- very necessary elements, involving process and structure that indirectly impacts the quality of patients' clinical care requiring a ruling within a set time period
- Important- significant process and structural elements affecting the quality of the environment wherein patients receive health care, must be addressed within a time period

The elements discussed above are scored as green, if achieved, amber when partially achieved or red, if not achieved. The average score, of the 212 elements weighted, determines whether a clinic has qualified for one of the four Ideal Clinic categories; silver, gold, platinum or diamond. An 'Ideal Clinic' status achieved for a facility, requires a minimum score of 90% as Vital, 70% as Essential and 68% as Important. This will translate to a facility status of silver. Depending on how a facility performs, it will be scored and subsequently categorised as either, no category achieved, silver (70-79%), gold (80-89%) and platinum (90-99%). However, when a clinic obtains a high average score of 80%, it does not qualify for an Ideal Clinic category because the minimum percentages as per the weighted categories are not obtained. In addition, managers providing healthcare at the different levels are equipped with the guidance of the Ideal Clinic manual to understand and interpret the requirements for achieving 'Ideal Clinic' status. The manual walks the clinic manager and staff, step-by-step through on how to achieve every element on the dashboard (Republic of South Africa, the Department of Health, 2016; 2017; 2018). The SDIP 2016/2017- 2018-2019, aims for all PHC facilities in South Africa (609 PHC clinics) to deliver optimal quality, integrated healthcare from a patient, healthcare provider and community standpoint and attain an ideal clinic status of 100% by 2020.

An ideal clinic status achieved, places the clinics in readiness to achieve 'ideal service delivery'. Such a status, thereafter, stands the clinics in good stead to explore the pharmaceutical care

model approach. The clinics under investigation in the study will be assessed and their status will be determined and discussed.

2.5.2 Ideal Service Delivery for Primary Health Care

A PHC clinic, with ideal status is aspired to deliver the following (Republic of South Africa, the Department of Health, 2014):

- Promotion of healthy lifestyle by empowering communities through education and information to take individual responsibility for health
- Provision of good quality care
- Access to essential medicine, clinical equipment and supplies timeously and effectively
- Clean, safe and comfortable environment for staff and patients
- Community engagement and inter-sectoral collaboration on social determinants of health
- Ease of transfer of patients to the nearest referral facility
- Delivery of PHC services supported by knowledgeable, skilled and motivated staff
- Integrated and supported health management information system

The Ideal Clinic Realization and Maintenance (ICRM) Lab was instituted to deal with the greatest challenges facing South Africa's primary health care (PHC) structure. The ICRM Lab was divided into eight work streams:

- Service Delivery
- Waiting Times
- Infrastructure
- Human Resources for Health
- Financial Management
- Supply Chain Management
- Institutional Arrangements
- Scale-up and Sustainability

The Service Delivery work stream for the ICRM revealed that the current Primary Health Care model is one of a Vertical Delivered Curative Service. They in addition identified numerous issues that affect the optimal functioning of the PHC system (ICRM, 2015). Some are as follows:

- insufficient waiting areas
- lack of SOP's and policies
- erratic application of PHC by provinces, and poor District control
- no appointment scheduling system
- no standardized records & processes
- lack of non-specific disease records/files
- monotonous procedure for retrieving files, infrastructure limitations for electronic file management
- disease centred care rather than patient centric
- lack of integrated services
- inconsistent primary health care guidelines
- poor health promotion and disease prevention
- no alignment with tertiary institutions regarding service delivery
- no clinical Governance
- no accountability for overspent budget
- depot stock outs
- unclear roles and responsibilities for medication management
- lost and unnecessary repetition of lab results, distance from laboratory services, inadequate lab results, lack of ownership for expensive tests- Hb-FBC.
- lack of information of current structure and need
- inequitable distribution of service delivery resources
- facility development decisions not based on sound ethical principles
- lack of ownership and impractical decisions
- absence of information of current structure and need
- lack of accountability- no reporting
- lack of referral processes to nearest hospital, unstructured referrals, patients lost in the referral system, no standardized referrals with feedback mechanisms

- staff incapable of treating emergencies
- poor response times
- poor continuum

Aligned to the above findings, the Office of Health Standards Compliance (OHSC), presented their inspection results (2015-2016 report) of the public health system in Parliament. The outcome revealed an alarming constant quality decline in all public healthcare facilities, in comparison to the 2012 baseline facility inspections, despite NDOH emphasis and plans of achieving transformation through improving quality at public facilities. The areas of concern were workforce, medicines and supplies, logistics, waiting times, and cleanliness, of which deteriorated over the four years, highlighting deficiencies in supply chain and staff availability required for effective delivery of healthcare (ICRM, 2015).

The scale-up of all PHC facilities, addressing the deficiencies as detailed above, is therefore anticipated to be completed by 2018/2019 (ICRM, 2015). Having said that, the system failure repair is reflected in the comparison of results of the General Household Survey (Stats SA, 2012; 2014; 2015), wherein the degree of patient satisfaction for public healthcare facility access in relation to the initial facility audit, reflected 79,2% and 7.7% that were very dissatisfied. Positively, this percentage steadily increased, as more patients accessed the public health facilities, showing 81,7% of satisfaction, compared to 5,3% that were very dissatisfied (Stats SA, 2017).

It is imminent that in order for healthcare facilities to deliver services, they need to be completely compliant with national norms and standards for NHI accreditation. Such endorsement will be continuously updated and disseminated as regulated by the National Health Amendment Act, 2003 (Act No. 61 of 2003) (Republic of South Africa, the Department of Health, 2017b). Hence this study intends to identify and address the pharmaceutical care gaps that exists within the ideal clinic concept by building and integrating the pharmaceutical managerial expertise to allow for holistic clinical patient care at PHC.

2.6 MEDICINE USE WITHIN THE PUBLIC HEALTHCARE SYSTEM IN SOUTH AFRICA

One of the underlying principles of South African National Drug Policy (NDP) is aimed at affording widespread healthcare in SA by lowering private healthcare costs and enhancing the quality of public health delivery (NDP, 1996).

With the right to health being a constitutional provision in South Africa, recent years has seen significant strides of concerted efforts by the NDOH in all levels of health care, guiding and addressing the current inequalities towards the improvement of quality delivery of healthcare within the public health system. Among such initiatives include major activities involving the accessibility to medicines alongside continuous initiatives to enhance care and safety to patients (Meyer et al. 2017). These are as follows:

- Development of a National Surveillance Centre and an innovative early warning system for the supply of medicines (Stock Visibility Solution - SVS)
- Availability of medicines through the initiation of stable chronic disease management initiatives (Centralized Chronic Medicine Dispensing & Distribution- CCMDD) to increase the number of external pick-up points for medicines programmes
- National Health Care Pricing Authority and strategies to better contract procedures
- Developments to enhance supply chain and promoting Medicine Procurement Units in the provinces with improved forecasting competencies
- Ongoing programmes to enhance adherence to medicines by encouraging prescribers to comply with the Standard Treatment Guidelines and the Essential Medicines List by improving on their availability
- Drive for enhancement of the role of health technology evaluation in future decisions
- Development of a guidance document on the role and process of PTCs to enhance medicine use at provincial, district, and institutional levels
- Enhancement of suitable and accurate medication procurement and usage choices for sustainable financial practices driving patient care improvement
- Hospital initiatives of intensified focus on reducing antimicrobial resistance through initiating stewardship programmes

- Improvement in adverse drug reaction reporting and related activities, such as pharmacovigilance

Furthermore, initiatives encompassing the NHI develop from current national medicines policies, the Standard Treatment Guidelines (STGs) and Essential Medicine List (EML) (Meyer et al. 2017). In addition, the Central Chronic Medicine Dispensing and Distribution (CCMDD) programme in South Africa, has been initiated since 2014 to improve chronic medicines access and aimed to enhance patient compliance by bringing the services closer to the people, given the growing incidence of NCDs (Republic of South Africa, the Deaprtment of Health, 2015; Department of Health KZN, 2016a). However, according to Meyer et al. (2017), there remains a concern over the degree of teaching of chronic patients regarding the CCMDD programme and the ensuing effect of medicine adherence, leaving an avenue for pharmacist intervention.

2.6.1 Quality of Pharmaceutical Care Service Delivery

Unquestionably, pharmaceutical products play a pivotal role in health care provision. They continue to drive treatment if used properly, which in turn drives positive patient outcomes, along with their improved quality due to the transformation of pharmaceutical products in treatment and prevention of many diseases (NDP, 1996). As such, pharmacists and well-functioning pharmaceutical services in healthcare fulfil such a role. However, the epidemiology profile shifts of South Africa has demanded the expansion of services provided by public healthcare institutions, resulting in a mammoth strain on available resources contributing to medicine shortages and impacting on the quality of care delivered (Meyer et al. 2017). From a healthcare quality viewpoint, of significant interest is the need to distinguish the purely clinical from the experience because it is particularly the experience that is the ultimate determinant of the quality of care rendered. Clinical quality, is referred to as the degree in which the clinical interventions experienced by those individuals served by the health system enhances the quality of their life, while all other things remaining equal, is vital to the experience (Reinhardt, 1998).

However, within the public healthcare sector, lessons in quality healthcare provision still remains a green space. A study that can draw valuable recommendations for the public sector at this point in time with regards to NHI and UHC bears reference in the private hospital pharmaceutical

health care group (Thobeli, 2007). The following factors are deemed to impact on pharmaceutical service delivery, elicited from customers' contributions in a private sector (Thobeli, 2007):

- Availability of pharmaceuticals as well as infrastructure to ensure procurement, safe keeping and correct dispensing of pharmaceuticals
- Competency of the service provider to deliver reliable services
- Readiness of the service provider to assist customers with consideration
- Capacity of the service provider to be knowledgeable and to inspire confidence and trust in customers
- Ability of the service provider to care and display empathy towards customers

The message is no doubt clear, that more care, empathy, knowledge about the service offered, confidence of professionals' clinical knowledge and availability of pharmaceuticals are paramount to a patients' list of concerns.

Similarly, of grave concern to the public sector, in addition is the following insight with regards to the delivery of quality service elicited by pharmaceutical service providers within the private sector (Thobeli, 2007):

- Performing one's work with passion and sincerity and not merely a contractual obligation
- Ethics, fluency in one's work and willingness to learn, rate as important elements
- Recognizing challenges (adherence to hospital protocols, rigid time frames and maintaining uniformity of standards throughout the hospital) for the provision of quality services and using them as inspiration to perform better
- Measuring the level of fulfilment that customers experience when their expectations are matched by the experience of the service they received
- Recognizing that the pharmacy profession is dynamic, customers' expectations change, and the need to continually keep abreast with developments serve as impetus for continuing professional development for pharmacists
- A leadership approach that seeks to guide others and allow them an opportunity to contribute positively and freely as professionals

- Interaction of pharmacists and members of other health care professions involved in the multidisciplinary team is needed for the benefit of the patient. In addition, continued cooperation and professional development of the health care team with good interpersonal communication style is invaluable

The above insight strongly highlights the need for a multidisciplinary team approach, where pharmacists are willing to engage in continuous professional development, innovative enough to inspire change through challenges, be ethical and to lead fuelled by customers' expectations to ensure quality patient care services.

Most importantly to establish the expectations of customers regarding the delivery of pharmaceutical services in a private sector hospital group were as follows (Thobeli, 2007):

- Health care consumers require treatment to be explained in a manner that is caring and takes into consideration their cultural background and consent
- They also expect to be treated in a scientific approach based on expert knowledge that offers them beneficial results that exceed the risks involved in their treatment.

In particular, there was absolute agreement by the customers on the important role pharmacists have in the hospitals in ensuring that medicines are available at all times. Some uncertainty and difference of opinion on the reliability of pharmacists to perform the services offered, their responsiveness to assist customers, their assurance by being knowledgeable and to inspire confidence and trust and their ability to show empathy by being caring and displaying compassion towards clients was identified. Patients support of having a medium to voice their dissatisfaction with the pharmacy service provided, required increased cooperation amongst health care providers especially doctors, nurses and pharmacists regarding their medicines and treatment options. Furthermore, they were in agreement that pharmacists are a helpful resource for medical related information (Thobeli, 2007).

On the other hand, the nurses believed that the provision of quality pharmaceutical service entailed the availability of medicines and drug related patient counselling, equally for inpatients

as for discharged patients. Some nurses displayed reservations of the delivery of pharmaceutical services not being in line with their expectations, not on time, inefficient and not always accurate. Moreover, some nurses expressed that pharmacists don't always perform their service in a friendly manner and are not always a helpful resource for medicine related information. Notwithstanding the general positive appreciation that nurses had of the pharmaceutical services, these doubts seriously call into question the quality of pharmaceutical services delivered by the pharmacists. There was also uncertainty expressed with regards to the pharmacists' capability to contribute to patients' treatment and wellbeing, that pharmacists are better informed about medicine-related patients' rights, that pharmacists should go on ward rounds to check prescription charts with the option of making suggestions related to patients' prescribed medicines and that pharmacists always provide an accurate service. This shadows doubt on the pharmacists' knowledgeability and to inspire confidence and trust (Thobeli, 2007).

With regards to the doctor's perceptions, there was no doubt that once discharged, patients should be able to contact the pharmacist on duty with queries related to their medicines. This stems from the assurance that pharmacists are a helpful resource for medicine related information. Doctors also concur that clients should voice their dissatisfaction with the pharmacy service provided. This is a vital aspect to ensuring quality service provision since it serves as a feedback mechanism (Thobeli, 2007). Furthermore, some doctors were strongly opposed to pharmacists involved in the planning of the patients' treatment. They did not support pharmacists on ward rounds to check prescription charts and of making suggestions related to patients' prescribed medicines as well as increased cooperation amongst health care providers regarding patients' medicines and treatment options. According to Thobeli (2007), this discord, may emanate from the viewpoint that doctors are overall in charge of the patients' treatment, and therefore, prefer to solely decide on their treatment (Thobeli, 2007). This perspective is, however, not in sync with that of patients with regards to inter-professional collaboration in their treatment management.

Although the above findings and recommendations to ensure quality pharmaceutical care stems from a private sector hospital, which presumably is driven by profit margins, patient care features strongly as a factor. The lessons learnt from both the doctor's and nurse's perceptions of the

pharmacist within the private context reflect positive needed change and mind set, towards how the public sector pharmacists need to view their patients and the healthcare they deliver to render quality service provision for the success of NHI to be eminent.

2.6.2 Pharmacist Role in the National Health Insurance

As the South African NHI strategy moves into the second stage of implementation, the role of pharmacists is herein featured. The Pharmaceutical Society of SA's (PSSA's), Lorraine Osman, confirmed the establishment of a task team to foster practical proposals for pharmacists' participation in the system. This entails close workings with Dr Anban Pillay, deputy director-general for health regulation and compliance management, "to map the way forward" (Medical Brief, 2017). But, what, does this mean? Are Pharmacists ready for the change? What is expected of them?

Joggie Hattingh, president of the South African Association of Hospital and Institutional Pharmacists, advised that all pharmacists must involve themselves in continued professional development, in preparation for this change, which is integral to professional growth (Gumede, 2017). In addition, The Pharmacy Advisory Board is a newly established body (in February 2017), constituting pharmacist' representatives from majority of fields, aimed at transforming the fraternity by identifying pharmacists' daily challenges and their functions in the "changing health landscape" (Gumede, 2017). The board is constituted of stakeholders from various pharmacy disciplines and academia, to seek solutions to challenges facing the South African pharmacy sector and to 'drive collaborative change'. It advocates that pharmacists and pharmacies have an increasingly valuable role in the provision of primary health care services in SA (Medical Chronicle, 2017). In support, the National Drug Policy of South Africa (NDP, 1996), clearly spells out the role of the pharmacist. It acknowledges pharmacists' extensive expertise which places them in a suitable position to promote the rational use of medicine and that pharmacists have an indispensable role and contribution to make as professionals within the re-vitalization and re-engineering of primary healthcare and preventative health services (SAPJ, 2012). Hence, it can be deduced that pharmacists can add value to this change, which can prove worthy, given the opportunity.

According to Gilbert, (1997), there is a local study scarcity related to exploring the community pharmacist role in PHC. However, a study of note was conducted in KwaZulu- Natal (KZN) PHC sector, examining the public health pharmacists' role, highlighting that such services rendered by pharmacists were lacking. In particular, attention was drawn to the hospital-based pharmacists non-provision of much needed pharmaceutical services at PHC clinics in KZN, suggesting the filling of this gap (Kishuna, 1996). However, pharmacist's intervention currently at public PHC, is one of support and overseeing MSM performed by the Pharmacist Assistants that are either permanently stationed there, or roving as outreach support to the clinics. What is evident within KZN, is the disparity in support processes offered by the public pharmacists at PHC clinics within the various districts and sub-districts. A second study conducted in primary health care clinics in KwaZulu-Natal, evaluated pharmaceutical services competency in respect of ARV treatment care. Crowley & Etelleriberg (2015), identified that scarcities of resources in PHC and the lack of pharmacists necessitated DSM and the prescribing and dispensing to be expanded to professional nurses. The recommendation was that well-defined guidance for PHC to support nurses in sustaining the principles of pharmaceutical provisions in decentralized ART services (Crowley & Etelleriberg, 2015). This translates to mentoring, training and empowering of PHC nurses to deliver optimal quality pharmaceutical care services.

In addition, a recent article entitled *Are There Too Many Pharmacists*? within the American context, spoke to the diversity and potential of the profession (DeBenedette, 2018), describing it as having 'a world of opportunities opening up' where models of integration of pharmacists into physician group practices is seen on the horizon (David Fong, a member of the Editorial Advisory Board of Drug Topics). He agrees that there are expanding roles with new types of jobs for pharmacists, and a need for those who are qualified for those new roles, thus encouraging pharmacist towards specialty training, by perusing advanced qualifications. In addition, the rural areas were identified wherein that need could be filled. In contrast, developed countries, finds pharmacists sub-optimally utilized in which their roles as health experts is not valued by either the community nor different health care benefactors (Azhar et al. 2009). Likewise, the profession of pharmacy in SA is only beginning to realize the pharmacist potential; it lags lengths behind in comparison and has to take that bold step in changing the pharmacist role and entrenching its

rightful place within the professional environment to bring value to the healthcare system and demonstrate the difference it can make.

The advent of NHI and PHC re-engineering is, therefore, a suitable junction to showcase the pharmacist. This study will aim to demonstrate the robust scope that pharmacists can have and the vital role they can play in patient care and outcomes and ultimately the positive impact they can afford to the future of healthcare, more importantly in the public rural domain, at the most decisive time in South Africa's health care transition.

2.7 HEALTH CARE EXPENDITURE

Universal health coverage (UHC) is said to improve population health outcomes and addresses gaps in health inequalities, given political, social, economic, and health leadership is combined with developed health systems that can ensure efficiency and equity (Dieleman et al. 2018). Therefore, UHC calls for 'pooled resources' to ensure the delivery of vital health services without financially burdening households (Dieleman et al. 2018). Furthermore, Dieleman et al. (2018), highlighted that, unless deliberate efforts are made by governments, helpless populations, e.g., the poor, informal workers, and those living in rural areas, might be without health care. This atrocity serves to motivate the need for a structured collaborative public healthcare sector model.

Governments were also cautioned that for any success and efforts towards UHC to be recognized, the presence of good governance and leadership at the national and local levels is required, bearing in mind the influence of factors such as physical infrastructure and education systems on the progress toward UHC (Dieleman et al. 2018). In addition, it has been established that access and quality, being critical priorities for UHC, drives the achievement of related SDGs (Barber et al. 2017). An important priority, according to Meyer et al. (2017), is to quantify the degree of personal healthcare and access impact in relation to population health improvement, and ultimately health system performance, considering that the extent and quality of UHC reflects the level of human improvement in a country (WHO, 2017).

In South Africa, health is fostered by The Vote purpose providing guidance and support of health services that are easily accessed, has a caring approach to the delivery of acceptable standards

of PHC for all its people. The commitment and political will is displayed and outlined by the financial allocations to meet its vote and mandate (Republic of South Africa, the Department of Health-National Treasury, 2017). The government spends 14.2% of its budget on healthcare, which is close to the 15% agreed upon by African countries in the Abuja declaration (KPMG, 2017).

Almost 86% of health services in South Africa are delivered by way of the public sector, while about 50% of its spending is government financed (Republic of South Africa, the Department of Health, 2015). The small private sector (16.3% of SA society), provides for medium to high income earners. An inequitable access in the health delivery is due to a laterally segmented population of socioeconomic standing giving rise to a “two-tiered” health system (van Zyl, 2016). Notwithstanding that private healthcare in South Africa is known to be unaffordable and comparatively unattainable to most. Medical Aid subscription and out-of-pocket expenses by members is increasing at an alarming rate making private healthcare difficult to sought after in the future (van Zyl 2016). Hence, the majority of the SA population remain reliant on public healthcare. To further add to this burden, the country continues to experience a high prevalence of HIV/AIDS and tuberculosis and an increase in non-communicable diseases, which further plagues its resources.

Government health expenditure (GHE) as a percentage of total health expenditure (THE) increased from 39.9% in 2006 to 48.4% in 2013. External resources decreased from 2.3% to 1.8% of the over the same period. The total expenditure on health was R333.5 billion in 2015, which represented about 8.6% of GDP (Republic of South, the Department of Health, 2015, cited in Health Financing Profile, 2016), way above the 5% recommended by the World Health Organization (WHO, 2016). Hence, about 8.5% of South Africa’s gross domestic product (GDP), translated to around R332 billion spent in monetary terms on healthcare. Despite this high expenditure, poor health outcomes remain, in comparison to other similar middle-income countries. This disparity can largely be due to the inequities between SA’s public and private health sector (Health Financing Profile, 2016).

However, South Africa has laid out a strategic program to achieve universal health coverage through the 10-point plan. The focus is strengthened on improving infrastructure, human resources for health, and procurement (Republic of South Africa; the Department of Health, 2013). However, implementation of National Health Insurance (NHI), must factor-in the challenges associated with the high cost, which is estimated at a total of R239.3 billion per year by 2025 (current exchange rate). Similarly, shortages of skilled health workers and the quality of care also require consideration (Republic of South Africa, the Department of Health, 2015). So, can the South African Government narrow this disparity and ensure equitable and quality universal health coverage (UHC) for all its citizens?

By virtue of performance indicators, Government is a step in the right direction, where an assessment on the progress made and justification for projections over the next two financial periods is accessible. This dashboard illustrates monitoring and evaluation (M&E) of Government's good Governance and transparency in working towards the promotion of a high quality healthcare system for all people in South Africa. Bokhari et al. (2007), revealed that for developing countries, results implied that while economic growth is an important contributor to health outcomes, government spending on health is an equally important factor, which is similarly echoed in South Africa's commitment and planned MTEF.

However, this argument is open to debate, as displayed by Dr. Coovadia, KPMG's Head of Healthcare for Africa and a member of the Global KPMG Centre for Universal Health Coverage, who is of an opposing view that it is imperative for the focus not to be on the cost and potential payment systems, but rather on the mechanisms needed to deliver the services that the NHI package is intended to, which is an affordable and accessible way. She is supported by her colleague, Prof Chetty, CEO of the KwaZulu-Natal Doctors Healthcare Coalition and Professor of Managed Care and Health Services Management at the University of KwaZulu-Natal, who concurred that "We don't want a public or a private sector, we want a health sector." He further advocated a general message at the 7th Annual Africa Health Exhibition & Congress, 2017, that "It is therefore imperative that we work together in private-public partnerships leveraging the skills and expertise of the private sector to assist in getting public health back on its feet but with strong government stewardship" (Medical Chronicle, 2017).

This argument is further supported by the identified disparity between the detected and potential UHC index performance, considering the noted variation amongst country's when their resources per capita were amalgamated. However, the availability of resources forecasts prospective leverage for UHC gains, however, it comes with cautionary overture against potential corruption, low health worker performance, high administrative costs, spending on unwarranted care, or exorbitant prices, etc., in the course of UHC (Dieleman et al. 2018).

2.7.1 Health Financing and National Health Insurance

This is a health funding system designed for the delivery of accessible, and inexpensive individual health care services for the people of South Africa (Republic of South Africa, the Department of Health, 2012). The bulk of health-sector funding comes from the South Africa's National Treasury. The health budget for 2017/18 was R187.5 billion, which was aimed at improving hospitals and strengthening public health ahead of the National Health Insurance scheme. A huge chunk of this, R83.6 billion (2017 Budget Highlights), is invested towards revitalization of the District Health Services and public healthcare facilities. Dr Aaron Motsoaledi, then minister of health, voiced at the 2016 National Pharmacy Conference that the Department of Health has pledged an investment of R17 billion spanning a three-year period for renovating public PHC clinics to 'workable' levels aligned with the planning of the introduction of the National Health Insurance (NHI) scheme. This commitment is projected with the R17.8 billion budget for refurbishing health establishments in the eleven NHI pilot districts, including health system related transformations. Attempts to strengthen TB programmes by encouraging early detection and treatment was fuelled with an additional R740 million, where R1 billion was set aside for extension of the ARV agenda. Further funds were set aside for the new substance-abuse management bases in the provinces of North West, Northern Cape, Free State, and Western Cape (Republic of South Africa, the Deaprtment of Health-National Treasury, 2016).

Much debate was raised over the possibility of seeing improvement in the poor quality of the public service with the shifting of the proposed finance model of National Health Insurance (NHI), wherein management shortcomings remain as the root cause (Serfontein, 2017). Nevertheless, NHI Funding overall amounts to R5.2 billion, of which R1 billion is prioritized for health professionals' recruitment and in addition to decant the over-crowded public health facilities

towards a target of 1.5 million chronic patients to receive their medication through a centralised, chronic medicine-dispensing and distribution system. Furthermore, attention has been focussed on the much needed patient-registration system and an electronic stock management system by budgeting R967.8 million from the national health insurance indirect grant. The central focus being the revitalization of PHC warrants a total of R132.8 million over the medium term to assist the NDOH to achieve a total of 3 172 'ideal' primary health care facilities by 2019/20 (Republic of South Africa, the Department of South Africa, 2017).

2.7.2 Revitalizing Public Health Care Facilities

There is a long way to go! Many of South Africa's public health facilities are in bad shape, with poor physical infrastructure, unreliable drug supplies and a short supply of caring staff (KMPG, 2017). However, the PHC clinics, being the first point of access in seeking healthcare are underutilized by patients who question their quality of care and therefore choose to receive care from the hospital level, resulting in "bottlenecks in the system" (Rispel, 2016; KPMG, 2017).

All health care facilities in South Africa require major restoration, some requiring full replacement. However, with commitment and focus on revitalizing the primary healthcare system, the department has a 10-year infrastructure plan aimed towards those with greatest need. Therefore, an investment of R20.8 billion in healthcare infrastructure over the MTEF period will be made. Furthermore, the department is working closely to ensure that strategies for all 872 primary health care facilities in the 11 pilot districts are constructed, revitalized and maintained by 2019/20 (Republic of South Africa, the department of Health-National Treasury, 2017).

2.7.3 Primary Health Care Expenditure

Examining PHC expenditure per capita (uninsured) is important as primary health is the first level of care. It is closest to the community and plays a large role in responding to the community needs. The health status of the population is influenced positively when investments are made towards PHC and when high-quality resources are used equitably, effectively and efficiently. Growth in this indicator may reflect progress in key government initiatives such as PHC re-

engineering and health systems strengthening in preparation for NHI (Republic of South Africa, the Department of Health- National Treasury, 2017).

The determinants for enhancing health service coverage and health outcomes relate to health workers being available, accessible and capable in providing patient-centred integrated care. Therefore, any investments made towards the required primary health care workforce prove cost-effective in ensuring equitable access to health care. Additional crucial factors include effective and efficient medicine procurement and supply processes, good governance, health technologies and health information structures that are efficient (WHO, 2017). The purpose of the investments is to grow and monitor the application of legislation, policies, systems, norms and standards for district health system uniformity, environmental health, communicable and non-communicable diseases prevention, health promotion and improved nutrition (Republic of South Africa, the Department of Health-National Treasury, 2017).

By adding value to ensure successful implementation of UHC, the South African healthcare system, must ensure a vital service delivery recharge to deliver integrated services that are people and community focussed. Such endeavours involve re-orienting health services and strengthening the coordination of care. In addition, more importantly within the SA context, a traditional and complementary medicine services approach that embodies the provision of the peoples' needs aims to trigger patient empowerment and active participation in their health and subsequently the healthcare system (WHO, 2017).

2.7.4 Pharmaceutical care benefits on expenditure

"… Drugs are of particular importance because they can save lives and improve health, and they promote trust and participation in health services. They are costly, and there are special concerns that make drugs different from other consumer products…" (Management Sciences for Health, 1997).

Pharmaceuticals or medicines are generally defined as "any substance or mixture of substances used, or purported to be suitable for use, or manufactured or sold for use in; (a) the diagnosis, treatment, mitigation or prevention of disease, abnormal physical or mental state, or the

symptoms thereof in man; or (b) restoring, correcting or modifying any somatic or psychic function in man. Products are further classified by Pharmacological or chemical group, by the way they work in the body (pharmacological effect), and by their therapeutic use (Medicines and Related Substances Control Act, No. 101 of 1965). Undeniably, pharmaceuticals drive treatment, and if used correctly can optimally impact on patient outcomes. Within healthcare organizations, pharmaceuticals represent the second largest budget alongside human resources. Therefore, understandably, its impact on healthcare expenditure is of concern. Exceptionally high global spending on healthcare is seen to rise at an unprecedented rate, attributing spending to both medicines and the management thereof. According to Hughes 2010, cited in Dalton & Byrne 2016, this can be ascribed annually to an array of factors such as: errors in medication, development in technology, high medicine spending, and aging populations (Hughes 2010, cited in Dalton & Byrne 2016). In addition, healthcare organizations globally are challenged by populations growing old contributing to the increased chronic disease burdens and polypharmacy across all ages, more especially the elderly. Furthermore, healthcare organizations are forced to initiate and enforce innovative measures to cut cost due to polypharmacy in the elderly, and the advent of newer costly pharmacotherapies (Lee et al. 2015, cited in Dalton & Byrne 2016).

Health care systems are plagued both clinically and economically by the occurrences of high medication errors and inappropriate prescribing, contributing to adverse drug events, dauntingly many of which are preventable. Having said that, what begs the question is, how can the health care system reduce this wasteful expenditure with the resources that they have? There exists an enormous “opportunity for pharmacists to have a significant impact on reducing healthcare costs, as they have the expertise to detect, resolve, and prevent medication errors and medication-related problems” (Dalton & Byrne, 2016). The practice of clinical pharmacy developments in current years has further contributed to a growth in the number of pharmacists working in clinically advanced roles globally, resulting in cost reductions. Many published studies have illustrated that services and clinical interventions by pharmacists have reduced the harm of potential adverse drug events and prove to be cost-effective thereby most importantly improve patient outcomes, demonstrating a positive effect on patient morbidity and mortality, while averting hospital admission and/or reducing the length of hospital stay (Dalton & Byrne, 2016).

In addition, nine years of collaborative workings of physician-pharmacist quality circles in the Swiss Canton, revealed not only 40 per cent annual drug cost savings when compared with control practices, but also safety and potential therapeutic gains (Niquille et al. 2010, cited in Bonanno et al. 2012). Another interesting perspective addresses that although medicines are universally accessible and appropriately prescribed, money spent cannot generate better health if the medication is not taken to gain optimal therapeutic value. Also, adherence, defined as the "extent to which the individuals for whom treatments have been provided use them in ways agreed with informed professional advice", has by many sources been estimated to be at or below 50 per cent in the chronic disease management (Trueman et al. 2010, cited in Bonanno et al. 2012).

Further, Pharmacists have a crucial role to play in decreasing costs by critically reviewing elderly patients' pharmacotherapy. Such intervention of reducing "inappropriately prescribed medicines" not only elicits cost savings but also reduces the danger of adverse drug events (ADEs) that frequently prolongs and raises costs of hospital admissions (Dalton & Byrnne, 2016). Another domain of interest to pharmacists, is in chronic diseases. Being the leading cause of death and disability globally, and their control being more than two-thirds of global healthcare expenditure, Yach et al. (2004) and Tinetti, et al. (2012), cited in Dalton & Byrnne (2016), encouraged health care systems to utilize Pharmacists to afford a skilful role in the control thereof. This would result in considerable savings in healthcare costs. In addition, literature proves that pharmacists within the primary care setting can promote both clinical and cost effective care for a variety of chronic illnesses, such as cardiovascular disease, chronic obstructive pulmonary disease and diabetes (Bunting et al. 2003; Morello et al. 2006; Khodoor, et al. 2009, cited in Dalton & Byrnne 2016).

Also, from a medicine use review (MUR) perspective, the primary and community care prescription medicine wastage and the value of unused prescribed medicines that remains in peoples' homes is reportedly high, advocating that Pharmacists have another dynamic role to play, in reducing such wasteful expenditure (Truman et al. 2010, cited in Dalton & Bryne, 2016). This picture is not unique to the developed countries. At present, patient returns in KwaZulu-Natal, which is exorbitant, is only documented, and not costed, nor is the information shared

with the patients' concerned, leaving a gap for monitoring, accountability, validation and remedial action. Therefore, the need for education of the community towards self- care and financial responsibility for the medication they receive cannot be over emphasized.

Pharmacist-led reconciliation has displayed the maximum anticipated cost benefits in comparison (Karnon et al. 2009, cited in Dalton & Byrne 2016). A welcomed saving was noted in 48% of the scenarios, led by pharmacists counselling on discharge (Dalton & Byrne, 2016). Medication reviews also permit the detection of any Medication related problems (MRPs), allows for collaborative consultation with co-professionals in recommending resolutions, thereby influencing the overall cost of stay and patient outcome (Bondesson et al. 2013, cited in Dalton & Byrne 2016). In addition, antimicrobial therapy intervention is a key responsibility of a specialized role, thereby eliciting cost savings from either promoting the switch from parenteral to oral treatment or from stopping inappropriate use of some agents without adversely affecting patients' well-being. The cost-savings that ensue are fundamentally due to decreases in antimicrobial costs and Length of Stay-LOS (Przybylski et al. 1997, cited in Dalton & Byrne 2016).

The above impact of pharmacist intervention in health care cost savings and patient outcomes demonstrated within the developed nation's healthcare context is sound and speaks volumes to a healthcare system in transitional phase of NHI, like South Africa. By not utilizing the available skill and expertise of pharmacists is a gross negligence and displays irresponsible and wasteful expenditure in itself.

2.7.5 Effects of Non-Communicable diseases on SA Economy

Factors cited by Mayosi and colleagues (2009), for the rising of non-communicable diseases, include changes in demographic, a percentage increase of the elderly population of over 60 years regardless of the impact of HIV/AIDS on life expectancy as well as the growing weight thereto. The NDOH with political will, has re-enforced its commitment, through the re-engineering strategy, by developing a national surveillance system encompassing integrated chronic disease care, management of risk factors and application of cost-effective interventions in both primary and secondary prevention of diseases (Republic of South Africa, the Department

of Health, 2013; Ideal Clinic, 2015). Hofman (2014), reported that the health of ones Country's population is one of the determining factors of the economic development of that nation. Therefore, the NDOH's strategies to address non-communicable diseases, is a positive move towards better public health outcomes and better economic growth. The reported leading underlying causes of death among 45-65 and older age groups are cerebrovascular diseases, diabetes mellitus, hypertensive diseases, chronic lower respiratory diseases and malignant neoplasm of digestive organs (Nojilana et al. 2016). South Africa's GDP losses between 2006 and 2015 from NCDs, of, diabetes, stroke and coronary heart disease was projected to cost the country R2 919 billion (Abegunde et al. 2007).

NCDs, also contribute to employers' supplementary costs of high staff turnover and absenteeism. In the country's working-age population, NCDs, apart from being a source of morbidity, present as the leading cause of mortality as well, resulting in such individuals no longer contributing to the economy of the country. In relation to paid time off, obese workers tend to cost their employers 49% more than their non-obese colleagues (Van Nuys et al. 2014). However, wellness programmes within the workplace are emerging in popularity, of which the vulnerable urban poor, have limited access. Also, the families of the dearly departed are burdened with exorbitant costs, considering that only two-thirds of poor households are without funeral benefits and rely on either a mere regular wage or a grant (Collins & Leibbrandt, 2007). NCDs is presenting alongside an ageing HIV-positive population. Hence, by 2030, NCDs will report five times more deaths than communicable diseases in low- and middle-income countries according to Collins & Leibbrandt (2007). This statistic calls for a number of new institutional models to be deliberated on in the plight to support and encourage the prevention of NCDs (Hofman, 2014). A Pharmaceutical Care approach is one such model that can be implemented in order to alleviate the current situation that we are facing in South Africa, by exploring the avenue of the underutilized skill of the pharmacist.

The old cliché- prevention is better than cure speaks to an approach to the management of NCDs and the appreciable and effective cost reductions as opposed to treatment for those that fall ill (Cecchini et al. 2010, cited in Nojilana et al. 2016). The need for Government and NDOH's sustained effort and political inclination to overcome and slow the onset of or remedying and

treating NCDs cannot be over stated. The focus needed now is eloquently addressed by Hofman (2014), when he states that “With fewer sick people to support, our health system could focus on providing better-quality care”.

2.7.6 Pharmacoeconomics, cost savings and cost avoidance

Health care systems, subjected to financial constraints, are required to display their cost-effective strategies, given the limited resources to deliver health care (Gallagher et al., 2014). This holds true for particularly South Africa as well, given its financial challenges to deliver equitable, comprehensive and quality, healthcare services to all its citizens.

Pharmacoeconomic evaluation research assists in identifying, measuring, and comparing the cost of different pharmacotherapies or services and highlights their impact on healthcare budgets and patient health (Barber et al. 1994). Pharmacists can influence healthcare decision makers on effective resource allocation and expenditure strategies to optimize populations’ health through medicines (Hughes, 2012). Therefore, Pharmacists exceptional medicine knowledge locates them in functions of medicine cost savings and cost avoidance. Cost savings as described by Dalton & Byrne (2016), suggests current spending declines with changes in patient’s treatment for e.g., appropriately changing from intravenous to oral therapy. Whereas cost avoidance describes an intervention that lessens possible future expenditure, e.g., a pharmacist’s recommendation for the removal of a potentially inappropriate medicine in an elderly patient. As such, the potential ADE, cost of a (GP) referral and/or hospital admission, as well as the actual medicine cost is averted (Gallagher et al. 2014), not to mention the immense discomfort spared for an elderly patient. If such cost avoidance by pharmacist intervention is projected over a lengthy period of time, significant cost savings can ensue (Dalton & Byrne, 2016). Although Dalton & Byrne (2016), demonstrate that pharmacists can incur significant savings across numerous healthcare settings, evidence in the literature emphasising the ‘specific aspects of pharmacists’ work to be highly effective and cost-effective’ is however, lacking.

2.8 PUBLIC HEALTH

This bears reference to "the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations (public and private), communities and individuals" (Amory, 1920). Bryant and Rhodes (2017), elaborated on the dimensions of ‘human health’ to encompass the promotion of physical and mental health, sanitation, personal hygiene and control of infectious diseases (WHO, 1946). They likewise exemplified the importance of the normal human interactions involved in dealing with the many problems of social life, emerging recognition of the importance of community action in the promotion of health and the prevention and treatment of disease in the concept of public health. The emphasis of such health intervention, therefore, aims to enhance health and most importantly the quality of life around prevention, disease therapy, physical and mental illnesses. The approach requires surveillance of incidents and health indicators, and healthy lifestyle promotion. Therefore, public health mediations involve promotion of hand washing, breastfeeding, vaccinations, suicide prevention and distribution of condoms (WHO, 1946).

“Public health is seen as an interdisciplinary field that aims to understand health problems, and to develop and evaluate programmes to improve the health status of populations” (South African Health Review, 2016). Zweigenthal and colleagues (2016), suggest that Public Health development in SA is based on compliance reflecting on the human health safety, and, on inventive hand-on models of care and policy accentuating holistic care. They highlight that current South African health reform strategies do recognize the importance of PH in health service delivery, however, they do not clarify their contributing role.

Public health encompasses many disciplines; environmental health, occupational health, epidemiology, biostatistics, demography, economics, health care organization and management (Beaglehole & Bonita 2004, cited in Zweigenthal et al. 2016). All of which collaboratively provides knowledge to inform health interventions. However, the social factors that need to be addressed, calls for outside health stakeholder’s engagement (Zwigenthal et al. 2016).

This modern intersectional nature of PH practice demands collaboration amongst PH professionals and multidisciplinary teams of public health workers and professionals to

incorporate; public health, community medicine or infectious disease specialist physicians; psychologists; epidemiologists; biostatisticians; medical assistants or Assistant Medical Officers; public health nurses; midwives; medical microbiologists; environmental health officers or public health inspectors; pharmacists; dentists; dietitians and nutritionists; veterinarians; public health engineers; PH lawyers; sociologists; community development workers; communications experts; bioethicists; and others (Joint Task Group on Public Health, 2005); on human health determining factors and in a systems approach to shift the health outcomes by utilizing change turbines of policy, social growth, and advocacy (Edwards & MacLean 2008, as cited in Zweigenthal et al. 2016).

The World Health Organization (WHO, 2013) has mandated a 'health in all policies' approach, which demands that PH professionals incorporate all health related initiatives into that of government's guiding principles, be it housing, education or energy, which is a recognized challenge in South Africa. Therefore, globally, it is agreed that PH functions involve "identifying the health status and needs of populations and their surveillance; developing policy; implementing and evaluating promotive, preventive and disease control programmes; ensuring the delivery and quality of services; and developing a competent workforce that is able to lead and develop partnerships" (Zweigenthal et al. 2016). Even though the focus to address urgent public health matters is imperative, Garrett (2007), contends that when foreign assistance is channelled towards disease-specific programs, the value of public health is ignored. This relates to a "stove piping" phenomenon, that robs a country of much needed funds for worthwhile disease fighting initiatives.

Zweigenthal et al. (2016), further elaborate that for mangers in health to lead health system transformation and restructuring, demands organizational and PH skills. For this reason, they advocate that in future district managers must possess a postgraduate PH prerequisite. Bonanno et al. (2012), advocate that 21st century pharmacy's development in 'Pharmaceutical public health' opportunities arise where the counselling of avoidable illnesses related to life style choices and behavioural adaptations can be effectively incorporated during facilitation of the optimal medicine use. The significance will extend beyond non-adherence reduction, to include the use of psychological and socially linked communication skills involved in assisting and

supporting people to avert or manage long term illnesses of obesity and/or diabetes, asthma, chronic obstructive pulmonary disease, Parkinson's disease, including the identification and management of circulatory disease risks (Bonanno et al. 2012).

Such an innovative approach could potentially prove affordable and beneficial in public health restitution. However, this approach also includes close collaboration with other professionals, to sensitively monitor adverse drug reactions and any unlawful drug habits of both patients and/or populations (FIP, 2012). Albeit, Pharmacists need to hold medicines use related competencies closer to heart and not take sole ownership of advancing societal shifts that no one professional cadre could achieve delivering; because, "Placing too much reliance on 'public health' service provision separated from the broadly defined supply of pharmaceutical treatment could prove a hazardous error" (Bananno et al. 2012). It is at the appropriate point in time to elaborate on the nature of the public rural environment in which the study was conducted.

2.9 KWAZULU-NATAL HEALTH STATUS

This research was conducted within the KwaZulu-Natal province, therefore, for the purpose of the study focus, it is important to reiterate the KZN Strategic Goals of 2015 – 2019, which are aligned to that of the NDOH and the broader Millennium Development Goals (MDGs). These include:

- Strengthening of Health System effectiveness
- Reducing the burden of disease
- Universal Health coverage
- Strengthening Human Resources for Health
- Improving the quality of healthcare

The Rural Health fact sheet (2013), reveals that a large proportion (43.7%) of South Africans reside in rural areas. The six provinces in which the majority of its population is rural are Mpumalanga, Limpopo, Eastern Cape, North West, and KwaZulu-Natal. In addition, Uthukela, Ugu, Sisonke, Zululand, Umkhanyakude and Umzinyathi are the extremely disadvantaged KZN districts. The Kwa-Zulu Natal Department of Health predominately provides services to

approximately 87.6% of uninsured population (Republic of South Africa, the Department of Health-SDIP-2016/2017-2018/2019). The majority of the population (60.8%) reside in eThekwini, Umgungundlovu and King Cetshwayo Districts regarded as the economic growth centres in the KwaZulu-Natal Province.

Importantly, the General Household survey (2015), highlighted the following statistics: Total Population in KZN is 10 919 077 and the Uninsured Population is 9 499 596, making up 6 District Health Councils. The Life Expectancy for male is 57 years (49.2 yrs. – 2012) and female is 58.4 years (53.8 yrs. – 2012). The concerning intensity of poverty is 42.5%.

The demographic profile of the KZN Province in Fig.1, illustrates its location east of the South African coast and adjoins Eastern Cape, Free State, Lesotho, Mpumalanga, Swaziland and Mozambique.

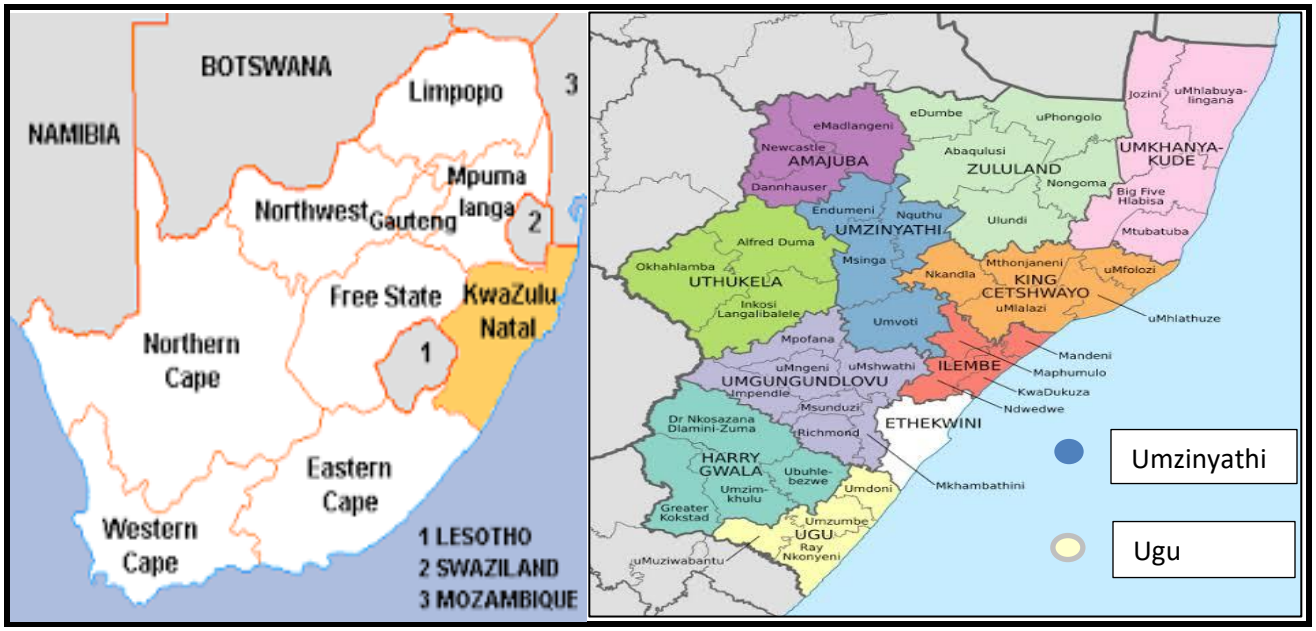


Fig.1: Source: Google-Map of South Africa and KwaZulu-Natal- depicting Umzinyathi and Ugu Districts

There is one Metropol, ten Districts, fifty Municipalities, and eight hundred and twenty-eight Wards. Four Districts, viz. Ugu, Umzinyathi (illustrated in Fig.1 above), Zululand and Umkhanyakude and one Municipality (Umzimkhulu), which have been declared Rural Development Nodes. The three chosen National Health Insurance (NHI) Districts are,

Umgungundlovu, Umzinyathi and Amajuba. Universal access to healthcare is considered for the whole of the SA population, however, the urgent task to better access for the noteworthy proportion of those uninsured within the current constraints, still remains (Republic of South Africa, the Department of Health-KZN, 2016). Hence, the focus of Government's health initiatives and this study is on improvement in service delivery to the rural nodes of the population. The PHC headcount in KZN is 30.7 million, supported by 249 School Health Teams, 137 Ward Based Outreach Teams, and 10 473 CCGs. The Catchment Population Norms for the Clinics is between 7 000 and 30 000 and in the CHC, is between 60 000 and 120 000, with the Current average catchment population of 17 579 (Republic of South Africa, the Department of Health-KZN, 2016). The social-economic profile, on the other hand, shows an estimated 306 076 households residing in informal settlements. Alarmingly, only 33.7 % of the labour age of the SA population are formally or informally in employment (Stats SA, 2015). Of note, in addition, is the Service delivery social determinants, which includes, Water, Sanitation, Waste removal, Electricity, Access to services (viz. Health services), and Crime. However, in relation to health, the 5 common immediate causes of death: are Infectious Diseases (TB remains the main cause of death, influenza, infectious diseases, viral diseases, Pneumonia), HIV Infection as an underlying cause of death, Hypertension, Diabetes and Cardiovascular Disease (Stats SA, 2015).

From a public health perspective, being aware of the above picture in respect of the determining factors of environmental, economic, and social, within a district, is paramount to planning and executing quality comprehensive healthcare service delivery. The statistics only accentuates that healthcare within this region demands a human resource work force compliment, although scarce, to be skilled and competent and to collaboratively deliver a public health approach.

2.9.1 Districts under study

As alluded to above, the rural development nodes are the focus of this research, hence, the Umzinyathi and Ugu Districts were purposefully chosen. In addition, Umzinyathi is one of the chosen NHI districts. The Ugu municipality is a Category C municipality, meaning, a District that is subdivided into local municipalities. It is situated on the south coast of KwaZulu-Natal stretching inland. The 5 866 km² district is adjoined by Eastern Cape, eThekwini Metropolitan,

the Indian Ocean, Harry Gwala District, and UMgungundlovu District. The Ugu District Municipality now comprises of 4 local Municipalities namely Umdoni, Umzumbe, Ray Nkonyeni and Umuziwabantu and falls in socio-economic Quintile 2 (District Health Barometer 2015-2016-HST publication, 2016). The percentage population distribution per sub-district in Ugu are presented in Fig.2 below.

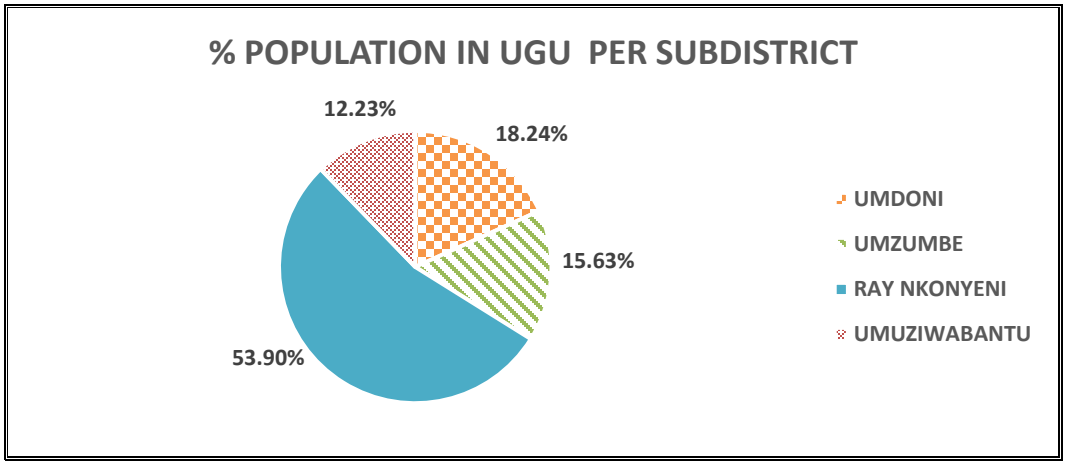


Fig.2: Percentage population distribution in Ugu district

It encompasses 81 wards and forty-two traditional authorities. Furthermore, cross-border residents from the Eastern Cape, predominately those to the far reaching south, tend to also access health care services in Ugu. However, all patient reviews that challenge the provision of services connecting the two provinces, is formally addressed by a Cross Border Committee. High poverty and unemployment levels with low economic growth challenges the District in improving the quality of life. Although the population of Ugu is predominantly 86% rural, a steady move away from such has been noted. Furthermore, industrialization, a shift away from agricultural events impacts on migration of populations in search of employment and state grants, altering settlement patterns (Republic of South Africa, the Department of Health-KZN, Districts & Local Government Handbook, South Africa, 2016).

Ugu District is said to have an uninsured population of 92.7% (Republic of South Africa, the Deaprtment of health-KZN, Districts & Local Government Handbook, South Africa, 2016). Only five clinics under the three sub-districts within Ugu were investigated, these were Ezinqoleni,

now re-named to Ray Nkonyeni, Umuziwabantu and Umzumbe, featuring as the only clinics with ideal status in Ugu at the commencement of the study.

The Umzinyathi District municipality is also a Category C municipality lying between the coastal region and Gauteng. The majority of its 571 650 people speak IsiZulu, expanding and Area of 8,589 km (DOH, KZN, Districts & Local Government Handbook, South Africa, 2016). The percentage population distribution per sub district in Umzinyathi are presented in Fig.3.

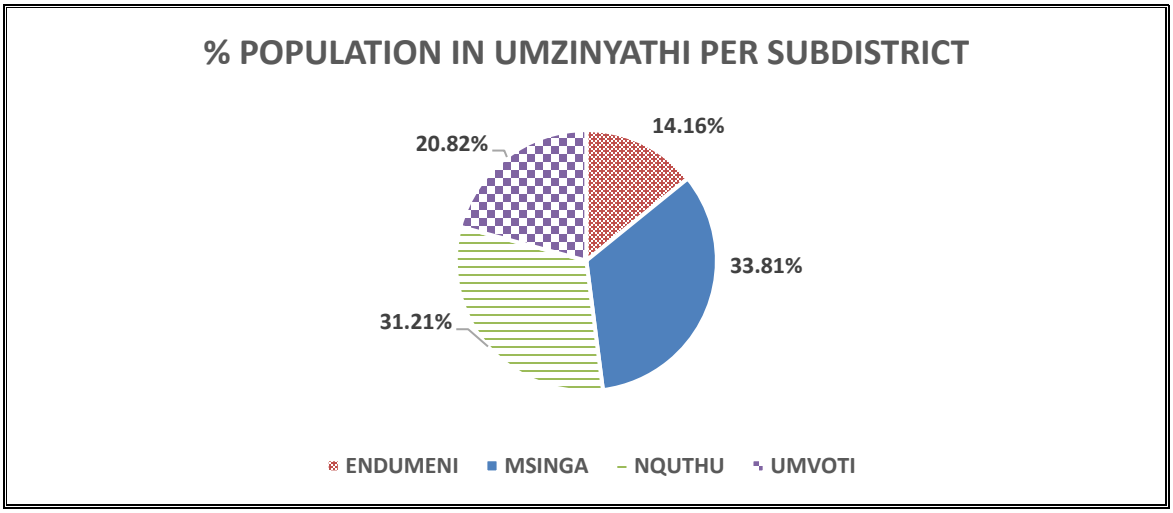


Fig.3: Percentage population distribution in Umzinyathi district

The Socio-Economic Status of Umzinyathi is classified as Socio Economic Quintile 1. This translates to a ranking amongst the poorest districts in the country, prompting anti- poverty initiatives to complement mainstream policies and to inform resource allocation for regeneration (Noble & Zembe- South African Multiple Deprivation Index, 2011). Msinga ranks number 1 as the most deprived local municipality in South Africa, (District Health Barometer 201516- HST Publication, 2016). Of the population, 93% are rural and 7% are urban. 88% of the population of Umzinyathi are uninsured, relying on the Public Health Services for health care. Furthermore, 80% of the population reside in deep rural and under-developed areas.

The district consists of four local municipalities: Endumeni, Nquthu, Msinga and Umvoti. The Towns include Dundee, Glencoe, Greytown, Kranskop, Nquthu, and Pomeroy, of which Dundee and Greytown are more urban (Republic of South Africa, the Deaprtment of Health- KZN Districts

& Local Government Handbook, South Africa, 2016). Ten clinics under the four sub-districts in uMzinyathi with ideal status were investigated.

The Rural Health fact sheet (2013), also revealed that Human resource and retail dispensary shortages are highest in rural areas, with an abundance of pharmacies at close radius to each other in the metropolitan areas. For this reason, The SAPC advent of PCDT pharmacists aims to bridge this gap. However, this process comes with its own limitations in providing the service intended, within a rural context. Such limitations will be further elaborated on. One can rightfully question the current quality of PHC clinics that provide healthcare to the majority of the rural population. If the scope of practice rendered is explored to introduce pharmacists in collaboration with Doctors and nurses in order to cater for the pharmaceutical care needs of the deprived population, can quality and cost effective care be afforded? With this approach in focus, the study proposes to tap into the healthcare disparity between urban and rural contexts.

2.10 RURAL HEALTHCARE

“Rural” is a multidimensional concept, having no universal covenant on its definition, however, the key lies in what purpose the definition is used for (Couper, 2003). Similarly, Gaede & Versteeg (2011), identified that in rural areas an evaluation of its health coverage and health care is challenged by the absence of a defined standardization of rurality. This is further supported by Rural Health Advocacy Project- RHAP (2015), which similarly advocates that by defining rural assists through policy to achieve the intended impact for underserved areas. Most definitions take into consideration the service, access and remoteness (distance). HST (2003), identify three rural attributes to be; the effort to travel to access services and to sustain them; the range of services which are frequently constrained in rural areas and where health professionals are ‘jack of all trades’, expected to perform outside their scope and training.

In developed countries rural and urban taxonomies are defined based on population size, degree of urbanization, infrastructure and services, but according to Couper (2003), in developing countries this bears little relationship. Therefore, in medicine, Rural health care is defined as the “provision of health services to areas outside of metropolitan centres where access to specialist, intensive and/or high technology care and resources, both human and material are lacking”. Couper (2003), further asserts that a Primary health care focus to this service provision may

occur from hospitals, health centres, clinics or independent practices, and is delivered by a team of health care workers (Couper, 2003). Rural medical practice on the other hand, refers to medical practitioners' scope of providing healthcare broadened to that of specialists in urban areas. It encompasses family/general practice, public health, and expanded procedural work domains, within the primary health care and the PHC team context (Couper, 2003).

Rural communities are subjected to poverty, poorer socioeconomic conditions, education constraints, higher tobacco and alcohol usage, and higher rates of mortality in comparison to their urban counterparts, reflecting on the grave impacts on the determinants of health (Canadian Institute for Health Information, 2006). Back home, Statistics South Africa (2006), projected in the urbanization and migration report that 43.7% of SA's population is rural. It has been documented that SA, despite considerable investment and spending on health in comparison to other middle-income and developing countries, is affected by poor health outcomes in both rural and urban areas (Bloom & McIntyre, 1998; Chopra et al. 2009, cited in Gaede & Versteeg, 2011). It has been noted that, rural populations have generally more aged and children, higher unemployment, lower population density, higher proportions of poor, uninsured, and underinsured citizens, of whom are more vulnerable to economic lows (Hart et al. 2005).

Access to healthcare is a basic human right, crucial to ensure the following elements of good health; holistically social, physical, and psychological well-being; prevention of disease; early warning signs and treatment; quality of living; death avoidance and life expectancy (HealthyPeople, 2020). However, rural communities are constantly challenged by a number of access barriers. Among them are the long distances patients travel to facilities over difficult terrain, expensive and limited service coverage with varying degrees of quality of care provided and the package of services accessible at various healthcare levels. There is a scarcity of healthcare benefactors; economically fragile hospitals with high closure rates; higher rates of chronic diseases and shortages of critical health care; remote specialists and tertiary hospitals, lack of community assistance, poor resource allocations and infrastructure, limited access to advanced technologies, different clinical practice behaviours and practice arrangements. Such an environment give rise to challenging conditions for rural communities and providers, with

marked inequalities between health outcomes of urban and rural communities (Hart et al. 2005; Gaede & Versteeg, 2011; RHAP, 2015).

Importantly, Hart et al. (2005), also maintains that by defining the context of rural forms the source for steering much needed resources to deprived rural residents. Despite the resource challenges, apprehension over the state of healthcare for rural populations at public facilities is being raised. Such citations included community engagements surrounding identification of long waiting times, shortages of staff, bad staff attitudes, and uncaring, abusive health care workers, remoteness to health establishments including essential services, inadequate and/or frequent stock outs of essential medication, lack of monitoring & evaluation, transport challenges for disabled patients and scarcity of emergency medical services as key subjects of trepidation. Health care workers themselves often work in an unsafe environment and some even have managers that undermine or even victimize them. It is also noted that health outcomes– life expectancy, infant and maternal mortality and the burden of disease across the country are compromised with variations across districts, provinces and also between urban and rural areas (Hart et al. 2005; Black Sash, 2010).

About 50% of the global population reside in inaccessible and rural areas, having only a quarter of the doctors and less than a third of its nurses providing healthcare (WHO, 2010). It is no wonder that the resultant outcomes of high mortality rates are questionable. Low-income countries are subjected to critical scarcities and uneven distribution of health personnel in which its service delivery is further compromised by the disintegrated systems coupled with the world-wide policy context, thereby raising costs and preventing universal health coverage (Lehmann et al. 2008; Buchan et al. 2013). Furthermore, the most devastating impact in impaired and under-resourced health systems, predominately experienced in remote areas, is that they are markedly compromised to supply, recruit and retain health professionals. However, incentives of special geographical allowances and job satisfaction through multi-skill training, and task shifting were cited (WHO, 2013). This inequality further calls for professionals to be not only clinically competent but also caring, responsive, productive and sufficient in numbers where they are needed the most, that is in the rural areas. A healthcare team of professionals, therefore,

provide an integral responsibility in developing care within a health system and should see themselves as part of the solution (Black Sash, 2010).

'Low wages, poor working conditions, lack of supervision, lack of equipment and infrastructure as well as HIV and AIDS, all contribute to the flight of health care personnel from remote areas' (Lehmann et al. 2008). It is identified that effective distribution and development of health workers is a vital element in attaining global health, delivering quality healthcare and coupled with health financing reforms can improve overall efficiency in health system performance (WHO, 2013). The rural context demands training doctors with 'heart', as an essential obligation to the population that are served (WHO, 2013). This only accentuates the need for the Ubuntu and care principles within health to be revived. Another key focus is addressing the inadequacies related to the misuse of resources, optimizing procurement systems and the strategic purchase functions, contract and economies of scale processes. In addition, medicine procurement expenditure, irrational medicines-use and the application of health technology evaluations to promote new technologies requires further investment and attention (WHO, 2013).

According to HST (2003), having a worthy health service, particularly in rural areas will reduce poverty by facilitating people to work; build relations by creating a sense that 'some-one cares'; creating formal and informal employment posts and encouraging development projects. Evidence also recommends a more integrated visit to include teaching, clinical audits and consultations to result in a more inclusive impact than simply relocation of the specialist clinic (McGranahan et al. 2002, cited in Hart et al. 2005). Numerous questions beg to consider 'rural-proof' within important approaches of PHC re-engineering and National Health Insurance being presently pioneered (Gaede & Versteeg, 2011). The prospective UHC goal, from a policy development and resource provision and implementation perspective, must include in its articulation, protection against financial risk and accessibility to quality health services to span a blend of prevention, promotion, treatment, rehabilitation and palliative care within the informal areas and rural populations for equitable outcomes to be realised (Gaede & Versteeg, 2011; WHO, 2013).

In addition, Dr. Desmond Kegakilwe, Chairperson of RuDASA, explicitly speaks to one urgent critical issue that requires consideration in health policy development and implementation phase, i.e., Rural-proofing. This involves certain exclusive policies to be critically evaluated determining if the rural dimension contributes to a different impact warranting an adjustment for policy to consider the needs of the rural population and making sure that public healthcare facilities are easily and fairly available (DEFRA, 2002). Therefore, the Rural Health Advocacy Project (RHAP) has developed guidelines in an effort to assist health policy makers and those responsible for strategic planning at the National, Provincial and District levels to engage with policy development & review and strategic planning processes through a 'rural lens' to ensure rural populations are fairly considered and benefit equally to access services as their urban counterparts (RHAP, 2015).

The current research study aims to correct the disparity in non-availability of pharmaceutical care services at PHC facilities, using this advocacy approach.

2.11 HEALTH ADVOCACY

The age old question of why advocacy should be learnt, was answered by students highlighting that their compassion for patients; advancing equitable access; promoting healthier community; empowering vulnerable population and the patient itself drives their passion towards advocacy efforts. Inspiring as it may, these students wished to join their voices with those in the shadows and encouraged the work of the manual- 'Advocacy for Health: An educator's guide to incorporating advocacy into the Health Sciences curriculum' (Prof Green- Thompson, 2014).

There are many definitions of advocacy, however, the one that is a best fit for this research study is 'Purposeful action by health professionals to address the determinants of health which negatively impact individuals and communities by either informing those who can enact change or by initiating, mobilizing and organizing activities to make change happen, with or on behalf of individuals or communities with whom the health professionals act' (Oandasan, 2005). It is the responsible action of the HPCSA to include an advocacy competence for health professionals to identify and use opportunities for their patients to promote health and prevent disease by incorporating ethics and human rights principles (HPCSA, 2008). Health advocacy may include,

but is not the same as health promotion. Health advocacy seeks to address systemic health system challenges and failures. The reasons patients do not receive the health care that they need and are entitled to, is due to poor planning and mismanagement, insufficient resources, under-staffing, and corruption. Health promotion speaks to the measures that society can take to enable people to live a healthier life (Advocacy Manual, 2017).

However, twenty-five years into democracy in South Africa and still many health system challenges and inequities remain. Efforts for an equitable, strong and effective health system for all citizens has not yet been realized. The country remains far behind in meeting its maternal and infant mortality targets and chronic communicable and non-communicable diseases such as HIV, TB, diabetes and hypertension, which are placing an incredible strain on an already overburdened and weak health system. Patient care and health outcomes vary widely nationally and inter-provincially, with rural, under resourced and under-served settings being the most disadvantaged. In addition, growing budgetary and human resource constraints place further strain on the health care system (RHAP, 2017).

RHAP (2017), encourages a passionate drive towards building skill to develop a 'strong, well-equipped, knowledgeable cadre of health care workers who can think creatively, address problems pro-actively and be a key resource for patient rights advocacy'. The manual, therefore, provides principles, guidelines, tips, strategies, tools, resources and case studies to assist universities with this new mandate, assisting South African Faculties of Health Sciences in their on-going transformation drive to remain relevant and responsive to the country's health care needs.

Advocacy must be a sociably responsible practice of life enabling a shift in actions, values, attitudes, policies and laws by inspiring our leaders, organizations, systems and structures at the various points (Measuring Up, 2010). The responsibility towards advocacy by healthcare workers is hence, very aptly described by Dr. Jenny Nash, Rural Doctor of the Year, 2014. "We each have a role to play in the realm of "advocacy". Advocacy should not scare or daunt health care workers: it is likely that many are practicing these principles on a daily basis without even realizing it."

It requires bold informed initiatives for Pharmacy and pharmacists to act as advocates for those individuals and groups requiring special needs for appropriate pharmaceutical care, nationally and internationally. In the twenty first century, technical advancement has forced capacity in general management and external regulatory systems towards monitoring, maintaining and improving health care quality. Hence, for professionals to remain relevant and trusted in serving societies' and their members' healthcare needs, calls for professional bodies to expand their responsibilities in the future. This similarly applies to pharmacy globally, in shifting from the primary focus to the optimal employment of pharmaceutical technologies (Bonanno et al. 2012).

2.12 CONCLUSION

This chapter addressed the first phase of the literature review, spanning Healthcare concepts in South Africa. Discussions gave the reader a comprehensive understanding of all the initiatives taken by the Deapartment of Health towards NHI. Medicine use within the public sector was elaborated on by evaluating the impacts on healthcare expenditure. A fresh approach was taken to introduce the financial benefits of the adoption of pharmaceutical care practice alongside a Pharmacists intervention. Moreover, the rual public health context highlighting the districts under study was thoroughly explained. The chapter closed with emphasis on the need for health advocacy within the present healthcare sphere in South Africa, only to set the tone for chapter three, where the role of the pharmacist and the concept of pharmaceutical care was given particular attention.

CHAPTER 3

LITERATURE REVIEW

PHARMACEUTICAL CARE PROVISION

THEORETICAL AND CONCEPTUAL FRAMEWORK

CHAPTER THREE: LITERATURE REVIEW- PHARMACEUTICAL CARE PROVISION THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1 INTRODUCTION

This chapter continued to take the reader systematically through the extensive literature review. The pharmacists' role was broadly discussed, defining the pharmaceutical care concept and international and local evidence based applications thereof. Thereafter, Primary healthcare and collaborative patient focussed care was explored against the backdrop of Role theory and Collaborative advantage, emphasing to the reader the scope of the research. Healthcare risk management accentuated patient safety with heightened reference to the role a patient has in manageing their health. A detailed discussion into relevant literature related to the various models of care in existence within the current and evolving Health Care system and the exploration of a Pharmaceutical Care Model, embracing the Ubuntu and Care concepts, then followed. This chapter concluded noting the emphasis, strengths, weaknesses and limitations of a proposed Pharmaceutical care model.

3.2 ROLE OF A PHARMACIST

Who is a Pharmacist? A medication expert that is skilled to prepare formulation, dispense medication to patients, and to afford various health professionals, including patients with clinical guidance on medication; ensuring optimal medication treatment outcomes while simultaneously assuring safe cost effective therapy and is a partner of the health care team that play a significant role in excellent health and pharmaceutical care provision to the community (College of Pharmacy- The University of Lowa). Pharmacists are custodians of medicine, adopting clinical skill, alongside formulation, quality control, and knowledge of practice to deliver safe medicine use. They are professionals enforcing the administration of quality pharmaceuticals and education through counselling to the communities they serve guided by government policies or regulation (Thamby & Subramani, 2014). It has also been portrayed that, Pharmacists change

lives; they are vital in enhancing and promoting patient care and wellness. Within the various areas of pharmacy practice, responsibilities may vary, however, the basic remains in that pharmacists help patients get well (American Association of Colleges of Pharmacy-AACP, 2016). The aim of Pharmacy practice is to promote health and assist with health problems by ensuring patients optimally utilize medication.

This being the mainstay of the pharmacist's responsibility, it has to be guided by the Good Pharmacy Practice (GPP) principles, which by definition is "the practice of pharmacy that responds to the needs of the people who use the pharmacists' services to provide optimal, evidence-based care". However, a reputable national structure encompassing quality standards and guidelines is vital to maintain this practice (SAPC, 2010). The 2010 GPP document underlines the requirements of Good Pharmacy Practice and guides the development of services around the established standards required for GPP that serves as a quality management framework and a strategic plan. GPP encompasses 4 major roles for pharmacists (SAPC, 2010):

- Role 1- Prepare, obtain, store, secure, distribute, administer, dispense and dispose of medical products
- Role 2- Provide effective medication therapy management
- Role 3- Maintain and improve professional performance
- Role 4- Contribute to improve effectiveness of the health-care system and public health

In addition, to complement and propel future roles of a Pharmacist, the foundation and expansion of such a role will be based upon the 'seven star' concept and the 'pharmacist oath' adopted by the WHO (1997), and FIP (2014), respectively. There is insurmountable opportunity for the pharmacist role to expand, which is what this study aimed to demonstrate.

3.2.1 "Seven Star Pharmacist"

The WHO (1997), consultancy established that future and current pharmacists must be equipped with specific "knowledge, attitudes, skills and behaviours" that validate their roles. In addition, global health systems must take cognisance of pharmacists' roles as essential,

minimum and common expectations. These were encapsulated as the “the seven-star pharmacist” (Thamby and Subramani, 2014) as:

- Care-giver – content with working with individuals and populations by providing caring clinical, analytical, technological or regulatory services. The pharmacist must integrate their practice with other healthcare professionals as a continuum of the highest quality of care services
- Decision-maker – aptitude for the most decisive, appraised, cost-benefit utilization of resources, such as, workforce, medication, chemicals, equipment, procedures, practices
- Communicator - the pharmacist’s ideal position between physician and patient allows for knowledgeable and confident interaction (verbal, non-verbal, listening and writing skills), in addition with other health professionals and the public.
- Leader – Pharmacist takes on a leadership role taking care of the communities’ welfare, by being able to make decisions, communicate, and manage effectively with compassion and empathy
- Manager - manages resources (human, physical and fiscal) and information effectively; contends with authority. Information and its related technology will be challenging while assuming more control and charge over medicine and related substances information sharing
- Life-long-learner - Pharmacists should embrace and commit to life-long learning from the early adoption of such principles, while given support throughout their careers
- Teacher – Empowering, training, mentoring and imparting skill and knowledge to future generations remains the responsibility of the pharmacist. This practice approach assists with securing new knowledge and the perfection of current skills

3.2.2 Pharmacist Oath

“When a new ethical dilemma is discussed today, either in a professional forum or in the public square, someone often asks, “What does the Hippocratic Oath have to say about this issue?” This ancient document bears contemporary relevance and application (Robert, 2009). A

professional in conducting his or her duties, has to reflect on the foundation of one's profession, and the Oath or promise that a Pharmacist takes, displays the ethical basis upon which the profession is built. Pharmacists and the fraternity embrace a unique conviction and authority founded on the profession's commitment to high standards of ethical conduct, and responsible professional behaviour relating to the managing of patient-care.

Hence, the roles and oath unpacked above, echoes the commitment and ethical obligation a pharmacist has to the profession and the community that is served. One can herewith gauge the extent of responsibility that the pharmacist has in the management of medicine. Therefore, having taken the oath coalesced with their roles as outlined by the WHO (1997), pharmacists, are an indispensable profession within the health care team, which if optimally utilized, can 'make that difference' in the health care delivery that we all envisage!

3.2.3 Evolution of Pharmacist Role

Pharmaceutical care (PharmaCare) transpired as what is termed a ground-breaking concept in the mid-1970s. Brodie used the term pharmaceutical care to describe the control of drug use and medication-related services, which featured as the initial published use thereof (Brodie, 1973; Brodie & Parish, 1980).

The delivery of health care is at present time undergoing drastic changes and the pharmacy profession like others finds itself in transition of noteworthy progress and improvement. Pharmacists signify a traditional health profession with ancient roots from 1900's to 1950's of evolutionary roles of apothecary, compounding, dispensing and labelling of manufactured products, to the mid-1960s where the pharmacists role experienced a paradigm shift toward a more patient-oriented practice and developed the concept of clinical pharmacy (Helper & Strand, 1989; Pearson, 2007). Traditionally, community pharmacists are seen by the public, behind a counter filling prescriptions, providing information about medications, consulting with physicians and answering customer questions about products and remedies on the store shelves.

However, within a few decades, community pharmacy largely lost 'three of the four pillars that had been the mainstay of its work for a millennium', viz., active pharmaceutical ingredient

procurement, drug storage and medicine compounding. Consequently, the pharmacy profession world-wide has a role to play by enabling individuals and populations quality at every life stage by improving their health (Bonanno et al. 2012). Today, pharmacists, in addition, afford rational and cost-effective medicine-use, promote healthy life-styles, enhance clinical outcomes through direct patient care and collaboration with various healthcare specialities. This collaborative approach, coupled with an expanded practice scope, recognizes pharmacists as a vital link in individual patient care delivery and within inter-professional healthcare teams (Dalton & Byrne, 2016).

Pharmaceutical Care has become the buzz word in many developing countries in community pharmacy practice. But what defines this philosophy?

3.3 Definition of Pharmaceutical Care

Helper & Strand (1989), coined the definition of pharmaceutical care (PhC). Much debate over the definition and various definitions of Pharmaceutical Care arose since, which differed greatly from each other. One approach saw Pharmaceutical Care as the “pharmacist’s contribution to the care of individuals in order to optimize medicines use and improve health outcomes” (Allemann et al. 2014). This definition was advocated for various work settings in countries inside and outside of Europe, and adapted to the current time. However, for the selective purpose of this research, the definition by Helper & Strand, (1989) and (1990), will be adopted, i.e., ‘PhC is the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life’. Pharmaceutical care involves a professional relationship of the pharmacist with a patient and other professionals in designing, implementing, and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient, as illustrated in Fig.4.

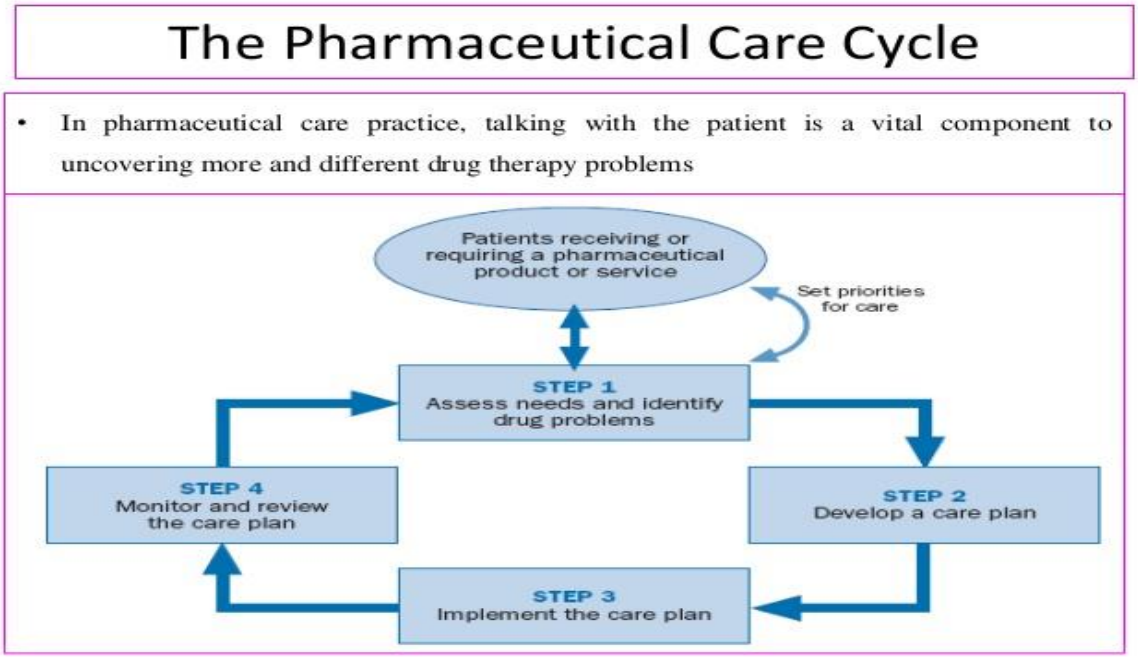


Fig. 4: Pharmaceutical Care Cycle

Healthcare requires an essential component- Pharmaceutical care to be inter-disciplinary. It involves the provision of care for the direct benefit of the patient, where the pharmacist bears the responsibility of quality care. Pharmaceutical care embodies a fundamental mutual synergistic relationship of patient and provider responsibility, of which the provider assumes, displaying competence and commitment. According to Helper & Strand (1990), the essential pharmaceutical care objectives, procedures, and interactions must continue in any practice setting (Helper & Strand, 1990).

The pharmaceutical care concept enunciated a new vision for the pharmacy profession, one apart from the traditional drug-distribution model. Pharmacists have displayed interest in this new vision, however, some view it as another name for clinical pharmacy while others see it as 'anything they do to achieve beneficial patient results' (Gouda, 2011). Foppe van Mil & Fernandez-Llimos (2013), formulated questions to illicit interrogation that challenged the definition in terms of the provision of not only drugs or medicine; the independence of Medication Therapy Management (MTM) to achieving definite outcomes including improving patients' medication adherence or medication-related health literacy; improving patients' quality of life relating to clinical or economic outcomes that ultimately improve humanistic outcomes; care that

may prolong life and addressing medicine treatment not only for a given patient but including educational activities or health promotion activities, such as smoking cessation programs or disease screening; care around pharmaceuticals or a pharmacist and expressing that 'pharmaceutical care' was never considered as a 'pharmacist-only' activity. Hence, the researcher, finds herself leaning towards such a broad interpretation of the definition and strongly in favour that pharmaceutical care is not exclusively the activity of a pharmacist.

Various national pharmacy organizations have adopted the concept with inconsistency and varying nuances in its description and understanding (Foppe van Mil & Fernandez-Llimos, 2013). The American Society of Health-Systems Pharmacists (ASHP), however, have adopted erstwhile refining Helper & Strand's definition of pharmaceutical care to one that implicitly captures the concept as "the direct, responsible provision of medication-related care for the purpose of achieving definite outcomes that improve a patient's quality of life". Unpacking this definition focuses on the subsequent features of the Pharmaceutical Care Model (ASHP, 1993).

3.3.1 Medication Related:

Pharmaceutical care involves the actual provision of medication therapy and decisions about medication use for individual patients. This translates to decisions to use medication therapy and professional judgments about medication selection, dosages, routes and methods of administration, medication therapy monitoring, and the provision of medication-related information and counselling to individual patients (ASHP, 1993).

3.3.2 Care:

Integral to the care theory lies caring, a special interest in another persons' well-being. The domains of patient care include an integration of medical care, nursing care, and pharmaceutical care, among others. Health professionals within their sectors hold unique skills and must collaborate in the overall continuum of patients' care. On occasion, they may be required to offer various types of care (including pharmaceutical care). However, in the provision of pharmaceutical care, unique knowledge and skills of pharmacists derive optimal medicine–use outcomes. The pharmacist, having the patients' health at best interest, collaborates personally with other professionals, including the patient to design, implement, and monitor a therapeutic

plan articulated to produce definite therapeutic outcomes that improve the patient's quality of life (ASHP, 1993). Sadly, Sinclair et al. (2016), reported the apprehension over the sub-standard and apathy of healthcare delivery amongst clinicians, advocating policymakers' reservations over the readiness of clinicians for the demands of their practice settings.

3.3.3 Outcomes:

The objective of pharmaceutical care is geared towards enhancing the quality health of patient's by achieving significant medicinal outcomes. Such outcomes include:

- alleviation of a disease
- eradication or lessening of a patient's symptoms
- halting or slowing down of a disease process
- averting a disease or symptoms

In order for the above outcomes to be delivered, the following crucial roles involve:

- detecting any potential and actual drug-related problems, which is defined as an event or circumstance that interferes with the patient gaining optimal medical or medication outcomes. Drug-related morbidity covers treatment failure and a new medical problem
- solving drug-related difficulties
- averting possible drug-related difficulties

The American Pharmacist Association (APhA, 2016) also cites the following practice principles that are important to deliver quality pharmaceutical care as:

- Data collection
- Information evaluation
- Formulation of a plan
- Implementing the plan
- Monitoring and Modifying the plan, while assuring positive outcomes

In order to achieve medication-related therapeutic outcomes, the categories of medication-related problems must be listed and addressed. These are (Helper & Strand, 1990):

- Untreated indications. The patient requires medication but fails to receive treatment for that indication.
- Improper drug selection. The patients' treatment is incorrect in relation to the indication
- Sub-therapeutic dosage. The patient is treated with too little of the correct medication.
- Failure to receive medication. A medical problem arising from patient not receiving a medication (e.g., for pharmaceutical, psychological, sociological, or economic reasons).
- Over-dosage. Patient treated with too much of the correct medication (toxicity).
- Adverse drug reactions. A medical problem resulting from an adverse drug reaction or adverse effect.
- Drug interactions. A medical problem exacerbated from a drug–drug, drug–food, or drug–laboratory test interaction.
- Medication use without indication. Medication administration for no medically valid indication.

3.3.4 Quality of Life:

There exist tools for assessing a patient's quality of life. However, these tools are continuously developing, requiring pharmacists to familiarize themselves with the available literature. A patient's quality of life should include both, objective and subjective (e.g., the patient's own) assessments. In addition, by capacitating patients with information allows them the opportunity to set quality-of-life goals related to their treatments (ASHP, 1993).

3.3.5 Responsibility:

This encompasses both moral trustworthiness and accountability. Pharmaceutical care allows for direct professional association between an individual patient and the pharmacist where the pharmacist is entrusted with their safety and wellbeing. The pharmacist honours this role by acting within professional capacity in the patient's best interest. Hence, accountability and responsibility is enacted by documenting the provision of care (Penna, 1990; Galinsky & Nickman, 1991; Angaran 1991, cited in ASHP, 1993; APHA, 1992). The pharmacist is personally accountable for patient outcomes (the quality of care) that ensues from the pharmacist's actions and decisions (Helper & Strand, 1990).

The principles of pharmaceutical care as cited by the American Pharmacists Association (APhA, 2016), are as follows:

- A professional relationship of patient and pharmacist must be recognized and sustained
- Patients' medical history must be gathered, organized, recorded and securely stored
- Patients' medical information, on assessment, derives a treatment plan in consultation
- Provision of relevant information, supplies and knowledge for adherence to the care plan

Hence, an approach of managing drug therapy that demands a shift in the traditional focus of professional positions and re-structuring of pharmacy settings, explains Pharmaceutical care. The features of such structuring to consider according to APhA (2016), are:

- Personnel knowledge, skill and function
- Method for information collection, recording and transmission
- Procedures for proficient flow of work
- Suitable equipment, references, and resources
- Skills to aid effective communication
- Dedicated to quality improvement and appraisal systems

With the advent of Pharmaceutical Care concept, Pharmacists have now taken a more proactive role in patient health care. This has elucidated interest in the role of Pharmacists and the pharmacy profession to ensure sustainable health care services with an increased patient focus (Canadian Pharmacist Association, 2016). From various definitions stated above, one can clearly deduce that Pharmaceutical care is not only related to Clinical Pharmacy but extends its definition to various disciplines where the Patient's Health is at the Centre of the Care provided. Therefore, the provision of PhC in diverse clinical environments and cultures by unique pharmacists, technicians, doctors and nurses' teams can be afforded. This approach, therefore, is considered a quality assurance mechanism for better teamwork and systems for drug-related therapy. It comprises both traditional and some new services and functions to pharmacy which are established and delivered by pharmacists. The emotional commitment of PhC involves the pharmacist's compassion, concern and trust directed towards patients' well-being (Bolton & Brook, 2002).

Hence, PhC as a model advocates pharmacists towards the development of their practices alongside improvement in inter-professional cooperation systems (Krska et al. 2002). This approach encourages revamping of pharmacy practice and the establishment of a multidisciplinary structure that focuses attention on improving the excellence within drug treatment delivery towards patient orientated outcomes (ASHP, 1992; UK Clinical Pharmacy Association, 1996; Cipolle et al. 2005).

3.4 The Philosophy of Pharmaceutical Care

Professions of medicine, nursing or dentistry, being patient-centred care practices, are based on three vital constituents. These embrace a philosophy of practice, a patient care procedure and a practice management structure. Hence, Pharmaceutical care philosophy has alike all three, and comprises the following (Cipolle et al. 2012):

- A practice that depicts the social need
- Practitioner responsibilities incorporating the social obligation that is clearly stated
- A patient-centred expectation
- Practice with a caring concept

A patient care process must be consistent with that of other health care providers and consists of, as illustrated in Fig. 5 below.

- An assessment of the patient's drug-related needs,
- A care plan to meet the specific needs of the patient, and
- A follow-up evaluation to determine the impact of the decisions made and actions taken.

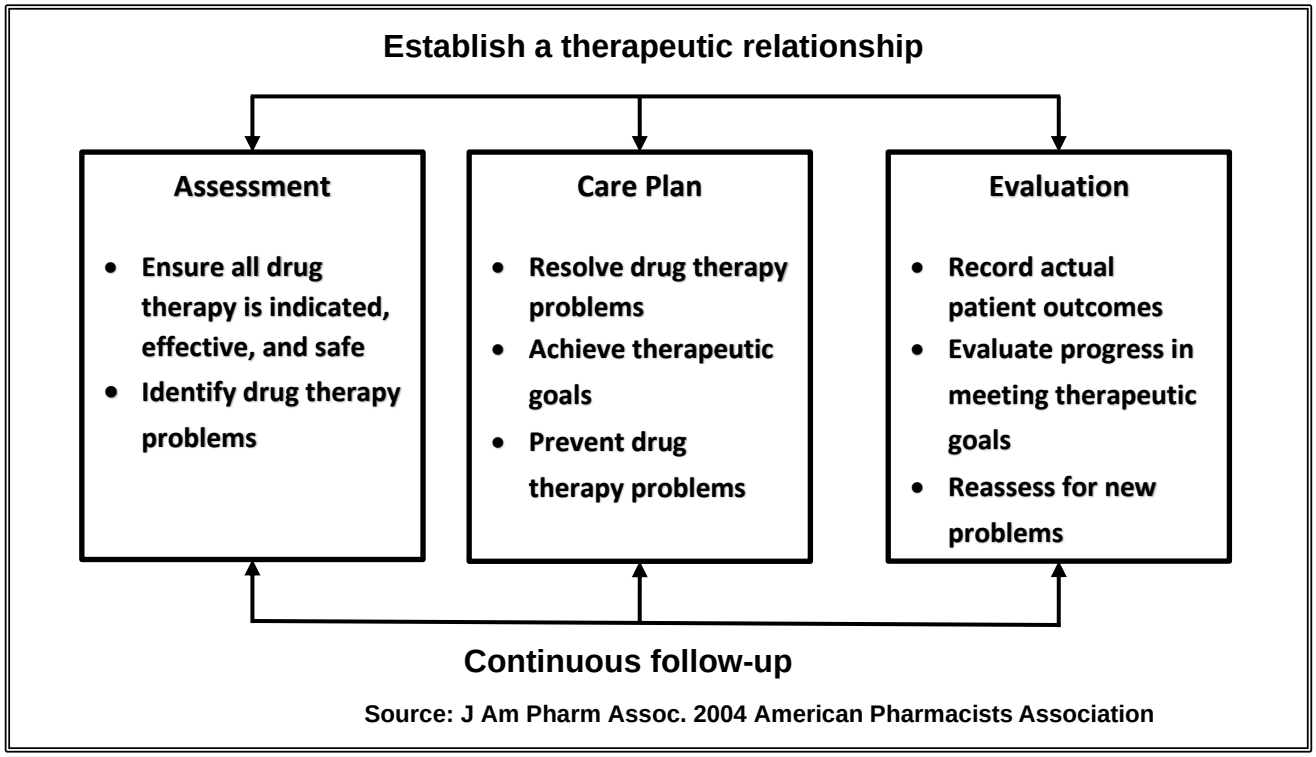


Fig. 5: Patient Care Process- (Adapted from Cipolle et al. 1998)

In order for a practice management system to function optimally, the required resources need to make the service accessible to the patient. These include, among others, space, a method for appointments, records, reporting, assessment, and payment system.

Pharmaceutical care is considered a “generalist practice”, hence embracing the primary health care model, in addition, can be integrated. When one speaks of a philosophy of practice, one associates it to a chain of principles that dictates a practitioner towards ethically suitable, clinically correct, and legally appropriate conduct. Such a practice, also identifies the practitioners’ guidelines, roles, relations, and responsibilities, which ultimately guides the establishment of a consistent practice (Cipolle et al. 2012). Therefore, the way in which a practitioner conducts his/her everyday duties will determine the ‘philosophy of that practice’ and determines if the appropriate standards of practice is adhered to. Hence, a ‘philosophy of practice is specific to a practice, and not the practitioner’. Consequently, the purpose of pharmacy practice surrounds a strong social need to manage morbidity and mortality related to medicines, thereby ultimately overseeing pharmaceuticals. Hence, reference to the application

of pharmaceutical care philosophy is defined by identifying drug-related complications, seeking resolution, and more significantly, preventing re-occurrence. These responsibilities are supported in a patient-centred approach using the caring paradigm where the practitioner holistically reviews medication requirements for patients, develops a care plan to deliver on those requirements, and then follow up determines if the anticipated results were realized without any mal-treatment to the patient (Cipolle et al. 2012). This encompasses the Pharmaceutical Care Cycle as elaborated on in Fig. 4.

Patient-centred care is healthcare where the patient comes first- 'Batho Pele' (Republic of South Africa, the Department of health- KZN, 2014). What the patient wants and needs is what drives the patient encounter. As such, the practitioner must understand the patient's concept of his illness and his medication experience by listening to the patient. The value of care provided will rely mainly on the value of the therapeutic relationship developed which can then be assessed by the impact of the patients' adherence to a medication regimen, thereby displaying the practitioner's ability to practice in a patient-centred approach. Medication management services, when provided with such an approach, can achieve adherence rates of over 80%, consistently, because of the active participation of the patient. This is achievable when the practitioner considers a patient's individual needs, his rights, his responsibilities and ensures that patient specific decisions are consistent, systematic, and comprehensive (Cipolle et al. 2012).

3.5 The Pharmaceutical Care Practice Model Initiative

We often hear the cliché 'the only constant in life is change'. One can argue a different global constant relating to change, which is individuals' unwillingness to accept it. However, challenging this resistance may be, one needs to persist to embrace and overcome change enabling success. This holds true in the pharmacy profession as well. With the introduction of NHI, and PHC re-engineering strategies, linked to continuing discussions over SA's future health care system, lies a distinctive prospect for the pharmacy profession. The time is right for self-reflection on its value as a profession, and assist in the growth of a developing health-system, focusing on a collaborative PHC practice model, to include pharmacists to assist in managing the majority of its population's pharmaceutical care needs. Traditionally pharmacist's reviewing prescriptions and counselling of patients was viewed as a fundamental element of the pharmacists' role**.** The

SAPC in introducing the Primary Care Drug Therapy (PCDT) Pharmacist, took the bold move, however, one can question, 'What about the rural context, that constitutes the bulk of the SA people that are dependent on public health care?'.

The "Practice of Pharmacy", involves the clarification, assessment, and application of medicine requests; the dispensing of prescriptions; selecting drug and device; drug administration; drug treatment reviews; tele-pharmacy functions; drug or drug-related research; patient counselling and any act or services constituting Pharmaceutical Care in every patient centred spaces, plus Primary Care and Collaborative Pharmacy Practice; responsible compounding; labelling and appropriate safe storage of drugs and devices, and maintenance of proper records thereof. This definition as instituted by the American Society of Health-System Pharmacists (ASHP, 1999) constitutes all domains of the provision of a comprehensive pharmaceutical service.

A clear vision of the (ASHP), aimed at supportive progression of the profession by way of the Pharmacy Practice Model Initiative (PPMI). The fundamental outcome thereof is focussed on appreciable improvements in patients' health and safety by optimizing the use of pharmacists' professional expertise and exceptional proficiency in management of medication and its use in a role of direct providers of patient care (ASHP, 1999, Woods, 2009). This speaks to the heart and passion of the pharmacy profession enabling high-quality pharmaceutical care to patients (Hertig, 2011).

In support, several studies in Netherlands, Germany, Australia, United Kingdom, Spain, United States, Canada, and Ireland regarding the application of the pharmaceutical care concept have been published and recognized. In Africa, Asia, and South America, however, very few activities in the field of pharmaceutical care can be identified, either in research or in practice (Cipolle et al. 2012). However, the level of acceptance and adoption for such a philosophy by health care providers will be influenced by the positive impact it has on patient outcomes.

South Africa, being at a decisive point in the revitalization of its healthcare system and given its many healthcare challenges, should embrace the opportunity for Pharmacists to promote the Pharmaceutical care concept and develop its integration into the public sector, as pharmacists

persistently demonstrate their worth within health structures by attending to patients needs across the continuum of care chain (Zellmer, 2009, cited in Hertig, 2011). Bearing in mind that improved medicine taking globally, associated with pharmacists' interventions, can ensure better access to effective treatments that radically impact on preventative and restorative approaches to both chronic and acute illnesses (WHO, 2003).

Therefore, according to Hertig (2011), the development of new and innovative models, must consider various factors, such as:

- Policy of medication-use and product selection
- Distribution of medication
- Clinical pharmacy practice
- Roles of Pharmacy technician
- Roles of Pharmacists as organizational leaders
- Standards-based practice adherence
- Medication-use quality and safety movements response
- Technology impacts

For the purpose of this research, the Pharmaceutical care domain, extending clinical pharmacy practice within a rural context begs the discussion, with emphasis on medication-use quality and safety issues. In attempting to do so, many challenges may arise. Hence, due consideration to peripheral pressures of demographic shifts, work-force strains, and diverse social and economic influences may arise as obstacles preventing effective leverage of the pharmacy professional proficiency for the benefit of patient care (Manasse & Speedie, 2001; ASHP, 2007, cited in Hertig, 2011).

Furthermore, Hertig (2011), advises that when practice models are considered, various vital professional questions require a response encompassing the development of a vision and strategy for future pharmaceutical care practice, like, how will pharmacists be deployed throughout an institution? how can the role of pharmacy technicians help advance the role of pharmacists in providing clinical management services? to what extent should the pharmacist accept responsibility for both clinical and distributive activities? Therefore, for the intent of this

research, the question of how the integration of the PCDT pharmacist into the rural public domain would impact on the independent prescriber and whether or not the scope of practice has emphasis on diagnosing and prescribing? needs to be investigated. For this reason, the proposal of the integration of the PCDT pharmacist into the public context with a collaborative focus requires much needed exploration.

3.6 Evidenced Based Application of Pharmaceutical Care

3.6.1 In Australia

There has been wide-spread interest and research across community pharmacy pharmaceutical care interventions of the dispensing process (Peterson and Tenni, 2007; Reeve et al. 2007; Peterson et al. 2010; Williams et al. 2011, cited in Cousins et al. 2012). This has led to extensive reforms to improve the effectiveness and efficiencies of the Australian healthcare system. The efforts were directed firstly towards the need to strengthen primary care and, secondly, the need to adopt a preventative focus to assure healthcare system quality, safety and sustainability (Peterson et al. 2010, cited in Cousins et al. 2012). The Australian government instituted the provision of pharmaceutical care as a basic dispensing service for community pharmacists and provided the necessary computer documentation software. Following this initiative, improvements in clinical outcomes were observed due to the following data elements being available, such as, the number of visits to a general practitioner, the number of visits to a hospital specialist, the number of investigative tests performed, the number of hospital admission days, and cost of purchased medicines.

3.6.2 In the United Kingdom

The introduction of regular visits by pharmacists providing pharmaceutical care in general practices in the United Kingdom reduced medication errors by interventions consisting of feedback, education and support to the general practice prescriber. This approach was adopted in all practice settings where medicines are prescribed, in a low to middle-income or industrialized country (Cousins et al. 2012). Alarmingly, such interventions can avoid in excess of 750 000 destructive medical errors annually, more than 3.2 million less hospital stays, reduction of permanent disability of 260 000, and an annual account of less than 95 000 deaths in the overall reduction rate of adverse events in the European Union alone (WHO, 2016).

3.6.3 Hospital settings: In-patients

Research demonstrated that the incorporation of pharmaceutical care services in Hospital in-patients, ensured enhanced care without mal-treatment. Such noted improvement is attributed to pharmacists' inter-professional approach on patient ward rounds, interviewing patients, reconciling medications and engaging in patient discharge counselling coupled with follow-up (Cousins et al. 2012).

Hospital Pharmacists in many less affluent countries, like in selected areas of Asia and Africa, spent majority of their time on distributive and manufacturing activities. The resultant slow progression of hospital-pharmacy model was limiting and underutilizing pharmacists' expertise in medicine management (Anderson, 2002; Doloresco & Vermeulen, 2009, cited in Dalton & Byrne, 2016). Therefore, no beneficial impact was noted.

From an FIP perspective, there lies an international opportunity to further develop the evidence base that shows good practice and to communicate this to relevant environments wherein hospital pharmacy still endures poor development. In addition to hospitals reducing their financial expenditure on unnecessary cost of medicines, the encouraging rewards that clinical pharmacy therein can deliver better health outcomes, must be realized. Therefore, inadequate investments in hospital pharmacy may lead to significant losses of life (Bonanno et al. 2012). Further, hospital pharmacists, being accepted as vital links in the multidisciplinary team having a direct patient-centric care approach, delivers core clinical service relating to medication therapy, affording reductions in medication errors, ADRs, mortality, and Length of Hospital Stay (Bond et al. 2004, cited in Dalton & Byrne, 2016).

The hospital pharmacists' clinical activities frequently embraced medicines reconciliation at various points of care, medication management reviews for in-patients, medicines information provision to other healthcare professionals, selection of drug therapy, monitoring patients for an appropriate medicine therapeutic response, identifying and reporting ADRs, patient counselling, as well as those functions ensuring safe and effective medicines use (Dooley et al. 2004, cited in Dalton & Bryne, 2016). Hence, these medication reviews assisted pharmacists on their daily clinical ward visits to recognise any Medicine Related Problems (MRPs) thereby devising and

recommending their resolutions with their fellow healthcare professionals (Dalton & Byrne, 2016). Subsequently, shorter delays between the time of prescribing and the pharmacist's intervention were possible to decrease the risk for costly ADEs, can be achieved and rendered more beneficial if a pharmacist is in attendance during prescribing, imparting their specialized knowledge at the time its most needed (Miller et al. 2011, cited in Dalton & Byrne, 2016). In addition, it has been cited that pharmacists being part of the clinical ward round team affords significant interventions per patient when compared to a ward-pharmacist visit alone (ibid).

Similarly, a study with collaborative interventions of the pharmacists with medical and nursing staff, where pharmacists performed medicine reviews, following MRP analysis, resulted in 94% of the pharmacist's advices being acknowledged, attributing the achievements to effective multidisciplinary communication (Halvorsen et al. 2010, cited in Dalton & Byrne, 2016). Finally, the discharge counselling by Pharmacists also proved to benefit the high risk elderly the most (Chinthammit et al. 2012, cited in Dalton & Byrne, 2016).

It has, hence, been demonstrated that across the continuum of patient care within a hospital setting, pharmacists interventions, have proven worthy of healthcare cost savings, coupled with optimal patient outcomes. One can see that throughout the discussion thus far that pharmacist play a vital role and contribute positively to patient outcomes.

3.6.4 In Ambulatory Care

In most primary care medical centre clinics, wherein pharmacists' completed patient assessments, delivered collaborative drug therapy management, and ordered medication therapy-related tests, proved beneficial and showed improvement in clinical outcomes (Cousins et al. 2012). It was also noted that when prescribing was delegated to an ambulatory care pharmacist, the outcomes of, freeing up GPs time and reduced patient waiting times delivered improved patient satisfaction (Hawes et al. 2016, cited in Dalton & Byrne, 2016). A recent study demonstrated the instrumental impact pharmacists could have in the planning for public health emergencies and focussing on opioid abuse outbreaks (John Hopkins Bloomberg School of Public Health, 2017).

3.6.5 Community Pharmacists and Chronic Disease Management

Dalton & Byrne (2016), cited that community pharmacists are ideally and uniquely placed for the provision of community-based patient-focused primary healthcare service. They, being frontline, are in routine contact with patients, specifically trained and capable of reducing disease severity, monitor medication therapy towards desired clinical outcomes, reduce adverse health problems, and appropriately advise patients and/or prescribers about pharmacotherapy. Studies have also demonstrated that more precise and comprehensive medication histories are taken by pharmacists than by any other healthcare practitioner (Reeder et al. 2008). Hence, they performed health screenings for disease prevention and progression, and can diagnose new diseases (e.g. type 2 diabetes). Furthermore, community pharmacy-managed anticoagulation services improved chronic anticoagulation control offering decreased bleeding and thromboembolic episodes (Chiquette et al. 1998, cited in Dalton & Byrne, 2016). Pharmacists have the required skill to manage self-limiting minor ailments, are available at convenient hours without an appointment, reduces minor treatments in a GP setting while ensuring upward referral (to GP) of patients with potentially serious illnesses (Hassell et al. 1997, cited in Dalton & Byrne, 2016).

When one considers preventative and chronic disease service management, one finds the pharmacist suitably capacitated in the role, having ample time and the necessary expertise to deliver high-quality patient-centred health care (Chisholm et al. 2010, cited in Dalton & Byrnne, 2016). Similarly, research finds pharmacists in primary care skilled to manage chronic patients, contributing to both clinical and profit benefits for many chronic illnesses, such as cardiovascular disease, chronic obstructive pulmonary disease, and diabetes (Morello et al. 2006; Bunting et al. 2008; Khdour et al. 2009, cited in Dalton & Byrne, 2016). However, for this expanded role of chronic disease management, extensive training and knowledge associated is required (Mossialos et al. 2015, cited in Dalton & Byrne, 2016). Furthermore, another specialized key role that pharmacists can add value in, is to be a heart health advocate. The results of a study proved that pharmacists, part of a multidisciplinary team, have contributed towards heart failure management interventions to improve patient health outcomes (Parajuli, 2017).

3.6.6 Patient Adherence

According to Osterberg & Blaschke (2005), cited in Dalton & Byrne (2016), medication adherence describes the extent to which patients take medications as prescribed by their healthcare providers. Albeit good medication adherence relates to positive health outcomes (Simpson et al. 2006) it is projected that between 20% and 50% of patients in developed nations may display non-adherence to their medications (WHO, 2003; DiMatteo, 2004, cited in Dalton & Byrne, 2016).

Non-adherence resulted in possible progression of disease, pharmaco-therapeutic failure, and hospitalization (Maher et al. 2014). A US research study found that 33%–69% of hospital admissions related to medication may be attributed to poor adherence thereof (Osterberg & Blaschke, 2005, cited in Dalton & Byrne, 2016). The significance of non-adherence in medicines taking encompass forgotten doses (or unaffordable) across inadequate professional support, fears of unwanted side effects and a lack of belief in the value of the medication (Horne et al. 2005). Some patients were also confused between traditional medicine and 'natural' health concepts, including scientific pharmaceutical care that impairs patient adherence. Therefore, for enhanced adherence to prove effective, several 'public health' (community wide) interventions, support from individual and family to professional collaboration beyond boundaries are recommended. However, even though the need for "joint action" for improving patient adherence, is recognised, pharmacists alone, can positively impact similarly, throughout activities of medication monitoring and review (Horne et al. 2005).

Hence, community pharmacists are geographically well placed to recognise those patients who fail to take their medicines as indicated, and can institute appropriate intervention at the medication dispensing juncture by way of teaching and counselling. Understandably, research has demonstrated that pharmacists can, therefore, improve medication adherence rates, to ultimately enhance patient medication-related outcomes (Lee et al. 2006; Rotta, et al. 2015).

3.6.7 Medicine use Review (MUR)

It an important function to review the appropriateness of a patients' medicines use, prior to encouraging adherence. This holds especially true for the elderly patients, who may be treated

with multiple medicines, and where adherence may have adverse outcomes. Hence, a medicine use review (MUR), talks to a private dialog between a pharmacist and a patient, with an outcome centred around improving the patient's knowledge, adherence, and medicine use (Latif et al. 2011). MURs, further offer a pharmacist an avenue to review a patient's pharmacotherapy, including prescribed, over-the-counter(OTC) medicines, and traditional medicines. Pharmacists, by engaging with a patient, can identify medicines not administered, as well as those potentially inappropriate. In doing so, can assist reduce wastage and optimize care. Of concern, is a global aging multi-morbid population, and polypharmacy remaining a critical problem, however, MURs performed by community pharmacists will suggestively assist in restricting healthcare costs (Latif et al. 2011). Hence, GPs and pharmacists working in close collaboration, could impact positively on patients' medicine use and related health care outcomes. Sadly, the current lack of such collaboration represents a missed opportunity for pharmacists and GPs to deliver effective prescribing and optimization of medicine use (Latif et al. 2011).

3.6.8 Antibiotic Stewardship

The buzz of 'Antibiotic Stewardship' is the response mechanism instituted to combat the global spread of antimicrobial resistance (AMR) that has evoked a worldwide health crisis. Alarmingly, it is projected that by 2050, 10 million people annually will be in danger, due to antibiotic resistant infections, predominantly bacterial (O' Neill, 2016). South Africa is no exception (Brink et al. 2008; Mendelson et al. 2012; Coetzee et al. 2016, cited in Brink et al. 2016) and in response has developed, a national antimicrobial resistance strategy and an implementation plan, aligned with government's annual performance plan (Republic of South Africa, the Depatment of Health, 2014). This framework 2014-2024, was instituted to preserve the value and viability of the accessible antibiotics (Republic of South Africa, the Department of Health, 2015a). The strategy encompasses a multidiscipline, inter-sectoral focus of human, animal, and environmental health sectors. The Antimicrobial stewardship programme was established for monitoring and improving the appropriate use of antibiotics by encouraging optimal antibiotic agent(s), dose, duration of therapy, and route of administration choices, through coordinated interventions. The 'One Health' is a national intervention that is geared towards creating and raising public awareness, improving infection prevention strategies, reinforcing antibiotic consumption and

resistance surveillance, antibiotic stewardship (AS), and the promotion of suitable antibiotic use (Brink et al. 2016).

In light and support thereof, research has established the value that the adoption of pharmaceutical care services can add to antibiotic stewardship by reducing inappropriate antibiotic consumption, incorrect dosages and reductions in *Clostridium difficile*-associated diarrhoea and resistant Enterobacteriaceae (Cousins et al. 2012). In countries such as, Sweden, Brazil, Australia and France, antibiotic use surveillance system interventions coupled with incentive changes in prescribing and dispensing and controls have since optimized drug use. These efforts are fuelled by Pharmacists. For instance, in Brazil the National Agency for Health Surveillance (ANVISA) acknowledged the primary responsibility for the control of antibiotic misuse and overuse to that of the pharmacist (IMS Institute for Healthcare Informatics, 2012, cited in Bonanno et al. 2012). In addition, in India, irrational antibiotic use, either excessive and/or otherwise, resulted in harm relating to financial loss, avoidable deaths, and the advent of bacterial resistance. Hence, “pharmacy as a world-wide profession can support protective change” (Bonanno et al. 2012; Wickens et al. 2013, cited in Dalton & Byrne, 2016). The substantial infectious diseases burden in South Africa has guided the following specific antimicrobial stewardship goals (Republic of South Africa, the Department of Health, 2015 a, b):

- optimizing individual patients’ therapy,
- preventing overuse and misuse of antibiotics, and
- minimizing resistance development at patient and community health levels

Stewardship models require the resources of microbiological teams and infectious disease (ID) specialists, and are reliant on monitoring practices and teamwork to develop and implement interventions, as well as organizational infrastructure (Shellack et al. 2016). Internationally, the pharmacist’s role is one of equal partners in the antimicrobial stewardship programme, where their focus is in ensuring optimal use of antimicrobials in collaboration with other health care team members or in leadership roles within multidisciplinary teams. Depending on the extent of their training and expertise, they embrace the management of antimicrobial mediations on a wide scale. Some involve: monitoring therapy for appropriateness, providing pharmacokinetic and pharmacodynamics consultation services, in-service training of young doctors, collaborative

research into innovative approaches regarding credible interventions and quantifying usage (Shellack et al. 2016).

However, in developing countries, like SA, it is difficult to replicate similar practices (Charani et al. 2011; Olans et, al. 2016, cited in Shellack et al. 2016). Be that as it may, according to Brink et al. (2016) and Meyer et al. (2017), it is crucial to make use of the current resources of pharmacists and registered nurses (RNs), who occupy positions suitable to co-ordinate anti-infective strategies contributing to improved patient outcomes. Brink and colleagues further elaborate that limited infectious disease proficiency within healthcare facilities can experience marked benefits by incorporating pharmacist-led antimicrobial stewardship programmes into existing resource structures and systems to ensure sustainability. A goal that they affirm to be rarely achieved in many programme implementation strategies (Brink et al. 2016). Furthermore, as custodians of medicine, pharmacists in SA can lead and drive the antibiotic stewardship initiative, not only through audit and data collection, but also through relationship-building with prescribers to influence crucial prescribing decisions. The scope of an antibiotic stewardship pharmacist, across the various sectors, was identified as follows (Broom et al. 2016; Van der Horst, 2016; Erickson, 2016, cited in Schellack et al. 2018):

- Driving and coordinating the hospital ASP
- Antibiotic prescription review
- Drug expertise
- Appropriateness of prescribed antibiotic evaluation as per indications
- Dose optimization
- Duration optimization
- Monitoring, interpretation and follow-up of microbiology results
- Development, education and maintenance of clinical guidelines
- Measuring and tracking stewardship-initiated interventions
- Compliance to institutional specific guidelines
- Education and training of other healthcare providers
- Co-ordination of research on antibiotic stewardship

Hence, the necessity for pharmacist-led ASPs was shared, analysing 47 private hospitals within South Africa, proving that almost one in every 15 prescriptions included unsuitably prescribed antibiotics, compelling an intervention. The outcome of the study emphasised the vital role pharmacists are capable of filling to enhance potential antibiotic use in South Africa, considering the current limited infectious disease-trained specialists (NDOH, 2015 a, b; Brink et al. 2016). The South African Society of Clinical Pharmacy has outlined the significance, role and purpose of pharmacists in ASPs to improve antimicrobial use within South African hospitals (Meyer et al. 2017). The indispensable role of pharmacists in engaging multidisciplinary teams and interdisciplinary clinician and nurse coordination in AS mediations (Shellack, et al. 2016) was demonstrated by studies highlighting a noteworthy decrease in antibiotic consumption on the whole of 18.1% and found that pharmacists and nurses can collaboratively improve timely administration of antibiotics, (Brink et al. 2016; Meyer et al. 2017).

Meyer and colleagues recommend that for ASPs in South Africa to function effectively, due consideration must be given to multidisciplinary skills within teams able to support pharmacists in improving antibiotic prescribing practices as guided by the Antimicrobial Resistance National Strategy Framework and its implementation (Republic of South Africa, the Department of Health, 2015 a, b). The appreciation to ensure AMR extension within the PHC context is recognized by Meyer et al. (2017), who advises on including possible research activities within the community to grasp a better sense of key stakeholder attitudes, on how to develop programmes relevant to their needs, and future improvement of antibiotic prescribing and dispensing. Simultaneously, the Committee is presently in the development stage of a national AMR and antibiotic use surveillance dashboard, which will account for private and public healthcare sectors data (Meyer et al. 2017). Also, Schellack et al. (2018), advocates that the successful implementation will be greatly dependent upon the effective quantification and monitoring of stewardship outcomes.

Interestingly, Brink et al. (2016), makes reference of the antibiotic stewardship programme in South Africa to the application of the ‘low-hanging fruit’ concept. The ‘Pareto principle or Law of the Vital Few’ is an economic theory that implies that 80% of outcomes result from only 20% of potential causes, basically translates to the investment of the vital most basic interventions, that will yield noteworthy returns with little effort (Goff et al. 2012, cited in Brink et al. 2016). One can,

hence deduce, from the literature that the pharmacist, as a health care professional, within resource deficient economies like SA, if adequately trained, can be optimally utilized to target the 'higher-level fruit', through integration and by co-operating with various healthcare experts, within all areas of the continuum of care (Brink et al. 2016).

3.6.9 Adverse Drug Reaction Reporting

Adverse drug events (ADEs) are considered as major triggers of morbidity and mortality, where in excess of 50% are preventable. Characteristically, Adverse Drug Reactions (ADRs) occur from either incomplete medication history-taking, errors in prescribing or dispensing or the over or under use of prescribed medication (Naicker et al. 2018). The adoption of pharmaceutical care philosophy and methods enables collaborative working of pharmacists with prescribers, patients and care-givers aiding in identifying and managing adverse drug reactions with reporting to a national spontaneous reporting programme (Cousins et al. 2012). To support the pharmacist-led participation bears reference to Meyer et al. (2017), in highlighting a study within the hospital in-patients ARV section. Hence, through the provision of pharmaceutical care, beneficial identification, management and reporting of ADRs was proven (Ally et al. 2015). Naicker et al. (2018), advocate that medication reconciliation involves a procedure for documenting an accurate account of each medication taken by a patient and comparing the list against the “different transitions of care”. This reduces medication inconsistencies and subsequently ADEs. They further recommend that to enable continuity of patient care, demands medication reconciliation throughout a patients’ hospital stay, involving all significant health professionals’ interventions (Naicker et al. 2018). Within the PHC context, ADRs reporting activity by a collaborative effort, having the pharmacist in this fundamental role must not be overlooked.

3.6.10 Traditional Medicine

A Traditional Healer Practitioner is defined by the World Health Organization (WHO) as “a person who is recognized by the community where he or she lives as someone competent to provide health care by using plant, animal and mineral substances and other methods based on social, cultural and religious practices” (WHO, 1978). In addition, there has been countries extending from Brazil to China, India and Turkey that have emphasized the vital supportive

pharmacist role in capacity of appropriate traditional medicine use (Bonanno et al. 2012). The available data also suggest that 50% of the global population when seeking healthcare primarily rely on “traditional herbal and allied treatments” (Zhang, 1999; Heinrich 2012, cited in Bonnano et al. 2012). However, almost 80% of South Africans are using traditional medicine to sustain their primary healthcare needs (WHO, 2002). In defence, traditional remedies assist in relief of suffering and can advocate a base upon which effective healthcare services can be gradually built. However, data continues to draw focus on the global future pharmaceutical care developments yet to be realised (Bonnano et al. 2012). Hence, safety around herbal medicines being of grave concern, is been given attention by FIP to WHO’s development of guidelines on interactions of herbal medicines with other medicines (FIP, 2016).

The focus back at home, in rural KZN in SA is that majority of sick people access public clinics, private Doctors’ offices and simultaneously rely on traditional healers and over-the-counter(OTC) medication from retail pharmacies. This was identified by the defaulter tracing challenges within the ICDM implementation, where HIV positive patients are utilizing both the PHC facilities and traditional healers remotely from where they receive their biomedical care (Ameh et al. 2017). Of note are community based centres that are focussed on providing basic healthcare training for traditional healers alongside capacitating them on any unsafe practices. One such community based centre is the KwaZulu-Natal Progressive Primary Health Care (KZNPPHC), where the training of the Traditional Healers is aimed at ensuring that they play a dominant role in rural areas in the reduction of new HIV infections once they are made aware of the myths and misconceptions of HIV & AIDS (KZNPPHC). The appointment of the Interim Traditional Health Practitioners Council (ITHPCSA) serves to integrate traditional medicine into the national health system (NHS) in South Africa (Ameh et al. 2017). This highlighted one milestone in Governments’ commitment to build capacity and realise its vision of “A long and healthy life for all South Africans.”

Traditional medicine has been improved by the African Union in its Plan of Action on Traditional Medicine (2001-2010, but extended to 2011-2020). The ITHPC of South Africa is in line with Traditional Health Practitioners Act 2007(Act No. 22 of 2007). The Council’s objective is to capacitate the public towards health awareness by upholding health service standards within

traditional health practices. This is aimed at public protection and safety of those who access traditional health practitioner's services. Considering the concerns around traditional medicine, the Council is also tasked to support and grow traditional health practice interest by inspiring research, education and training. In addition, setting the standards of training will enable a traditional health practice professional code of conduct to comply with universally accepted healthcare norms and values (Mbatha et al. 2012). Hence, this new approach aids the country by regulation to "protect and enhance the indigenous knowledge system in the field of medicine". The council's duty therefore will be to attend to any public concerns over dishonest and bogus practitioners practising under the disguise of traditional medicine (Mbatha et al. 2012).

Like any other practitioner, once registered, a Traditional Healer is subjected to compliance to appropriate ethical and professional standards (Mbatha et al. 2012). To date no THP in South Africa is registered with the Council as the Council is not yet fully functional. Reasons for the delay was stated by Boyane Tshehla (lecturer at NWU) who advised that the Council is facing difficulties in selecting the credible practitioners from bogus ones. He further commented that by Council dragging the issue of finalization of registration not only further prolongs these practitioners from issuing sick notes, but more importantly blocks them from accountability in respect of their "wrongful acts and omissions" (Fokazi, 2015).

Undoubtedly, for many patients, within the South African health context, traditional Healers serve as the first point of call besides being culturally acknowledged as "promoting practices within primary and secondary health care" (Zuma et al. 2016). Traditional medicine and uninformed traditional healers is of grave concern as they may hinder pharmaceutical treatment and effect inferior patient health outcomes (Ameh et al. 2017). Having said that, the exploration of 'plural healing' involves the adoption of alternate treatment by traditional healers, biomedicine, prophets and churches as a practical community-based approach for the management of diseases (Thorogood et al. 2007), which can proof worthy within our unique healthcare context. This hence, further justifies the need for upskilling and registering the traditional practitioners to allow for ethical and legal integration of traditional medicine into the conventional medicine arena.

One can similarly agree on the need to explore the pharmacist role in this context, wherein a large proportion of its population, are still reliant on traditional medicine which calls for 'African solutions for African problems'.

3.6.11 Antiretroviral Treatment

In the history of health care, the challenges of the HIV/AIDS pandemic have taken the world by storm. In response, especially with scarcities in resources, demands health systems to shift their health care delivery strategy from that of an acute approach to one of chronic patient care (WHO, 2006). Human resources being the most critical component for effective and efficient health systems delivery, are in short supply to provide routine health care (WHO, 2006; 2008). Therefore, individuals with composite skills (management, administration, supply management, clinical care and community based care) instigate the delivery of safe and effective ART. In addition, for positive outcomes, health policies and strategies are relied upon to lessen the necessity of highly skilled health professionals. In addition, the focus involves having a shared perspective on patient care and follow-up among the different cadres of health care workers, the community and family members (Wiedenmayer et al. 2006). Hence, the expansion of the ART programme to treat its majority of the infected population, propelled the task shifting approach of the NIMART- Nurse Initiated Management of Antiretroviral Treatment (NDOH, 2010; Mutiti, 2014). However, twelve years since its inception and the quality of care remains under the radar. Patients are lost-to-follow and failing treatment with regimen one and even two. Adverse drug reactions are shown to be on an increase (those few that are reported on), with non-adherence featuring as the most common.

This, hence echoes the call for a model change to policies and processes regarding the control over this chronic condition. According to Wiedenmayer et al. (2006), pharmacists are one of the fundamental health professionals that must be "mobilized and involved". He further advocated that pre-service and continuous training of pharmacists towards HIV/AIDS prevention, care and treatment must be fostered. This training will take the shape of pharmacists' allocated roles and responsibilities. Having said that, adherence to chronic HIV/AIDS care and treatment is one of the significant roles for pharmacists to get involved in, considering that their knowledge, attitudes and behaviour impacts on how HIV care, treatment and prevention services are delivered and

used (Wiedenmayer et al. 2006). In 2003, the FIP Council adopted a Statement of Professional Standards on the Role of the Pharmacist in Encouraging Adherence to Long Term Treatments. Their focus encapsulated improving adherence to long-term therapies for chronic diseases such as HIV/ AIDS, for better health outcomes, improved quality of life and patient safety, including cost-effectiveness for all stakeholders (FIP, 2003). Therefore, Pharmacists and other health professionals in delivering healthcare treatment with medicines have an obligation to empower patients towards improving adherence to their treatments. Hence, in 1997, the role of pharmacists' strength in combating HIV/AIDS was recognised in a joint Declaration by FIP and WHO. Thereafter, in 2004, FIP launched an International Network for Pharmacists on HIV/AIDS (*www.fip.org/hivaids*) which emphasised three key elements:

- training,
- documentation and
- exchange of experience

This network aims to connect pharmacists throughout the world by assisting them become leaders in the fight against HIV/AIDS (Wiedenmayer et al. 2006).

In addition, of great concern, is the undetected Cryptococcal Meningitis infections among the HIV/Aids patients in South Africa. As indicated by Jarvis et al. (2010), *Cryptococcus neoformans,* presents as the most common cause of laboratory-confirmed meningitis. Notwithstanding the expanded coverage of antiretroviral treatment (ART), the country's incidence of Cryptococcal Meningitis projections is high, with a case-fatality ratio of >50% at 12 weeks' post-diagnosis (Jarvis et al. 2009; Park et al. 2011; GERMS-SA, 2011). Early screening and prophylactic treatment with antifungals is recommended to prevent the development of Cryptococcal Meningitis and associated deaths (Jarvis et al. 2010; Jarvis et al. 2011; Klausner et al. 2012). Therefore, primarily, the goal of Cryptococcal screening is advocated to reduce associated Cryptococcal Meningitis morbidity and mortality in South Africa, whereby early treatment enables cost effective care (Govender, 2012).

According to Govender (2012), numerous operational challenges require attention, firstly, Cryptococcal screening of patients to be integrated into routine management algorithms for those requiring rapid ART initiation and TB treatment. Secondly, patients diagnosed must be timeously traced, assessed and initiated on antifungal treatment before they develop meningitis or die. Strengthening of laboratory reporting and clinic tracing systems is in addition, paramount. Thirdly, the supply, procurement and distribution of antifungal drugs to PHC clinics must be reliable and sustainable and nurses who identify patients with antigenaemia must initiate antifungal treatment. With early detection of Cryptococcal Meningitis, results need to be followed-through with treatment initiation, allowing for a multidisciplinary approach to patient care, where the pharmacist can guide on availability, treatment dosing, and proper documentation of Fluconazole, for monitoring and evaluation of the program, opening up another avenue for the pharmacist in support of PHC.

3.6.12 Tuberculosis management decentralized to PHC

Globally South Africa stands third in relation to carrying the heaviest health load of tuberculosis (TB), next to China and India. Notwithstanding the availability of highly effective drugs, disease and deaths due to *Mycobacterium tuberculosis* are rising in South Africa, mostly driven by the HIV epidemic. Increasing emergence of drug-resistant TB strains is attributed to treatment defaulting, slow initiation of treatment, insufficient bed capacity, inferior facility infection control processes, and new infections (Ndjeka, 2013).

The concern is that DR-TB is considered to be “a man-made problem”, mainly related to human error in one or many of the listed (Ndjeka, 2013):

- Drug supply management
- Management of patient
- Chemotherapy prescription
- Patient adherence

For the above reasons cited, the advent of the MDR-TB-Clinical Guidelines was updated in January 2013. This guideline has evidence-based recommendations aimed to achieve optimum management of DR-TB in South Africa (Republic of South Africa, the Department of

Health, 2013). It describes the different levels of roles in patient management and gives attention to the various models of care, clinical management, and the referral mechanisms, however, it lacks the pharmacists' clinical support role, highlighting another potential gap in healthcare. Ndjeka (2013), reiterates that efforts to improve MDR-TB patient care access in South Africa, leans towards the nurse-initiated treatment that has demonstrated success in HIV management globally and is seen as a logical option. Hence, Nurse-initiated MDR-TB treatment will form part of the decentralised MDR-TB services (NDOH, 2013).

Therefore, Primary health care (PHC) facilities will adopt a dominant role in providing treatment and DOT to all DR-TB patients in their areas. This approach calls for simultaneous integration with other TB and HIV patients' treatment. The existing TB nurses at PHC will be trained to handle these activities, obviating the need for dedicated DR-TB nurses (Republic of South Africa, the Department of Health, 2013). Hence, another decentralized nurse-driven activity that places additional functions and responsibilities for the Primary Health Care Facilities (Republic of South Africa, the Department of Health, 2013).

Also, South Africa becomes the first country globally to take a bold step of scaling up access to an effective new drug- Bedaquiline. Hence, MDR-TB treatment will be more tolerable in comparison to the devastating impact of the side effects caused by the injectable agents. WHO (2013), guidelines recommend that Bedaquiline be reserved for people with extensively drug-resistant TB (XDR-TB), and those who have experienced hearing loss or other toxicity with the injectable treatment. Like with any new introduction, especially pharmaceuticals there will be hurdles to its implementation. Therefore, health facilities must be supported in developing capacity to use Bedaquiline and other new drugs (MSF, 2018). This is another call for active pharmacist participation in procurement, distribution, education, counselling, monitoring and evaluation of the use of a new introduced pharmaceutical, especially within the primary healthcare context, given that South Africa has ensured that no one with DR-TB be denied access to this drug (Reuter MSF, 2018), and considering the added workload shifted to a PHC nurse.

With the rapid decentralization of the ARV programme to PHC, the massive drive towards Universal Test and Treat- UTT, as well as the MDR-TB management in South Africa, patient initiation and management at PHC level, definitely calls for a vital link of the pharmacist in a multidisciplinary, collaborative team approach. There is hence, sufficient evidence extending from HIV/AIDS treatment to MDR-TB and the use of pharmaceuticals to prove that majority of the communities fail to take their medication as prescribed, despite being at risk and irrespective of them paying for their medicines or receiving them free (Reuter MSF, 2018), hence requiring a pharmacist intervention.

3.6.13 Chemotherapy

With the high cancer incidence worldwide, sees the frequency for antineoplastic prescriptions. This spells complex chemotherapy dosing regimens, that are subjected to frequent dosage changes, making them more susceptible to error. Therefore, these medication errors can be tragic owing to the drugs' narrow therapeutic index, making pharmacists' contribution vital (Ranchon et al. 2011, cited in Dalton & Byrne, 2016). A Pharmacist role in a chemotherapy preparation unit can prevent ADEs in a high-risk environment, thereby impacting positively on the hospital budgets. In addition, one study demonstrated that despite the overall pharmacist intervention rate being low (1.59%), over 50% of these interventions were considered to be higher than clinically "significant", and 1% being "very significant" or "extremely significant", producing an annual net profit of R1.8 million (Han et al. 2016, cited in Dalton & Byrne, 2016).

3.6.14 Palliative Care

This is "an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems—physical, psychosocial, and spiritual" (WHO, 2016).

Globally, 35 million people cannot access palliative care, and hence, are undergoing pain and suffering at the end stage. Further to this gruelling statistic, is the estimation that 60% of cancer patients will have devastating pain (Stjernsward, 2013). One of the contributing factors is technology. Dr Rajagopal, described as the "father of palliative care" in India, stated at a lecture

in UKZN Nelson Mandela School of Medicine that ‘major advancements in medical technology is one of the key reasons for the great divide between doctor and patient”. He explained that today, doctors rely on technology as opposed to back in his day, when doctors interacted and treated a patient more holistically (Gopi, 2018). Can the pharmacist then, assist collaboratively in filling this gap?

From a pharmaceutical care perspective, pharmacists are engaging with patients and hence, are fundamental in the formulation of their individual medication therapy. Hence, a treatment plan has specific patient goals with pharmacological and non-pharmacological management to ultimately improve the quality of life, while simultaneously having a focus to reduce cost and unwarranted medicines. The resultant effects optimises care of active disease states, promotes individual dosing regimens and aids in reducing adverse effects (AEs) of medications (Demler, 2016). Unwarranted and excessive medicine use signifies polypharmacy and AEs. Hence, Pharmacists can intervene to prevent and/or reduce polypharmacy by way of medicine reconciliation, educating patients, consulting with geriatrics, and multidisciplinary teams (Gokula & Holmes, 2012). Furthermore, the Beers List Criteria, serves as a useful resource to guide the effective and appropriate scaling down of elderly patients’ medication (AGSFHA, 2012).

In addition, from a palliative care approach, considering that such regimens are highly patient specific to sustain their needs, the integration of a pharmacist into the interdisciplinary team is paramount to attaining tailored care goals (Barbee et al. 2016). Further consideration needs to be given to the body kinetics and volume of distribution that changes in end-of-life care. Therefore, Pharmacists equipped with a unique knowledge base can optimize patient care while decreasing toxicity and AEs. Also, individual patient characteristics affect their pain. Important to note is that patients requiring palliative treatment predictably need higher doses of opioids. This develops pronounced tolerance of the medication contributing to increased AEs (Barbee et al. 2016). Advanced cancer and neurologic disorders develop secondary gastrointestinal issues (Erichsen et al. 2014), where Pharmacists role can be extended to prevention and management of constipation symptoms, to include bowel obstruction, dehydration, loss of appetite, mobility problems, and medicine AEs (Gokula & Holmes, 2012). Severe discomfort and pain from

constipation may require pharmacologic intervention to prevent further deterioration in quality of patients' life (Goodman et al. 2005).

Progressively, illness and chronic pain results in anxiety and depression, suggesting another avenue wherein pharmacists can offer the most appropriate therapy. In addition, Pharmacists can evaluate medications life expectancy and provide patients with medication that have the desired therapeutic effect (Barbee et al. 2016). Furthermore, within collaborative interdisciplinary teams (spiritual counsellor, nurses, physicians, caregivers, and volunteers), the pharmacist is tasked to assess not only the needs of each patient, but their family dynamics and spirituality, to aid in the best treatment approach (Thompson, 2008).

Counselling by pharmacists can keep patients and caregivers informed about any potential changes (additions or deletions) of long-term medications. In addition, pharmacists part of interdisciplinary teams can empower both patients and their families towards medication risks and potential dangers to improve patients' quality of life ensuring that their "dignity and comfort is always at the centre of any care plan" (Barbee et al. 2016).

Furthermore, from a financial perspective, responsible management of pain, was highlighted in the Journal of Pain and Symptom Management, (2011) showing that if a fourth of hospital patients requiring PC are transferred to home management, an appreciable cost saving of R2.5 billion a year will ensue (JPSM, 2011).

Moreover, the alliance of the Hospice Palliative Care Association (HPCA) and the National and Provincial DOH, is aimed to facilitate the training of health care professionals, such as Doctors, professional nurses, social workers, physiotherapists, occupational therapists, and enrolled Nurses. Consideration was also given, and rightly so to the Traditional Health practitioners. However, the vital omission to this target group is the pharmacist, highlighting again the lack of acceptance or understanding of the vital role pharmacists can play in managing or in early detection of PC to ensure quality life of terminally ill patients.

3.6.15 Childhood Vaccination

Vaccines, being a momentous evolution in the history of medicine, is still considered one of the most cost-effective public health interventions against infectious life threatening diseases, averting incapacity, enhancing and saving lives (Meyer et al. 2018). According to the WHO, two to three million avoidable deaths due to non-vaccination are forecasted annually that unduly influence children, making it a vital approach towards the fight against antimicrobial resistance that now plagues the global public health arena (Meyer et al. 2018). Hence, EPI-SA has embraced the WHO (1974) EPI call to expand infant immunization services and coverage. In addition, with the focus on Universal Health Coverage, optimal immunization ensuring both high coverage and adherence to scheduled vaccinations are paramount to achieve Sustainable Development Goal 3.8, which addresses "access to safe, effective, quality and affordable medicines and vaccines for all" by 2030 (WHO, 2016, 2018; Republic of South Africa, the Department of Health, 2018, cited in Meyer et al. 2018).

Furthermore, Pharmacists in providing vaccinations can find themselves in a 'privileged position' to fulfil a vital public health role in disease prevention and protection against antibiotic resistance, provided they have the necessary knowledge and skills to do so (Meyer et al. 2018). According to the International Pharmaceutical Federation (2016 & 2018), this skill can be acquired by access to additional education and specific practical training in vaccinology for pharmacists. Research has also demonstrated an increase in vaccination services provided by pharmacists displaying public health benefit in various countries (Carroll & Hanrahan, 2017; FIP, 2016, 2018; IAC, 2017, cited in Meyer et al. 2018).

As the country shows progress in NHI implementation (Republic of South Africa, the Department of Health-NHI, 2018) and PHC reengineering (Republic of South Africa, the Department of Health, 2018), there is no opportune time than the present for pharmaceutical services to exercise an essential role, particularly at primary healthcare level. Furthermore, this allows for pharmacists to increase their public health involvement at a micro-level (health promotion and disease prevention) and macro-level (policy formulation, planning and management functions) activities (Bradley & Saunders, 2011). It is, therefore, advisable that pharmacists, as public health advocates, occupy a vital position in promoting the importance of vaccination by

screening patients, patient counselling, ensuring safe administration of vaccines, vaccine pharmacovigilance, supply chain and cold chain management, vaccination advocacy and social mobilization, monitoring and evaluation (ASHP, 2003; FIP, 2016 & 2018; SAPC 2010, cited in Meyer et al. 2018).

3.7 Limitations to the Implementation of Pharmaceutical Care

According to Ogbonna et al. (2015), the limitations to the implementation of pharmaceutical care are as follows:

- Pharmacist's attitude
- Lack of pharmaceutical care skills
- Resource restrictions
- System-related restrictions
- Inter-professional and academic barriers- lack of collaboration and role models

According to Gray et al. (2016), South Africa lacks the legislature to allow dependent prescribing, such as collaborative practice, similar to other countries, which mandates pharmacists to maintain a patient's medicine therapy management following a medical practitioners' initial diagnosis and prescription. Hence, pharmacists' practice within the hospital context are limited to antimicrobial stewardship programs (changes from IV to oral administration), skilled in pharmacokinetics (therapeutic drug monitoring), or supporting anticoagulant clinics, but remain powerless to personally initiate dose changes or request laboratory tests (Gray et al. 2016).

However, practically in the South African public sector, specialists of "clinical pharmacy" is needed, but are awaiting posts to be created following the institution of a register for such a category by Council (Gray & Suleman, 2012). Nevertheless, the SAPC has proposed the scope of practice for clinical pharmacists, in March 2009 to the National Department of Health's ministerial task team. Hence, a registered clinical pharmacist may:

- Provide advanced clinical service to many specialties, plus general medicine and surgery
- Provide a leading pharmaceutical role in development of clinical protocol and guideline
- Lead a clinical audit of medicine use

- Act as a leading pharmaceutical partner within a multi-professional healthcare team.
- Develop, provide, implement, and evaluate strategic leadership in clinical pharmacy services
- Undertake pharmaceutical risk management
- Provide education and training relating to clinical pharmacy

According to Gray & Suleman (2012), the educational course for the registration of clinical pharmacists was not stipulated. Instead, significant attention was devoted to the training of primary care drug therapy pharmacists (authorized prescribers). Sadly, since then, progress in respect of clinical pharmacists came to a halt (Gray & Suleman, 2012).

3.8 Role of Pharmacist in Healthcare System

Defining specific roles and responsibilities within organizations is challenging at times, as several individuals are multitasked and perform an array of jobs outside their scope. However, this does create uncertainty within the organization. Therefore, structure and favourable outcomes are offered by clearly defining roles and responsibilities, which in essence promotes team tasks (Blezak, 2016). Similarly, at this crucial stage in the healthcare environment, more specifically in the public sector where the pharmacy profession is required to extend the expertise of its members, the need for clearly defining the new roles and the responsibilities is duly required.

Regulation 3 of The South African Pharmacy Council contains the acts specially pertaining to the profession of a pharmacist and includes provision of pharmaceutical care (i.e., evaluation of patients' medicine related needs; dispensing; furnishing of information and advice; determining patient compliance with therapy and follow-up; pharmacist initiated therapy); compounding, manipulation, preparation of medicine; and purchasing, acquiring, keeping, possessing, using, releasing, supplying or selling of medicine. The scope of practice of a pharmacist (Regulation 4) consists of the acts specifically pertaining to the profession of a pharmacist, namely formulation; distribution; repackaging; initiation and conducting of pharmaceutical research; and the promotion of public health (SAPC, 2000).

Globally, community or retail pharmacies is said to be the commonest providers of health care services. The delivery of PHC in South Africa, by community pharmacies is offered to patients' that are financially capable, and those with the luxury and means to afford medical aid schemes. The SAPC, in attempting to advance and optimally utilize pharmaceutical services and pharmacists' proficiency, introduced a new qualification, the primary care drug therapy pharmacist (PCDT), rendering 'community pharmacies as providers of expanded services to better serve communities' (Malangu, 2014).

The majority of the South African population do, however, rely on rural public primary health care facilities to provide for their health care needs. How then can this service be extended to the majority of the South African population seeking healthcare to close the chasm in the availability of services offered within the public and private sectors? The SAPC has in principle, however, extended the authorized pharmacist prescriber practice to the public sector as well. However, the interpretation of this is the allowance of a community or retail pharmacy within a rural area, as specified by Council. There still remains a void in the public sector provision of healthcare services offered by the PCDT pharmacist. What it then poses is that, how can NHI, in its implementation strategies, narrow the divide and rationalize the pharmaceutical services it offers within the private, community sector? This study will aim to tap into exploring such a possibility.

3.9 Primary Care Drug Therapy Pharmacist (PCDT)

The International Pharmaceutical Federation (FIP) is responsible for establishing universal standards for pharmacy guided by professional, scientific, policy and testimonials in partnership with other international establishments, incorporating the WHO and other United Nation (UN) organisations. Based on this premise, and bench marking with United Kingdom and Canada's model of Pharmacists prescribing rights and scope of practice, the SAPC identified to improve the Pharmacists scope back home to deliver primary health care services by introducing a supplementary course, where on completion, the issue of a permit by the NDOH is made to such pharmacists, who wish to expand their skill base within the profession (SAPC, 1994; Department of Health, 2016). Hence, hailed the advent of the PCDT pharmacist.

This move is intended to better the prescribing service delivery and hence health care needs, which should ultimately improve patient outcomes by optimizing medication treatment within an improved health approach for South Africans. The main goal is to better patient care, while ensuring patient safety, improving the availability of healthcare services, allowing patient's more options, optimal utilization of health professional's knowledge, and to afford a team approach within primary healthcare environments (Government Gazette, 2011). Hence, this initiative is geared towards expansion of the core clinical and pharmaceutical teachings, including expertise of the Bachelor of Pharmacy degree, to incorporate the scope to diagnose and treat minor ailments.

The PCDT pharmacist, under specific conditions, once gaining SAPC approval is issued with a permit in terms of Section 22A (15) of the Medicines and Related Substances Act 101 of 1965, as amended (The Medicines Act) to make a diagnosis and administer treatment to patients utilising Schedule 3 and Schedule 4 specified medication (Government Gazette, 2011), as aligned to the Primary Health Care Standard Treatment Guidelines and EML. The PCDT pharmacist will be expected among others to:

- Close skills chasm in delivery of healthcare
- Easily accessible services to those that are challenged
- Control chronic medical conditions
- Address difficult medicine regimes and co-morbidities
- Providing healthcare for the community by working in cooperation with co-professionals (proper referrals) to serve the best interest of patients and the public
- Compliance with pharmaceutical care principles

The practice capacity of an Authorized pharmacist prescriber, apart from that of a Pharmacist as laid down in terms of Section 35A of the Pharmacy Act, 53 of 1974 are:

- history taking
- physical examination
- assessment of diagnosed and undiagnosed conditions
- requesting, performing, and explaining relevant diagnostic and laboratory tests

- analysis of assessment and or diagnosis
- choosing safe and suitable treatment
- controlling possible or current health demands by prescribing appropriate medicines
- modifying former prescribed treatment
- monitoring effects of treatment prescribed
- appropriate referral to an alternative health professional

A PCDT pharmacist is hence qualified to (SAPC, 1994):

- Diagnose and treat common ailments experienced within a PHC environment, exhibiting clinical and pharmaceutical knowledge
- Deliver prescribing of high performance
- Clinical evaluation to ascertain a diagnosis
- Articulate a treatment management plan
- Execute treatment plan and oversee therapeutic effect
- Conduct particular routine patient evaluations and managing processes to warrant optimal prescribing

Highlighting the broad clinical skill base of a PCDT pharmacist finds the added clinical problem solving proficiency that strengthens effective communication with relevant healthcare professionals regarding patient care and management (Summers et al. 2004; Jones et al. 2005; South African Pharmacy Council, 2011; Gray & Suleman, 2012, cited in Malangu, 2014), which is underutilized. One might posit the need for the PCDT pharmacist, given the access to multifariousness of authorized prescribers within the present public PHC setting, i.e., the authorized nurse prescriber through task shifting, the Medical officer and the Clinical Associate. This can then, in addition, beg to question the need for the introduction of another cadre of healthcare professional with prescribing rights into the PHC domain? As demonstrated above, the PCDT pharmacist, however, brings a unique blend to a package of expertise, in both the prescribing and dispensing scope of practice- a mix that encompasses an in-depth pharmacological knowledge, and patient-caring nature that for far too long was neither recognized nor legitimized.

The skill that sets the pharmacist apart from all other authorized prescribers is their extensive clinical training and knowledge (Malangu, 2014). In the similar vein, a South African Professor, Leah Gilbert, since 1998, through her studies (Gilbert, 1998a, 1998b, 1998c, 2001, 2004), aroused interest pertaining to 'dispensing doctors and prescribing pharmacists, re-professionalization of pharmacists and role play between nurses in the Primary Healthcare Community. Her research investigated the concerns and conflicts over pharmacists' wanting to expand their practice to incorporate prescribing rights within community primary healthcare; while medical doctors, dentists and nurses desired dispensing of medication to their patients (Malangu, 2014). Finally, Pharmacists, in obtaining a qualification in Primary Care Drug Therapy, afforded them their rightful place within the healthcare team.

With increased public need and expectations, coupled with the demands for expansion of health service delivery, made a call for nurses to undertake a dispensing course, rendering them competent to dispense medicines at primary health clinics (Gilbert, 2001 & 2004; National Department of Health, 2013 a-c; Gray & Strasser, 1999; Gray & Suleman, 2012, cited in Malangu, 2014). Stemming from Gilbert's studies validates the need for role clarity to avoid role conflict, which is certainly instituted for a proposed integration of pharmaceutical care and collaborative pharmaceutical care model at public PHC. The South African Pharmacy Council strongly supported the co-operation with the nursing profession (SAPC, 1995a). From a collaborative advantage perspective, a team approach towards primary healthcare (SAPC, 1995b), entitled Pharmacist and nurse, was recommended. Council further reiterated that pharmacies can be changed to primary healthcare clinics where the pharmacist and the nurse work collectively as the "first line of defense" reinforced its recommendations and support thereof (SAPC, 1995a).

Malangu (2014), suggested that the PCDT pharmacist in a community pharmacy has to be self-reliant and not essentially work in "close collaboration" with a medical doctor, demonstrating an "independent prescribing model" (MacLeod-Glover, 2011; Foppe van Mil & Fernandez-Llimos, 2013). However, the proposed Pharmaceutical care model within the public PHC clinic, allows for pharmaceutical care application in the traditional context discussed. The integration, calls for close collaboration with the inter-professional team, viz., the medical officer, authorized nurse

prescriber and Clinical Associate, in a dependent prescribing rights capacity. The encouraging perspective is the self-reliance and professional confidence of the PCDT Pharmacist allowing the opportunity to impart expert clinical knowledge and skill to perform comprehensive medication reviews, document and report adverse reactions (Malangu, 2006; Anderson et al. 2008, cited in Malangu, 2014).

However, for the PCDT pharmacist to be integrated into a PHC setting, within the public sector, a variety of factors and arguments require consideration. These include the following:

3.9.1 Infrastructure Requirements

The infrastructure must support the expanded role and integration. Since the authorized nurse prescriber is already providing a PHC package of service, basic equipment, like stationery and materials is available, although in scarcity. However, the major challenge that will present is the infrastructure constraints currently experienced within the public sector facilities (Chopra et al. 2009; ICRM, 2015; Rispel, 2016; Meyer et al. 2017). In addition, the SAPC facility requirements must be compliant to allow for such a legislative move (SAPC, 2017).

3.9.2 New Modalities- IT infrastructure

“Never was the world so technologically advanced, so interconnected and at the same time never was it so unequal socially and economically, harbouring such oppression” Amartya Sen (2011).

South Africa has been afforded an opportunity to revolutionize healthcare through Mobile technology, given the challenges in providing care to deep rural settings and wherein there lies a thriving telecommunications market. Although broadband penetration is low and bandwidth expensive, mobile phones have given communication access to millions with approximately 90% of the country covered by mobile telephone. Therefore, it is likely that mHealth will play an ever increasing role in medical informatics, telemedicine, surveillance and healthcare education in Africa (Mars & Seebregts, 2008).

Further, a National Surveillance Centre has been established, as an innovative early warning tool, with dashboards presenting medicine stock levels at various levels of care across the country. In addition, mobile applications or electronic systems have been instituted to generate medicine availability information, allowing prompt alerting on possible medicine shortages (Meyer et al. 2017). This is the Stock Visibility System (SVS) that has been rolled out to the PHC managers or stock managers' thereby encouraging innovative technology for the sole purpose of health care workers' empowerment towards quality service delivery. In addition, the STGs-EML (Adult- Hospital & Paediatric, and PHC versions) are now available as a mobile application, further promoting the use of innovative technology. Furthermore, ADRs, and stock-outs reporting, and provision of healthcare facilities' performance information are all available by way of innovative technology. Therefore, such will afford in future, strengthened efficiency to medicine access (Meyer et al. 2017). Hence, the development on an integrated online platform, Essential Medicines Electronic Access (EMelA), will be integrated with various electronic platforms, embracing that of electronic prescribing and dispensing tools, patient management and stock management systems (Meyer et al. 2017).

Moreover, NDOH will persist in exploring innovative technologies for service delivery and the quality of care improvement. The focus involves the use of mobile applications to improve adherence to medicine especially within scarce health savvy environments, like the rural context. Technology will hence, drive a prominent and significant role in South Africa's future endeavours to improve medicine access and availability, while reducing wastage (Meyer et al. 2017).

The inference is the call for continuous innovative technology support to those healthcare professionals and communities with limited IT literacy, such as the rural public PHC areas that are in dire need.

3.10 Dependent and Independent Prescribing Rights of the Pharmacist

What clearly requires clarity and much debate is the differences between supplementary and independent prescribing for the context of this study (Gray, 2010). The definitions below draw clarity as follows:

- Supplementary or dependent prescribing is a collaboration of a medical practitioner (independent prescriber, who makes a diagnosis and starts therapy), with a pharmacist, (supplementary prescriber, who oversees the patient and continues treatment by prescribing subsequent medication) in which the patient accepts such a prearrangement (Root, 2003). Furthermore, according to Emmerton et al. (2005), the pharmacist selects, initiates, monitors, modifies and continues or discontinues pharmacotherapy appropriately to realize the established patient outcomes. Emmerton et al. (2005), in addition, describes this arrangement as a "delegation of authority from an independent prescribing professional, usually a physician", formally agreeing to a set of rules wherein the level of authority is determined. Such delegation comes with a caveat of the physician assessing the competence of the pharmacist, the pharmacist measuring their own abilities, and accepting these roles (Herrier et al.1990). Hence, responsibility and risk for patient outcomes should be shared by both professionals (Pearson, 1998; Pearson et al. 2001).
- Independent prescribing constitutes a practitioner being exclusively liable for patient assessment, diagnosis and clinical management (Galt, 1995). However, for this to prevail, the levels of knowledge and skill must be regulated legally and examined by way of a license (Galt 1995; Pearson et al. 2001). Independent prescribing involves (in the case of a pharmacist) the writing of a prescription for medication (excluding Controlled Drugs at present) related to a list of stipulated ailments. The prescribing might vary from pharmacists having either a role in minor illnesses, a scope of self-limiting conditions to those that wish to specialize in specified clinical care of patients. Pharmacists, as independent prescribers afford them the right to work as autonomous practitioners making prescribing decisions based on their assessment of the patient's condition and their judgement of the most appropriate medication regime (Royal Pharmaceutical Society, 2018).

Emmerton et al. (2005), recommended that the advent of collaborative or supplementary models of prescribing is an important measure to establish before pharmacists are granted the right to prescribe. In support, Gray (2010), advocated that instead of focusing on the subject of the section 22A (15) permits, and on independent prescribing, as the ultimate goal, much can be

gained from exploring the possibilities of “supplementary” or “dependent” prescribing by pharmacists. Emmerton et al. (2005), further cautions that prescribing and dispensing functions should be distinct in relation to patient safety and clinical governance directives (Crown 1999, cited in Emmerton et al. 2005). Otherwise, clear accountability mechanisms should be in place (Root 2003; Emmerton et al. 2005).

Consequently, with the proposal of the integration of PCDT pharmacist into the public rural context, the clarity of whether a pharmacist with dependent or independent prescribing rights must be established. What is clearly evident, is that a change is eminent- one that will be beneficial to NHI’s envisaged role of the pharmacist within the rural public sector.

3.11 Continuous Professional Development (CPD)

In a business environment of continuous change, where the boundaries within healthcare are being redefined and when service providers are required to respond rapidly to opportunities as well as perceived threats, the flexibility in human resource competencies will allow for the paradigm shift in healthcare (Tann et al. 1996). In addition, given the required deliverables for continuum of patient care, fair access, quality and safe care serve as the fundamentals in managing health services (Emmerton et al. 2005). Given the local burden of diseases specific to a geographical or catchment area, and the different populations that seek healthcare at pharmacies, will encourage authorized pharmacist prescribers to up-skill themselves through continuing professional development learning activities that allows them to stay relevant to new developments in the diagnosis, monitoring and treatment regimens (Malangu, 2014; South African Pharmacy Council. Continuing Professional Development, 2016).

It was hypothesized and proven that innovation in tasks and working methods correlates to both, a group of generic features acquired in those that advocate professional change, as well as certain supporting features within such individuals’ professional environments (Tann et al. 1996). The study went on further to highlight CPD’s potential in the period of continuing change within healthcare, calling for professionals to adapt to changing customer needs and challenging environments (Tann et al. 1996).

There however, remains a need for more productive associations across the pharmaceutical, nursing and medical service domains globally. Hence, Bonanno et al. (2012), suggested that with the move towards computerized dispensing procedures, sustainable adaptation will be compulsory, and population needs changing from an acute treatment approach towards one supporting disease prevention and active ageing. Bonanno et al. (2012), advocate that, pharmacists' interest in expansion of their services involves promotion of high quality prescribing and better medicine adherence to improve health outcomes, is the intended direction. However, this is essentially reliant on pharmacists' ability to operate and communicate their capacity regarding shifts in effective use of medicines and other health related activities. Moreover, it would require them to promote a wider acceptance of their roles among the public and medical doctors. Notwithstanding the fact that, for this approach to be entrenched, a Continuing Professional Development (CPD) model as adopted by FIP in 2002, must be recognized, where each pharmacist is personally responsible for "the maintenance, development and broadening of knowledge, skills and attitudes, to ensure competence as a professional, throughout their career" (FIP, 2002).

Likewise, the SAPC has recognized the value of CPD in patient safety and clinical governance (SAPC-Continuing Professional Development, 2016). Therefore, the significance of continuing professional development (CPD) cannot be over emphasised and needs to be inculcated in pharmacists if the pharmacy profession wishes to expand its services and be recognised and accepted by society. The provision of patient-centred care and services is not without added responsibility and accountability. As Els and du Plessis point out, that improvements in health care have heightened the expectations that individuals have of the services they utilize, which has challenged the status of professionals, to continuously demonstrate their abilities in order to justify their position (Els and du Plessis, 2003).

3.12 Clinical Pharmacist

"We must become the change we want to see." Mahatma Gandhi

"Clinical pharmacy is a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention. The

practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialized therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes. As a discipline, clinical pharmacy also has an obligation to contribute to the generation of new knowledge that advances health and quality of life" (American College of Clinical Pharmacy- ACCP, 2008).

Unpacking this definition highlights that Clinical pharmacists focus their care ultimately to the patients, in all health care practice settings, utilizing both pharmacological and non-pharmacological strategies for promoting patient health. In addition, they hold strong skill of medication combined with the biomedical, pharmaceutical, socio-behavioural, and clinical science knowledge. Therefore, clinical pharmacists apply evidence-based therapeutic guidelines, evolving sciences, emerging technologies, and relevant legal, ethical, social, cultural, economic, and professional principles to deliver the preferred patient outcomes. They hence, accept responsibility and accountability for medication treatment management practicing in isolation or in collaboration with other health care professionals. In addition, a clinical pharmacist researcher can improve the well-being and quality of life through research generation, dissemination, and application of new knowledge (ACCP, 2008).

Therefore, within the health care system, clinical pharmacists assume the role of drug therapy expert. They ensure rational drug therapy by routinely providing scientific information on the safe, appropriate and cost-effective use of medication and by conducting assessments of medicine treatments, while furnishing advice to fellow professionals and patients alike. In so doing, they avert many of the medication therapy misadventures at the point of prescribing (ACCP, 2008).

However, to achieve a vision of a clinical pharmacy profession, requires pharmacists who are adequately knowledgeable and skilled clinically to be available in reasonable numbers (ACCP, 2008). Similarly, learning from lessons of past practice model initiatives and summits in America, back home in SA, the health care system deficiencies relating specifically to pharmacy practice model requires urgent reflection and presents opportunities for transformation. According to Ashby (2009), initiatives must encompass the following:

- Optimizing the capabilities of pharmacists in the management of patients' medication therapies. Additional general clinical pharmacists with comprehensive knowledge base
- Pharmacists are to be accepted as clinical team members
- Expanded roles for pharmacy technicians
- Revolutionizing Information technology and moving beyond the 'brick and mortar' patient care phenomenon. Need for new technology- automation in drug dispensing and distribution systems
- Decentralized pharmacists promoted collaborative practice
- Clearly defining expectations of the profession: demand by practitioners versus supply of opportunities
- The Health System pharmacy to have an equitable consistent practice model? Integrating Private and Public
- Reducing health care compensation, especially drugs.
- Clear vision of drug management versus direct patient care stability
- Regulations and laws in favour of pharmacists attaining their full potential
- Acknowledging that Science is changing how medicine is practiced

Hence, literature highlights the need for CPD of the registered pharmacists in the clinical sense to achieve the therapeutic advantage that the philosophy of pharmaceutical care embraces, with attainment of synergy by incorporating the caring concept with expert therapeutic knowledge, skill, and professional acumen to deliver ideal care outcomes. This however, cannot ensue in isolation. Health System Policy must embrace the paradigm shift towards pharmaceutical care, strengthened in the clinical realm of patient care delivery to address any potential healthcare risk.

3.13 HEALTHCARE RISK MANAGEMENT

The Constitution of the Republic of South Africa (1996), section 27(1) (a), indoctrinates that the availability of healthcare is a "basic human right". The rising of medical litigation in the country has approached crisis proportions for various reasons. The resultant compromise on delivery of health to those with (private) or without (public) medical aid is alarming and worrying. The

explosion in medical malpractice litigation is seriously impacting on the availability of present and potential health professional specialists in significant health disciplines. This threatens Government's vision in achieving a 'long and healthy life for all South Africans' (Republic of South Africa, the Deaprtment of Health- Medico-Legal Summit declaration, 2015). Reviewing the medico-legal claims amongst provinces from 2011 to 2015, poignantly reveals, wasteful expenditure of tax payers' money, in which KZN is the second highest. This echoed a resonating call for implementation strategies to effectively combat such futile expenditure. It was hence, identified and advocated at the Medico Legal summit (2015), that areas of attention required by healthcare professionals in their daily work be given to the following:

3.13.1 Patient Safety and Quality in Public Healthcare

The delivery of safe healthcare has prompted much concern within the public domain arising from the landmark report- To Err Is Human, by the Institute of Medicine in 1999. Thereto, alongside Crossing the Quality Chasm, commanded the incorporation of a safe and sound health care system by integrating tried and tested safety methods to prevent medical misadventures. Hence, the majority of the public today are 'Patient safety' savvy. The definition of which surrounds the "freedom from accidental or preventable injuries produced by medical care" (AHRQ, 2008). Therefore, for such deliverance, the focus is on an approach that (1) averts errors; (2) gains knowledge through past errors; and (3) builds a safety culture around health care professionals, organizations and patients (Aspen et al. 2004; Clancy et al. 2005). Globally, health care systems, professionals and patients are challenged by patient safety issues, subjected to near misses and the outcomes of adverse events, compromising health care service delivery (Hughes, 2008). Hence, apprehensions over safe healthcare delivery influenced the founding of a WHO patient safety program following the World Health Assembly in 2002 having a vision that 'every patient receives safe health care, every time, everywhere' (WHO, 2002).

The responsibility and the desire for quality and safe healthcare is a professional duty of all clinicians, health care providers, and health care managers and leaders. It is critical that such leaders, across health care environments commit to an enduring quest to utilize evidence based research and information to inform practice (Hughes, 2008). According to Vaismoradi et al.

(2011), to assume that patient safety is only medication errors, masks the identity of the other noteworthy phenomena of patient safety (Vasismoradi et al. 2011). National data on the occurrence of Patient Safety Incidents (PSI's) in public health institutions in SA is not currently obtainable. Therefore, the National Department of Health (NDOH) established a policy for Patient Safety Incident Reporting and Learning in the public health sector of South Africa (Republic of South Africa, the Department of Health, 2016).

The Just Culture is a safety model that encourages safe delivery of healthcare in a transparent, fair, interactive and understanding approach (Youngberg, 2012). Although the 'Just Culture' is not punitive in nature, i.e., unsupportive of punishing staff for wrong doing, but practices zero tolerance for reckless behaviour. However, it encourages education and empowerment following mistakes that inadvertently occur in a non-supportive safety system. The Just Culture is instituted on conducts of Human error, At-risk Behaviour and Reckless behaviour. Therefore, health institutions are required to comfort those who are guilty of human error, provide coaching to those who commit at-risk behaviour and discipline those for reckless behaviour (Republic of South Africa, the Department of Health, 2016). One can then argue, the lack of attention to strengthen, the reporting feedback mechanisms (within this guideline), that was cited, as one of the reasons, where pharmacists, chose not to report on ADRs. Nonetheless, this does not undermine its importance in any way. It draws focus to the National Procedural Manual for Patient Safety Incident Reporting and Learning (Republic of South Africa, the Department of Health, 2016).

While many publications have focused more on the issues of patient safety practice, the pharmacy fraternity within the public sector requires more attention. Therefore, of deeper concern for the purpose of this study are the following crucial medicine related indicators that must be reported on as cited (Republic of South Africa, the Department of Health, 2016):

- Wrong dispensing
- Omitted medicine or dose
- Medicine not available
- Adverse Drug Reaction

- Wrong medicine
- Wrong dose/strength administered
- Wrong patient
- Wrong frequency
- Wrong route
- Prescription error

In addition, FIP (1999), recommended that Organizations providing Health Care, such as., hospitals, community pharmacies, nursing homes, etc., ought to develop reporting, analyses and preventative medicine misadventure structures. The organizations' leaders must build a culture and system around strategic elements, such as:

- Health settings that are focused and encouraged to improve internal medicine use reporting structures for actual and possible errors
- Systematic approaches to classify and assess reported and possible triggers of errors.
- System and individual performance procedures for suitable error preventative action
- Methods for reducing and preventing medication errors through teaching and training programmes for health care professionals, including pharmacists, technical support personnel and patients

Not only is the above vital, but more importantly is the successful implementation of an institutional culture of good governance to prevail, embrace and sustain such reporting throughout the various disciplines to allow for learning to effect change within the health organization. Adherence to Standard Operating Procedures and scope of practice will avoid preventable safety failures and promote pharmacovigilance.

3.13.2 Pharmacovigilance

The World Health Organization calls pharmacovigilance, the science and activities for detecting, assessing, understanding and preventing Adverse Drug Reactions (ADR) or any potential medicine-related challenge (WHO, 2004). Hence, with safety and quality patient care at the heart of health systems and processes, and with patient safety as one of the indicators of health care

services, demands urgent monitoring and reporting to trace health care quality performance. Furthermore, medicine safety monitoring forms an integral part of clinical practice. Therefore, excellent medical care requires safety monitoring as an on-going practice to deliver effective medicine use (FIP, 2006). Within medicine procedures, the administration thereof represents the last action where errors stemming from them directly impacts patients' well-being and identifies health care professionals as either the "source of an error, a contributor, or an observer". Consequently, they have a professional, legal and ethical obligation to identify as well as present such incidents (Bifttu et al. 2014). WHO & FIP (2006), have been able to supplant the notion of pharmacovigilance centres being not just accessible in the developed world but affords a necessary and reliable drug monitoring system that ensures safety. It is an active and cost-effective mechanism to identify, as well as reduce harm to patients and prevent any likely disaster for public health in all countries (WHO & FIP, 2006).

Pharmacovigilance has broadened the scope to include the following categories of medicine (Meyboom et al. 1999, cited in WHO, 2002; FIP, 2006):

- Herbals
- Traditional and complementary medicines
- Blood products
- Biologicals
- Medical devices
- Vaccines

Wherein, many issues of relevance to the science of Pharmacovigilance are (WHO, 2002):

- Substandard medicines
- Medication errors
- Lack of efficacy reports
- Use of medicines for indications that are not approved or there is inadequate scientific basis
- Case reports of acute and chronic poisoning
- Assessment of drug-related mortality

- Abuse and misuse of medicines
- Adverse interactions of medicines with chemicals, other medicines and food.

The Erice Declaration Report on Effective communications in Pharmacovigilance (1997), cited specific aims of pharmacovigilance in relation to medicine use. These include (WHO, 2002):

- Patient care, safety and all medical and paramedical interventions
- Public health and safety
- Review and measurement of the benefit, effectiveness, harm and medicines threat, promoting rational, safe and more efficient and cost-effective use
- Pharmacovigilance knowledge, learning and clinical coaching with responsible interaction with the public.

Hence, the definition of Pharmacovigilance now encompasses all phases of the medicine development chain: manufacturing, registration, warehousing, logistics, prescribing, dispensing, use and the destruction of expired medicine and in doing, spans the complete product life cycle (Joubert & Naidoo, 2016). Moreover, Suleman (2010), states that a strong clinical sense of the adverse drug reaction (ADR) and understanding the said drug effects will aid in drawing an inference. Hence, pharmacovigilance responsibility is shared by manufacturers, drug regulators, public health programmes, clinical institutions, academic researchers, health care workers, the media and consumers alike to provide a 'warning network', to allow remedial actions to be enforced timeously and systematically (WHO, 2002; FIP, 2006; Suleman, 2010).

For this study's objective, from a prescribing and dispensing standpoint, no clinician can forecast with absolute confidence the way a patient may react to any particular medication. Therefore, with the aid of The Medicines Control Council (now called South African Health Products Regulatory Authority- SAHPRA) regulation of the possible risk- benefit ratio of each product marketed is ascertained. Favourably, majority of medicines that are regulated by the SAHPRA do meet the documented therapeutic outcome in patients, nearly always (Suleman, 2010). Nonetheless, certain patients do suffer unfavourable effects of their medication. However, the

seriousness thereof may extend from slight distress to complete incapacity, wherein certain situations, mortality may result (Manasse & Speedie, 2007).

Drug-induced disease is an unplanned outcome of medication, consequently leading to mortality or morbidity. Some warning signs do warrant health attention to be sought out, while others may necessitate hospitalization. Furthermore, as a result of the pharmacokinetics and/or the pharmacodynamics of medications, concomitant diseases, physiological conditions and drug–drug and drug–food interactions, such drug-induced disease may arise. In addition, a patient's genetic make-up, lifestyle factors, and degree of adherence to medication treatments can also be contributing factors (Manasse & Speedie, 2007)

Furthermore, FIP (2006), views the demonstration of safety as the central focus of pharmacovigilance rather than the detection of risk and sees the Pharmacists has having an important responsibility in early detection of ADRs and evaluating continuous safety of medications (FIP, 2006). Thereto, finds verity as pharmacists progressively afford medicine management by means of pharmaceutical care application (FIP, 1998) in their professional practices and as members of the healthcare team. Pharmacists, serving as a resource of drug knowledge and evaluation imparts their expertise in relation to crucial medicine safety issues tailored for a patients' needs (FIP, 2006).

Therefore, concerns over widespread underreporting and the importance of addressing the shortcomings of pharmacovigilance activities in an effective approach within the public healthcare sector require attention (Rudd et al. 2010). This void only opens up another avenue in which the pharmacist can play an instrumental role within this context.

3.13.2.1 Inappropriate and unsafe use of medicines- Evidence based studies

A medication error is defined as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labelling, packaging, and nomenclature; compounding; dispensing; distribution; administration;

education; monitoring; and use" (NCCMERP, 1995). Hence, the reasons of medicine mishaps are often described as being 'highly varied' and often 'difficult to determine' (NCCMERP, 1995). Furthermore, the errors can take place along any of the medication-use steps in the highly complex continuum of a patient care process.

Hence, the distress experienced from subsequent medication misadventures and irregularities at the medicine process stages of prescription, drug dosage, monitoring, supply, and medicine dispensing is at the cost to recipients of health care services, their relatives, health professionals and institutes (NCCMERP, 1995). Responsibly, some accounts of morbidity and mortality following such 'misadventures' get publicised in the media and in professional journals, raising medication safety knowledge within the greater society (Manasse & Speedie, 2007). It is, hence, vitally important to classify the medication errors, in order to implement reactive interventions accordingly. Hence, NCCMERP (1995), classified the various types of medication errors, into categorizes and outlined the individual outcomes thereof, as illustrated in Table 1.

Table 1: MEDICATION ERROR INDEX: SOURCE: NCCMERP -1995

Type of Error	Category	Result
NO ERROR	Category A	Circumstances or events that have the capacity to cause error
ERROR-NO HARM	Category B	An error occurred but the medicine did not reach the patient
	Category C	An error occurred that reached the patient but did not cause patient harm*
	Category D	An error occurred that resulted in the need for increased patient monitoring but no patient harm
ERROR HARM	Category E	An error occurred that resulted in the need for treatment or intervention and caused temporary patient harm*
	Category F	An error occurred that resulted in initial or prolonged hospitalization and caused temporary patient harm*
	Category G	An error occurred that resulted in permanent patient harm*
	Category H	An error occurred that resulted in a near-death event (e.g. anaphylaxis, cardiac arrest)
ERROR DEATH	Category I	An error occurred that resulted in patient death

The above categorization in Table 1, serves to responsibly update a database that tracks medication errors in a consistent, systematic manner and can serve as a training tool for capacitating healthcare professionals in prevention of possible medication errors. Often, patients don't see the benefits of medication, either due to treatment failures or deficits, however, what is even more tragic is the reported mortality and morbidity of significant proportions that is attributed to the "inappropriate use of medicine, for example: prescribing errors, dispensing errors/administration errors, patient non-adherence with treatment regimen, inappropriate monitoring and reporting, patient idiosyncrasy and lack of medication-related health literacy in the public"(Cousins et al. 2012).

The US Institutes of Medicine (IOM) found that "a hospital patient can expect on average to be subjected to more than one medication error each day" (IOM, 2006). The prescribing errors within a hospital in-patient setting, conducted in the USA and UK, reported most errors in adults and antibiotic use. Incorrect dosage was common but overall, prescribing errors was the most frequent incident. Hence, statistically, such errors contribute to 7% of medication orders, patient days contributing to 2% and hospital admissions 50% (Lewis et al. 2009). In addition, research has demonstrated almost 2.0% to 21.4% of patients are hospitalized due to ADRs, while 1.7% to 25.1% of those admitted, acquired an ADR (Chan et al. 1992; Lagnaoui et al. 2000; Bond et al. 2006; Tribino et al. 2006, cited in Mehta, 2008).

In 2010, the National Reporting and Learning System (NRLS) in England and Wales undertook to analyse all informed medication errors. 16% of medication errors reported actual patient harm, with 0.9% causing serious harm or death. Medicine administration errors was 50% and prescription 18%. Categories of medicine errors, such as, omitted, late administration and wrong dosages encompassed the greater part of such categories. In addition, 46% of the mistakes involved thirteen medicines or therapeutic groups/classes of drugs (Cousins et al. 2012). A further Eastern Mediterranean and African study, found that almost one third of patients who experienced a harmful incident, demised, with 14% sustaining permanent disability, 16% moderate disability, 30% enduring minimal disability and 8% had non-specific harm. From the observed incidents, 34% resulted from therapeutic errors, of which, 4% was attributed to drug-related incidents (WHO, 2011).

Barber et al. (2012), identified a host of fundamental reasons for prescribing errors in general practice in the UK. These were attributed to the prescriber, the patient, the primary care team, the working environment, the intervention, the computer system and the primary/secondary care interface (Barber et al. 2012). In addition, James et al. (2009), documented dispensing errors in community and hospital pharmacies in Brazil, Spain, Australia, and the USA. The most common dispensing errors were, dispensing the wrong medicine, strength, form or quantity, or labelling medication for use with incorrect instructions. James and colleagues cited subjective factors causing dispensing errors, such as “look-alike, sound-alike” medicines, scarcity of staff, and software. Furthermore, excessive amount of work, distractions and insufficient lights have contributed to a rise in incidence of dispensing oversights (James et al. 2009).

On the other hand, drug induced diseases clinically impact negatively on society. Such studies in hospital admissions have identified the drug classes including hypoglycaemic agents, cardiovascular agents, psychotropic, gastrointestinal drugs, nonsteroidal, anti-inflammatory, anticonvulsants, antineoplastic, corticosteroids and antibiotics to frequently result in drug induced diseases (Bifttu et al. 2016). Kelly & Wright (2011), studied the Medication Administration Errors (MAEs) in older people in the UK hospital wards. It was discovered that the number and severity of medication administration errors increased. In addition, 38.4% incorrect drug administrations were noted in 65 ward rounds (Kelly & Wright, 2011).

Adverse drug events are surprisingly common in ambulatory care as well, with many being preventable and requiring hospitalization (Thomsen et al. 2007). Under-reporting of adverse drug reactions (ADRs), was also noted (Hazell & Shakir, 2006). They alarmingly identified that the majority of harm from medication goes unreported. Poor adherence to prescribed medicines and lack of effectiveness to treatments is commonly noted (Haynes et al. 2008). Furthermore, the rise in self-administered treatments, apparently calls for improved understanding and management of non-adherence. A Cochrane review of 24 studies (an evidence-based medicine database) presented only 5 (21%) with positive trends on adherence and clinical outcome. Of these, three included allied health professionals, such as nurses and pharmacists, leading the role in adherence intervention. Therefore, it was recommended that patient adherence can be

addressed and improved by expanding the nurses' and pharmacists' roles to incorporate patient counselling of medication (Haynes et al. 2008).

In addition, Vaismoradi et al. (2014), revealed that Iranian nursing students perceived that their teaching programmes are the reason for medication errors, which is found exposing them to "drug errors" resulting in patient safety being jeopardized. Hence, the recommendation called for more radical investing in medication management of the nursing programmes to deliver better skilled, competent and consciously patient safety orientated practice for students, accompanied by far-reaching clinical academic support from both institutions and mentors (Vaismoradi et al. 2014).

Another, recent noteworthy deduction was made in a SA prominent hospital children's ward, where hundreds of misadventures relating to medicine, was backed by evidence in the South African Journal of Child Health, where Pharmacists identified 663 medication errors on 227 patients during a 16 weeks' investigation in the four paediatric wards. Chambers (2017), raised alarm for public awareness, when he addressed this study in the BusinessDay on 14 May 2017. Researchers identified incorrect dosing (34%), alongside medicine exclusion (18.5%) and untimely medicine administered (12%), as the prevalent classification of errors, of which they intervened on some to avert (Chambers, 2017).

The errors cited presented in equal proportion between doctors and nurses respectively- prescribing (47%) and administration (51%). The remaining 2% were pharmacy-related. The origins of the mistakes were predominately miscalculation (26%), failure to monitor (15%) and non-adherence to procedures (15%). The responsible classes of pharmaceuticals were anti-infective drugs- antibiotics, antifungals and antivirals, attributing to 43% of errors and pain relievers, 25% (Truter et al. 2017).

Alarmingly, a high number of prescribed analgesics for post-operative pain relief was cited as the ultimate medicine error risk in the paediatric orthopaedic ward (Truter et al. 2017). The recommendations made was the assigning of a pharmacist to the paediatric wards (errors will reduce by half) , improving training for doctors and nurses, regular discussions on preventive

measures among the multidisciplinary team and introduction of a digital database system for recording of medication errors (Truter et al. 2017).

According to Gray (2008), the challenge is to prevent all medication errors and not just those that are life-threatening. The IOM (2006), called for more effective and accurate internal monitoring ADE programmes to improve medication safety. One approach, would be the adoption of the pharmaceutical care philosophy and methods, that can position the pharmacist to work jointly with nursing staff, prescribers, and in addition patients to identify medicine error risks beforehand, and secondly, as they arise to prioritize reaction to actively reduce the associated dangers and damaging reactions enabling positive impact on patients' health (Cousins et al. 2012). One can painfully, deduce from the evidence based studies that the chasm in patient safety processes, globally, and locally, requires a paradigmatic turnaround. For healthcare policy makers, professionals and patients alike, patient safety must be at the centre stage of health care delivery.

3.13.2.2 Role of Pharmacist in Pharmacovigilance (PV)

It has been demonstrated that often health care impairs patients and regularly neglects to present the desired outcomes. "Between the health care that we now have and the health care that we could have lies not just a gap, but a chasm" (IOM, 2001).

Physicians, pharmacists, and nurses do play a central role in the medication continuum of care chain, driven by societies' expectations, must own the responsibility to recognize, report and re-mediate medicine administration errors causing harm and compromising patient safety. This can be achieved by simplifying and interrogating medicine orders that prove unclear and inappropriate (Runciman et al. 1993, cited in Bifttu et al. 2014). Early detection and reporting of medication error through established systems assist in preventing similar or even more serious ones from occurring (Schmidt & Buttoni, 2003). Nevertheless, nurses display reluctance to inform medication errors for; fear of disciplinary action, no protection from the informed errors; a blame and punishment culture; differences in describing errors; and damage to the reputation of the hospital (Stratton et al. 2004; Lisby et al. 2010; Schmidt & Bottoni 2013; Bahadori et al. 2013; cited in Bifttu et al. 2016). Evidence to support this fear, is cited by Arries (2014),

highlighting that the reporting system has disparities in its structure, process and outcome. These included, organizational factors, culture of safety, structural accountability, lack of patient involvement in safety, adverse events, injuries from medical devices and medication (Arries, 2014).

Hence, one can similarly argue, that physicians and pharmacists, alike, are reluctant to report medication errors. The traditional pharmacist's role has evolved from the 'lick, slap and stick' product orientated practice of dispensing of medicines to a patient care focused approach by acting as a pharmacotherapy consultant, for physicians and patients. Understandably, in supporting all of these roles lies the safe use of medicines. Hence, what then constitutes the role of the pharmacist, as an Adverse drug reaction (ADR) reporter? ADRs contribute to potentially expensive and prolonged length of hospital admissions and are regarded as a major public health priority (Zolezzi & Parsotam, 2005; Doherty, 2009; Abdel-Latif & Abdel-Wahab, 2015, cited in Williams, 2015). This in effect has a detrimental effect on a country's economy due to loss of income and loss of production days (Zolezzi & Parsotam 2005, cited in Williams, 2015).

In countries like United States, Canada and the United Kingdom, hospital pharmacists, contribute to ADR reporting whereas in the Netherlands, Japan, Portugal and Cuba, it is the community pharmacists that contribute to more ADR reporting (Van Grootheest & de Jong-van-den Berg, 2005, cited in Suleman, 2010). In South Africa, ADRs are mainly detected by a spontaneous reporting system but it is plagued by under-reporting (Williams, 2015). Therefore, in light of most ADRs being preventable, it is essential for any healthcare system to institute an effective and adequate pharmacovigilance management programme (IOM, 2006; Jose et al. 2014, cited in Williams, 2015).

Hence, pharmacists on the whole, whether in the community, allowing early detection or the hospital milieu, orchestrate a fundamental role in drug safety by way of "prevention, identification, documentation and reporting of ADRs" (FIP 2006; Zollezzi & Parsotam 2005, cited in Joubert & Naidoo 2016). However, Gray (2008), argues that the development of safe systems within the hospital sector is poor due to the unclear scope of practice in placing such

responsibility with the Hospital responsible pharmacist. He advocates, the importance of preventative actions taken after “every error” or “near miss”, identifying the root cause and for actions to be practical and sustainable. It can, therefore, be deduced from Manasse & Speedie, (2007) and Suleman (2010), that for an effective, efficient preventative and reporting pharmacovigilance system to be sustained, the following is required to protect the public against preventable injury and mortality:

- Pharmacists taking the management role
- Pharmacists directly involved in patient well-being
- A functional, extensive supported reporting system
- A pharmacy work force of sufficient trained personnel
- Organizational, technological, and financial resources

Suleman (2010), further advocates that activities such as therapeutic drug monitoring, management of the formulary and specific high risk medicine monitoring defines some areas within which institutional pharmacists can render positive patient safety impacts. Few studies in South Africa by Ruud et al. (2010); Williams (2015), and Joubert & Naidoo (2016), on the barriers to ADR reporting by health professionals, identified that most health professionals, including pharmacists experienced the following:

- Lack of understanding of what to report on,
- Unaware of where to obtain the forms from,
- Reporting forms not being user-friendly,
- Lack of knowledge and skill to ADR identification
- ADRs being outside their legal and clinical scope of practice.
- Work and time constraints of the additional paperwork,
- Pharmacists associating an ADR experience with a clinical intervention and relying on medical officers for clinical action

Hence, Joubert & Naidoo (2016), assisted to define a clinical intervention to include, a change of medication, dose and other prescription changes, medical officer referral of patient to a higher level of care (owing to severity of ADR), performing complex diagnostic tests, observations and

laboratory investigations. Sadly, health professionals reported a lack of motivation to produce quality data, because of the irrelevance and rare feedback they receive leaving little incentive to comply with reporting requirements (Joubert & Naidoo, 2016).

Considering Pharmacy as a health discipline, with practitioners that are specifically trained and educated in the chemical properties and clinical implications of drug therapy (Manasse & Speedie, 2007), if empowered by the correct mentorship and training with sound reporting and feedback systems, can have an important leadership role as the gatekeepers and drivers (enabling other HCPs) to report on ADRs in the further development of pharmacovigilance (Suleman, 2010; Williams, 2015). According to Van Grootheest (2003), cited in Joubert & Naidoo (2016), pharmacies can also act in an administrative capacity, from which report forms can be accessed, filled and couriered to a nearby PV outlet, and serve as a reference for any communication regarding the safety of medicine (Joubert & Naidoo, 2016). In addition, Pharmacists can be positioned collaboratively for monitoring and evaluation of safe medicine use, including that of ADRs and patient compliance (Joubert & Naidoo, 2016). While, Pharmacists are valuable in collecting PV information, they have conveyed their discontent over the current PV structure in SA, but expressed their willingness to develop PV skill and activities through extended education and training (Joubert & Naidoo, 2016).

Hence, the above compelling evidence cited, is implicitly summed up by the Erice declaration, of the WHO (1997), which states that noteworthy enhancements regarding the under-reporting of Adverse Drug Reactions (ADR) and other drug-related problems by “actively involving pharmacists in the surveillance of drug safety within the context of pharmaceutical care” can be realised globally (Erice Declaration WHO, 1997). Hence, gleaning from the literature reviewed, pharmacists are conditioned by biological and pharmaceutical products to aid them in restoring health to patients; are the custodians, experts of medicine and ADR reporters, and are strategically positioned to enact a distinctive and crucial role in contemporary public health care, by entrenching their role as an integral part of pharmaceutical care (Manasse & Speedie, 2007; Suleman, 2010). This can be further enhanced by working in close collaboration with healthcare professionals.

3.14 COLLABORATIVE PATIENT-CARE

"*We can't make access to health care and its delivery safer by working in silos; bringing pharmacists together with doctors, nurses and other health professionals is key*" Yves Daccord-DG International Committee Red Cross, (2016).

In one's daily working environment, there is constant interaction with ones' colleagues. The word collaboration expresses the concept of involvement and suggests co-operation towards desired and shared objectives. Advances in Medical Science and Technology, coupled with emergent healthcare difficulties and shortages of health workers has challenged the nation's health care delivery system to apply the new technology safely and appropriately (D'Armour et al. 2005; WHO, 2010; Green & Johnson, 2015). Bearing in mind that the demands of public healthcare has also shifted. Societies now live longer, owing to some extent to technology and medical science improvements. However, with the age progression, comes the rise in incidence of chronic diseases, such as diabetes, heart disease, and asthma, which feature as the principal triggers of illness, disability and death (WHO, 2008b). However, one finds current health structures adopting an acute, curative care approach.

Moreover, literature shows a shortage of clinical programs, multidisciplinary infrastructure and multiple specialties available for the provision of a comprehensive health package to patients suffering from general long-lasting illnesses and complex diseases with a public health practice approach (IOM, 2001; D'armour et al. 2005; WHO, 2013; Green & Johnson, 2015). Furthermore, health care delivery structures are disintegrated, poorly organized and uncoordinated to endure these challenges (WHO, 2010; Green & Johnson, 2015). The IOM (2001), also maintains that elaborate healthcare procedures does not capture information completely, causes gaps in health coverage, and fails to utilize the strengths of all healthcare professionals and resources appropriately, questioning the quality, safety and timely delivery of care. This concern was resonated among its partners in WHO (2010) citation, stating that in periods of global scarcities of health workers, appeals for policymakers to engage in innovative strategies to strengthen the health workforce worldwide is needed (WHO, 2010).

In defence and action to combat this crisis, The World Health Organization (2010), together with its partners, had sufficient evidence to recognize this chasm and the role of inter-professional collaborative benefits as an inventive approach in the fields of education and practice. Hence, such a health approach is defined as care "when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings," and inter-professional education as having "two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" (WHO, 2010). Furthermore, in terms of modern health care delivery, studies have shown that engaging multidisciplinary expertise is one of the goals for achieving ultimate population health (Anderson, 2002). Simply put, collaborative practice, jointly in education and clinical practice within health, empowers professionals to promote and enrich the health outcomes and systems.

In support, the fields of research, education and clinical practice go 'hand-in-glove'; research informs education, consequently impacts clinical practice and patient care outcomes. Therefore, inter-professional education is an essential move in building a "collaborative practice-ready" health workforce that is better equipped to respond to local health requirements (WHO, 2010). Collaborative practice (CP) strengthens health systems and improves health outcomes by improving patient flow affording acceptable outcomes for the system, the care providers, and the patient alone (Canadian Nurses Association-CAN, 2011). Such collaboration is seen worldwide as assisting health systems deliver complicated health demands having both human and finance resource scarcities (Reeves et al. 2009; Mickan et al. 2010 cited in WHO, 2013).

How then, can pharmacists ready themselves for such a collaborative approach to health care delivery? Medicine management has two interrelated spheres, the logistic function, comprising of procurement and distribution and the more clinical nature of selection and use. The logistic function as described by Gray (2010), traditionally falls within the scope of pharmacy practice, while the clinical functions have always demanded a more multi-disciplinary team approach. He further alluded to the ignorance of the laws governing the scopes of practice for health care professionals within each profession to allow and address the necessary overlaps. As a result, conflict can arise when tasks considered as "specially pertaining" to a specific profession are to

be shared (Gray, 2010). The advent of the PCDT Pharmacist has, however, reconsidered these strict boundaries, leaving much work yet, on the horizon of building a collaborative practice of health care delivery. Equally important of note is that collaborative practice is supported by the NDP (1996), which addresses rational drug use. This involves pharmacists in a multi-disciplinary setting ensuring rational utilization of drugs and enhanced cooperation between themselves and other health professions within communities and hospitals to support medication and treatment protocols (NDP, 1996).

3.14.1 Concepts of Collaborative Practice

Collaborative practice means to foster a change in the activities and attitudes of participants of health care to allow for effectiveness of team work for patients and trained professionals. Their shared knowledge and resources will ensure a more satisfying and supportive work force and environment. However, this will not exist without prior organizational and inter-professional experience and opportunities for specialist skills (Leathard, 2003).

Hence, such deductions of collaborative practice mentioned, is possible with transcending of professional boundaries, wherein each member embraces each other's abilities and unique expertise participating towards the development of patient orientated care (D'Amour et al. 2005). Collaboration occurs when individuals enter into a partnership, have mutual trust and respect for one another and one another's profession, values their contributions and are willing to cooperate to pursue common goals (D'Amour et al. 2005; Bridges et al. 2011, cited in Green & Johnson, 2015). Partnership denotes constructive relationships, demanding openness and honest communication, mutual trust and respect (D'armour, et al. 2005).

Therefore, as soon as teams' acknowledge interdependencies, individual contributions augment towards a synergistic outcome of collective action (D'Amour et al. 2005). Whereas the concept of power, grounded by knowledge and experience and not functions nor titles, is perceived to be shared amongst team members (D'Amour et al. 2005). Such commitment is apparent in an inter-professional oath recommended by Brown et al. (2014), cited in Green & Johnson (2015) "We will work with others to provide care, recognizing the unique skills of each and we will seek to collaborate effectively in the healthcare team".

3.14.2 Benefits of Collaboration

The power of partnerships is realised by the combination of a cohort of peoples' viewpoints, resources and knowledge, including organizations enabling synergy which is a distinguishing feature of collaboration that gives partnerships the benefit in focussing on health related matters in comparison to individual agents (Lasker et al. 2001), consequently, yielding improved patient outcomes and health services to the communities that rely on them (D'Amour et al. 2005; WHO, 2010; WHO, 2013). Littlechild & Smith (2013), cited in Green & Johnson (2015), stated that better efficiency, enhanced blend of skills, greater awareness, more comprehensive services, innovative methods and a more employer-friendly system can be afforded by a collaborative approach. What was also demonstrated from the framework for action on collaboration was the related Interprofessional Collaboration (IPC) practice-link with improved family health outcomes, infectious diseases, caring principles, and responsible action towards outbreaks and non-communicable diseases (WHO, 2010). In addition, studies have demonstrated related advances in the availability of caring and harmonized services, proper application of specialty care, chronic disease management and safety outcomes (WHO, 2010; Lemieux-Charles & McGuire, 2006, cited in Green & Johnson, 2015).

Evidence, in addition, also demonstrated the positive impact on existing health concerns relating to waiting times, health conscious work environments, workforce forecasting, health safety, rural and remote ease of access, primary health care, public health and wellbeing (Enhancing Interdisciplinary Collaboration in Primary Health Care-EICP, 2005). The introduction of 'patient-centred medical homes and family home teams' sees IPCP as an attractive model, towards the provision of better care (Green & Johnson, 2015). Support for IPCP gained appreciation to address medical error (IOM, 2013), and rightfully so, as within any health care system, indicators are a measure of its performance. Studies of IPCP showed favourable performance in vital indicators of "patient safety, patient care and environment, complications and error rates, length of hospital stay, conflict among caregivers, staff turnover and mortality rates" (WHO, 2010). Hence, global support and driving force for collaborative practice is voiced in Gostin and colleagues (2004), citation in Green & Johnson (2015), stating that siloed models of care are mere short-term solutions, and in no means adequate to ease the overall disease burden in developing countries, but suggestively stated that "We need partnerships because most of the

problems we will face in the 21st century will require multi-sectoral, multidisciplinary, multi-component efforts" Richardson & Allegrante (2000), cited in Lasker et al. (2001).

3.14.3 Enablers to Inter-Professional Education and Collaborative Practice

However, to achieve the benefits of IPCP, requires the implementation and support of enablers to IPE and CP, which cannot be overlooked. The principal enablers include: leaders and champions; administrative, institutional and work culture support; mentorship and learning; a shared vision and mission; and an enabling built environment (WHO, 2010 & 2013). However, Lasker et al. (2001), identified the following partnership synergy elements as:

- Resources: - Money; equipment, space, goods; skills (shaping of community, outreach, governance, communication, electronic technology, management, clinical proficiency, public health approach, assessment, cultural diversity, public policy and coaching) and expertise; evidence; network of people, establishments and alliances; validations; assembling control
- Partner attributes: - diversity; participation level
- Relations among partners: - Trust; respect; disputes; power struggles
- Affiliation characteristics: - Leadership; administration; governance; competence
- External surroundings: - community attributes; public and institutional policies

Therefore, in addition the importance of the ten characteristics underpinning effective interdisciplinary team work are as follows (Nancurrow et al. 2013):

- Positive leadership and management characteristics
- Communication strategies and structures
- Personal rewards, training and development
- Appropriate resources and procedures
- Appropriate skill mix
- Supportive team environment
- Individual characteristics that support interdisciplinary team work
- Clear vision
- Quality and care outcomes and

- Respect and understanding of roles

3.14.4 Barriers to Collaborative Practice in Pharmaceutical Care Implementation

Today the forces of chronic, complex diseases and scarcity of health care providers drives health care delivery towards a team-based community care approach with multiple specialties (IOM, 2003). Knowing the main barriers can assist in directing action (Hall, 2005; Baker et al. 2011; Herbert et al. 2007, cited in WHO, 2013; D'Amour et al. 2005). Some of these barriers are as follows:

3.14.4.1 Professional cultures and stereotypes

Today, health complications are increasing, forcing professionals towards interdependency (D'Amour et al. 2005). Bearing in mind that the relationships between health professionals is also complex - as they are somewhat indoctrinated during their teaching to implement a 'discipline-based' approach towards patients and services offered (D'Amour et al. 2005). Hall (2005), describes professional culture as the "social heritage" of a population that gives rise to professional power boundaries and stereotyping about professional identity, compounded by opportunities and constraints of the organizational environment in which they work (D'Amour et al. 2005; Green & Johnson, 2015). Hence, paradoxically collaboration can lead to conflict. This conflict arises from various potential boundary disputes, status contentions, language barriers, customer service preferences, reporting structures, physical space lacking adequate and/or appropriate design, role overlap, confusion, and territorialism (Green & Johnson, 2015). Enforcing collaboration within this context would hence, require, paradigm changes (D'Amour et al. 1999, cited in D'armour et al. 2005).

3.14.4.2 Knowledge of the roles and scope of other health professions

Lack of inter-professional awareness is another barrier to collaboration. The importance, acceptance and respect for each discipline's roles and scope of practice are crucial to successful implementation of CP. This hence calls for role clarity and identification of definitive roles and responsibilities as a driving force to CP (Nancarrow, 2013).

"Times are changing, silos are falling, national health burdens are being shared, and it is going to take much more than a single practitioner or paradigm to solve the serious health care issues confronting humanity today and in the future. Through collaboration, we can work together for a better future" (Green & Johnson, 2015).

3.15 CLINICAL GOVERNANCE

Is a framework that equips managers and clinicians (such as nurses, doctors, physiotherapists) to enhance service excellence and continuously in a thoughtful and coordinated focus safeguard the standards by crafting a work setting and culture wherein clinical care flourishes (HST, 2014). Clinical governance also ensures the best clinical outcomes for patient care (NDOH, 2014). Hence, clinical governance can be achieved by ensuring the following (NDOH, 2014):

- Organizational commitment at all levels comprising of key clinical care-givers
- The formation of an organizational culture that supports excellence, is safe and sound, fair and just, has collective passion, respect, openness and transparency, and a non-criticizing patient and client care approach
- Processes and practices to be aligned and communicated to all. Health care workers to identify and act upon opportunities for improving the quality of care and safety.
- Effective teamwork, managing health and health care risks to ensure clinical efficiency and effectiveness.

In order for clinicians to practice good governance, the components of clinical governance must be known. These include the following pillars (Republic of South Africa, the Department of Health, 2014):

- Clinical effectiveness- involving evidence informed practice with clinical guidelines by way of SOPs and clinical audits measured against a standard of the quality of care offered
- Patient safety- including control of risk, identifying possible risks with remediation and adverse event reporting by detecting, investigating and learning from lessons
- Patient focus – addressing complaints, patient information and involvement

The Department of Health's concerted efforts are displayed by including Clinical Governance as an indicator in the National Core Standards audit (Republic of South Africa, the Department of Health, 2009). Inclusive thereof, lies another vital arm to successful patient outcomes, which translates to patient self-care and self-medication.

3.16 ROLE OF PATIENT IN PRIMARY HEALTH CARE

Many medication issues observed in primary health care settings fall outside health professionals' immediate influence, but rests largely with that of the patient (Bajcar et al. 2005). The responsibility of the patient in taking charge of their health, more importantly chronic conditions cannot be over emphasized. There is little doubt that the management of chronic disease goes beyond a mere medicine prescription. The managing of chronic conditions is a daily effort which is reliant on a patient's behaviour at home and the time spent in a healthcare practitioner's office (Viljoen & Wesso, 2017). Hence, patients' behaviour has a direct impact on their experienced symptoms, outcomes of their health and value of their lives. It is therefore correct to deduce that 'self-management' has an important bearing on patient care. Treatment adherence, healthcare utilisation and lifestyle management is often overwhelming for life-long physical or mental health suffering. Although patients' can be provided with medical care and can be educated and skilled about their condition, self-care dominates the achievement of any treatment intervention (Viljoen & Wesso, 2017).

Hibbard et al. (2004), defined patient activation as "understanding one's own role in the care process and having the knowledge, skills, and confidence to take on that role". Many patients already know the lifestyle changes that are necessary to improve their health, but are unable or feel unable to implement these changes. It is regarded as an individual's 'level of activation' which determines the successful self-management of their chronic diseases (Viljoen & Wesso 2017). Patient and family members' involvement in healthcare remains a developing area of research and practice considering the interest they display to be part of "patient care teams" (Garrouste-Orgeas et al. 2010, cited in Reeves et al. 2015). Zwarenstein et al (2009), cited in Reeves et al. (2015), proposes that patient care can be realized by on-going staff interactions and agreements with regards to their involvement in patient care in addition to supporting family

members (Davidson et al. 2007, cited in Reeves et al. 2015). This highlights the power of knowledge and community based care.

3.16.1 The Role of Patient Activation in Self-Management

Nowadays, the public are more knowledgeable and demonstrate reliability for self-health than before. Many display interest in being well-informed and equipped through expert sources advocating appropriate action. Hence, Hibbard et al. (2013), advises that by using patient activation levels to effectively and appropriately support patients is an important way for delivery systems to improve outcomes and lower costs. Self-care is the responsible avoidance of sickness through diet, exercise, moderate alcohol intake, quitting smoking and other tobacco products and preventing drug abuse (Van Royen et al. 2014). Self-medication on the other hand involves the patient managing their symptoms with non- prescription medication (Van Royen et al. 2014). Therefore, encouragement of sensible self-care is the stance most Governments and health insurers foster for enhancing healthy inhabitants (FIP, 1996). Van Royen et al (2014), strongly advocates that Primary care should not only coordinate people's care but should first of all empower people's self-care (Van Royen et al. 2014).

Patient activation is described across three elements, namely, on how knowledgeable, skilful, and confident they are regarding their health management (Hibbard et al. 2005). Patients with 'low levels' of activation are less likely to play an active role in staying healthy and lack the confidence to manage their own health. As a result, patients' are not prone to seeking healthcare when required, follow the advice of their doctor's and unable to manage their own health independently once treatment has completed. Therefore, Viljoen & Wesso (2017), state that both healthcare practitioners and funders are required to understand the elements of patient activation in order to support patients in empowering them to discuss their obstacles while trying to achieve three important self-management skills, i.e., taking care of a health condition, carrying out daily activities and managing their emotional changes.

The challenging predicament facing healthcare professionals within the rural public context is the high illiteracy rate and economic circumstances of the patients that access the services, thereby requiring more empowerment towards self-care by the primary care teams.

3.17 MODELS OF PATIENT CARE

Access to healthcare is a fundamental human right. Hence, universal healthcare access of desired, proficient, and excellence in the delivery of health services is the objective of any care system for supporting the health of its people. There are various models of patient care that aim to deliver optimum service. The models in existence within the South African Health care system will be discussed and the proposed pharmaceutical care model will emanate from the discussions, not to re-invent the wheel, but to integrate within the existing models to improve on chasms identified throughout this research literature review.

3.17.1 Primary Health Care Model

Influenced by the ideals of the 1978 Alma- Ata International Declaration, all national governments were mandated to adopt and reaffirm the definition into practice, i.e., “primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community, through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self- reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process” (WHO, 1978).

As the global guru- Canada, enhanced the primary health care approach and outlined a plan of action by defining five guiding principles for primary healthcare to be, accessibility, public or community participation, health promotion, appropriate use of technology, and inter-sectoral collaboration (Ottawa Charter- WHO, 1986).

The Canadian Society of Hospital Pharmacists (CSHP), later in, 2003, reflected on Primary care as a ‘philosophy of care’ delivered to persons to focus on prime medical requirements, whereas the Canadian Nurses Association in 2015, approached Primary care, as more of a community-based clinical health-care service delivery. Primary care focusses on the provision of care at the

first point of call within a health system, mobilizing and coordinating health services to enable equitable and timely access to other health-care services and providers. It focusses on educational interactions to empower health, management of common illness, minor injury and chronic health difficulties. Therefore, primary care incorporates diagnosing, treating, preventing, promoting, curing, supporting and rehabilitating services on assessment and evaluation offered by a range of professionals. For the anticipation, prevention, and management of health matters for the majority of the population, demands strategies in health promotion, education, action of early warning signs in disease and inter-sectoral co-operation to be aligned (CSHP, 2003; CAN, 2015).

PHC acknowledges the broader conditions that determine health, which encompasses the significance of, healthy lifestyle promotion to avert illness, injury and sustained chronic disease management. Therefore, its value and principles are appreciated through policy and practically by its deliverance through programs (Pillay, 2012). This approach defines the repair strategies of the health system in the 10 Point Plan and the National Service Delivery Agreement (NSDA), which spoke to four urgent issues requiring attention, viz., increasing life expectancy, reducing rates of maternal and child mortality, preventing HIV and AIDS alongside decreasing TB disease burden, and enhancing health system efficiency (Pillay, 2012).

3.17.1.1 WHO perspective on Task Shifting

The WHO Alma Ata Declaration on Primary Health Care of 1978, envisaged an equitable access to health services by encouraging the movement of services to communities. WHO describes task shifting as “a process whereby specific tasks are moved from a category, where appropriate, to health workers with shorter training and fewer qualifications” (WHO, 2008). Task shifting, in essence embraces a logical reallocation of tasks among health team members, thereby generating a sound, efficient and accommodating workforce, needed for the challenges that a changing public health system brings, hence advocating the responsible utilization of scarce human resources (NDP, 2016). It is established practice in South Africa, with a constrained health workforce that task shifting to nurse practitioners be instituted to service primary healthcare needs of the communities, especially in improving access to HIV services. As a result, the National Department of Health, in 1996, introduced the National Drug Policy with

Standard Treatment Guidelines and Essential Drug lists to facilitate safe and effective prescribing (Republic of South Africa, the Department of Health, 1996).

The WHO (2008), in advocating task shifting, recommended a number of guiding principles to ensure responsible prescribing practices. Of note are the following concerns within the South African context:

- Task shifting to be implemented alongside other efforts to increase the numbers of skilled health workers
- Human resource quality assurance mechanisms to be in place
- Cadres of health workers to practice according to an extended scope of practice and to allow the creation of new cadres within the health workforce
- Defining strong M&E mechanisms
- Roles and Competency levels defined and competency based training that is needs-driven and accredited
- Nationally recognized training programmes and continued education support
- Health personnel within teams offered on-going encouraging guidance and clinical mentoring. Mentors to be competent and have appropriate supervisory skills

Therefore, professional fraternities can adopt the task shifting approach to include pharmacists, pharmacy technicians or technologists, laboratory technicians, records managers and administrators to deliver a comprehensive package of healthcare (WHO, 2008). The ICDM model approach also adopts the Task sharing team approach, allowing different health workforce domains to work together towards achieving the said objectives. This entails shifting tasks from highly trained workers such as medical practitioners to professional nurses and to Community Health Workers (CHW), working as a team and sharing ownership for providing care for chronic patients. However, a timely warning from Gray (2014), with regards to task shifting emphasizes that by not clearly defining the tasks to be performed by the different health cadres within the PHC context, presents a major barrier for determining the type of training and supervision that is required for those that are already overburdened with tasks (Gray, 2014).

3.17.1.2 Primary Healthcare Nurse Prescribers

The SA Government's health policies specified that the nursing/midwifery profession, being the largest of the health care professional domains, should deliver primary health care services to populations (Geyer & Cur, 2001). Therefore, patient care necessitated the nurse moving into the grey areas with overlap in scopes of practice among medical practitioner and other practitioners (physiotherapists, dieticians and pharmacists). Due to scarcities among multi-professional team members, the nurse was expected to hold the skills without restrictions to either treat or to refer patients. However, this required knowledge, skills and expertise, alongside enabling legislation and regulation (Geyer & Cur, 2001).

Section 22A of the Medicines Act that deals with medicines and scheduled substances control, sub-section 22A (17) (a), considers a nurse to be an authorized prescriber. Section 56(6)(iii) (Special provisions relating to certain nurses) of the Nursing Act 33 of 2005 as amended states that despite the provisions of this Act, the said Medicines and Related Substances Act, 1965, the Pharmacy Act, 1974 (Act 53 of 1974), and the Health Professions Act, 1974 (Act 56 of 1974), allows a nurse in the service of the health department to perform PHC functions. This encompasses them to physically examine, diagnose and prescribe medicines to treat adults and children in accordance with the current prescribed PHC EML lists and STG's to improve the accessibility and value of healthcare service for all populations of SA (Republic of South Africa, the Department of Health, 2008). This enabling legislative process involved the nurse to be designated and authorized by either the Director-General, the head of provincial department of health, a medical officer of health of such a municipality or the medical practitioner in charge of the organization (Republic of South Afica, the Department of Health, 2008).

Aligned to 'an enabling environment', the National Drug Policy (1996), states "Prescribing of drugs above schedule 2 by pharmacists, except as provided in the regulations of the Medicines and Related Substances Control Act (101 of 1965), will not be permitted. Similarly, prescribing by nurses will only be in accordance with the provisions of Act 101 of 1965. The objective is to ensure that all health personnel involved in diagnosis, prescribing and dispensing of drugs receive adequate theoretical and practical training" (NDP, 1996).

Therefore, at primary healthcare level prescribing by nurses is competency and not occupation based. Such competency is further deemed by the DG or medical officer of the institution under which a PHC clinic is managed. However, the PHC practice, within the public provincial and municipal sectors, have for many years since, task shifting became institutionalized, been non-compliant to the legislative prescripts alluded to above. The concerns over task shifting raised by Gray (2014), suggested revising of the 'enabling environment' and for listings in the schedules to be proposed by individual professional councils within a coordinated HRH strategy of task-shifting and collaborative practice (using both dependent and independent prescriber options).

The recent, 2015 advent of the Centralized Chronic Medicines Dispensing and Distribution (CCMDD) programme, where a pharmacist (from the service provider) is allowed to dispense against a nurse's prescription, opened up a whole debate about the underlying legalities in the nursing practice regarding medication and called upon Heads of Health for the radical 'shift' to correct and legalise the practice (Acting DG-Pillay, 2012). Hence the policy arose in the interest of patient safety, to increase access to medicines, ensure quality while protecting all professionals providing the service (Republic of South Africa, the Department of Health, 2016). For a remote pharmacist to dispense CCMDD prescriptions, from a PHC nurse, such an authorized prescriber must possess a written authorization as alluded to above. Hence, the dispensing of nurse prescriptions by pharmacy personnel (pharmacists, pharmacy interns and pharmacist assistants) is regulated in terms of Section 22A (Control of medicines and scheduled substances) of the Medicines and Related Substances Act 101 of 1965 as amended and the Regulations relating to pharmacy practice in the Pharmacy Act 53 of 1974.

The prescribing of medicines and the dispensing of prescriptions are separate functions. Dispensing licenses are also issued by the Director General in terms of Section 22C (1)(a) of the Medicines Act. The Director General may also issue permits to persons to acquire, possess, use or supply certain medicines in terms of Section 22A (15) of Medicines Act. However, the authorized nurse in terms of Section 56(6) does not require a dispensing license nor a Section 22A (15) permit to prescribe medicine (Republic of South Africa, the Department of Health, 2016). A decentralized District based system to manage a data base of authorized prescribers,

allows for quick authorization and prevents lapses in service delivery. The move towards a sub-district PHC model, will decentralize this function to the Medical Manager of the Hospital management team. The list must be current and made available to respective pharmaceutical services, pharmacy supporting personnel (rendering pharmaceutical services within Districts) and to the SA Nursing Council, annually. They must be reviewed every three years, subject to, place of work or service change and training and refresher courses to ensure continuous professional development and relevance to competency (WHO, 2008). The comprehensive list must include the demographic placement details, qualifications and training certificates, as authorization is not transferable from service to service, or clinic to clinic. The entire nurse authorization process is at present being corrected within the KZN DOH.

Further, relevance to the discussion under this study requires defining the two predominant categories of "Advanced practice Nurse" (APN) within the SANC guidelines. "The (APN) is a registered nurse who has acquired the expert knowledge base, complex decision-making skills and competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he is credentialed to practice. A master's degree is recommended for entry level" (ICN, 2002). Hence, the two principal classification for APN is as follows (ICN, 2002):

- Clinical Nurse Specialist (CNS), is defined as a person qualifying in a specialized field, has in-depth knowledge and expertise that enables her/him to focus on facility care and to work closely with medical officers on a consultative basis.
- Advanced Nurse Practitioner (ANP), is defined as a person focused on primary care, health assessment, diagnosis and treatment. This allows working with medical officers on a referral basis. In South Africa, this category through 'task shifting' allows for Primary Health Care (PHC) nurse and at time the midwife, psychiatric and paediatric nurse to work outside the formal hospital environment.

Within the current public PHC context, facilities do have Clinical Nurse specialists termed Clinical nurse practitioners apart from the professional nurses with basic nursing training (SANC, 2012). However, the 'task shifting' mechanism has not allowed for the clear operational implementation and utilization of this specialist category. The only differentiation is through OSD. The need to

explore this category within the PHC practice context leaves room for quality PHC patient service delivery and optimal medicine supply management. However, the task shifting process requires urgent attention in relation to the process of Nurse authorization of competency for the delivering of quality service at PHC. At present, very few medication errors are reported from PHC, and in no way depicts a 'clean bill'. The additional burden placed on the National Department of Health with medico-legal litigation is sufficient justification to warrant additional emphasis on risk assessment and non-reporting at PHC, ahead of NHI and PHC re-engineering (Republic of South Africa, the Department of Health, 2010 & 2012).

The integration of the PCDT pharmacist into PHC, hence requires revising of the legislations by the NDOH to include the pharmacists' services in collaboration with the nurse. Role conflict becomes very apparent with this new scenario, bringing to focus a need for role clarification to allow for seamless integration.

3.17.1.3 PHC Re-Engineering Model

"SA as a country needs to go back to the basics of primary health Care. The strategy of preventing diseases before they occur must be adopted" (Minister Motsoaledi, July 2010).

In order to accelerate the provision and improvement of Primary Health Care (PHC) services, an activist and community-oriented approach is advocated. Therefore, the reengineering of Primary Healthcare in all districts is based on the Brazilian and Cuban models (Habib, 2011). This sentiment was also echoed by Sunpath (2014), when he enunciated that the "health system needs to find its focus". One that outwardly takes services closer to where people live and develops and sustains all attributes of health in individuals and communities alike. And inwardly, creating adequate, suitably skilled, motivated, enthusiastic and committed health workforce to accomplish this focus. Sunpath, (2014), further recommended that for this to transpire, the availability of the necessary resources (inclusive of academia and the private sector doctors, pharmacists, and other) must be fostered. He also stated that the time is right and that the necessary political will is strong.

The National Department of Health (NDOH) of SA has embraced the PHC approach towards rehabilitation of the health system. This approach is guided by the district health systems (DHS) focusing on the five pillars of PHC, as alluded to earlier (Alma. Ata 1978). However, the challenges that plague health outcomes and quality care service delivery are real time issues that require bold health advocacy and innovative strategies. The challenges identified include the burden of disease from HIV & AIDS and NCDs and a weak health system. Hence, further clarity yields the following (Sunpath, 2014; Rispel, 2016):

- Lack of leadership at various levels
- Lack of innovation and uptake of innovations
- Lack of and poor financial resource allocation & spending
- Operational inefficiencies
- Lack of devolution of authority
- Tolerance of ineptitude
- Low health worker morale
- Poor quality of care
- Inability to prevent new and emerging epidemics (MDR-TB),
- Inadequate HR (shortage and properly trained)

Through a reflective health lens focusing on practices that worked despite the myriad challenges faced by implementers and policy makers, a call for an overhauling of the healthcare system to the PHC re- engineering framework, based on the District Health model, transpired.

3.17.2 District Health System Model (DHS)

The district health system continues to be the institutional vehicle for the delivery of PHC and district hospital services. It translates to strengthening the District level forecasting and allocation of funds. This involves intensifying community involvement, inter-sectoral collaboration, district management teams, support implementation and the use of current information systems to monitor and support service delivery. It also calls for quality of care to be improved through supportive supervision and clinical governance with a focus on the basics among other systemic interventions (Pillay & Barron, 2011). The re-engineering process (Bench marked from the

Brazilian health model), consist of three streams, namely, a District Clinical Specialist Team (DCST), a ward based outreach team (WBOT) consisting of professional nurses, enrolled nurses and community health workers (CHWs) across the country and an integrated school health programme (ISHP), integrated to reform the health system and produce better health outcomes. In essence, it means that District Management Teams (DMTs), Sub-DMTs and district hospital CEOs embody the responsibility and accountability for all the services provided in the facilities and communities within the districts. This focus demands constant reviewing of all key performance indicators related and fosters prompt action plans and remedial action to correct any non-target adherence (Pillay, 2012).

This approach denotes a systems approach to health, which by definition is -"one that applies scientific insights to understand the elements that influence health outcomes; models the relationships between those elements; and alters design, processes or policies based on the resultant knowledge in order to produce better health at lower cost" (Kaplan et al. 2013). Similarly, Asmal & Odayr (2012), advocated that the Public health approach, lend itself to a “systems perspective" and address interventions across the care continuum to cover; “primary prevention through health promotion, early detection, appropriate screening and surveillance; secondary prevention by the provision of appropriate treatment and care; tertiary prevention through rehabilitation and palliative care” at the different phases of the disease pathway. The ultimate aim of this strategy is to create medical alertness through early warning signs and appropriately manage high-risk patients (Asmal & Odayr, 2012).

Hence, all Government initiatives have to allow for seamless integration of all systems of building blocks to work in synchrony, delivering the same mission with a unified vision to improve the health outcomes of the population of South Africa. As advised by Sunpath, (2014), that continuing health sector reform requires a joint and focused effort from us all.

3.17.3 Sub-District Model

In response to the DOH Task Team (2011), and Rispel (2016), the findings of the ‘fault lines’ within the current, non- functional district health system, proposes a sub district model of care, to remedy these faults. The Primary Health Care Re-Engineering Strategy, identified the need

for the Mother hospitals within a sub-district to take complete management of its feeder PHC clinics. In this way, a more 'hands-on' approach to management is aimed to be fostered. This will posit 'smarter, well designed plans with implementation strategies that are aligned to that of the hospital, that are measurable and achievable and most importantly where the hospital bears accountability and responsibility for the PHC clinic performance in totality (Republic of South Africa, the Department of Health- Task Team, 2011). The task team also attributed the cause of 'system failure' to the public visiting the health sector as "health users" and consumers instead of being empowered to take full responsibility for their own health and wellness.

The team also highlighted the limiting factor of clinicians managing symptoms rather than focusing on the root causes and which they described as a 'revolving door' syndrome that compromises patient outcomes and has cost implications (Republic of South Africa, the Department of Health-Task Team, 2011). Hence the organizational structure proposed for PHC service delivery remains at the District level that must be well capacitated to provide strategic and operational leadership while bearing accountability for improving the District Health Status by embracing the National MDG priorities, which are as follows:

- Sub-district management that plan to deliver community based health services
- Ensure its implementation
- Monitor and evaluate services
- Ensure equity, efficiency and sustainability of health delivery systems,
- Establishment and maintenance of ward based multi-skilled health teams that are family/community orientated in promotion, ill health prevention, early diagnostic, curative and rehabilitative approach to health care delivery.

3.17.4 Integrated Chronic Disease Management Model

3.17.4.1 Non-Communicable Diseases

"*The world has reached a decisive point in the history of non-communicable diseases (NCDs) and has an unprecedented opportunity to alter its course" (Chan- WHO, 2014)*

There is a global rise in deaths from Non-Communicable diseases. Therefore, several low- and middle-income countries (LMICs) are experiencing rising chronic NCD burdens (WHO, 2010). It is projected that NCD deaths annually will increase to 55 million by 2030 (WHO, 2013b) and alarmingly Africa will have to deal with the biggest increase of 27% (WHO, 2008b). In some countries it features as the prominent cause of death (Alwan et al. 2010, cited in Nojilana et al. 2016).

Statistics of chronic diseases in respect of uncontrolled, diabetes, hypertension, chronic respiratory diseases, and hyperlipidaemia in public and private health environments are high due to both the illnesses and their threats being rarely diagnosed and ineffectively managed (Alberts et al. 2005; Puoane et al. 2008). Furthermore, evidence showed the emergence of non-communicable diseases in both rural and among the poor living in urban areas. This has echoed the need for enhanced acute and chronic health-care services (Mayosi et al. 2009). The South African Health care system, while undergoing transformation, finds itself profoundly plagued by a quadruple burden of communicable, non-communicable, perinatal and maternal and injury-related disorders. Nojilana et al. (2016), revealed in a study that NCDs remain among the chief causes of SAs' deaths, with cardiovascular diseases found to be the leading category of NCDs. Alarmingly, 39% of all the deaths in SA, was attributed to NCDs in 2010, of which, 36% thereof, transpired prior to the age of 60. What is very disturbing is that the comparable number of NCDs deaths was collectively similar to that of HIV/AIDS and tuberculosis (TB). The concerning rise in the incidence of risk factor burden for chronic diseases (diabetes mellitus, renal disease, endocrine/nutritional and blood disorders) is attributed to lifestyle and urbanization as theorized by Omran's model of epidemiological transition. Hence, mortality would be driven by failures in secondary and tertiary prevention, where many South Africans are found to be overweight and obese (Peer et al. 2014, cited in Nojilana et al. 2016).

The SA government in response to WHO (2002), initiative on NCDs, considered its alarming statistics and recognized the need to boldly address NCDs. This was proposed in its ambitious strategic 10-year plan to reduce premature mortality related to cardiovascular disease, cancer, respiratory conditions and diabetes by 25% (Republic of South Africa, the Department of Health-Strategic Plan, 2013).

Furthermore, the lack of competence to holistically manage non-communicable diseases was also highlighted within the clinician and nurse cadres at primary care clinics (Steyn et al. 2006, cited in Mayosi et al. 2009), or their restricted competence allows partial intervention of comparable illnesses resulting in missed opportunities of adequate treatment and identification of other non-communicable diseases (Mayosi et al. 2009). They, further state that although the control of non-communicable diseases in SA has numerous community-based initiatives, the outcome thereof needs to be ascertained. Further suggestions around the increasing occurrence of such mortality was reported in rural areas coupled with Government's demands to decrease such, while improving acute and chronic care through an innovative model for improvement to health-systems to be realised (Mayosi et al. 2009).

The plight to preventing and controlling NCDs in LMIC, is challenged by the serious shortage including mal-distribution of the health workforce. It is hence, advocated that task-shifting is an effective and feasible model to ensure clinically and cost-effective management of NCDs (Joshi et al. 2014). However, they add that task- shifting alone will not resolve the problems of NCD management in low and middle income economies. The obstacle, cited in task-shifting is the lack of capacity within NPHWs scope of practice to prescribe or titrate dosage of medication in many LMICs. Re-engineering the health workers combined with health system changes, including training of Non-Physician Health Care Workers (NPHWs) in new skills is required.

As recommended by WHO (2008), on task shifting, Joshi et al. (2014), states that for an effective functioning of this model of care, a number of changes at the health policy and systems level apart from enhancing training programs capacity for NPHWs is imperative (WHO, 2008; Joshi et al. 2014). Some of the urgent changes that must take place include standardized protocols, sufficient equipment and drug supply, strengthening of NPHWs integration within multi-disciplinary team given adequate assistance from physicians, as well as discussions with the medical and nursing regulatory councils (Joshi et al. 2014).

Therefore, the growing burdens of NCDs facing South Africa, calls for an urgent shift in health system reform attention, from acute care towards complex chronic diseases management at primary health care domain (Jakovljevic & Milovanovic, 2015). In addition, Meyer et al. (2017),

recommends that future estimates of the SDG indicators, must ensure that the UHC tracer indicator captures the quality of the interventions through its delivery to improve the management of NCDs. Therefore, in SA, this should include the chronic disease management programmes, the modification of risk factors and enhanced NCDs management as key strategies (Meyer et al. 2017). What is needed is rightfully bold and ambitious steps, however, the under- utilization of skilled workforce within the pharmacy fraternity, leaves much to be desired.

3.17.4.2 Integrated Chronic Disease Management Model (ICDM)

Statistically, in excess of 40 percent of individuals diagnosed with long-lasting illnesses, suffer from two or more such illnesses, advocating more specialized processes of coordinated support. In spite thereof, health care establishments, hospitals and general practitioner units usually function in “silos,” without the benefits of a comprehensive approach to patient’s condition, their medical history, any healthcare services received elsewhere or medications provided by other clinicians (IOM, 2001).

Integrated Chronic Disease Management (ICDM), presents as a model of managed care that affords integrated prevention, treatment and care of chronic patients at the level of primary healthcare (PHC) moving towards “assisted” self-management within the community (Asmal & Ozayr, 2012). This model is aimed to achieve optimal clinical patient outcomes for those with chronic communicable and non-communicable diseases (NCDs). The ICDM model is based on the WHO- health system building blocks framework approach (WHO, 2002), and encompasses Human Resource Strengthening, Medicine Supply and Management, Health Information, Leadership and Advocacy, Mobile Technology and Equipment Supply (Asmal & Ozayr, 2012). Simply put, it is a health system strengthening model, wherein clinical management support is afforded with the following incentives:

- PHC professional nurses and other health care professionals assisted in the delivery of holistic care aligned to best practices and evidence-based guidelines
- Quality of care improvement to chronic patients
- Optimal clinical stability of the disease states

Furthermore, Clinical management support and care is, therefore, offered by evidence-based clinical guidelines (PC101 or APC), health promotion compendium and guidelines, the chronic patient record and the District Clinical Specialist Team (DCST) for mentoring and supervision (Asmal & Ozayr, 2012). This model presents an innovative opportunity to be modified to include the pharmacist in the clinical sense to further impact on the patients' outcome.

3.17.5 Central Chronic Medicine Dispensing and Distribution Model (CCMDD)

South Africans are experiencing an 'unprecedented growth' in seeking access to chronic medication therapy. This is attributed firstly, to the introduction of universal access to antiretroviral therapy (ART) for patients living with HIV and AIDS (Communicable disease) and secondly to the rise in patient numbers with non-communicable diseases (NCDs) (HST, 2016). South Africa's changing epidemiological profile has further contributed to an overwhelming impact on the public sector healthcare facilities, more especially the primary health care (PHC) clinics. The resulting strain on available resources has further compounded to some extent on medicine shortages and hence, a decline in the provision of quality of care (HST, 2016).

The Central Chronic Medicines Dispensing and Distribution (CCMDD) programme was implemented by the NDOH to enhance access to medicines for stable public patients on, ARVs, ARVs with comorbidities, including patients with NCDs requiring chronic therapy (Rampamba et al. 2017). Chronic patients on a repeat prescription for six months are required legally to six-monthly clinical assessments and monthly access to their repeat medication from the healthcare facility. Of the daily prescriptions required to be dispensed at facility level, 70% are repeat prescriptions, congesting the facility. This results in the patient's experience to be one of lengthy waiting times and frequently repeat visits to collect medicines that were not available and more detrimental is when patients' neglect to return to the facility due to financial constraints (Rispel, 2016). The resultant frustrations to both the staff and patient has a ripple effect on patient adherence barriers, staff burn-out, bad attitude, absenteeism and 'fault lines' (Rispel, 2016) which may lead to poor health outcomes. In addition, the financial implications, transport costs and loss of income burden on the patient is alarming, especially within a rural context (Hofman, 2014). Since, the private sector pharmacies and health facilities are capable of offering extended operation times (than does the public sector), inclusive of weekends and are easily accessible

from patients' place of work and residence, Governments initiative to partner with the contractual NGO, is a win-win for all. This can be proclaimed by the benefits of the CCMDD programme imperatives (HST, 2016; Republic of South Africa, the Department of Health, 2016; Kettledas, 2016), as follows:

- Increase chronic medicines access
- Better service delivery
- Enhance patient experience
- A private-public partnership business model in providing health care services
- Pilot NHI project implementation

Therefore, the encouraging and motivating benefits of the programme are aimed to deliver the following: (HST, 2016, NDOH, 2016)

- Shorter waiting times at facilities, patients collect medicine at alternative pick-up point, leaving fewer clinic visits
- Patients to collect medicines at convenient points close to their homes and work
- Improved availability of epidemiological and medicine utilization data
- Private sector expertise utilized to support medicine management, delivering positive medicine availability through demand planning
- Improved retention of patients on treatment and follow-up on defaulters
- Reduced congestion at public health facilities, leaving decreased work load, allowing more time for patient care with less stock to manage

In addition, the service provider reported more than 1.2 million registered patients on the programme across the 11 municipalities in KZN (December 2019 Pharmacy Direct –CCMDD monthly report). There has also been more than 650 external PuPs established by NDOH. Furthermore, patients have the option of Adherence Clubs and outreach PuPs for collection of repeat medicines that are managed by the PHC facilities. This initiative is promising to effect improved access and medicines use within the public healthcare sector (Meyer et al. 2017).

However, no model of care is devoid of challenges, as noted by Zeeman (2016). Hence, the CCMDD concerns can be validated on the ground at most facilities to be:

- Few to none external pick up points in rural areas
- Resistance of patients to decant from facilities
- Less than 20% collections from external PUP's, due to system challenges of late/non-deliveries of medication packs from service provider, lack of patient data record at facility level and at the PUP and lack of patient and parcel tracking
- Lack of space and human resources at facilities for parcel management
- Incorrect next collection date (NCD) on patient prescription from the institution

Therefore, the CCMDD automated system expansion is aimed towards correcting many of the challenges cited above (Zeeman, 2016). These include the following:

- Automate CCMDD process from patient registration to collection of medicines to improve access of medicines
- Ensure compliance with STGs and formularies
- Improve tracking of patient medicine parcels (PMPs)
- Identify trends in practice (both positive and negative)
- Enable efficient communication between all stakeholders
- Transparency between all stakeholders
- Reduce prescription rejections and medication errors
- Improve patient outcomes and clinical monitoring

However, with the awarding of a new CCMDD service provider (as of 1 April 2018), currently the transition is far from seamless, impacting on the programme deliverables. Once again, awareness of the salient challenges that the rural communities face must not be overlooked. Furthermore, as much as the CCMDD model of dispensing has its benefits, distribution to the communities that need them the most must be fostered by the ICDM and PHC re-engineering strengths of the WBOT's and CCG's. The focus must not be a 'numbers game' driven programme without quality care with positive patient outcomes.

3.17.6 Conceptual framework for a Team Approach to Medication Management (TeAMM) Model

The TeAMM Model by Bajcar et al. (2005), that is structured on the pharmaceutical care model and patient-centredness, describes three primary medication use processes: medication-presrcibing practice, medication-taking practice and medication-dispensing practice, with accompanying specific activities or responsibilities within each practice as per Appendex 13. The approach taken in developing the TeAMM model was to examine three existing frameworks, the Drug use proces (Smith & Knapp, 1992); the Medication use Process (Bates et al. 1995) and The Pharmaceutical care process (Cipolle et al. 1998) as depicted in Appendix 14. The resultant framework stemmed from the need to address two burning issues, one being the large number of healthcare professionals on the team in medication management in family medicine requiring a need to clarfiy their respective roles and responsiblities to avoid potential conflict and the second was to devise an all-embracing approach to assess the pharmacist's impact within this collaborative environment, thereby identifying new opportunities in added development of the pharmacist's role. The TeAMM model focus was on clarifying the collaborative practice differentiating between primary control and the suportive roles. In addition the model recognises the significance of patient's and their families role and responsibility in the medication management process being essential to the relvant patient care outcomes (Bajcar et al. 2005).

The TeAMM Model framework amongst others as illustrated propelled the dialogue and interactions with the primary healthcare professionals of doctors, authorized nurse prescribers and pharmacists on the roles and responsibilities both directly, shared or indirectly that the PCDT pharmacist will play in collaborative medication management. This in event will assist to craft the public collaborative rural Pharmaceutical care model.

3.18 PROPOSED PHARMACEUTICAL CARE (PhC) MODEL

Health care professionals around the globe share one common vision. All are unified in their endeavours to cure, prevent and treat patients in need of medical attention. Their interventions guided by their professional bodies that they are affiliated to and the health policies within the country, transcribe the legal 'prescription' to afford them this function.

However, medication benefits cannot always be realized in patients, either owing to treatment failures or more devastating, due to mortality and morbidity that are associated with inappropriate medicine use (Cousins et al. 2012). Therefore, Pharmaceutical care is considered a “quality philosophy” to assist professionals within the medication continuum of care (Kijlstra et al. 2009, cited in Cousins et al. 2009). It affords good, safe and cost effective use of medicines, optimizes patient outcomes and prevents harm and inappropriate medicine use. These factors are achieved through improving the learning and knowledge of medication-related use, patients partaking in their medicine consumption and accepting responsibility for patient’s management of care (Cousins et al. 2009).

The model allows a pharmacist to engage with a patient and other professionals in designing, implementing and monitoring a therapeutic plan, and preventing drug-related problems, such as, medicine therapy failure due to inappropriate or missing medicine and adverse drug reactions thereby influencing positive patient behaviour (Cipolle et al. 2012).

3.18.1 Vision, Mission, Values and Quality of Pharmaceutical Care Delivery

From a Pharmaceutical care perspective, factors which focus on leadership, vision and on context, are more likely to influence the provision of acceptable outcomes for individuals. According to Petch (2012; 2014), the achievement of personal outcomes for individuals should be the focus of integrated care and support, as indicated by Fig. 6.

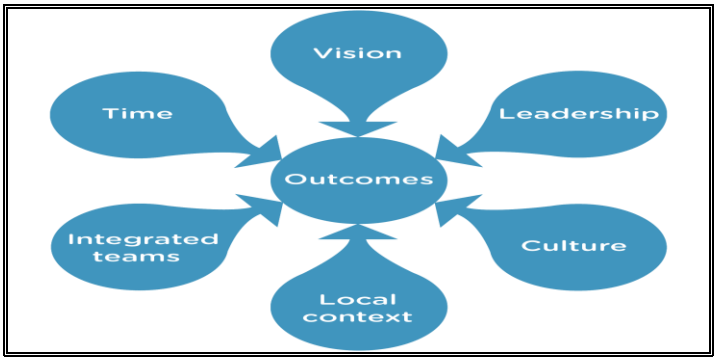


Fig.6: Factors to Deliver Successful Integrated Care and Support

Hence, vision; leadership; culture; local context; integrated teams and time drives successful integrated care and support as follows:

- Transformational and distributed leadership of the vision requires to be conveyed, shared, supported and entrenched
- People to work as 'boundary spanners' to assist across organizational boundaries
- New cultural identities are required instead of obliging to the old
- A responsive delivery to local assets and partnerships of a specific area are geographic, financial, policy and professional
- Structure of an integrated team or management with distinct methods of accountability
- Integration development and adoption requires timescales of several

To further support this argument is addressed by Williams (2012), highlighting four components of leadership that is vital to enable integrated delivery. These include:

- promoting common purpose
- developing a collaborative culture
- facilitating multi-disciplinary teamwork
- developing learning and knowledge management strategies.

Furthermore, according to Petch (2014), effective communication information sharing at a local level is paramount for the provision of integrated care and support. Hubbard & Themessl-Huber (2005), suggest that professionals working together sharing existing knowledge about patients and services is not sufficient but require the design of “new ways of thinking and models of care” to be adapted to collaborative working.

Therefore, as presented previously and with the proposed collaborative pharmaceutical care model in mind, at the local level, similar to the rural PHC and CHC context of this study, for change to effectively be implemented, staff have to primarily realise their role in the new plans and establish how this ties in with their “current professional identities” and their “own professional development”. Hence, the provision of integrated care and support must be

embraced as the principal focus of an “individual's professional identity” (Petch, 2014). The co-location factor is just as important in enabling effective collaborative working (Freeman & Peck, 2006; Hudson, 2007). Staff are inclined to share enhanced working relationships of better mutual understanding and communication when co-located. However, it is worth understanding that co-location alone does not essentially provide adequate commitment, but working towards shared objectives are significant (Warne et al. 2007). Ultimately, according to Petch (2014), the argument made here is that the integrated care and support cycle requires a move from individual outcomes-focused assessment, planning and review to aggregation of outcomes across individuals, to outcomes-based focus.

Therefore, in the design of the pharmaceutical care model, the first and foremost step is to map the chosen path of action with clear guidelines on its deliverables. Hence, the implementation strategy must focus on a buy-in and uniformed vision from all relevant stakeholders to ensure success. The adoption of the South African Pharmacy Council proposed vision, mission statement and values for pharmacy profession will form the basis upon which to build the desired pharmaceutical care model (SAPC, 2018).

Therefore, for the pharmacy profession to collectively embrace the pharmaceutical care principles, the vision, mission statement and values must arouse sufficient passion, commitment and action among practice leaders in pharmacy to radically improve health and patient well-being by optimising the pharmacists’ role. The mission will involve unpacking patient care services and activities for safe and effective medicine use aligned to models of care that adopt utilising optimal potential of pharmacist, technician, and technology resources.

Moreover, to foster implementation and attainment of any crafted mission and vision, the next vital step is to define the roles and responsibilities of employees, in this case, for the new cadre professional before their integration into the rural public PHC context. Therefore, it is worth reiterating that when clear roles and responsibilities are formally crafted, everyone within the group comprehends their expectations. They “know how to behave, what they need to accomplish, and how to achieve the group’s goals” (Blezak, 2016).

Furthermore, one might debate the feasibility of such a model in relation to performance, challenges, quality and outcomes. One survey looking at key concepts in pharmaceutical care and services and the performance indicators for quality evaluation thereof in Europe was conducted by Kijlstra et al. (2009). They embraced the pharmaceutical care philosophy defined by Helper and Strand (1989 and 1990), with a distinct focus on patient involvement, monitoring and multi-disciplinary co-operation amongst healthcare professionals across the medication process. This lead to the following performance indicators that can be realized and measured to reduce inequalities in health care by the application of PhC, which must be economically sound and responsible for cost-effective medicine and health resource utilisation. These include the number of pharmaceutical care interventions; number of patients counselled; number of formal written feedback from patients and the number of adverse drug reactions reported as elaborated on in Appendix 17.

3.18.2 Assimilation of the proposed Pharmaceutical Care Model to the ICDM Model

In South Africa, the integrated chronic disease management (ICDM) model was introduced as a national pilot in 2011 in chosen primary health care (PHC) facilities in response to the dual burden of HIV/AIDS and non-communicable diseases (NCDs). This model aimed to leverage the HIV programme initiatives towards quality care improvement for non-communicable diseases (NDOH, 2012).

The ICDM model design utilises the health system building and strengthening blocks as the foundation and links it to the PHC re-engineering framework. Hence, the preference towards adopting the ICDM model not only appreciates its focus approach, but also extends to the NCS priorities linking of the model that talks to the philosophy of pharmaceutical care on all three levels. The outcome thereof achieves the following (Asmal & Ozayr, 2012):

- Improved staff values and attitudes, waiting times and cleanliness through the facility re-organization component
- Patient safety and security, infection prevention and control through the clinical management component

- Availability of medicines and supplies through the system strengthening component of the ICDM model.

It is at all three levels wherein the Pharmacist intervention can suitably fit to add value. In addition, the Public Primary Health systems approach where the patient is empowered to take responsibility for their own health by the pharmacist intervening at a community/population and health service level needs exploration. This involves a focus on “Primary prevention through health promotion, early detection, appropriate screening and surveillance; secondary prevention by providing appropriate treatment and care and tertiary prevention through rehabilitation and palliative care at the various stages of the disease pathway” (Asmal & Ozayr, 2012). The key purpose being, early detection and appropriate management of high-risk patients. The health education/promotion and preventative aspect are strategically targeted at the common high risk factors, contributing to the four priority NCDs- Cardiovascular diseases, chronic respiratory disease, diabetes, cancer, and other NCD’s (Asmal & Ozayr, 2012; Sunpath, 2014). Hence, ICDM is focused on managed care, adopting a patient-centric approach that embraces the all-inclusive “value chain of continuum care and support” (Sunpath, 2014).

Therefore, the focus adopted for the Pharmaceutical Care Model is based on the premise of the ICDM Model. The application of model has already been rolled out within some of the PHC facilities and has paved the way in itself for the introduction of the pharmacist into that context to clinically impact on the patients PHC experience and ultimately on their treatment outcomes. Hence, it will be futile to reinvent the wheel, but modification of the model to include this critical cadre of professional staff within the framework will display a pivotal clinical role as alluded to in the literature review.

Unpacking the ICDM model displays the framework imperatives of the PhC model. The facility re-organization aspect of ICDM has already entrenched the organizational changes in which the pharmacist can be incorporated into the PHC clinical space very easily, having access to patients’ clinical records. The Clinical management support can be reinforced by the pharmacist to mentor and train, support and conduct baseline assessments. The above two activities, result

in improved operational efficiency and quality of care (Asmal & Ozayr, 2012), which can be further managed and improved by the presence of a pharmacist.

In the “Assisted” Self –Management aspect of the model at present the PHC ward based outreach team (WBOT) was identified to support and empower patients and communities to take responsibility for their own health and well-being (Asmal & Odayr 2012). However, the teams are not sufficient for ward coverage and often are utilised for campaigns and to fill the staff scarcity issues rather than meet their intended deliverables. This area requires mentorship and support from the nursing and pharmacy components and most importantly are required in adequate numbers to reach the outcomes envisaged by the ICDM model, which is currently challenged. Therefore, the pharmacist can add a vital role in the empowerment of chronic patients to take responsibility to manage their illness by educating them to understand the necessary preventive and promotive actions, resulting in improving patient adherence.

Within health promotion and education/population screening aspect of the ICDM model, Pharmacists’ knowledge and expertise in primary health care (Dalton & Byrnne, 2016) warrants intervention at this level in association with the WBOT team to add value to health promotion, in both communicable and non-communicable diseases. This approach will assist derive an activated and informed population (Asmal & Odayr, 2012).

Quality being one of the performance indicators of health, is required to be assessed to ensure optimal delivery of any model of care. Hence, Ameh et al. (2017), conducted an in-depth perspective of the quality of care in the ICDM model within the rural clinics in measuring the outcome of waiting times by assessing the viewpoints of healthcare providers by way of the Avedis Donabedian’s (theoretical framework for evaluating the quality of healthcare), structures of care, processes of care, and outcome. Inadequacies in management and patient structures were identified (faulty blood pressure machines and inadequate staff); process (unsuitable prepacking of drugs); and outcome (long waiting times). It was therefore, deduced, that the ICDM model that was aimed at utilising the HIV programme as leverage for scaling up services for NCDs was not yet realised (Ameh et al. 2017). In addition, the above study could not include the impact of the ICDM model on the patient outcome aspects of their disease management

states, like hypertension due to stock-outs and equipment challenges. Although the study investigated the ICDM outcome in relation to waiting times, numerous concerns were also highlighted calling for more active and frequent supervisory visits.

It further leaves room for exploring the intervention of a pharmacist in assisting with the scaling up of services for NCDs management. Therefore, promoting the need to critically evaluate and assimilate the ICDM model to a proposed pharmaceutical care model is required for an impact on the clinical care outcomes of NCDs to be realized. The ICDM model is the classical model operational at present that overlooked the incorporation of a pharmacist in the clinical realm, and therefore, presents a window of opportunity. The model only considers the District Pharmacist role to be one of ensuring drug availability (reviewing stock levels, updating minimum stock levels and ensuring good pharmacy practice at facilities). Hence, the criticism of the ICDM model is the omission of a Pharmacist team, preferably from a Sub-district approach with clear roles and responsibilities in the clinical involvement of patient and community outcomes. Though, as Asmal & Ozayr (2012), so heuristically advises, “This manual is not prescriptive, but instead provides a platform for systemic thinking in order to address the huge burden of chronic diseases in an efficient manner”. Hence the advent of integrating the pharmacist into this model is the novel and creative approach to revising the present outcome, beyond just the waiting times, to impact and improve on the quality of clinical outcomes in management of chronic NCD’s, given the seven-year inception of the ICDM model.

The new approach will be instituted with an agenda, not to re-invent the wheel, but to build and add value to existing working models of care within the PHC context. The pharmacist can then afford a pharmaceutical care approach to management of chronic diseases assisting Government in its collective plight and fight of NCDs (Republic of South Africa, the Department of Health, 2010, 2011, 2012, 2013). In conclusion, the ICDM model design and structure positions the foundation against which the integration of Pharmaceutical care can be effortlessly instituted, considering, the similarities in a patient-centric approach.

3.18.3 Proposed Pharmacist in Primary Health Care

"Retailers are product focused whereas we need to be patient and outcome focused" Pharmacist- Allan Jelleff (1999).

The majority of South Africans are reliant on public sector Health Care services. The worst tragedies in public health, firstly, occur when solutions to problems are known and resources are available on a sustainable basis, yet remain inadequately managed, and secondly, when resources are so scarce that it impedes progress, improvement and basic health care service delivery for the majority of its population. Despite the major efforts made globally to ensure access to essential medicines (EM) by the many international resources and the national policies on medicines, a substantial number remain without (PAHO/WHO, 2011). The reason is the fragmented focus of the provision of medicines, resulting in inequitable access, irrational use, losses, and limited supply for clinicians to treat (WHO, 2011). This backdrop calls for revamping of regulations, and approaches governing medicine, 'beyond the brick and mortar' of medicine product approach to a patient-centric one. There is also a universal profound demand for a justifiable, integrated and an all-embracing approach the health system efficiency (WHO, 2009). Hence, the values, principles and elements embracing the PHC concept offers an ideal prospect aiding in quality pharmaceutical services development, entrenching itself as a fundamental sector of the health care structure and services. This can be achieved as advocated by the following four conceptual frameworks (PAHO/WHO, 2011):

- Philosophy based on PHC concept
- Operational features of PHC-based pharmaceutical services within integrated networks
- Management through process
- Pharmaceutical practice embracing pharmaceutical care concepts

Since the Alma Ata conference in 1978, and the renewed commitment from WHO member of States in 2007, South Africa has implemented many health reform initiatives to enhance the delivery of health care services. Embedded in the Department of Health's Vision of "A long and healthy life for all South Africans" lays the commitment in the National Development Goals and Strategic plans (Republic of South Africa, the Department of Health, 2015).

Furthermore, the pharmacy profession is part of a changing healthcare environment, and the time is right for expanding its role in the provision of clinical patient care, which is pharmaceutical care. What then defines an ideal pharmacy practice model? ASHP's- Pharmacy Practice Model Initiative, encompasses a patient-centred model in which pharmacists accept ownership and accountability for both clinical and distributive functions. Such a model must allow for creativity and freedom for innovation. In addition, greater emphasis is currently placed on collaborative practice and moving toward a more decentralized practice model. Primary healthcare clinicians are required to be well-informed about patients' medical history and life challenges as well as the resources in their communities (Elliot et al. 2016). Within a defined population, the availability of teams with a mix of practitioners can together achieve the patient or population deliverables, thereby assisting health services. At any given time, Primary care clinicians might seek the assistance and skills of different categories of people, not necessarily those with healthcare knowledge. Furthermore, within many culturally dominated communities, Traditional healers likewise may also assist in the provision of primary healthcare (Donaldson et al. 1996).

In majority of the research conducted in the United Kingdom, Canada and United States, regarding the delivery of pharmaceutical services in primary care, found that the integration of pharmacists within that context drives effective communication for the development of inter-professional associations that improves positive patient outcome interventions (Tan et al. 2014, cited in de Melo & de Castro, 2017). Despite the initial barriers of time and lack of knowledge of pharmacist's role, in addition, the integration of the pharmacist into the multi-professional team allows for a vital function in enhancing the prescribing habits and lessening medicine associated difficulties (de Melo & de Castro, 2017). However, pharmacists must be sensitized to the process.

3.18.4 Integrating Pharmacists into Primary Care Teams

As demonstrated in the discussions above, health systems are driven by a more inter-professional approach to primary care. This approach is further substantiated by Bajcar et al. (2005), stating that within a primary health care context, having numerous professionals involved in medication management, either present in a single or distant location are often challenged with medicine management roles and responsibilities. This team-based paradigm includes

pharmacists embracing a significant place and function within primary health care systems. Bajcar and colleagues advocated the need for a platform to define and clarify medicine management needs and the roles and responsibilities of its members including the patients and their families (Bajcar et al. 2005). Therefore, such roles required integration mechanisms to be understood and practiced and barriers overcome to allow for Pharmacists to bring value to these teams. Hence, an outcome based approach to healthcare is achievable by improving medication use through individual patient assessments as well as population-based interventions, empowering other team members though education and drug information and implementing system-level practice enhancements (Dolovich et al. 2008, cited in Jorgenson et al. 2013).

Pharmacists, however, frequently experience barriers to primary care team integration. Examples demonstrated indicate, that many pharmacists experience a lack of role clarity and other team members' expectations regarding the pharmacists' responsibilities are frequently unclear (Kozminski et al. 2003; Newton et al. 2007; Farrell et al. 2008; Deya et al. 2011; Berdine et al. 2012). In addition, patients often do not understand the role of the pharmacist in the primary care setting (Assa-Eley et al. 2005; Deya et al. 2011; Berdine et al. 2012). Furthermore, Pharmacists are also on average unfamiliar with the roles of other team members (Dobson et al. 2006), which creates difficulties in collaborating successfully (Gulliver et al. 2002; Gurney, 2009; Goldman et al. 2010). It was established that during the early stages of integration, nurses and physicians do assist pharmacists, thereby creating additional work (Brock & Doucette, 2004). Other frequently reported barriers included physician resistance, lack of pharmacist assertiveness, inadequate pharmacist support, lack of space and inadequate pharmacist training (Gulliver et al. 2002; Silcock et al. 2004; Brock & Doucette, 2004; Dobson et al. 2006; Dobson et al. 2009; Berdine et al. 2012).

Jorgenson et al. (2013), undertook to postulate guidelines affording pharmacists successful entry and incorporation into existing primary healthcare teams. The outcome yielded the one overarching theme, i.e., the importance of pharmacist assertiveness. It, therefore, emerges that the personality traits of individual pharmacists have a significant influence on their integration into a team. Hence the following recommendations will guide Pharmacists integration into a PHC team (Jorgenson et al. 2013). Pharmacists should:

- Determine the needs and priorities of the team and its patients
- Develop a pharmacist job description
- Educate the team about the pharmacist role
- Educate themselves about other team members' roles
- Ensure clinic infrastructure supports the pharmacist role
- Be highly visible and accessible to the team
- Ensure their skills are strong and up to date
- Provide proactive care and take responsibility for patient outcomes
- Regularly seek feedback from the team
- Develop and maintain professional relationships with other team members

Further to the guidelines as indicated above, Jorgenson et al. (2013), cautions Pharmacists against:

- Providing services without enquiring about the practice and its patients
- Waiting for other team members to decide what their role should be
- Working without a job description that the entire team has agreed on
- Not understanding what other team members do
- Passively accepting inadequate space or resources
- Waiting for the team to request assistance or send referrals
- Working from home- waiting for other team members to refer patients
- Avoiding complex patients/services requiring expanded training, knowledge or skills
- Not getting to know other team members

In addition, Jorgenson et al. (2013), recommends that pharmacists should invest time and energy learning about the team, determining specific medication-related needs and patient population. This will ensure the provision of pharmacist services that add value to the team. Pharmacists must in addition have an understanding of some health specific information about the community they are serving. Such as:

- The most common chronic diseases within the population
- The teams' key medication-related challenges requiring the most assistance

- Registries or indicators in place to focus on improving management of a specific disease or patient group
- Knowing if there is a frail elderly population
- Aware of existing programs and services being offered that would benefit from pharmacist support
- Familiar with the local community pharmacist's involvement with the team

The importance of a pharmacist's job description was also emphasized, guiding the pharmacist towards activities to focus on. In addition, acknowledging that collaboration is improved and misunderstandings over responsibilities and authority is reduced by clearly defined roles and responsibilities (Zillich et al. 2004; Oandasan, 2009; Farrel et al. 2010, cited in Jorgenson et al. 2013). The job description should be collaboratively developed with the team and must be aligned to the skills and expertise of the individual pharmacist and the needs and priorities of the team and its patients. The job description should be shared and must cover the following specific information (Jorgenson et al. 2013):

- Pharmacist services provided and time allocated to each service
- Patient referral process and communication of patient assessments
- Hours of service
- Location of service
- Reporting structure
- Pharmacist continuing educational needs

Moreover, practicing within a primary care team requires unique skills and expertise that will challenge even experienced pharmacists. Most will need a strategic professional development plan. Authors have stated that it is common for pharmacists new to this role to require additional training in areas such as conducting medication assessments, collaboration, interviewing and assessing patients, developing care plans, documentation and making evidence-based decisions (Doucette et al. 2005; Bell et al. 2007; Newton et al. 2007; Killeen 2007; Kolodziejak et al. 2010; Phillips et al. 2012; Legault et al. 2012).

In addition, to be able to deliver competent care requires ongoing development of skills enabling pharmacists to find 'their place' within the team. Pharmacists can also proactively seek out opportunities to improve patient care. Some examples include, high-risk patients, which can be flagged for a pharmacist assessment; recent hospital admissions; newly diagnosed chronic diseases; recent specialist physician appointments; patients taking multiple medications; patients taking BEERS or STOPP drugs (Barry et al. 2007; Gallagher et al. 2008; American Geriatrics Society, 2012); or patients recently initiated on anticoagulants or insulin. However, the options are endless, but it is imperative that such patients seek assistance from a pharmacist without waiting for a referral from another provider. Furthermore, Pharmacists can easily identify patients at risk for drug therapy problems through patient self-administered screening tools that have been created and validated (Farrell et al. 2008).

Research suggests that pharmacists who integrate into primary care teams generally take on two approaches to the role (Farrell et al. 2013). Some focus on responding to physician requests for drug information or patient support, providing "reactive care." Others take active responsibility for patient outcomes by seeking opportunities to improve patient care, providing "proactive care." According to Farrell et al. (2013), the latter has achieved higher levels of inter-professional collaboration and more successful pharmacist integration.

In as much as discussing the enablers of integration, so too is it important to understand the barriers. Jorgenson et al. (2013), identified seven vital team barriers in pharmacist integration. These include:

- Relations, trust and respect
- Role clarity
- Direction and support

- Pharmacist personality and professional experience
- Pharmacist availability
- Resources and financial support
- Benefit of the pharmacist role

Further to the above, guidelines for incorporating Pharmacists' into primary healthcare teams by Jorgenson (2013), were validated via action research by Barry & Pammett (2016). The guidelines measured-up to 'real-life' integration which definitely warranted adoption for new and existing primary care pharmacists teams alike. Within these inter-professional teams, various characteristics influence team work. These were identified by Nancurrow et al. (2013), as the following:

- Positive leadership and management attributes
- Communication strategies and structures
- Personal rewards
- Training and development
- Appropriate resources and procedures
- Appropriate skill mix
- Supportive team climate
- Individual characteristics that support interdisciplinary team work
- Clarity of vision
- Quality and outcomes of care
- Respecting and understanding roles of the interdisciplinary team members

Therefore, knowing these characteristics can aim for the development of supportive teams focused to deliver their planned vision.

3.19 THEORIES ADOPTED FOR THE STUDY

3.19.1 Role Clarity and Collaborative Advantage Theory

Before the reader is presented with the role clarity framework approach taken for this study, a description of the two principle theories relating to the framework should be outlined. Health, being a multidisciplinary field, must take into consideration social sciences to comprehend individuals' perceptions and appreciation for their environment (Nuseibeh & Easterbrook, 2000).

According to Bajcar et al. (2005), in order for patients to achieve the maximum therapeutic benefits and to reduce preventable adverse events, a more collaborative approach to medication management is called for, especially with chronic illnesses. Hence, the roles and functions of various health care professionals included in the drug use practice can be challenging to define, due to a "lack of common ground" (Bajcar et al. 2005). They advocate discussions to develop an integrated team approach to management of medication, where the different professionals learn to improve their understanding of each other's roles and responsibilities, and patients' alike, and hence realise ways towards collective working and coordinated efforts to optimize medication benefits for their patients (Bajcar et al. 2005).

Therefore, to address the position statement of this study and to determine a process for gathering the roles and activities of a new cadre of professional into the public primary healthcare environment, the researcher attempted to realize how the nurses, doctors and pharmacists perceive their own and each other's tasks and responsibilities within that context. This drew attention to the concept of organizational role from the organizational behaviour literature, which states that employees should understand their organizational roles in order to determine what they have to do in the organization (Nuseibeh & Easterbrook, 2000).

Positioning this research study against the background of Role Theory (role clarity) and Theory of Collaborative Advantage, with respect to physicians, nurses and pharmacist in a three phase study approach at rural public primary healthcare clinics, will seek to describe the roles and responsibilities of the new cadre of qualified Primary Drug Therapy Pharmacist in an expanded role in rural primary health care and create a model for such collaboration.

Role theory, as defined by Biddle (1979), concerns the study of human behaviour and the factors that influence these behaviours. While, Schuler et al. (1977), indicate that role theory can ensure a conceptual framework relating the characteristics of the organization and the person. Furthermore, Hardy & Conway (1988), views role theory as a "collection of concepts and a variety of hypothetical formulations", predicting actor's behaviour and performance in a given role, or under specific circumstances. This premise in addition positions role theory to investigate individuals' thoughts and opinions in their interactions in delivering health care within organizations in a rural context. The basic constructs are roles that are defined as characteristic behaviours and social positions, which are the parts to be played and expectations are the scripts for behaviour (Biddle, 1986). Therefore, type of behaviours, characteristics, norms and a persons' values or position defines the concept of role in relation to role theory (Biddle & Thomas,1966).

The application of Role theory offers an effective framework for the investigation of role perceptions in the said study approach and makes intuitive sense for this research study as the role of the pharmacist is highly ritualized (Guirguis & Chewning, 2005), and role theory is illuminating because it has been widely used in sociology, health care and pharmacy (Guirguis & Chewning, 2005). The exploration of the roles and functions of the PCDT pharmacist within the public rural Primary Health care context formed an all-encompassing intention through the adoption of role theory to guide the theoretical framework for the design, collection and analysis of the study's data findings. Subsequently, the need to clearly define roles and responsibilities are of importance within any organization, according to Blazek (2016), because:

- Everyone knows what to do to achieve the defined goals
- Everything gets done when people understand their job responsibilities and are made responsible for accomplishing tasks
- Collaboration among people works better when roles are realized and minimal competition and opposition leads to overall optimal higher resourcefulness
- Less energy is wasted with clear direction on roles

In addition, researchers however, concur that three distinct yet interrelated constructs constitute the role stressors, i.e., role overload, role ambiguity and role conflict (Kahn, 1980; Schaubroeck et al. 1989; Kelloway & Barling, 1990; Peiro et al. 2001, cited in Idris, 2011. Role attributes have different impacts on different individuals. Roles are an accepted part of society and the workplace as they contribute psychological benefits of status, ego gratification, and increased self-esteem (William & Alliger, 1994, cited in Idris 2011). Lee and Schuler 1980, cited in Idris (2011), argue that when individuals are unclear about their role's authority and responsibility, they will encounter stress, experience frustration and perform ineffectively. This is demonstrated by work stress in nursing which was first assessed in 1960 (Menzies, 1960, cited in Jennings, 2008). Furthermore, predicaments of role conflict, overload, and erratic stakeholder role recognition are triggered by the absence of role clarity and unreliable prospects (Beal et al. 1997; Knaus et al. 1997; Woods, 1998; Kleinpell-Nowell, 1999; Irvine et al. 2000; Sidani et al. 2000; Nursing Studies and the Institute for the Advancement of Public Policy, 2001, cited in Bryant et al. 2004).

Furthermore, any member within an organization requires relevant information to aid in adequate role play. An absence of such leads to role ambiguity. Therefore, as suggested by Kahn et al. (1964), firstly individuals are required to be aware of their members' expectations within a role set. Hence, a role's expectations include a role's rights, duties, and responsibilities (Taghavi, 2015). Therefore, the position taken in this study was to ensure role clarity by including all stakeholders in crafting out the desired anticipated roles they envisage for each professional within the proposed context of healthcare delivery.

This particular approach moulded the foundation of the role clarity framework; however, in order to accurately collect and evaluate the expectations, activities, and consequences of a proposed multidisciplinary public primary healthcare team approach, demanded a supplementary guide. Therefore, the researcher applied the collaborative advantage theory (Huxham and Vangen, 2005) and operationalized it into the proposed framework by way of a qualitative analysis approach.

Collaboration implies working in association with others for some common aim (Huxham, 1996), or for the improvement of service provision as depicted by Huxham & Hibbert (2008). Collaboration translates to a multifaceted process “along the developmental continuum, and includes networking, co-ordination, co-operation and collaboration” (Himmelman, 1992). The theory of collaboration has two organizing principles. The first is that it is structured around collaborative advantage, which is the synergy derived from shared working with collaborative inertia, which depicts collaborative activities that generate either gradual output or conflict. The second is that it is structured around issues that tend to energize those who manage collaborations, their anxieties and rewards (Vangen & Huxham, 2010). This research study underpins the former perspective of the synergistic collaborative advantage. However, attention needs to be driven towards understanding the conflict issues that may impede a collaborative advantage.

Furthermore, the valuable viewpoint of Huxham (1996), i.e., collaboration is costly, time and resource consuming, where time is needed to achieve mutual understanding, gaining goodwill, creating trust, accountability and organizational priorities requires noteworthy advisement. Vangen & Huxham (2010), also further elaborate that the theory illustrates the complexes of collaborative situations and its key challenges. It also describes issues that must be managed without providing guidelines for managerial action. It is further explained that each member of the collaboration brings their own, expertise, resources and experiences providing the potential for collaborative advantage. The potential strength and real potential for collaborative advantage lies in the collaborations ability to tap into the expertise and experiences of all involved (Vangen & Huxham, 2010).

Five themes that emanated and of importance is, trust, communication, accountability, knowledge transfer and working processes that will be addressed within this study (Huxham, 1996). His view is that collaboration is valuable in a sense of allowing organizations to achieve what they on their own would not. The theory of collaborative advantage advocates the use of themes to promote a sensitive starting point for managerial action (Vangen & Huxham, 2010). One of the perspectives of success of collaboration by Huxham & Hibbert (2008), relates to financial and resource gains, e.g., better use of public funds, improvement of service provision

and training or learning. The collaborative initiative may be beneficial for the organization, the individuals themselves and for the clients and citizens affected (Huxham & Hibbert, 2007). This perspective will be further explored in the present research study.

As indicated before, knowledge of the barriers to inter-professional integration is paramount to strategic collaboration of pharmacists into primary health care teams. Findings from studies suggests that numerous inter-professional barriers exist between GPs and community pharmacists, obstructing primary health care team integration (Bradley et al. 2008). Hence, to gain the collaborative advantage of primary health care teams, with such an integration, requires addressing of factors that inhibit its success, aiding in a strong foundation to allow for the collaborative incorporation of pharmacists. Hence, Bradley et al. (2008), describes this as "a piecemeal process, with a reliance on goodwill and trust-based relationships". Undoubtedly from a healthcare perspective though, when there is commitment, passion, moral and legal professional obligation and most importantly 'care' and 'Ubuntu' a lot is achievable- a David Goliath missile effect (1 Samuel 17).

3.19.2 Care Concept

"*No one knows for certain how much impact they have on the lives of other people. Often times, we have no clue. Yet we push it just the same.*" - Jay Asher

Professor Dowse gave a candid, poignant and thought-provoking presentation on patient-centred pharmacy from her perspective as a cancer patient. Her inspiring and touching words were driven to provoke greater empathy from pharmacists for their patients. Her words on 'patient-centred pharmacy care' during her stay in the hospital revolved around never seeing a pharmacist during her 16 operation stays, dispensing was of varying efficiency, problem-solving skills ranged from very good to embarrassingly non-existent, no counselling, attitude and demeanour of health professionals varied from good, unfriendly to rude, lack of humanity, no warmth and caring, no smiles and no patient-centred care (SAPJ, 2014).

The above real life experience of a fellow professional is hoped to stand as a mirror to the pharmacy profession. Similarly, further likened to this lack of compassion and care was reflected

by Shellack (2016), when she opened her presentation of ‘Searching for a caring face of pharmacy’ at the Second Annual Pharmacy Conference, 2016. Shellack (2016), eloquently, provoked thought about the public perceptions of pharmacists and rhetorically cited some as just counting a few tablets or viewed as a shopkeeper or businessmen. Shellack (2016), attributes the chasm to the undergraduate lack of ‘care’ teaching and exclusion of caring in the curricula to create caring professionals. Her presentation had a profound impact in highlighting that pharmacists must and can be health advocates in displaying the caring nature to provision of health care (Shellack, 2016).

The concept of care or caring is a fundamental culture to eradicate illness and effect healing. As Shellack (2016), eloquently puts it “there is no curing without caring”. It is hence said that for an adoption of such a culture, care standards, principles, and habits are motivated by and rooted to multiple concepts, like, a worldview, vernacular, philosophy, religious conviction (and spirituality), affiliations, societal, constitutional, legally recognized, instructive, economical, technological, ethno historical and ecological (Shellack, 2016). Therefore, a necessary feature of service provision is that healthcare providers must be satisfied with what they are offering and the ‘job’ at hand must instil a sense of conviction rather than a sense of duty. The theme that resonated at the World Pharmacists Day, 2016, was “Pharmacists: Caring for you”, reflecting the emotional connection pharmacists have with patients and the important role they have in providing care to the public (FIP, 2016). Hence, the South African health care system has to foster and cultivate a culture of care and caring, into its health priorities and teaching institutes. It must in addition take cognizance of cultural awareness, competence, knowledge and sensitivity to the diverse South African health landscape to ensure that ‘Together We Move South Africa Forward” (Republic of South Africa, the Deaprtment of Health, 2014).

3.19.3 The African Ubuntu Philosophy

"A person with Ubuntu is open and available to others, affirming of others, does not feel threatened that others are able and good, for he or she has a proper self-assurance that comes from knowing that he or she belongs in a greater whole and is diminished when others are humiliated or diminished, when others are tortured or oppressed” Archbishop Desmond Tutu (2004).

Ubuntu translates to a South African ethical ideology embracing people's loyalties and interactions with one another. Ubuntu is seen as a traditional African concept. The phrase *"a person is a person because of or through others"* truly depicts the meaning of Ubuntu. Although, Ubuntu provides a philosophical stance of "*humanity towards others*", within the African context, it is more broadly used in the context of "*the belief in a universal bond of sharing that connects all humanity*" (Khomba, 2011).

Ubuntu is thus considered an African world view that supports much of African values and social thinking (Broodryk, 2005, cited in Buqa, 2015). The Ubuntu philosophy has faith in collaboration, and serves as a vital survival strategy for the African communities (Dia, 1992; Mbigi & Maree, 2005, cited in Khomba, 2011). Table 2. below cites the characteristics and understanding of the African Ubuntu philosophy (adapted from Broodryk, 2005, cited in Khomba, 2011).

Table 2: Attributes and meanings of the African Ubuntu Philosophy

UBUNTU ATTRIBUTE	AFRICAN UBUNTU MEANING
U- Universal	Global, intercultural brotherhood
B- Behaviour	Human (humane),caring, sharing, respect, compassion (love, appreciation)
U- United	Solidarity, community, bond, family
N- Negotiation	Consensus, democracy
T- Tolerance	Patience, diplomacy
U- Understanding	Empathy (forgiveness, kindness)

Therefore, as described above, Ubuntu has the capacity in an African culture to express compassion, reciprocity, dignity, humanity and mutuality in the interests of building and maintaining communities with justice and mutual caring (Khoza, 2006; Luhabe, 2002; Mandela, 2006; Tutu,1999, cited in Khomba, 2011). Ubuntu serves as a moral compass for virtues as it voices interconnectedness that can be related to healthcare professional-patient affiliation within a social contract. Hence, it encourages humanitarianism, accepting others' values and beliefs; recognizing social interactions and displaying sensitivity to their needs (Thomas, 2009). Ubuntu embodies the following virtues concerning care attributes; sympathy, respect, kindness, consideration, warmth, patience, loyalty, empathy, and understanding (Pera & Van Tonder, 2011), that should be 'part and parcel' to all healthcare professionals' daily practice.

3.19.3.1 Significance of the African Ubuntu Philosophy

According to Khomba (2011), the significance of implementing the Ubuntu philosophy is as follows:

- Community is bigger than an individual
- Relates to Positive behaviour
- Synergies and competitive advantages arise
- African culture and leadership styles are familiar under the framework
- Cultivates a team spirit towards work
- Recognizes an employee's socio-cultural values within an African context
- Respect is shown to one's elders
- Respect for the community and corporate social responsibility
- Good corporate governance is made possible

Therefore, one can clearly realise the dire need to inculcate the Ubuntu philosophy into the South African healthcare system. Khomba (2011), was able to identify that there is a need to take into account the local socio-cultural dimensions, which is critical for organizational performance and ultimately success. One must bear in mind that the assumptions and beliefs of employees (their cultural affiliations) drive their behaviour. Their collective behaviour determines the result and the result in turn measures performance and in doing determines the strategic business objectives (Yuksel et al. 2013). Similarly, the Ubuntu philosophy application within the health sector and more importantly, incorporation within the designing of the pharmaceutical care model, like the study proposes, is crucial as one of the overwhelming lessons of Ubuntu lies in the integration of African organizations with local communities (Khomba, 2011).

3.19.3.2 Challenges towards the African Ubuntu Philosophy

Khomba (2011), was able to reveal that organizations are able to realize synergies through communalism and collectivism that arise from the Ubuntu principles. This concept can be related to inter-professional collaboration in executing pharmaceutical care within the rural public context. However, aligned to the Ubuntu philosophy are the external factors that affect internal

organizational operations (Khomba, 2011). These include African culture and leadership styles, business ethics and corporate governance, employees' socio-cultural values, including extended family systems and corporate social responsibilities which are deeply entrenched in African Ubuntu cultural systems. According to Khomba (2011), knowledge about the socio-cultural elements would allow for its inclusion to ensure the successful implementation of an African management system.

Therefore, of pivotal note is the importance of community inclusion and the value of the human being (munthu). From a governance approach, as presented by former president of SA, the late Mr. Nelson Mandela, who defined Ubuntu as a philosophy founded on "a universal truth, a way of life, which underpins an open society", implying that people should question whether their actions will enable or empower the community towards improvement. The Ubuntu philosophy simply implies that if people are treated well, they are likely to perform better, thereby, contributing positively towards corporate performance (Khomba, 2011). Likewise, from a collaborative advantage perspective, in a working environment, when the spirit of extended family systems is practiced, there is productivity, where everybody would contribute to the success of the organization (Broodryk, 2005, cited in Khomba, 2011). Most importantly, from a legal standpoint, Judge Yvonne Mokgoro, describes Ubuntu to fundamentally represent personhood, humanity, humaneness, morality and wherein the African values of Ubuntu are compatible with that of the Constitution and the Bill of Rights (Mokgoro,1998). Hence, the display of respect and love among the community portray an influential role in an African framework. Therefore, Ubuntu expresses the responsibility of individuals to each other (Khomba, 2011), further relating to collaborative advantage. Khomba (2011), advocates that for organizations in Africa to be successful, management systems are encouraged to realign with the local Ubuntu philosophy that defines the African socio-cultural framework.

For the desired end of this study and of concern is the relevance of instituting the Ubuntu philosophy within the health organizational sector, as "*African problems, need African solutions*". Former President Nelson Mandela left a legacy of Ubuntu and inspiration that few can live up to- but we all need to rise to the challenge. No doubt, similarly, the proposed pharmaceutical

care design framework, with a collaborative approach in mind, must also embrace the Ubuntu philosophy attributes, as discussed above, because, simply put- "*All we need is Ubuntu*".

3.20 CONCLUSION

This chapter gave an in-depth appraisal of the literature related to the research matter. The gap in research as well as within the rural public primary healthcare sector in South Africa was highlighted. The literature mapped out clearly the current public healthcare structure, the various models of care, its deficiencies and merits and proved the vital role that pharmacists can play within primary healthcare teams, especially within a resource deficient context, like South Africa. In addition, the collaborative approach to patient care, utilizing a pharmacist expertise can improve patient outcomes and further contribute to healthcare cost savings. Moreover, SA, in its period of health transition can embrace the opportunity to further explore an approach of '*business unusual*' by the integration of a pharmacist within the PHC context, provided clear roles and responsibilities are identified. This chapter concludes that the need for Ubuntu to transcend the sense of family within an organization and for caring healthcare professionals is paramount to achieve any measure of success within SA's health revitalization strategies. The following chapter affords the reader with the research methodology and design.

CHAPTER 4

RESEARCH METHODOLOGY

DESIGNS AND METHODS

CHAPTER FOUR: RESEARCH METHODOLOGY, DESIGN AND METHODS

4.1 INTRODUCTION

The preceding chapters presented a seminal background and an overview of the related literature. This chapter encompasses a sequential discussion of the various approaches utilized in the research setting, the philosophical assumptions and methodological strategies underpinning this research study. This further translates to the researcher taking cognizance of the purpose of the enquiry, the time dimension, topical scope, the research environment and the degree of research question crystallization, method of data collection, analysis and control of variables, which will be explained. An elaborate discussion will afford the reader a better appreciation of the decisions taken in addressing how the research was conducted by discussing known trends and models from the research methodology literature, forming the basis of the research strategy and plan. Delimitations of the study draws attention to the scope of the research and the chapter is brough to a close with a look at the ethical considerations.

4.2 RESEARCH DESIGN AND METHODOLOGY

Research methodology is considered as the “science and philosophy behind all researches”, embodying a good research paper that is guided by fundamentals for organizing, planning, designing and conducting research (Legesse, 2014). The approach adopted was philosophical and theoretical to develop knowledge. The intention of this research was to investigate the perceptions of healthcare professionals particularly, doctors, authorized nurse prescribers and pharmacists concerning the integration of pharmaceutical care by introducing the PCDT pharmacist into the rural context. Furthermore, it aimed to characterize the roles and responsibilities of the new cadre of professional in medicine management to afford quality clinical care to the most deprived communities by utilizing the skill set of pharmacists and to recognize pertinent elements of quality service by identifying factors that influence the delivery of optimal pharmaceutical care from those perceptions. Since the purpose of a research study shaped its design, the approach of this study was essentially a mixed research. In addition, the research methodology in any research reflects particular historical, ontological and

epistemological assumptions concerning how claims to knowledge might be justified (Evans, 2000). Hence, knowledge of these assumptions served as a vital tool in conducting and evaluating any research.

In this study, the research methodology adopted was essentially of an exploratory and descriptive nature, comprising of a two phase survey and case study of mixed triangulation approach: Exploratory, as it tended towards loose structures and attempted to highlight areas for future research and Descriptive, as it was concerned with establishing how various health professionals (doctors, authorized nurse prescribers and pharmacists) perceive pharmaceutical care integration to influence their attitudes towards quality delivery of patient care in public primary and community health care clinics in Ugu and UMzinyathi rural districts. Therefore, exploration of the variables related to pharmaceutical care and its contribution demanded an active research approach that is entrenched in both qualitative and quantitative epistemology, resulting in a mixed methods research.

The research questions formed the basis of the research strategy, gathering of information and culminating in examination and understanding of the information. The data was only collected on one occasion and represented a snapshot of the responses at a specific point in time (during November 2017 to February 2018). The statistical nature of the study was designed for more breadth, rather than depth. This was accomplished by means of self-administered questionnaires and an inspection questionnaire on the structural legal requirements of a clinic, should a pharmacist be incorporated into the delivery of services as per SAPC. The qualitative nature of the study on the other hand, displayed the depth, due to the effort and length of time needed to perform a deep and detailed interpretation of the findings relating to interviews with focus groups and informants. The research environment involved the primary and community health care facilities allowing for familiar territory for the participants. The research, hence, embraced a framework of epistemology and philosophical paradigm of that of a critical realist. The ontological positioning of the research influenced the link between the theoretical framework and the design methodology and is explained in more detail. Furthermore, the techniques used to enrich the reliability and validity of the research inference is described and final attention is conferred to the ethical considerations.

In accordance with Holliday (2007), “no matter how extensive the research, different researchers will always pursue and see very different things in the same setting”. Therefore, the critical view point is that the research methodology selected must ultimately determine the outcomes of a study. Consequently, efficient and effective patient treatment outcomes depend to a great extent on finding new ways of narrowing the professional gap. One such way is through the advent of a pharmaceutical care model. Hence, the knowledge acquired will revolutionize the PHC re-engineering strategies through communication and education.

4.3 RESEARCH PROCESS

The process of inquiry increases in complexity when one applies it to questions, information, knowledge, assumptions and decisions that purposefully involve other people, processes or systems as one typically aims to achieve in formal research (Du Plooy-Cilliers et al. 2014). Hence, once the research problem or an area of interest is identified, the researcher has to ascertain appropriate method(s) to address the problem. Therefore, direction to this study was afforded by the research process ‘onion’ illustrated in Fig. 7, (Saunders et al. 2003), to ‘peel’ out the layers of this research strategy. Therefore, this metaphoric ‘onion’ approach will provide an effective progression through the current research methodology design and will also assist to navigate the reader through the processes that the research study journeyed.

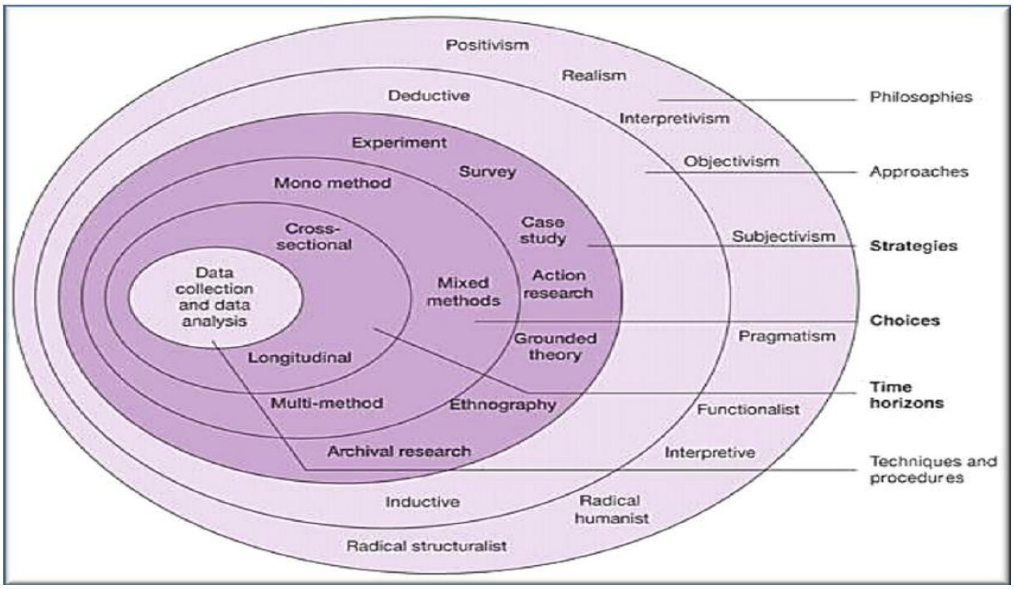


Fig. 7: The Research Onion (Saunders et al. 2003)

The research process ‘onion’ depicted above, summarizes the pertinent issues that need to be considered and appraised before embarking on any research. The researcher’s approach is hence, defined by the different layers of the onion to consider the following:

- the philosophical orientation
- the research approach
- appropriate research strategies
- the research time lines that are under review
- the data collection techniques employed by the researcher

Therefore, the usefulness thereof rests in its flexibility for adoption to practically any research methodology and its application in many contexts (Bryman, 2012).

4.3.1. Research Philosophy

When one talks of a research philosophy, one suggests a set of beliefs regarding the type of truth being sought (Bryman, 2012). Therefore, the selected philosophy for any study depends on the nature of learning explored (May, 2011). Hence, philosophical viewpoints of researchers form the basis of their labour. This might be built around one or many paradigm(s), subject to the type of work being undertaken. Hence, researchers bring their own world views, paradigms, or sets of beliefs to the research study which in turn informs the conduct and writing thereof (Mafuwane, 2012). Furthermore, the ontological and epistemological features, which depict a person’s worldview, has a relatively marked impact on one’s sense of reality (Thomas, 2010).

At the epistemological position of a critical realist, one does not see knowledge generated as permanent, but considered within its historical and social context, not clouded by the values of the researcher, rather questioned and scrutinized and geared towards action and therefore have practical value. The critical realist’s approach, favoured for this study, prefers to comprehend and clarify instead of merely forecasting. Hence, critical realists claim that researchers are obligated to change public interactions by displaying, and assessing any prejudices. Therefore, the key goal being that of exposing myths, transforming the public and freeing them from various kinds of domination, thereby enabling empowerment for the creation of an improved humanity

(Du- Plooy-Cilliers et al. 2014). Hence, the rural communities that so desperately rely on public services for their healthcare needs are similarly entitled to have access to a pharmacist's expertise in managing their clinical outcomes. Creswell (2003), maintains that a phenomenological study affords a description of numerous meaningful life experiences relating to a concept or phenomenon. This translates into gathering "deep" information and perceptions through inductive qualitative research methods such as interviews and observation and presenting this information and perceptions from the perspective of the research participants (Lester, 1999). Observation and interviews are the key data collection methods within phenomenology (Aspers, 2004). Therefore, it is with this understanding that the perceptions of healthcare professionals about their knowledge and experiences of pharmaceutical services that need to be offered by pharmacists was considered valuable in the discussions to serve the most deprived populations that the public health service caters for.

With reference to the ontological position of critical realism, lies the main tenet, the emphasis on change. It maintains that theory should be practical and include a plan for change, hence, critical theory seeks to provide people with a resource to help them understand, question and change their world. They also accept their own bias; they value equality and human freedom (Du Plooy-Cilliers et al. 2014). In doing they can strive for cultural, political and social change (Thomas, 2010). Thus, the researcher was encouraged to enquire and analyse the cultural and political assumptions that motivates the deliverance of an effective investigative product or programme (Reeves & Hedberg, 2003), referring to the public healthcare system.

At this juncture, it is important to discuss the Ubuntu Philosophy that the researcher is passionate about and aimed to transcribe throughout the research study and in doing described its influence. "Ubuntu" means "*humanity towards others*". From a critical realist approach this 'culture' of Ubuntu aims to effect change within the PHC rural public context by embracing the concepts of Ubuntu and effect change in the healthcare culture by allowing the benefits of inter-professional collaboration with the pharmacist. The philosophy also encourages healthcare professionls to see their vocation as a calling to serve and care with virtues of sympathy, respect, kindness, warmth, patience, loyalty, empathy and understanding (Pera & Van Tonder, 2011). By embracing the concepts of the Ubuntu principles the collaborative advantage can be

achieved within a working environment (rual public PHC), to deliver quality healthcare. From an ethical and moral perspective, the adoption thereof can in addition enable healthcare professionals to question their actions in executing their duties towards empowering communities' healthcare improvement.

Hence, the researcher supported Gephart (1999), when he stated that the objective of critical realism forces social transformation by displacing current power structures and domination thereby encouraging prospects of social contributions among those previously disregarded and dominated. In this study context, reference is made to the rural communities within the PHC context.

Therefore, in following the above discussions, one can draw on the philosophical assumptions fundamental to this study to be that of critical realism, displaying a combination of the footprints of both traditions-positivism and interpretivism. Firstly, the interpretive paradigm uses inductive logic and qualitative research methods and secondly, the positivist paradigm uses deductive logic and quantitative research methods. Therefore, with this approach, multi-faceted reality can be investigated from different angles and informs that no single method can provide definite results (Deetz, 1996). Through interpretivism, an understanding of the world in which researchers live and work in, is sought out, as well as them grasping a sense of the meanings others hold about the world (Creswell, 2007). Furthermore, an interpretive approach equips the research with sufficient capacity to focus on influential issues and to ask questions such as 'why' and 'how' regarding pharmaceutical integration within the public sector (Deetz, 1996). The above assumptions and the subsequent paradigms influenced the researcher's methodology approach to both qualitative and quantitative (mixed methods research) for this study.

The interpretivist perspective was adopted through interviews conducted to collect data from the participants' responses to the qualitative questions. The questionnaire (quantitative instrument) embraced the positivist perspective, thereby seeking responses to theory driven questions (Creswell & Tashakkori, 2007). The interpretive perspective involved a participatory paradigm which recommended reform in the lives of the participants, the institutions in which they live and work, or even the researchers' lives (Heron & Reason, 1997). The synergism displayed by the

use of the above two paradigms, yields critical realism, which ultimately justified this research context, with its aim to empower people through knowledge (Du Plooy-Cilliers, 2014). Hence the researcher positioned herself within the parameters of a critical postmodernist (realist) epistemological and ontological discourse.

4.3.2 Research Approaches

'Not everything that can be counted counts and not everything that counts can be counted' William Bruce Cameron (1963).

4.3.2.1 Research Classification

Applied research, is research techniques, procedures and methods useful for gathering of evidence; related to a situation, issue, problem or phenomenon; enabling policy formulation, administration, and enriching the knowledge of a phenomenon (Kumar, 2011). Hence, applied research, aptly embodied the focus of the researcher's approach to the current study. The objectives in undertaking research were descriptive, explanatory or exploratory. For this study, a descriptive research approach attempted to describe systematically characteristics of a situation, service and provide information describing attributes of the issue in respect of the integration of the PCDT pharmacist into PHC. Descriptive research can be the purpose of both qualitative and quantitative studies (Kumar, 2011). As identified by Du Plooy (2006), in order to acquire fresh perceptions, to identify key stakeholders and to familiarize with unidentified circumstances, strategies and actions, drives the exploratory research. Given the current research study of an unknown area, the researcher leaned towards a more flexible research design to elicit an insight. Hence, the exploratory approach in part covered a literature search, engaging in focus group interviews and with informants regarding the research matter. Hence the research approach adopted for this research was exploratory and descriptive to assess the perceptions of doctors, authorized nurse prescribers, pharmacists and experts in the field of pharmacy.

4.3.2.2 Deductive and Inductive Research

According to Onwuegbuzi (2004), mixed method research uses the induction approach of detecting patterns, deduction of testing theories and hypotheses and abduction, recognizing and relying on the most effective account for comprehending the outcomes. In addition, the inductive approach is also described as the move of specific information detected to the general (Bryman & Bell, 2011). Therefore, in this research, the questionnaires were the initial stage and patterns were sought from the data of the interviews among respondents (Beiske, 2007; Flick 2009). Bryman & Bell (2011), stated that while new theories may develop at this juncture, it can also yield data that can be relevant to existing theory. The deductive approach was also characterized as the move from general to particular, where the general theory and knowledge base, once recognised from the research process, tested the specific knowledge gained against it (Kothari, 2004), as was the case in defining the roles and responsibilities where the role theory and theory of collaborative advantage was verified.

4.3.2.3 Mixed Methods Research Methodology

Kemper et al. (2003), described this methodology to embrace both qualitative and quantitative data collection and analysis alike. Bazely (2003), on the other hand, defined this method as the use of mixed data (numerical and text) and alternative tools (statistics and analysis), applying the same method. This type of research afforded the researcher the benefits of the qualitative research paradigm for one phase of a study and a quantitative research paradigm for another phase, similar to that adopted by the researcher in ensuring a natural complement (Burke & Onwuegbuzie, 2005).

Creswell et al. (2004), argued that mixed methods research involved not only the gathering of qualitative and quantitative data, but also suggested that data are integrated, related, or mixed at some phase during the research process. Bearing in mind that the primary reasoning behind mixing lies in that neither of the approaches alone can sufficiently capture the trends and details of the situation. Nevertheless, when combined, data can generate a more comprehensive and complementary analysis. Furthermore, the researcher identified with Sale et al. (2002), in stating that such an approach affords an array of perspectives to study a phenomenon, while displaying

commitment and understanding towards the improvement of human condition and the common goal of sharing knowledge for practical application. Hence, the mixed approach allowed for cross-validation or triangulation (combining two or more theories or sources of data) to examine the same phenomena for a broad understanding of that phenomenon.

In accordance with du Plooy-Cilliers et al. (2014), the research methods adopted within exploratory research usually encompass qualitative approaches of focus group interviews, surveys and case studies, similarly adopted in this study. Therefore, in order to understand the significance that participants attached to the events, situations and actions regarding pharmaceutical care that they deliver, understanding the particular PHC context within which they work and its influences on their actions as well as understanding their perceptions of the PCDT pharmacist integration, justified the qualitative research approach (Maxwell, 1998). Hence, the qualitative method of focus group and informant interviews as complementary modes of investigation, afforded a deeper understanding of the studied phenomenon (Herman & Egri, 2003). The quantitative approach taken in this research, through self-administered questionnaires aimed to identify the anticipated roles and responsibilities of the PCDT pharmacist at PHC level. In addition, the evaluation of the legal structural requirements and compliance of the PHC and CHC clinics, offered a quantitative approach to the study. In Fig. 8, is an illustration of the research approach taken for the current study.

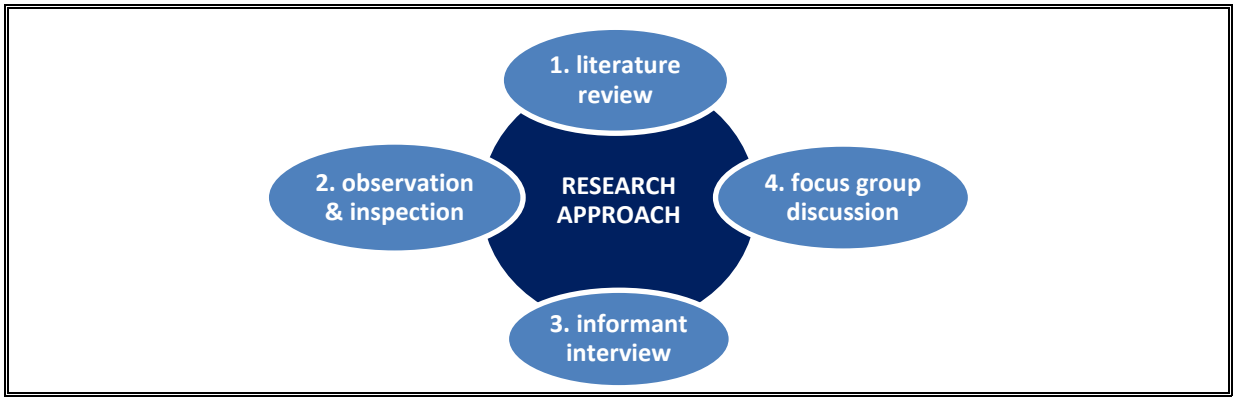


Fig. 8: Schematic Representation of the Multi-Method Research Approach

4.3.2.4 Rationale for the Research Study Approach

Any business and management research undertaken involves data to be gathered and analysed to respond to the research question(s) and to accomplish the study objectives. Hence, the two types of research designs as mentioned assisted in the collection, analysis and interpretation of the data. Hence, qualitative and quantitative research differs by way of the practice approach in the data gathering, assessment and submission (Saunders et al. 2007).

A qualitative research approach adopts various intellectual assertions, probing, information gathering, and analysis methods (Creswell, 2007). In respect of qualitative data sources, observation, including that of the participant during fieldwork, one-on-one and group interviews, different questionnaires, various documents and texts, as well as the investigator's feelings, and responses were applied (Myers, 2009). In attempts to explain the observation approaches available, participants' behaviours during interviews as directly observed, opinions given in writhing, or documents of public nature is stated by Sprinthall et al. (1991). Further to this, written descriptions involving people, actions, view-points, stand-points and settings of the research also constitute data sources (Creswell, 2003). Furthermore, considering the qualitative style taken, the researcher is known as the primary vehicle of data processes. Therefore, the study in question, allowed engagement to foster a meaningful outcome from the numerous analyses (experiences evolve from researcher and the participants) within the PHC context. Hence, the aim was to allow no researcher interference, and restraints during the process of information gathering that might impact on the study outcome (Thomas, 2010). According to Merriam (1998), frequently researchers build an understanding of the research setting through their own analysis of what the nature of events is in the absence of an observation schedule. Therefore, stemming from this, qualitative research yielded an outcome depicting "an interpretation by the researcher of others' views filtered through her own", which was the case in this study.

A descriptive account using words represents qualitative research and challenges recognition of phenomena in "*natural settings*" (Thomas, 2010). However, Lincoln and Guba (1985), caution that qualitative research, which distinguishers researcher's subjectivity, insists that the "biases, motivations, interests or perspectives of the inquirer" be recognised and made aware of across the study. The researcher, hence, approached this with a clear understanding to record these

assertions. The researcher went a step further to allow the participants to check the written dialogue after each interaction. Therefore, to defend the use of qualitative research, according to Merriam (1985), most authors should evoke judgment if the research is “credible and confirmable” rather than enforcing generalization through numerical, quantitative concepts. In support, qualitative research served most applicable to the researchers’ need for familiarity of phenomenon of interest (need for pharmaceutical care at PHC). It afforded a rich narrative of the groups’ behaviours within their natural setting (public PHC), to deliver a rich insight of how people (healthcare professionals) perceive a topic and exclusively define the participants’ perspectives. Furthermore, the researcher aimed not to influence the discussions but to remain calm and objective (Thomas, 2010).

Collection of qualitative data required categorization and conceptualization. Due to the non-standardized complex implications of qualitative data analysis, the data collected was assembled into classifications that was afforded meaningful analysis (Saunders et al. 2007). This approach for the analysis of data gathered was adopted for the focus group interviews with the doctors and the authorized nurse prescribers supporting primary and community health care clinics as well as the informant interviews with specialists in the pharmacy field, which the researcher has mapped out. In order to explore the expectations or shortfalls of the PCDT pharmacist integration at PHC clinics, the chosen themes were vision/objectives/aims, reliability and trust, accountability and responsibility, knowledge and learning, resources and location, working processes, communication and information sharing (Bradley et al. 2008). In addition, the assessment of key informants was by way of structured open ended questions to realize their views, challenges, implementation strategies, and recommendations of the integration of the PCDT pharmacist in the rural context to ensure collaborative pharmaceutical patient care and management.

Thomas (2010), advocates the general recognition that qualitative researchers’ focus lies more with processes instead of the outcomes. It is also essential to note that having the knowledge and description of an episode or process defines a unique relation and insight of peoples’ experience, wherein a qualitative approach affords the necessary understanding to the participants’ role and perceptions in the incident and experience (Thomas, 2010). The focus in

this study was on participants' perceptions and value of actions and processes in integrating the PCDT pharmacist into PHC domain and of the researcher's understanding thereof.

According to Creswell (2003), quantitative research utilises strategies of inquiry: experimental techniques, questionnaires, and surveys to collect data that is reviewed and numerically tabulated, allowing data to be collected on predetermined instruments that is characterized by the use of statistical analysis (Creswell, 2003). Hence, in this study the chosen variables were diagnosing and prescribing, monitoring, administration/ documentation, education and training, and medication review (Farrel et al. 2008). Quantitative researchers measure variables on a sample of subjects and express the relationship between variables using effect statistics such as correlations, relative frequencies, or differences between Means with their focus being on the testing of theory (Creswell, 2003). Therefore, the approach taken for this study was one of factor analysis and adoption of the Kruskal Wallis test. Factor analysis is a statistical data reduction (represent a set of variables by a smaller number) and analysis technique that strives to explain correlations among multiple outcomes as the result of one or more underlying explanations, or factors (Dos SANTOS & De LIMA, 2017). The Kruskal-Wallis H test (sometimes also called the "one-way ANOVA on ranks") is a rank-based nonparametric test that was used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. Due to the Kruskal–Wallis test proving significant, a post-hoc analysis was performed to determine which levels of the independent variable differed from each other level (Kaiser, 1974; Cerny & Kaiser, 1997). Furthermore, according to Cresswell (2003), quantitative research itself is independent of the researcher. Therefore, data collected was utilised to objectively measure reality, thereby creating meaning. This comes with the anticipation that results are replicable, irrespective of who conducted the research (Mafuwane, 2012).

Onwuegbuzie & Leech (2006), identified the following rationales for mixing qualitative and quantitative approaches. They included, participant enrichment, instrument fidelity, treatment integrity and significance enhancement. Participant enrichment is the involvement of more participants in the research. Onwuegbuzie & Leech (2006), maintains that reliability and validity of the research findings will be enhanced by a larger sample of participants.

In terms of this rationale, and the purposeful sampling of participants for this study, the number of facilities chosen is as indicated in Table 3.

Table 3: Clinics/Facilities sampled and their Annual Utilization by patients

	Clinic	Frequency	%	Valid %	Cumulative %		POPULATION UTILIZATION PER FACILITY 2017-2018			
Valid	Not specified	18	13,7	13,7	13,7		DISTRICT	SUB-DISTRICT	FACILITY	ANNUAL POPULATION
	Braemar	2	1,5	1,5	15,3		UGU	RAY NKONYENI	IZINGOLWENI	25 112
	Cwaka	6	4,6	4,6	19,8				BRAEMER	6 290
	District Office	2	1,5	1,5	21,4				GAMALAKHE CHC	49 228
	Empathe	8	6,1	6,1	27,5			UMZUMBE	KHAYELIHLE	10 015
	Gamalakhe	13	9,9	9,9	37,4				TURTON CHC	57 245
	Greytown Gateway	6	4,6	4,6	42,0		UMZINYATHI	UMSINGA	CWAKA	11 016
	Hlathi Dam	7	5,3	5,3	47,3				QINELANI	5 990
	Izingolweni	8	6,1	6,1	53,4				POMEROY	25 415
	Khayelihle	9	6,9	6,9	60,3			UMVOTI	GREYTOWN GATEWAY	10 969
	Pine Street	6	4,6	4,6	64,9				PINE STREET	13 558
	Pomeroy	8	6,1	6,1	71,0				UKUTHULA	7 851
	Qinelani	6	4,6	4,6	75,6			ENDUMENI	EMPATHE	18 826
	Siphimpilo	7	5,3	5,3	80,9				SIPHIMPILO	10 670
	Turton	17	13,0	13,0	93,9				WASBANK	10 925
	Ukuthula	2	1,5	1,5	95,4			NQUTU	HLATHI DAM	13 674
	Wasbank	6	4,6	4,6	100,0					
	Total	131	100,0	100,0						

The assistance of the statistician utilizing software: GPower version 3.1.9.2, identified that the minimum number of respondents of doctors and pharmacists should be 26, and the authorized PNs 82 to perform statistical comparisons between the various groups. The sample of clinics in the Umzinyathi district (all clinics in this district were of ideal clinic status) that were selected, in addition, was conveniently chosen due to the difficult mountainuous unfamiliar terrain for the sole researcher, making this the limiting factor, due to PHC support available being predominantly that of Pharmacists assistants and a single doctor supporting more than one clinic. Hence, to be able to detect a large effect at an 80% power and an error margin of 5%, a sample of 26 for doctors and pharmacists was required. More Authorised PNs were available to be able to detect a medium effect at an 80% power and an error margin of 5%, justifying a sample of 82. However, the purpose of smaller samples is attributed to these participants being the only human resource support for the PHC and CHC clinics at the time of the study. The actual staff complement is very sparse and under resourced, hence the low number of respondents (Table 3), contributing to increased workloads (Table 3), like any public rural healthcare context. This could impact on the respondents' perceptions towards task-shifting, which this research study aims to demonstrate further through probing questionnaires, as the

rural primary healthcare clinics are challenged on numerous levels. The limitation of two rural districts was governed by time constraints. Five facilities from Ugu and ten from Umzinyathi (conveniently) were selected. A total of nineteen doctors, seventeen authorized nurse prescribers and fifteen pharmacists from Ugu and eight doctors, sixty-five authorized nurse prescribers and eight pharmacists from Umzinyathi were chosen to participate in the quantitative study. In addition, all authorized nurse prescribers from the two districts completed a second questionnaire.

Instrument fidelity is accomplished by maximizing the appropriateness and/or usefulness of the instruments used (Onwuegbuzie & Leech, 2006). Hence, for the undertaking of this study, two instruments were used, namely: questionnaires and interviews. The questionnaire for doctors, authorized nurse prescribers and pharmacists was applicable as it aided the researcher in seeking the perceptions of the health care professionals on the roles and responsibilities of the recent cadre of PCDT pharmacist; the questionnaire for authorized nurse prescribers generated information regarding the activities that they perceived to be relevant to the PCDT pharmacist. The SAPC Primary Health Care Clinic inspection questionnaire allowed for the inquiry of the structural legal compliance of the facilities to the delivery of pharmaceutical care. The focus group interviews aimed to explore themes related to the practicalities of pharmaceutical care integration into PHC context, focusing on the perceptions of the doctors and authorized nurse prescribers in relation to the challenges, expectations and opportunities of the PCDT pharmacist integration. And the key informant interview aimed to glean and explore their views on the need for the integration of the PCDT pharmacist into the PHC domain, considering possible roles, responsibilities, activities and recommendations of policy changes.

Whereas, treatment integrity signifies mixing qualitative and quantitative research methods to measure the trustworthiness of interventions, treatments, or programmes and significance enhancement refers to maximizing the researcher's interpretation of data (Onwuegbuzie & Leech, 2006). Therefore, a mixed study approach, both a qualitative and a quantitative method of data analysis allowed for easy computation and answering of the research questions that were aligned to the research objectives. This perspective of multiple sources of data collection increases the validity and reliability of the study (Du Plooy-Cilliers et al. 2014). Finally, to improve

the primary health care service delivery through change, can be effected by encouraging health care practitioners to be aware of their own and others practice merits, to embrace these and to be prepared to allow change for collaborative improvement.

4.3.3 RESEARCH STRATEGY

This involved the way in which the researcher undertook the work (Saunders et al. 2007). Therefore, the strategy involved numerous different research approaches, such as experimental, action, case study, interviews, surveys, a systematic or narrative literature review. Furthermore, such approaches can be adopted in exploratory, descriptive and explanatory research (Yin, 2003). However, there is no research approach that is in any way superior or inferior to any other. According to Saunders et al. (2007), to adopt a single approach or another is '*unduly simplistic*'.

For the rationale of this study, the researcher unpacked the case study, interview, survey and a narrative literature review approach, which will be further discussed.

4.3.3.1 A Case Study Approach

Such a research study measures a single unit, allowing vital characteristics to be drawn on generalizations (Bryman, 2012). The case study research method as adopted for the two districts in this study is an empirical inquiry to explore a contemporary phenomenon within its real life context by the adoption of multiple sources of evidence (Robson, 2002; Du Plooy-Cilliers et al. 2014; Msweli, 2015).

The case study strategy afforded a rich understanding of the context of the research and the processes performed (Morris & Wood, 1991). Hence such a study method enabled a deep exploration within a natural context thereby providing a full and thorough understanding of the particular experience of participants in this research inquiry. A case mode of study aimed to be reliably depicted thereby unpacking 'symbolic realities' that amplify 'the unique voice of those whose experience in, and perspective on, the world is unknown, neglected or suppressed' (Gomm et al. 2000). A case can be something relatively concrete such as an organization (likened to the PHC and CHC clinics of the two chosen districts in this study), a group or an

individual (Doctors, authorized nurse prescribers and pharmacists), or else conceptual like an incident, a management decision or a change plan.

A case study was approached for its greatest strengths in features of being, adaptable to different types of research questions and settings, affording an extensive study from a composite case of a few, a large number of data collected and analysed, studied in real-life context, understanding its influence to or by the context, not manipulated and its use of multiple sources of data to allow for triangulation of the findings (Gomm et al. 2000; Yin, 2009). Case studies also offer the benefit of making the research accessible to wider readership than others (Rose et al. 2014). Hence, the research environment chosen allowed the researcher by strategies of observation, and focus-group interviews to enquire and comprehend the working processes, which further assisted in collecting and documenting in detail the events within a social and cultural context (Thomas, 2010).

A case study approach has proven its versatility in its design by sheer application in various management research contexts including strategy, information systems, innovation and organizational transformation. Case studies allows for thorough investigation of numerous sources of data in both descriptive research studies- emphasis surrounds a specific circumstance or setting and affords less generalization, whereas applied research describes the application of a programme or policy (Thomas, 2010).

Hence the Doctors, authorized nurse prescribers and pharmacists were defined within the researcher's cases of the two districts- Umzinyathi and Ugu as the unit of analysis for the study. Many case studies take a more inductive approach (Rose et al. 2014). In addition, multiple cases afforded a solid foundation of theory with a variety of evidence for the benefit of comparison (Yin, 2009). Therefore, the researcher's deliberate choice of the two Districts is justified to obtain results for comparison and deliberation.

Nevertheless, an exploratory and interpretive case study of the PHC clinics involves a rigorous description of the case within its broader context in an attempt to understand the nature of the case (Du Plooy-Cilliers et al. 2014). The chosen method was analysed through qualitative

methods. Interviews were used to evaluate participant's perceptions on the roles and responsibilities and activities of the PCDT pharmacist within PHC context. This approach best assisted the researcher to develop a case to explain role clarity theory and use approaches of data collection such as interviews and observation to highlight the PHC clinics as multiple cases under evaluation, focusing on ascertaining if the outcomes fall one way or the other and then drawing on generalization from the findings.

4.3.3.2 Survey Method

Du Plooy-Cilliers et al. (2014), explains a survey as a data collection tool that is based on a sequence of questions articulated to collect information about a fairly large group of individuals. It is known to be widely used to collect peoples' attitudes, opinions, impressions, degree of satisfaction, demographic information, and so on. Hence, this tool often provides a quantitative or numeric account of the tendencies, attitudes and viewpoints of a population, whereby questions are directed to a sample of the participants and thereafter a generalization of the findings against the population from the selected sample is made (Du Plooy-Cilliers et al. 2014). In addition, structured indirect observation, questionnaires and interviews forms the basis in the data collection of survey studies. A simple survey is intended to describe a phenomenon. No variable is manipulated and no relationship between the variables is determined. Moreover, simple descriptive surveys allow for accurate information about the characteristics of particular subject groups, institutions, situations or the frequency of a phenomenon's manifestation (Brink, 2002). Hence, a survey method of data collection was favoured for its versatility and flexibility to permit various methods of data collection, such as observation, interviewing and mailing, its usefulness in verifying theories and the facilitation of drawing on generalizations about large populations (Krishnaswami & Rangantham, 2007).

Hence the empirical investigation for this survey study involved a two pronged research strategy. Firstly, a pre-coded questionnaire was administered personally to the sample population of doctors, authorized nurses and pharmacists of the two Districts. Secondly, a questionnaire was required to be completed by the authorized nurse prescribers only. The chosen type of survey was a group administration, where a group of the sample population all filled in the questionnaire at the same time during one session. The advantages of this approach were, high response rate

in these settings, the data collection time was short and the questions were clarified by the researcher in real time. A survey using a questionnaire was the adopted choice, as such devices are very useful in simplifying and quantifying responses. Moreover, participants generally favour ticking boxes instead of writing or typing lengthy responses (Thomas, 2010).

4.3.4 LITERATURE REVIEW

The extensive literature review was approached by accessing numerous databases relating to the academic enigma waiting to be investigated. In essence a concise account referred to: Pharmaceutical care is vital for optimal medication adherence and hence better patient care and outcomes. The pharmacist has the expertise of medicine management combined with clinical knowledge to ensure optimal medicine adherence and collaboratively with other health care professionals, like nurses and doctors can be that vital link in the chain of continuum in patient care. In primary health care in the private sector, the community pharmacist, having obtained the additional qualification of Primary Care Drug Therapy, is afforded a permit from the SAPC, permitting the extension of scope of practice to prescribing and diagnosing. This allowance was made to extend health care pharmaceutical services to retail pharmacies within the rural context. The public sector patients are hence discriminated against in the provision of pharmaceutical care, as the pharmacist intervention at PHC at present is purely one of Drug Supply Management, viz., ensuring the availability of medicine.

This study, hence explored the need to extend the clinical services that a pharmacist can offer to especially patients, within the rural context, accessing the public primary health care facilities. Literature demonstrated both the need for pharmaceutical integration, and the challenges of such integration. An in-depth review, guided the economic, financial, social and medical benefits of this model approach. However, barriers to pharmaceutical care integration included among others, the perceived tensions between the various health care professionals. The aspect of paramount importance is the clarity of roles, responsibilities and activities of the health care professionals in such collaboration. Hence, the study focus was aligned to address these challenges and in doing, propose a collaborative pharmaceutical care model for the most deprived majority of the South African population seeking health care.

4.3.5 TIME HORIZONS

The Time Horizon encompasses the ‘time framework’ of a projects finalization (Saunders et al. 2007). There are two types of time horizons indicated within research as depicted in Fig.7, the cross sectional and the longitudinal (Bryman, 2012). Hence, the cross sectional time horizon is used to design an inclusive approach to an experience at a point in time (Maree, 2007). Thus, data is collected only once from the respondents at a specific point in time. This is termed a ‘snapshot’ recording the time and period in which data is gathered (Flick, 2011).

Hence, the most suited time horizon for the chosen study is that of a cross-sectional one. Although the respondents were subjected to both, questionnaires and an interview process, the outcomes were measured at one point in time. This occurred during the period of November 2017 to February 2018. However, the time horizon chosen is not reliant on a particular study style or method (Saunders et al. 2007).

4.3.6 RESEARCH SAMPLING DESIGN

Most research cases are impractical, time-consuming and expensive to conduct on the entire population, hence, sampling proposes a way out. Hackley (2003), advises that researchers should plan sample selection criteria to allow for data to be gathered systematically enabling the data set to meet the research objectives.

This entire study design, consisted of four phases, Firstly, the informants, specialist in the field of pharmacy policy and practice were telephonically contacted for their perceptions and expertise on the integration of the PCDT pharmacist. With the aid of an interview schedule of semi-structured open ended questions, the informant’s perspective on challenges and opportunities as well as the associated roles and responsibilities for collaborative pharmaceutical care in rural PHC and CHC clinics was explored (Appendix 7). Secondly, the structured survey questions (Farrell et al. 2008), (Appendix 8), aimed to evaluate the perceptions of prescribing nurses, visiting Doctors, and public pharmacists, towards defining the roles and responsibilities to ensure inter-professional collaboration of the PCDT pharmacist at rural clinics. In addition, the authorized nurse practitioner group undertook a second self-administered

questionnaire (Adamick et al. 1986 & Gilbert, 1997b), (Appendix 9), of their perceptions of the PCDT pharmacists integrating with them at the PHC clinic in collaborative management of patients. This questionnaire was intended to inform the prescribing nurse's perceptions of the activities pertaining to either the nurse or PCDT pharmacist. This investigation was essential to include, as the nurse practitioner at present drives the prescribing at PHC level within the rural public context. Thirdly, the semi-structured- in depth focus group interview (Canadian Society of Hospital Pharmacist, 2003; Bradley et al. 2008; Vangen & Huxham, 2010), (Appendix 10), comprised of open-ended questions for a convenience sample of doctors and nurse prescribers. Fourthly, the SAPC inspection questionnaire (2017), (Appendix 11) of 'ideal' public PHC and CHC clinics which measured adherence to legislative pharmaceutical standards of practice and functionality within which a Pharmacist and Assistant is authorized to practice. This was conducted in each of the 'ideal' clinics, by the researcher herself. The overall outcome aimed to capture the theoretical background of role clarity and collaborative advantage related to roles and responsibilities of the PCDT pharmacist.

The focus groups are sub-sets of the population sample. The face-to-face interviews of doctors and authorized nurse prescribers identified the best framework to structure the role of the PCDT pharmacist in rural public primary health care clinics. Focus groups are useful, particularly in the exploratory phase. It generates dependable ideas on key variables economically within a short time. The focus sessions were aimed at the researcher obtaining participants impressions, interpretations and perceptions on a particular topic or item, while steering the discussion and keeping the participants on track (Sekaran, 2000). Seeding questions common to all in the focus group were used to facilitate the discussion, helped to maintain consistency and reduced any potential interviewer biases.

Semi-structured interviews of doctors and nurse prescribers were separately subjected to a focus group interview process. This was conducted at the participants individual PHC or CHC facilities of work and lasted for a duration of 45 to 60 minutes each. The research instrument design for this study is summarised in Table 4.

Table 4: Research Instrument Design	
Category of professional-participant	**Research instrument**
15 'ideal clinics'	SAPC inspection questionnaire
Key Informants-experts in the pharmacy field	Semi- Structured interview
Doctors, Nurses-authorized prescribers, Pharmacists	Survey questionnaire
Doctors	Focus group semi-structured interview
Nurses- authorized prescribers	Focus group semi-structured interview and second Survey questionnaire

4.3.6.1 Sampling

This is referred to a part of the data collection process. The definition encompasses a component of the chosen population in the research process (Bryman & Bell, 2011). In event, researchers are cautioned about the importance of the size and choice of the sample when planning the design of the research (Gill & Johnson, 2010). Furthermore, the adoption of sampling methods suggested the following advantages (Blumberg et al. 2005):

- Cost reduction
- Results that display more precision
- Data collection with more rapidity
- Population components accessible

Therefore, the researcher was guided by a six step model for drawing up the sample for the given research study (Lacobucci & Churchill, 2005). This involved:

- Step 1 Identify the target population
- Step 2 Determine the sampling frame
- Step 3 Establish a sampling procedure
- Step 4 Define the sampling size

- Step 5 Chose the sampling components
- Step 6 Gather data from the components

4.3.6.1.1 Target Populations

Two rural Districts were chosen, Umzinyathi and Ugu. The purposeful selection was attributed to the confinement of the two among the most rural regions within the province of KwaZulu-Natal. The participants of choice were based on health care professionals providing services within the Primary and Community health care facilities. Such professionals were chosen on their predefined qualities. The identifiable characteristics being, their health care knowledge, qualification, expertise and work experience within the rural public healthcare context. The authorized nurse prescribers are defined as those professional nurses afforded the delegation, authorized by the District Director, or District Medical Manager to diagnose, prescribe and treat all patients accessing the primary health care facilities under the limitations of District PHC prescribing rights, District policies and procedures in accordance to task shifting (WHO, 2008) as well as the legislative parameters of the SA Nursing Council (SANCA). Doctors are those prescribers, by virtue of their qualification, can diagnose, prescribe and treat patients within restrictive District policies, processes and binding legislature of the Health Professionals Council of South Africa (HPCSA). In addition, the pharmacists are those professionals that have a pharmacist degree, allowing the dispensing of prescriptions, restrictive to District policies, processes and the South African Pharmacy Council (SAPC) prescripts.

The support to PHC by pharmacists in the public sector is predominantly MSM, i.e., ensuring the availability and legal receiving, storage, and issue of medication within acceptable SAPC laws and regulations. However, pharmacist support across Districts differ, in that some extend the support to clinical reviewing of nurse prescribed prescriptions. Of the two districts under investigation, prescription audits by pharmacists are conducted within the Ugu district in all PHC facilities on a quarterly basis. However, the pharmacist support in the Umzinyathi district is limited to an ad hoc basis and where the permanent support from Pharmacist Assistants is one of MSM only. Nevertheless, pharmacist knowledge of current clinical care across both Districts is known, due to some type of intervention, either direct or indirect. Hence, the hospital pharmacist as a participant in this study added a vital dimension to the results to inform the

future pharmacy scholarly policy makers of the need for pharmaceutical care training and development incorporation into future curriculums.

4.3.6.1.2 Sampling Frame

The full set of cases or group members from which a sample is taken is referred to as the population (Saunders et al. 2007), while a sample as illustrated by Msweli (2015), involved a group of individuals or entities from which the results of a study was generalized and displayed the exact population characteristics against which the quality of the research was judged. Hence, to utilize the entire population is time consuming, expensive, impossible and impractical in certain contexts. This is overcome by sampling, which systematically selects cases for inclusion in a study (Saunders et al. 2007). In addition, the understanding of a focus group to be a sub-set of the population sample, allowed for either a semi-structured or in-depth group interview. This enabled exploration of aspects of the research through a small group discussion that was facilitated by the researcher (Saunders et al. 2007). On engagement with a statistician the sample population of the different sampling frames was agreed upon.

It is hence, necessary to distinguish the sampling frame appropriate for this study. These are clearly identifiable as follows:

- The doctors that support PHC and CHC clinics in the rural Districts of UGU and Umzinyathi
- The authorized nurse prescribers stationed at the PHC and CHC clinics from both districts
- The pharmacists that support PHC clinics within the two districts
- The key informants**,** experts in the field, lecturers and pioneers in pharmacy

4.3.6.1.3 Sampling Procedure

Sampling techniques provided the researcher with an array of methods enabling reduction of the data that was required while taking account only of data from a sub-group, rather than all possible cases or elements (Saunders et al. 2007). The purposive sampling technique, also known as selective or subjective sampling was the conscious choice of the participants for this study, based on the participant desired qualities. It is a non-random technique not requiring

underlying theories or a set number of informants (Adam, 2014). Simply expressed, the researcher asserted what was needed to be known and planned to recruit those willing to deliver the required evidence based on their experience and expertise (Bernard, 2002; Lewis & Sheppard, 2006, cited in Adam, 2014).

The researcher subjectively chose KwaZulu-Natal, being the province of employment, familiarity with pharmaceutical care processes and policies and the identified need for an intervention. Therefore, the purposive sampling preferred consisted of a sampling frame of 4 strata, i.e., all visiting Doctors and pharmacist to the 'ideal' clinics, all authorized nurse prescribers and key informants. In respect of the key participants (informants), they are attentive, insightful members of the community of significance who are learned about the topic and display eagerness to share their knowledge (Bernard, 2002 cited in Adam, 2014). Hence, key informants were also subjectively chosen by virtue of their pharmaceutical and healthcare related knowledge and expertise. The detailed sample representation is highlighted in Table 5 below.

4.3.6.1.4 Sampling Size

The criterion for the sample or number of the clinics for evaluation in each of the districts rested on the 'ideal clinic status'. At the time of the research planning (April 2016), only 5 of the clinics in the Ugu District (non-NHI pilot site) had attained close to the desired status. However, in the Umzinyathi District (one of the poorest districts in the country), being one of the NHI chosen implementation pilot sites (commenced 'repair' in April 2012), had all its clinics close to 'ideal status'. Therefore, due to the vast distance and difficult unfamiliar rural terrain within the district, only 50% of the clinics were conveniently chosen, i.e., 10 clinics. In addition, the population of the study comprised of authorized nurse prescribers, visiting PHC Doctors and pharmacists supporting the 'ideal' clinics from two rural districts in KwaZulu-Natal. The sample of participants for this study is outlined in Table 5.

Table 5: Sample of Participants for this Study							
DISTRICT	IDEAL CLINIC	VISITING DRS Focus		AUTHORISED NURSE PRESCRIBER Focus		SUPPORT PHARMACIST	KEY INFORMANT
UGU	5	19	6	17	5	15	
UMZINYATHI	10	8	4	65	19	8	
TOTAL	15	27	10	82	24	23	5

4.3.6.1.5 Sampling Element

The researcher planned the approach of the research study in four phases. In phase 1, the unit of analysis was the key informants, subjected to a telephonic interview by a process of choice. Followed by the phase two, the unit of analysis was the authorized nurse prescribers, visiting doctors and public pharmacists supporting the PHC and CHC 'ideal clinics', requiring the answering of a structured questionnaire. In addition, the nurse prescribers completed a second questionnaire.

Focus group interactions posed useful in phase three of the research considering limited resources of time, finances and labour (Morgan, 1998) to adequately cover all chosen clinics (given the challenges of transport and difficult, unknown travel terrain). The main focus of such a group is aimed at utilizing the feelings, perspectives and viewpoints of the participants. Hence, for this study the focus group interaction proved beneficial, in sharing and appreciating the samples' experiences and beliefs to allow depth, insight and understanding of particular phenomena (Morgan, 1998). Hence, in this case study, the phenomena being the participants' perceptions of pharmaceutical care within their work domain.

The adoption of convenience sampling is utilized in focus groups (Nagle & Williams, 2013). However, taking cognizance that focus groups' intention rests on understanding, determining the range for generalization and to afford awareness of the groups' individual perceptions regarding a situation, the chosen sample thereof encompassed people with attributes

representative of the population at large and their contributions assisted the researcher gain a greater understanding of the topic. Therefore, the phenomena required collective discussion to drive more knowledge about behaviour, opinions and status of the research. A focus group comprised of between 4-12 participants. Hence, this ideal range encouraged active debate and assisted in keeping facilitation of the group tasks on point (Saunders et al. 2007).

For this study a 10% of the sample population in each stratum of Doctors and nurses, were selected for the focus groups as advised by the statistician. Therefore, phase three encompassed collection of data from semi-structured focus group interviews, where the unit of analysis was the prescribing nurse and the visiting doctors in separate engagements. Lastly, phase four involved the inspection of all the 'ideal clinics' through the SAPC questionnaire.

4.3.7 PILOT STUDY

In any study, a pre-test serves to validate and guarantee the reliability of the measurement tools (Saunders et al. 2007). A choice of a group having similar characteristics in relation to the chosen sample population for the study, comprised the pilot sample. The pilot and experimental group were exposed to external influences alike, which aimed to eradicate any changes to the planned intervention and risks to internal validity (Saunders et al. 2007). The sample pre-test was conducted within the Ugu District at GJ Crookes Hospital. The clinic close to ideal status was selected for the pre-test (Appendix 11). The authorized prescribers at the clinic, visiting Doctor to that clinic and pharmacist that offer support were chosen from GJC Hospital (Appendix 8, 9, & 10). Two informants were chosen (both of vast knowledge and expertise in the pharmacy field), one from within the healthcare environment and the other external (private sector pharmaceutical support) and subjected to the questionnaire (Appendix 7). In addition, a cover letter with the information letter (Appendix 5), and consent form (Appendix 6), were distributed to all participants and collected prior to the pilot study. Importantly to note is that the participants in the pilot study were not included in the main research study. Following the pilot study, attention was drawn to the structured questions and interview schedules for both the focus groups. These were, thereafter, probed and revised from information gleaned during the informant's interaction and the pilot study with individuals in the focus group discussions of both doctors and authorized nurses.

4.3.8 DATA SOURCES OR MEASURING INSTRUMENT

Data gathered methodically from participants and other stakeholders relating to their views and encounters defined the process of evaluation (du Plooy-Cilliers et al. 2014). For the study in question, three sources of data were classified, specifically, questionnaires and interviews (focus group and informant) being the primary sources, and the secondary data reflecting on the literature review (Mouton, 2002). The gathering of secondary data afforded the primary reason for re-examining the data. This came with a benefit of forcing the researcher to precisely view the data relating to principal ideas and theories (du Plooy-Cilliers et al. 2014).

4.3.9 QUESTIONNAIRES

4.3.9.1 Construction and structure of Questionnaires

The chosen approach of questionnaires was preferred and is defined as a research instrument, comprising of a sequence of questions and other 'prompts' assisting in data collection (Mckee, 2015). Hence the questions are further elaborated by Saunders et al. (2007), as being standardized and pre-set advocating the importance of conceptualising and operationalising the variables being studied in order to develop the measuring instrument. Questions can take on patterns of either being open ended; allowing participants to respond in their words, giving explanations for their answers; or closed ended, where questions are either "Yes/No" options, or "tick box" options, with alternatives provided, confining respondents to the question, which are easy to fill, wherein the latter was adopted for the "Nurse only" questionnaire. In addition, questionnaires can be closed questions that describe various degrees of responses, such as scaled items or Likert scales (Saunders et al. 2007). As described by Bertram (2007), and McLeod (2008), a *Likert scale* is a psychometric response scale that is used to gauge participants' attitudes, values, opinions, preference or the intensity of conformity with an assertion or a composite of assertions. The Likert scale allows a person to indicate the extent to which they agree or disagree with a series of statements from which to choose. The Likert scale approach was favoured as one can obtain fairly accurate assessments of beliefs or opinions with such type of questions (du Plooy-Cilliers et al. 2014). Hence, the advantage of questionnaires that are closed-ended, checklists or rating scales type are valuable in simplifying

and quantifying responses. In addition, people are more accepting of ticking boxes rather than writing or typing long answers (du Plooy-Ciliers et al. 2014).

Questionnaires can be used for descriptive, exploratory and explanatory research. Exploratory research, such as the one undertaken in this research, sought to explore the perceptions of the target sample population (Saunders et al. 2007). Questionnaires have the advantage of covering a wider audience compared to interviews, but has a disadvantage of not being able to customize it to individuals as is possible with other methods of data collection (Saunders et al. 2007). This study used three questionnaires that was constructed and structured from the literature review as listed below:

- Questionnaires were derived using a template (Farrell et al. 2008), stemming from the IMPACT (Integrating family Medicine and Pharmacy to Advance primary Care Therapeutics) project and the “Drug Use Process”, modified, to extract the perceptions of healthcare professionals, namely, doctors, authorized nurse prescribers and pharmacists on the different steps and stages in the ‘drug use process’ exploring the “Team Approach to Medication Management” (TeAMM) model (Bajcar et al. 2005), (Appendix 13), on collaborative tasks and activities in management of a public rural PHC context. The adoption of the Likert scale was found most appropriate (Appendix 8).
- The second questionnaire was derived from Adamick et al. (1986), and Gilbert (1997), modified to explore the perceptions of the authorized nurse prescribers on the activities of the PCDT pharmacist within a PHC rural context. A closed tick box type of questionnaire was chosen (Appendix 9).
- The third was derived from the South African Pharmacy Council inspection questionnaire, to evaluate the structural legal compliance of the PHC and CHC facilities having the presence of a Pharmacist Assistant or Pharmacist. This questionnaire was part open-ended and part Likert scale (Appendix 11).

4.3.9.2 Distribution and Collection of Questionnaires

The initial District (Ugu and Umzinyathi) engagement comprised of the Operational Manager, one authorized prescriber, the Doctor and pharmacist supporting each of the facilities chosen. Thereafter, the remaining of the participants were engaged personally by the researcher at each of their facilities identified to allow for consistency, clarity and assurance in completion of the two questionnaires and focus group interactions. The preference of individual facilities as the venue for the remaining of the participants was favoured for convenience and avoidance of workflow disruptions to patient care. The engagements were planned for the introduction to the research and for the conducting of the focus group interview later on that day. The initial task was a welcoming address and to create a friendly, secure and cooperative relationship with the participants by displaying appreciation for engaging in the research. The letter of information (Appendix 5), consent letter (Appendix 6), together with the first questionnaire (Appendix 8), was distributed to the participants present. Thereafter, a power point presentation highlighted in more detail, the purpose of the study and afforded participants an explanation of their involvement in the study and its outcomes. The stakeholder engagement as detailed, in addition afforded the researcher an opportunity to clear up any misconceptions with the interpretation of the questions. This approach, as indicated by Saunders et al. (2007), adds to the reliability of the study.

The second questionnaire was distributed to the nurse prescribers (Appendix 9), present before the focus group interaction. These were collected after the engagement. The third survey questionnaire (SAPC inspection- Appendix 11) was completed by the researcher herself at each of the 15 facilities under study.

4.3.10 INTERVIEWS

This method of collecting information occurred by way of verbal engagement comprising of a cohort of pre-planned underlying questions. Shneiderman & Plaisant (2005), stated that this approach allows the interviewer to pursue specific concerns to illicit focused, constructive suggestions, including rich data using few participants. Therefore, interviews being the chosen technique of engagement and data gathering was preferred in this research.

A research need and design dictated whether interviews are structured, unstructured, or semi-structured amongst participants, or might involve interviews of focus-groups in nature (Thomas, 2010). Therefore, the researcher leaned towards semi-structured and focus group type interviews. A semi-structured method of interview for the key informants encompassed characteristics of structured and unstructured interview process using both closed and open questions, as outlined in Appendix 7, affording the benefit of both methods of interview. This allowed ease of probing by the researcher towards participant freedom to express their feelings (Thomas, 2010); ease of standardization of questions and conducting of the interview (Preece et al. 2002). The semi-structured interview schedule specified predetermined open-ended questions and a system for the interviewer. The structured part of the interview was designed with the research purpose and the literature review in mind, comprising of an interview schedule of close-ended questions. An element of consistency was afforded to all participants, guided by pre-planned core questions enabling similar issues to be addressed with each interviewee (Appendix 10). Hence, as the interview proceeded, the participants were allowed an opportunity to elaborate or offer more relevant information if opted to do so, in order to generate rich data, information and ideas by the researcher varying the level of questioning to suit the PHC and pharmaceutical care policy and process context (Thomas, 2010).

Furthermore, focus group interviews are another data collection method involving a group interaction that stimulates the sharing perceptions, experiences, and concerns to achieve agreement in a safe, non-pressurizing approach (Denzin & Lincoln, 2005; De Vos et al. 2005). Therefore, focus groups bring to light rich data from a variety of perceptions in a defined area of interest, thereby capturing sensitive issues that would not be revealed in individual interviews (De Vos et al. 2005). For these reasons, the researcher opted for focus group interviews for the doctor and authorized nurse participants. The approach in addition, required a technique of listening and learning from people, thereby attaining ideas and insights (Breen, 2006). However, of concern, was that in a group, people can develop and express ideas that have been influenced by the other members within the group (Preece et al. 2002). A focus group should ideally range from six to twelve participants (Maughan, 2003). Hence, this suited the researcher given the scarcity of healthcare professionals within the public context.

4.3.10.1 Focus Group Interview process

Interviews initially took place in the respective District offices of the key participants, as described above and followed through to the participant's work stations to allow for a more familiar territory and ease of the interview, due to challenges experienced by the participants in terms of time, transport and scarcity of staff for service delivery. Therefore, the nurses' interactions, thereafter, took place at their respective facilities. However, considering that only one doctor provides support to a PHC facility at any given time, coordination for the researcher was challenging. Therefore, the doctors' engagements took place at the community healthcare facilities where all doctors that provide PHC support are stationed and commute either daily or weekly for outreach. The initial task was a welcoming address and to begin a friendly, secure and cooperative relationship with the participants by conveying thanks for willingness to participate in the research. Having conducted the PowerPoint presentation to highlight the purpose of the study, participants were well aware of their role and contribution to the study. The information and explanations shared were included in Appendix 5, that was handed to each participant, with the contact detail of the researcher for possible future inquiries, as well as the consent forms (Appendix 6). Furthermore, the format and structure of questioning were clarified before the actual interview. The interview schedule (Appendix 10), guided the discussions. Following participants' permission to undergo the research study, the recording of the interview data took place by way of note-taking and audio recording to ensure transcribing, analysis and integration as suggested by Gall et al. (1996), Huberman & Miles (2002) and De Vos et al. (2005). To reinforce the process, note-taking aided an additional recording measure and a back-up procedure given the refusal of interviewees to record their interview.

Caution was taken to ensure that the researcher facilitated the interview process according to the dynamics of each particular group to allow for an interactive and participative atmosphere in which all participants had an opportunity to openly share their views (Denzin & Lincoln, 2005; Breen, 2006; Mertler, 2006, cited in Adam, 2014). The questions that dominated the discussions in the nursing and medical officer focus groups were based on the research problem and purpose as stated in chapter one. To further assist meaningful interactions and relevant data, the background of the research with related aims were explained to the interviewees. In addition, the participants were assured of their confidentiality in their engagement. In order to maintain

structure, the pace and time of the interview was continuously monitored (Best & Kahn, 2003; Breen, 2006).

4.3.10.2 Key Informant Interview

A key informant is an expert source of information, wherein an interview generates specifically 'informed perspectives' on the issue being investigated (Lasker et al. 2001, Macfarlan, 2014). The key informant technique is an ethnographic research method originally used in the field of cultural anthropology. According to Marshall (1996), today the technique is more widely adopted in other branches of social science investigation. Key informant interviews are qualitative in nature. They are described as in-depth dialogues between 15 and 35 people preferred because of their direct expertise in relation to the focus issue under discussion (USAID, 1996). The dialogues are 'loosely structured' and rely on a variety of subject matters for discussion. They basically resemble an interaction among associates for easy generation of thoughts and data. Moreover, the questioners design the enquiry to investigate and document for later analysis (USAID, 1996).

The researcher, by adopting the key informant method of data collection found this approach very useful as it was important to gain an understanding of the perspectives, behaviour and motivations of inter-professional healthcare workers' activities within the rural context in order to explain the shortcomings or successes of the activities, with the aim of generating recommendations for the key purpose, to assist with interpreting the quantitative data by addressing the 'how' and 'why' aspects and to assist with the mapping of relevant issues before the designing of the quantitative study (USAID, 1996). In addition, the adoption of this approach was further encouraged by the advantages of being a cost-effective approach to absorb a clearer essence of the circumstances under study, the evidence generated being from those with specific skills and know-how, allowing innovative and unsuspected concepts to arise (USAID, 1996). Nevertheless, the researcher was cautioned by the potential influence of the informant's responses and was wary of bias if the informants were not selected with care (USAID, 1996).

Relevant to this study was the deliberate choice of five key informants. They were each approached by email and followed-up by telephone. Once consent was obtained via e-mail, an

appropriate time and venue for a telephonic interaction (Lasker et al. 2001), was arranged, at the convenience of the key informant. The interview was conducted to inform the roles and responsibilities of the PCDT pharmacist at rural PHC clinics as well as to highlight its possible pitfalls and to glean new insight and recommendations for the future of public pharmaceutical care services, as guided by the interview schedule (Appendix 7). A concise summary of the study was shared to engage the informants on their views and recommendations, which was recorded using a Dictaphone (on consent), and note taking. The findings from this interaction were to inform the restructuring of the interview questions for the focus groups and the research study at large by way of triangulation.

4.3.11 DATA COLLECTION AND ANALYSIS

This function is reliant on the method embraced (Bryman, 2012). Consideration was given to the appropriate process to use to ensure the research's inclusive validity and reliability (Saunders et al. 2007). Therefore, irrespective of the method adopted, the data gathered can be divided into two categories: primary and secondary. This study collected and analysed primary data collected first-hand by the researcher using surveys and interviews. However, the researcher made reference to secondary data gathered from studies and surveys that were run by other people or for other research (Saunders et al. 2007). Hence, critical realism adopted by the researcher, attempted to obtain the data across both direct and indirect collaboration with the pharmaceutical care phenomena being examined.

4.3.11.1 Data Collection

Invitation to participate was formally sought and informed consent forms (Appendix 6), were filled and returned prior to the commencement of the research. Majority of the questionnaires (Appendix 8 and 9) were collected on the same day, while some a week later due to either the unavailability or absence of the participants as well as time constraints on their workflow demands at the time of engagement. Those 'delayed' questionnaires were followed by telephone calls prior to their collection to ensure compliance and support. Once completed, arrangements were made to have them sent and collected from their respective District offices. The Umzinyathi questionnaires were then couriered to the Ugu district office for collection by the researcher. All

chosen participants were covered allowing the entire data collection process spanning over two weeks.

Furthermore, the semi-structured in depth focus group interview is a specialized form of interaction, differing from everyday conversation. This involved specific roles played by the interviewer (asking the questions) and the interviewee (answering them), as suggested in the interview guide in Appendix 10. The face-to-face responses to interview were captured by tape-recordings by the researcher in relation to each respondent's answer and has the highest response rates, according to Saunders et al. (2007). Hence, the face-to-face focus group interview was semi- structured and encompassed themes that were described at length in the methodology. Such engagement allowed for an in-depth insight into contexts, gestures and nonverbal communication of the participants (Saunders et al. 2007).

The selected focus sample of Nurses' interview, took place at the participant's individual facilities as arranged with the District coordinator and operational managers of the facilities. The doctor's engagement, on the other hand took place at the community health care facilities, where all are based. This was the most practical approach to coordinate the doctors focus group interaction. The sample focus groups each were engaged in 45-60-minute sessions. Furthermore, the informant interview was conducted telephonically for convenience and was guided by the interview schedule as outlined in Appendix 7. Each session lasted approximately 30 minutes. Similarly, the interviews (informant and focus group) were recorded verbatim by a Dictaphone (on approval by the participants) for clear analysis and by note-taking by the researcher. In addition, the SAPC, inspection (Appendix 11), was conducted personally by the researcher at the 15 sites. Each inspection took approximately 30 minutes.

4.3.11.2 Data Analysis

The self-administered structured questionnaire for the visiting Doctors, prescribing nurses and pharmacists supporting the ideal clinics was structured in the form of a Likert Scale and was presented to participants personally by the researcher. It is most often seen as a five (or seven) point scale allowing participants to articulate their responses in terms of the degree of agreement

or not with a specific assertion (Bertram, 2007). Therefore, in phase two of the development of the Collaborative Pharmaceutical Care Model (CPC) in rural PHC, a quantitative method was chosen. The scale adopted was intended to measure the participants' perception of five tasks, viz., diagnosis & prescribing, monitoring and patient safety, administrative/documentation, education and training and medication review experienced by doctors, prescribing nurses and pharmacists. Therefore, the closed questions in a Likert five-point scale reflected the levels of responsibility (i.e., lead role= 1, shared lead role= 2, supportive role = 3, or minor = 4, or no role= 5) was adopted. This rating scale allowed the researcher to measure the individual participants' perception of their fellow colleagues in the responsibility contributing to the process of clinical medicine management and patient care as depicted in Appendix 13. In addition, the 'nurse only' questionnaire (Appendix, 9), was administered in conjunction with Appendix 8, consisting of "Yes" or "No", type questions. A Kruskal Wallis test was adopted to establish any significant scoring patterns per statement and per profession. Therefore, whether similar scores were observed by each profession served as the null hypothesis. The Kruskal Wallis test compared medians (general p-value). The highlighted significant values (p-values) less than 0.05 (the level of significance), implied that the distributions were un-related.

The Primary Healthcare Clinics Inspection questionnaire for SAPC compliance of PHC facilities was carried out by the researcher herself on site at the 15 chosen ideal clinics as a quantitative evaluation. This questionnaire was structured in a 7 point Likert scale reflecting levels of importance (i.e., not at all important but necessary to document=1, low importance=2, slight importance=3, neutral importance=4, moderate importance=5, very important=6, extremely important=7) as reflected in Appendix 11. In respect of the informant interviews, three open ended questions were structured to derive their views, challenges, implementation strategies and recommendations of the integration of the PCDT pharmacist in rural public PHC clinics to ensure pharmaceutical care in collaborative patient care and management as indicated in the key informant interview guide (Appendix 7).

In respect of a qualitative case enquiry, a crucial phase in the analysis of data, surrounded the meaningful search by way of direct explanation of the researcher's observation in addition to that which the respondents experienced and described (Saunders et al. 2007). Qualitative

analysis of data is regarded as “working with the data, organising them, breaking them into manageable units, coding them, synthesising them, and searching for patterns” (Bogdan & Biklen, 2003). Similarly, in support, Thomas (2010), states that categorisation begins the data analysis process and assists the researcher in making comparisons and contrasts among the identified patterns. Therefore, the aim of analysis of qualitative data is to discover patterns, concepts, themes and meanings seen as causal links in the data base (Yin, 2003).

An approach as “open coding” was adopted in this research, whereby, the researcher identified and with caution assigned a label to the “conceptual categories” wherein the phenomena observed was categorized (Strauss & Corbin, 1990). This approach aimed for descriptive, multi-dimensional categories to guide the analysis. Considering that qualitative researchers utilize inductive analysis, the emergent categories were of utmost significance (Strauss & Corbin, 1990). In a case study like the current one, the data collection and analysis followed a pattern of informing each other resulting in the final analysis being termed a “higher level synthesis of the information” (Thomas, 2010). Therefore, during the interviews, both the individual (key informants) and focus group (doctors and nurses), were recorded and dialogue transcribed. Following an engagement of a few open-ended questions, afforded participants to explore in the discussion enabling valuable experience-related information to develop. Thereafter, analysis, comparison and categorisation of the individual responses against the transcription results of the focus group interviews ensued. These were consequently triangulated and interpreted to draw conclusions.

Onwuegbuzie & Teddlie (2003), expressed that qualitative and quantitative data analysis within a mixed methods framework, subjects the researcher to a procedure involving at least seven stages, which was supported for this study. Table 6, represents the operation of the seven stages in the data analysis process that was elaborated on in detail.

Table 6: Seven steps in the data analysis process adapted from Mafuwana (2012)			
Stages in the mixed methods data analysis process	**Description of each stage**	**Application in quantitative data analysis**	**Application in qualitative data analysis**
1. Data Reduction	Reducing the dimensionality of the qualitative and quantitative data	Via descriptive statistics, exploratory factor analysis	Via exploratory thematic analysis
2. Data Display	Pictorially describing both the qualitative and quantitative data	Using tables, graphs, cross tabulations, matrices and other figures	Using matrices, charts, graphs, networks
3. Data Transformation		Quantitative data are converted into narrative data that can be analyzed qualitatively	Qualitative data are converted into numerical codes that can be represented statistically
4. Data Correlation		Quantitative data is correlated with qualitative data by triangulation	Qualitative data is correlated with quantitative data by triangulation
5. Data Consolidation	Both qualitative and quantitative data are combined to create new or consolidated variables		
6. Data Comparison	Involves comparing data from both the qualitative and quantitative data sources		
7. Data Integration	This is a final stage, wherein both qualitative and quantitative data are integrated into either a coherent whole or two separate sets of coherent wholes		

4.3.11.2.1 Quantitative Data Analysis

The quantitative data of the study was generated from two survey questionnaires and one inspection questionnaire. The self-administered survey questionnaire encompassed the collaborative tasks (doctors, authorized nurse prescribers and pharmacists), authorized nurse prescriber questionnaire on performance of activities and the SAPC inspection questionnaire of the PHC and CHC facilities. The latter two questionnaires were examined with the assistance of descriptive statistical analysis whereas the initial questionnaire was analysed by means of exploratory factor analysis as elaborated on below. The sample size was not sufficient for principal component analysis. Component analysis and reliability were done merely to determine consistency of scoring. However, the groupings were highly specialised (especially in terms of the doctors and pharmacists). For the self-administered questionnaires, data was captured in

Excel and transferred to SPSS. Thereafter the data was coded and then validated using the Validation option. The statistical program used to analyse the data was SPSS version 25.0.

a. Data Reduction- Factor Analysis

Factor analysis aims to condense information such that an understanding and analysis can be easily drawn from the relationships and patterns. Its application has been widely employed in several disciplines. Behavioural and social sciences, medicine and economics are among those included. Furthermore, factor analysis techniques include Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). CFA endeavours to confirm hypotheses, while EFA tries to reveal intricate patterns by studying data and examining hypotheses (Child, 2006, cited in Yong & Pearce, 2013). Hence, for the purpose of this study the latter technique was employed.

Therefore, a researcher applies EFA with the intention of determining the factors affecting variables and to examine those that are more closely correlated (DeCoster, 1998, cited in Yong & Pearce, 2013). In addition, the primary goal of this statistical technique was reducing data into minute set of concise variables for investigating underlining theoretical make-up of the phenomena. Hence, it assisted in classifying the relationship between the variable and the respondent (Yong & Pearce 2013). On average factor analysis is used in survey research, allowing a researcher to significantly represent a number of questions with a small number of hypothetical factors. In addition, Factor analysis is adopted only for the Likert scale items, thereby warranting its suitability in the self-administered questionnaire of doctors, authorized nurse prescribers and pharmacists (Yong & Pearce 2013).

In the case study presented, participants were asked to answer between 3 to 4 separate questions regarding the collaboration of tasks pertaining to medicine management in pharmaceutical care, reflecting on variables of, diagnosing and prescribing, monitoring and patient safety, administrative and or documentation, education and training and medication review. Each question, by itself would not be an adequate measure of attitude towards pharmaceutical care services on the whole. However, together, they would provide a better measure of the attitude (dos SANTOS & de LIMA, 2017). In this study the Kaiser-Meyer-Olkin

(KMO) Test and Bartlett's Test was adopted to measure its suitability of the data for Factor Analysis. For completeness of the model, each variable was tested for its sampling adequacy by way of the application of the said tests. Hence, the common variance was then derived from the proportion of variances among variables. The acceptable norm is that KMO- Measure of Sampling Adequacy should be greater than 0.50 and Bartlett's Test of Sphericity less than 0.05. This test is not usually calculated by hand, because of the complexity. Hence, the SPSS version 25.0, Run Factor Analysis (Kaiser 1974; Cerny & Kaiser, 1977). The results proved worthy of factor analysis, and the researcher had to ascertain if the set of questions factually do measure the same thing. Therefore, they could be combined to create a new variable, a factor score variable that comprises a score for each respondent on the factor.

Furthermore, the analysis to establish the significant difference among the scoring patterns per statement by profession, required a Kruskal Wallis test to be executed. The key output of such a test encompassed the 'point estimates and the p-value'. Hence, to ascertain any statistical significant difference between the medians, a comparison of the significant level to the p-values were compared, thereby measuring the null hypothesis (McDonald, 2014). The null hypothesis states that the population medians (interquartile ranges were drawn -Appendix 20) are all equal. Usually, a significance level (denoted as α or alpha) of 0.05 is acceptable. A significance level of 0.05 indicates a 5% risk of concluding that a difference exists when there is no actual difference (McDonald, 2014). For the given study, the null hypothesis claimed that similar scores were observed by each profession (doctor, authorized nurse prescriber and pharmacist). The results were postulated in a table form from the rotated component matrix (Appendix 15). There were two sets of Kruskal Wallis results. The first compared the professionals within each district (Ugu and Umzinyathi), and the overall looked at the ratings, irrespective of the district. In addition, the pairwise comparisons were done using Kruskal Wallis 1-way ANOVA, illustrating whether differences exist among the means of the parings of Authorized PN vs PCDT Pharmacist; Authorized PN vs Doctor and PCDT Pharmacist vs Doctor (Appendix 19). Each row tested the null hypothesis in Sample 1 and Sample 2 to allow for comparisons among the parings to be made. Considering that the result of ANOVA does not provide detailed information regarding the difference among the various combination of the three groups, additional analysis to clarify the differences between the particular pairs was done by applying the 'multiple

comparison test' (MCT), or a 'post-hoc test.', using the Bonferroni method (Lee and Lee, 2018). Thereafter, the results were explained in relation to the way in which the respondents scored, both within the individual districts and then holistically per profession, drawing to conclusions and recommendations (Appendix 16, 19 and 21).

b. Data Reduction-Descriptive Statistics

On the other hand, the questionnaire for activities was categorized into clinical care, diagnostic testing, health education and professional training, child health, contraception and injections, medicine supply management, and emergency medical services (Appendix 9). Likewise, the SAPC inspection tool aimed to investigate the legal compliance of the facilities by categorizing into, inspection details; clinic details; clinic staffing; general, premises and layout; equipment; storage; thermolabile medicines; control of medicines/record keeping; written standard operating procedures and availability of reference material (Appendix 11). This allowed for an easy descriptive explanation of the results. Hence, descriptive statistics is a quick method allowing for comparisons of different data sets, identification of the smallest and largest values and trends or changes over a period of time. It is a graphical representation of data. Therefore, the quantitative aspects of the study data were visually represented by bar graphs and tables.

c. Data Display, Transformation and Correlation for Factor Analysis and Descriptive Statistics

Quantitative analysis was represented using descriptive statistics and factor analysis that described the phenomena of interest, by method of graphs, bar graphs, pie charts, and cross tabulation and matrices allowing the data derived from numbers to be transformed into meaningful information for this study. The collection thereof resulted in numerical and standardized data. This information was helpful in exploring, presenting, describing, and examining relationships and trends within the collected data. Hence, the quantitative data was translated into narrative data to be analysed qualitatively. Quantitative data was, hence, correlated with qualitative data by means of triangulation.

4.3.11.2.2 Qualitative Data Analysis

In analysing data and interpreting results, it is important to note that purposive sampling technique is an inherently biased method. For this reason, one needs to document the bias and not to apply interpretations beyond the sampled population (Saunders et al.2007). However, the advantage of purposeful sampling, stated by Patton (2002), is that there should be interest and value in capturing any frequent patterns that are derived from 'great variation' of either the main experience or shared dimensions of a setting or phenomenon.

Editing and data cleaning detects errors and omissions, corrects them when possible and maintains a minimum data quality standard. The researcher edited the data for the assurance of accuracy, consistency with other information, uniformity of entering, completeness and simplicity of coding and tabulation (Cooper & Emory 1995, cited in Saunders et al. 2007). Field editing must be undertaken and in this case was the responsibility of the researcher herself. It was done shortly after the data was gathered. Participant verification, further allowed for 'cleaning' of the data soon after the interview by way of summarizing the key points of discussion. Thereafter, the report forms were edited. It is advised that should gaps be present from interviews, a call-back should be made instead of guessing what the respondent would have said (Cooper & Emory 1995, as cited in Saunders et al. 2007). Furthermore, a 25% in excess of the questionnaires left blank, results in an exclusion of such in the data set for analysis (Sekaran, 2000). If only two or three items were left blank in a questionnaire of 20 items, as was the case in the present study, the midpoint in the scale as the value was taken. The Likert scale used in the uniform questionnaire was already coded from one (1) to five (5). In the nurse questionnaire one (1) was assigned to the choice of PCDT Pharmacist and two (2) to PHC nurse. Hence, coding helped the researcher condense the responses into meaningful categories of vital information for analysis. Closed questions as used in the questionnaires were easier to measure, record, code, analyse and enable pre-coding (Saunders et al. 2007).

a. Data Reduction- Thematic Data Analysis

The choice of thematic analysis to identify themes and patterns, proved most suitable for this study. The thematic analysis method enabled a methodological systematization of data in order

to conceptualize the identification and development of themes (Thomas & Harden, 2008). Hence, thematic analysis is important to the description of the phenomenon and associated research question (Daly et al. 1997). This involved the recognition of themes by “careful reading and re-reading of the data” (Rice & Ezzy, 1999). Hence, a type pattern was detected from the data, wherein the themes arrive at categories for analysis (Fereday & Muir-Cochrane, 2006). Thematic analysis encompassed a six phase coding procedure enabling traditional and significant patterns (Braun & Clarke, 2006). Hence, the phases performed in this study included the following, familiarization with data, generating initial codes, searching for themes among codes, reviewing themes, defining and naming themes and producing the final report as illustrated in Appendix 18.

Furthermore, the subjective focus on personal encounter relates to phenomenology and thematic analysis (Guest & Namey, 2012). Therefore, this method emphasized the participants' opinions, beliefs and occurrences. This allowed a very casual discussion among the participants’ over the subject matter without limitations to the design of “fixed-response questions”, expected in quantitative research studies. Noteworthy, is that in conducting thematic analysis, researchers are advised to seek deeper understandings of the information and to provide an accurate, reliable interpretation and representation of the data (Braun & Clarke, 2006). The process of member checking is at the last stage before the report is generated, serving to derive credibility, which was adopted by means of a summary data verification at the closure of each focus group interview. Researchers are advised to initiate feedback from the participants through sharing of the final themes and the discussions (Guest & Namey, 2012), which is what ensued.

b. Data Display, Transformation and Correlation

From the assessment of the literature, issues regarding pharmaceutical care that emerged with consistency were discussed under categories that were developed in advance. Categorisation is a systematic process of identifying key factors and possible relationships between them, making it possible for the sorting of text into convenient categories for easy computing (Cooper & Emory, 1995 as cited in Saunders et al. 2007; Neuman, 1997; Mouton, 2002). According to Kvale (1996), categories can be developed ahead of time or planned for in the course of the analysis stage. Hence, categorization for the qualitative collection of information during the

interview process of the research involved groupings into the following themes: role clarity, professional attitude and clinical competence, co-location, inter-professional communication and collaboration, information sharing, responsibility and trust, pharmacist training, training and learning (Biddle, 1979; Huxham, 1996; Bradley et al. 2008; Huxham & Hubbert, 2008; Vangen & Huxham, 2005 & 2010; Jorgenson et al. 2013). In qualitative research interviews as the case in this study, the responses and interactions were audio-recorded and thereafter transcribed.

Furthermore, researchers are advised on the importance to capture both what the participant is saying and how it is said, including the tone and non-verbal communications. This resulted in transcribing of audio-recorded interviews, which is time consuming (Saunders et al. 2007). The interviews were transcribed and electronically stored in distinct files, using a file name that "maintained confidentiality and preserved anonymity", as well as easily recognizable (Saunders et al. 2007). In the present study the file names were comprised as follows, e.g. the number of the participant, the professional status and the question number, e.g. 12DQ3 (12th participant is a doctor who answered question 3). The quantified data assisted in answering the research question(s) and met the study objectives (Saunders et al. 2007). Using matrices, charts, graphs and networks, afforded a statistical representation of qualitative data from numerical codes. In addition, qualitative data was correlated with quantitative data by means of triangulation. Finally, the processes of data analysis of quantitative and qualitative data collectively underwent the following:

c. Data Consolidation

Both qualitative and quantitative data were combined to create new or consolidated variables.

d. Data Comparison

Involved comparing data from both the qualitative and quantitative data sources

e. Data Integration

This was the final stage, wherein both qualitative and quantitative data are integrated into either a coherent whole or two separate sets of coherent wholes.

An overall summation of the data collection and analysis is presented in Table 7 below.

Table 7: Summary of the Phases in the data collection and analysis process		
Data Collection Methods	**Steps in Process**	**Phases of Data Collection and Analysis**
Phase 1: Qualitative- Key Informant Group	Step 1	Selection of participants for the Key Informant interviews and conducting the interviews
	Step 2	Analysis of the Key informant interviews
Phase 2: Quantitative - Inspection Questionnaire- South African Pharmacy Council	Step 3	Selection of the facilities under study and conducting of the inspection. Analysis of the inspection data.
Phase 3: Quantitative – Questionnaires	Step 4	Identification of respondents to the questionnaires
	Step 5	Construction of the two questionnaires for the different groups of respondents as identified
	Step 6	Administration of the questionnaires and their retrieval
	Step 7	Analysis of the quantitative data
Phase 4: Qualitative – Focus group interviews	Step 8	Selection of participants for the doctor focus group interviews and conducting the interviews
	Step 9	Selection of participants for the authorised nurse focus group interviews and conducting the interviews
	Step 10	Analysis of focus group interviews

4.3.12 RESEARCH EVALUATION OF THE STUDY

The traditional evaluation criteria for ensuring the credibility of research data are:

- Objectivity,
- Reliability and
- Validity

4.3.12.1 Validity and Reliability

The principles of validity and reliability are described as central to the scientific method in research (Shuttleworth, 2008, b). Validity encompasses quality, rigour, trustworthiness and appropriateness of the method adopted to answer the research question (Msweli, 2015). It also addressed whether the researcher's conclusions are true or correct. Therefore, validity and reliability for the study was aimed for by a thick and rich depiction of the research environment, the target population and the emerging themes, expert views of the informants to support participants' narrative and disclosure of the researcher's assumption, values and beliefs around the topic to reduce interviewer bias. This is said to increase the credibility of the research (Msweli, 2015). Furthermore, evaluation validity encompassed the similarity of the extent in which the evaluation results are representative to the undertakings in real time (Adams, 2008). Whereas, statistical validity is the extent to which the conclusions drawn from a statistical test are accurate and reliable. Therefore, in order to achieve statistical validity, researchers must choose an adequate sample size and the right statistical test to analyse the data (Kalla, 2010). Hence, for validity to be considered in the design and evaluation of this research, as explained by Cook & Campbell (1979), and Adams (2008), internal, external and construct validity was pursued. Internal validity is a way to measure if research is sound. Therefore, in relation to the questionnaires in this research, it refers to its ability to measure what the researcher intends it to measure (Saunders et al., 2007). Hence, the KMO- measure of sampling adequacy and Bartlett's test of Sphericity were used. Construct validity had been sought in the research study seeking the extent to which the results will support the theory behind the research (White & McBurney, 2012). In addition, external validity or generalizability, is defined as the extent one's research results are generalizable. This translates to whether one's results can be fairly replicated within any research environment (Saunders et al. 2007).

Adams (2008), explains statistical validity as to whether researchers arrive at the correct conclusion regardless of the association amid the variables (Saunders et al. 2007). Moreover, the structured questionnaire (Farrell et al. 2008), that was adopted, was subjected to clinical sensibility including content validity testing. The uniform questionnaire, nurse questionnaire and interviews were piloted to enforce content validity, accuracy and ease of participant understanding by allowing corrections to be made before adopting its use in the chosen sample populations. Therefore, in order for the results to be valid, a statistically representative sample size afforded a 95% certainty that the opinions expressed in the sample are the same as those of the population. This translates to a 0.05 degree of accuracy, a 95% confidence level and 0.005 reliability level (Krippendorff, 2014).

Reliability is the measure of the range in which results show consistency across time in which the sample gives a true account of the total population under study (Msweli, 2015). In addition, it must yield the same results on other occasions, by other observers and must bear transparency in how sense was made from the raw data (Easterby-Smith et al. 2002). Moreover, reliability was computed by taking several measurements on the same subjects (survey and interview).

Saunders et al (1997), affirmed that the assurance of validity and reliability of data collected relies on the design of the questions, the structure adopted for the questionnaire and how thorough the pilot test was. Hence, the Cronbach's alpha (*coefficient alpha)* test was embraced as a convenient approach to estimate the reliability and internal consistency of the composite score within the instrument used. Reliability (how well a test measures what it should) of this study was assured by Cronbach's Coefficient Alpha. Reliability measurements of less than 0.60 reflect poorly, while results in the range of 0.7 are considered satisfactory, and those above 0.8 are good. The closer the reliability gets to 1.0 the better the result (Saunders et al. 2007).

As this study adopted both qualitative and quantitative research data, the concepts used to express validity and reliability extends to include that of qualitative data. Therefore, the concepts of trustworthiness, dependability, transferability, and credibility need to be factored in.

4.3.12.2 Trustworthiness of the Study

This concept is adopted in qualitative research to gauge the research quality. It measures the authenticity and trustworthiness of the data and interpretation thereof (Thomas, 2010). Guba and Lincoln (1981); Krefting (1991), and Creswell (1998), recommend the use of strategies of credibility, transferability and dependability to determine the trustworthiness of qualitative research.

a. Credibility

Thus, from the researcher's interpretive perspective, an understanding is jointly established where there is "no objective truth or reality" from which a comparison of the study results can be drawn (Thomas, 2010). Therefore, credibility was increased by the researcher devoting scheduled time with the respondents with the aim of better understanding them; making use of triangulation, where more than one research method was used to collect the data and the adoption of member checking approach into the findings (participant feedback on the data, interpretations and conclusions (Lincoln & Guba, 1985; Collis & Hussey, 2003). Even though, member checking comes with its own disadvantages, Lincoln and Guba (1985), considers this approach as "*the most critical technique for establishing credibility*".

b. Transferability

The results obtained in research are transferable or generalizable simply if they can be applied to comparable study contexts delivering results alike (du Plooy-Cilliers, 2014). The major challenge in qualitative research relates to transferability, wherein the researcher's subjectivity of being the key instrument, is a threat to authentic interpretations traditionally found with research data (Thomas, 2010). However, to overcome this drawback, the researcher enhanced transferability through an elaborate, deep presentation of the study environment, explaining in detail research methods, contexts, and assumptions underlying the study, thereby, providing adequate evidence to test the authenticity of replicating the results in other study environments (Seale, 1999).

c. Dependability

Du Plooy-Cilliers et al, (2014), makes reference to the process quality of integrating the data collection methods, analysis of data and the generation of theory thereof (Lincoln & Guba, 1985; Collis & Hussey, 2003; Shenton, 2004). Bearing in mind that the assurance of reliability in qualitative studies is often difficult and practically unachievable, considering human behaviour to be not static, therefore continuously influenced by various factors. These included, several explanations of participants' experiences; a comparable study with altered participants or in another institution with organizational culture and context differing or by another researcher that may not necessarily yield the same results (Thomas, 2010).

Therefore, dependability of the study was approached by the researcher adopting the following strategies to explain the assumptions and theory following the study; using multiple methods of data collection (surveys and interviews) and analysis (triangulation of quantitative and qualitative data techniques to confirm developing findings); member checks (reviewing data and tentative interpretations by the participants to establish credibility of results) and acknowledging the researcher's biases, assumptions, worldview and theoretical inclinations at the study inception (Merriam, 1998).

4.3.12.3 Scientific Honesty

This is deemed imperative for ethical responsibility throughout the research process. Hence, when the design, methods, and data are manipulated, dishonest conduct is at play (Brink, 2002). Subsequently, the researcher ensured honesty in recording truthfully the responses of the participants. Therefore, the possibility of data manipulation was averted as an independent statistician entered the data from the quantitative questionnaires into the SPSS computer software programme.

Furthermore, the statistician generated the results independently of the researcher to avoid subjective collaboration. In relation to the qualitative questions, a summary of the results was checked by the members after each focus group interview, in addition to the supervisor checking the analysed results for confirmation of credibility.

4.3.12.4 Triangulation

The term triangulation in research is the application of various methods that evaluates empirical phenomenon enabling one to 'overcome problems of bias and validity' (Blaikie, 2000; Scandura & Williams, 2000). Triangulation for this study stemmed from an ethical perspective to confirm the validity of the processes, which in case studies, can be achieved by the use of multiple sources of data (Yin, 2003). While triangulation can be defined in many ways, it simply involved the application of numerous, theoretical viewpoints and/or methods, sources of information, informants, researchers or concepts for the purpose of data assembling and interpreting regarding a particular occurrence for collective and accurate representation of that particular "reality" (Brink, 2002; Weyers et al. 2014). These multiple methods (participant observation, surveys, focus groups, informant interviews, member checking), was employed to capture variable viewpoints of pharmaceutical care for a comprehensive appreciation of the phenomena within the rural public context. However, Patton (2002), cautions that the common misconception made of triangulation is for consistency across data sources. However, relative strengths of different approaches can be heightened. Therefore, these inconsistencies instead of being viewed as weakening the evidence, should be seen as an opportunity to uncover deeper meaning in the data (Paton, 2002).

The general acceptance over the reliability and validity of any study centres around the researcher using a number of various sources to deliver added understanding of the event or relationship alike which is then cross-checked against that of another (Weyers et al. 2014). In addition, triangulation was preferred as it is a unique approach of 'validating' qualitative research findings and can uncover bias when there is only one researcher investigating a phenomenon (Thomas, 2010). Hence, Denzin (1994), acknowledged four types of triangulation. However, for the purpose of this research, only two were adopted- data triangulation and methodological triangulation. The research approach undertook to utilise data sources of questionnaires, semi-structured focus groups, key informant interviews and an in-depth literature review.

The methodological triangulation approach was assisted by both qualitative and quantitative techniques within the study alike. An extensive understanding of the said techniques applied

were afforded in the former sub-sections of the methodology. Triangulation proved worthy in the current research as it offered added means of a richer, helpful understanding that the traditional literature review alone could not. It also, compensated and minimised the essential weaknesses that hold true for single method application and contributed to a more compelling outcome (Weyers et al. 2014) in adopting three complementary and validating data sources.

4.3.12.5 Member Checks

The researcher, after each interview, conducted a summation which allowed participants to verify the correctness and whether the information was a true reflection of what was discussed.

4.3.12.6 Thick Description

This is a procedure adopted in qualitative research to afford validity and reliability to a research study. It encompassed a description of the setting, the participants, and the themes of a qualitative study in rich detail. The adoption of thick description was applied in this study presentation of the qualitative research findings by constant reference of the actual words of the participants. Therefore, the intent of thick description is that it creates “verisimilitude”, meaning ‘statements that produce for the readers the feeling that they have experienced, or could experience, the events being described in the study’ (Mafuwana, 2012). The researcher adopted this approach to provide practical detail for the readers with the aim to enable them to judge how applicable the findings are in relation to other settings or similar contexts (Mafuwana, 2012). Therefore, in this study, a detailed description of the two main concepts in chapter one, which are pharmaceutical care and patient outcomes and the background of public primary health care facilities of the Umzinyathi and Ugu districts wherein the research was conducted, including all the samples of participants have been comprehensively defined.

4.3.13 DELIMITATIONS/SCOPE

The Umzinyathi District is situated centrally within the province of KwaZulu-Natal. The mountainous landscape, with deep valleys, challenges health services accessibility. In addition, the demand for health services are high owing to the disease burden arising from relatively high poverty levels. Ugu Health District is found in the lower South Coast of the Province of KwaZulu-

Natal. Therefore, only two Districts within the rural public healthcare context in KZN was explored. The Primary and Community Healthcare facilities comprised the organizational structure. The first delimitation was that only rural PHC clinics and Community Health Centres in KZN province of 'ideal' status was selected for the study. The second criterion is the choice of only one NHI District status as per National guidelines and performance and only one non-NHI District with ideal clinic status, was included. Healthcare professionals, namely doctors, authorized prescribing nurses and pharmacists supporting these ideal clinics were sampled for the study.

The valuable resources of time and distance had a huge impact on the limitations with convenience sampling of only two districts within KZN of rural status. The clinical associates were deliberately left out of the study, due to the scarcity of this cadre in the facilities at the present time of fieldwork. The further limitation was extended to only 10 of the 52 facilities (20%) within the Umzinyathi District and only 5 of the 56 facilities (9%) of the Ugu facilities. In the case of the Ugu district only 5 facilities were of 'ideal' status at the time of the planning. On the other hand, in the Umzinyathi District, 20% was a manageable size given the challenges. The distance travelled to the Umzinyathi and some areas of the Ugu District had associated risk of, difficult terrain, unfamiliar territory, researcher travelling alone and lack of network connection in parts. Moreover, resources of own transport and accommodation were also factored in.

4.3.14 ANONYMITY AND CONFIDENTIALITY

Full Ethics clearance for the study was obtained from the Department of Health- KZN on the 27 September 2017 (Appendix 2) and DUT IREC (Appendix 1) on the 13 October 2017. Confidentially and anonymity is important in relation to gaining access to organizations, individuals, including in identifying important outcomes for exploration (Saunders et al. 2007). All questionnaires and interview measuring tools had no names on individual response sheets. The letter of information detailed clearly and gave the participants guarantee in writing at the time of seeking the request for access. Once initial permission was granted by the two districts CEO's (Appendix 3 and 4), assurance about anonymity and confidentiality of the participants was re-iterated and personal delivery and collection of questionnaires ensued. All questionnaires were collected by hand by the researcher and some via a courier service to a central collection

point - the District offices. Focus group and informant interviews were audio-recorded with participants' permission and transcribed by thematic analysis into appropriate themes. In addition to audio-recording, summary notes were prepared for each interview interaction.

For the telephonic interview requests, care was exercised not to reveal the participants' personal details or names. The research records will be kept for at least 5 years and then destroyed. Ideally, the retention policy was defined in the consent form so that the participants were made aware. All proceedings recorded on paper will be shredded and recycled, and not haphazardly thrown amongst the refuse. In the case of those records stored on a computer hard drive, by application of specific commercial software, data will be permanently deleted. All information is securely put in storage and will be reported anonymously. For the tape recordings, raw data will be kept for five years and then destroyed. In respect of data that is saved on USB drives and tape recordings will be destroyed physically. The researcher will keep an account of the details (type of records, time, place and process) regarding the destruction.

4.3.15 THE ROLE OF THE RESEARCHER

In mixed study research, the researcher stands central to the data collected (Wood, 2012). The researcher collected the data by means of a semi-structured key informant interview and focus group interview guides, self-administered questionnaires and the SAPC inspection questionnaire. Therefore, the researcher as the primary instrument of data collection and analysis, became immersed in the phenomena under investigation (McMillian & Shumacher, 2000). In addition, as an active participant in the research, the researcher adopted an exploratory, non-judgmental orientation and learnt what was going on within the rural public PHC and CHC context. Through analysis and interpretation as described at length, she gained an understanding of the distinctive orientations, perspectives and beliefs of the participants (Biggerstaff & Thompson, 2008; McMillian & Schumacher, 2000). Finally, the researcher was introspective and acknowledged her own biases, interest, perspectives and values by recording these, which displayed reflective qualities of a good qualitative researcher (Cresswell, 2003).

Hence, in this study, the researcher declared her perspective that Pharmacists can add value to patient outcomes, given the opportunity to be integrated within the professional, clinical Primary

Health care team. This assumption is gleaned from the extensive literature review conducted and bearing close reference to Gilbert (1997b; 1998a, b, and c; 2001;2004); Farrell (2013 & 2014), and Jorgenson et al. (2013 & 2014), studies. She further declared her assumption that within the public healthcare context, professionals have good working relationships. She also expressed her passion about the caring concepts and Ubuntu philosophy that she sees as lacking in the current healthcare system in SA.

4.3.16 ETHICAL CONSIDERATIONS

Essentially, "*we must actively attempt not only to avoid harms, but to benefit those studied, to augment, not merely respect, their autonomy*" Cassell (1982).

When one debates about the principle of justice in research, one refers to the "fair distribution of the burdens and benefits" in relation to the selecting and recruiting of participants (Mastoianni & Kahn, 2001). In accordance to The Belmont Report National Commission (1979), researchers' adherence to two general rules is imperative: do no harm, maximize the possible benefits and minimize possible harms.

Therefore, in this mixed study, the researcher interacted deeply with the participants, accessing their personal spaces of values, weaknesses, individual perceptions and the like to gather data (Silverman, 2013). Therefore, clearly, this brings to light several ethical issues that requires clarity during and after the research is conducted. Therefore, Creswell (2003), conditions the researcher towards respecting participants' rights, requirements, ideals and passions. Furthermore, the importance of cultural sensitivity is most often overlooked when ethical issues are considered (Creswell, 2003).

Silverman (2013), advises that the impact of the researchers' values and cultural affiliations need to be considered in the relationship between the researcher and the participant during an interview, of which the researcher easily embraced, having worked 27 years within the public sector. Therefore, cautionary measures ensured adherence to strict ethical guidelines to uphold participants' privacy, confidentiality, dignity, rights, and anonymity. In view of the preceding

discussions, the researcher, hence, described how ethical conduct of this research had been maintained:

- Informed consent - the participants (the doctors, authorized nurse practitioners and pharmacists) were informed by the researcher of the purpose, nature, data collection methods, and extent of the research before onset. In advance, the researcher explained their distinctive roles. In agreement, informed consent was obtained in writing as depicted in Appendix 5 and 6
- Harm and risk- the Researcher guaranteed that no participant will be subjected to any harmful physical and psychological circumstances due to their involvement in the study (Trochim, 2002 a)
- Honesty and trust- strict adherence to all ethical guidelines served as honesty and trustworthiness standards in relation to data collected and data analysis processes
- Privacy, confidentiality, and anonymity of the participants was assured through prompt detection and removal of any potential features before extensive distribution of information. The researcher clarified that the participants' names would remain exclusive to the study, nor will information reveal their identity at all
- Voluntary participation- participants were assured that the research was purely for academic purpose and that their participation was totally voluntary. Hence, no one was coerced into participating

For the study in question, on provisional approval of the research proposal from the DUT Faculty Research Committee (IREC) (31 July 2017) and the Institutional Research Ethics Committee (IREC) full approval (13 October 2017- Appendix 1), ethical clearance from the Department of Health (DOH-KZN) was sought and received on the 27 September 2017 (Appendix 2). On receipt thereof, all approvals received were attached to the request to the Districts Directors. Gatekeepers letters were obtained from the DOH research (Dr Lugte- Appendix 2) and the two research population sites, i.e., the Ugu District Director (Mrs Mkhize- 15 August 2017- Appendix 3), and the Umzimyathi Acting District Director (Ms Shabangu- 22 August 2017- Appendix 4). Participant information letters (Appendix 5) together with consent letters (Appendix 6) was personally delivered to the participants after a stakeholder engagement at the above offices.

Once the consent letters, were received, the research field work officially and ethically commenced.

DUT ethical checklist for research approval was completed by the researcher intending to conduct research under the auspices of Durban University of Technology. The three fundamental principles of research, respect, beneficence and justice was upheld. The philosophical paradigms of 'Ubuntu' emanated throughout the research structure. Ethical consideration was enforced throughout the research process. Starting from the conceptualization and design of the study, where a risk mitigating strategy was enforced. All questionnaires and interview instruments are from reliable trustworthy sources as cited in the methodology. When participants were recruited, a large sample was chosen to ensure an acceptable response sample for analysis. A stakeholder engagement assured the participants and cleared any misconceptions about the research. A personal call to all participants of the questionnaire and interview was held to ensure compliance to participation in the research.

Participation was morally voluntary at any given phase of the research. The right to privacy was ensured through the informed consent. Throughout the intervention procedural stage, participants were assured of respect, and confidentiality as detailed in the methodology. The survey question form did not require the name of the participant. In the focus group interview process, audio-recordings were at the participant's approval only. In addition, as indicated above, data storage and protection was ensured. The final results of the research were shared with the participants in a stakeholder engagement. Protection of confidentiality and anonymity was assured throughout the research process.

After the release of the results, the participants and the rural community involved will ultimately benefit with policy review and pharmaceutical quality improvement in management of patient care.

4.3.18 CONCLUSION

Chapter four focussed on expanding the study methodology applied. It encompassed in detail the systematic approach adopted in conducting this research. The methodology adopted was

overall strongly guided by the environment of rural primary health care, having challenges of vast difficult terrain, corrugated roads and staff shortages impacting on service delivery. In addition, Saunders et al. (2003), explains of the different research techniques. Considering that these approaches and strategies must occur in unison, they can be “mixed and matched”. The summary of the phases adopted in the data collection and analysis processes is outlined in Table 7.

The following chapter highlights the data analysis followed by an interrogation of the outcomes from the empirical investigation conducted.

CHAPTER 5

RESEARCH DATA MANAGEMENT

PRESENTATION, ANALYSIS AND DISCUSSION

CHAPTER FIVE: RESEARCH ANALYSIS, FINDINGS AND DISCUSSIONS

5.1 INTRODUCTION

In this chapter the results of the study are presented and discussed with reference to the aim, which is to guide the development of a collaborative pharmaceutical care model, within the rural context to define the roles and responsibilities of the Primary Care Drug Therapy (PCDT) pharmacist. The sub-aims focused on identifying enabling and disenabling factors to consider in developing a collaborative health care team. The preceding chapter mapped out the methodology adopted by the researcher, leaving the reader with an understanding of the decisions taken. Hence, the focus was twofold, one on the framework of descriptive and interpretive approaches to analyse and compare both, textual data in a hermeneutic context using the qualitative oriented procedures of text content and thematic analysis with interpretation and on the other, a degree of numerical quantitative oriented procedures, characterized by the use of statistical descriptive and factor analysis.

In the discussion, an analysis with interpretation of the results stemming from the two phases unfolded. The first phase, which is based on the results of the survey questionnaires, embraced a quantitative analysis of data. The second, which encompassed the informant interview findings and focus group discussions, is one of a qualitative interpretation. The results thereof represent the phenomena intended, thereby, displaying to the reader its validity in this case study by means of triangulation of multiple sources of data. The chapter further enlightened the concluding remarks.

5.2 STATEMENT OF RESULTS, INTERPRETATION AND DISCUSSION OF THE QUANTITATIVE DATA

Data was obtained from a total of 131 self-administered questionnaires distributed, within the two districts in KZN and to the three categories of health care professional participants, namely, the doctors, the authorized nurse prescribers and the pharmacists supporting PHC clinics. All 131 completed questionnaires were the base for computing the results and conformed with the essential inclusion criteria as discussed in the previous chapter. The questionnaire was the primary tool that was used to collect data. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 25.0. A $p < 0.05$ was considered statistically significant. The results presented the descriptive statistics and explorative factor analysis in the form of graphs, cross tabulations and other figures for the quantitative data that was collected.

5.2.1 Section A: Biographical Data

The demographic characteristics of the respondents featured in the following narrative. The Quantitative study involved 2 self-administered questionnaires - one for the doctors, authorized nurse practitioners and the pharmacists, of which in total, 132 questionnaires were despatched and 131 were returned which gave a 99.2% response rate. The second questionnaire for the authorized nurses, 82 questionnaires were despatched, of which 81 were returned, giving 98.8% response rate. Fig. 9, represents the sample composition of healthcare professionals (Doctors, Authorized nurse practitioners and Pharmacists).

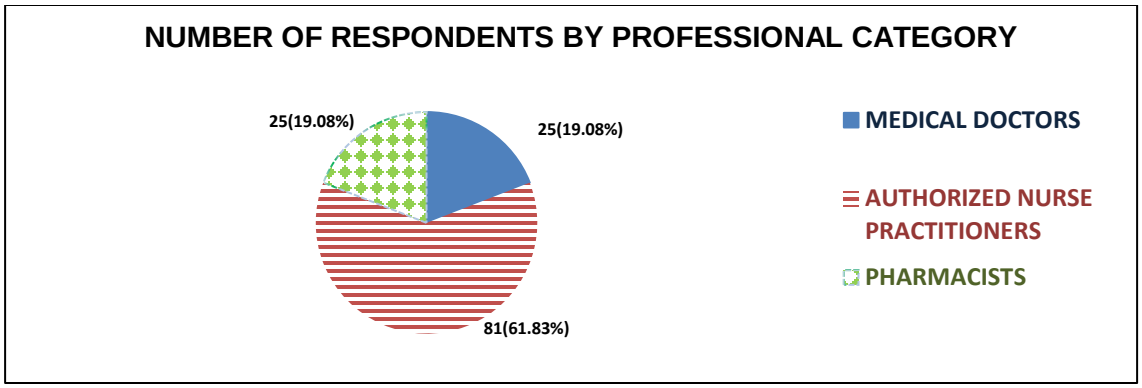


Fig. 9: Healthcare professionals by category

The ratio of respondents was approximately 1:1:3 for Doctor: Pharmacist: Professional Nurse ($p < 0.001$). This further exemplified the nurse proportion of the healthcare professionals within the public sector, which being the largest, warranted the need for appropriate task shifting (WHO, 2008).

Bearing in mind that purposive sampling was adopted in the case study as deliberated at length in the methodology, figures 10 & 11, below further highlighted the distribution of respondents per professional category and per district, displaying the varying support to PHC within the two districts of the chosen sample.

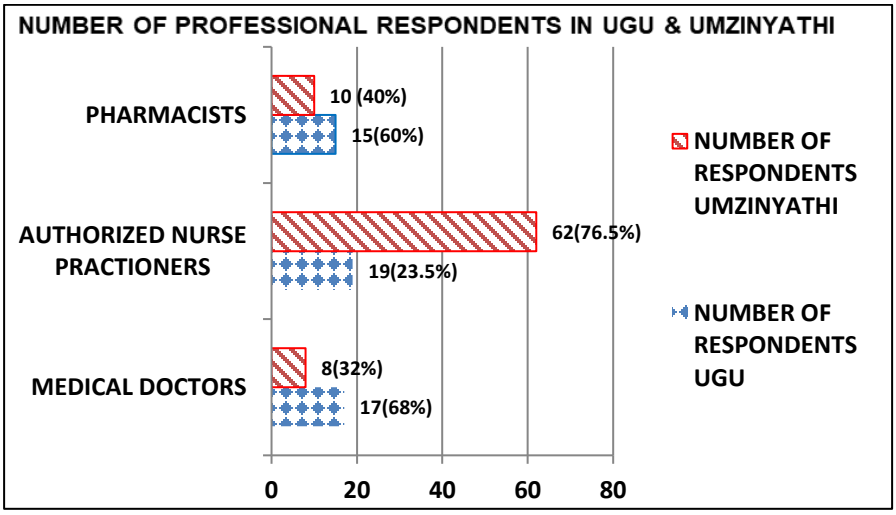


Fig. 10: Number of professional respondents per district

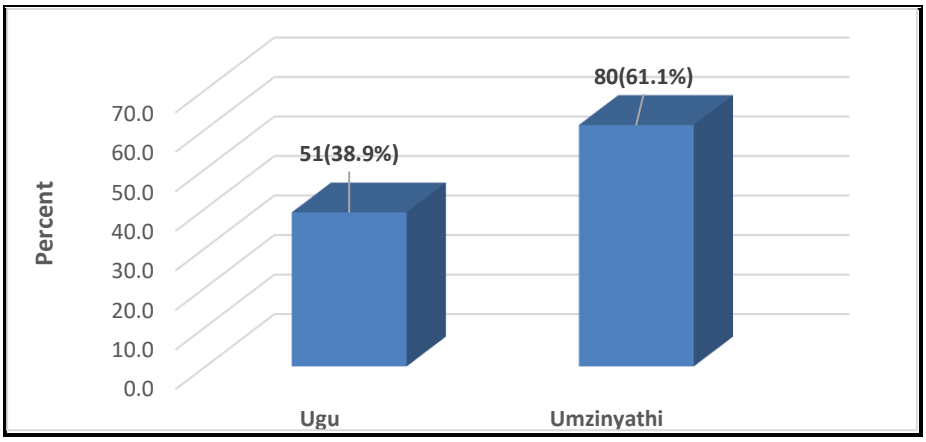


Fig. 11: Healthcare professionals collectively by District

The ratio of respondents within the two districts was approximately 2:3 for Ugu compared to Umzinyathi (p = 0.011). This was attributed to the purposeful sampling approach of the two districts among the most rural within KwaZulu-Natal region as alluded to. In addition, of the two, the Umzinyathi district is a NHI site (inception started 1 April 2012), was compared to results with a non NHI district like Ugu. Furthermore, the study focus also targeted the ideal status of the PHC and CHC facilities. At the time of sampling, coupled with Purposive sampling technique, only 5 of the facilities in the Ugu District qualified with ideal status and the participants were those providing PHC support. In the Umzinyathi District all the facilities chosen were purposively organised for the researcher's convenience in terms of distance and access. To project a clearer visual of the population coverage in relation to the limited resources in healthcare professionals, the population utilization per district is highlighted in Table 8 below.

Table 8: Population utilization of Umzinyathi and Ugu District

District	Entire District Utilization	Utilization at facilities under study
Umzinyathi	571 650	128 894
Ugu	694 959	147 890

Figures as of July 2018 per District Office Information Facility department

With the scarcity of public healthcare professionals being known, especially within the rural context, justified the ratio of respondents for the chosen study. The proposed norms for PHC

and CHC level included the impact of rurality. The application of the proposed norms to the Actual PHC Utilisation rate of 2010-2011 demonstrated shortages of 192 specialists, 361 medical officers, over 10 000 PNs, including specialised nurses, basically to accommodate new services; 7 453 PNs needed for the outreach teams, 417 PNs for school health and 156 specialised nurses for the district specialist teams. The Nursing Assistants were in excess of 3211, but there was a shortage of 1652 counsellors, 4500 post-basic pharmacy assistants and 1417 administrative support in PHC facilities. It was highlighted at that stage that more detailed work is required regarding the need for the pharmacists (MRC SA, 2012).

The Biographical data in Fig. 12, included public healthcare participants in the study -doctors, authorized nurse prescribers and pharmacists supporting PHC and CHC facilities. The researcher by observation ascertained the participants' data as follows:

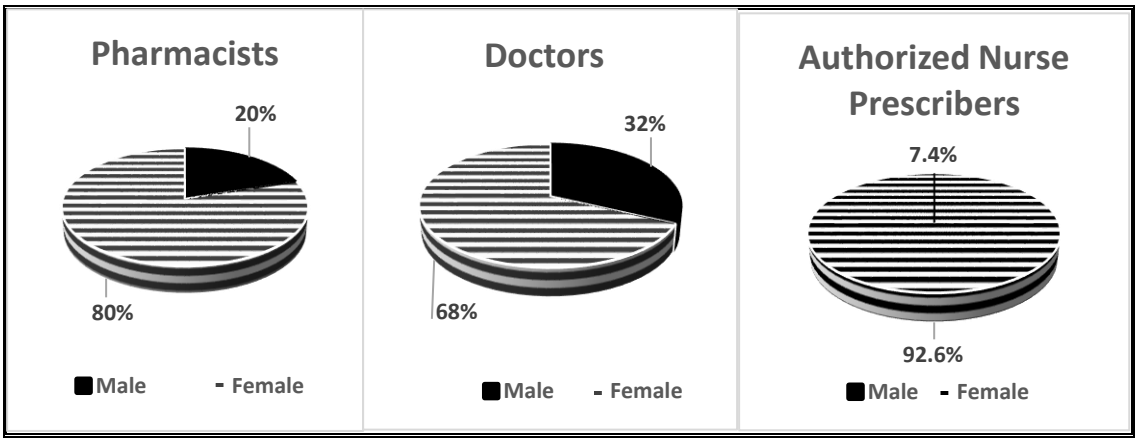


Fig. 12: Percentage of Male and Female distribution of participants

The graphical representation demonstrates a higher percentage of female practitioners in all 3 groups of professionals that formed the sample, highlighting the male: female ratio of 1:6.

5.2.2 Section B: The Research Instrument

The research instrument consisted of 40 items in total, with a level of measurement at a nominal level. There were two questionnaires as indicated below which measured various themes that will unfold in the course of discussion.

- Appendix 8 – Collaboration in Tasks of Doctors, Authorized Nurse Prescribers and PCDT Pharmacists
- Appendix 9 – Activities of PCDT Pharmacist and Authorized Nurse Prescriber

5.2.3 Reliability Statistics

The generated items are believed to contribute to the same fundamental construct of medication prescribing and use, and, therefore, Cronbach's alpha was used to establish the internal reliability of the questionnaire. The two most important aspects of precision are reliability and validity. Reliability is computed by taking several measurements on the same subjects. A reliability coefficient of 0.70 or higher is considered as "acceptable". For the quantitative aspect of the study the Cronbach's alpha score for all the items that constituted the questionnaire was assessed as indicated in Table 9.

Table 9: Cronbach's Alpha scores per theme identified in quantitative data

		N of Items	Cronbach's Alpha
Collaboration in Tasks	Diagnosis & Prescribing	18	0.801
	Monitoring and Patient Safety	12	0.734
	Administrative / Documentation	9	0.692
	Education and Training	9	0.704
	Medication Review	12	0.782
Activities		40	0.971

The Table above shows the reliability scores for all sections to exceed or approximate the recommended Cronbach's alpha value. Hence, the overall Cronbach's alpha for the sample was 0.78. Diagnosis and Prescribing showed a high degree of consistent scoring (0.80) and Collaboration in Tasks and Activities showed (0.97). Therefore, this indicates a degree of acceptable, consistent scoring for all the sections of the research, hence declaring the case study reliable.

5.2.4 Factor Analysis

A summary in Table 10, below reflected the results of KMO and Bartlett's Test for the Collaboration in Tasks of the quantitative questionnaire. The requirement is that Kaiser-Meyer-Olkin Measure of Sampling Adequacy should be greater than 0.50 and Bartlett's Test of Sphericity be less than 0.05. Subsequently, in all instances, the conditions were satisfied which allowed for the factor analysis procedure. Furthermore, Factor analysis is conducted only for the Likert scale items. Hence, this rendered its use appropriate for the Collaboration in tasks of the quantitative questionnaire, in which a 5-point Likert scale was adopted.

Table 10: KMO and Bartlett's Test applied per theme in quantitative data

	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	df	Sig.
Diagnosis & Prescribing	0.770	1033.602	153	0.000
Monitoring & Patient safety	0.644	576.274	66	0.000
Administrative / Documentation	0.643	401.184	36	0.000
Education and Training	0.527	361.973	36	0.000
Medication Review	0.723	773.606	66	0.000

In Table 10 above:

- The principle component analysis was the extraction method applied, whereas, the rotation method was Varimax with Kaiser Normalization. This is an orthogonal rotation method that minimizes the number of variables that have high loadings on each factor. It, therefore, affords simplicity to the interpretation of the factors.
- Factor analysis/loading show inter-correlations between variables.
- Items of questions that loaded similarly implied measurement along a similar factor. An examination of the content of items loading at or above 0.5 (and using the higher or highest loading in instances where items cross-loaded at greater than this value) effectively measured along the various components. Understandably, values less than 0.5 were suppressed.

It is, therefore, noted that for the most part, the alignment of the coefficients matches the component categories. The component categories being the 3 groupings by profession (Appendix 15).

5.2.5 Section C- Annexure G – Presentation and Interpretation of Results of Collaboration in Tasks of Doctors, Authorized Nurse Prescribers and PCDT Pharmacists

The section that follows presents the scoring patterns of the respondents per variable per medication process. The perception variances among health professional groups' of doctors, authorized nurse prescribers and public PHC practice pharmacist's contributions in the five medication process groupings were thereafter evaluated. The results were first presented using summarised means for the variables that constituted each section per district and per professional category and then computed to reflect the overall mean. The scoring was **reverse coded** (from the distributed questionnaire) for the purpose of analysis, with None =1 and Lead = 5, so that the height of the bars in the graphical outputs would reflect better for interpretation. This scale allowed the researcher to measure individual professional's perceptions of the responsibility contributed to the 'Drug Use Process". Results were then further analysed according to the importance of the statements.

Therefore, unpacking the results from the ratings of the doctors, authorized nurse prescribers and the pharmacists within the two districts, Ugu and Umzinyathi, in relation to their roles and those of the PCDT pharmacist in the "Drug Use Process" and the "Pharmaceutical Care" activities will be further elaborated on.

A Kruskal Wallis test was used to establish any significant scoring patterns per statement and per profession. Therefore, the null hypothesis states that there is no difference in the central score by profession. The Kruskal Wallis (p-value) for individual professionals per district and composite values is demonstrated in Appendix 16. There are two sets of Kruskal Wallis results. The first compares the professionals within each district, and the overall looks at the ratings, irrespective of district. The highlighted significant values (p-values) are less than 0.05 (the level of significance), implying that the distributions did not have the same central values. This translates that the scoring differences among the respondents were significant. Differences, however, was anticipated among the groups as to how they viewed the 3 groups' contributions in response to the practices considering that the proposal of pharmacists'

integration to the PHC site within the rural public context is an innovative approach. Results obtained ranged from demonstrating statistical significance to “trending” toward statistical significance among the different PHC practice team member groups in the perceived contribution of each other in executing medicine-related practices occurring in PHC. In addition, pairwise comparisons were run using Kruskal Wallis 1-way ANOVA test (Appendix 19 & 21). These comparative measures revealed that there was a degree of similarities between the Kruskal wallis and ANOVA tests. Due to the graphical representations in Figure 13 to Figure 32 depicting means, medians and the interquartile ranges (IQR, mean, and standard deviation of a population *P* can be used in a simple test of whether or not *P* is normally distributed, or Gaussian) were tabulated (Appendix 20), further accentuating similarities in the results elaborated on below.

The limitation of the statistical analysis of the questionnaire data was unadjusted for potential confounders due to the nature of the collected viarables in which an overall Binary Logistic Regression Model was not feasible considering the numerous combination of the viarables. Hence, the Model Chi-square was used. It is not a measure of effect size, but rather a test of statistical significance. Furthermore, larger data sets would have generally given larger chi-square statistics and more highly statistically significant findings than smaller data sets from the same population (Berger, 2017). In addition, the sample size was not sufficient for principle component analysis to be performed. Hence, Component analysis and reliability were done merely to determine consistency of scoring. However, the groupings were highly specialised (especially in terms of the doctors and pharmacists).

Table 11, summarised the overall scoring patterns in terms of those subsets that showed a significant difference ($p<0.05$) in contributions to the five medication-related processes.

Table 11: Overall Kruskal Wallis value ($p<0.05$) of the five medication-related processes by different groups(only statstically different results presented)

		N of Items	OVERALL Kruskal Wallis p-value ($p<0.05$)	Percentage
Collaboration in Tasks	Diagnosis & Prescribing	18	10	56%
	Monitoring and Patient Safety	12	5	42%
	Administrative / Documentation	9	5	56%
	Education and Training	9	7	78%
	Medication Review	12	7	58%

Statistically significant differences were found regarding the doctor's contributions in four medication-related processes: diagnosis & prescribing, administration/documentation, education and training and medication review. The results further displayed higher ratings to their own profession's contribution in diagnosis & prescribing and medication review.

The authorized nurse prescriber on the other hand saw a significant difference in all five medication-related process subscales, in diagnosis & prescribing, monitoring and patient safety, administrative/documentation, education and training and medication review, displaying statistically higher ratings to their own profession's contribution in diagnosis & prescribing as well as monitoring and patient safety. The pharmacist's contribution leaned towards strong ratings of the PCDT pharmacists in medication-related process of making a diagnosis, monitoring patient compliance to their medication, educating patients about their chronic medication, providing drug information to prescribers and identifying prescribing errors under medication review. However, overall the results of the pharmacists demonstrated more a collaborative approach to shared tasks in medication-related processes (Bajcar et al. 2005; Vangen & Huxham, 2010).

The scoring utilized for analysis was as follows: No Role = 1, Minor Role= 2; Supportive Role= 3; Shared Role= 4 and Lead Role = 5. The graphical representation per theme is observed in the collaboration of tasks as illustrated below. The following patterns were observed with respect to the “Drug use Process” and “ Medication use process” in Prescribing and Medication-Dispensing Practice. In relation to Diagnosis and Prescribing, the following six tasks were assessed: make a dignosis, determine if drug therapy is needed, select the best drug for patient, involve patient in decision making regarding medication choices, select the best regimen, and decide whether to continue, alter or discontinue medication. Fig.13, demonstrates the responses of participants in making a diagnosis.

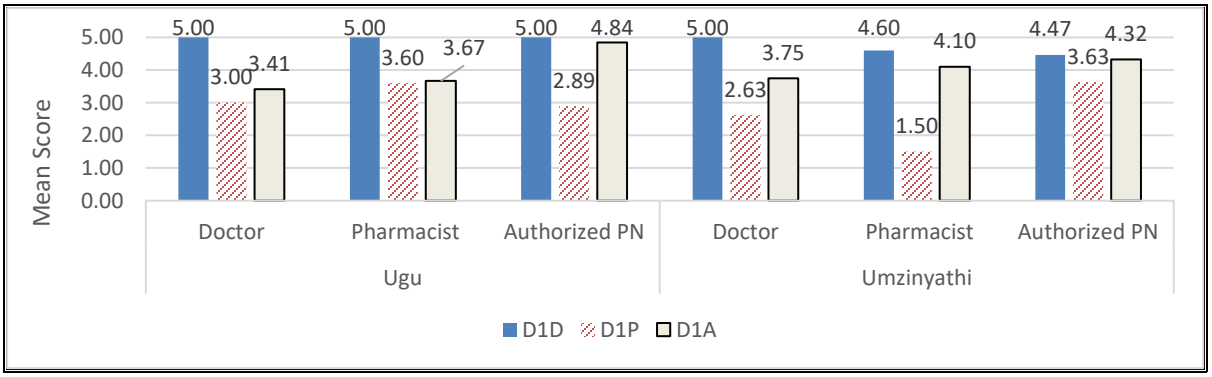


Fig. 13: Making a diagnosis in medication-related processes

- All three professional groups overall, irrespective of the district displayed a significant difference to whom takes the lead role in making a diagnosis, where the doctor (p=0.001) sees this role as a lead for himself and a shared one with his co-professionals (Biddle, 1979; Bajcar et al. 2005; Bradley et al. 2008).
- In both districts, the Authorised PN (A) believed that they were more adept at making a diagnosis (p<0.001), and saw themselves more as leaders than when compared with how they saw the pharmacists role. This is in keeping with the task shifting responsibility within our present public context (WHO, 2008; Republic of South Africa, the Deaprtment of Health, 2016).
- The doctor and authorized nurse in both districts considered the PCDT pharmacist to have a supportive to shared function. However, the pharmacist in both districts shared

different views with regards to the PCDT pharmacits' role in diagnosis. Statistically the Umzinyathi pharmacists identfied this as a minor to no role for the pharmacst within the proposed model. Collectively, pharmacists perceived the role of making a diagnosis (p=0.021, a statistical significant result) as a shared repsonsibliltity with both the doctors and the authorized nurses. The inference made here is twofold, one that supports a collaborative focus (Bajcar et al. 2005; Farrell et al. 2008; Bradley et al. 2008; Rigby, 2010) and moreover that pharmacits foresee the PCDT pharmacist dominant role as not that of diagnosing and prescribing.

Similar patterns as illustrated in Figures 14, 15 & 16, were observed with respect to the first three steps of the 'Drug Use Process', namely, determining if drug therapy is needed; selecting the best drug and the best regimen for the patient (Smith & Knapp, 1992 cited in Farrell et al. 2008).

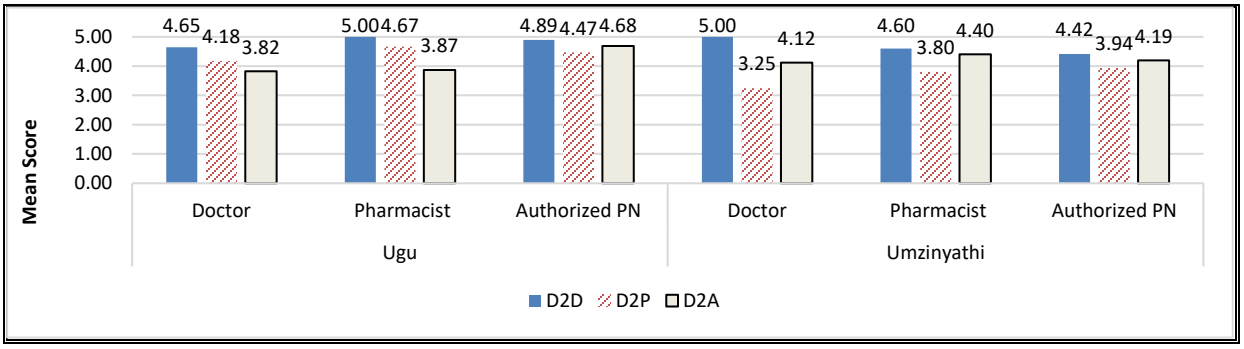


Fig. 14: Determining if drug therapy is needed in medication-related processes

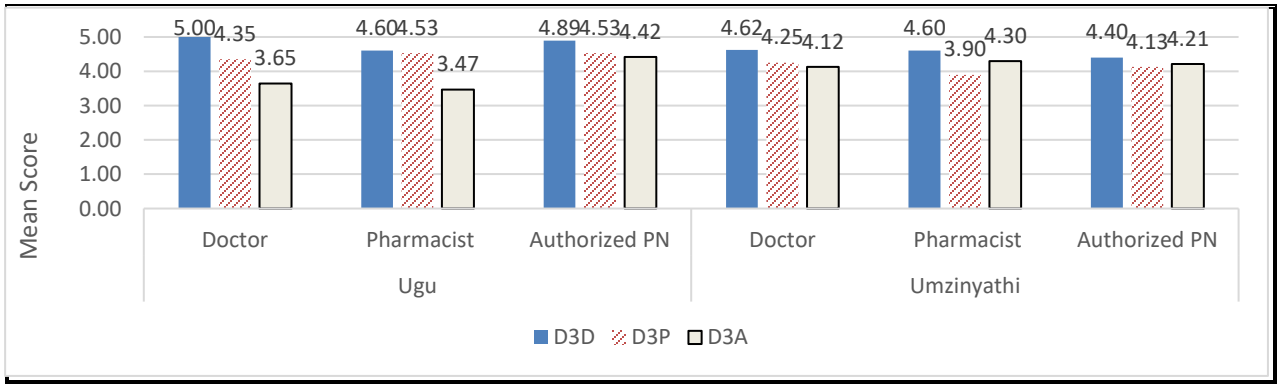


Fig. 15: Selecting the best drug for patient in medication-related processes

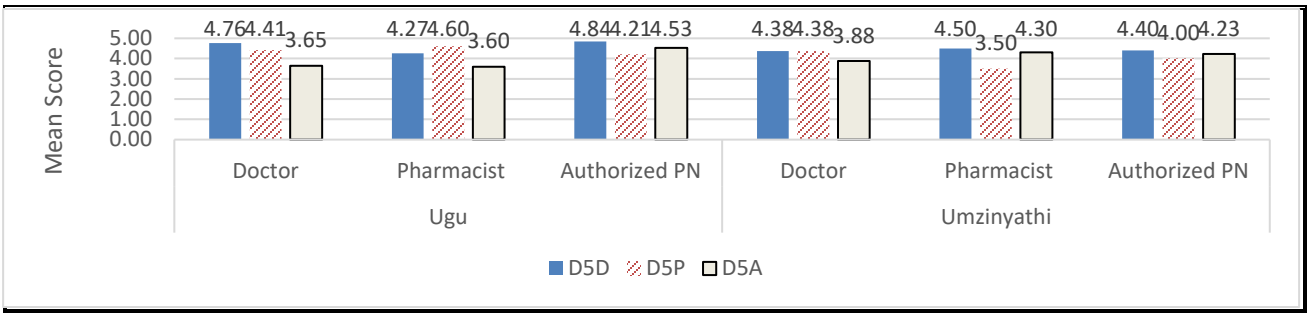


Fig. 16: Selecting the best regimen in medication-related processes

- All professionals in both districts identified a shared to lead role of the PCDT pharmacist in firstly determining if drug therapy is needed (Fig.14) and then selecting the appropriate drug (Fig.15) and regimen (Fig.16) for the patient. In addition, collaboration of these tasks was noted. This finding is consistent with the principles of pharmaceutical care (Helper & Strand, 1990) and collaborative practice (Huxham, 1996; Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005; Farrell et al. 2008; Rigby, 2010).
- The authorized nurse prescribers overall showed a marginally significant difference in their ratings to their counterparts in respect of selecting the best drug ($p= 0.029$) and the best regimen ($p= 0.009$) for the patient. They see themselves in more a dominant lead role for the latter two tasks. The Umzinyathi District favoured a more collaborative role for the same. This is in keeping with the current public context (wherein they conduct their activities) where task shifting affords them their place in this role (Bajcar et al, 2005; WHO, 2008; Republic of South Africa, the Department of Health, 2016).

Fig 17, below, highlights the responses of the participants to the involvment of the patient in decision making regarding medication choices

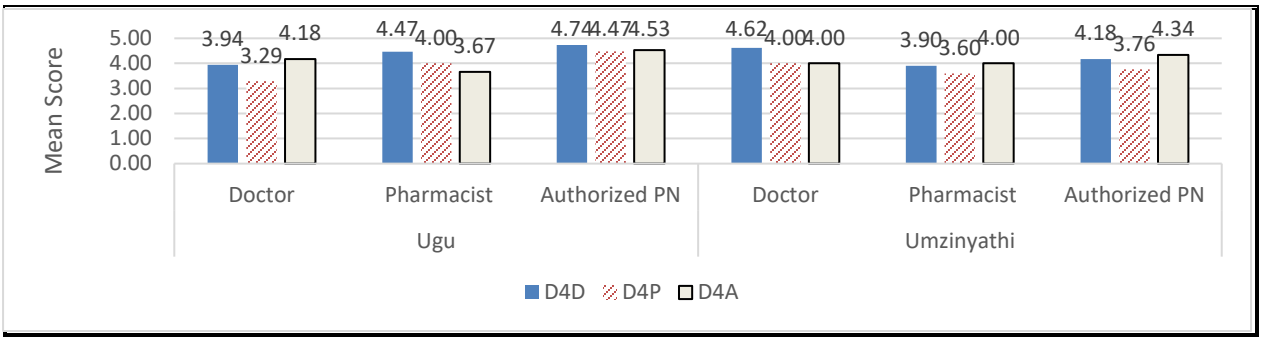


Fig. 17: Involving the patient in decision making regarding medication choices in medication-related processes

Hence, the results presented that all 3 professionals ($p>0.05$), is "trending" toward a statistically significant result, where they perceived this function as a collaborative role (Farrell et al. 2008). This highlighted the importance and focus of healthcare professionals on patient involvment in management of care, insituting selfcare towards achievable outcomes. Here again, the priciples of pharmaceutical care features prominately, in keeping with Helper & Strand (1989 & 1990) and collaborative advantage, with a view of improving service provision (Vangen & Huxham, 2005; Huxham & Hubbert, 2008; Carmichael et al. 1997).

In addition, the task of deciding whether to continue, alter or discontinue patients'medication is depicted in Fig 18, below.

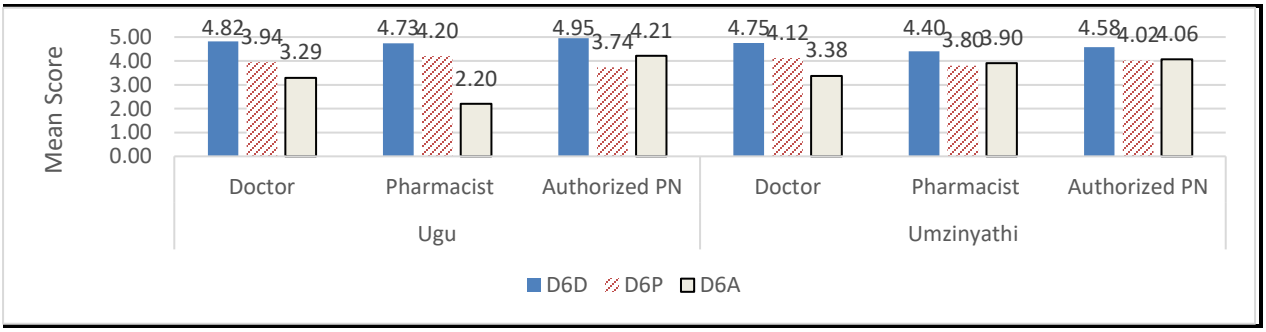


Fig. 18: Deciding whether to continue, alter or discontinue medication in medication-related processes

- Doctors responses displayed a non-significant difference ($p= 0.460$). However the trend leans towards a lead role in this function and nurses have a lead to supportive role. When it comes to the PCDT pharmacist, however, doctors feel that this role can

be shared with them, dispalying collaboration of tasks (Carmichael et al. 1997; Vangen & Huxham, 2005 & 2010; Cipolle et al. 2005).

- Nurses, however statistically showed a significant ($p<0.01$) dominant role, one displaying a significant difference from their co-professionals in both districts, while similarly anticipating the PCDT pharmacists to have a shared role in this function
- Similarly, to the doctors, the Pharmacist results revealed a non-significant difference ($p= 0.768$), "trending" towards statistical significance. Hence, they too anticipated a shared role capacity when it involves decisions about patients' treatment status.

Results again displayed a collaborative function among all three health care professionals within the public rural PHC and CHC context (Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Farrell et al. 2008; Rigby, 2010), aiding in improving the provision of health service.

The Monitoring and Patient Safety theme encompasses four tasks that require investigation of the participants responses. These include: monitoring effectiveness and safety, monitoring compliance, instituting compliance and interventions as needed, and receiving and organizing requests for script renewals. Fig. 19, illustrates these responses.

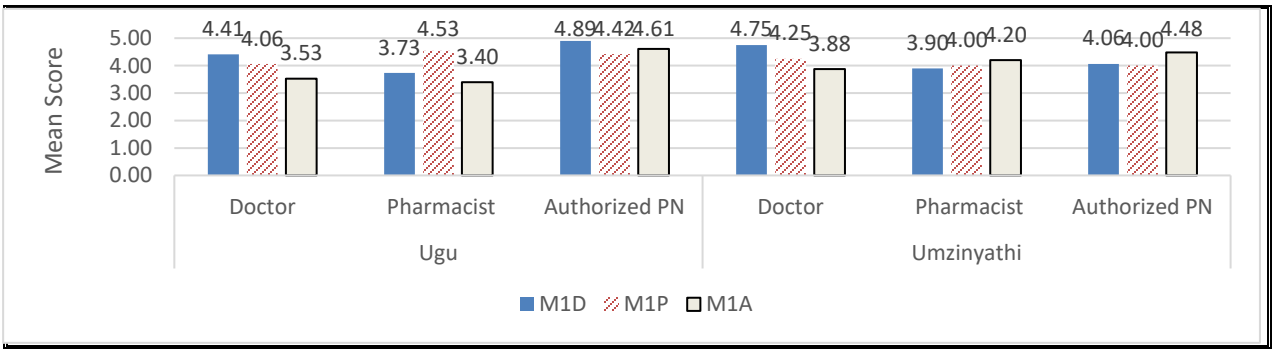


Fig. 19: Monitoring the effectivness and safety in medication-related processes

- With respect to monitoring patient effectiveness and safety to medicines, the doctors overall, statistically significantly, ($p<0.05$) rated their contributions towards the lead

role. They, however, anticipate the PCDT pharmacist and the nurse to work in collaboration.

- The nurses' ($p<0.001$), however, perceived the doctors to have more of a lead role besides their shared role with the PCDT pharmacists
- The Pharmacists revealed a non-significant result ($p>0.10$)

The following three tasks, viz., to monitor compliance (Fig. 20), institute compliance or interventions as needed (Fig. 21), and to receive and organize script renewals (Fig. 22), is graphically depitcted below. All three professionals agreed ($p>0.05$), that these are collaborative tasks. The inference can be made that the participants view patient monitoring and safety to be each of their colleagues professional responsiblity in managing a patient's condition (Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Farrell et al. 2008; Rigby, 2010).

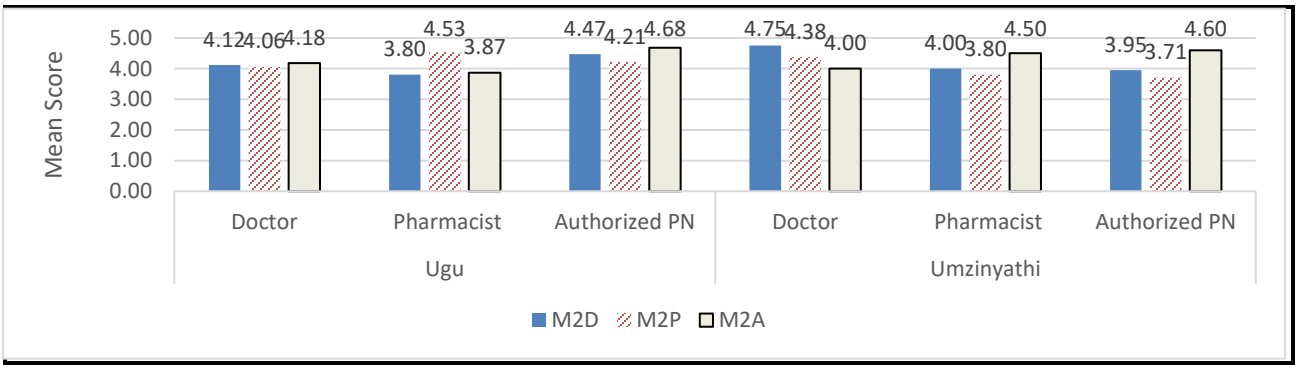


Fig. 20: Monitoring compliance in medication-related processes

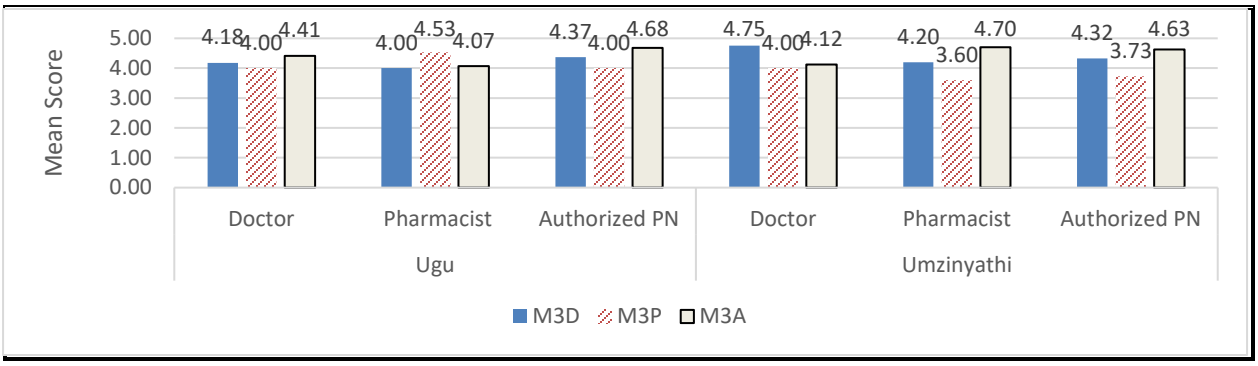


Fig. 21: Instituting compliance and intervention as needed in medication-related processes

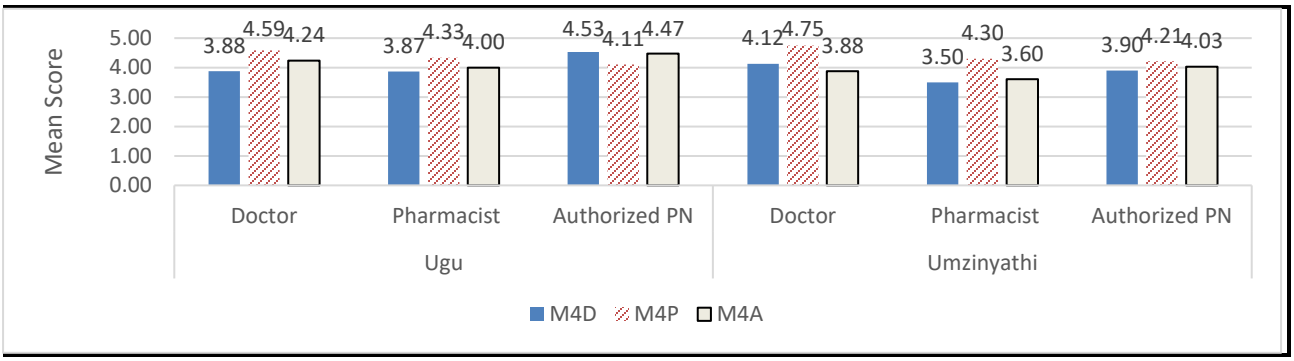


Fig. 22: Receiving and organizing requests for script renewals in medication-related processes

The administrative and or documentation functions in patient care were assessed, under the following three tasks: filling in the required patient forms (records, blood tests- Fig.23), updating patient's medication profile and allergies in medicine charts (Fig.24), and documenting medication-related information in patient's medicine chart (Fig. 25).

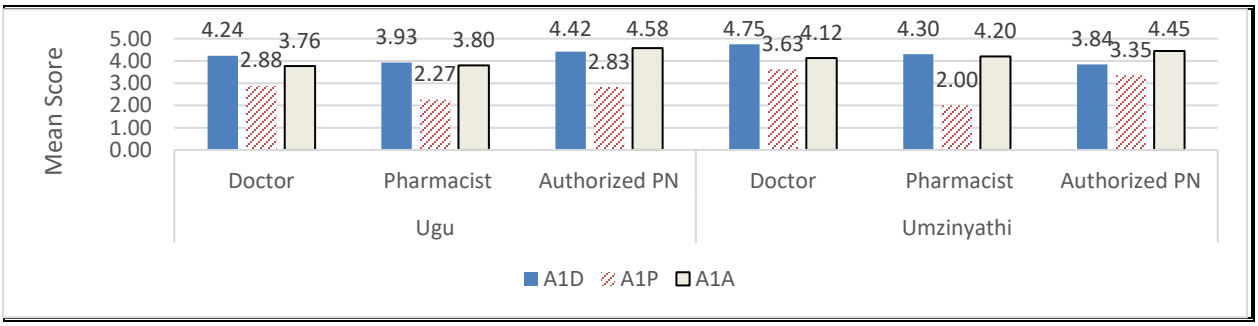


Fig. 23: Filling in the required patient forms (records, blood tests) in medication-related processes

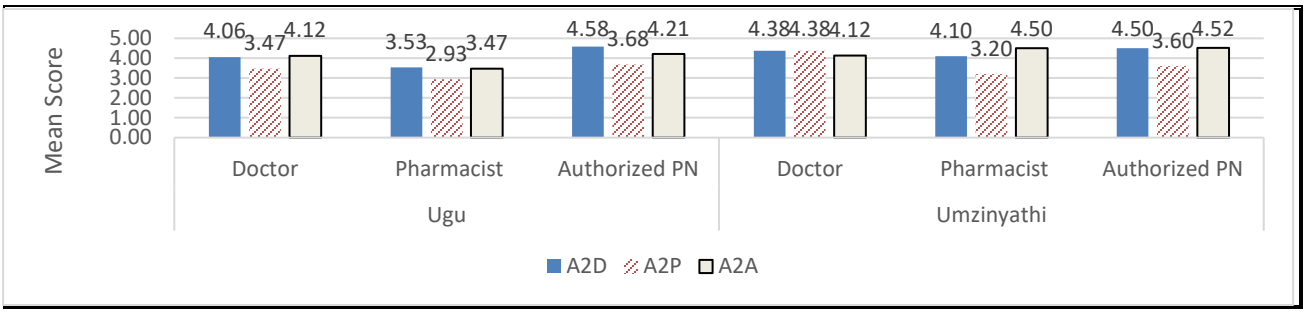


Fig. 24: Updating patient's medication profile and allergies in medicine charts in medication-related processes

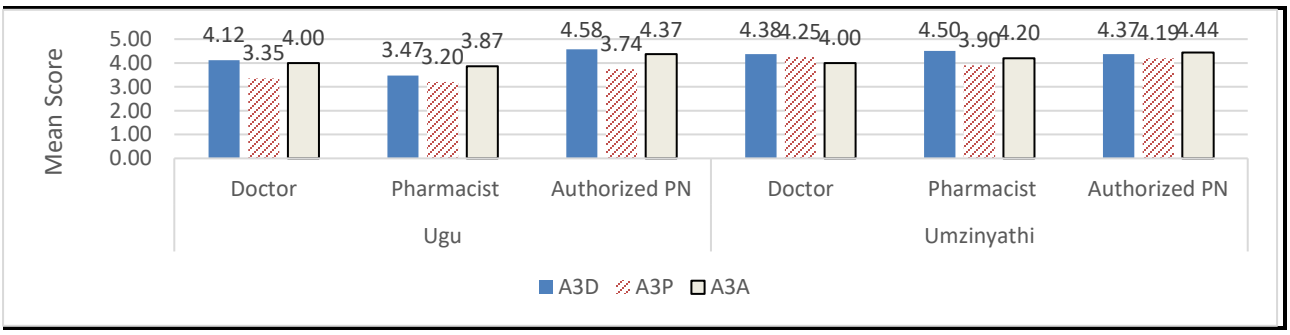


Fig. 25: Documenting medication-related information in patient's medicine chart in medication-related processes

- The nurses'results were significant ($p<0.05$), in respect to the filling in of the reqired forms (Fig. 23), and documenting medication related information in patients medicine charts (Fig. 25). On ther other hand, their results were "trending" toward statistical significance, and possibly if a larger sample size was used it might have reflected as statistically significant ($p= 0.095$), in relation to updating patient's medication profile and allergies in medicine charts (Fig. 24), in the medication-related processes. Nurses, therefore, predominentely chose the lead role in conducting the above three tasks. The doctor viewed this role more of a shared one. They both saw the PCDT pharmacist to support them with filling in the required patient forms. However, the pharmacist attached a supportive to no role in filling of the required patient forms.
- With respect to updating the patients' medication profile and allergies in their charts (Fig. 24), the doctor and authorized nurse felt that this warranted a shared role by all professionals, however, the pharmacist preferred a supportive role.

- The documentation of any medication related information in a patients' chart (Fig. 25), revealed that the doctor and nurse viewed this as another collaborative task. The pharmacist ($p<0.05$), statistically significant result, however, preferred to support their collegues in this role (Carmichael et al. 1997; Vangen & Huxham, 2005 & 2010).

The discussion of Education and Training, required three tasks to be explored. These included: educating the patient about the chronic medication (Fig. 26), providing group education and training regarding medications (Fig. 27), and providing drug information to prescribers (Fig. 28).

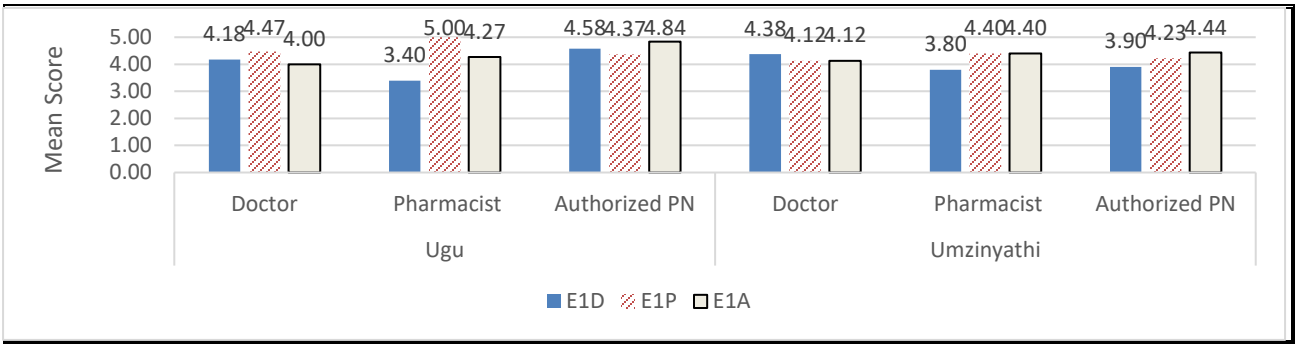


Fig. 26: Educating the patient about the chronic medication in medication-related processes

- In Fig. 26, both districts data presented that the doctor and authorized nurse identified that all 3 healthcare prodfessionals should share the responsibility in managing chronic patients through education about their medication (Carmichael et al. 1997; Farrell et al. 2008; Rigby, 2010).
- A note worthy difference in the ratings were stastically observed in respect of the pharmacists ($p<0.05$). They, anticipated the PCDT pharmacist to lead the role in education of chronic patients, with both the doctors and the authroized nurses sharing in this responsibility. All in all, a collaborative approach to chronic patient care is advocated and suppported (Carmichael et al. 1997; Vangen & Huxham, 2005 & 2010; Farrell et al. 2008; Rigby, 2010), relates to literature in terms of knowledge transfer, working processes and the collaborative advantage benefits.

In Fig. 27, the perceptions of the participants are illustrated in relation to providing group education and training regarding medications.

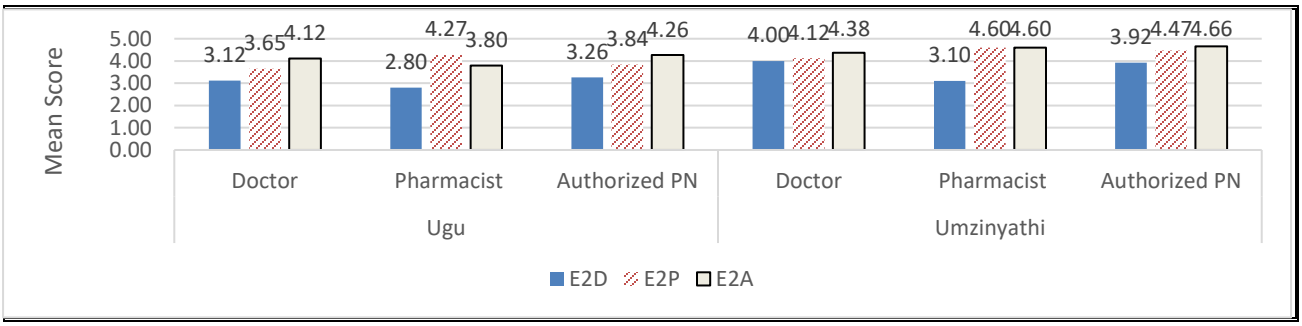


Fig. 27: Providing group education and training regarding medication in medication-related processes

- The doctor (p=0.003), in both districts saw their role more as a dominant than shared one in education and training of medication. They, however, anticipated both the authorized nurses and PCDT pharmacists to share this role. This in keeping with the collaboraitve advantage benefits aligned to Carmichael et al. (1997); Vangen & Huxham,(2005 & 2010); Huxham & Hubbert, (2008).
- The authorized nurses (p=0.014), a statistically significant result, seeing themselves in collaboration with the PCDT pharmacist in education and training, while the doctors support them. The ambigious nature of this question was further clarified in the focus group interactions. The intended interpretation was one of education and training to professionals rather than patients (Carmichael et al. 1997; Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008).
- The pharmacists (p=0.054), again “trending” towards a ststistically significant result in both districts, wishing to lead this role in training and education, considering they are the ‘custodians’ of medicine, having a shared responsibility with the authorized nurses and a supportive one with the doctors (Biddle, 1997; Bajcar et al. 2005).

Fig. 28, allowed a discussion over the provision of drug information to prescribers.

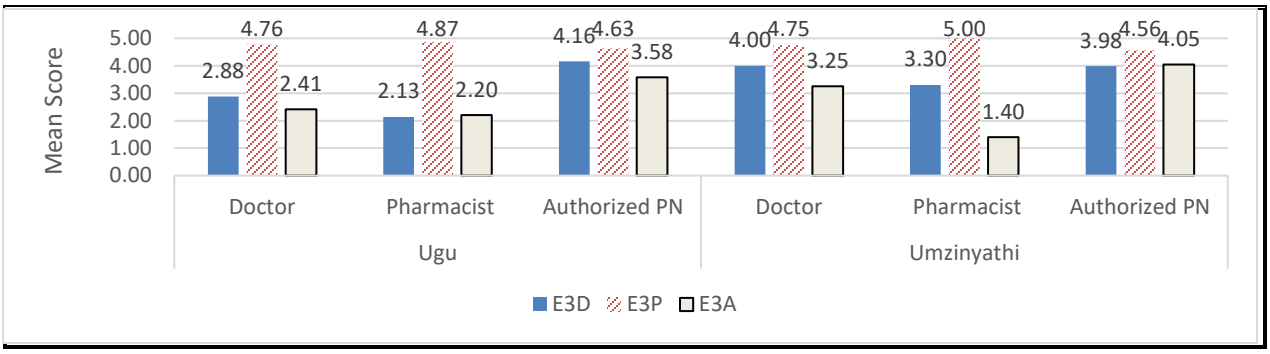


Fig. 28: Providing drug information to prescribers in medication-related processes

- Doctors, ($p<0.001$), a significant result where they wish for the PCDT pharmacist to support this role as is traditionally, with them playing a shared role.
- Pharmacist, ($P=0.071$), displaying a “trend” of statistical significance, requiring this role to be predominately carried out by the PCDT pharmacist, and the doctors and authorized nurse practitioners having a shared role
- The authorized nurse prescribers, ($p<0.001$), wish for the role of drug information provision to be a shared role, displaying collaborative practice among all professionals

The last theme of medication review, was explored through seeking the perceptions of the participants in relation to the following tasks: identifying prescribing errors (Fig. 29), screening patient's medication lists (Fig. 30), providing complete medication overview (Fig. 31), and identifying adverse drug reactions (Fig. 32).

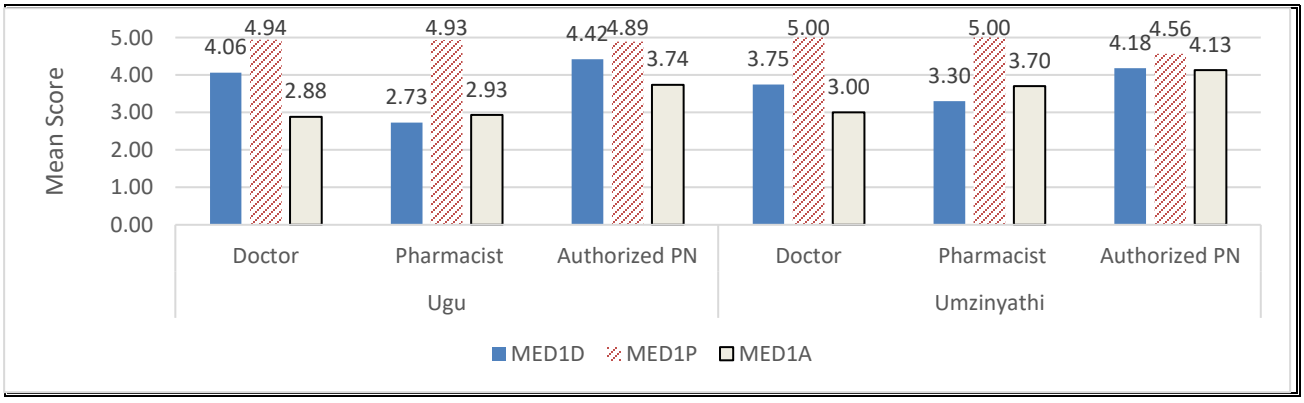


Fig. 29: Identifying prescribing errors in medication-related processes

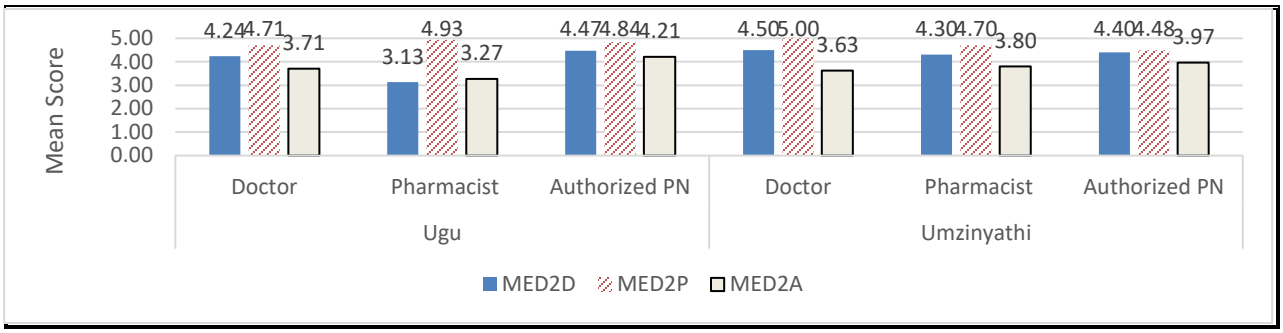


Fig. 30: Screening patient's medication lists in medication-related processes

- There was statistically ($p<0.05$), a significant difference in the ratings of all three categories of professionals in their scoring.
- All three categories of professionals foresee the PCDT pharmacist in identifying prescribing errors and screening of patient's medication lists as a lead role. This is similarly reflected in the TeAMM Model by Bajcar et al. (2005), where the medication-dispensing practice is typically the pharmacists' primary responsibility
- The pharmacist however, values the importance of these roles to be shared amongst their colleagues (Carmichael et al. 1997; Vangen & Huxham, 2005 & 2010; Bajcar et al. 2005).
- The doctor to share the role and the authorised nurse to share and or support these roles

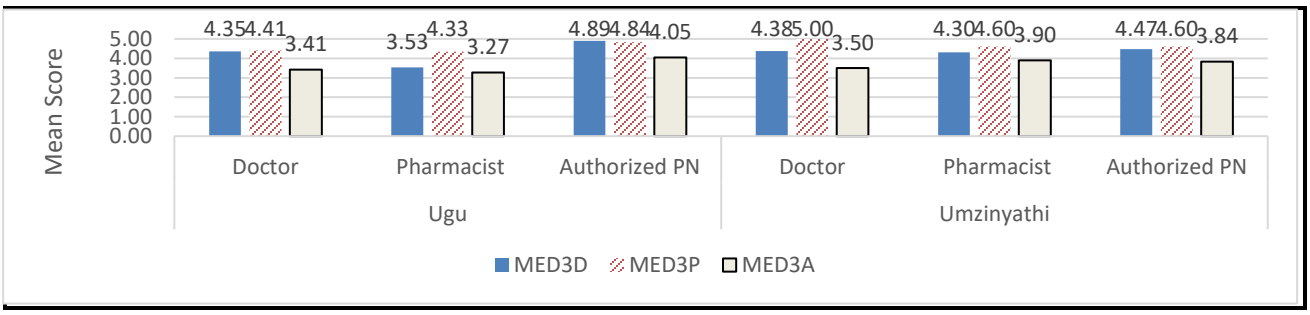


Fig. 31: Providing complete medication overview in medication-related processes

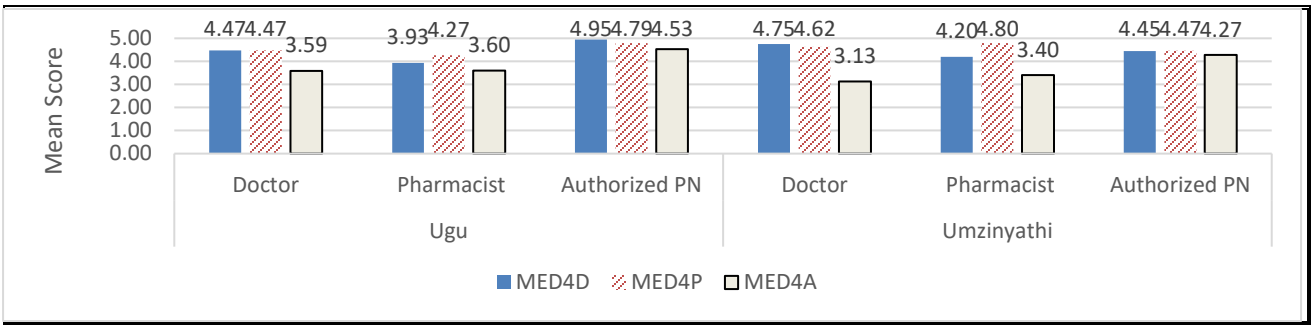


Fig. 32: Identifying adverse drug reactions in medication-related processes

The above two tasks of providing complete medication overview (Fig. 31), and identifying adverse drug reactions (Fig. 32), presented as collaborative tasks for all three healthcare professionals (Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Farrell et al. 2008; Rigby, 2010). However, the authorized nurses rated themselves statistically ($p<0.001$), higher than the doctors and PCDT pharmacist in their contribution to identifying adverse drug reactions.

5.2.5.1 SUMMARY OF RESULTS AND DISCUSSION

There are three process orientated frameworks that are relevant and useful for medication management within the pharmacy practice. One being, the “Drug Use Process” , which describes six steps in the process of drug use that requires decisions to be taken by one or more of the health care professionals, including patients and care givers (Smith & Knapp, 1992, cited in Farrell et al. (2008). These are (i) perception of a need for a drug, (ii) selection of a specific drug product, (iii) choice of a treatment regimen, (iv) acquistion of the drug product, (v) adminsitration/consumption of the drug product; and (vi) effect of drug therapy. In addition, according to Bates et al. (1995), cited in Farrell et al. (2008), the second framework is medication process orientated, considering four stages in the medication use process in which medical errors may be corrected, these being, (i) prescribing, (ii) transcribing, (iii) dispensing, and (iv) administration. Furthermore, the third model identified patient care of various tasks associated with collaborative drug therapy management by pharmacists describing the provision of pharmaceutical care (Cipolle et al. 2005) and prescribing activities (Carmichael et al. 1997).

The resultant framework, therefore, required a focus discussion of the roles, responsibilities and activities of various healthcare professionals within a mulitdisciplinary team. The TeAMM Model by Bajcar et al. (2005), hence, describes three primary medication use processes: medication-presrcibing practice, medication-taking practice and medication-dispensing practice, addressing the gaps and defining and discussing the roles and responsibilities in collaborative medication management of a team-based primary care practice while highlighting in addition the significance of patient's and their families role and responsibility in the medication management process. Hence, the discussion and explanation of the results from the questionnaires is approached with the above focus. Factor analysis of the results produced significant patterns of groupings of medication-related processes as indicated above. Hence, among the professions, variances in the factor combinations were identifed.

In relation to Diagnosis and Prescribing, the following six tasks were assessed: make a dignosis, determine if drug therapy is needed, select the best drug for patient, involve patient in decision making regarding medication choices, select the best regimen, and decide whether to continue, alter or discontinue medication. Hence, the following lead to shared role by all 3 healthcare professionals was identified for the PCDT pharmacist within the 'new' proposed model:

- Determine if drug therapy needed
- Select the best drug for patient
- Select best regimen
- Provide drug information to prescribers
- Identify prescribing errors
- Screen patient' s medicine lists

These findings complement literature (Biddle, 1979; Carmichael et al. 1997; Bajcar et al. 2005; Farrell et al. 2008; Rigby, 2010) in identifying that the medication-dispensing practice function is primarily the pharmacists' responsibility. Similarly, support for pharmacist's intervention and access to medical records as identified by Blondal et al. (2017), is necessary for optimal care service, where pharmacist-led clinical service is deemed most needed in

dose dispensing polypharmacy patients. Having a pharmacist part of the clinical multi-disciplinary team, also affords the added benefit of strengthening pharmacotherapeutic knowledge amongst its members (as in the case study of doctors, pharmacists and authorised nurse prescribers), thereby promoting increased “medicine-based thinking” (Page and Somers, 2015). The role of the pharmacist in identifying prescribing errors and screening patients’ medical charts demonstrated a strong consistency to Page and Somers, (2015), in supporting clinical governance in the form of drug usage evaluations and monitoring drug safety, along with Schindel et al. (2019), in strengthening the collaborative novel approach to information sharing for optimal care planning services in primary health care.

On the other hand, the collaborative tasks with all 3 health care professionals, the doctors, authorized nurse prescribers and the PCDT pharmacist in the proposed rural pharmaceutical care model, has demonstrated the following: -

- Make a diagnosis
- Determine if drug therapy needed
- Select the best drug for patient
- Select best regimen
- Involve patient in decision making regarding medicine choices
- Decide whether to continue, alter or discontinue medication
- Monitor effectiveness and safety
- Monitor compliance
- Institute compliance, interventions as needed
- Receive and organize requests for script renewals
- Document medication-related information in patient’s medicine chart
- Educate the patient about chronic medication- this identified in collaboration with the nurses only having doctors supporting
- Provide group education and training regarding medication in collaboration with the nurses only having doctors supporting
- Provide drug information to prescribers
- Provide complete medication overview

- Identify adverse drug reactions

The above findings support Adamcik et al. 1986; Carmichael et al. 1997; Bajcar et al. 2005; Farrell et al. 2008; Rigby, 2010. Furthermore, support for Lasker et al. (2001), relates to partnership synergy in today's environment with regards to collaborative advantage, considering that the achievement of majority of health-related outcomes is not possible with the workings of a person, organization, or sector in isolation. In this time, with the growing need to deliver healthcare outcomes, health care organizations and health professionals are expected to do more with less, and accountability for non-achievement outside their influence is demanded (Lasker et al. 2001). Hence, it is advocated that in such healthcare environments there is a great potential for collaboration of different healthcare professionals bringing together their unique strengths and expertise enabling synergy to support the desired health deliverables (Lasker et al. 2001). Further support for a collaborative novel approach to patient and medicine management, highlighted opportunities for expansion of information sharing strategies and improved benefits of care planning services for both clinicians and patients (Schindel et al. 2019). Teamwork was further emphasised as a "fundamental tenet" to solve medication problems and improving the quality of life of patients, where the presence of the pharmacist optimises treatment adherence (Barberato et al. 2019). In order to achieve an end where patients' perceived value of care planning related to waiting time to access care and the the involvement of the patient in self-care with a collarborative muti-disciplinary approach to primary care was desired (Schindel et al. 2019; Barberato et al. 2019).

The above summation, highlights the role clarity theory (Biddle, 1979), the identification of roles in medicine collaboration of tasks (Bajcar et al. 2005; Farrel et al. 2008 & 2013), and clarity of working processes to avert role ambiguity, role conflict (Brynant et al. 2004; Idris, 2011), and challenges of pharmacist integration (Bradley et al. 2008; Jorgenson, 2013 & 2014), while realising collaborative advantage in respect of knowledge transfer, training and learning (Huxham, 1996; Carmichael et al. 1997; Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008) to ultimately impact positively on improvements in public health service provision. Essentially, the recognition of Pharmacists competencies was appreciated more by the doctors than the authorized nurses as demonstrated by Blondal et al. (2019).

5.2.6 Section D: Appendix 8 – Presentation and Interpretation of Activities of PCDT Pharmacist and Authorized Nurse Prescriber

Aligned to the prevailing healthcare environment within the community context, the SAPC aimed to transform the pharmacist's role and the restructuring of the health services by proposed initiatives of reforming community pharmacy in South Africa through pharmacists and nurses working in a therapeutic alliance to provide accessible and affordable primary health care (SAPC, 1995b). Furthermore, The SAPC maintains that 'the community pharmacist should see himself, and encourage others to see him as part of a health care team working together for the benefit of the patient' and to support this they have 'the facilities and expertise available to provide for primary health care clinics in collaboration with registered nurses' (SAPC, 1995b). Considering that this research is investigating the 'therapeutic alliance' between both the doctors and authorized nurse prescribers with the PCDT pharmacist within a rural public context, it was imperative to survey the nurses' attitude towards the collaboration. With this focus in mind, in relation to the rural public context, this section investigates the ratings of the authorized nurse prescribers only in respect to traditional 'Primary Healthcare activities' between themselves and the PCDT Pharmacist.

The Figures 33 to 40 indicated the percentage of Nurse Respondents who identified the PCDT Pharmacist (P) or Professional Nurse (N) as being responsible for each of the activities listed within the PHC context.

Therefore, the result for the prescribing and dispensing according to a diagnosis is demonstrated in Fig. 33.

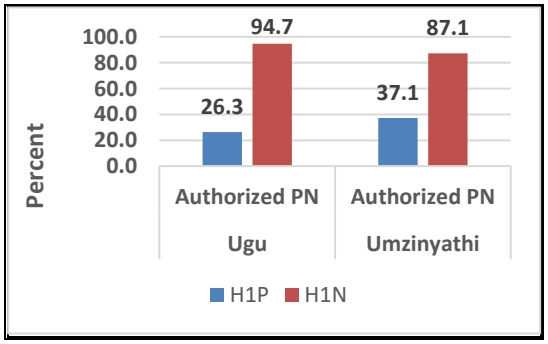


Fig. 33: Prescribe and dispense according a diagnosis

There is no significant difference in the scoring between the two districts ($p > 0.05$), but within each district, there is a significant difference in opinion ($p < 0.05$). Hence, approximately 90% of the Authorized PNs ranked the Nurse as being the lead person to prescribe and dispense according to a diagnosis. This trend is in keeping with the current context in which they perform, aligned with the 'task shifting' focus (WHO, 2008; Republic of South Africa, the Department of Health, 2016). However, a small percentage (av. 31.7%) of Authorized PNs believed that a Pharmacist could perform this activity as well. Overall, the authorized nurse prescribers anticipated sharing this function in the "Drug Use Process" with the PCDT pharmacist (Biddle, 1979; Gilbert, 1999; Bajcar et al. 2005; Farrell et al. 2008; Rigby, 2010; Cipolle et al. 2012).

The responses of the nurses' in respect to counselling of patients about prescribed drug is illustrated in Fig. 34.

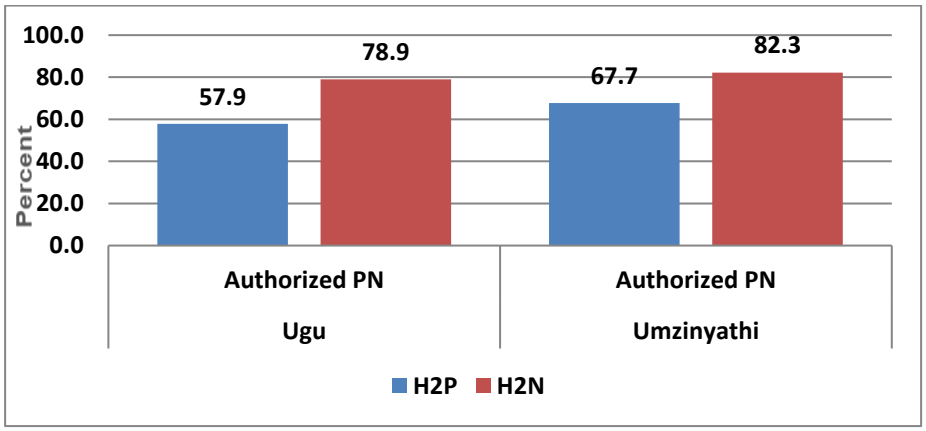


Fig. 34: Counsel patients about prescribed drug

Almost 80% of the ANs in both districts predominately favoured themselves to counsel patients about the prescribed drug. Here again very much in keeping with the present public health context (WHO, 2008; Republic of South Africa, the Department of Health, 2016). However, more than 50% did identify the PCDT pharmacist for counselling of patients about the prescribed drug, displaying collaborative activity.

The results for monitoring of drug therapy of chronic patients is represented in Fig. 35.

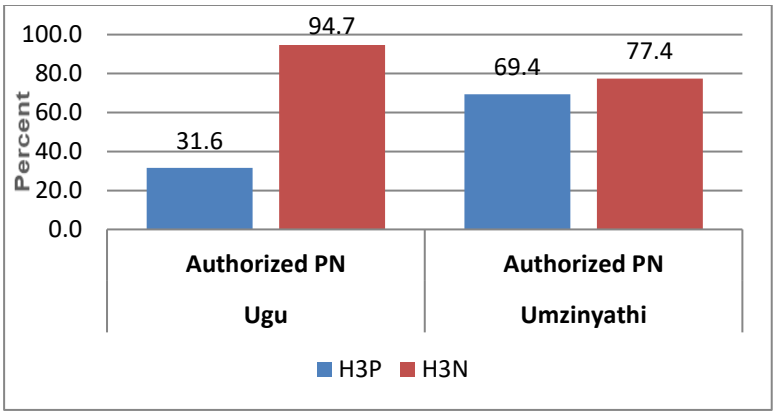


Fig. 35: Monitor drug therapy of chronic patients

A disproportionate % of ANs between the districts indicated that the PCDT pharmacist is most suited for monitoring drug therapy of chronic patients, projecting on average a 50%, while 86% on average ranked themselves favourably. This result drew attention to the 19,8% of the South African population in entirety that are diagnosed with non-communicable diseases within our public context and the plight of its management (Stats SA - General Household survey, 2015) that warrants a multi-disciplinary team approach (Thobeli, 2007).

The activity of assessing the patients' problem and referring to other Health professionals was met with no surprises as depicted in Fig. 36.

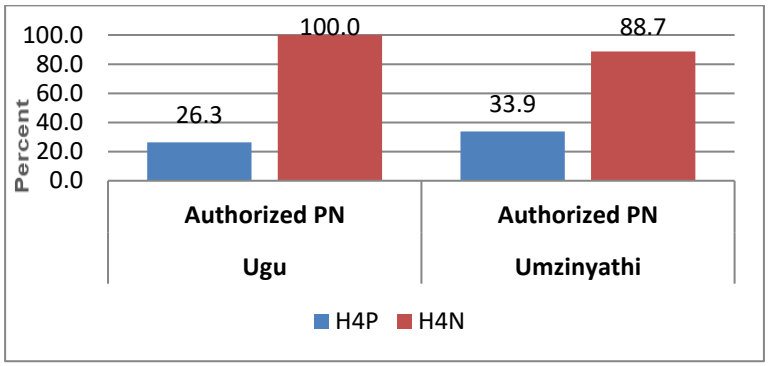


Fig. 36: Assess patients' problem & refer to other Health Professionals

The ANs rated themselves statistically significantly higher (av. 94.5%) in respect to assessing the patient's problem and referring to other healthcare professionals. Once again, this accentuates the current practice within the public PHC context (WHO, 2008; Republic of South Africa, the Department of Health, 2016). However, for the purpose of this study,

deliberation was further sought in the focus group interviews to explore this activity in the perspective of a multi-professional realm.

In respect of advising patients about personal health was exhibited in Fig. 37.

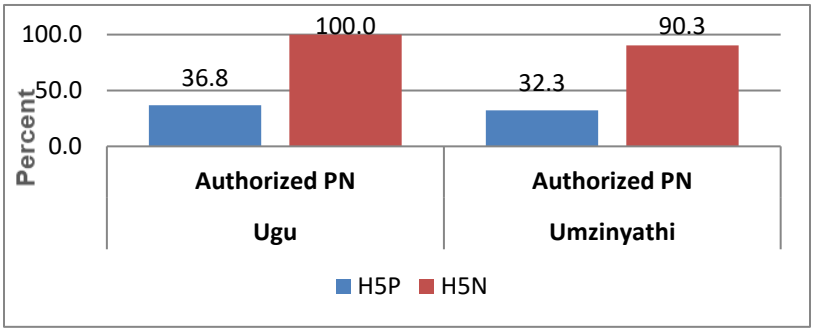


Fig. 37: Advise patients in regards to personal health

Similarly, the ANs identified with their traditional role of basic health education-advising patients with regards to personal health, leaving 40% in favour of the PCDT pharmacist to perform this activity. This result demonstrated of interest a slight variation in the results obtained from a similar study conducted within a community context by Gilbert (1997), where the nurses ranked the community pharmacist's role as a 'health educator' as the most important component. In essence of the Primary healthcare approach aligned to Alma-Ata (WHO, 1978), health education is, hence, a collaborative activity demanding shared responsibility by a multi-professional team to ensure a continuum of patient care.

Furthermore, the provision of drug information to other health Professionals is represented in Fig. 38.

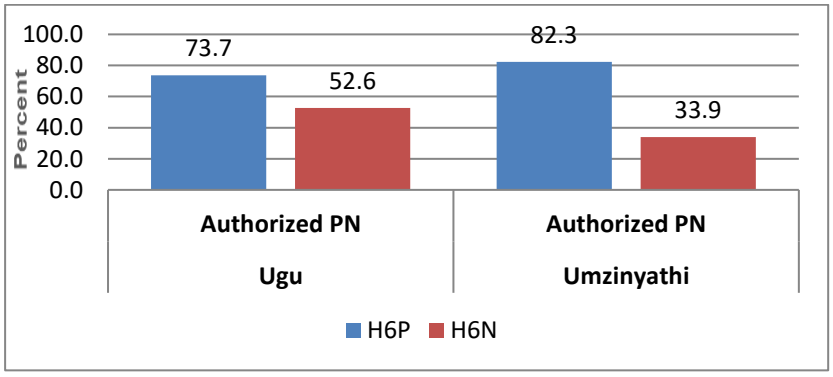


Fig. 38: Provide drug information to other health Professionals

This activity yielded a collective rating of 78% in favour of the PCDT pharmacist to perform this activity. This rating differed slightly from the first questionnaire, where the authorized nurse prescribers ranked themselves higher than their counterparts in performing this function. Nevertheless, the overall result proved one of a shared collaborative practice (Biddle, 1979; Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Farrell et al. 2008; Rigby, 2010).

The investigation of the ANs responses in providing education to patients in respect of STD's, diet, etc., is shown in Fig. 39. The graphical picture revealed that patients' basic health education features here again to be a dominant traditional role for the AN, with only approximately 30% favouring the PCDT pharmacist for this activity.

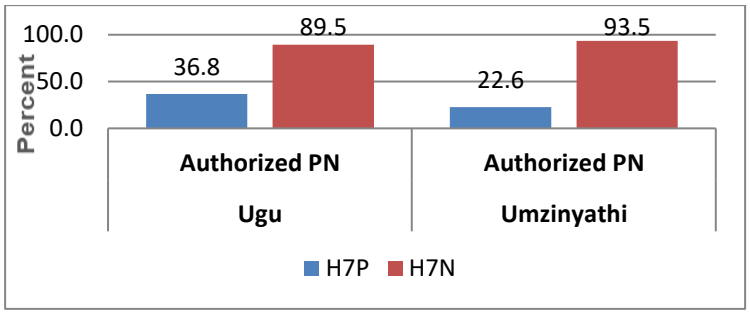


Fig. 39: Educate patients (STD's, diet)

Furthermore, the remainder of the activities 8-19 (Appendix 9), were demonstrated by the authorized nurse prescribers to be predominately performed by themselves: -

- Participate in health promotion programmes in the community
- Training of home care patients
- Blood pressure monitoring
- Cholesterol monitoring/testing
- Order laboratory tests
- Glucose monitoring/testing
- Immunization
- Developmental Screening
- Administering Injections
- Prescribing/administering contraception

- Attend to emergencies/casualties
- Prescribe in acute illness

All activities above are currently performed by the authorized nurse prescriber as per task shifting within the public PHC context (WHO, 2008; Republic of South Africa, the Department of Health, 2016), given the higher ratio of nurses to doctors (MRC SA, 2012). Therefore, not surprisingly, these activities were attributed by the authorized nurse prescriber's as part of their traditional 'primary healthcare activities' and responsibilities, other than that of a PCDT pharmacist (Biddle, 1979; Bajcar et al. 2005; Farrel et al. 2008). Of note is the small percentage of the ANs that share the view that the PCDT pharmacist can be responsible for prescribing and administering contraception and treating emergency and casualty cases. This is in keeping with the traditional scope of practice of that of a PCDT pharmacist (SAPC, 1994).

Lastly, Fig. 40 displays the responses of the ANs in managing the pharmacy at PHC or CHC.

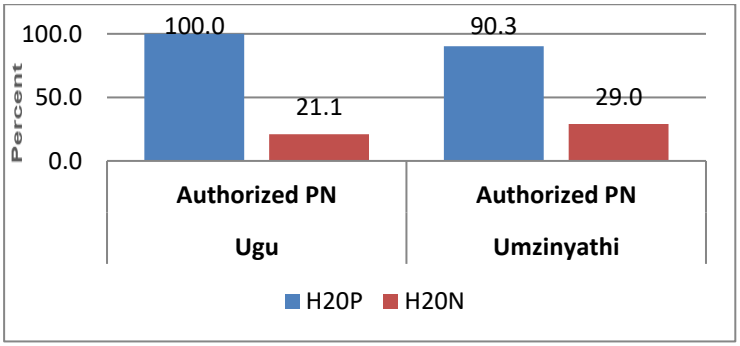


Fig. 40: Manage the pharmacy- Medicine Supply Management

There was general consensus amongst the authorized nurses that the ultimate responsibility for medicine supply management must remain with the PCDT pharmacist, while at least 20% feel that they will share in this responsibility. Currently within the study context, most PHC facilities do not enjoy the privilege of a qualified pharmacist assistant to manage their medicine rooms, and hence are required to fulfil all the necessary policies and procedures governed by SAPC (SAPC- GPP, 2010).

5.2.6.1 SUMMARY OF RESULTS AND DISCUSSION

The investigation undertaken, revealed the activities anticipated for a pharmacist (and not necessarily that of a PCDT pharmacist), with additional clinical expertise in the medicine domain to be performed within the rural public PHC and CHC context. The result showed activities chosen by more than 50% of the authorized PNs. Such activities are aligned to patient education, advice and monitoring as appropriate and important for the pharmacist (Gilbert, 1997 & 1999) and medication-dispensing practice that is generally a pharmacists' primary responsibility (Bajcar et al. 2005; Farrell et al. 2008). The said activities are as follows:

- Counsel patients about prescribed drug
- Monitor drug therapy of chronic patients
- Provide drug information to other health professionals
- Manage the pharmacy in respect of drug supply

The above Pharmacist-led activities is aligned to literature findings (Blondal et al, 2019), advocating clinical services of a pharmacist to avert polypharmacy and management of dosing regimens, including medication reviews and routine check-ups for patients with long term conditions (Hindi et al, 2019). Utimately, such a novel approach to Pharmacist integration, supports clinical governance through quality improvement activities, across the practice, focusing on medication audits, drug usage evaluations and monitoring drug safety (Page and Somers, 2019).

In addition, the ANs results proved that the following activities can be shared with the PCDT pharmacist in a form of collaborative practice:

- Prescribe and dispense according to diagnosis
- Assess the patient's problem and refer to other health professionals
- Advise patients in regards to their personal health- health education
- Educate patients (STD's, diet)
- Participate in health promotion programmes in the community
- Training of home care patients
- Prescribe/administer contraceptives

- Attend to emergencies/casualties
- Prescribe in cases of acute illness

Gilbert's (1997) study considered the South African scenario, wherein the core primary health care team will include both the nurse and the pharmacist, once the strategy to transform retail pharmacies into "primary health care centres" is realized. With this in mind, within the public context, similar shifts in provision of primary healthcare needs to be instituted. The current study analysed the identified responses of the roles and activities that the primary health care professional team within the present public context perceived for the pharmacist joining the team. Similarity to Gilbert (1997; 1999), the reflected data is in keeping with the conventional view of role conflict (Biddle, 1979; Bryant et al. 2004; Idris, 2011), where the pharmacist's role in the primary health care team is predominately around medication, while maternal and child health (MCH), immunisation, family planning, various approved screening tests, and administering of injections are perceived as responsible activities provided primarily by the nurses. Although the findings of the study are consistent with literature where the 'extended role' of the pharmacist was perceived as not only confined to drug therapy, a strong sense of collaborative practice was welcomed by the participants (Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Farrell et al. 2008; Bradley et al. 2008; Rigby, 2010; Jorgenson et al. 2013 & 2014). Such activities proposed is aligned to Page and Somers, (2019), in which an integrated multidisciplinary practice model favours the pharmacist role as one that includes a "combination of patient services, physician-focused activities and systems-level interventions".

5.3 STATEMENT OF RESULTS, INTERPRETATION AND DISCUSSION OF THE QUANTITATIVE DATA– PHASE 2: SAPC INSPECTION QUESTIONNAIRE

5.3.1 Introduction

The South African Pharmacy Council is mandated to defend the general public justices aligned to global pharmacy practice standards in both public and private divisions by performing distinct pharmacy inspections and monitoring related to new premises, training,

and disciplinary (SAPC, 2017). All practicing pharmacists are compelled to deliver excellence in service that complies with Good Pharmacy Practice Standards (SAPC- GPP, 2010). This translates in the Public enterprise to the supervising pharmacists from the Mother Facility Hospitals whom are responsible in ensuring such compliance at the PHC and CHC facilities they manage. The inspection conducted at the Government Rural Primary Health Care and Community Health Clinics within the Ugu and Umzinyathi Districts was one of monitoring orientation to establish the nature, extent and standard of pharmaceutical services rendered. Hence, thereby identifying any legal gaps that require further action plans, to highlight remediation and thereby ensure compliance. Therefore, to guide the interpretation of the results, a weighting key for every indicator accessed is as follows: 1=Not at all important but necessary to document; 2=Low importance; 3=Slight importance; 4=Neutral importance; 5=Moderate important; 6=Very important; 7=Extremely important.

Listed below are the findings of the Primary and Community Health Care Clinic Inspection Questionnaire, conducted in Ugu and Umzinyathi.

Fig. 41, graphically accounts for the Inspection Report Summary of Ugu clinics (N= 5):

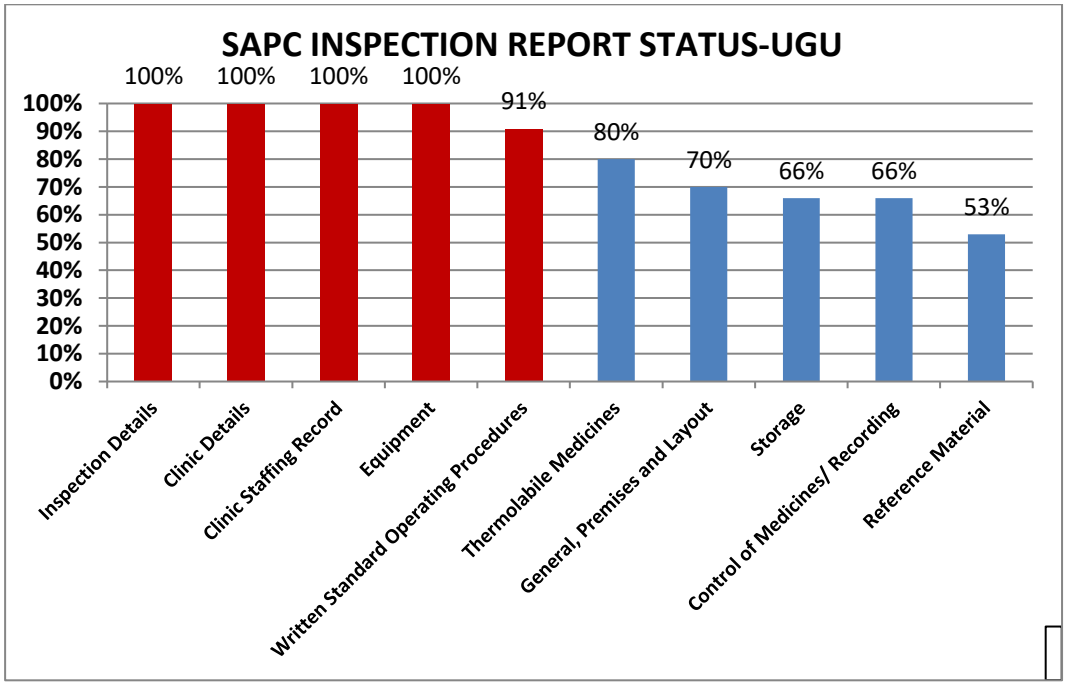


Fig. 41: Compliance of Ugu Clinics against SAPC Indicators

- 100% was achieved in Inspection details, clinic details, clinic staffing record, equipment and written SOP's.
- Areas of concern in the Ugu district were thermolabile medicines, general premises and layout, storage of medication, control and recording of medicines and availability of reference material.

Fig. 42, represents an Inspection Report Summary of Umzinyathi clinics (N= 10):

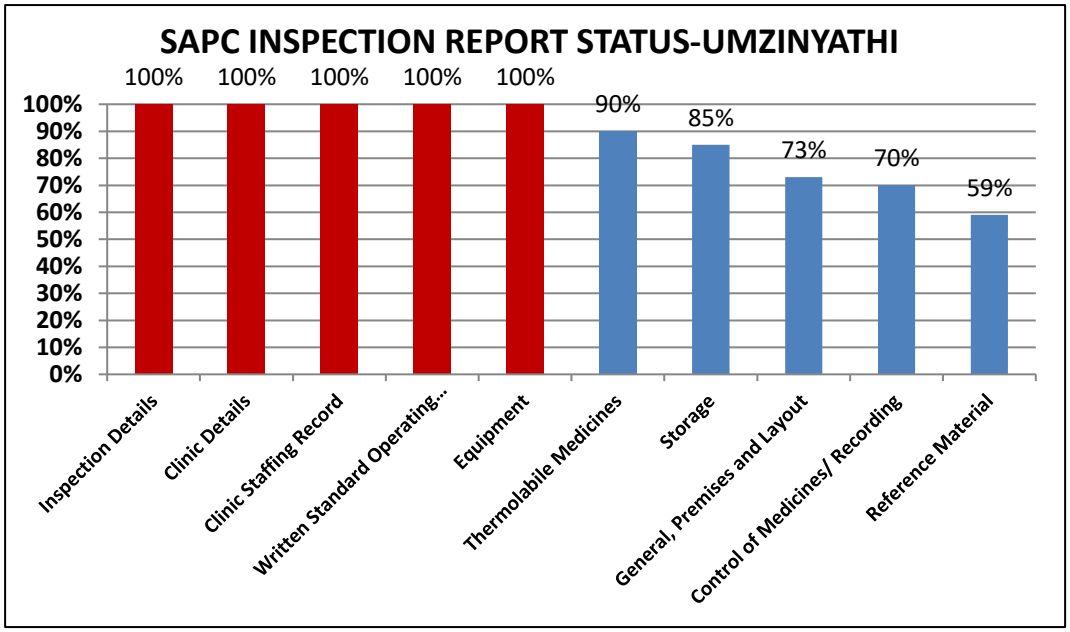


Fig. 42: Compliance of Umzinyathi Clinics against SAPC Indicators

- 100% was achieved in Inspection details, clinic details, clinic staffing record, equipment and written SOP's
- Areas of concern in the Umzinyathi district were thermolabile medicines, general premises and layout, storage of medication, control and recording of medicines and availability of reference material

An elaborate discussion below demonstrates the observed criteria in respect to the inspection of all PHC and CHC facilities within the chosen sample.

5.3.2 Inspection Details

All Primary Health Care and Community Health Care clinics within the two investigating Districts underwent a monitoring type inspection personally by the researcher, resulting in 15 assessments. All inspection details were easily accessible to the researcher.

5.3.3 Clinic Details

In total, 12 PHC clinics and 3 CHC's that were investigated were rural and situated in KwaZulu–Natal, within two sub Districts of Ugu and Umzinyathi. The CHC clinics assessed, comprised of 2 in Ugu and 1 in Umzinyathi, having a designated pharmacy, where dispensing of medication to patients consulted by doctors takes place. In addition, the authorized nurse prescribers consult and dispense medication to patients directly from their consulting rooms that are replenished by the pharmacy.

The PHC clinics, however, have a medicine store room and consulting rooms that have medication from which the authorized nursing sisters consult, diagnose, prescribe and dispense directly to patients. The store rooms at PHC are purely for storage and issuing of medication to the consulting rooms, and not for dispensing directly to patients.

5.3.4 Availability of Communication Tools

With regards to the consultation rooms at CHC, Umzinyathi has 7 doctors and Ugu has 15 Doctors, hence the remaining of the consulting rooms have medication for patient dispensing. The communication tools available at PHC are depicted in Fig. 43.

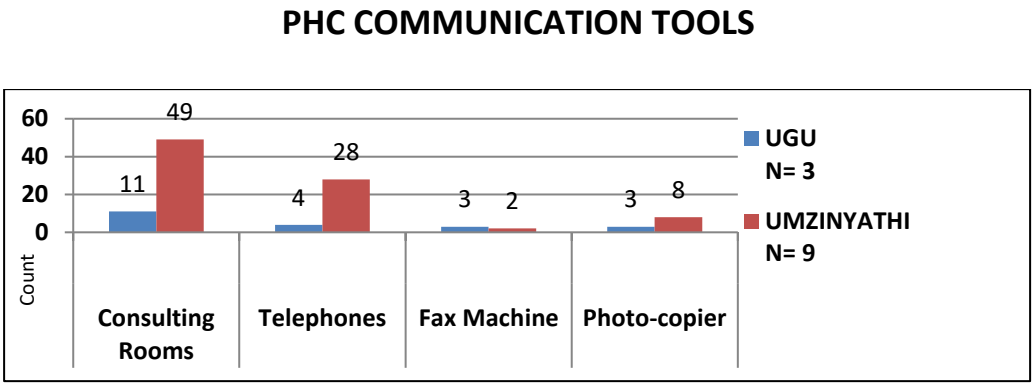


Fig. 43: Communication Tools Availability at PHC facilities in Ugu and Umzinyathi District

Fig. 44 represents the communication tools available at the CHC facilities.

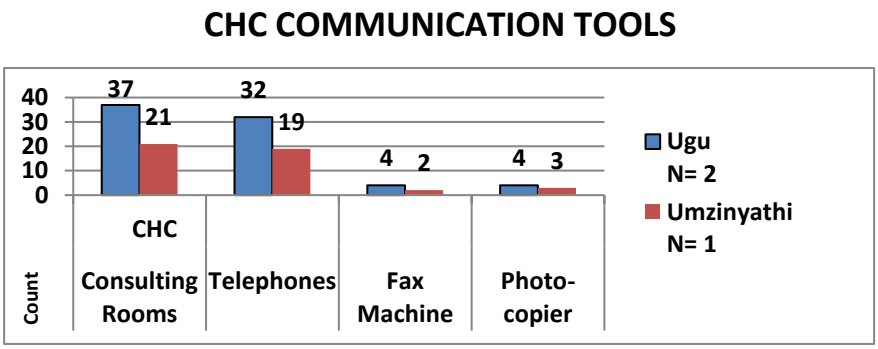


Fig. 44: Communication Tools Availability at CHC facilities in Ugu and UMzinyathi District

The availability of communication tools to conduct an efficient service, is limiting in both districts. However, the PHC's are more deprived than the CHC's. Ideally all facilities consulting rooms should have telephone lines with telephones in each consulting room, in the duty room and in the Operational Manger's office. A photocopier and fax machine is vital to manage day to day operations. Considering, these facilities are deep rural, a need for connectivity is vital to communicate and receive remote support from the Mother facilities. Unfortunately, network challenges are overwhelming and debilitating within the rural context.

5.3.5 The Services Rendered

Both PHC's and CHC's provide an out-patient service. In addition, both service the deep rural areas by providing mobile and school health care programmes.

5.3.6 Pharmaceutical Care Services

Within the Umzinyathi District, Post Basic Pharmacist Assistants have been employed to manage the store rooms in all the PHC clinics. They provide pharmaceutical support in terms of medicine supply management and ensuring the availability of the required medication. In Ugu, on the other hand, only registered nurses or enrolled nurses manage the store rooms.

Overall, medicines are stored in the following locations:

- Dispensary-in the CHC or medicine room in the PHC
- Consulting Room
- Store Room

The District mother hospitals are ultimately responsible for the management of the PHC clinics. Pharmacist assistants and/or pharmacists visit the PHC clinics quarterly. Supervisory support ensures the following:

- Availability of medicines- Tracer drug audits, Stock Takes and re-order levels
- National Core Standard audits
- Expiry drug evaluation
- Re-order levels of medication
- Ideal clinic tool audit
- Management of CCMDD challenges

This confirms that all PHC dispensaries are under indirect supervision of a pharmacist, with the Supervising pharmacists located at the Mother District Hospitals.

5.3.7 Clinic Staffing Record

There are on average of 4 to 5 authorized nurse prescribers in each of the PHC clinics and CHC's in both districts inspected. Both authorized nurse prescribers and pharmacist assistants wore their ID staff badges at the time of inspection. However, no proof by way of a certificate was available for the authorized nurse prescribers nor was there the SAPC Post Basic Assistant certificate displayed or on site.

5.3.8 General Premises and Layout

A personal visit by the researcher to the PHC and CHC sites initiated the observations. The intention of the visit was to acquaint the researcher, refine the purpose of the research to those who were to participate and significantly, have a 'birds eye' view of the set-up and the nature of the pharmaceutical service rendered at the sites. The observations were meant to note both structural and process elements that are necessary for providing pharmaceutical services. Accordingly, factors especially related to structural elements of access and security, and storage space were included in order to facilitate discussions. All PHC clinics evaluated, both in Ugu and Umzinyathi had medicine storage facilities that holds bulk stock and store personnel that issue medication generated from an order to the consulting rooms. Such personnel within the Umzinyathi District were trained qualified Post Basic Pharmacist Assistants, however, in Ugu, only one facility had such, the others had staff nurses who were delegated with the responsibility, among other allocated duties. However, the legal requirement, with SAPC is that should services be rendered by a full time registered post basic Pharmacist Assistant, that clinic, therefore, should be recorded with SAPC (SAPC, 2010). The Umzinyathi clinics that have employed Post Basic Pharmacists Assistants are not recorded and /or registered with the SAPC. Similarly, none of the said PHC clinics in the Ugu district were recorded either.

In addition, the consulting rooms in all the facilities were very small for stock and for consultation. The space constraints for storage of stock in the medicine rooms is a very real and concerning issue. The Community health care centres, however, have a pharmacy with a store room. There is designated seating/waiting area for patients, whom they dispense

medication to that have been consulted by doctors. The CHC's have qualified trained registered Post Basic Pharmacist Assistants managing drug supply in the consulting rooms and within the pharmacy. As per SAPC legal criteria, registration of a primary healthcare clinic dispensary is required. Therefore, the criteria to be considered when applying for the registration of a primary healthcare clinic dispensary are: (SAPC, 2018):

- The dispensary must be linked to an institutional public pharmacy or local authorities;
- The institutional public pharmacy must have a Responsible Pharmacist and be recorded with council, local authority must have a pharmacist;
- A dispensary linked to either institutional public pharmacy or local authorities, must have a post basic pharmacist's assistant and a supervising pharmacist;
- A supervising pharmacist may only supervise a maximum of three primary healthcare clinic dispensary

Furthermore, provinces or local authorities intending to place a pharmacist in the PHC Dispensary must apply for a license with DOH and record the facility as a Pharmacy with SAPC. The reasons why a primary healthcare clinic dispensary may not be registered are as follows:

- If the institutional public pharmacy is not recorded with Council
- If there is no RP at the institutional public pharmacy
- If the supervising pharmacist is already linked to three primary healthcare clinic dispensary
- If there is no post basic pharmacist's assistant at the primary healthcare clinic dispensary
- If the supervising pharmacist is an RP or tutor at a different facility
- If the primary healthcare clinic dispensary is not linked to an institutional public pharmacy or local authorities
- If either the post basic pharmacist's assistant, RP or supervising pharmacist are erased for any reasons

Therefore, there is no reason, why all PHC clinics in the Umzinyathi District and those in Ugu that have PBPA cannot be recorded and registered with SAPC. In addition, annual fees for PHC dispensary shall be payable with every application and then by 1 July every year thereafter. Council must be informed at all times about the resignation of any parties involved (SAPC, 2018).

5.3.9 Explanation of the Results

In a clinic, the 'dispensaries' are the consulting rooms. Medication is issued from the consulting rooms and not a common dispensary. There is on average 3 to 4 consulting rooms in each clinic, with registered professional nurses or clinical nurse practitioners in charge of their consulting rooms. There is no prepacking nor compounding of pharmaceuticals operated at a PHC clinic. The following indicators listed in (Table 12), were found to be non-compliant in both Districts accompanied by a weighting assigned by the SAPC inspection tool (SAPC, 2017):

Table 12: SAPC Inspection Indicators Weighting Score in both Districts

Indicator	SAPC Weighting
General, Premises and Layout	4-6- Neural to very important
Storage	4-7- Neutral to extremely important
Thermolabile Medicines	5-6- Moderate to very important
Control of Medicines/Record Keeping	5-6- Moderate to very important
Availability of Reference material	5-6- Moderate to very important

A detailed explanation regarding the above non-compliant indicators follows and would require urgent remediation in relation to the SAPC weighting of moderate to extremely important.

5.3.9.1 General, Premises and Layout

- The medicine rooms and consulting rooms, are not suitably located in the institution
- There is no accessibility of pharmaceutical services, as the Pharmacists don't have 24-hour access to the pharmacy
- There are no fire extinguishers in the medicine room and only one available in the entire clinic, with an average of 3-4 consulting rooms.
- The dispensing surfaces in the consulting room, where the sisters dispense from is most often a wooden table, and not of sufficient working surface area as required by SAPC
- The absence of a semi-private area for patient counselling (information and advice) as laid down by GPP principles. However, each consulting room, allows one patient in at a time, hence privacy of the patient is provided.
- The waiting area is not always situated near the medicine room or consulting rooms
- There are no designated signs for "NO SMOKING"; "NO EATING" in the consulting rooms and the medicine storage rooms.
- The designated staff that are full time employed at the clinic are not registered pharmacy personnel. They are nurses; hence they too have access to the store room, in the absence of Pharmacists Assistants in UMzinyathi and at all times in the Ugu District. The names and qualification of those that have access to the store rooms are not displayed

5.3.9.2 Storage

- The PHC clinics don't have a separate bulk storeroom, however, the CHC's do.
- The storage capacity is not significant to adequately equip all pharmaceuticals as per GPP standards
- Some facilities have visible cracks and holes
- Floor and shelves require frequent cleaning
- All PHC facilities require a distinct, secure and covered receiving area for stock

5.3.9.3 Thermolabile Medicines

- Medicines were stored in the refrigerator not in accordance to a system
- All refrigerators at PHC clinics are not linked to a generator nor are they fitted with the warning/alarm device which is linked to Operational Managers cell phones to indicate malfunctioning or temperatures not between 2°C and 8°C for prompt action

5.3.9.4 Control of Medicines, Scheduled Substances and Active Pharmaceutical Ingredients/Medicines

- There is no computerized system for dispensing in all the clinics
- There is no prescription book/permanent record for S1-S6 medicines as required by Regulation 11 (1) and (2) of Act 101 of 1965
- There is a challenge at PHC, with regards to the storage of patient's medication prescription folders. Files are not always easily retrievable. There is often a shortage from suppliers of patients' folders, hence, prescriptions are written on patients green/white carrier cards that leave with them. In addition, the CCMDD prescription record is not available in patients' files. Hence, there is no stored record available at the clinic. This presents a major gap in patient history. Prescribers, including visiting doctors are challenged to manage patients due to a lack of patient records.
- In some facilities, the balancing of Schedule 5 and S6 registers is not being performed quarterly on the last day of March, June, September and December of each year or within 14 days as required in Regulation 30(2) of Act 101 of 1965, unless visiting supervising pharmacists undertake this exercise.

5.3.9.5 Reference Material

- Evidence of the latest edition of Good Pharmacy Practice (GPP) Manual; Daily Drug Use; MDR or SAMF at all the PHC clinics, is absent, however, the CHC's do have them.
- The non-printing of the latest NDOH- Standard Treatment Guidelines (Adult & Paediatric for Hospital and Primary Health Care), results in the non-availability of these references at the facilities. Older versions are present though. The authorized

prescribers are expected to download the App onto their cell phones and have it at their disposal for easy access.

- All facilities, including the CHC's do not have a list of authorized prescribers available, nor is a list displayed at the clinic and medicine rooms.

5.3.9.6 Inferences of Results between Ugu and Umzinyathi Districts shown in Fig.45.

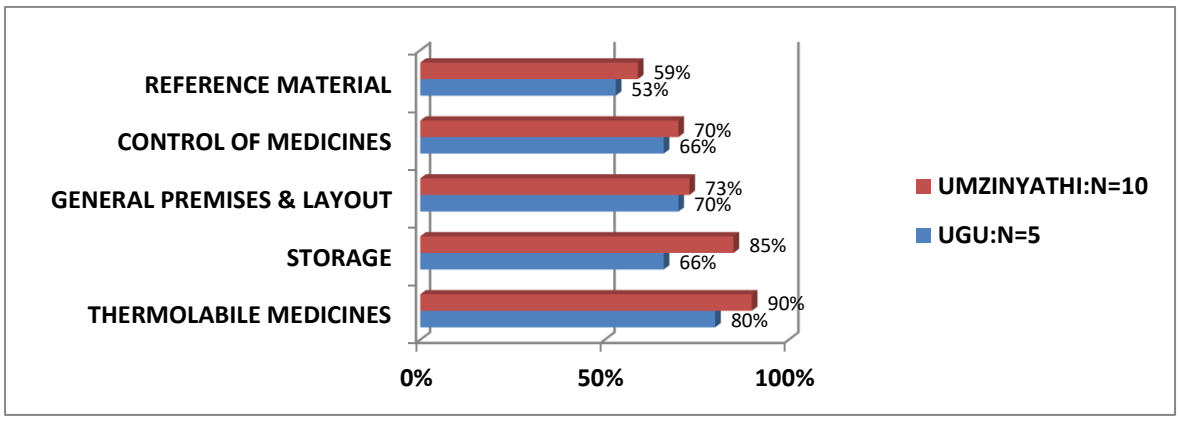


Fig. 45: Non-compliant SAPC indicators in both districts

A comparison of the two districts reveals the following:

- The PHC clinics are overall better managed in Umzinyathi District due to the on-site availability of registered Post Basic Pharmacist Assistants that are employed within this district. The link to the remote Mother facilities, and hence the supervising Pharmacist is available to ensure better management and compliance.
- The medicine storage rooms were cleaner, dust-free, cleaner shelves, due to the PA on site
- More control and compliance is enforced of the medicine rooms, thereby allowing restricted access
- Thermolabile medicines are more strictly managed and controlled, with the presence of a PBPA on site, however, considering the sensitive nature of these medicines, the absence of linking of the fridges to a back-up generator or to the operational manager's cell phones in cases of fridge malfunctioning or electricity disruptions increases the vulnerability to wasteful expenditure.

5.4 PRESENTATION AND DISCUSSION OF IDEAL CLINIC ACCREDITATION RESULTS

The PHC clinics under discussion for the study, are located in the Umzinyathi (NHI district) and Ugu (non-NHI district). The score chart below in Table 13 & 14 and Fig. 46 & 47, gives an indication of the status of the PHC clinics within the chosen districts in the financial period 2017-2018. These results were obtained from the Quality Assurance Manager from the two Districts (Annual Ideal clinic report from Ugu and Umzinyathi: 2017-2018).

Table 13: UMzinyathi District Ideal Clinic Results for the financial year 2017-2018

Facility	Score %	Category
Cwaka	95	Platinum
Wasbank Clinic	94	
Qinelani Clinic	92	
Ukuthula Clinic	91	Gold
Epathe Clinic	89	
Greytown Gateway Clinic	86	
Pine Street Clinic	82	
Siphimpilo clinic	84	Silver
Pomeroy CHC	72	
Hlathi Dam Clinic	63	Not Achieved

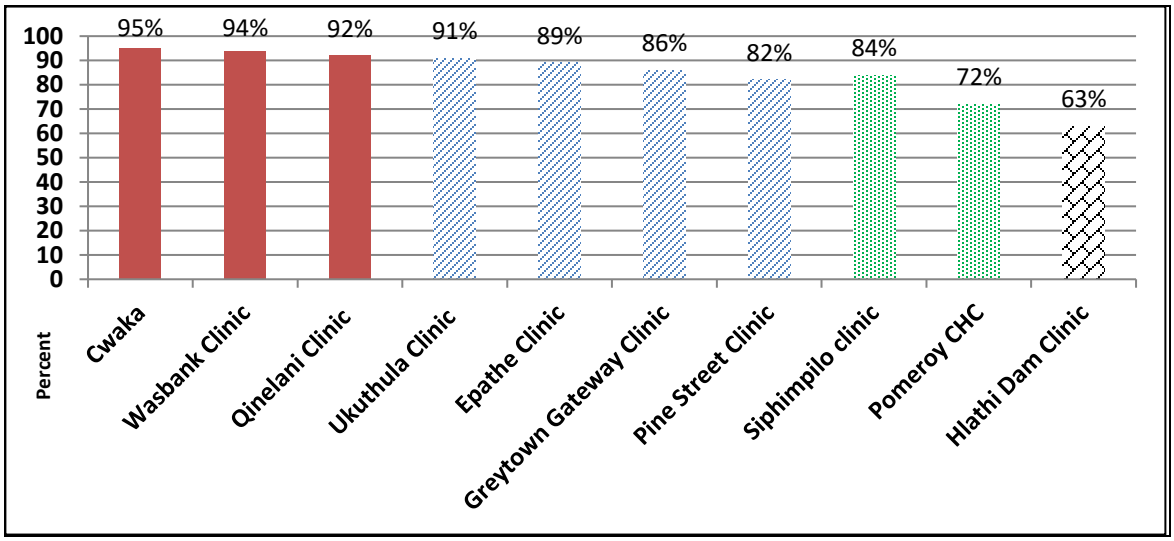


Fig. 46: Umzinyathi Ideal Clinic Score- 2017-2018

Of the 10 facilities assessed within the Umzinyathi District, only three obtained platinum ideal clinic status during the financial year 2017-2018. 'Ideally' all facilities should be performing at this capacity (Republic of South Africa, the Department of Health, 2018).

Table 14: Ugu District Ideal Clinic Results for the financial year 2017-2018		
Facility	**Score %**	**Category**
Braemer	84	**Gold**
Gamalakhe CHC	84	
Izingolweni	78	**Silver**
Turton CHC	83	
Khayelihle	64	**Not Achieved**

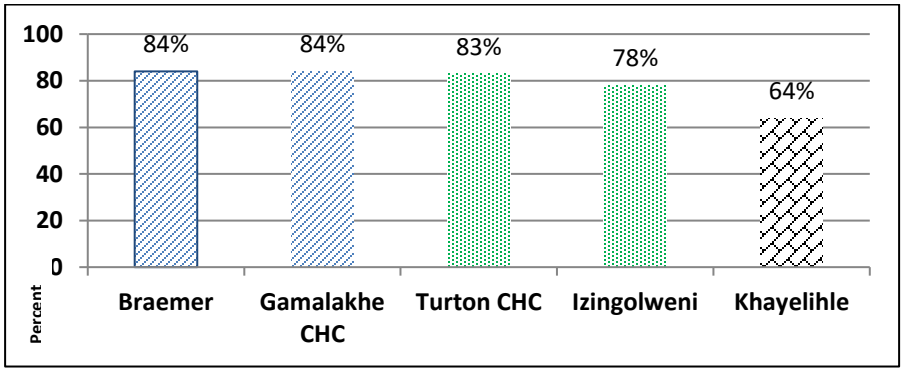


Fig. 47: Ugu Ideal Clinic- Score % for 2017-2018

Of the 5 facilities assessed, within the Ugu District, none obtained platinum status during the financial year 2017-2018.

It is clearly evident that although the platinum status is what all facilities are striving towards (Republic of South Africa, the Department of Health, 2018), work is in progress and needs to be scaled up rapidly aligned to the PHC re-engineering strategies to meet NHI standards for delivering of quality care.

5.5 PRESENTATION AND DISCUSSION OF THE WASTEFUL EXPENDITURE OF PHARMACEUTICALS IN UGU AND UMZINYATHI

In Table 15, the expired pharmaceuticals written off in the Board of Survey (BOS) for destruction in two financial periods are outlined.

Table 15: Expired Stock Written Off - Board Of Survey		
	FINANCIAL PERIOD	
DISTRICT	2016-2017 BOS	2017-2018 BOS
UGU	R 275 844.01	R 458 162.00
UMZINYATHI	NO RECORDING	R 98 277.00

Pharmaceuticals being the second largest public health budget alongside human resources, requires monitoring and evaluation with action plans to reduce and avoid such wasteful expenditure incurred through either expired medication, theft or pilferage. Table 15, illustrates that the recording of the expired pharmaceuticals is not religiously conducted in the Umzinyathi District. Furthermore, that of the Ugu district, as well, is not inclusive of all its PHC facilities.

Therefore, the pharmacist and assistant teams are required not to lose focus of managing medicine supply at PHC and CHC facilities, and more importantly, to ensure that accurate documentation and action plans to reduce wasteful expenditure is enforced. This viewpoint was further demonstrated in the focus group interviews with the nurse group, predominately by the clinical nurse practitioners who, expressed first hand that unnecessary wastage of pharmaceuticals occurs with having medicine in each consulting room, as opposed to a central dispensary within the PHC facility. They further recommended the presence of the Pharmacist team at PHC and CHC facilities to allow for consolidation, effective and efficient

stock management and in essence, better control and reduction of irresponsible wastage (Dalton & Byrne, 2016).

One can argue from a pharmaceutical care perspective that, the most important responsibilities that have been overlooked is the financial and economical obligation of a patient to medicine adherence. This approach can force social cohesion towards the provision of responsible and quality health care service delivery (Van Royen et al. 2014; Viljoen & Wesso, 2017). It is a known practice that patients tend to 'stock pile' medication that could be used for those in need, considering the current state of medicine scarcity and non-availability issues. Huge medicine expenditure losses are incurred annually from patient returns and non-adherence. The returned medication unfortunately, legally as per SAPC (GPP, 2010) and NDOH guidelines (Republic of South Africa, the Department of Health-KZN, 2015), cannot be reused, and poignantly is destroyed. It is also not appraised. Another aspect of concern is the fear of the use of expired medication and 'sharing of medication' with friends and families due to 'stock piling'. Hence, patients are not responsible, nor held accountable for such wastage. However, the philosophy of Pharmaceutical care, addresses these concerns by promoting self-care and self-medication.

5.6 PRESENTATION AND DISCUSSION OF THE QUALITATIVE RESEARCH FINDINGS-PHASE 3

5.6.1 Introduction

Familiarization and engagement of the data afforded a preliminary understanding and the ability to develop ideas from which the identification and exploration of meaningful categories and coding commenced, so as to be able to construct meaning from analysed and interpreted data which is influenced by perspectives, understanding, context, social realities and worldviews (LeCompte & Goetz, 1982; Lofland & Lofland, 1996; Krauss, 2005). It has been told that the key to good and sound qualitative research analysis is to embrace the data, to analyse it from a benevolent standpoint and to present a contextually rich interpretation of the phenomena under study (Terre Blanche et al. 2006).

When asked about how policy and practice decisions in health are instituted, the answers are informed by findings from qualitative and quantitative research. Hence, qualitative research bears usefulness to policymakers as the environment in which policies are to be implemented in, is often described. It further provides usefulness to pharmacy specialists and academics engaging in research environments such as universities and practice towards development in educating and coaching (Anderson, 2010). Furthermore, healthcare, encompasses complex human interactions and circumstances that necessitates complex investigation, understanding and explanation, reflective by the adoption of qualitative research methods. Therefore, the relevance for its use in this study lies in providing a healthier appreciation of the nature of healthcare challenges and accordingly adding awareness to process change, thereby influencing and guiding the nature of educational "teaching and learning in a number of contexts" (Anderson, 2010).

5.6.2 Informant Interview Analysis and Discussion

The key informants selected in this study included five expert leaders in the pharmacy field, among them from, academic, research, Non-Governmental Organization and Department of Health leaders. They provided insights from a range of perspectives, drawing on their own understanding and experience and reflecting the same of others in their respective work associations. Thus, these interviews provided a "balcony view" of the impact of the integration of pharmaceutical care to the rural communities' lives (Macfarlan, 2014).

Stemming from the interview schedule (Appendix 7), areas related to the establishment of a rural contextual Pharmaceutical care model were explored. Some of the key areas and responses to the following important interviewer questions are as follows:

Definition of Pharmaceutical Care?

All participants agreed that 'pharmaceutical care' needs to be defined. It was "*originally defined as every single patient should be seen by a pharmacist and should not access medicine without a pharmacist*" (Cipolle et al. 2012). This approach to the definition, however, challenges its implementation, due to the under-resourced health system and sheer numbers in South Africa.

However, what begs the question to assist with the definition, was posed by one informant as "*What is challenging in our part of the world is to say what is it that the pharmacist can do that affects outcomes that might not involve direct face-to-face contact with the patient- almost a type of pharmaceutical care at population level and like a type of public health intervention".* Therefore, it was unanimously agreed that the broad definition of pharmaceutical care by Helper & Strand (1990), is more suited.

Is there a need for a pharmaceutical care model in our current health care system?

All respondents strongly agreed. The discussions evoked responses that spoke directly to quality of patient care that is lacking in our present current healthcare system. They commented that there is definitely a place for pharmaceutical care, as defined above, where the pharmacist with additional clinical knowledge and expertise through intervention in a collaborative approach can improve on patient outcomes. They further reiterated that a pharmacist integrating into PHC or CHC level presents an opportunity that needs to be explored and pursued.

One comment that encapsulated the existing healthcare delivery was passionately expressed by a key informant "*Rational medicine use is terrible in our public sector, is probably as bad in PHC as it is in Hospital, we have great policies on pieces of paper, but pieces of paper are sitting on the shelf, we need to change these into reality, need to prove we actually know what's happening*".

In addition, Pharmaceutical care at a population level was another argument, where it was cited that it can work, e.g., *"knowing how many pregnant women are receiving Calcium carbonate supplementation during pregnancy". We as pharmacists don't know these answers; hence we can only speculate that most of the Calcium Sandoz Forte is dispensed to the osteoarthritic patients rather than the pregnant women".* Therefore, knowing this information for certain, can assist to remediate the practice, hence, *"Pharmaceutical care can make a difference at a population level, rather than an individual- patient level".*

In seeking answers as to whether this model can transform health care delivery in our community, the following roles and tasks for pharmacists arose

The informants proposed that by focusing on key activities, that the pharmacist will perform within the designed model, desired patient outcomes can be achieved. In addition, very emphatic themes

- ***Clinical governance- audits***

It was highlighted that errors picked up are not investigated, calling upon the institution of "*clinical governance*". An Important component is for clinical audits to ensure good clinical outcomes for the patient, where the "*pharmacist can take a day to do x number of clinical audits on say diabetes patients, looking at the type of medication they are on and the type of clinical outcomes for the management of that patient, the pharmacist then can be a vehicle to say for 100 prescriptions reviewed over 6 months, x number are not controlled in their disease state, these are the medication they are on and these are the potential reasons why the medication is not working*". Medicine selection allows for ensuring that the right medication is available to be prescribed through the development of STG's and monitoring medicine usage at population level, through Medicine Use Reviews-(MUR)/surveys/audits. This allows data to be collected at a population level in determining community outcomes

- ***Medicine Supply Management and CCMDD***

  Indirect supervision of the Post Basic Pharmacist Assistant is currently an area that is poorly developed and predominantly focused on logistics- stock on hand, stock take, and stock outs. The expectation of pharmacy staff is very much on stock management, which is the '*wrong focus'* as expressed by a key informant. It was highlighted that the "*Clinical side is neglected and we are not empowering the Pharmacist Assistants to get the best possible outcomes in a patient perspective*". Reference here was made to areas such as NCD- in chronic management of patients. The reengineering of CCMDD also calls for Pharmacists' to identify which patients can be recruited onto the programme, identify any problems, and most importantly monitoring of patient outcomes.

- ***Education and training for colleagues, pharmacist's assistants, medical doctors, allied workers, nurse prescribers and patients***

Pharmacists can create awareness and share medicine errors identified. This can be achieved by structuring training around the identified areas of concern. Reference was drawn to the Cryptococcal algorithm for screening, inciting the crucial role that pharmacists can play in early detection, training, mentoring and educating of the prescribing nurses and doctors, to prevent undetected cases and possible irresponsible deaths, by ensuring the following:

- Training and ensuring understanding of the interpretation of the algorithm
- Appropriate supply of Fluconazole
- Filling of proper paperwork/documentation
- Accurate Dosing of Fluconazole for prophylaxis and treatment
- Maintaining of the Fluconazole register

- ***Training and continuous development of pharmacists***

In the discussion attention was drawn to the degree of training required of a pharmacist to offer a pharmaceutical care service at primary health care. It was unanimously agreed that more clinical training is required.

"There is certainly something additional that is required, training slightly out of the box, with specific PHC training required to manage something like clinical governance and audits".

A healthy discussion around the inadequacies that pharmacists feel in the clinical realm was highlighted. According to one key informant, the 4+1 model at pharmacy schools, translating to four years of theoretical background and one year of practical training as an intern in the public sector, is somewhat responsible. The attention was drawn to Clinical application that is learned through bed-side intervention. However, the clinical ineptitude of pharmacists/ tutors that accompany pharmacist's interns on ward-rounds disadvantages them to impart the required training. Hence, intern's training becomes more focused on the logistics- Medicine Supply management, "*writing name and number*" was cited as the "*wrong focus*". There is a definite need to "*upskill the pharmacists",* by channelling this back to universities. The current model at some Pharmacy Schools offers the 'clinical Pharmacy course' or 'Doctor of Pharmacy' and graduates now are equipped more, if given on-the-job PHC training, which can ensure extra clinical service delivery for roles of clinical governance.

The one argument that challenged the integration of the PCDT pharmacist stressed that the training need not be that of a PCDT pharmacist, but does require "*some of the skills we want in terms of clinical application to ensure PhC at PHC level*". A focus on more in-service training, or self-learning or training through a programme such as the Board of Pharmaceutical Specialties, similar to the one in the USA, was the viewpoint expressed. Pharmacists can purchase this programme (various series of pharmacy practice specialties are available), write an exam, to become Board certified and have to go through CPD's, to be deemed clinically competent and relevant. This model is used in Gulf countries, e.g. Saudi, and was a proposed model, instead of what SAPC requires through a four year, extra Masters that they have on draft regulations on specialist training. Therefore, the model where people are upgraded through a series of in-service certificates was strongly recommended.

- ***Management of patient by Patient chart reviews, clinical regimens and pharmacological dosing***

Some of the roles cited by the informants of the dependent prescribers, similar to the UK-licensed dependent prescribers; with patient level directive roles for expansion in SA are to be as follows:

- Antibiotic monitoring and stewardship, with IV antibiotic and switch to oral; Antibiotic prophylactic use in theatre
- Ambulatory care
- Patient Safety: Ensuring the desired outcomes are achieved
- Adverse drug reporting: identify and treat; monitoring, reporting and preventing potential ADR's

The general consensus was that "*Pharmacist can give input on Pharmacological adjustments, dosing etc. There is room for pharmacists to look at clinical effectiveness of medicine use, advice on add-on treatments or best regimen that is needed, review different regimens. These are activities, due to workload, that pharmacist don't find time to do, but with a model set up, this role can be given to a pharmacist- almost like research type activities, associated with their tasks that work*"

Having said this, colleagues agreed that for this model to transform the health care delivery in our community, "*there must be a certain degree of openness, errors that are picked up by the pharmacist, must not be seen as pharmacist detective-work to point out mistakes, but that they doing this to build the system to have a better clinical model in place*".

- ***Patient engagement and interaction- counselling, lifestyle modification***

The informants' further informed that Pharmacist can educate the patient on chronic diseases, like diabetes. They can take it one or two steps further than just counselling to offering lifestyle modification.

Why such a model for the rural context?

The salient reality that our current rural health care system is emblematic of being scarcely resourced with human, infrastructure and equipment, could not be over emphasized. "*A proverbial problem is that our facilities are too small- undersized*". To highlight the drastic need for improvement in this sector was accentuated by the comment *"before we think of expanding the roles, we need to provide additional facilities and address the infrastructure challenges*". This only strengthened the need for the PHC re-engineering and Ideal clinic strategy to urgently address.

Informants further, enunciated the necessity to investigate the crucial point of when a Pharmacist is required at PHC. In addition, there is a need to revamp the "*District Pharmacy infrastructure, beyond just a District Pharmacy Manager*". The general consensus was that the visibility of pharmacists at PHC is required. In addition, following the discussions of "*Rational medicine use is terrible in our public sector, is probably as bad in PHC than in Hospital*", welcomed suggestions of having three or four non-dispensing pharmacists within a District, whose "*role is to support, to train not only PBPA, but nurses and front-line medical staff, not in individual patient care, but in population level interventions.*"

The theme that steered thereon the discussions was Quality of care**.** 80% of the participants agreed that the PCDT pharmacist has the extra pharmacology and clinical background aligned to enforce STG's adherence to add to quality of care needed within the rural PHC context. Within this environment, the nurses tend to work very much in isolation, due to the extreme shortage of Doctors and qualified nurses. Patients' access to services is further compounded by transport and infrastructure challenges. Therefore, the pharmacists having the expertise can act as a go-between, to concur with the nurses and doctors. The issue of lack of patient compliance highlighted an area for the pharmacist intervention. The comment that was raised was that "*pharmacists are best placed to ensure pharmacokinetics, drug-interactions and reporting.*"

In terms of the structure of the proposed pharmaceutical model, reference was made to the current structure of PHC re-engineering, with WBOT and clinical specialists teams. A reminder that these teams are built not to "*see individual patients, but to support, mentor, train, to improve the quality of other people's deliverables through the best use of the scarce resource*" was evoked to offer a recommendation. The respondents in addition, highlighted the high incidence of HIV/Aids within the communities, where majority of the patients are reliant on public healthcare facilities for their medication and health needs. Pharmacists can manage "*opportunistic infections*" and again inference to the Cryptococcal algorithm implementation was made.

What are your Perceptions on inter-professional collaboration?

Collaboration is "k*ey to clinical Governance*". A strong sense of the need for a "*multi-disciplinary team*" approach came through and "*out of the box*" approach to "*specific training*", almost a type of "*research activities*" for this pharmacist to perform "*extra-clinical*" and "*clinical governance*" parameters in "*any scenario or any disease state relating to better outcomes in providing healthcare to the patient.*"

For the most part, the Fluconazole example came through again during this discussion, citing it as an example of the "*inter-disciplinary*" approach required by all health care professionals. Laboratory, being the driver, performing the reflex testing, makes these results available.

However, only if accessed from the patients' files by the prescribing nurse or doctor, will subsequent initiation of therapy ensue. Thoughts were shared around the pharmacist adding value and "*best placed*" to offer "*specific training*" and "*extra clinical*" expertise in dosing with Fluconazole and the "*clinical governance*" of ensuring the appropriate stock and paperwork, like registers are filled. Furthermore, "*pharmacist have an additional role in creating and facilitating the processes in line with whatever strategy Government has set in ensuring better outcomes for the patient.*"

The model used in most pharmacy schools are advocating rotation of students into PHC and ward rounds, thereby allowing for "*more exposure to a multidisciplinary training approach.*" Pharmacy staff expectation is very much around stock management, only because, we are portraying the "wrong focus". This argument, however, stressed that as pharmacy, we must still continue to hold on to DSM, because, "*it's what we do best*", if we "*don't control it, it goes to pot*". However, it's time for pharmacy to expand towards the clinical perspective as well.

Collaborative care practice is centred around "*therapeutic drug monitoring*". Perceptions of dependent prescribing, similar to the British model, featured strongly, where inter-professional collaboration between the pharmacist and doctor will ensue. In some health systems the dosing adjustments, can be done by pharmacist, e.g. Warfarin clinics. The pharmacist, as a dependent prescriber, can adjust dose, in agreement with the doctor, who still bears the responsibility for the patient. Hence, this collaborative interaction, allows both, the "*pharmacist and the doctor together to achieve the best possible INR, and hence the desired clinical outcome for the patient- doesn't have a heart attack, doesn't have a stroke.*"

What factors contribute to achieving a collaborative advantage in the proposed model of care?

Once again, a "*multidisciplinary team of the various stakeholders, SAPC, NDOH, PDOH, and Universities*", must "*buy-in*" and all will have their role to play. An understanding of the model will ensure that patient outcomes are built into the model. Policies will need to be imbedded around the Universities offering Pharmacy training to ensure the "*clinical Governance*" essence is taught. Awareness was drawn to the often "*disconnect*" with policy implementation

as it is filtered down to the operational levels. The strongpoint was for clear guidelines and communication of whom is involved in the model; what role they play, and where and how it will be implemented. It is vitally important to have training around the proposed model. Most importantly, with NHI on the horizon, recommendation that the proposed model be built into these plans going forward, with good communication and on-going measurement and evaluation was encouraged.

Interestingly it was highlighted that *HCW "don't do", "not because they don't have the passion and drive, they don't do, because they don't know how to, they don't have the necessary skills, this comes across as poor governance."* The participants expressed their preference to the collaborative model approach by stating that there is a "*need for healthcare professionals to step out of the box".* They must adopt an outcome based approach. They further elaborated that in order to achieve clinical patient outcomes and offer "*value for money* healthcare". A '*toolkit'* is required to guide this process. Training of health care professionals by the pharmacist featured dominantly in the discussions as an indispensable tool to effect Ubuntu.

5.6.2.1 Role of the PCDT Pharmacist in the Proposed Model

Discussions around the role of the PCDT Pharmacist elucidated that "Originally it was formulated by the SAPC, for more the private sector- a Community Pharmacist Model" (SAPC, 1994). Three distinct arguments arose. On one hand, this translated to "*Pharmacists doing something other than dispensing*" The view that dominated the discussion thereon was that "*some people see this as activists of Pharmaceutical care- I don't want to do PhC, but want to be a prescriber*". This approach sees the PCDT pharmacist, much like in the retail context, as an independent prescriber. Having this approach integrated within the PHC context, will then argue the need for another prescriber, apart from the doctor, authorized nurse prescriber and the clinical associate. This will surely question if such an integration is then justified.

The second interesting argument made was that the "*biggest hole in the PCDT system and Authorized Pharmacist prescriber is the need for re-focusing on collaborative practice that of dependent prescribing before moving to the independent prescribing-like the PCDT*

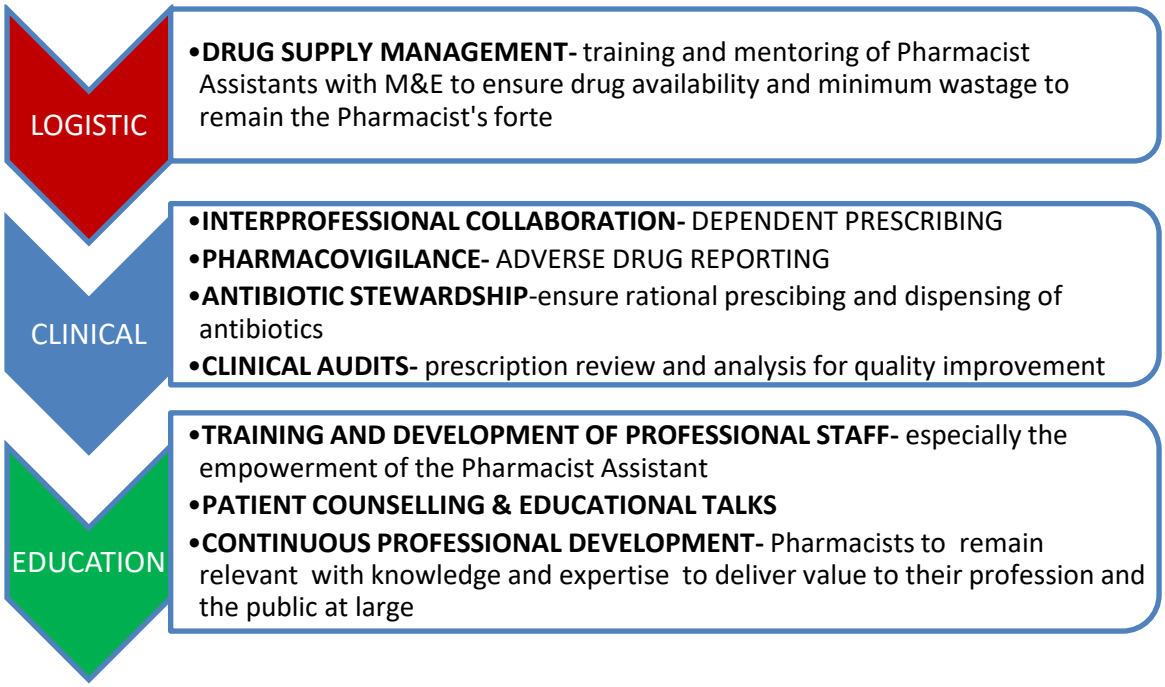
Pharmacist". This view altered the perceptions of independent integration, favouring a more collaborative approach to management of patient care. This translates to having the dependent pharmacist prescribing scenario. The third focus of the discussion questioned the need for a PCDT pharmacist qualification to allow for a collaborative mix of professionals to add clinical value to patient outcomes.

During the discussion, the views and attitudes of current PCDT pharmacists in training, those employed within the Government sector, were shared with the key informants by the researcher. The approach was that they placed more emphasis on the value of "*building their clinical confidence*" and the "*concern for the patients' end result"*, rather than wishing to adopt the 'prescribing rights' approach. This reiterated the argument made by 50% of the informants that the "*content of PCDT is right, but the end target is not*".
Therefore, it was deduced that the training of PCDT, "*gives the Pharmacist confidence, and the right clinical exposure to change their ability to work differently not only in the wards, but in WBOTS and towards PHC re-engineering*" on the whole.

Equally important, are those remaining 50% of informants that argued 'yes' to the PCDT pharmacist in PHC? They agreed that this pharmacist can be integrated into PHC to add value to the professional mix. This approach, involved the thinking that, in the presence of the PCDT pharmacist, the added knowledge, both clinically and pharmacologically, can positively impact PHC re-engineering initiatives. At this juncture, it was unanimously agreed that, '*something extra*' in terms of clinical expertise of a pharmacist, is required to allow for "*quality of patient care*" and possible "*improvement and monitoring of patient outcomes*" Whether it is a Pharmacist, with dependent or independent prescribing rights, the extra clinical knowledge, confidence and expertise is what is required to steer PHC re-engineering forward and bridge the identified gap in pharmaceutical service delivery within the public rural PHC context.

Having explored the various arguments, what remains is the much awaited clarity and decision over dependent prescribing, in a more collaborative practice approach that is required to be taken by the Minister of Health.

In summary the following themes and roles for the PCDT pharmacist were identified within the key informant interviews.



5.7 FOCUS GROUP DISCUSSION (FGD) INTERVIEW

The focus group interview represented widespread knowledge of local public primary healthcare clinic authorized nurse prescribers and medical doctors. Hence, their professional roles could bring to light various viewpoints on the fundamentals of pharmaceutical care integration. Different participants' perspectives are evident in their focus on particular elements of pharmaceutical care practice and potential roles and responsibilities as well as on expectations and challenges of the PCDT pharmacist integration in rural public primary health care service delivery. Given the challenges of time, transport and participants' work load, that arose with the initial anticipation of an interaction of the PHC and CHC clinic authorized nurse prescribers and doctors at the two district offices (Ugu and Umzinyathi), focus groups were finally convened at each clinic of the respective districts for the ease of the interview and to accommodate the nurses at their work stations, not to disrupt service delivery. Hence, the data gathered from the focus group interview was subjected to a thematic analysis process as outlined in Appendix 18.

5.7.1 Face-To-Face Focus Group Interviews- Qualitative Analysis

Healthcare providers' perspectives on the role, responsibilities, expectations, challenges and collaboration of the PCDT pharmacist in the proposed public pharmaceutical care model are discussed below using role and collaborative advantage theory framework for health service improvement. Verbatim quotes are used to explain and substantiate the data themes identified.

5.7.1.1 Socio-demographic Characteristics

There were 34 adult South African public health care professional participants, comprising of 1 White, 5 Indian, and 28 Black, of which 26 were female and 8 were male in the eight FGDs. The demographic of the FGD participants reflected the dominance of black people in the study environment. The gender imbalance of the 34 participants in the FGDs -26 (76%) females and 8 (24%) males validates the gender composition of the participants of a population-based research in the study setting (female vs. male: 76% vs. 24%). The data is presented in Fig. 48, below.

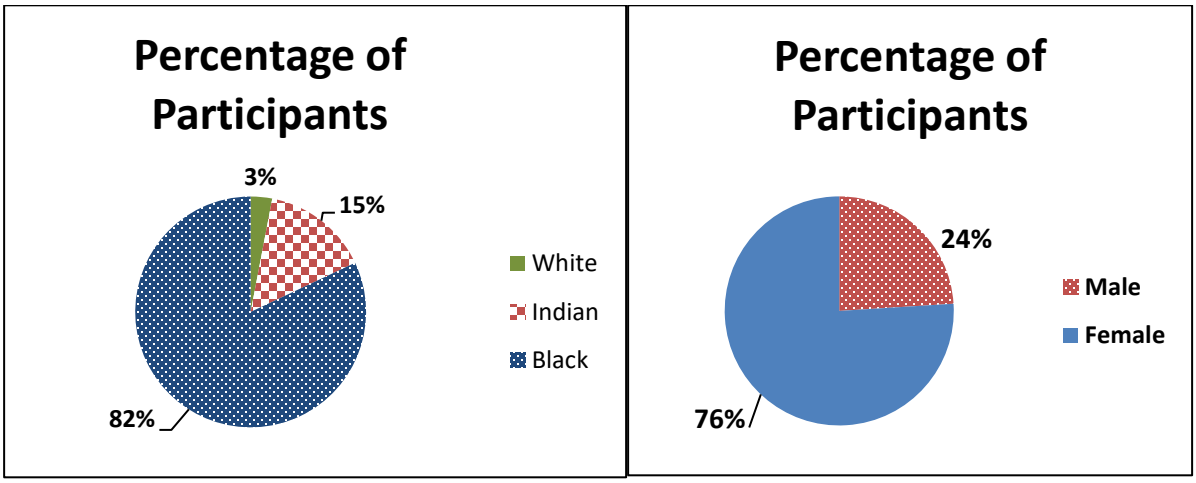


Fig. 48: Percentage distribution of participants in focus group interview in relation to race and gender

Within this mix of participants, the professional make-up consisted of 10 medical doctors (29%) and 24 authorized nurse practitioners (71%), comprising 10 Clinical Nurse Practitioners

(42%) and 14 were professional nurses (29%). Graphical presentation is shown below in Fig. 49. Of the authorized nurse prescriber group, 8.3 % were male and 91.7% were female with an age range of 40–55 years with between 15–20 years of nursing experience. The medical doctors on the other hand constituted 60% male and 40% female, which were much younger, within an age range.

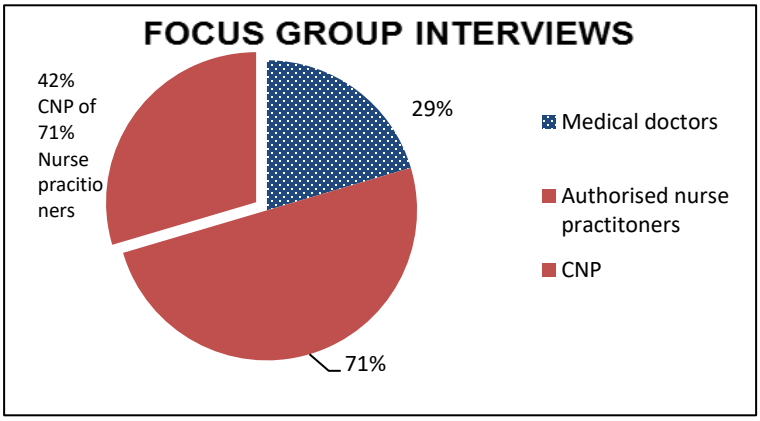
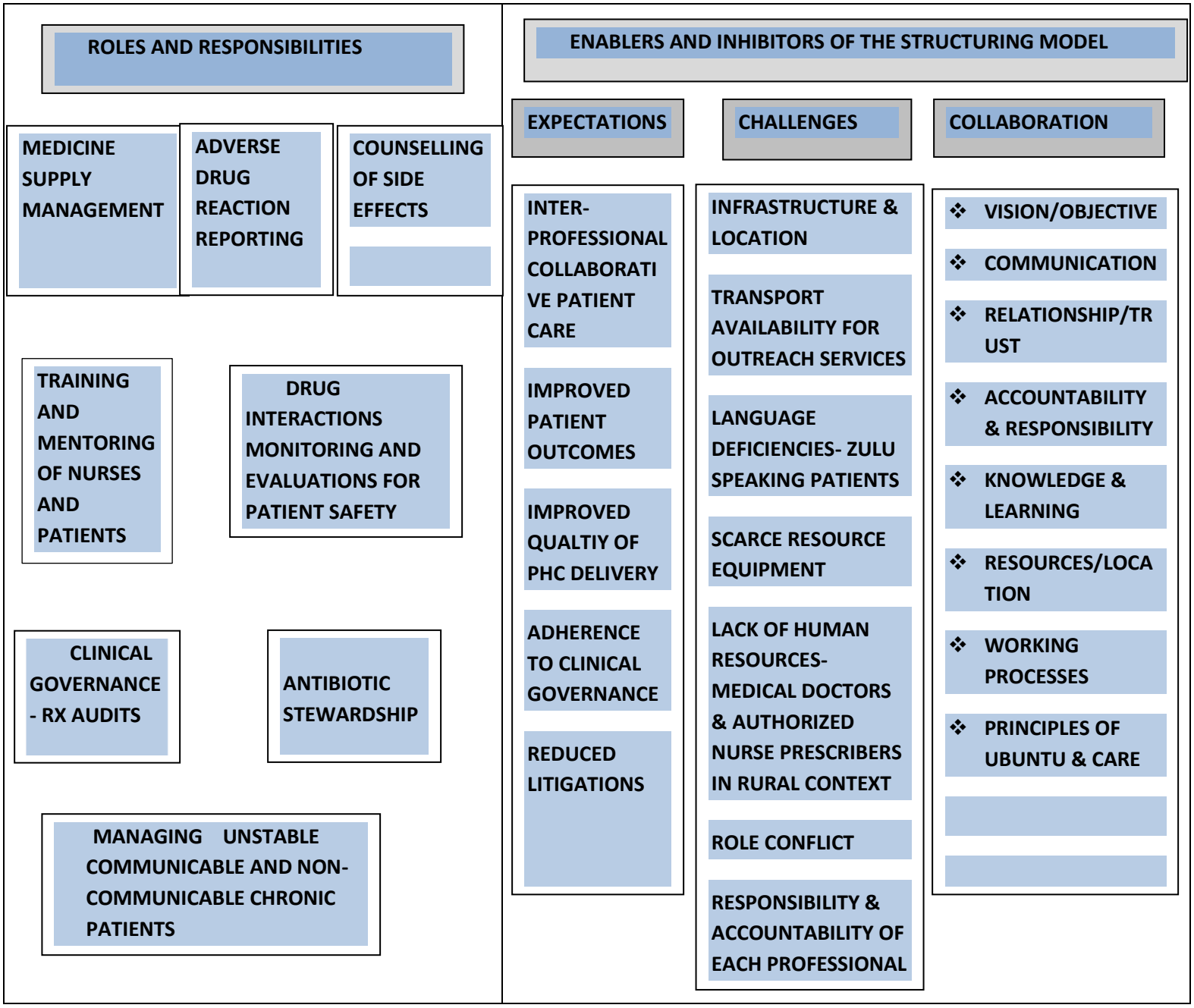


Fig. 49: Distribution of participants in focus group interview in relation to professional status

Table 16 summarizes the proposed pharmaceutical care model from the perceptions of the doctors, authorized nurse prescribers during the focus group interactions.

Table 16: Data Mapping of the Pharmaceutical Care Model for the Rural PHC Context- Perceptions of Doctors and Nurses on the Integration of PCDT Pharmacist at PHC



5.7.1.2 Themes Identified in Face-to-Face Group Interviews

The common elements identified by all or most of the participants in both, the doctor and authorized nurse group interviews are of particular interest. These focused on role clarity, resources and location, drug supply management, inter-professional collaboration, clinical governance, training of nursing staff, patient safety, vision & mission, quality of care, trust and communication, pharmacist development and training, responsibility and accountability (Biddle, 1979, Huxham, 1996; Carmichael et al. 1997; Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Farrel et al. 2008 & 2013). Discussions also positioned the challenges and expectations of PCDT pharmacist integration into existing PHC teams (Bradley et al. 2008; Jorgenson et al. 2013 & 2014). Although, agreement for the integration the PCDT pharmacist was welcomed of all participants, they were remarkably vocal that procurement and drug availability is the pharmacist forte, and hence, should remain an area they closely monitor. The discussions brought to the forefront the empathy, caring and Ubuntu 'way of thinking' that the majority of the public professional healthcare workers do possess, despite the often negative publicity that is portrayed.

Fig. 50 depicts the response rate collectively of the authorized nurse prescribers (24) and the medical doctors (10) in relation to each of the themes identified during focus group interviews.

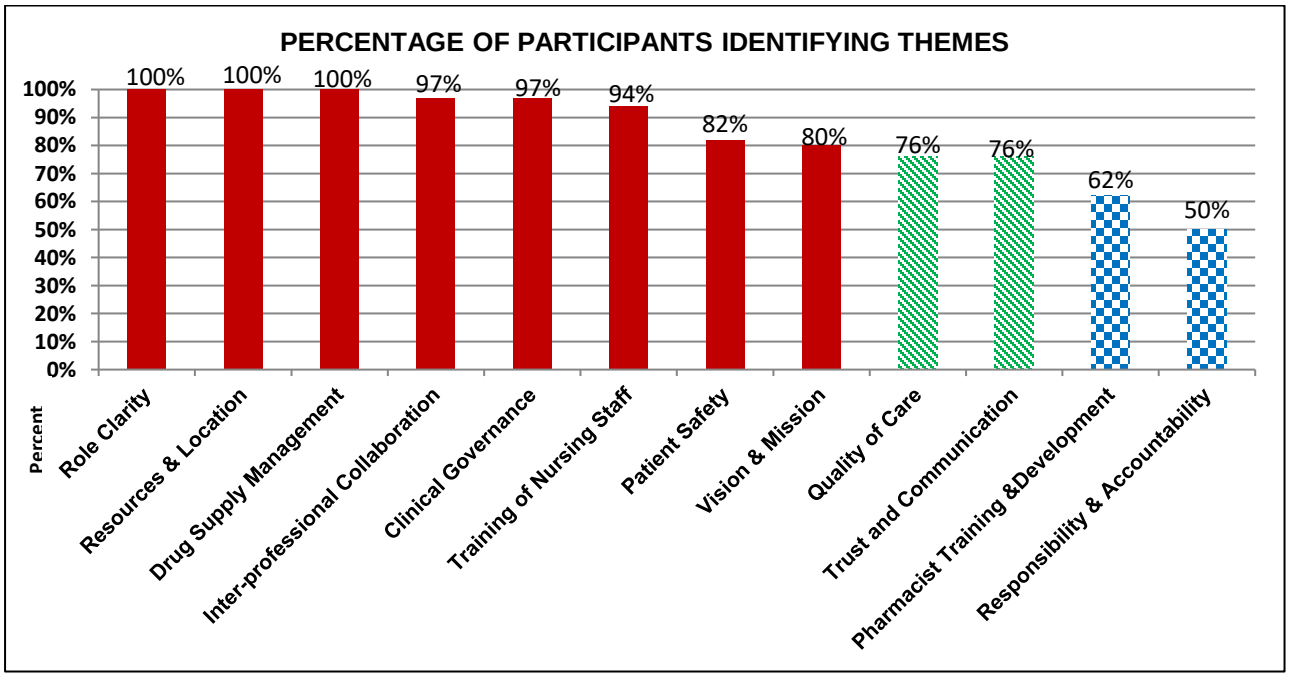


Fig. 50: Response rate collectively of participants in relation to the themes identified

Table 17 summarizes the responses of the participants in relation to the identified themes represented in Fig. 50.

Table 17: Comments of participants on identified themes

Comments on themes identified by 80-100% of participants	Comments on themes identified by 50- 79% of participants
• The participants in both categories unanimously agreed that role clarity is of paramount importance in the process of integration of the PCDT pharmacist into the public rural domain of healthcare provision • However, although new roles are being identified, it was unanimous that DSM still remain with the pharmacist • They in addition were in unison over resource (space and equipment) and location posing challenges to the integration, but 80% suggested an alternative to the PCDT being permanently stationed at the facility • A welcoming 97% of the participants firmly expressed their views on the positive impact they foresee in inter-professional collaboration and clinical governance with such an integration • 97% of the participants acknowledged the importance of clinical governance • A promising 94% identified training of the nursing staff by the PCDT pharmacist as an advantageous role to optimal care and patient outcomes • The element of patient safety saw an 82% in agreement that warrants such an integration for optimal care and patient outcomes • The importance of a vision and mission was agreed by 80% of the participants	• 76% of the participants anticipate enhancement in excellence regarding patient care with the pharmacist integration • The significance of trust and communication among the healthcare professionals working in collaboration was featured by 76% of the participants • Similarly, 76%, felt that quality of care can be improved with such an integration • A meagre 62 % of them cited the need for continuous Pharmacist training and development • The element of responsibility and accountability, remains an area for further improvement, as only 50 % cited its relevance

The results above are explained separately in relation to the authorized nurse prescribers and medical doctors collectively from both the districts.

5.7.1.2.1 Responses from Authorized Nurse Prescribers

The authorized nurse prescribers were 100% in favour of this new cadre of professional joining their team in what they perceived as their collective pursuit to achieve optimal patient outcomes. This resonated in the comments like "*the pharmacist knowledge definitely will benefit", and "will be of value*". A worthy note is the depth of passionate and positive

interaction received from the Clinical Nurse Practitioner (CNP) in relation to the professional nurse (PN). It was pleasantly observed that the CNP's displayed greater enthusiasm for the integration. Hailing from an intensified clinically orientated training, the CNP's were stimulated by the discussions and described the innovative change as a "*breath of fresh air*". Hence, a discussion of the identified themes is featured below:

a. Role clarity

The need for role clarity in medicine management cannot be over stated. Reference is made to ICRM (2015), report that identified roles and responsibilities for medication management not being clear within the public health care clinics. Therefore, not surprisingly, this theme encompassed unequivocal statements from 100% of the nurse participants agreeing that the "*PCDT Pharmacist role must be clearly defined*". This supports (Biddle, 1979 & 1986; Gilbert, 1999; Bryant et al. 2004; Idris, 2011) in respect of the importance of clearly defined roles. Engaging in the discussion brought to focus the roles that the prescribing nurses envisaged for the PCDT pharmacist integrating into PHC clinics. These roles are as follows:

- Referrals of the following patients to the Pharmacist
  - Patients with multiple diagnosis
  - Defaulters- patients that display non-adherence
  - ARV patients
  - Thyroid management
  - Epilepsy
  - MDR-TB
  - Paediatric patient with weight band dosage forms
  - Traditional/Herbal medication used concomitantly with conventional treatment or therapy
  - Psychiatric patients

However, these referrals must be standardized and structured to include feedback mechanisms as advocated by the ICRM report (2015).

- Training, empowerment and support, to assist nurses with medication knowledge

- Managing the chronic medication for those patients that are on Hospital based medication
- Steering Antibiotic Stewardship. It was highlighted that rapid patient movement presents a challenge to monitor and manage patients. In addition, the current disease profile of (HIV/Aids), warrants wide spread antibiotic usage
- Managing uncontrolled Diabetes and Hypertensive patients
- To improve the interaction between the Doctor and Nurse at the clinic level
- Overseeing or auditing of the prescriptions. This was referenced to the Zambian pharmaceutical model of care at PHC
- To optimize patient care
- To oversee procurement and drug availability
- Manage and screen drug interactions
- Counselling patients on possible side effects

The roles identified for the PCDT pharmacists by the nurses, supported Haynes et al. (2008), and Dalton & Bryne (2016), in addressing the need for inter-professional counselling of patients by nurses and pharmacists and preventing medication related problems, such as adverse drug reactions that impact on patient outcomes.

b. Resources and Location

The nursing sisters emphatically voiced their concerns over the current space constraint challenges. They mentioned that if and only if and when the PHC re-engineering strategies of NHI adequately addresses the infrastructure challenges, can the PHC facilities accommodate for the integration of the PCDT pharmacist on a permanent basis to be stationed at the facility. In the same breadth, though, not to dismiss the welcomed innovative change, 50% of them suggested support from the PCDT pharmacist to be as an outreach initiative in the interim. The support from the interviewees with regards to co-location was met facilitating a greater level of integration into primary health care teams than working separately (Huxham, 1996; Lasker et al. 2001; Vangen & Huxham, 2005 & 2010; Bradely et al. 2008; Rigby, 2010). However, more integrated visits of teaching, clinical audits and

consultation by a pharmacist have better overall impact than relocation according to McGranahan et al. (2002) and Hart et al. (2005).

c. Inter-professional Collaboration

The assumption made that inter-professional collaboration within a public domain is easier to be achieved was welcomed by the 100% response rate of the nurse practitioners. They did not view the integration as a threat, but rather as a "*benefit to the patients' outcomes*" (Bajcar et al. 2005; Vangen & Huxham, 2005 & 2010; Farrell et al. 2008; Rigby, 2010; Jorgenson et al. 2013 & 2014). The overall perception of caring and the Ubuntu philosophy came through in the discussions. This then accentuated the patients' need for a multi-disciplinary team as demonstrated by Thobeli (2007).

d. Clinical Governance & Quality of Care

In defining the roles of the PCDT pharmacist by the nurses, activities that were identified did encompass clinical governance. This revelation draws attention to the ICRM (2015), results which stated that the public health sector lacked clinical governance. Therefore, clinical governance can be addressed by enforcing its implementation through the efforts of the PCDT pharmacist. The discussions summed up the importance of quality of care by optimizing patient care. Hence, health care professionals have demonstrated responsiveness towards the changing of patients' needs. The nurses agreed that Pharmacists have the "*skills and knowledge to contribute to the quality use of medicines, to minimize medication misadventures and to assist patients to better manage their conditions and medication*". This perception similarly supported Thobeli (2007), wherein the nurses agreed that Pharmacists are better informed about medicine related patient rights. Hence, the incorporation of interdisciplinary clinical teachings, communication and relationships between the nurses and the pharmacists, will improve collaboration to achieve optimal medication management (Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Rigby, 2010).

e. Training of Nursing Staff

A response rate of 92 % (22/24) of the nurse participants, agreed that training is an avenue where the "*pharmacist can add value*". However, for the impact to be sustainable, the training must be routinely provided to "*make that difference*". Great emphasis was placed on community training of patients with respect to the side effects of medication, storage and disposal of medication as well as the creation of awareness to the various PHC campaigns Van Royen et al (2014) and Viljoen & Wesso (2017). Complementary synergy has been noted by Bajcar et al (2005), Vangen & Huxham (2005 & 2010), Huxham & Hubbert (2008), Rigby (2010), in advocating that inter-disciplinary teaching of pharmaco-therapeutics equips health professionals with a better understanding of their separate roles. In doing so, can enhance medicine use, and lessen preventable medication-related errors.

f. Patient Safety

Patient safety is the latest "buzz" words in healthcare and clinical governance. This theme featured prominently by 83% (20/24), citing concerns of the following:

- Patient's poor understanding of their medication
- Poor patient screening
- Non-compliance, due to non-adherence to return dates
- Over-prescribing of diabetic and hypertensive medication

The authorized nurse prescribers do believe that the Pharmacist, can most certainly assist them (the nurses) through training to manage such patients and ensure patient safety. Hence, pharmacists' interventions can deliver numerous risk management approaches to enhance medication safety for high-risk patients and disease states as well as to detect potential safety problems (Huxham & Hubbert, 2008; Rigby, 2010).

g. Vision & Mission for integration of Pharmaceutical care

Within the group, in addition almost 80% (19/24) agreed that by defining and communicating shared vision and goals makes things easy to implement. The clinical nurse practitioners, however, have already envisioned the mission that needs to be fostered. This aligns to Hertig

(2011) and Petch (2012 & 2014), who advocate that a vision and mission is essential to ensure the development of patient-centred services.

h. Trust & Relationship with Communication & Information Sharing

Under this theme, it was hypothesized by the researcher that in the public sector, health care professionals generally have good inter-personal relationships and communication with one another. The reasons were attributed to the non-profit gain and the common interest being 'the patient'. The 'caring' intentions of the team were observed, aligned to the importance of the principles of 'Caring' and 'Ubuntu". Moreover, it was cited by 79% (19/24) of the nurses that "*working in close proximity with the pharmacist will build a relationship and therefore good communication with one another*". This was further elaborated to concur with the others that by working together will allow for an inter-professional understanding of personality, skills, trust, respect and would allow for "*all-learn, all-teach*" approach that will be a '*win-win*' all round (the doctor-nurse-pharmacist) and most importantly the patient, highlighting the enablers of collaborative practice (Bryant et al. 2004; Vangen & Huxham, 2005; Lasker et al. 2001; Bradley et al. 2008; Huxham & Hubbert, 2008; Rigby, 2010). Reference were drawn to the comment made under the promotion of integration, which states "*fear of losing the pharmacist*". This further elaborated, explained that once the nurses developed relationships of trust with mutual communication and understanding with the Pharmacist, they would reap the benefits, which they demand, must be sustained. This concurred with the importance of trust to growing healthy professional teams that are in the patients' best interest to afford information sharing (Rigby, 2010) and ensures the elements of Pharmaceutical care (APhA, 2016). A known reality of the language barrier was also cited by 25% (6/24) of the nurse interviewees, highlighting an important barrier that will require attention to allow for the smooth transition of the pharmacist into the said context (Bradley et al. 2008; Jorgenson et al. 2013; Green & Johnson, 2015). Their trepidations were certainly worthy of intervention, as the majority of patients attended to are Zulu speaking and the PCDT pharmacist will need to be able to communicate to the patient in IsiZulu.

i. Pharmacist Development & Training

A response rate of 58% (14/24), of the nurse practitioner interviewees cited the need for pharmacist training and development. In a negative light, of this quota, 4% (1/24) raised concerns of the "over–qualification" of the pharmacist in this scenario and related this to the remuneration package of benefits that it might bring, which was felt that this was not a priority for the public service at this point in time, given all the present scarcities and adversities. On the other more positive note, 54% (13/24) of the nurses, of which 42% (10/24) being CNP's, recognized the qualification and expertise of the PCDT pharmacist to "*benefit the PHC setting*". Hence, inadequate pharmacist training for the PHC and CHC context will bring about conflict, resentment and diminish the faith their fellow colleagues have for them, this is cited as a documented barrier (Tann et al. 1996; FIP, 2002; Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Bonanno et al. 2012; Jorgenson et al. 2013 & 2014).

j. Responsibility & Accountability

This theme was not very eagerly discussed by the nurse practitioners, drawing similarity to the ICRM (2015), report findings that identified a lack of accountability within the public healthcare clinics. Only 29% (7/24), 20% being CNP's, expressed confidence in their practice to allow them to bear responsibility and accountability. The interaction, however, favoured the introduction of the PCDT pharmacist, who will then share this role with the medical doctors and themselves. In addition, feelings of concern over the management of pharmaceuticals were strongly expressed, by all 42% of the CNP's favouring the pharmacy team of a pharmacist and assistant with the central dispensary for improved management. They were also very vocal in the unnecessary wastage of pharmaceuticals without dedicated, constant monitoring. They expressed that this responsibility is primarily that of the pharmacy team. Hence, the salient interaction, stressed the importance of a pharmacist's assertiveness regarding ownership of responsibility and accountability in such an integrated work space (Bajcar et al. 2005; Bradley et al. 2008; Jorgenson et al. 2013).

k. Challenges

The challenges came under discussion in twofold. Firstly, the nurses identified and aired their current challenges at the clinic. They agreed that a number of factors (outlined below) would assist to alleviate these challenges. Secondly, they cited challenges that would pose impediment to the integration. The dynamic interactions suggested challenges that the nursing staff at PHC are currently experiencing that validate and promote the pharmacist integration. The following factors cited supported the promotion of the Integration of the PCDT pharmacist:

- Lack of Good Pharmacy Practice (GPP) at PHC- mainly MSM
- High volume of Patients at clinics
- Referral of patients from the Sister to the Doctor at CHC, which is not welcomed by the doctor, citing that the Nursing Sister should be able to manage the patient as aligned to EDL/PC101/APC. Sisters claim that they are not equipped to manage the referred patient at nurse level of care. This highlighted conflict!
- Although "*Fear of losing the pharmacist, once they were contracted or assigned to the clinics*" was surprisingly shared by a 21% (5/24) of the nurse interviewees, it remains worthy of note. This merely, accentuates the potential "*benefit that the pharmacist can display*" within the rural context that the nurses alluded to at the conception of the interviews.
- Shortage of clinical nurse practitioners, further promotes the need for intervention of prescribing
- Shortage of nursing staff at the clinic is "*draining our power"* to render holistic care, resulting in litigation
- Nurses are over-worked and overburdened. The difficulty of remotely contacting the doctor or the pharmacist at the Hospital was painfully shared.
- Too many programmes decentralized to PHC for management, where Pharmacist can assist
- Health education, once the mainstay of the nursing profession, has been side tracked with their numerous responsibilities at the clinic. Pharmacists can assist with "*explanation about patients' treatments*"

- Doctors write up prescriptions and refer to the nurse at PHC to dispense medication. Doctors don't dispense their own prescriptions – pharmacist or Pharmacist Assistant can assist in these areas
- Patient rapid movement within PHC clinics or districts presents a challenge for managing their treatment. The presence of the Pharmacist can alter this perception and the need for "*clinic-hopping*"
- Failing to make a diagnosis with no doctor available, nursing sisters are forced to refer patients to the Hospital
- Nurses saw the integration as a roving team pharmacist more of a practical solution

Therefore, understanding these factors will assist pharmacists integrating into the said context, knowing what to expect, what is expected of them and understanding their role as well as their colleagues', to allow for successful collaboration (Bradley et al. 2008; Jorgenson et al. 2013 & 2014).

The following were barriers cited by the respondents that will impede the Integration of the PCDT pharmacist into PHC:

- The current infrastructure challenges will present space constraints to accommodate the pharmacist to allow for adequate consulting
- It will "*disrupt the flow of work*" at present
- Language, seen as a communication barrier, as majority of patients are Zulu speaking- the need to be able to communicate to the patient in IsiZulu
- Human Resource- shortage of staff in the public sector, both nursing and doctors- "*will there be enough Pharmacists*?"
- A view that threw the 'spanner in the works' so to speak, was a comment voiced by a nursing sister that saw the integration as a "*luxury, as a pharmacist get paid a lot at present*". The thinking arose from a monetary gain perspective for that pharmacist, having the '*extra qualification'*, will now be earning more than the present pharmacist and the nursing staff. The explanation further elaborated the concern that the clinic has "*too many problems and this is not a priority now*".

The importance of addressing the barriers to including the pharmacist within primary health care teams must in no way be overlooked (Jorgenson et al. 2013). Only then, can the elements of structure of Pharmaceutical care be successfully instituted (APhA, 2016).

I. Expectations of The Pharmacist in the Team

When engaged in the discussion over the expectations that the nurses have of the pharmacist integrating, the favourable response received was that it is "*more promising than challenging*". They hence, welcomed inter-professional collaboration in medicine use. The nurses, 83% (20/24), place utmost importance on availability of medication and the pharmacist being readily available to assist with alternatives and improving patient care and ultimately the quality of PHC and CHC service delivery. According to Jorgenson et al. (2013), primary healthcare team members' expectations regarding the pharmacists' responsibilities must be clear. Subsequently, this approach will certainly address the shortcomings that the ICRM (2015), reported on in terms of medication stock-outs, lack of clinical governance and poor patient continuum of care.

5.7.1.2.2 Responses from Doctors

The doctor's engagements surprisingly came with very passionate responses, with 100% (10/10) agreeing that the importance of defining the pharmacist role cannot be understated. They emphasized the need to "*define the role and put it on paper*"- "*have clear scope with limitations*" and "*there is no need to have conflict*". These observations and remarks were refreshing and supported role theory (Biddle, 1979 & 1986; Bryant et al. 2004; Idris, 2011), yet conflict with documented evidence with regards to the doctors' viewpoints towards pharmacists and their contribution to better manage medication (Gilbert, 1998 a, b, c; 2001; 2004) which is seen as a barrier, must be overcome for integration of the pharmacist into primary health care teams to be achieved (Bradley et al. 2008; Jorgenson et al. 2013 & 2014).

a. Role Clarity

The anticipated roles that 90% (9/10), of the doctors predicted for the Pharmacist at PHC clinics are:

- Advisory capacity/support
- Clinical support
- Assisting with doses, adjusting doses
- Dealing with minor ailments
- Identifying potential Drug interactions/ Side effects
- Assisting with ARV's and nurses with IMCI programme on children's regimens
- Patient and nurse Education
- Adverse drug reaction reporting and monitoring
- Reviewing of problem prescriptions
- Improving the quality of prescriptions
- "*Patient will be optimized on treatment, more a pharmacological problem and not a diagnostic one*"
- Offering clinical governance

b. Resources and Location

Similarly, 100% of the medical doctors expressed grave concerns over the resource deficiencies presently at PHC clinics. They, however, favoured the CHC's more over the PHC's for the integration, in relation to the adequate space and infrastructure to afford co-location of the healthcare professionals. The medical doctors also highlighted the location benefit of the PCDT pharmacist within the vicinity of the authorized nurse practitioners, supporting that 'geographical isolation' and 'separate premises' are integration barriers for pharmacists into PHC (Lasker et al. 2001; Huxham & Hubbert, 2008; Rigby, 2010).

c. Training, development and Inter-professional collaboration

As a pharmacist, I was humbled by one medical doctor that stood out from the rest. He admirably stated his support for a pharmacist and nurse "*for one to learn, don't make yourself bigger than the person next to you, because at some point in time you may miss something.*" He further went on to explain that as a doctor he learnt to "*stay close to the nurses, learn from them, they will teach you the small details that you don't get from a text book*." His remarks of collaboration that resonated through the room encouraged the others to think and add to the

discussion, most were inspired by him further commenting that, "*one thing you should know; you can never know everything. Work hand-in-hand- respect everyone's profession- if you are humble enough to allow the other person to show and tell you what they think, agree to argue with evidence, you will learn from each other*." According to, Lasker et al. (2001); Vangen & Huxham (2005 & 2010); Huxham & Hubbert (2008); Rigby (2010); Nancarrow (2013), and Jorgenson (2013 & 2014), it is the same inter-disciplinary teachings that arouse appreciation for each other's profession. It was refreshing to sense feelings of '*passion*', '*caring*' and the '*Ubuntu*' concepts during the discussions with the doctors, over an innovative strategy for the patients' benefit.

This doctor also bravely and devotedly referenced that "*there is a tendency with some health professionals wanting to be known that I hold this position and it's bigger than yours*" He remarked that "*it's useless*! *And the nurses will step back*". The discussions, thereon, were encouragingly very positive. Others, freely shared their interactions with pharmacists that either "*saved them from serious consequences*", or "*possible litigation*". The doctors moreover, highlighted their respect for "*the Pharmacists knowledge on pharmacokinetics*" adding that this "*is a valuable tool to ensure better patient outcomes*". Such interdisciplinary exchanges of pharmacotherapy will provide health professionals with a greater appreciation for their colleague's expertise and highlight their respective roles, supporting collaborative practice (Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Rigby, 2010; Nancarrow, 2013; Jorgenson et al. 2013 & 2014).

On a more empowering note, some doctors occasionally "*try and teach*" the nurses by presenting case seminars, their time at the clinic, however, is very restricted and the material too is not always relevant to all. 100% of the Doctors also expressed feelings of demotivation by the frequent rotation of the nursing staff. It was therefore, agreed (100% of the medical doctors), that with the pharmacist integration at PHC, familiarity with deficiencies in nursing staff competencies can be adequately assessed. Pharmacists, hence can play a "*vital role*" in supportive training, with continuous updating of the nurses, by way of presentations to "*improve the quality and service delivery*" to the patients. For the integration to achieve the desired outcome, the doctors optimistically, alluded to the importance of the Pharmacists

being "*confident*". They, in the similar breath, expressed the crucial need for "*routine academic meetings*" and very emphatically called for "*no finger-pointing*", not to undermine the professional.

In summary, it was clear that an avenue for supportive training and empowering of sisters and doctors at the clinic awaits the pharmacists as professionals. Doctors too- 90% (9/10), were humbled enough by the discussion to acknowledge the importance of inter-professional collaboration and welcomed the proposal for potential interaction of the pharmacist in the future. The discussions only affirmed that teamwork, communication and collaboration between health professionals' bare importance for safe and effective health care delivery (Institute of Medicine, 2000; Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Jorgenson et al. 2013 & 2014).

d. Clinical Governance & Quality of Care

The medical doctors, 80% (8/10), of them valued the interaction they received at present with the pharmacist at hospital level. The comments made that "*it's comforting to know that pharmacists are there to check the prescription before it is dispensed*" and "*I even wake them up at night for advice*", exemplifies the good working relationships some doctors have, to ensure optimal clinical outcomes and hence quality of patient care delivered. This clinical governance culture, if built upon, can give rise to clinical care excellence (HST, 2014). The shared experiences of good inter-professional working relationships currently, only exemplify the ease with which such integration and acceptance of the pharmacist into the PHC context will be welcomed as the "traditional relationship between the doctor as prescriber, and the pharmacist as the dispenser, is no longer appropriate alone to ensure safety, effectiveness and adherence to therapy" (Rigby, 2010). Furthermore, pharmacists are equipped with both, skill and knowledge, affording quality use of medicines and minimizing medication misadventures (Vangen & Huxham, 2005 & 2010; Huxham & Hubbert, 2008; Rigby, 2010).

e. Patient Safety

The interview of the medical doctors displayed an 80% (8/10) concern over patient safety or the lack thereof within the public sector healthcare. They were of opinion that the PCDT pharmacist can definitely be a "*watchdog*" in identifying prescription errors and in doing avoid possible litigation and gross patient safety incidents. Similarly, pharmacists have the knowledge to help patients better manage their medicine (Rigby, 2010; Van Royen et al. 2014; Viljoen & Wesso, 2017).

f. Vision & Mission for integration of Pharmaceutical care

In addition, within the doctors group 80% (8/10) agreed that by defining and communicating shared vision and goals makes things easy to implement. They went on further to elaborate that this must be incorporated within the District structure and be included in their collective vision and mission. Support of literature voices the need for a vision and mission to ensure patient- centredness (Hertig, 2011; Petch, 2012 & 2014), of which a lack thereof featured strongly as a result finding in ICRM (2015).

g. Trust & Communication

In the public sector, health care professionals generally tend to have good communication and relationships with one another. This hypothesis was welcomed by 70% (7/10) of the positive responses of the doctors, stated below:

- "*Nice to know there is an extra colleague to lean on*"
- "*We rely on the pharmacist for advice on medication treatment*"
- "*Pharmacists' voice is respected- potential for a role at PHC, to develop a relationship with the nurses*"
- When compared to a doctor the "*Pharmacist less intimidating to approach*" was a strong point noted.

The respect and acceptance of each disciplines scope of practice, drawing on inter-professional awareness supports Vangen & Huxham (2005 & 2010); Nancarrow (2013). In light of medicine supply management, it was surprisingly brought to attention by the doctors

that there is a gap in communication between the Mother Hospital pharmacy that supports the PHC clinics. Stock outs and Off-code pharmaceuticals are not communicated to the nursing staff. Hence, the need for building of trust and collaboration amongst the healthcare professionals is required. Communication and understanding and appreciation of teamwork go hand-in-hand and grows over time to allow for safe and effective delivery of healthcare (IOM, 2000; Rigby, 2010; Jorgenson et al. 2013 & 2014).

h. Pharmacist Development & Training

A response rate of 70% (7/10), of the medical doctors cited the Pharmacist development and training as an important criterion for their integration. The extent of the PCDT pharmacist clinical knowledge was questioned. Doctors, however, felt comfortable to work in collaboration with the PCDT pharmacist, if there is regular continuous professional development recorded. Reference to Tann et al. (1996); FIP (2002); Bonanno et al. (2012), and Jorgenson et al. (2013 & 2014), highlights the doctors' concern and cites the inadequacy of pharmacists training as a barrier to integration.

i. Responsibility & Accountability

For most part the discussion around the elements of responsibility and accountability with inter-professional collaboration sparked off the seriousness of "*litigation*". Much time was spent on this engagement, resulting in 70% of the doctors agreeing that the time has come to "*work hand-in-hand*" with all professions, more so with the pharmacist. In light of who bears accountability and responsibility given the integration of professionals, it was lucidly stated that this can be "*achieved by careful documentation on a patient's file*" by the individual prescribers, namely the doctors, the authorized nurse prescribers and the new addition- the PCDT pharmacist, to ensure "*proper record tracking*". The doctors (50%-5/10) in addition explained that their dilemma most often is that "*nurses don't ask patients- they just prescribe medication that is sometimes not required by the patients, it is then difficult to remove the items and explain, why to patients*." Furthermore, doctors cited "*outside competition*" from "*Traditional Healers*" and also "*churches*" has very real stumbling blocks in patient care management. Doctors unequivocally questioned "*who will protect the prescriber in the case*

of lawsuits?" highlighting the dire need for professional accountability and responsibility of Traditional Healers (Tshehla, 2015).

In this vein of thought, came the acknowledgement by the doctors that generally the "*community listens to a Pharmacist, they have the understanding that a pharmacist knows best*", highlighting that the presence of the pharmacist in the PHC context can "*benefit the community and the nursing staff*". However, to strengthen and validate this assertion, they advised that the need to "*explore community perceptions*" must definitely not be overlooked, for buy-in for the PCDT Pharmacist integration. Although responsibility and accountability should follow with one's professionalism, these traits are often transferred to others, and with the pharmacists' integration into PHC, fear of the pharmacists bearing all responsibility needs to be guarded against and they need to display assertiveness, as advocated by Jorgenson et al. (2013 & 2014), in addition, to Bradley et al. (2008), in promoting interprofessional collaboration amongst the healthcare team members, which only builds a reliance on goodwill and trust-based relationships, given time and effort from all concerned.

j. Challenges

Location and resources were cited as challenges for the pharmacist integration. The doctors explained this in relation to cost implications, space and transport. Having worked, within the public sector for some time, many did not ascribe too much concern to these challenges, describing them "*as the way we are accustomed to working*". However, location and space are documented barriers to pharmacist integration in the primary health care teams (Rigby, 2010; Jorgenson et al. 2013). Their greater focus was on the clinical capacity of the pharmacist, questioning the "*depth and extent of the clinical knowledge of the PCDT pharmacist"*, reflecting on the impact of role clarification (Idris, 2011 and Bryant el al. 2004).

In addition, the doctors raised the concerns that "*Doctor's outreach is very limited with time*", and "*with the known current human resource problem, will there be enough pharmacists to manage this role*?" They further commented that for the pharmacist integration to be of any "*value*", time and sustainability must be factored into. The discussion over roles brought to focus that "*role conflict can present a problem*." The concern that came to light was the "*egos*

clash" syndrome, which can be easily overcome by "*clearly defined roles*", as demonstrated below in training and collaboration. Litigation featured high in the ranks of challenges. Doctors voiced their apprehensions over the additional cadre (Pharmacists) with prescribing rights. This translated to "*who will bear the responsibility for the litigation*". They openly expressed that in the current public context, with the nurses prescribing; they, the doctors tend to bear the accountability which accounts for the major challenges from the nurses themselves, drawing attention to the role professional conflict can have on their integration (Idris, 2011; Bryant et al. 2004; Bradley et al. 2008; Jorgenson et al. 2013 7 2014).

k. Expectations

It was observed that despite the initial passion that the integration of a pharmacist into PHC was met with by the doctors, their concerns was that the "*sisters tend to up- refer patients for the doctors to see, purely for reasons of non-availability of the medication at the clinic*." They strongly suggested that more attention to the need for greater emphasis on optimal stock management at the clinic is required by the pharmacist. In essence, Pharmacists must not lose sight of ensuring availability of essential, required medication at the PHC level. Doctors do believe that with the integration of the pharmacist "*service delivery will be optimized in patient care*." Their views on being able to sustain the service rendered by the pharmacist, once agreed and implemented, is that "*the pharmacist visiting a clinic, must be permanent and not rotated, so relationships and trust can be developed among the nurses*". They finally concluded on a positive note to re-iterate that the pharmacist's integration into the public domain "*can have a lot of positives.*" Such cooperation and acceptance of the pharmacist into the doctors' domain, displays support that will ensure success (Bradely et al. 2008 and Jorgenson et al. 2013).

5.7.1.3 Interpretation of Results

A range of both quantitative (SAPC Inspection questionnaire, questionnaires, and a methodical review) and qualitative (individual informant interviews, focus groups with authorized nurse prescribers and medical doctors) methods were adopted in the research. Hence, the diversity of the two methods applied allowed methodological triangulation of the

diverse perspectives, since data was gathered from more than one participant group (informants, authorized nurse prescribers, pharmacists and medical doctors within the public primary healthcare domain).

A summary of the themes identified as enablers to the integration of the PCDT pharmacist into PHC teams is presented in Table 18.

Table 18: Summary of themes identified in the research as enablers to the integration of the PCDT pharmacist into PHC teams, with agreement between research components identified

Theme	Systematic review	Qualitative study: Authorized Nurse prescribers	Qualitative study: Medical Doctors	Qualitative study: Informants	Questionnaire
Role Clarity	X	X	X	X	X
Patient Safety-engagement with counselling	X	X	X	X	X
Clinical Governance	X	X	X	X	X
Training and Development of Nurses	X	X	X	X	X
Drug Supply Management	X	X	X	X	X
Inter-professional collaboration	X	X	X	X	X
Training and development of Pharmacists	X		X	X	
Relationship & Trust	X	X	X	X	X

Vision & Mission	**X**	**X**	**X**	**X**	
Quality of Care	**X**	**X**	**X**	**X**	**X**
Communication and Information sharing	**X**	**X**	**X**	**X**	**X**
Resources & Location	**X**	**X**	**X**	**X**	
Responsibility & Accountability	**X**		**X**	**X**	

In Table 18, the absence of a theme in a particular research, reflected participants' silence on that theme. The identified themes shaped the role clarity method in the proposed framework

From the overall results presented, the established 'pharmacist role' can be summarized to include tasks of a clinician, mentor or educator, a manager, administrator and most importantly a personal carer.

5.7.1.3.1 Role Clarity and proposed Role of PCDT Pharmacist

A narative review of the literature showed a reliable finding among all components of the qualitative and quantitative study, and that role clarity within occupational status is a vital component for consideration before embarking on integrating the PCDT pharmacist into the rural PHC environment. Issues that were raised was that by postulating the role that the PCDT pharmacist will perform, will avoid conflict and elucidate the expectations and any misconceptions with regards to role overlap among the current healthcare professionals working within the rural context. This validates theory in that "Role theory concerns one of the most important features of social life, characteristic behaviour patterns or roles. It explains roles by presuming that persons are members of social positions and hold expectations for their own behaviours and those of other persons" (Biddle, 1979 & 1986; Bajcar et al. 2005; Bryant et al. 2004; Idris, 2011).

In addition, the perspective of role theory suggests that institutions are rational, constant units and that all encounters involve role conflict, which when resolved will ensure employees are again happy and productive (Biddle, 1979 & 1986). The viewpoint that all healthcare professionals will accept the roles envisaged for the PCDT pharmacist and appreciate the skills set contribution in all working towards a positive outcome for the patient was strongly expressed. This finding supports FIP (2016), in highlighting that the main criteria that should guide the development of new roles for pharmacists and other health professionals should be to deliver a more patient-centred care with greater teamwork. This approach is fundamental to solving medication problems and improving the quality of life of its users (Barberato et al, 2019). A strong reflection was made on the need for a pharmacist, and not ideally that of a PCDT pharmacist (a non-prescribing, non-dispensing clinical pharmacist) to be integrated into the multidisciplinary primary care team as an alternative model of care to embrace the crafted roles. Participants further advocated pharmacy services with clear specifications, as highlighted below, which focused on interventions to reduce variability in service delivery and quality (Hindi et al, 2019). Therefore, for this to be realised, all stressed the importance of having an appropriate system to share relevant information.

They demonstrated a welcomed approach towards the therapeutic alliance with the pharmacist. This affirms SAPC's recommendations and support of the "Co-operation with specifically the nursing profession" (SAPC, 1995a). In addition, the issues of professional autonomy and boundary disputes between occupations were confronted (Gilbert, 1997; 1999), by engaging in meaningful interactions with the responsible professionals within the PHC and CHC context on efficient use of human health resources. Hence, support for the Pharmacist integration was further validated by evidence of the diverse advanced roles that Pharmacists can play to deliver high healthcare cost savings (FIP, 2016; Dalton & Bryne, 2016). Such an integration was identified to be on a daily basis within the same physical space. This direct contact with the pharmacist can improve physicians' knowledge of pharmacists' competencies (Blondal et al, 2019), and embrace a collaborative approach for information sharing, thereby building and strengthening professional realtionships to maximize efficiency (Schindel et al, 2019). Having this end to be fulfilled though, would require, additional clinical skill and training to be remodelled. The concept of collaborative

patient care made compelling arguments in favour of patients, physicians, and pharmacists in varying degrees (Schindel et al, 2019).

Fig. 51 & Fig 52 is a pictorial representation of the consolidated identified role for the PCDT pharmacist or pharmacist, within the rural public PHC context as proposed by the authorized nurse prescribers, medical doctors and the pharmacist.

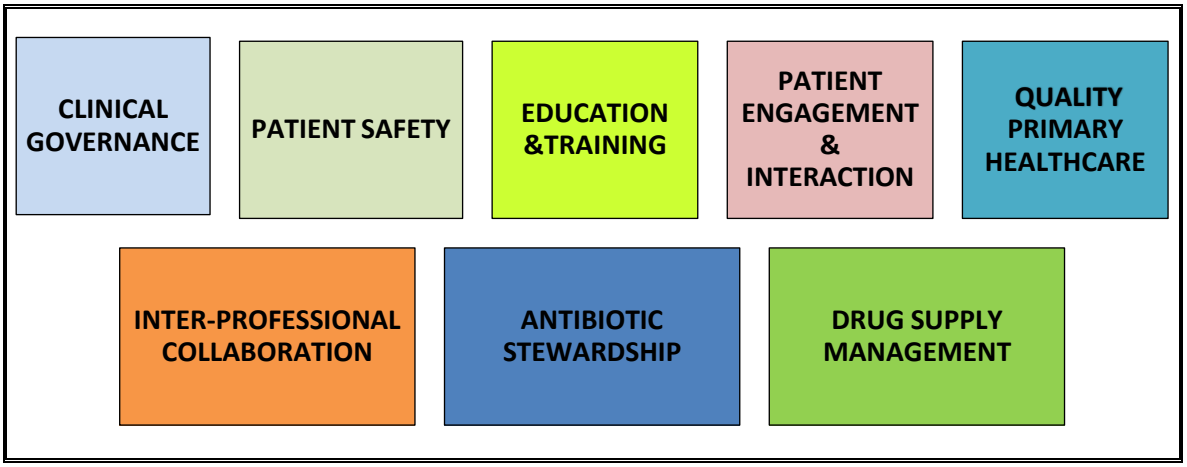


Fig. 51: Consolidated identified role for the PCDT pharmacist within the rural context

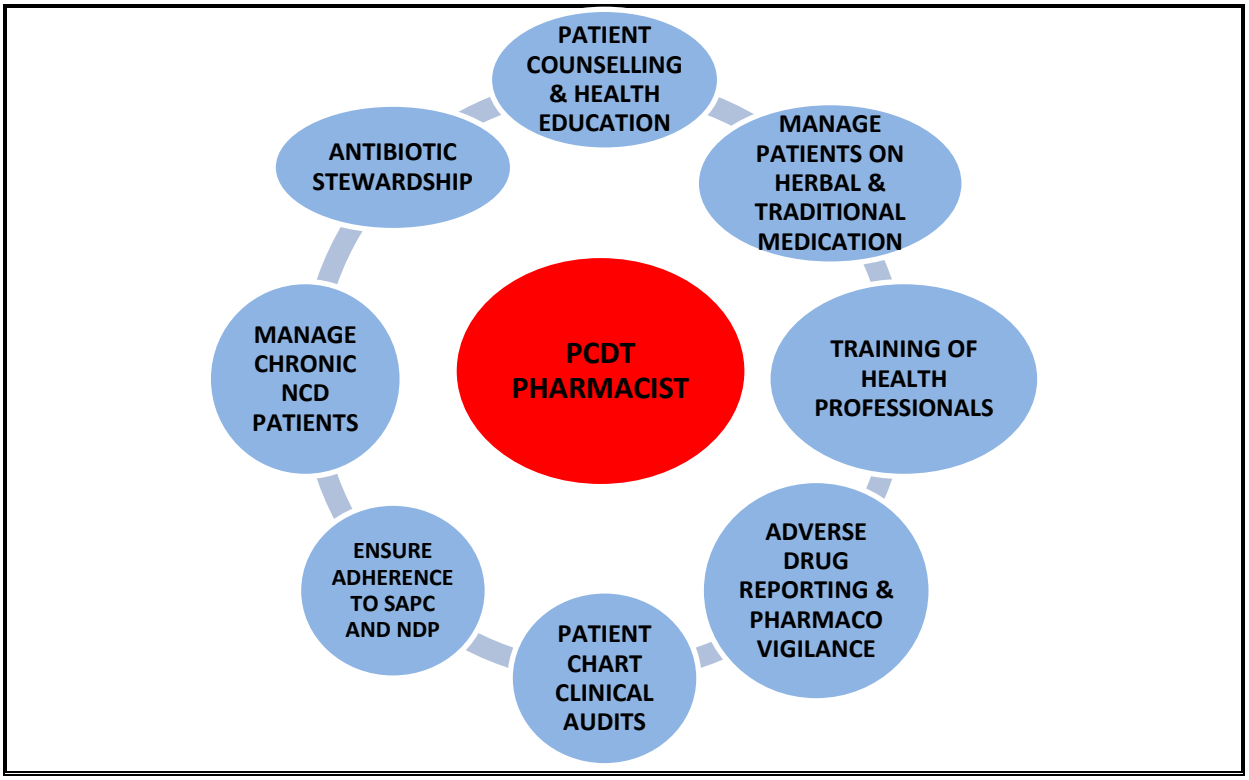


Fig. 52: Proposed activities of the PCDT pharmacists

Furthermore, it is vitally important to illustrate the percentage of participants that were in agreement with the proposed Roles (Fig. 53).

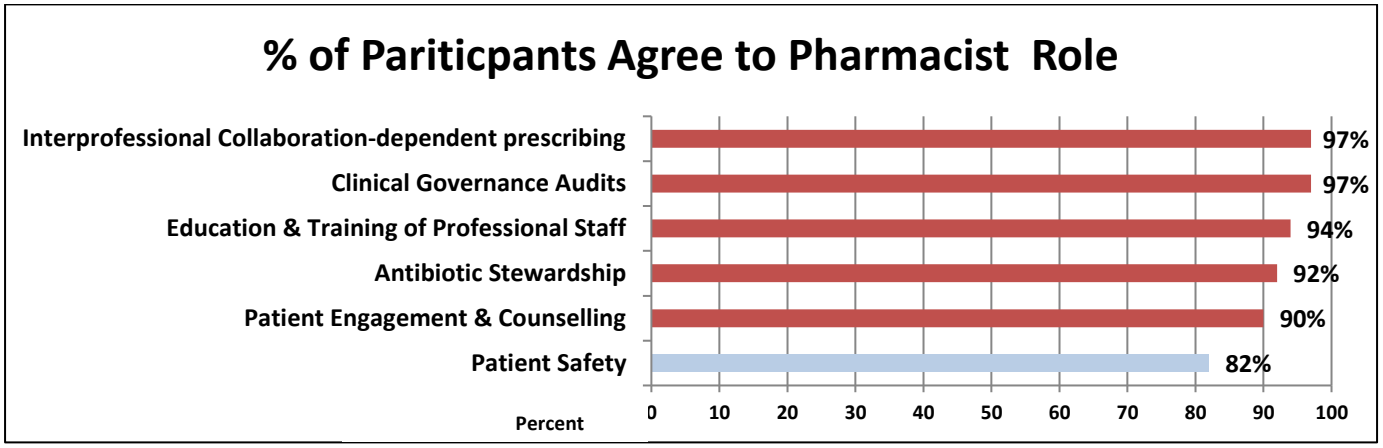


Fig. 53: Participants agreeing to the proposed role

5.7.1.3.2 Barriers to Integration of PCDT Pharmacist

In addition, the following themes were ascertained as potential barriers to the integration of the PCDT pharmacist (Fig. 54).

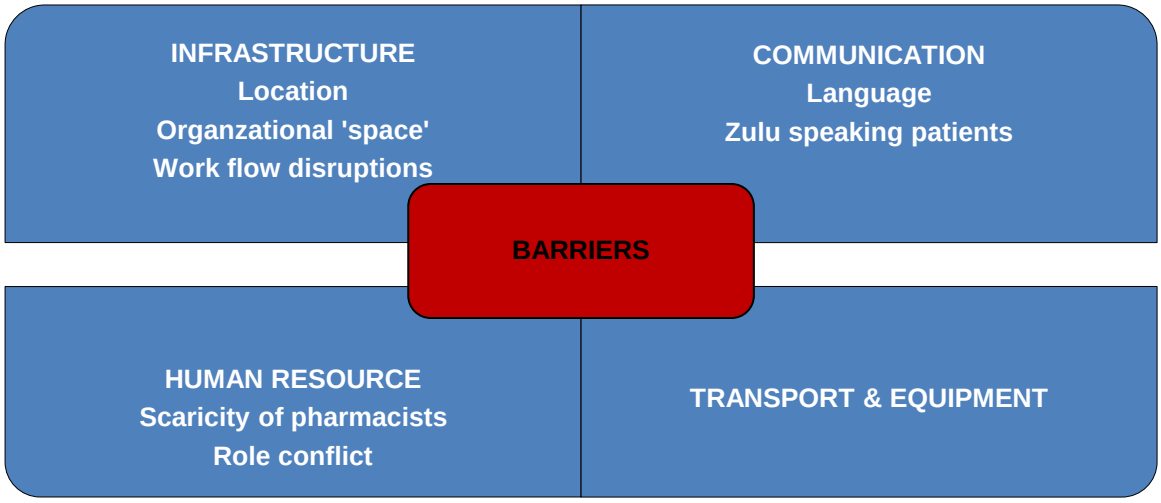


Fig. 54: Barriers to Integration of PCDT Pharmacist

As identified by the participants, the above resource constraints were cited limiting pharmaceutical care implementation (Bradley et al. 2008; Ogbonna et al. 2015). The barriers

are further exemplified by Blondal et al, (2019), as the lack of time and attitude or opinion of other professionals, clinical education, communication skills, and remuneration, while, Schindel et al, (2019), eluded to the collaborative team approach to information sharing that is best suited in a particular practice setting and location. The location, including space, size and poor quality of consultation rooms was cited as impediments that created doubt in both patients and GPs of the pharmacist's potential to expand patient care planning services (Hindi et al, 2019). However, for the ideal, the required investment in the linkage of actions among the professions and incorporation of new knowledge and practices, apart from the preservation of specificities of each profession to overcome fragmentation of the services (Barberato et al, 2019) can be reached, alongside understanding the barriers to be addressed before integration initiatives can be made.

5.8 PCDT Pharmacist Intervention- Action Research in Ugu North PHC Clinics

A written proposal (Appendix 12), was forwarded to the District Pharmacy Manager of Ugu, detailing a quality improvement strategy of the PCDT Pharmacist intervention at the Ugu North PHC clinics (letter dated 5 June 2018). This initiative is a bold, innovative, 'out of the box' cutting edge, action type research, given the availability of qualified PCDT pharmacists in the public service at GJ Crookes Hospital to investigate the impact that can be made. It is hence, work in progress as illustrated by training questionnaires (Appendix 12A, 12B, 12C, and 12D), directed to the authorized nurse prescribers within the PHC clinics under indirect control of the Mother Hospital.

5.9 Proposed ICDM Model Integration with Pharmaceutical Care

At present, after inception of the ICDM model in 2012, CCMDD took the PHC facilities by storm, given its own challenges. One might argue then, with all new initiatives and with numerous programmes that continue to be decentralized to PHC level, why the need for another model of care? The evidence and literature presented does speak volumes in favour of this need. Therefore, the ICDM Model approach to which the Collaborative Pharmaceutical Care Model proposed assimilation is envisaged as follows:

It is under the clinical management support aspect of the ICDM model that the integration of pharmaceutical care proposed model will feature the following (Asmal & Ozayr, 2012):

- The patient follow-up record will extensively cover an in depth patient history taking record, which is presently the limiting factor. Step-by-step guidelines, allows for a comprehensive record, to allow for management of the patient's chronic condition.
- PC 101, now termed APC- Adult Primary Care is a clinical guideline, and adopts a symptom based approach and guides a standardized format for routine care and chronic treatment. It allows for examination, diagnosis and treatment as per STG's and the PHC EDL.

The medication record will have precise current treatment, having consulted with the PC101 guideline. The Clinical support will include copies of PC101 guideline for PN's managing chronic patients. Each facility will have a facility trainer empowered and capacitated on the methodology of train-the-trainer. This will be followed by a maintenance programme to ensure strengthening of clinical care by service providers. Similarly, the supportive supervision by the DCST within this PC model will focus on (Asmal & Ozayr, 2012):

- activities of facilitation
- integration and coordination of staff
- services, programmes and packages of care
- Surveillance, monitoring and evaluation

The primary role of the district clinical specialist team is one of supportive supervision and clinical governance by exercising control over the quality of care through mentoring and supervising the delivery process of care and by performing clinical audits of the healthcare professionals. This team, in addition, strengthens the referral system between PHC clinics and referral hospitals and is not responsible for direct delivery of clinical services (Asmal & Ozayr, 2012). At present this team's intervention requires strengthening to meet the intended purpose of the ICDM model. The action research alluded to above, demonstrated a hands on approach of the value a pharmacist can afford to the mentorship and training of the authorized nurse prescribers within the PHC context. Therefore, the role for the DCST of the ICDM model

is to be incorporated into that of the Pharmaceutical care model to allow the pharmacist to ensure (Asmal & Ozayr, 2012):

- Supervision and mentoring of PHC nurses in management of chronic diseases
- Conducting clinical audits
- Primary referral for complicated cases
- Strengthening the referral mechanism to district and regional Hospitals
- Monitoring patient clinical outcomes

Therefore, the proposed Collaborative Pharmaceutical Care Model envisaged is depicted within the DHS model in Fig. 55, incorporating the PCDT pharmacist into the PHC domain and supporting clinical patient outcomes with the identified roles and responsibilities.

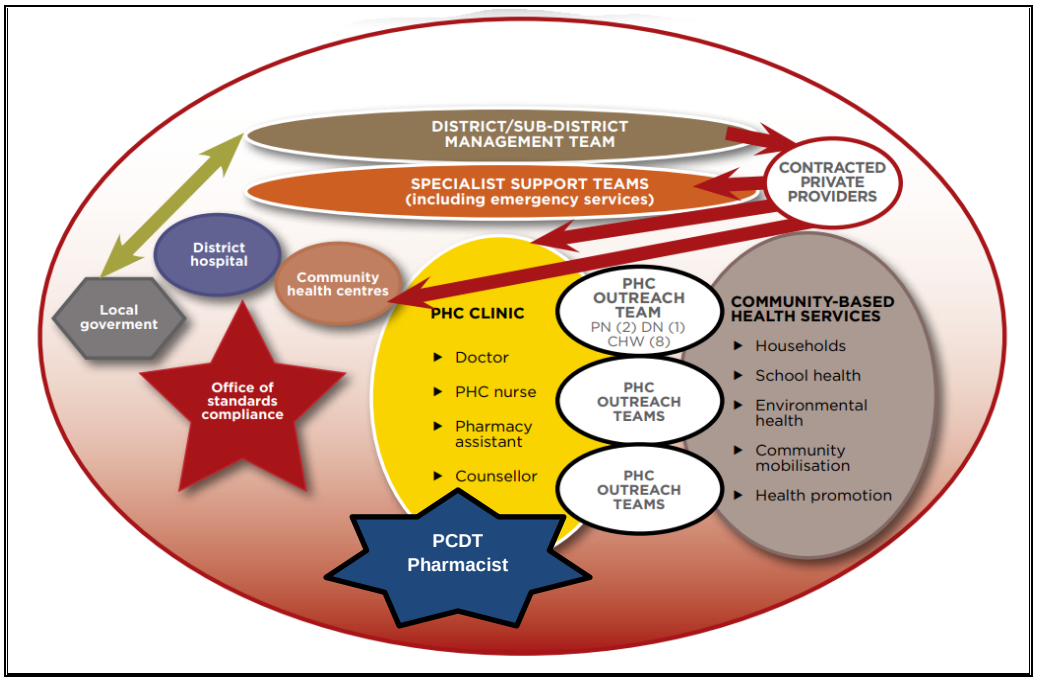


Fig. 55: Source: Modified Integrated District Health System Model (Pillay & Barron, 2012) indicating potential entry point for Public Pharmacists

5.10 SUMMARY AND CONCLUSION

This chapter has engaged the analysis and interpretation of the quantitative and qualitative data. Subsequently, important themes emerged, which assisted the researcher to condense and present the findings. It is noted that the said themes also related directly the conceptual framework of this study and these were used to strengthen the concluding arguments in the ensuing chapter.

CHAPTER 6

CONCLUSION AND

RECOMMENDATIONS

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1 INTRODUCTION

This chapter presents the lessons learned from the research, conclusions reached and recommendations to contribute towards quality pharmaceutical service improvement efforts in rural public primary and community healthcare facilities. Globalization, presently has seen health professions evolve, making pharmacy no different. Wherein, pharmacists were primarily responsible for manufacturing and supplying medicines, today sees their role has one progressing towards a clinical focus. However, the profession continues to evolve. In addition, pharmacists have potential to further their role to meet the changing demands in healthcare.

Therefore, in order to remain relevant to 21st century healthcare needs, pharmacists must deliver timely and economic ways of dealing with present-day health problems and continue drawing public and political support. It is envisaged that Pharmacy's ongoing success will ultimately rest on its members' competencies in identifying and publicly communicating their most passionate function of preserving lives and optimizing the health of people and populations that they are privileged to serve (FIP, 2016). The main direction, being that of progress towards reinforcing improved medicines selection and use for optimal benefits in pharmaceutical technology spending, while promoting improvements in clinical care and public health (FIP, 2012).

The South African health care system has undergone essential transformational growth post-apartheid. However, equitable access to quality health care for all citizens, being a basic constitutional right, continues to be a challenge. Hence, the country's health policy is committed towards the provision of safe, efficient and cost-effective health care services. Yet, the public sector healthcare is riddled with policy implementation challenges and the quadruple burden of diseases. The South African National Drug Policy continues to inform the transformation of the pharmaceutical system and demands the contribution from

pharmacists in all sectors of practice. “As the process of change to universal health care unfolds, pharmacists will need to play a crucial role in managing system and policy development to ensure the provision of equitable patient care and access to essential medicines across all sectors” (Gray et al. 2016).

6.2 LESSONS LEARNT

Undoubtedly, since the health care delivery sector is dynamic with consumers and providers continuing to influence it alike, further lessons may still be inferred from the research study. The following are broad lessons, not necessarily exhaustive, however, surmised from the literature review process:

- Delivery of quality health care services to its citizenry and maintenance of good health care is amongst the contentious challenges facing South Africa since the dawn of the new political dispensation. The challenges stem partly from ineffective poor management and policy implementation. Tolerance to ineptitude, failures in leadership, management and governance, an inadequate district system to drive the primary health system and unresolved health workforce crisis underpins the relatively poor performance resulting in disparities between the public and private sector healthcare delivery
- Despite the fact that the state pays for about 40% of all expenditure on health care, provincial and local health authorities have to deliver health care services to 80% whilst the private sector provides for the remaining 20% of the population
- Public healthcare is experiencing extensive resource constraints, over-utilisation of public health care services, poverty and the fact that the country is largely inundated with an appreciable burden of communicable and non-communicable diseases, including high maternal, neonatal, and child morbidity.
- The existing disparity in terms of facilities, package of services, personnel and financial support between the public and private health care sectors remain
- Efficient use of health human resources, key policy levers and organisational factors with focus on inter-professional collaboration promotes access to healthcare and its safe delivery

- Recent years have seen significant progress in public health system improvement and focus on current inequalities. The introduction of National Health Insurance, programmes to enhance chronic access to medicines, and activities to improve care in hospitals, including improving pharmacovigilance are some of the initiatives
- Literature further demonstrates that many drug-related problems, like under/over-treatment, non-adherence, adverse effects and inappropriate prescribing can possibly be prevented if an approach to improvements are sought such that health care providers work together in medication, prescribing and monitoring systems management
- Team-based collaborative care is progressively acknowledged as a strategy best-suited to manage the complex drug therapy needs of an aging population
- The integration of pharmacist's drug therapy expertise alongside other healthcare professionals within primary healthcare contexts is one strategy to reduce drug-related problems
- Pharmacists' role in collaborative pharmaceutical care extended to pharmacovigilance, ADRs, and antibiotic stewardship has proven to reduce healthcare costs and improve patients' outcomes and quality of life
- More than ever before in South Africa, the pharmacy profession is faced with the question of whether or not its role is seen as "only a distributive function" adding any value to the health care team
- The challenge for pharmacists is to develop and expand their practice models to go beyond the so-called "count and pour, lick and stick" function so that their clinical knowledge, advice on products and professional services are not necessarily attached to the supply of medicines *per se*. As such, the emphasis in the paradigm of pharmacy practice has to shift so as to boost the worth of the medicines and/or other treatment that patients receive
- The rural context healthcare needs are unique and demand health advocates to drive its agendas and this study proved that a collaborative approach to medication use is warranted
- Awareness of a health environment's context, its enablers and barriers is paramount to a Pharmacists successful integration

- Knowledge of customers' perceptions of the services that they receive is an important step in the comprehensive pursuit for improved quality in health care

6.3 CONCLUSION

The Pharmacy fraternity finds itself suitably placed, and favourably equipped with the prospect of displaying maturity as a health profession by lessening avoidable medicine-related morbidity and mortality through acknowledging public obligation and professional conviction, which this research aimed to explore (Helper & Strand, 1990). Subsequently, knowledge acquired from the research recognises the following factors as influencing and shaping the development of a collaborative pharmaceutical care model, determines the appreciation of Pharmacists' knowledge base and verifies the need for quality service delivery from professionals within the PHC and CHC environment. Furthermore, it assists to create a point of reference for quality service delivery in the public rural primary and community healthcare facilities, drawing attention to the principles of Ubuntu and Care.

These factors deemed to impact on the roles and responsibilities of the PCDT pharmacist in collaboration that were elicited from the informant interview:

- Logistic: Drug Supply Management
- Clinical:
    - Inter-professional collaboration
    - Pharmacovigilance
    - Clinical Audits
    - Antibiotic Stewardship

- Education:
    - Training and Development of professional staff with specific empowerment of pharmacist assistants
    - Patient Counselling and Educational talks
    - Continuous Professional Development

The factors that deemed to impact on the roles and responsibilities of the PCDT pharmacist in collaboration were stimulated by the doctors, authorized nurse prescribers and pharmacists towards:

- Role Clarity
- Resources & Location
- Inter-professional Collaboration
- Clinical Governance
- Quality of Care
- Trust & Communication
- Pharmacist Development & Training
- Responsibility & Accountability
- Principles of Ubuntu and Care

Notwithstanding the recognition of the above enablers to a Pharmacists' integration into a rural public PHC context, it is equally important to be cognisant of the barriers. Hence, the study established the following resource constraints for consideration of:

- Infrastructure: Location, organizational space, work flow disruptions
- Communication: Language, Zulu speaking patients
- Human Recourses: Scarcity of pharmacists, role conflict
- Transport and equipment

In identifying with roles being positions team members assume or are assigned to within an organization, in the case of responsibilities, they involve the accomplishing of specific tasks or duties that are aligned to member's roles (Blazek, 2016). The following roles in which a pharmacist for PHC integration will add value are:

- Clinical Governance
- Patient Safety
- Education & training
- Patient engagement & interaction

- Quality of PHC
- Inter-professional Collaboration
- Antibiotic Stewardship
- Drug Supply Management

In addition, the activities that followed from the above roles and from the qualitative engagement were highlighted as follows:

- Pharmacovigilance– performing prescription audits and adverse drug reaction reporting with ongoing M&E
- Document and action patient incidents that are medication related
- Training of Nursing sisters, medical doctors & other healthcare professionals alongside continuous professional development
- Counselling patients on side effects and managing unstable chronic NCD and Communicable Diseases
- Adherence to SAPC prescripts, National drug policy and implementation of the principles of pharmaceutical care
- Working in collaboration with doctors and authorized nurse practitioners with good communication and teamwork
- Driving antibiotic screening and training of sisters as per APC guidelines
- Continue to manage drug supply and oversee PA's to ensure adequate access to required medication

Further to the above, the quantitative investigation of all three healthcare professionals revealed in depth the following lead to shared role for the PCDT pharmacist in respect of medication-dispensing practice:

- Determining if drug therapy is needed
- Selecting the best drug for patient
- Selecting the best regimen
- Providing drug information to prescribers
- Identifying prescribing errors

- Screening patient' s medicine lists

Furthermore, the quantitative analysis of the Nurses' questionnaire established the following specific lead role in medication-dispensing practice for the PCDT pharmacist:

- Counselling of patients about the prescribed drug
- Monitoring drug therapy of chronic patients
- Providing drug information to other health professionals
- Managing the pharmacy in respect of drug supply

Moreover, the results strongly demonstrated the collaborative approach to medicine use. Hence, the collaborative aspect of the 'Drug Use Process" in crafting the pharmaceutical care model was demonstrated by the quantitative analysis to distinguish the collaborative tasks rated by all three professionals as follows:

- Making a diagnosis
- Determining if drug therapy is needed
- Selecting the best drug for the patient
- Selecting the best regimen
- Involving the patient in decision making regarding medicine choices
- Deciding whether to continue, alter or discontinue medication
- Monitoring effectiveness and safety
- Monitoring compliance
- Instituting compliance, interventions as needed
- Receiving and organizing requests for script renewals
- Documenting medication-related information in patient's medicine chart
- Educating the patient about chronic medication- this was identified in collaboration with the nurses only having doctors supporting this task
- Providing group education and training regarding medication in collaboration with the nurses only having doctors supporting
- Providing drug information to prescribers
- Providing complete medication overview

- Identifying adverse drug reactions

Likewise, the activities identified by the nurses in alliance with the PCDT pharmacist demonstrated the following in support of collaborative practice:

- Prescribe and dispense according to diagnosis
- Assess the patient's problem and refer to other health professionals
- Advise patients in regards to their personal health- health education
- Educate patients (STD's, diet)
- Participate in health promotion programmes in the community
- Training of home care patients
- Prescribe/administer contraceptives
- Attend to emergencies/casualties
- Prescribe in cases of acute illness

The results from the assessment of the SAPC inspection defined the issues and factors that emerged with consistency with regards to the requirements for quality pharmaceutical service delivery, regarding pharmacy infrastructure and availability of pharmaceuticals of the PHC and CHC facilities in Ugu and Umzinyathi to be:

- Thermolabile Medicines were not stored as per SOP and GPP standards as well as the absence of back-up generators in cases of power outages.
- Non-compliance to the control of medicines, scheduled substances and active pharmaceutical medicines in relation to unavailability of a computerized method for stock management and dispensing; lack of patient folders and files with comprehensive medical history available for consulting visiting doctors and the authorized nursing practitioners; no quarterly balancing of schedule 5 drug registers.
- General premises and layout is not in accordance to GPP, unavailability of adequate fax machines, also network points with e-mail, photocopiers, consulting rooms and telephones is debilitating to conduct an efficient and optimal healthcare service; staffing is also inadequate in most facilities for the number of patients and the number of programs that continue to be decentralized for PHC management and

implementation. These communication equipment challenges are very overwhelming considering the deep rural location of the facilities, transport challenges and the need for prompt support from the Doctors and pharmacists from the Mother hospital.

- Inaccessibility of pharmaceutical services; no fire extinguishers in medicine rooms; dispensing surfaces are not suitable; non SAPC registered staff having access to the medicine rooms. The pharmaceutical services rendered at present are predominately one of MSM and ensuring the availability of pharmaceuticals by conducting - Tracer drug audits, Stock Takes and re-order levels. However, the audits, like many audits becomes merely a paper exercise for compliance purposes if no proper action plans are generated to meet the identified gaps. Resources of time and healthcare professionals with the required expertise are essentially crucial to manage and address the documented challenges.
- Storage rooms are non-compliant to SAPC standards. There is no receiving and dispatch areas, too small medicine and consulting rooms and visible cracks and holes in walls
- Unavailability of hard copies of the compulsory medical reference books

Clinics in the Umzinyathi district all have registered post basic Pharmacist assistants managing Medicine Supply. The facilities in Ugu have at present PBPAs managing in only 12 of the 52 facilities available. However, these clinics are not registered nor recorded with the SAPC by legislation. In Ugu the pharmacists do visit clinics, providing support in conducting:

- National Core Standard audits
- Expiry drug evaluation
- Re-order levels of medication
- Ideal clinic tool audits
- Management of CCMDD challenges

The Umzinyathi district is in process of implementing the pharmacist supervisory capacity similar to that of the Ugu District.

In terms of the Ideal clinic accreditation assessment that was instituted to improve the quality of primary healthcare services rendered within the public sector facilities, the following were revealed:

Of the 15 facilities inspected, only 3 from UMzinyathi District achieved a platinum status. However, there is evidence of both Sub-district and District support, with constant monitoring and evaluation to ensure that optimal platinum status is achieved to deliver quality healthcare services.

Besides, the ascertaining of expired pharmaceuticals raises concerns within the public context. Two issues are prevalent here. They are:

- The non-reporting and
- The high cost of wasteful expenditure considering that pharmaceuticals contribute to the second largest budget holding within public institutions.

The reporting of expired medication only commenced in the 2017-2018 financial year within the Umzinyathi District. Although documented figures were presented for the Ugu district, these figures do not include all the facilities under its management. Therefore, the PHC and CHC teams with the Pharmacist team from the Mother hospitals are required to intensify its management of stock and ensure accurate recording and action plans to actively impact on reducing the irresponsible expenditure.

Finally, the informant engagement contributed vital insights into the crafting of the collaborative pharmaceutical care model. The suggestions included the following:

- First and foremost was the need to have a mission and vision to guide the process and form the foundation upon which to build the model
- A buy- in from all relevant stakeholders with regards to the identified parameters of importance is required. These being; role clarity; identifying Pharmaceutical Care and the responsibilities of the PCDT pharmacist once integrated into the PHC context

- The stakeholders were identified as SAPC, Department of Health, Department of higher education – Universities and National and Provincial Pharmaceutical services
- Pharmaceutical care was agreed by all informants that it is the broad definition incorporating all parameters of pharmacy practice and does not exclusively relate to the prescribing rights afforded by the SAPC qualification
- The perspective of having a pharmacist at PHC and CHC level was unanimously agreed upon to add value to the deliverance of quality PHC. The general consensus was that a pharmacist 'with something extra' is needed in terms of clinical expertise
- Pharmaceutical care at a population public health perspective was also recommended in addition to individual patient care outcome orientated approach
- The role of the pharmacist within this context is suitable to drive pharmacovigilance in adverse drug reporting, antibiotic stewardship, clinical governance with continuous prescription audits followed by structured training for PHC authorized nurse prescribers, patient engagement and interaction to ensure optimal patient outcomes and safety
- Informants being experts in the pharmaceutical field voiced their appreciation for the pharmacist expertise in medicine supply, highlighting that this focus must not be skewed in the venture to expand their role clinically
- However, to stay relevant and informed, pharmacists are to engage in continuous professional development
- The rural context was favoured for this integration to deliver the greatest impact of the pharmacists' expertise
- The recommendation for the model was one of a collaborative approach where all healthcare professional's expertise can be utilized for the benefit of the patient aligned to the NHI prescripts

6.4 SUGGESTIONS FOR FUTURE RESEARCH

This research study, together with its propositions and recommendations, has opened a window of opportunity of potential areas for further research. Having encountered the cited limitations, the following areas, in my view, warrant further investigation.

a. Sample Size

A larger sample including all primary health care facilities within the KwaZulu-Natal region, extending to other provinces of similar context, will generate richer data for generalization.

b. Professional Participant inclusion

In addition to understanding the perceptions of doctors, nurse prescribers and pharmacists and identifying the roles and responsibilities for the PCDT pharmacist integration into the public primary health care context, researching the perceptions of the PCDT pharmacists themselves will add a valued dimension. The Clinical Associates as a new cadre of staff within the public context need to be investigated as they in future have a vital role within the public and more importantly within the rural context. Interviewing the Provincial and District Pharmaceutical Services managers, Medical and Nursing services team and Pharmacy managers supporting PHC facilities can add another useful perspective to the study. The stakeholders of importance in addition include members from the practice department from the South African Pharmacy Council, Department of higher education, viz., lecturers from the pharmacy department of Universities.

c. Testing Clinical Outcomes of such an Intervention

Of grave consequence is testing practically the patient outcome profile with the integration of the PCDT pharmacist in the rural context as an action research. Furthermore, the need to differentiate between purely clinical quality of health care and the experience of quality health care is essential because it is particularly the experience that determines the quality of health services in general.

d. Patient Perceptions

Thereafter, lastly, but in no way least, will be to investigate the patients' perceptions and understanding or recommendations for having the PCDT pharmacist sharing the professional arena with their counterparts within the rural public context. Therefore, knowledge of customers' perceptions of the services that they receive is an important step in the comprehensive pursuit for improved quality in health care. Therefore, any effort intended to improve health care service provision have to consider the sensitivity of patients in this regard, because patients are the eventual and important consumers of the services (Thobeli, 2007).

6.5 RECOMMENDATIONS

The study results have mapped out undoubtedly the need for a collaborative pharmaceutical care model within the public Primary and Community healthcare facilities. It has in addition successfully demonstrated that first and foremost, a mission and vision is required to be crafted to guide the development and hence the implementation of the proposed model of care. However, the implementation is only possible with all key professionals understanding their roles and responsibilities as well as the enablers and barriers for such an integration. Therefore, the value of the research results will only be fully appreciated by making use of the knowledge generated. This informed the following recommendations:

The National and Provincial Departments of Health should consider, given the most opportune time of NHI roll out, to support the integration of the proposed collaborative pharmaceutical care model in the rural Primary and community healthcare environments by acknowledging the vital role pharmacists can add to improving the value of care provided.

The South African Pharmacy Council is encouraged to relook at the prescribing rights for pharmacists and extend their capacity with the necessary clinical leadership to add value to patient outcomes in a collaborative approach.

The Department of Health is prompted to escalate the required resources to up-grade the PHC and CHC facilities both in professional staff and infrastructure to enable rapid

improvement in ‘ideal’ clinic accreditation status of all the clinics aligned to NHI initiatives. As far as the pharmacy infrastructure and availability of pharmaceuticals are concerned, it was agreed that there needs to be logical work flow that allows easy access to items, enough room for staff members and stock, stock procurement and control procedures, sufficient effective communication and infrastructure at PHC and CHC facilities, which is fundamental to allow for service provision.

The Pharmacy departments at universities are encouraged to relook at the curriculums to incorporate a more clinical orientated focus to pharmacy practice, incorporating the rural context challenges and needs to improve on patient centred outcomes. Every health care profession must display more awareness to the changing patient needs by harnessing the principles of ‘Ubuntu’ and ‘Caring’ that is still very much alive within the public sector healthcare, only masked and slowing losing essence by the day-to-day challenges.

The Department of Health is also challenged to create posts for pharmacists with additional clinical knowledge to advocate a noticeable difference in the rural context by identifying where the competencies of pharmacists are best used and most needed.

The rural context healthcare and providers’ needs must be fully appreciated and challenges addressed in terms of infrastructure, communication, transport, equipment and human resources.

The PCDT training (or enhanced clinical training) can be introduced into the public pharmacists’ scope of practice and aligned to NDoH posts at PHC and CHC facilities alongside sound implementation strategies for sustainable primary healthcare improvements.

This research demonstrated the need for future research in the field of pharmaceutical service delivery to introduce healthcare professionals to the potential contribution of pharmacists in patient care and that action research serves as a viable methodlogy to promote and develop a relationship among the healthcare providers within the rural PHC and CHC context.

It has been successfully demonstrated in this study that there is a dire need within the public sector to similarly expand, redefine and re-orientate the pharmacists' role with regards to managing medication therapy in a collaborative approach for safety, effectiveness and adherence for pharmacotherapy to ensue. In addition, the application of PHC re-engineering and in the face of NHI, the need for an integrated care model (not to reinvent the wheel), delivering all healthcare professional roles is paramount to the provision of quality outcome based primary healthcare services. This endeavour will obviate the current picture where numerous South Africans are plagued by unnecessary morbidity and premature mortality from treatable conditions and preventable diseases.

Fig. 56, in summary, displays a conceptual model relating to the factors essential for sustainable collaboration between the doctors, pharmacists and authorized nurse practitioners within the rural public PHC and CHC context informed by the findings of this study.

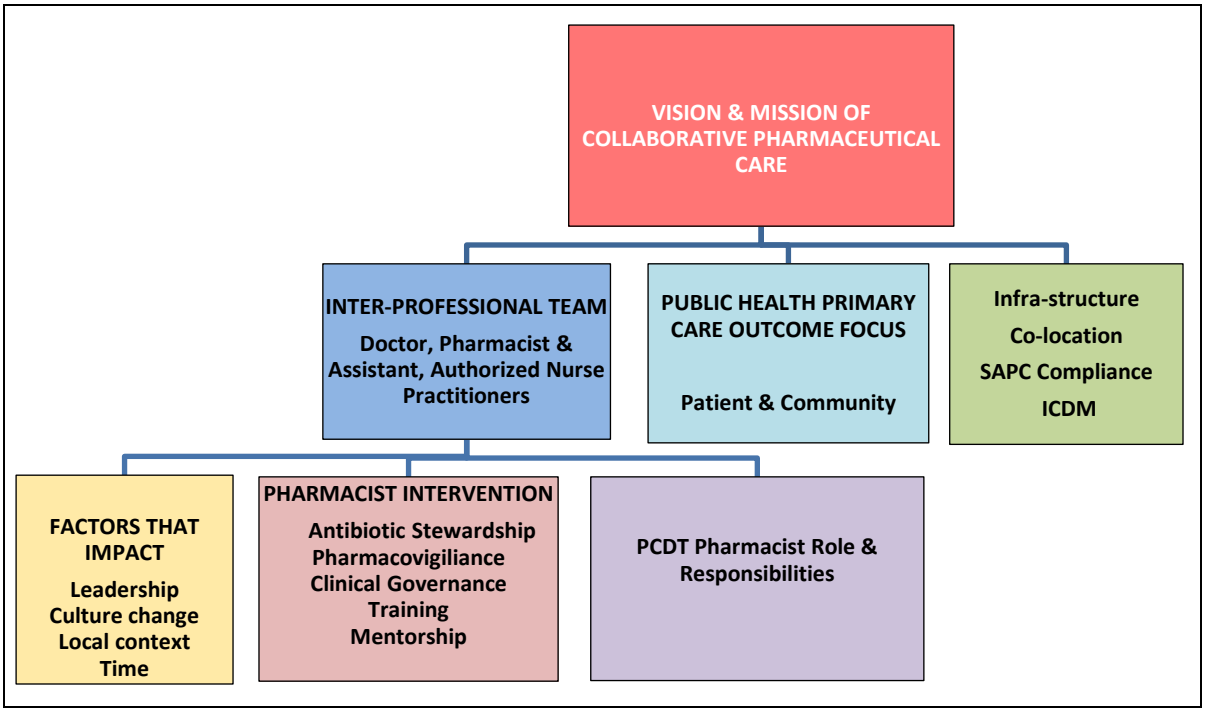


Fig. 56: Conceptual Framework of the collaborative Pharmaceutical Care Model for public PHC and CHC Facilities

In conclusion, Pharmacists and their institutions must stop looking inward and start redirecting their energies to the greater social good (Helper & Strand, 1990). The adoption of an integrated multidisciplinary practice model suggestive of a pharmacists' role to include patient services, physician-focused activities and system-level interventions (Page and Somers, 2019), is favoured. Therefore, a call is made for innovative ways, as demonstrated in the study, to promote more efficient use of human resources to provide people-centred care (FIP, 2016), especially in resource deficient health contexts as South Africa.

The time is here for the public pharmacists to *'Dive in, head first; get involved; make a difference; and grow in the process' (Gray, 2014).*

REFERENCE LIST

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Abegunde, D.O., Mathers, C.D., Adam, T., Ortegon, M., Strong, K. 2007. The burden and costs of chronic diseases in low-income and middle-income countries. Available: http://dx.doi.org/10.1016/S0140-6736(07)61696-1 (Accessed 7 May 2017).

Anon. n.d. About the Name. Available: https://web.archive.org/web/20130223104643/https:/help.ubuntu.com/10.04/about-ubuntu/C/about-ubuntu-name.html (Accessed 2 February 2017).

Adam, T. 2014. *Advancing the application of systems thinking in health*. Health Research Policy and Systems. Available: https://health-policy-systems.biomedcentral.com/articles/10.1186/1478-4505-12-50 (Accessed 12 September 2017).

Adams, J.A. 2008. *Statistical Validity Pitfalls*. Vanderbilt University Nashville, TN USA.

Adamcik, B.A., Ransford, H.E., Oppenheimer, P.R., Brown, J.F., Eagan, P.A., Weissman, F.G. 1986. New clinical role for pharmacists: a study of role expansion. *Social Science and Medicine,* 23(11): 1187-1200.

Anon. 2017. Africa's Medical Media Digest. Pharmacists to have key role in NHI- PSSA. *Medical Brief*. Available: https://www.medicalbrief.co.za/archives/pharmacists-key-role-nhi-pssa/ (Accessed 29 June 2016).

Agency for Healthcare Research and Quality (AHRQ). 2008. PSNet Patient Safety Network. Patient safety. Available: http://psnet.ahrq.gov/glossary.aspx#P (Accessed 6 May 2017).

Alberts, M, Urdal, P, Steyn, K., Stensvold, I., Tverdal, A., Nel, J.H., Steyn, N.P. 2005. Prevalence of cardiovascular diseases and associated risk factors in a rural black population of South Africa. *Eur J Cardiovasc Prev Rehabil. 12*: 347–354.

Allemann, S.S., Foppe van Mil, J.W., Botermann, L., Berger, K., Griese, N., Hersberger, K.E. 2014.Pharmaceutical Care: the PCNE definition 2013.*International Journal of Clinical Pharmacy*. Dordrecht.36: 544-555. Available: http://search.proquest.com.dutlib.dut.ac.za/docview/1524249578?pq-origsite=summon. (Accessed 2 May 2017).

Ally, S., Meyer, J.C., Schellack, N., Summers, R.S. 2015. Improving patient safety with antiretroviral treatment by actively soliciting adverse drug reaction reports: patient centered treatment and care. *African Journal for Physical Health Education, Recreation and Dance,*2: 252-267.

ALMA-ATA. 1978 Primary Health Care. Report of the International Conference on Primary Health Care Alma-Ata, USSR, 6-12 September 1978. WHO and United Nations Children's Fund. Available: https://www.unicef.org/about/history/files/Alma_Ata_conference_1978_report.pdf (Accessed 9 June 2018).

Al Shaqha, W.M.S., and Zairi, M. 2001. The role of quality in Pharmaceutical care management. Managing Service Quality: *An International Journal*, 11(1):32-39. Available: http://dx.doi.org/10.1108/09604520110365936 (Accessed 26 April 2016).

Alwan A. 2011. Global Status Report on Non-communicable Diseases 2010. Geneva: World Health Organization.

Ameh, S., Lipstein-Grobusch, K., D'ambruoso, L., Kahn, K., Tollman, S.M., Gómez-Olivé, F.X. 2017. *Health Policy and Planning*, 32(2): 257– 266. Available: https://academic.oup.com/heapol/article/32/2/257/2555432 (Accessed 5 May 2018).

American College of Clinical Pharmacy. 2008. The Definition of Clinical Pharmacy. Pharmacotherapy, 28(6): 816–817. Available: https://www.accp.com/docs/positions/commentaries/Clinpharmdefnfinal.pdf (Accessed 3 April 2017).

American Geriatrics Society. 2012. Beers Criteria Update Expert Panel American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc,* 60: 616-631.

American Public Health Association (APHA). 2016. Principles of Practice for Pharmaceutical Care. Available: http://www.pharmacist.com/principles-practice-pharmaceutical-care (Accessed 24 April 2016).

American Society of Heath Systems Pharmacists. ASHP Statement on Pharmaceutical Care. 1993. *Am J Hosp Pharm,* 50: 1720-1723. Available: http://www.ashp.org/DocLibrary/BestPractices/OrgStPharmCare.aspx (Accessed 28 August 2016).

American Society of Health-System Pharmacists. 1999. ASHP statement on the pharmacist's role in primary care. *Am J Health-System Pharm,* 56: 1665–1667. Available: https://www.ashp.org/DocLibrary/BestPractices/SpecificStPrimary.aspx (Accessed 2 September 2016).

American Society of Health-System Pharmacists. *ASHP Pharmacy Practice Model Initiative*. Available: www.ashp.org/ppmi (Accessed 8 April 2017).

American Society of Health-System Pharmacists (ASHP). 2009. ASHP Statement on the Health-System Pharmacist's Role in National Health Care Quality Initiatives, 265-266. Available: https://www.ashp.org/-/media/assets/policy-guidelines/docs/statements-health-system-pharmacists-role-national-health-care-quality-initiatives.ashx?la=en. (Accessed 10 June 2017).

Amory, W.C.E. 1920. "The Untilled Field of Public Health". *Modern Medicine,* 2: 183–191.

Anderson S. 2002. The state of the world's pharmacy: a portrait of the pharmacy profession. *Journal of Interprofessional Care,* 16(4):391-404. Available: https://www.ncbi.nlm.nih.gov/pubmed/12487847 (Accessed 1 May 2017).

Anderson, C. 2010. Presenting and Evaluating Qualitative Research. *American Journal of Pharmaceutical Education,* 74(8): 141.

Arries, E.J. 2014. Patient safety and quality in healthcare. Nursing ethics for ethics quality.*Sage Journals,* 21:3-5. Available: http://journals.sagepub.com/doi/abs/10.1177/0969733013509042 (Accessed 5 May 2017).

Ashby, D. 2009. Redefining the Practice Model: Where have we been, where do we go? Building the Future for Health System Pharmacy Practice.44th ASHP Midyear Clinical Meeting & Exhibition. Available: http://www.ashpmedia.org/pai/docs/MCM09-PPMI-Presentation.pdf (Accessed 22 April 2018).

Asmal, S., Ozayr, M. 2012. Integrated Chronic Disease Management: A step-by-step manual to guide Implementation. DOH. Available: file:///C:/Users/hifi%20corp/Desktop/Research%20Articles/Integrated-chronic-disease-management-manual.pdf (Accessed 6 July 2016).

Aspden, P., Corrigan, J., Wolcott, J., Erickson, S.M. 2004. Patient safety: achieving a new standard for care. United states of America: The National Academies Press.

Aspers, P. 2004. *Empirical phenomenology: An approach for qualitative research.* Paper presented to the Methodology Institute at the London School of Economics and Political Science, London, UK.

Assa-Eley, M., Kimberlin, C.L. 2005. Using interpersonal perception to characterize pharmacists' and patients' perceptions of the benefits of pharmaceutical care. *Health Commun*;17: 41-56.

Avery A, Barber N, Ghaleb M et al. 2012. Investigating the prevalence and causes of prescribing errors in general practice. *General Medical Council*. Availabe: https://www.gmc-uk.org/about/what-we-do-and-why/data-and-research/research-and-insight-archive/investigating-the-prevalence-and-causes-of-prescribing-errors-in-general-practice (Accessed 14 June 2018).

Azhar, S., Hassali, M.A., Ibrahim, M.I.M., Ahmad.M., Masood, I. and Shafie, A.A. 2009. The role of pharmacists in developing countries: the current scenario in Pakistan. BMC Medicine. *Human Resources for Health*. Available: https://doi.org/10.1186/1478-4491, 7: 54 (Accessed 16 June 2018).

Bahadori, M., Ravangard, R., Aghili, A., Sadeghifar, J., Manshadi, M.G. and Smaeilnejad, J. 2013. The factors affecting the refusal of reporting on medication errors from the Nurses' viewpoints: a case study in a hospital in Iran. *International Scholary Research Notices.* Available: https://www.hindawi.com/journals/isrn/2013/876563/ (Accessed 17 June 2018).

Bajcar, J.M., Kennie, N., Einarson, T.R. 2005. Collaborative medication management in a team-based primary care practice: An explanatory conceptual framework. Elservier. *Research in Social and Administrative Pharmacy,* 1: 408–429.

Baptista, D.R., Wiens.A, Pontarola, R., Regis, L., Reis, W.C.T. and Correr, C.J. 2016. A chronic care model for type 2 diabetes: a systematic review. *Diabetology & Metabolic Syndrome, 8*:7. Available: https://dmsjournal.biomedcentral.com/articles/10.1186/s13098-015-0119-z (Accessed 10 March 2017).

Barbee, J., Kelley, S., Andrews, J., Harman, A. 2017. Palliative Care: The Role of the Pharmacist. Available:https://www.pharmacytimes.com/publications/health-system-edition/2016/november2016/palliative-care-the-pharmacists-role (Accessed 25 May 2018).

Barber, N., Smith, F., Anderson, S. 1994. Improving quality of health care: the role of pharmacists. *Qual Health Care,* 3(3): 153–158.

Barber, R. M., Fullman, N., Sorensen, R., Bollyky, T., McKee, M., Nolte E., et al. (2017). Healthcare Access and Quality Index based on mortality from causes amenable to personal health care in 195 countries and territories, 1990-2015: a novel analysis from the Global Burden of Disease Study 2015. May/July:231–266. Available: https://www.ncbi.nlm.nih.gov/pubmed/28528753 (Accessed 27 May 2018).

Barberato, LC., Scherer, MDdosA., Lacourt, RMC. 2019. The Pharmacist in the Brazilian Primary Health Care: insertion under contruction. Ciênc. saúde coletiva. 24(10):3717-3726.Available:http://www.scielo.br/scielo.php?pid=S1413-81232019001003717&script=sci_abstract (Accessed 22 March 2019).

Barron. P., Shasha, W., Schneider, H., Naledi, T., Subedar., H. 2010. Re-engineering Primary Health Care in South Africa: Discussion document, 2010. Available: https://www.phasa.org.za/wp-content/uploads/2011/11/Pillay-The-implementation-of-PHC.pdf (Accessed 12 May 2017).

Barry, P.J., Gallagher, P., Ryan, C., O'Mahony, D. 2007. START (Screening Tool to Alert doctors to the Right Treatment)—an evidence-based screening tool to detect prescribing omissions in elderly patients. Age Ageing, 36(6) :632-638. Available: https://www.ncbi.nlm.nih.gov/pubmed/17881418 (Accessed 23 February 2018).

Barry, A.R., and Pammett, R.T. 2016. Applying the guidelines for pharmacists integrating into primary care teams. Canadian Pharmacist Journal (Ott), 149(4): 219-

225. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4973413/ (Accessed 16 April 2018).

Bazely, P. 2003. Teaching Mixed Methods. *Qualitative Research Journal*, 3 (Special issue): 117 -126.

Beiske, B. 2007. Research Methods. Uses and Limitations in Questionnaires, Interviews and Case Studies. University of Manchester. Manchester School of Management.

Bell, J.S., Rosen, A., Aslani, P., Whitehead, P. and Chen, T.F. 2007. Developing the role of pharmacists as members of community mental health teams: perspectives of pharmacists and mental health professionals. *Res Social Adm Pharm,* 3(4): 392-409. Available: https://www.ncbi.nlm.nih.gov/pubmed/18082875 (Accessed 20 March 2019).

Berdine, H., Dougherty, T., Ference, J., Karpa, K., Klootwyk, J., Kozminski, M., Leon, N., Osborne, M., Welch, A.C., Willey, V.J., Peterson, A., Stanchak, L.A. and Whisler, A.G. 2012. The pharmacists' role in the Patient-Centered Medical Home (PCMH): a white paper created by the Health Policy Committee of the Pennsylvania Pharmacists Association (PPA). *Ann Pharmacother*, 46(5): 723-750. Available: https://www.ncbi.nlm.nih.gov/pubmed/22535839 (Accessed 14 February 2018).

Berger, D. E. 2017. Introduction to Binary Logistic Regression and Propensity Score Analysis. *Research Gate*. Available: https://www.researchgate.net/publication/320505159_Introduction_to_Binary_Logistic_Regression_and_Propensity_Score_Analysis (Accessed 28 February 2020).

Bertram, D. 2007. Likert Scales. Available: http://poincare.matf.bg.ac.rs/~kristina/topic-dane-likert.pdf (Accessed 2 June 2016).

Best, J. W., and Kahn, J. V. (2003). *Research in education*. 9th ed. Needham Heights, MA: Allyn & Bacon.

Biddle, B.J. 1986. Recent Developments in Role Theory. *Center for Research in Social Behavio*r, University of Missouri-Columbia, 12: 67-92. Available: http://www2.ece.ohio-state.edu/~passino/RoleTheory-Biddle-1986.pdf (Accessed 12 February 2017).

Biddle, B.J. 1979. Role Theory Expectations, Identities, and Behaviors.Center for Research in Social Behaviour, The University of Missouri, Columbia, Missouri.

Biddle, B.J., and Thomas, E.J., eds. 1966. Role theory: Concepts and research. New York: Wiley.

Bifttu, B.B., Dachew, B.A., Tiruneh, B.T. and Beshah, D.T. 2016. Medication administration error reporting and associated factors among nurses working at the University of Gondar referral hospital, Northwest Ethiopia. *BMC Nursing*, 15:43. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4949890/ (Accessed on 5 May 2017).

Biggerstaff, D. and Thompson, A.R. 2008. *Interpretative phenomenological analysis (IPA): a qualitative methodology of choice in healthcare research. Qualitative Research in Psychology*, 5: 214-224. Available: https://www.researchgate.net/publication/47553068_Interpretative_Phenomenological_Analysis_IPA_A_Qualitative_Methodology_of_Choice_in_Healthcare_Research (Accessed on 25 April 2017).

Black Sash. Report on nine provincial community consultations on health reform May 2010 - June 2011. Cape Town: Black Sash; 2010.

Blaikie, N. 2000. Designing Social Research. London: Polity

Blezak, K. 2016. The Importance of Defining Roles and Responsibilities. Available: https://www.truscore.com/360-feedback-resources/the-importance-of-defining-roles-and-responsibilities/ (Accessed 5 July 2018).

Blondal, AB., Sporrong, SK., Almarsdottir. 2017. Introducing Pharmaceutical Care to Primary Care in Iceland-An Action Research Study. Pharmacy (Basel). 5(2):23. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5597148/ (Accessed 17 June 2018).

Blumberg, B., Cooper, D.R. and Schindler, P.S. 2005. Business Research Methods. 1st ed.: McGraw-Hill Education.

Bodenheimer, T., Edward, H., Grumbach, K. 2002. Improving Primary Care for Patients with Chronic Illness. *JAMA.* 288: 1775-1779. Available: http://som202d.ucsd.edu/HCS%20Course%20PDFs/Bodenheimer_Improving.pdf (Accessed 8 March 2017).

Bogdan, R. and Biklen, S. 2003. *Qualitative research for education: An introduction to theory and methods*. 4th ed. Boston: Allyn and Bacon.

Bokhari, F.A., Gai, Y., Gottret., P. 2007. Government health expenditures and health outcomes. Health Econ.16(3): 257-273. Available: https://www.ncbi.nlm.nih.gov/pubmed/17001737. (Accessed 12 June 2018).

Bolton-Maggs, P. and Brook, L. 2002. The use of vitamin K for reversal of over-warfarinization in children. *Br J Haematol,* 118(3): 924. Available: https://www.ncbi.nlm.nih.gov/pubmed/12181071 (Accessed 15 July 2018).

Bonanno, S.T., Gill, J., Wlodarski, M. and Taylor, D. FIP, 2012. From Making Medicines To Optimising Outcomes: The evolution of a profession 1912-2012. *International Pharmaceutical Federation*. Available: file:///F:/evolution%20of%20the%20pharmacy%20profession-%201912-2012.pdf. (Accessed 10 June 2017).

Borkan, J. 1999. Immersion/Crystallization. In B. F. Crabtree & W. L. Miller (Eds.), *Doing Qualitative Research*. 2nd ed. Thousand Oaks, CA: Sage Publications.

Bradley, F., Elvey, R., Ashcroft, D.M., Hassell, J., Kendell, J., Sibbald, B. and Noyce, P. 2008. The challenge of integrating community pharmacists into the primary health care team: a case study of local pharmaceutical services (LPS) pilots and interprofessional collaboration. *Journal of Interprofessional Care,* 22: 387- 398. Available: https://www.ncbi.nlm.nih.gov/pubmed/18800280 (Accessed 30 April 2016).

Bradley H, Saunders D. 2011. Public health: every pharmacists business! *S Afr Pharm J,* 78(10): 26-34. Available: http://www.sapj.co.za/index.php/SAPJ/article/view/1193 (Accessed 25 March 2018).

Brannen, J. 2004. *Working Qualitatively and Quantitatively*. In C. Seale, G. Gobo, J. F. Gubrium & D. Silverman. (Eds.), Qualitative Research Practice. London: SAGE Publications.

Brault, I., Kilpatrick, K., D'Amour, D., Contandriopoulos, D., Chouinard, V., Dubois, CA., Perroux, M. and Beaulieu, MD. 2014. Role Clarification Processes for Better Integration of Nurse Practitioners into Primary Healthcare Teams: A Multiple-Case Study. *Nursing Research and Practice*. Available: https://www.hindawi.com/journals/nrp/2014/170514/ *(Accessed* 6 June 2016].

Braun, V., Clarke, V. 2006. "Using thematic analysis in psychology". *Qualitative Research in Psychology,* 3 (2): 93. Available: https://www.tandfonline.com/doi/abs/10.1191/1478088706qp063oa (Accessed 18 February 2018).

Breen, J. 2006. Croesus Track Historic Heritage Assessment and Baseline Inspection Report prepared for Greymouth Mawheranui Area Office. West Coast Tai Poutini Conservancy, Department of Conservation.

Brink, H.I. 2002. Research Methodology for Health Care Professionals. Cape Town: Juta.

Brink, A.J., Messina, A.P., Feldman, C., Richards, G.A., Becker, P.J., Goff, D.A., Bauer, K.A., Nathwani, D., van den Bergh, D. 2016. Netcare Antimicrobial Stewardship Study Alliance. *Antimicrobial stewardship across 47 South African hospitals: An implementation study*. Lancet Infect Dis 16(9): 1017-1025. Available: https://www.ncbi.nlm.nih.gov/pubmed/27312577 (Accessed 28 August 2017).

Brink, A.J., van den Bergh, D., Mendelson, M., Richards, G.A. 2016. *Passing the baton to pharmacists and nurses: New models of antibiotic stewardship for South Africa?.* South African Medical Journal, 106: 10. Available: http://www.samj.org.za/index.php/samj/article/view/11448 (Accessed 28 August 2017).

Brock, K.A., Doucette, W.R. 2004. Collaborative working relationships between pharmacists and physicians: an exploratory study. *J Am Pharm Association,* 44: 358-64. Available: https://www.ncbi.nlm.nih.gov/pubmed/15191246 (Accessed 25 August 2018).

Brodie, D.C. 1973. Is pharmaceutical education prepared to lead its profession? The Ninth Annual Rho Chi Lecture. Rep Rho Chi. 39: 6–12. Available: https://journals.sagepub.com/doi/abs/10.1177/875512250802400402 (Accessed 18 June 2017).

Brodie, D.C, Parish, P.A., Poston, J.W. 1980. Societal needs for drugs and drug-related services. *Am J Pharm Educ*. 44:276–278. Available: https://www.ncbi.nlm.nih.gov/pubmed/10317016 (Accessed 19 September 2018).

Bryant, J.H. and Rhodes, P. 2017. 'public health'. *Encyclopedia Britannica*. Available at: https://www.britannica.com/topic/public-health (Accessed 25 March 2017).

Brysman, H. and Burgess, R. 1999. *Qualitative research methodology: A review*. London: Routledge.

Bryman, A. 2012. *Social Research Methods*. 4th Edition. Oxford University Press. New York.

Bryman, B. and Bell, E. 2011. *Business Research Methods*, 3rd Edition, Oxford: Oxford University Press.

Buchan, J, Couper, I.D., Tangcharoensathien, V., Thepannya, K., Jaskiewicz, W., Perfilievaf, G. and Dolea, C. 2013. Early implementation of WHO recommendations for the retention of health workers in remote and rural areas. Bulletin World Health Organisation, (91): 834-840. Available: http://www.who.int/bulletin/volumes/91/11/13-119008.pdf (Accessed 30 April 2017).

Buqa, W. 2015. Storying Ubuntu as a rainbow nation. Available: file:///C:/Users/hifi%20corp/Downloads/1434-10039-1-PB.pdf (Accessed 1 July 2017).

Burke R, Johnson R. 2004. *Mixed methods research: a research paradigm whose time has come.* Educ Res. 33(7):14–26. Available: https://sites.uci.edu/socscihonors/files/2017/09/Mixed_Methods_Research.pdf (Accessed 15 October 2018).

Burke, J.R. and Onwuegbuzie, A.J. 2005. *The validity issue. Mixed Research in the Schools*, 13: 48 – 63. Available: https://www.researchgate.net/publication/228340166_The_Validity_Issues_in_Mixed_Research (Accessed 28 December 2017).

Canadian Institute for Health Information. 2006. *How Healthy Are Rural Canadians? An Assessment of Their Health Status and Health Determinants.* Available: https://web.archive.org/web/20100308025204/http://www.phac-aspc.gc.ca/publicat/rural06/pdf/rural_canadians_2006_report_e.pdf (Accessed 30 April 2017).

Canadian Nurses Association. 2011. Inter Professional Collaboration. Position Statement. Available:http://www.cna-aiic.ca/~/media/cna/page-content/pdf-en/interproffessional-collaboration_position-statement.pdf?la=en (Accessed 5 July 2016).

Canadian Society of Hospital Pharmacists (Saskatchewan Branch). 2003. Role of the Pharmacist in Primary Health Care. *College of Pharmacy and Nutrition*, University of Saskatchewan. Pharmacy Coalition on Primary Care.

Cancialosi, C. 2016. *Do You Know What's Really Driving Your Organizational Culture?*. Available: https://www.forbes.com/sites/chriscancialosi/2016/01/11/do-you-know-whats-really-driving-your-organizational-culture/#473ed89930b3 (Accessed 2 July 2017).

Cannon, H.M. 2004. Redesigning the principalship in Catholic Schools. Unpublished Doctoral Thesis. Australia Catholic University.

Carey M. 1994. *The group effect in focus groups: planning, implementing, and interpreting focus group research.* In Critical Issues in Qualitative Research Methods (Morse J., ed.), Sage Publications, London: 225–241.

Carmichael, J.M., O'Connell, M.B., Devine, B., Kelly, W., Ereshefsky, L., Linn, W.D., Glen, L. 1997. Collaborative Drug Therapy Management by Pharmacists. *American College of Clinical Pharmacy.* ACCP Position Statement. Available: https://www.accp.com/docs/positions/positionStatements/pos19.pdf (Accessed 9 August 2018).

Cassell, J. 1982. 'Harm, Benefits, Wrongs, and Rights in Fieldwork', in J. Steiber (ed) *The Ethics of Social Research: Field work, Regulation, and Publication*, New York: Springer-Verlag:7-31.

Cerny, C.A. and Kaiser, H.F. 1977. A study of a measure of sampling adequacy for factor-analytic correlation matrices. *Multivariate Behavioral Research*, 12(1):43-47. Available: https://www.ncbi.nlm.nih.gov/pubmed/26804143 (Accessed 26 August 2017).

Chambers, D. 2017.The great drugs bungle: How hospital doctors and nurses put kids at risk. *BusinessDay*, 14 May. Available: https://www.businesslive.co.za/bd/national/2017-

05-14-the-great-drugs-bungle-how-hospital-doctors-and-nurses-put-kids-at-risk/ (Accessed 15 May 2017).

Chan.M. Director-General of the World Health Organization. 2008. *Primary health care - now more than ever.* Almaty, Kazakhstan. Available: http://www.who.int/dg/speeches/2008/20081014/en/ (Accessed 16 June 2016).

Chopra, M., Lawn, J.E., Saunder, D., Barron, P., Abdool Karim, S.S., Bradshaw, D., Jewkes, R., Karim, Q.A., Flisher, A.J., Mayosi, B.M., Tollman, S.M., Churchyard, G.J., Coovadia, H. 2009. *Achieving the health Millennium Development Goals for South Africa: challenges and priorities*. Pubmed.gov, 374(9694):1023–1031. Available: https://www.ncbi.nlm.nih.gov/pubmed/19709737 (Accessed 26 September 2017).

Cipolle, R.J., Strand, L.M., Morley, P.C. 2005. *Pharmaceutical Care Practice:* The Patient-Centered Approach to Medication Management. 2nd Edition. New York: McGraw Hill.

Cipolle, R.J., Strand, L.M., Morley, P.C. 2012. *Pharmaceutical Care Practice: The Patient-Centered Approach to Medication Management.* 3rd Edition. New York: McGraw Hill.

Clancy, C.M., Farquhar, M.B., Sharp, B.A. 2005. Patient safety in nursing practice. *J Nurs Care Qual,* Jul-Sep 2005; 20(3):193-197. Available: https://www.ncbi.nlm.nih.gov/books/NBK2681/ (Accessed 18 April 2018).

Cohen, J.T., Neumann, P.J., and Milton C. Weinstein, M.C. 2008. Does Preventive Care Save Money? Health Economics and the Presidential Candidates. *PERSPECTIVE. NEW ENGLAND JOURNAL OF MEDICINE*. 358:661-663. Available: http://www.nejm.org/doi/ref/10.1056/NEJMp0708558#t=references (Accessed 19 June 2017).

Collaborative Justice. 2013. *Center for Effective Public Policy*. Available: http://www.collaborativejustice.org/how/tools/structure/structure-ex1.htm (Accessed 5 July 2018).

Collins, D.L., Leibbrandt, M. 2007. *The financial impact of HIV/AIDS on poor households in South Africa*. AIDS 2007;21(Suppl. 7): S75-S81. Available: http://dx.doi.org/10.1097/01.aids.0000300538.28096.1c (Accessed 7 May 2017).

Collis, J and Hussey, R. 2003. Business research. *A practical guide for undergraduate and postgraduate students*. New York., NY: Macmillan.

Cooper, D.R. and Schindler, P.S. 2003. *Business Research Methods*. 8th Edition, McGraw-Hill Irwin, Boston.

Cook, T. D. and Campbell, D. T. 1979. *Quasi-experimentation: design and analysis issues for field settings*. Boston: Houghton Mifflin.

Couper, I.D. 2003. Rural hospital focus: defining rural. The International Electronic Journal of Rural and Remote Health Research, Education, Practice and Policy. Rural and Remote Health 3. Available: https://www.wits.ac.za/media/migration/files/cs-38933-fix/migrated-pdf/pdfs-5/rrh%20defining%20rural.pdf (Accessed 11 January 2019).

Cousins, C., Kijlstra, N., Waber, S. 2012. Pharmaceutical Care. Policies and Practices for a Safer, More Responsible and Cost-effective Health System. *European Directorate for the Quality of Medicines & HealthCare, EDQM.* Available: file:///C:/Users/hifi%20corp/Desktop/Research%20Articles/Pharmaceutical%20Care-.pdf (Accessed on 2 February 2017).

Creswell, J. W. 1998. *Qualitative Inquiry and Research Design: Choosing Among the Five Traditions*. Thousand Oaks, CA: Sage.

Cresswell, J.W. 2003. *Research design: Qualitative, quantitative and mixed methods approaches*. 2nd ed. Thousand Oaks, CA: Sage.

Creswell, J.W. 2007. *Qualitative Inquiry and Research Design: Choosing among five Approaches.* SAGE Publications.

Cresswell, J.W. and Poth, C.N. 1998. *Qualitative Inquiry and Research Design. Choosing Among Five Approach*. 4th Edition. Available: https://books.google.co.za/books?hl=en&lr=&id=DLbBDQAAQBAJ&oi=fnd&pg=PP1&dq=creswell+1998+ethnography&ots=-gn3a8JSNs&sig=JWFH4sMkVOl0iUxRpwxykaj4gpA#v=onepage&q=creswell%201998%20ethnography&f=false (Accessed 27 August 2017).

Cresswell, J.W. and Miller, D.L. 2000. *Determining Validity in Qualitative Inquiry.* Available: https://people.ucsc.edu/~ktellez/Creswell_validity2000.pdf (Accessed 26 August 2017).

Creswell, J.W., Fetters, M.D. & Ivankova, N.V. 2004. Designing a Mixed Methods study in primary care. *Annals of Family Medicine*, 2: 7-12.

Creswell, J.W., Plano Clark V.L. 2006. *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: Sage.

Creswell, J.W. and Tashakkori, A. (2007). Differing Perspectives on Mixed Methods Research. *Journal of Mixed Methods Research*, 1: 303-308. Available: https://www.researchgate.net/publication/240730453_Differing_Perspectives_on_Mixed_Methods_Research (Accessed 17 July 2018).

Crowley, T.and Etelleriberg, E.L. 2015. An evaluation of the adequacy of pharmaceutical services for the provision of antiretroviral treatment in primary health care clinics. Available https://hsag.co.za/index.php/hsag/article/view/923 (Accessed 29 May 2018).

D'Amour, D., Ferrada-Videla, M., Rodriguez, L.S.M. 2005. The conceptual basis for interprofessional collaboration: Core concepts and theoretical frameworks. *Journal of*

International Care. 1:116-131. Available: file:///C:/Users/hifi%20corp/Downloads/Ciollaboration.pdf (Accessed 16 May 2017).

Dalton, K. and Byrne, S. 2016. Role of a Pharmacist in reducing healthcare costs. *Current insights*. Available: https://www.dovepress.com/role-of-the-pharmacist-in-reducing-healthcare-costs-current-insights-peer-reviewed-article-IPRP (Accessed 19 June 2017).

Daly, J., Kellehear, A. and Gliksman, M. 1997. *The Public Health Researcher: A Methodological Approach*. Melbourne, Australia: Oxford University Press: 611–618.

Darkoh, E. 2010. HIV expert Ernest Darkoh: *Africa can't use Western models to fight AIDS.*

Daviaud, E and Subedar, H. 2012. Staffing Norms for Primary Health Care in the context of PHC Re-engineering. *MRC SA*. Available: http://www.mrc.ac.za/sites/default/files/files/2016-07-14/StaffingNorms.pdf (Accessed 4 August 2018).

DeBenedette, V. 2018. Are There Too Many Pharmacists? *Drug Topics- Voice of the pharmacist,* 164(5). Available: http://www.drugtopics.com/pharmacy/are-there-too-many-pharmacists (Accessed 13 June 2018).

Deetz, S. 1996. Describing Differences in Approaches to Organizational Science: Rethinking Burrell and Morgan and Their Legacy. Organization Science, 7: 191-207. Available: https://www.sfu.ca/cmns/courses/2012/801/1-Readings/Deetz%20Describing%20Difference%20in%20Approaches.pdf (Accessed 28 August 2017).

De Melo, D.O., de Castro, L.L.C. 2017. Pharmacist's contribution to the promotion of access and rational use of essential medicines in SUS. *SciELO*, 22(1). Available: http://dx.doi.org/10.1590/1413-81232017221.16202015 (Accessed 10 May 2017).

Demler, T.L. 2016. Pharmacist involvement in hospice and palliative care. *US Pharmacist,* 41(3): HS2-HS5. Available: https://www.uspharmacist.com/article/pharmacist-involvement-in-hospice-and-palliative-care (Accessed 29 June 2018).

Denzin, N.K. 1978. *Sociological methods*: A sourcebook. New York, NY: McGraw-Hill.

Denzin, N.K. 1989. *The research act: a theoretical introduction to sociological methods*. Englewood Cliffs: Prentice Hall.

Denzin, N. K. and Lincoln, Y. S. 2003. *The landscape of qualitative research: theories and issues*. Thousand Oaks, Calif., Sage.

Denzin, N. K. and Lincoln, Y. S. 2005. *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage Publications.

Department for Environment, Food & Rural Affairs (DEFRA) (2002). A guide to rural-proofing: considering the needs of rural areas and communities. DEFRA: London. Available at http://www.ofmdfmni.gov.uk/rural.pdf (Accessed 25 July 2017).

De Vos, A. S., Strydom, H., Fouché, C. B. and Delport, C. S. L. 2005. *Research at grass roots for the social sciences and human service professions*. 3rd ed. Pretoria: Van Schaik.

Deya, R.M., de Vriesb, M.J.W., Bosnic-Anticevicha, S. 2011. Collaboration in chronic care: unpacking the relationship of pharmacists and general medical practitioners in primary care. *Int J Pharm Pract,* 19: 21-29. Available: https://www.ncbi.nlm.nih.gov/pubmed/21235656 (Accessed 20 February 2017).

Dey, I. 1993. *Qualitative Data Analysis: A User-Friendly Guide*. London. Routledge.

Dieleman, JL., Sadat, N., Chang, AY. 2018. Trends in future health financing and coverage: future health spending and universal health coverage in 188 countries, *Lancet,* 5;391(10132), :1783-1798. Available: https://www.ncbi.nlm.nih.gov/pubmed/29678341 (Accessed 12 June 2018).

Dobson, R.T., Henry, C.J., Taylor, J.G., Zello, G.A., Lachaine, J., Forbes, D.A., Keegan, D.L. 2006. Interprofessional health care teams: attitudes and environmental factors associated with participation by community pharmacists. *J Interprof Care*, 20(2): 119-32. Available: https://www.ncbi.nlm.nih.gov/pubmed/16608715 (Accessed 1 August 2017).

Dobson, R.T., Taylor, J.G., Henry, C.J., Lachaine, J., Zello, G.A., Keegan, D.L., Forbes, D.A. 2009. Taking the lead: community pharmacists' perception of their role potential within the primary care team. *Res Social Adm Pharm,* 5(4): 327-36. Available: https://www.ncbi.nlm.nih.gov/pubmed/19962676 (Accessed 26 March 2018).

Domegan, C. and Fleming, D. 2007. *Marketing Research in Ireland*. 3rd ed. Dublin: Gill MacMillan.

Donaldson, M.S., Yordy, K.D., Lohr, K.N., & Vanselow, N.A. 1996. *Primary Care: America's Health in a new Era. Institute of Medicine*. 4: 27-51. Available: https://www.nap.edu/read/5152/chapter/4 (Accessed 13 May 2016).

Dos SANTOS, A.A.A., and de LIMA, T.H. 2017. Thematic section: Psychological Assessment- Exploratory and confirmatory factor analysis of the *Roteiro de Avaliação da Consciência Fonológica*, a phonological awareness test. Estud. psicol. (Campinas), 34(2), Campinas May. /June 2017. Available: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-166X2017000200211 (Accessed 29 September 2018).

Doucette, W.R., Nevins, J., McDonough, R.P.2005. Factors affecting collaborative care between pharmacists and physicians. *Res Social Adm Pharm,* 1: 565-578. Available: https://www.ncbi.nlm.nih.gov/pubmed/17138496 (Accessed 19 October 2018).

Du Plooy, GM. 2006. *Communication research*. Cape Town: Juta & Company.

Du Plooy-Cilliers, F., Davis, C., Bezuidenhout, RM. 2014. *Research Matters*. Landsdowne: Juta & Company.

Du Toit, J. 2017. Alternative models for delivery of medication to stable patients on long term therapy. South African Pharm. Journal, 84: 56–57. Available: https://journals.co.za/content/journal/10520/EJC-8369b97c0 (Accessed 18 February 2017).

Easterby-Smith, M., Thorpe, R. and Jackson, P. 2002. *Management Research: An Introduction*. 1st ed. SAGE Publications Ltd.

Economists Intelligence Unit. 2011. *Health Systems Trust*. The future of healthcare in Africa. Available: http://www.hst.org.za/sites/default/files/The%20Future%20of%20Healthcare%20in%20Africa.pdf (Accessed 24 March 2017).

Elliott. J., McNeil, H., Ashbourne, J., Huson, K., Boscart, V., Byrne, K., Stolee, P. 2016. Engaging older adults in health care decision-making: a realist synthesis. 9 (5): 383-393. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5021754/ (Accessed 22 November 2017).

Els, L. and du Plessis, H. 2003. *Continuing professional development: a great big, buzzing, booming confusion?* Pharmaciae. 11: 10-11.

Emmerton, L., Marriott, J., Bessell, T., Nissen, L., Dean, L. 2005. Pharmacists and prescribing rights: review of international developments. *J Pharm Pharmaceut Sci*, *Encyclopedia Britannica.* 8 (2): 217-225.*Available:* https://www.britannica.com/search?query=pharmaceuticals (*Accessed 15 June 2018).*

Erichsén. E., Milberg, A., Jaarsma, T., Friedrichsen, M.J. 2014. Constipation in specialized palliative care: prevalence, definition, and patient-perceived symptom distress. *J Palliat Med,* 18(7): 585-592. Available: https://www.ncbi.nlm.nih.gov/pubmed/25874474 (Accessed 25 May 2018).

Evans, A.C. 2000. *Qualitative research teaching in a South African university psychology department*. Thohoyandou: Psychology Department, University of Venda.

Eze, M. O. 2010. *Intellectual History in Contemporary South Africa*, 190–191.

Farrell, B., Pottie, K., Haydt, S., Kennie, N., Sellors, C., Dolvich, L. 2008. Integrating into family practice: the experiences of pharmacists in Ontario, Canada. *Int J Pharm Pract,* 16: 309-315. Available: https://onlinelibrary.wiley.com/doi/abs/10.1211/ijpp.16.5.0006 (Accessed 9 June 2017).

Farrell, B., Pottie, K., Woodend, K., Hua Yao, V., Kennie, N., Sellors, C. 2008. Developing a tool to measure contributions to medication-related processes in family medicine. Available: http://www.impactteam.info/documents/Farrelletal2008.pdf (Accessed 18 June 2016).

Farrell, B., Ward, N., Dore, N., Russell, G., Geneau, R., Evans, S. 2013. Working in interprofessional primary health care teams: what do pharmacists do? *Res Social Adm Pharm*, 9: 288-301. Available: https://www.ncbi.nlm.nih.gov/pubmed/22835709 (Accessed 19 Novemeber 2017).

Fereday, J., Muir-Cochrane., E. 2006. "Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development". *International Journal of Qualitative Methods,* 5 (1): 4. Available: https://journals.sagepub.com/doi/full/10.1177/160940690600500107 (Accessed 15 January 2018).

Flick, U.W.E. 2009. *An Introduction to Qualitative Research*. 4th ed. Sage.

Fokazi, S. 2015. Still no traditional healers registered. *Affinity Health cover- Official site*. Available: https://www.iol.co.za/news/politics/still-no-traditional-healers-registered-1841714 (Accessed 18 June 2018).

Foppe van Mil, J.W and Fernndo Fernandez-Llimos. 2013. What is 'pharmaceutical care' in 2013? *Pharm Pract Granada,* 11(1): 1-2. Available: https://pharmacypractice.org/journal/index.php/pp/article/view/172(Accessed 21 September 2018).

Freeman, T and Peck, E. 2006. Evaluating partnerships: a case study of integrated specialist mental health services, Health and Social Care in the Community, 14 (5): 408-417. Available: https://www.ncbi.nlm.nih.gov/pubmed/16918833 (Accessed 14 August 2017).

Gaede, B., and Versteeg, M. 2011. The State of the Right to Health in Rural South Africa, pp. 99-105. *Health Systems Trust*. Available: http://www.rhap.org.za/wp-content/uploads/2014/02/Chap-9-State-of-right-Rural-Health-pgs-99-106.pdf. (Accessed 28 February 2017).

Gall, M. D., Borg, W. R., Gall, J.P. 1996. Educational Research: An Introduction. New York: Longman.

Gallagher, P., Ryan, C., Byrne, S., Kennedy, J., O' Mahony, D. 2008. STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment): consensus validation. *Int J Clin Pharmacol Ther*, 46(2): 72-83. Available: https://www.ncbi.nlm.nih.gov/pubmed/18218287 (Accessed 12 May 2019).

Gallagher J, Byrne S, Woods N, Lynch D, McCarthy S. 2014. Cost-outcome description of clinical pharmacist interventions in a university teaching hospital. *BMC Health Serv Res,* 14: 177. Available: https://www.ncbi.nlm.nih.gov/pubmed/24742158 (Accessed 16 February 2019).

Galt, K. 1995. The key to pharmacist prescribing: collaboration. *Am J Health Syst Pharm*, 52: 1696- 1699. Avaialble: https://www.ncbi.nlm.nih.gov/pubmed/7583834 (Accessed 17 July 2018).

Gephart, R. 1999. Paradigms and research methods. Available: http://www.aom.pace.edu/rmd/1999_RMD_Forum_Paradigms_and_Research_Methods html (Accessed 20 June 2017).

Geyer, N. and Cur, M. 2001. Enabling legislation in diagnosis and prescribing of medicine by nurses/health practitioners. *Democratic Nursing Organisation of South Africa.* Available: http://curationis.org.za/index.php/curationis/article/viewFile/873/810 (Accessed 6 April 2017).

Gilbert, L. 1997b. Pharmacist and nurse: A team approach towards primary health care or a convenient 'therapeutic alliance'? *International Journal of Nursing Studies*, 34: 367-374.

Gilbert, L. 1998a. Dispensing doctors and prescribing pharmacists: A South African perspective. *Social Science & Medicine*, 46(1): 83–95. Availeble: https://www.ncbi.nlm.nih.gov/pubmed/9464671 (Accessed 21 September 2017).

Gilbert, L. 1998b. Community pharmacy in South Africa: A changing profession in a society in transition. *Health & place*, 4(3): 273–285. Available: https://www.ncbi.nlm.nih.gov/pubmed/10670977 (Accessed 2 March 2018).

Gilbert, L. 1998c. Pharmacy's attempts to extend its roles: A case study in South Africa. *Social Science & Medicine*, 47(2): 153–164. Available: https://www.ncbi.nlm.nih.gov/pubmed/9720635 (Accessed 5 February 2017).

Gilbert, L. 1999. Interprofessional care in South Africa: the expanding role of community pharmacy and the therapeutic alliance with nurses. *Journal of Interprofessional*

*care,*13(2):175-188. Available: https://www.ehrn.co.za/publications/download/71.pdf (Accessed 10 April 2018).

Gilbert, L. 2001. To diagnose, prescribe and dispense: Whose right is it? The ongoing struggle between pharmacy and medicine in South Africa. *Current Sociology*, 49(3): 97–118. Available: https://journals.sagepub.com/doi/10.1177/0011392101049003007 (Accessed 8 January 2018).

Gilbert, L. 2004. "Your health is our duty, our commitment, our life's work": Pharmacists in South Africa claim new ground. *Society in transition*, 35(2): 302–318. Available: https://www.tandfonline.com/doi/abs/10.1080/21528586.2004.10419121?journalCode=rssr19 (Accessed 2 August 2017).

Gill, J., and Johnson, P. 2010. *Research Methods for Managers*. 4th ed. Sheffield Management School. Sage Publishers.

Glasgow, R.E., Orleans, C.T., Wagner, E.H. 2001. Does the Chronic Care Model Serve Also as a Template for Improving Prevention? *The Milbank Quaterly*, 79(4): 579-612. Available: https://www.ncbi.nlm.nih.gov/pubmed/11789118 (Accessed 26 Novemeber 2018).

Gokula, M., Holmes, H.M. 2012. Tools to reduce polypharmacy. *Clin Geriatr Med,* 28(2): 323-341. Available at: https://www.ncbi.nlm.nih.gov/pubmed/22500546 (Accessed 25 May 2018).

Goldman. J., Meuser, J., Rogers, J., Lawrie, L., Reeves, S. 2010. Interprofessional collaboration in family health teams: an Ontario-based study. *Can Fam Physician*, 56(10):368-74. Available: https://www.ncbi.nlm.nih.gov/pubmed/20944025 (Accessed 15 June 2019).

Gomm, R., Hammersley, M. and Foster, P.eds. 2000. *Case study method*. London: Sage.

Goodman. M., Low, J., Wilkinson, S. 2005. Constipation management in palliative care: a survey of practices in the United Kingdom. *J Pain Symptom Manage,* 29(3): 238-244. Available at: http://dx.doi.org/10.1016/j.jpainsymman.2004.06.013 (Accessed 25 May 2018).

Gopi, A. 2018. Technology is 'dividing doctors and patients'. Press: *The Independent on Saturday*, 2 June.

Govender, N.P. 2012. Phased implementation of screening for cryptococcal disease in South Africa.*The South African Medical Journal*, 102 (12) Available: http://www.samj.org.za/index.php/samj/article/view/6228/4735 (Accessed 6 April 2018).

Gray, A. 2008. Medication safety and medication errors – where are we?.SA Association of Hospital and Institutional Pharmacists. KZN Coastal Branch.*SA Pharmaceutical Journal.* Available: https://journals.co.za/docserver/fulltext/mp_sapj/75/4/mp_sapj_v75_n4_a8.pdf?expires=1582895729&id=id&accname=guest&checksum=8D41D3D524F0B835B7BFA7F73BB5F63F (Accessed 1 May 2017).

Gray, A. 2010. Collaborative practice – more than just task shifting. SAAHIP. KwaZulu-Natal Coastal branch, 77:1. Available: http://www.sapj.co.za/index.php/SAPJ/article/view/728/668 (Accessed 16 October 2017).

Gray, A. 2014. *Prescribing in South Africa: what's next?* Available: http://www.sahivsoc.org/Files/Thurs_Andy_Gray%20Prescribing%20in%20south%20africa.pdf (Accessed 13 April 2018).

Gray, A., Suleman, F. 2012. Training for clinical pharmacists: plat du jour or smörgåsbord?.SA Association of Hospital and Institutional Pharmacists. *South African Pharmaceutical Journal,* 79(2): 38-40. Available:

https://www.sapj.co.za/index.php/SAPJ/article/download/1248/1733 (Accessed 11 April 2018).

Gray, A., Riddin, J., Jugathpal, J. 2016. Health Care and Pharmacy Practice in South Africa. *The Canadian Journal of Hospital Pharmacy,* 69(1): 36-41. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4777579/ (Accessed 11 April 2018).

Green, B.N., and Johnson, C.D. 2015. Interprofessional collaboration in research, education, and clinical practice: working together for a better future*. The Journal of Chiropractic Education,* 1: 1–10. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4360764/ (Accessed 15 May 2017).

Guba, E.G., & Lincoln, Y. S. 1981. *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA: Jossey-Bass

Guest, G and Namey, M. 2012. "Introduction to Thematic Analysis". *Applied Thematic Analysis*.

Guirguis, L.M., and Chewning, B.A. 2005. *Research in Social and Administrative Pharmacy*, 1: 483–507.

Gulliver, P., Peck. E., Towell, D. 2002. Balancing professional and team boundaries in mental health services: pursuing the holy grail in Somerset. *J Interprof Care,* 16(4): 539-570. Avaialble: https://www.ncbi.nlm.nih.gov/pubmed/12487844 (Accessed 4 March 2019).

Gumede, M. 2017. July conference to look at pharmacists' role in NHI. *BusinessDay,* 12 May. Available: https://www.businesslive.co.za/bd/national/health/2017-05-12-july-conference-to-look-at-pharmacists-role-in-nhi/ (Accessed 15 May 2017).

Gurney, M.K. 2009. Health care at a crossroad: what will the pharmacists' role be? *Res Social Adm Pharm*, 5(4): 302-304. Available: https://www.ncbi.nlm.nih.gov/pubmed/19962673 (Accessed 30 February 2019).

Habermas, J. 1966. *Knowledge and Interest*. Inquiry, 9: 285-300. Available: https://www.tandfonline.com/doi/abs/10.1080/00201746608601463?journalCode=sinq20 (Accessed 23 June 2019).

Habermas, J. 1971. *Knowledge and Human Interests*. Boston, MA: Beacon Press.

Habib, H.A. 2011. Introduction to Primary Health Care- PHC Model. Available: http://www.anovahealth.co.za/uploads/930-blog-Gauteng%20Provincial%20Overview%20on%20PHC%20Reengineering_%20Mr%20Modise%20Makhudu.pdf (Accessed 14 March 2017).

Hackley, C. 2003. Divergent Representational Practices in Advertising and Consumer Research: some thoughts on integration. Quantitative Market Research:an international journal, 6: 175-184. Available: https://www.emerald.com/insight/content/doi/10.1108/13522750310478976/full/html (Accessed 12 August 2018).

Hall, J.R. 1991. Being methodical in educational research. *Issues in Educational Research*, 1(1):1-5. Available: http://www.iier.org.au/iier1/hall.html (Accessed 15 May 2017).

Hammel, K. W. 2002. Informing client-centred practice through qualitative inquiry: Evaluating the quality of qualitative research. *British Journal of Occupational Therapy*, 65(4): 175-184. Available: https://journals.sagepub.com/doi/10.1177/030802260206500405 (Accessed 14 March 2019).

Hardy, M.E., Conway, M.E. 1988. *Role theory: perspectives for health professionals.*2nd ed. Norwalk, Conn.: Appleton & Lange.

Hart, L.G., Larson, E.H. and Lishner, D.M. 2005. Rural Definitions for Health Policy & Research. *AMJ.Public Health*, 95: 1149-1155. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449333/ (Accessed 24 July 2015).

Haynes, R.B., Ackloo, E., Sahota. N. McDonald, H.P., Yao, X. 2008. Interventions for enhancing medication adherence (Review). *THE COCHRANE COLLABORATION*, 16(2). Available: http://www.sefap.it/servizi_letteraturacardio_200807/CD000011.pdf (Accessed 17 June 2017).

Hazell L, Shakir SA. 2006. Under-reporting of adverse drug reactions: A systematic review. *Drug Saf,* 29(5): 385-396. Health Financing Profile South Africa. 2016. *Health Policy Project*. Available at: https://www.healthpolicyproject.com/pubs/7887/SouthAfrica_HFP.pdf (Accessed 19 June 2017).

Health Professionals Council of South Africa (HPCSA). 2008. Guidelines For Good Practice In The Health Care Professions National Patients' Rights Charter. Available: http://www.hpcsa.co.za/downloads/conduct_ethics/rules/generic_ethical_rules/booklet_patients_rights_charter.pdf (Accessed 25 April 2018).

Health Systems Trust. 2014. Annual performance plan 2014/2015 and 2016/2017. Available: http://www.hst.org.za/sites/default/files/app201415.pdf (Accessed 20June 2016).

Health Systems Trust. 2014. A Clinical Governance Handbook For District Clinical Specialist Teams. Available: http://www.hst.org.za/publications/HST%20Publications/Clinical%20Gov%20Handbook_LR_24Oct2014.pdf (Accessed 11 April 2018).

Health Systems Trust. 2016. District Health Barometer 2015/2016. Available: http://www.hst.org.za/publications/District%20Health%20Barometers/District%20Health%20Barometer%202015_16.pdf (Accessed 4 September 2018).

Health Systems Trust. 2016. Central Chronic Dispensing and Distribution programme (CCMDD).Zeeman, H. Available: http://www.hst.org.za/projects/central-chronic-medicine-dispensing-and-distribution-programme-ccmdd (Accessed 8 May 2017).

Health Systems Trust. 2016. South African Health Review 2016. Available: http://www.hst.org.za/publications/Pages/South-African-Health-Review-2016.aspx (Accessed 12 May 2017).

HealthyPeople 2020. Available: https://www.healthypeople.gov/2020/data-search/ (Accessed 12 June 2017).

Helper, D.D. and Strand, L. M. 1989. Opportunities and Responsibilities in Pharmaceutical Care. *American Journal Pharmacy Educ*,53: 270-274. Available: http://pharmacy.ouhsc.edu/about/pharmcare.asp (Accessed 26 May 2016).

Helper, C.D. and Strand, L.M. 1990. Opportunities and Responsibilities in Pharmaceutical Care. *American Journal Hospital Pharmacy*, 47:533-543. Available: http://apps.who.int/medicinedocs/en/d/Jh2995e/2.2.html#Jh2995e.2.2 (Accessed 18 April 2016).

Herman, S. and Egri, C. 2003. *Triangulation in action: Integration of qualitative and quantitative methods to research environmental leadership*. In K. Parry & J. Meindl (Eds.). Grounding leadership theory and research: Issues, perspectives and methods: 83-107. Greenwich, CT: Information Age Publishing.

Heron, J. and Reason, P. 1997. *A Participatory Inquiry Paradigm. Qualitative Inquiry*, 3: 274-294. Available: https://journals.sagepub.com/doi/10.1177/107780049700300302 (Accessed 10 January 2019).

Herrier, R., Boyce, R. and Apgar, D. 1990. Pharmacist managed patient-care services and prescriptive authority in the U.S. Public Health Service. *Hosp Formula*, 25(1): 67-68, 76-78, 80. Available: https://www.ncbi.nlm.nih.gov/pubmed/10103538 (Accessed 14 March 2018).

Hertig, J. 2011. New practitioners and the Pharmacy Practice Model Initiative: Our opportunity to define the future. *American Journal of Health-System Pharmacy*. 12:1074-1076. Available: http://www.ajhp.org/content/68/12/1074 (Accessed 8 April 2017).

Hibbard, J.H., Stockard, J., Mahoney, E.R., Tusler, M. 2004. Development of the Patient Activation Measure (PAM): conceptualizing and measuring activation in patients and consumers. *Health Serv Res*, 39(4 Pt 1): 1005–1026. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361049/ (Accessed 12 February 2019).

Hibbard, J.H., Greene, J., and Overton, V. 2013. Patients With Lower Activation Associated With Higher Costs; Delivery Systems Should Know Their Patients' 'Scores'. Health Affairs, 32(2):216-222. Available: https://www.ncbi.nlm.nih.gov/pubmed/23381513 (Accessed 15 March 2017).

Himmelman, T. A.T. 1992. *COLLABORATION FOR A CHANGE* (revised January 2002) Definitions, Decision-making models, Roles, and Collaboration Process Guide. HIMMELMAN Consulting.

Hindi, AMK., Schafheutle, EI, and Jacobs, S. 2019. Community pharmacy integration within the primary care pathway for people with long-term conditions: a focus group study of patients', pharmacists' and GPs' experiences and expectations. *BMC Fam Pract*, 20(1):26. Available: (Accessed 8 February 2020).

Hirschheim, R., Klein, H. K., Lyytinen, K. 1995. *Information Systems Development and Data Modeling - Conceptual and Philosophical Foundations*, Cambridge.

Hofman, K. 2014. Non-communicable diseases in South Africa: A challenge to economic development. *The South African Medical Journal (SAMJ),* 104. Available: http://www.samj.org.za/index.php/samj/article/view/8727/6218 (Accessed 20 March 2017).

Holliday, A. 2007. *Doing and Writing Qualitative Research.Language Arts & Disciplines*. 2nd ed. Sage Publication.London - Thousand Oaks - New Delhi. Available: https://methods.sagepub.com/book/doing-and-writing-qualitative-research-2e (Accessed 20 September 2016).

Hongoro, C.H., Dinat, N.A. 2011. A Cost Analysis of a Hospital-Based Palliative Care Outreach Program. *JPSM*; 41(6): 1015-1024. Available: https://www.ncbi.nlm.nih.gov/pubmed/21330096 (Accessed 17 January 2020).

Horne, R., Weinman, J., Barber, N., Elliot, R., Morgan, M. 2005. Concordance, adherence and compliance in medicine taking. Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R & D (NCCSDO). Available: http://www.netscc.ac.uk/hsdr/files/project/SDO_FR_08-1412-076_V01.pdf (Accessed 12 January 2019).

Hubbard, G and Themessl-Huber. M. 2005. Professional perceptions of joint working in primary care and social care services for older people in Scotland, *Journal of Interprofessional Care*, 19(4): 371-381. Available: https://www.ncbi.nlm.nih.gov/pubmed/16076598 (Accessed 11 July 2017).

Huberman, A. M. and Miles, M. B. 2002. Introduction. In A. M. Huberman, & M. B. Miles (Eds.), *The qualitative researcher"s companion*. Thousand Oaks, CA: Sage Publications.

Hudson, B. 2007. Pessimism and optimism in inter-professional working: the Sedgefield Integrated Team, *Journal of Interprofessional Care*, 21(1): 3-15.

Available: https://www.ncbi.nlm.nih.gov/pubmed/17365370 (Accessed 12 March 2018).

Hughes, R.G. 2008. Patient Safety and Quality: An Evidence-Based Handbook for Nurses.Agency for Healthcare Research and Quality (AHRQ) Publication. Available: https://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/nurseshdbk.pdf (Accessed 6 May 2017).

Hughes, D.A. 2012. An agenda for UK clinical pharmacology: pharmacoeconomics. *Br J Clin Pharmacol,* 73(6): 968–972. Available: https://bpspubs.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1365-2125.2012.04247.x (Accessed 6 July 2017).

Huxham, C. ed. 1996. *Creating Collaborative Advantage*.Sage Publications. London. Thousand Oaks: New Delhi.

Huxham, C., and Vangen, S. 2005. *Managing to Collaborate, the Theory & Practice of Collaborative Advantage*. Routledge: Available: https://books.google.co.za/books?id=oooZV3EasU0C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false (Accessed 24 June 2016).

Huxham, C., and Hibbert, P. 2008. Manifested Attitudes: Intricacies of Inter-Partner Learning in Collaboration. *Journal of Management Studies*, 45(3): 502-529. Available: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3026843 (Accessed 9 July 2018).

Idris, M. K. 2011. *Over Time Effects of Role Stress on Psychological Strain among Malaysian Public University Academics*, 2(9): 154-161. Available: https://pdfs.semanticscholar.org/474f/c8fc4aa7ac12186751c822d2296275aa09d9.pdf?ga=2.257835531.1260681881.1582901114-959590170.1582901114 (Accessed 3 June 2016).

Institute of Medicine. 2000. Creating safety systems in health care organizations. In: Kohn, L., Corrigan, J., Donaldson, M, eds. *To err is human: building a safer health system*. Washington (DC): National Academy Press.

Institute of Medicine. 2001. *Crossing the Quality Chasm: A New Health System for the Twenty-first Century.Washington*: National Academy Press. Available: http://www.nationalacademies.org/hmd/~/media/Files/Report%20Files/2001/Crossing-the-Quality-Chasm/Quality%20Chasm%202001%20%20report%20brief.pdf (Accessed 18 May 2018).

Institute of Medicine. 2003. *The Future of the Public's Health in the 21st Century*. Washington, DC: National Academies Press.

Institute of Medicine. 2006. *Preventing medication errors: Quality Chasm Series*. Washington.Available: http://www.nationalacademies.org/hmd/Reports/2006/Preventing-Medication-Errors-Quality-Chasm-Series.aspx (Accessed 30 March 2017).

Institute of Medicine. 2013. Cuff. P.A.: Interprofessional Education for Collaboration. Global Forum on Innovation in Health Professional Education: Washington DC.

International Pharmaceutical Federation (FIP). 1998. FIP Statement of Professional Standards: Pharmaceutical Care.

International Pharmaceutical Federation (FIP). 1999. Fip Statement Of Professional Standards Medication Errors Associated With Prescribed Medication. Available: https://www.fip.org/www/uploads/database_file.php?id=229&table_id= (Accessed 10 June 2017).

International Pharmaceutical Federation (FIP). 2000. Fip Statement Of Policy On Good Pharmacy Education Practice. Available: https://fip.org/www/uploads/database_file.php?id=188&table_id= (Accessed 11 June 2017).

International Pharmaceutical Federation (FIP). 2006. FIP STATEMENT OF POLICY THE ROLE OF THE PHARMACIST IN PHARMACOVIGILANCE. Available: http://www.fip.org/www/uploads/database_file.php?id=273&table_id= (Accessed 10 June 2017).

International Pharmaceutical Federation (FIP). 2014. OATH / PROMISE OF A PHARMACIST. Available: http://www.fip.org/www/uploads/database_file.php?id=364&table_id= (Accessed 10 June 2017).

International Pharmaceutical Federation (FIP). 2012. FIP Global Pharmacy Workforce report. Available: https://www.fip.org/static/fipeducation/2012/FIP-Workforce-Report-2012/index.html#/40 (Accessed 12 July 2017).

International Pharmaceutical Federation (FIP). 2016. Putting people first. International Pharmaceutical Federation Annual Report 2016. Available: https://fip.org/files/fip/FIP_Annual_Report_2016.pdf. (Accessed 4 November 2018).

Jakovljevic, M. B. and Milovanovic, O. 2015. Growing Burden of Non-Communicable Diseases in the Emerging Health Markets: The Case of BRICS. *Front. Public Health* 3: 65. Available: https://www.frontiersin.org/articles/10.3389/fpubh.2015.00065/full (Accessed 28 October 2017).

James, K.L., Barlow, D., McArtney R., Hiom, S., Roberts, D., Whittlesea, C. 2009. Incidence, type and causes of dispensing errors: a review of the literature. *Int. J. Pharm. Pract*. 2009; 17(1): 9-30. Available: https://www.ncbi.nlm.nih.gov/pubmed/20218026 (Accessed 25 May 2019).

Jarvis, J.N., Boulle, A., Loyse, A., Bicanic, T., Rebe, K., Williams, A., Harrison, T.S. and Meintjes, G. 2009. High ongoing burden of cryptococcal disease in Africa despite

antiretroviral roll out. *AIDS* 2009;23(9): 1182-1183. Available: https://journals.lww.com/aidsonline/Fulltext/2009/06010/High_ongoing_burden_of_cryptococcal_disease_in.19.aspx (Accessed 22 March 2018).

Jarvis, J.N., Meintjes, G., Williams, A., Brown, Y., Crede, T., Harrison, T.S. 2010. Adult meningitis in a setting of high HIV and TB prevalence: findings from 4961 suspected cases,10: 67. Available: https://bmcinfectdis.biomedcentral.com/articles/10.1186/1471-2334-10-67 (Accessed 12 July 2018).

Jarvis, J.N., Lawn, S.D., Wood, R., Harrison, T.S. 2010. Cryptococcal antigen screening for patients initiating antiretroviral therapy: time for action. *Clin Infect Dis*, 51(12): 1463-1465. Available: https://www.ncbi.nlm.nih.gov/pubmed/21082878 (Accessed 17 February 2019).

Jarvis, J.N., Harrison, T.S., Govender, N., Lawn, S.D., Longley, N., Bicanic, T., Maartens, G., Venter, F., Bekker, LG., Wood, R., meintjes, G. 2011. Routine cryptococcal antigen screening for HIV-infected patients with low CD4+ T-lymphocyte counts – time to implement in South Africa? *S Afr Med J*, 101(4): 232-234. Available: http://www.samj.org.za/index.php/samj/article/view/4752 (Accessed 10 August 2018).

Jarvis, J.N., Percival, A., Bauman, S., Pelfrey, J., Meintjes, G., Williams, G.N., Longley, N., Harrison, T.S. and Kozel, T.R. 2011. Evaluation of a novel point of care cryptococcal antigen (CRAG) test on serum, plasma and urine from patients with HIV-associated cryptococcal meningitis. *Clin Infect Dis,* 53(10):1019-1023. Available: https://academic.oup.com/cid/article/53/10/1019/332860 (Accessed 4 July 2016).

Jennings, B.M. 2008. Work Stress and Burnout Among Nurses: Role of the Work Environment and Working Conditions. Patient Safety and Quality: *An Evidence-Based Handbook for Nurses*. Available: http://www.ncbi.nlm.nih.gov/books/NBK2668/ (Accessed 10 June 2016).

Johns Hopkins Bloomberg School of Public Health. 2017. Center for Health Security. Serving the greater good. Public health and community pharmacy partnerships. Available: https://hub.jhu.edu/2017/01/17/center-health-security-bloomberg-public-health/ (Accessed 16 June 2018).

Johnson, R.B. and Onwuegbuzie, A.J. 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Source: Educational Researcher*, 33(7): 14-26 Published by: American Educational Research Association.

Joint Task Group on Public Health Human Resources; Advisory Committee on Health Delivery & Human Resources; Advisory Committee on Population Health & Health Security. 2005. *Building the public health workforce for the 21st century*. Ottawa: Public Health Agency of Canada.
Available: http://publications.gc.ca/collections/collection_2008/phac-aspc/HP5-12-2005E.pdf (Accessed 26 March 2017).

Joint United Nations Programme on HIV/AIDS. 2015. *Progress Report on the Global Plan towards the elimination of new HIV infections among children and keeping their mothers alive.* Geneva: Joint United Nations Programme on HIV/AIDS.

Jooste, N. 2017. CCMDD Electronic System- Best Practices and Data Use Innovations Workshop. *Health Systems Trust*. Available: https://za.usembassy.gov/wp-content/uploads/sites/19/S07_1125_JoosteN_CCMDD.pdf (Accessed 20 January 2018).

Jorgenson, D., Dalton, D., Farrel, B., Tsuyuki, R.T. and Dolovich, L. 2013. Guidelines for pharmacists integrating into primary care teams. *Can Pharm J (Ott),* 146(6): 342–352. Available:
file:///C:/Users/hifi%20corp/Downloads/Guidelines%20for%20pharmacists%20integrating%20into%20primary%20care%20teams.htm (Accessed 20 May 2016).

Jorgenson, D., Laubscher, T., Lyons, B., Palmer, R. 2014. Integrating pharmacists into primary care teams: barriers and facilitators. *International Journal of Pharmacy practice*. 4: 292-299. Available: https://www.ncbi.nlm.nih.gov/pubmed/24279947 (Accessed 23 May 2017).

Joshi, R., Alim, M., Kengne, A.P., Jan, S., Maulik, P.K., Peiris, D., Patel, A.A. 2014.Task Shifting for Non-Communicable Disease Management in Low and Middle Income Countries – A Systematic Review. PLoS ONE. 9(8): e103754. Available: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0103754 (Accessed 13 April 2018).

Joubert, M.C. and Naidoo, P. 2016. Knowledge, perceptions and practices of pharmacovigilance amongst community and hospital pharmacists in a selected district of North West Province, South Africa. *Health SA Gesondheid*, 21:238-244. Available: http://www.sciencedirect.com/science/article/pii/S1025984816300084 (Accessed 28 April 2017).

Kahn, R. L., Wolfe, D. M., Quinn, R. P., Snoek, J. D. and Rosenthal, R. A.1964. Organizational stress: Studies in role conflict and ambiguity. John Wiley & Sons Inc.

Kaiser, H. 1974. *An index of factor simplicity*. Psychometrika, 39: 31–36.

Kalla, S. 2010. Statistical Validity. Available: https://explorable.com/statistical-validity (Accessed 1 October 2018).

Kaplan, C., Mason, V., Bo-Linn, G., Gordon and Betty Moore. 2013. Bringing a Systems Approach to Health.National Academy of Engineering. *Institute of Medicine*. Available: https://www.nae.edu/File.aspx?id=86344 (Accessed 12 May 2017).

Kautzky, K. and Tollman, S.M. 2008. A Perspective on Primary Health Care in South Africa. *School of Public Health, University of the Witwatersrand*. Available: http://www.hst.org.za/uploads/files/chap2_08.pdf (Accessed 14 May 2016).

Keeton C. 2010. Bridging the gap in South Africa. *Bull World Health Organ*, 88(11): 803–804. Available: https://www.ncbi.nlm.nih.gov/pubmed/21076558 (Accessed 5 December 2018).

Kelly J, Wright D. 2011. Medicine administration errors and their severity in secondary care older persons' ward: a multi-centre observational study. *J. Clin. Nursing*. Available: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2702.2011.03760.x (Accessed 12 August 2017).

Kemper, E. A., Stringfield, S. and Teddlie, C. 2003. *Mixed method sampling strategies in social science research*. In Tashakkori & Teddlie (Eds.) Handbook of Mixed Methods in Social and Behavioral Research (Chapter 10). Thousand Oaks, CA: Sage Publications.

Kettledas, R. 2016. Central Chronic Medicine Dispensing and Distribution Programme." Reaching 90-90-90 in South Africa Part III: Best Practices and Innovations in Linkage, Treatment, and Viral Suppression". National Department of Health.

Keyton, J. 2001. *Communication research. Asking questions, finding answers*. 3rd ed. New York: McGraw- Hill.

Khomba, J.K. 2011. 4 CHAPTER FOUR: THE AFRICAN UBUNTU PHILOSPHY. Available: http://repository.up.ac.za/bitstream/handle/2263/28706/04chapter4.pdf?sequence=5 (Accessed 1 July 2017).

Kiguba, R., Karamagi, C., and Bird, S.M. 2017.Antibiotic-associated suspected adverse drug reactions among hospitalized patients in Uganda: a prospective cohort study. *Pharmacology Research & Perspectives*, 5(2): e00298. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5368962/ (Accessed 23 April 2017).

Kijlstra, N., Ridge, K., Walser, S. 2009. Pharmaceutical Care: Where do we stand-Where should we go?: *EDQM Publication*. Available: https://store.edqm.eu/index.html. (Accessed 20 April 2017).

Kijlstra, N. 2010. Quality of pharmaceutical care – How to reconcile patients' rights and demands with healthcare system's missions and goals. Available: https://www.edqm.eu/sites/default/files/proceedings_expert_workshop_10th_december_2010.pdf (Accessed 14 May 2017).

Killeen, R. 2007. Communicating with physicians. *Canadian Pharmacists Journal. (Ott),*140(4): 231-232. Available: https://journals.sagepub.com/doi/10.3821/1913701X2007140231CWP20CO2 (Accessed 10 Decemeber 2017).

Kishuna, A. 1996. Pharmaceutical services at primary care clinics in KwaZulu-Natal: Implications for extending the role of the public sector pharmacist towards supporting such services. *Health Systems Trust Update*.

Klausner JD, Govender N, Oladoyinbo S, Roy M, Chiller T. 2012. Preventing AIDS deaths: cryptococcal antigen screening and treatment. *Lancet Infect Dis,* 12(6): 431-432. Available:https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(12)70094-4/fulltext (Accessed 19 March 2019).

Kohn, L.T., Corrigan, J.M., Donaldson, M.S. 2000. *To err is human: building a safer health system. A report of the Committee on Quality of Health Care in America*, Institute of Medicine. Washington, DC: National Academy Press; 2000.

Kolodziejak, L., Remillard, A., Neubauer, S. 2010. Integration of a primary healthcare pharmacist. *J Interprof Care,* 24(3): 274-84. Available: https://www.ncbi.nlm.nih.gov/pubmed/20388026 (Accessed 2 December 2018).

Kothari, C. R. 2004. *Research Methodology: Methods and Techniques*, 2nd ed. New Age International Publishers.

Kozminski, M., Busby, R., McGivney, M.S., Klatt, P.M., Hackett, S.R., Merenstein, J.H. 2003. Pharmacist integration into the medical home: qualitative analysis. *J Am Pharm Assoc*, 51(2):173-183. Avaialble: https://www.ncbi.nlm.nih.gov/pubmed/21382807 (Accessed 21 Novemeber 2017).

KPMG. Centre for Universal Health Coverage. 2017. Lessons the world has learnt on the path to Universal Health Coverage. Available: https://assets.kpmg.com/content/dam/kpmg/za/pdf/2017/08/lessons-learned-on-the-path-to-uhc-2.pdf (Accessed 14 June 2018).

Krauss, S. E. 2005. Research paradigm and meaning making: A primer. *The Qualitative Report*, 10(4): 758-770. Available: https://nsuworks.nova.edu/tqr/vol10/iss4/7/ (Accessed 26 December 2018).

Krefting, L. 1991. Rigor in qualitative research. The assessment of trustworthiness. *An American Journal of Occupational Therapy*, 45(3): 214-222. Available: https://ajot.aota.org/article.aspx?articleid=1876643 (Accessed 2 January 2019).

Krippendorff, K. 2014. *Content Analysis: An Introduction to its Methodology*. 4th ed. Thousand Oakes. CA: Sage.

Krishnaswami, O.R, and Ranganatham, M. 2007. *Methodology of Research in Social Sciences*. New Delhi: Himalaya Publishing House.

Krska, J., Jamieson, D., Arris, F., McGuire, A., Abbott, S., Hansford, D., Cromarty, J. 2002. A classification system for issues identified in pharmaceutical care practice. *Int J Pharm Pract*, 10(2): 91-100. Available: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.2042-7174.2002.tb00593.x (Accessed 18 April 2019).

Kuhn, T.S. 1974. Second thoughts on paradigms. In The essential tension: Selected studies in scientific tradition and change. Chicago: University of Chicago Press. Available: https://philpapers.org/rec/KUHSTO (Accessed 18 December 2018).

Kumar, R. 2011. *Research methodology: A step-by-step guide for beginners*. London: Sage.

Kvale, S. 1996. *Interviews: an introduction to qualitative research interviewing*. New York: Sage.

KZNPPHC. KZN Progressive Primary Health Care- PPHC. Available: http://www.kznpphc.org.za/previous-programes--projects (Accessed 3 July 2017).

Labuschagne, E. 2012. Health Care and Poverty in Rural KZN. News24, City Press, 24 August. Available:http://www.news24.com/mynews24/health-care-and-poverty-in-rural-kzn-0120824 (Accessed 12 April 2017).

Lacobucci, D. and Churchill, G.A. 2005. *Marketing research: Methodological Foundations.*

Lasker, R.D., Weiss, E.S., and Miller, R. 2001. Partnership Synergy: A Practical Framework for Studying and Strengthening the Collaborative Advantage. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2751192/pdf/milq_203.pdf (Accessed 24 June 2016).

Latif, A., Pollock, K., Boardman, H.F. 2011. The contribution of the Medicines Use Review (MUR) consultation to counseling practice in community pharmacies. *Patient Educ Couns,* 83(3): 336–344. Available: https://www.ncbi.nlm.nih.gov/pubmed/21621943 (Accessed 20 March 2017).

Leathard, A. 2003. *Interprofessional Collaboration: From Policy to practice in Health and Social Care*. Routledge. Available:

https://books.google.co.za/books?hl=en&lr=&id=21ExV0lQ0XIC&oi=fnd&pg=PR3&dq=WHO+ON+INTERPROFESSIONAL+COLLABORATION&ots=gQum_wwcTQ&sig=ywosvhPyfGvTUGN0g78wwWnAXIk#v=onepage&q=WHO%20ON%20INTERPROFESSIONAL%20COLLABORATION&f=false (Accessed 16 May 2017).

LeCompte, M. D., & Goetz, J. P. 1982. Problems of reliability and validity in ethnographic research. *Review of Educational Research*, 52(1): 31-60. Available: https://www.researchgate.net/publication/255615696_Problems_of_Reliability_and_Validity_in_Ethnographic_Research (28 December 2017).

Lee, J.K., Grace, K.A., Taylor, A.J. 2006. Effect of a pharmacy care program on medication adherence and persistence, blood pressure, and low-density lipoprotein cholesterol: a randomized controlled trial. *JAMA,* 296(21): 2563–2571. Available: https://www.ncbi.nlm.nih.gov/pubmed/17101639 (Accessed 21 April 2018).

Lee, S., and Lee, D.K. 2018. What is the proper way to apply the multiple comparison test? *Korean J Anesthesiol*, 71(5): 353-360. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6193594/ (Accessed 28 February 2020).

Legault, F., Humbert, J., Amos, S., Hogg, W., Ward, N., Dahrouge, S., Ziebell, L. 2012. Difficulties encountered in collaborative care: logistics trumps desire. *J Am Board Fam Med*, 25(2): 168-76. Available: https://www.ncbi.nlm.nih.gov/pubmed/22403197 (Accessed 14 July 2019).

Legesse, B. 2014. *Research Methods in Agribusiness and Value Chains*. School of Agricultural Economics and Agribusiness, Haramaya University.

Lehmann, U.,Dieleman,M., & Martineau,T. 2008.Staffing remote rural areas in middle- and low-income countries: A literature review of attraction and retention. *BMC Health Services Research.* Available: https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-8-19 (Accessed 17 March 2017).

Lester, S. 1999. An introduction to phenomenological research. Available: https://www.researchgate.net/profile/Stan_Lester/publication/255647619_An_introduction_to_phenomenological_research/links/545a05e30cf2cf5164840df6.pdf (Accessed 26 August 2017).

Lincoln, Y.S. and Guba, E.G. 1985. *Naturalistic Inquiry*. 75. Sage.
Local Government Handbook- South Africa 2016. A complete guide to Municipalities in South Africa. Available: *http://www.localgovernment.co.za/districts/view/22/uMzinyathi-District-Municipality#overview* (Accessed 6 July 2016).

Lofland, J., & Lofland, L. 1996. *Analyzing social settings*. Belmont, CA: Wadsworth.

Lorig, K. 1993. Self- management of chronic Illnesses: a model for the future. *Generation*; 17:11-14. Available: https://www.scienceopen.com/document?vid=45ba4d30-4d5c-466c-854e-c81d43df6813 (Accessed 11 June 2019).

Macfarlan, A. 2014. Key Informant Interviews. BetterEvaluation. Available: https://www.betterevaluation.org/evaluation-options/key_informant_interviews. (Accessed 28 March 2018).

Mafuwane, B.M. 2012. The contribution of instructional leadership to learner performance. University of Pretoria. Available: https://repository.up.ac.za/bitstream/handle/2263/24016/Complete.pdf?sequence=10. (Accessed 11 September 2017).

Maher, R.L., Hanlon, J., Hajjar, E.R. 2014. Clinical consequences of polypharmacy in elderly. *Expert Opin Drug Saf,* 13(1): 57–65. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3864987/ (Accessed 12 December 2017).

Malangu, N. 2014. The Future of Community Pharmacy Practice in South Africa in the light of the Proposed New Qualification for Pharmacists: Implications and Challenges.

Global Journal of Health.6:226-233. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4825480/ (Accessed 20 January 2016).

Management Sciences for Health. 1997. *Managing Drug Supply*. 2nd ed. Connecticut: Kumarian Press.

Manasse, H.R., & Speedie, M.K. 2007. Pharmacist, Pharmaceutical, and policy issues shaping the work force in Pharmacy. American Journal of Health-Systems Pharmacy. 12: e30-48. Available: http://www.ajhp.org/content/64/12/e30?ijkey=f562dcad8cf3b9000e21d75fc90a983944b49902&keytype2=tf_ipsecsha (Accessed 9 April 2017).

Maree, K. 2007. *First Steps in Research*. Van Schaik Publishers.

Mars, M and Seebregts, C. 2008. Country Case Study for eHealth: South Africa. Rockefeller Foundation.

Mason, P. 2001. Pharmaceutical care- the German experience. *The Pharmacy Journal,* 266(7132): 122-123. Available: https://www.pharmaceutical-journal.com/news-and-analysis/features/pharmaceutical-care-the-german-experience/20004023.article?firstPass=false (Accessed 24 June 2018).

Mason, J. 2002a. *Qualitative Researching. 2nd ed.* London: Sage Publications.

Mason, J. 2002b. *Qualitative Interviewing: Asking, Listening and Interpreting*. In T. May (Ed.), Qualitative Research in Action. London: Sage Publications

Massyn, N., Peer, N., English, R., Padarath, A., Barron, P., Day, C. 2016. District Health Barometer 2015/2016. Health Systems Trust. Available: http://www.hst.org.za/publications/District%20Health%20Barometers/District%20Health%20Barometer%202015_16.pdf (Accessed 11 May 2017).

Mastroianni, A. C. and Kahn, J.P. 2001. Swinging on the Pendulum: Shifting Views of Justice in Human Subject Research. Hastings Center Report 31(3): 21-28. Available: https://ssrn.com/abstract=2490725 (Accessed 28 August 2018).

Matiwane, Z. 2017. UKZN panel finds national health plan White Paper lacking. The Sunday Tribune, 5 February: 6.

Maughan, P. D. 2003. Focus Groups. In E. A. Dupuis (Ed.), *Developing Web-Based Instruction: Planning, Designing, Managing, and Evaluating for Results*. London: Facet Publishing.

Maxwell, J. A. 1998. *Using Qualitative Research to Develop Causal Explanations.* Working Paper, Harvard Project on Schooling and Children, Harvard University.

Maxwell, J. A. 2002. *Understanding and validity in qualitative research*. In A. M. Huberman & M. B. Miles (Eds.), The qualitative researcher's companion: 37-64. Thousand Oaks: Sage.

May, T. 2011. *Social Research: Issues, Methods and Process*. 4th ed. Maidenhead, Berks: Open University Press. London: Mc Graw-Hill International.

Mayosi, B.M., Flisher, A.J., Lalloo, U.G., Sitas, F., Tollman, S.M., Bradshaw, D. 2009. The burden of non-communicable diseases in South Africa. *The Lancet Journal*. 374: 937-947. Available: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(09)61087-4/fulltext (Accessed 18 March 2017).

Mayring, P. 2000. Qualitative content analysis. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*. Available http://www.qualitative-research.net/index.php/fqs/index (Accessed 9 March 2017).

Mbatha, N., Street, R.A., Ngcobo, M., Gqaleni, N. 2012. ISSUES IN MEDICINE. Sick certificates issued by South African traditional health practitioners: Current legislation, challenges and the way forward. *The South African Medical Journal*, 102(3). Available: http://www.samj.org.za/index.php/samj/article/view/5295 (Accessed 12 July 2017).

McDonald, J.H. 2014. Handbook of Biological Statistics. 3rd ed. Sparky House Publishing, Baltimore, Maryland: 157-164. McKee, S. 2015. Is It Questionnaire Or Survey? Available: https://www.surveygizmo.com/resources/blog/taking-the-question-out-of-questionnaires/ (Accessed 3 June 2016).

McLafferty, I. 2004. Focus group interviews as a data collecting strategy. *Journal of Advanced Nursing,* 48(2): 187–194. Available: https://www.ncbi.nlm.nih.gov/pubmed/15369499 (Accessed 18 May 2019).

McMillan, J. H. and Schumacher, S. 2001. *Research in Education: A conceptual introduction.* 5th ed. New York: Addison Wesley Longman.

McLeod, S. A. 2008. Likert Scale. Available: www.simplypsychology.org/likert-scale.html (Accessed 21 July 2017).

Medical Chronicle. May 16. 2017. New Pharmacy Advisory Board to drive collaborative change. May 16. Available: https://www.medicalchronicle.co.za/new-pharmacy-advisory-board-to-drive-collaborative-change/ (Accessed 27 June 2017).

Medical Chronicle. June 26. 2017. Improving South Africa's health sector. Available at: https://www.medicalchronicle.co.za/more-private-public-partnerships-needed-to-achieve-universal-healthcare/ (Accessed 27 June 2017).

Mehta, U., Durrheim, D.N., Blockman, M., Kredo, T., Gounden, R., & Barnes, K.I. 2007. Adverse drug reactions in adult medical inpatients in a South African hospital serving a community with a high HIV/AIDS prevalence: prospective observational study. *Br J Clin Pharmacol,* 3: 396-406. Available:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2291259/ (Accessed 22 April 2017).

Mehta, U., Dheda. M., Steel, G., Blockman, M., Ntilivamunda, A., Maartens, G., Pillay, Y., Cohen, K. 2014.Strengthening pharmacovigilance in South Africa. *SAMJ- South African Medical Journal,* 104: 104-106. Available: http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0256-95742014000200014 (Accessed 17 March 2018).

Merriam, S. B. 1998. *Qualitative Research and Case Study Application in Education: Revised and Expanded from Case Study Research in Education*. San Francisco: Jossey- Bass.

Meyer, J.C., Schellack, N., Stokes, J., Lancaster, R., Zeeman, H., Defty, D., Godman, B and Steel, G. 2017. Ongoing Initiatives to Improve the Quality and Efficiency of Medicine Use within the Public Healthcare System in South Africa; A Preliminary Study. Available: https://www.ncbi.nlm.nih.gov/pubmed/29163151 (Accessed 28 May 2018).

Meyer, J.C., Khosa. L.A., Nhira, S., Chiloane, L., Sibanda, M., Schonfeldt, M., Burnett, R.J. 2018. Childhood vaccination and the role of the pharmacist. Medpharm. *South African Pharmaceutical Journal*, 85(4): 26-39. Available: https://www.researchgate.net/publication/327703892_Childhood_vaccination_and_the_role_of_the_pharmacist (Accessed 10 August 2018).

Miles, M. B. and Huberman, A. M. 1994. *Qualitative data analysis*. Thousand Oaks, CA: Sage.

Miller, E. 2011. Measuring personal outcomes: Challenges and strategies, *Iriss Insights No 12*.

Mingers, J. 2011. *Realising Research. Critical Realism as an Underpinning Philosophy for IS and Management Research*. Kent Business School.

Mkhize, M.2017.Medics to march over system collapse. The South African Medical Association's protest to highlight the 'collapse of the healthcare system' in KwaZulu-Natal.BusinessDay, 20 April. Available: https://www.businesslive.co.za/bd/national/health/2017-04-20-terrible-working-conditions-drive-doctors-to-protest-in-kwazulu-natal/ (Accessed 12 May 2017).

Mokgoro, Y. 1998. Ubuntu and the Law in South Africa. PER, 1(1): 15-26. Available: https://www.researchgate.net/publication/26633677_UBuntu_and_the_law_in_South_Africa (Accessed 20 October 2017).

Morgan, D. L. 1998. *The focus group guide book*. London: Sage Publications.

Morris, T., and Wood, S. 1991. Testing the survey method: continuity and change in British industrial relations. *Work, Employment and Society*, 5(2): 259-282. Available: https://journals.sagepub.com/doi/10.1177/0950017091005002007 (Accessed 1 June 2019).

Mosby's Medical Dictionary, 9th ed. Elsevier.

Mouton, J. 2002. *Understanding social research*. 3rd ed. Pretoria: Van Schaik.

Msweli, P. 2015. *Research Design*. Durban University of Technology.

Mutiti, A. 2014. Strengthened and Uniform Approaches to the Continued Roll-out of the NIMART Programme. ICAP at Columbia University. Mailman School of Public Health. Available: https://za.usembassy.gov/wp-content/uploads/sites/19/2016/06/Strengthened-and-Uniform-Approach-to-the-Continued-Roll-Out-of-the-NIMART-Programme_Anthony-Mutiti.pdf (Accessed 10 September 2018).

Myers, M. D. 2009. *Qualitative Research in Business & Management*. London: Sage Publications.

Nagle, B., and Williams, N. 2013. *Methodology Brief: Introduction to Focus Groups. Ceter for Assessment, Planning & Accountability*. Available: http://www.mmgconnect.com/projects/userfiles/file/focusgroupbrief.pdf (Accessed 25 June 2017).

Naicker, P., Schellack, N., Godman, B., Bronkhorst., E. 2018. Creating and evaluating an opportunity for medication reconciliation in the adult population of South Africa to improve patient care. Available: https://www.tandfonline.com/doi/abs/10.1080/21548331.2018.1461528?journalCode=ihop20 (Accessed 30 June 2018).

Nancarrow, S.A., Booth, A., Ariss, S., Smith, T., Enderby, P. and Roots, A. 2013. Ten principles of good interdisciplinary team work. Human Resources for Health.11:19. Available:https://human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-11-19 (Accessed 23 May 2017).

National Hospice and Palliative Care Organization (NHPCO). The hospice team. Available: https://www.nhpco.org/nhpco-0 (Accessed 25 May 2018].

National Institute for Communicable Diseases. 2012. GERMS-SA Annual Report- 2011. Johannesburg: National Institute for Communicable Diseases. Available: http://www.nicd.ac.za (Accessed 6 April 2018).

Ndjeka, N. 2013. THE NEW DR-TB NATIONAL POLICY AND STATE OF IMPLEMENTATION. TB online. Available: http://www.tbonline.info/media/uploads/documents/tbmeeting10august/ndjeka-nationaldrtbpolicy.pdf (Accessed 13 January 2019).

Neuman, W. L. 1997. *Social research methods: Qualitative and quantitative approaches*. 3rd ed. Needham Heights, MA: Allyn & Bacon.

Newton, P.J., Halcomb, E.J., Davidson, P.M., Denniss, A.R. 2007. Barriers and facilitators to the implementation of the collaborative method: reflections from a single site. *Qual Saf Health Care*, 16: 409-414. Available: https://www.ncbi.nlm.nih.gov/pubmed/18055883 (Accessed 22 May 2019).

Ngcobo, Z. 2017. NON- COMMUNICABLE DISEASES SA'S LEADING CAUSE OF DEATH. *Eye Witness* News. Available: http://ewn.co.za/2017/03/01/non-communicable-diseases-in-top-10-of-sa-s-leading-causes-of-death (Accessed 14 March 2017).

Noble, M., Zembe, W. 2011. Introducing the South African Index of Multiple Deprivation 2011. *South African Social Policy Research Institute- SASPRI*. Available: http://www.plaas.org.za/sites/default/files/publications-pdf/PLAAS%20Seminar%20-%2024%20%20February%20-%20Michael%20Noble%20compressed.pdf (Accessed 4 September 2018).

Nojilana, B., Bradshaw, D., Pillay-van Wyk, V., Msemburi, W., Somdyala, N., Joubert, J.D., Groenewald, P., Laubscher, R., Dorrington, R.E. 2016. Persistent burden from non-communicable diseases in South Africa needs strong action. *The South African Medical Journal,* 106(5). Available: http://www.samj.org.za/index.php/samj/article/view/10776 (Accessed 14 March 2017).

Nuseibeh, B. and Easterbrook, S. 2000. *Requirements engineering: a roadmap. In Proceedings of the Conference on the Future of Software Engineering*: 35– 46. ACM.

Ogbonna, B.O., Ezenduka, C.C., Soni, J.S., Operah, A.C. 2015. Limitations to the dynamics of Pharmaceutical care practice among community pharmacists in Enugu urban, southeast Nigeria, 4: 49-55. Available: https://doi.org/10.2147/IPRP.S82911. (Accessed 12 June 2017).

Oliveira de Melo, D., and Cardozo de Castro, L.L. 2017.Pharmacist's contribution to the promotion of access and rational use of essential medicines in SUS. Available:

http://www.scielo.br/pdf/csc/v22n1/en_1413-8123-csc-22-01-0235.pdf (Accessed 23 May 2017).

Olsen, M.H., Angell, S.Y., Asma, S., Boutouyrie, P., Burger, D., Chirinos, J.A., Damasceno, A., Delles, C., Gimenez-Roqueplo, AP., Hering, O., Jaramillo, PL., Martinez, F., Perkovic, V., Rietzschel, ER., Schillaci, G., Schutte, A.E., Scuteri, A., Sharman, J.E., Wachtell, K., Wang, J.G. 2016. A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations: *The Lancet Commission on hypertension*. *Lancet, 388*: 2665–2712.

O' Neill, J. 2016. TACKLING DRUG-RESISTANT INFECTIONS GLOBALLY: FINAL REPORT AND RECOMMENDATIONS. *THE REVIEW ON ANTIMICROBIAL RESISTANCE*. Available: https://amr-review.org/sites/default/files/160525_Final%20paper_with%20cover.pdf (Accessed 26 May 2017).

Onwuegbuzie, A. J.and Johnson, R. B. 2004. *Validity issues in mixed methods research*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA.

Onwuegbuzie, A.J. and Leech, N.L. 2006. Linking Research Questions to Mixed Methods Data Analysis Procedure. *The Qualitative Report*, 11: 474-498. Available: https://nsuworks.nova.edu/tqr/vol11/iss3/3/ (Accessed 2 April 2019).

Onwuegbuzie, A.J. and Teddlie, C. 2003. *A framework for analysing data in mixed methods research*. In A. Tashakkori & C. Teddlie (Eds.). Handbook of mixed methods in social and behavioural research. Thousand Oaks, C.A: SAGE.

Padyachee, T., Jassat, W., Seunandan, T., Nyawo, K., Blanchard, C., Jansen Van Rensburg, M. and English, R. 2012. Documenting Good Practices in Primary Health Care, KwaZulu-Natal. *Health Systems Trust.* Available:

http://www.hst.org.za/publications/HST%20Publications/KZNGP_WEB_AD30Sept2016_0.pdf (Accessed 9 May 2017).

Page, AT. And Somers, GT. 2015. The pharmacist in a primary healthcare setting. *Journal of Pharmacy Practice and Research*, 45(3): 257-258. Available: https://www.researchgate.net/publication/282305987_The_pharmacist_in_a_primary_healthcare_setting (Accessed 8 February 2019).

Painter, D. and Rigsby, L. 2005. Data Analysis. Available: http://gse.gmu.edu/research/tr/TRanalysis.shtml (Accessed 9 June 2016).

Parajuli, D.R., Franzon, J., McKinnon, R.A., Shakib, S., Clark, R.A. 2017. Role of the pharmacist for improving self-care and outcomes in heart failure. *Curr Heart Fail Rep*. 14(2): 78-86.

Park, B.J., Shetty, S., Ahlquist, A., Greenbaum, A., Miller, JL., Motsi, A., McCarthy, K., Govender, N. 2011. Long-term follow-up and survival of antiretroviral-naive patients with cryptococcal meningitis in the pre-antiretroviral therapy era, Gauteng Province, South Africa. *Int J STD AIDS.* 22(4): 199-203. Available: https://journals.sagepub.com/doi/10.1258/ijsa.2010.010235 (Accessed 24 June 2016).

Patton, M.Q. 1999. Enhancing the quality and credibility of qualitative analysis. *Health Sciences Research*, 34: 1189–1208.

Patton, M. Q. 2002. *Qualitative research & evaluation methods*. 3rd ed. Thousand Oaks, CA: Sage Publications.

Pearson, G. J. 1998. Pharmacist Prescribing. Taking on a new role - and new responsibilities. *Pharm Connects*, November/December.

Pearson, G. J. 2007. Evolution in the practice of pharmacy—not a revolution! *CMAJ.176(9):*1295-1296.Available: https://www.cmaj.ca/content/176/9/1295 (Accessed 28 August 2016).

Pearson, G., Card, D., Chin, T., Gray, M., Hawboldt, J., Jackevicius, C., Slavic, R. and Thompson, A. 2001. Task force on Pharmacist Prescribing. An Information Paper on Pharmacist Prescribing within a Health Care Facility. *Canadian Society of Hospital Pharmacists*, Canada.

Pera, S. and van Tonder, S. 2011. *Ethics in Healthcare*. 3rd ed. Juta: 400.

Petch, A. 2012. Integration of health and social care. Iriss. Available: https://www.iriss.org.uk/resources/insights/integration-health-social-care (Accessed 20 January 2019).

Petch, A. 2014. *Delivering integrated care and support*. Available: https://www.iriss.org.uk/resources/insights/delivering-integrated-care-and-support-insight (Accessed 17 July 2018).

Pharmacy Coalition on Primary Care. 2003. Role of the Pharmacist in Primary Health Care, *Canadian Society of Hospital Pharmacists*. College of Pharmacy and Nutrition, University of Saskatchewan. Available: http://napra.ca/Content_Files/Files/Saskatchewan/Publications/PCPC_Submission-final.pdf (Accessed 18 May 2016).

Philip, L. J. 1998. *Combining qualitative and quantitative approaches to social research in human geography: An impossible mixture?* Environment and Planning, 2: 261-276.

Phillips, L., Ferguson, R., Diduck, K., Lamb, D. and Jorgenson, D. 2012. Integrating a brief pharmacist intervention into practice: Osteoporosis pharmacotherapy assessment. *Canadian Pharmacist Journal (Ott);*145: 218-20. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3567584/ (Accessed 23 May 2018).

Pillay, Y. and Baron, P. 2011. The implementation of PHC re-engineering in South Africa. *PHASA Newsletter*, 15 November. Available: https://www.phasa.org.za/wp-content/uploads/2011/11/Pillay-The-implementation-of-PHC.pdf (Accessed 12 May 2017).

Pillay, Y. 2012. PHC re-engineering in South Africa: are we making progress? *PHASA Newsletter*, February. Available: https://www.phasa.org.za/wp-content/uploads/2012/02/Pillay_PHC-re-engineering.pdf (Accessed 12 May 2017).

Position Statement. Primary Health Care. 2015. *Canadian Nurses Association*. Available: https://www.cna-aiic.ca/~/media/cna/page-content/pdf-en/primary-health-care-position-statement.pdf?la=en (Accessed 25 March 2017).

Preece, J., Rogers, Y. and Sharp, S. 2002. *Interaction Design: Beyond Human Computer Interaction*. New York, NY: John Wiley & Sons.

Puoane, T, Tsolekile, L, Sanders, D. and Parker, W. 2008. Chronic non-communicable diseases. In: Barron, P. and Roma-Reardon, J, (eds). SouthAfrican Health Review 2008. *Health Systems Trust*, Durban: 73–87. Available: http://repository.uwc.ac.za/xmlui/handle/10566/255?show=full (Accessed 23 November 2018).

Rajasingham R, Meya DB, Boulware DR. 2012. Integrating cryptococcal antigen screening and pre-emptive treatment into routine HIV care. *Journal of Acquired Immune Deficiency Syndrome*, 59(5):85-91. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3311156/ (Accessed 12 May 2017).

Rampamba, E. M., Meyer, J. C., Helberg, E. and Godman, B. 2017. Knowledge of hypertension and its management among hypertensive patients on chronic medicines at primary health care public sector facilities in South Africa; findings and implications.

Expert Rev. Cardiovasc. Ther. 15, 639–647. Available: https://www.ncbi.nlm.nih.gov/pubmed/28712328 (Accessed 24 June 2018).

Reeves, T.C., and Hedberg, J.G. 2003. Interactive learning systems evaluation. Englewood Cliffs, N.J.: Educational Technology Publications.

Reeves, S., McMillan, S.E., Kachan, N., Paradis, E., Leslie, M., Kitto, S. 2015. Interprofessional collaboration and family member involvement in intensive care units: emerging themes from a multi-sited ethnography. Journal of Interprofessional Care, 29(3): 230-237. Available: https://www.ncbi.nlm.nih.gov/pubmed/25238573 (Accessed 23 May 2017).

Reinhardt, U. 1998. Quality in consumer-driven health systems. *International Journal for Quality in Health Care,* 10 (5): 385-394.

Republic of South Africa, National Department of Health. Province of Kwa-Zulu Natal. District Offices. Available: http://www.kznhealth.gov.za/districtoffices.htm (Accessed 6 July 2016).

Republic of South Africa, National Department of Health. National Drug Policy for South Africa. 1996. Pretoria: Available: http://apps.who.int/medicinedocs/documents/s17744en/s17744en.pdf (Accessed 12 July 2016).

Republic of South Africa, *National Department of Health: Public Health Facilities in South Africa*. Available: http://www.health.gov.za/. (Accessed 12 January 2018).

Republic of South Africa*, National Department of Health. 2005. Definition of Clinical Governance. Pretoria: Department of Health.*

Republic of South Africa, National Department of Health. 2007. *Policy on Quality in Health Care for South Africa*. Pretoria: Department of Health.

Republic of South Africa, Department of Health. 2010. *A practical guide for TB and HIV service Integration at Primary health care facilities*. Available: https://www.inpracticeafrica.com/~/media/Guidelines/Practical_Guide_TBHIV.pdf (Accessed 10 September 2018).

Republic of South Africa, National Department of Health. 2010. *National service delivery agreement 2010–2014.* Pretoria: Department of Health. Government Printer.

Republic of South Africa, National Department of Health. 2010. *Negotiated Service Delivery Agreement: Delivery agreement for outcome 2: A long and healthy life for all South Africans.* Pretoria: Department of Health. Government Printer.

Republic of South Africa, National Department of Health. 2010. *Re-engineering Primary Health Care in South Africa. Discussion document.* Pretoria: Department of Health. Government Printer.

Republic of South Africa, National Department of Health. 2011. *National Core Standards for Health Establishments in South Africa*. Pretoria: Department of Health. Government Printer.

Republic of South Africa, National Department of Health. 2011. *Scope of Practice and Qualification for Authorized Pharmacist Prescriber*. Government Gazette 34428: 1 July. Pretoria: Government Printer.

Republic of South Africa, National Department of Health. 2012. *National Development Plan 2030: Our Future - Make It Work.* National Department of Health. Available: http://www.gov.za/issues/nationaldevelopment-plan-2030 (Accessed 12 May 2016).

Republic of South Africa, National Department of Health. 2012. *National Health Insurance - Healthcare for all South Africans*. Pretoria: National Department of Health. Available:

http://docplayer.net/1525312-National-health-insurancehealthcare-for-all-south-africans.html (Accessed 1 September 2017).

Republic of South Africa, National Department of Health. 2012. *Quality Improvement Guide - Quality Improvement - The key to providing improved quality care.* Pretoria: Department of Health. Government Printer.

Republic of South Africa, National Department of Health.2013. *Fact Sheet. Rural Health. Rural health Advocacy Project*. Pretoria: National Department of Health. Available: https://www.health-e.org.za/wp-content/uploads/2014/02/Updated-Rural-Fact-Sheet-27-Nov-2013.pdf (Accessed 20 April 2017).

Republic of South Africa, National Department of Health. 2013. *Management Of Drug-Resistant Tuberculosis Policy Guidelines*- January. Pretoria: National department of Health. Available: https://www.health-e.org.za/wp-content/uploads/2014/06/MDR-TB-Clinical-Guidelines-Updated-Jan-2013.pdf (Accessed 23 April 2018).

Republic of South Africa, National Department of Health. 2013. *National Development Plan 2013.* Available: http://www.gov.za/issues/national-development-plan-2030. (Accessed 12 August 2016).

Republic of South Africa, National Department of Health. 2013. *Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013-17*. Pretoria: National Department of Health. Available: http://www.hsrc.ac.za/uploads/pageContent/3893/NCDs%20STRAT%20PLAN%20%20CONTENT%208%20april%20proof.pdf (Accessed 2 April 2016).

Republic of South Africa, National Department of Health. 2014. *Antimicrobial Resistance National Strategy Framework 2014-2024*. Pretoria: National Department of Health. Available: http://www.health.gov.za/index.php/antimicrobial-resistance (Accessed 23 May 2017).

Republic of South Africa, National Department of Health KZN. 2014. *Batho Pele: People First*. Available: http://www.kznhealth.gov.za/bathopele.htm (Accessed 1 September 2017).

Republic of South Africa, National Department of Health. 2014. *General Household Survey 2014*, Statistics South Africa. Available: http://www.statssa.gov.za/wp-content/uploads/2015/10/Annual_Report_2015_Book_1.pdf (Accessed 16 June 2016).

Republic of South Africa, National Department of Health. 2015. *General Household Survey 2015*, Statistics South Africa. Available: https://www.statssa.gov.za/publications/P0318/P03182015.pdf (Accessed 16 June 2017).

Republic of South Africa, National Department of Health. 2016. *General Household Survey 2016*, Statistics South Africa. Available: https://www.statssa.gov.za/publications/P0318/P03182016.pdf (Accessed 16 June 2017).

Republic of South Africa, National Department of Health. 2014. *Implementation Plan for Antimicrobial Resistance National Strategy Framework 2014-2019*. Pretoria: National Department of Health. Available at: http://www.health.gov.za/index.php/antimicrobial-resistance (Accessed on 23 May 2017).

Republic of South Africa, National Department of Health. 2014. *Medium Term Strategic Framework 2014-2019.* Pretoria: Government Printer.

Republic of South Africa, National Department of Health. 2014.*Operation Phakisa.* Available at: http://www.operationphakisa.gov.za/Pages/Home.aspx (Accessed 31 May 2018).

Republic of South Africa, National Department of Health. 2015. *Annual performance plan 2015/2016 and 2016/2017*. Pretoria: National Department of Health. Available:

http://www.kznhealth.gov.za/Annual-Performance-Plan-2015-16.pdf (Accessed 16 June 2016).

Republic of South Africa, National Department of Health. 2015a. National Department of Health - Republic of South Africa. *Antimicrobial Resistance: National Strategy Framework 2014 – 2024*. Available: https://www.health-e.org.za/wp-content/uploads/2015/09/Antimicrobial-Resistance-National-Strategy-Framework-2014-2024.pdf (Accessed 16 September 2018).

Republic of South Africa, National Department of Health. 2015b. National Department of Health - Republic of South Africa. *Implementation Plan for Antimicrobial Resistance National Strategy Framework 2014-2019*. Available: http://www.health.gov.za/index.php/antimicrobial-resistance (Accessed 16 September 2018).

Republic of South Africa, National Department of Health. 2015. Republic of South Africa. *Essential Drugs Programme. Hospital level (Adults) Standard Treatment Guidelines and Essential Medicines List. 4th Edn. Republic of South Africa*: National Department of Health. Available: http://www.health.gov.za/edp.php (Accessed 16 September 2018).

Republic of South Africa, National Department of Health. 2015d. *National Policy for the Establishment and Functioning of Pharmaceutical and Therapeutics Committees in South Africa*. Available: http://www.health.gov.za/index.php/pharmaceutical-and-therapeuticscommittees (Accessed 16 September 2018).

Republic of South Africa, National Department of Health. 2015. National Health Insurance. Pretoria: National Department of Health. Available: www.health.gov.za/index.php/gf-tb-program/109-national-health-insurance (Accessed 31 July 2017).

Republic of South Africa, National Department of Health. 2015. National Health Insurance For South Africa Towards Universal Health Coverage. Pretoria: Government Printer.

Republic of South Africa, National Department of Health. 2015. *Operation Phakisa. IDEAL CLINIC REALISATION AND MAINTENANCE FINAL LAB REPORT- 2015*. Pretoria: National Department of Health. Available: https://www.idealclinic.org.za/docs/2016/phakisa/Operation%20Phakisa%20Ideal%20Clinic%20Realisaation%20&%20Maintenance%20Final%20report%20May%202015.pdf (Accessed 12 February 2017).

Republic of South Africa, National Department of Health. 2015. *Primary Health Care Re-engineering in Kwa-Zulu Natal. Pretoria*. Government Printer.

Republic of South Africa, Department of Health. 2016. Annexure C: Governance of Public Sector Hospital under the National Health Insurance. Pretoria: Government Printer.
South Africa, National Department of Health.2016. *Ideal Clinic Manual.Version 16*. Pretoria: National Department of Health. Available: https://www.idealclinic.org.za/docs/2016/Ideal%20Clinic%20Manual%20v16%20-%2023Jun16.pdfm (Accessed 7 May 2017).

Republic of South Africa, National Department of Health. 2016. National Department of Health Republic of South Africa. *Adherence Guidelines for HIV, TB and NCDs. Policy and Service Delivery Guidelines to Care, Adherence to Treatment and Retention in Care*. February. Available: https://www.nacosa.org.za/wp-content/uploads/2016/11/Integrated-Adherence-Guidelines-NDOH.pdf (Accessed 20 May 2018).

Republic of South Africa, National Department of Health. 2016. *National Policy for Patient Safety Incident Reporting and Learning in the Public Health Sector of South Africa*. Pretoria: National Department of Health. Available: file:///C:/Users/hifi%20corp/Desktop/DOH-%20REPORTS/National%20Policy%20for%20Patient%20Safety%20Incident%20ReporPATIENT%20SAFETY%20INCIDENT%20REPORTING.pdf (Accessed 28 April 2017).

Republic of South Africa, National Department of Health. 2016. *Policy For Issuing Of Authorisations To Professional Nurses To Perform Functions Provided For In Terms Of Section 56(6) Of The Nursing Act33 Of 2005*. Lu-Pol-042016/01. Pretoria: National Department of Health.

Republic of South Africa, National Department of Health. 2016. *PRESCRIBING BY NURSES*. Pretoria: National Department of Health. Circular:LU-Cir-022016/01.

Republic of South Africa, Department of Health KZN. 2016a. Province of KwaZulu-Natal. Launch of the Central Chronic Medication Dispensing and Distribution Programme. Available:http://www.kznhealth.gov.za/mediarelease/2016/Launch-CCMDD-10062016.htm (Accessed 12 August 2016).

Republic of South Africa, Department of Health KZN. 2016b. Huge Applause for the KZN Department of Health as Patients Collect Chronic Medication Closer to Home and Save on Traveling Costs. Available: http://www.kznhealth.gov.za/mediarelease/2016/Huge-applause-for-the-kzn-department-of-health-a-%20patients.htm (Accessed 5 July 2017).

Republic of South Africa, National Department of Health. 2017. IDEAL CLINIC DEFINITIONS, COMPONENTS AND CHECKLISTS. Available: https://www.idealclinic.org.za/.../Final%20Ideal%20Clinic%20Framework%20-%20ve.... (Accessed 14 April 2018).

Republic of South Africa, National Department of Health. 2017. *South African Antibiotic Stewardship Programme- SAASP: Mission Statement of the South African Antibiotic Stewardship Programme*. Available: http://www.fidssa.co.za/SAASP (Accessed 20 June 2018).

Republic of South Africa, National Department of Health. 2017. National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research

Council (SAMRC), and ICF. 2017.*South Africa Demographic and Health Survey 2016: Key Indicators.* Available: https://www.statssa.gov.za/publications/Report%2003-00-09/Report%2003-00-092016.pdf (Accessed 14 May 2018).

Republic of South Africa, National Department of Health. 2017. Government Gazette, 4 January. *Norms and Standards Regulations Applicable to Different Categories of Health Establishments.* Pretoria: National Department of Health. Available: http://www.samed.org.za/Filemanager/userfiles/nationalhealth-act-61-2003-norms-and-standards-regulations-applicable-todifferent-categories-of-health-establishments_20170104-GGN-40539-00010.pdf (Accessed 31 May 2018).

Republic of South Africa, National Department of Health. 2017. *Ideal Clinic Manual. Version 17*. Pretoria: National Department of Health. Available: https://www.idealclinic.org.za/.../v17/Final%20Ideal%20Clinic%20Manual%20-%20vers (Accessed 14 April 2018).

Republic of South Africa, National Department of Health. 2017. National Department of Health (NDoH), Statistics South Africa (Stats SA), South African Medical Research Council (SAMRC), and ICF. 2017.*South Africa Demographic and Health Survey 2016: Key Indicators.* Available: https://www.statssa.gov.za/publications/Report%2003-00-09/Report%2003-00-092016.pdf (Accessed 14 May 2018).

Republic of South Africa, National Department of Health. 2017. *National Treasury.Estimates of National Expenditure*. Pretoria: National Department of Health. Abridged version. Vote 16(291): 341. Available: http://www.treasury.gov.za/documents/national%20budget/2017/ene/FullENE.pdf (Accessed 12 May 2018).

Republic of South Africa, National Department of Health. 2017. *Patients' Rights Charter.* Pretoria: National Department of Health. Available: http://www.kznhealth.gov.za/Patientcharter.htm (Accessed 10 May 2017).

Republic of South Africa, National Department of Health. (2018). Ideal Clinic Manual. Version 18. Pretoria: National Department of Health. Available: https://www.idealhealthfacility.org.za/ (Accessed 20 May 2019).
Republic of South Africa, Department of Health-Kwa-Zulu Natal. (2018). ABC Analysis March report- Ugu District.

Rice, P. L. and Ezzy, D. 1999. *Qualitative Research Methods: A Health Focus*. South Melbourne (Australia): Oxford University Press.

Richardson, L. 1995. *Writing: A Method of Inquiry*. In N. K. Denzin & Y. S. Lincoln (Eds.), Handbook of Qualitative Research. 2nd ed. London: Sage Publications, Inc.

Rieck, A. and Pettigrew, S. 2013. How physician and community pharmacist perceptions of the community pharmacist role in Australian primary care influence the quality of collaborative chronic disease management. *Quality in Primary Care*, 21: 105- 111. Available: http://primarycare.imedpub.com/how-physician-and-community-pharmacist-perceptions-of-the-community-pharmacist-role-in-australian-primary-care-influence-the-quality-of-collaborative-chronic-disease-management.pdf (Accessed 12 June 2017).

Rietzschel, E.R. and De Buyzere, M.L. 2018. Hypertension: time for doctors to switch the driver's seat? *The Lancet*, 391: 914-916. Available at: https://doi.org/10.1016/S0140-6736(18)30317-9 (Accessed 17 March 2018).

Rigby, D. 2011. The imperative- to become patient-centred and collaborative. *Australian Pharmacist*, 30: 825-826.

Rispel, L. 2016. South African Health Review - Analysing the progress and fault lines of health sector transformation in South Africa. *Health System Trust*: 17-23. Available: http://www.hst.org.za/publications/South%20African%20Health%20Reviews/2%20Analysing%20the%20progress%20and%20fault%20lines%20health%20sector%20transformation%20in%20South%20Africa%20.pdf (Accessed 18 June 2017).

Ritchie, J. and Lewis, J. 2003. *Qualitative research practice: A guide for social science students and researchers*. London: Sage.

Robert, D. 2009. Professional Oaths: History, Usage, Content and Changes. *Today's Christian Doctor* - Spring 2009. Available: http://cmda.eresources.com/resources/publication/tcd-spring-2009-professional-oaths (Accessed 10 June 2017).

Robson, C. 2002. *Real World Research*. 2nd ed. Oxford: Blackwell.

Roland, MO., Baker, R. 1999. *Clinical Governance: A practical guide for primary care teams*. University of Manchester, National Primary Care Research and Development Centre.

Root, G. A Royal Pharmaceutical Society publication. 2003. Supplementary prescribing - a groundbreaking opportunity**.** *The Pharmaceutical Journal*, 270(7230): 19-20. Available: https://www.pharmaceutical-journal.com/pj-online-supplementary-prescribing-a-groundbreaking-opportunity/20008504.article?firstPass=false (Accessed 20 June 2016).

Rose, S., Spinks, N., Canhoto, A. 2014. *Management Research: Applying the Principles. Routledge,* 1st ed. Routledge.

Rotta, I., Salgado, T.M., Silva, M.L., Correr, C.J., Fernandez-Llimos. F. 2015. Effectiveness of clinical pharmacy services: an overview of systematic reviews (2000-2010). *Int J Clin Pharm,* 37(5): 687–697. Available: https://www.ncbi.nlm.nih.gov/pubmed/26001356 (Accessed 15 August 2017).

Royal Pharmaceutical Society. 2018. Pharmacist Independent Prescribers. Available: https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Policy/GB%20Prescriber%20Policy%20-FINAL.pdf?ver=2018-08-07-152908-900 (Accessed 16 January 2019).

Rubin, A. and Babbie, E. 2001. *Research methods for social work*. London: Wadsworth Thomson Learning.

Rural Health Advocacy Project. 2015.RURAL-PROOFING FOR HEALTH: GUIDELINES. Available:https://www.health-e.org.za/wp-content/uploads/2015/02/2015-01-13-RHAP-Rural-Proofing-Guideline-A4-Email-1.pdf (Accessed 1 May 2017).

Rural Health Advocacy Project. VOICE. 2017. ADVOCACY FOR HEALTH: AN EDUCATORS GUIDE TO INCORPORATING ADVOCACY INTO THE HEALTH SCIENCES CURRICULUM. Available: http://www.rhap.org.za/wp-content/uploads/2017/03/Integrating-Advocacy-into-the-Curriciulum-Manual-January-2017-1-1.pdf (Accessed 23 March 2017).

Ruud, K.W., Srinivas, S.C., Toverud, EL. 2010. Addressing gaps in pharmacovigilance practices in the antiretroviral therapy program in the Eastern Cape Province. South Africa. *Res Social Adm Pharm*, 6: 345– 353. Available: https://www.ncbi.nlm.nih.gov/pubmed/21111391?dopt=Abstract (Accessed 9 February 2018).

Sale, J.E.M., Lohfeld, L.H. and Brazil, K. 2002. Revisiting the Quantitative – Qualitative Debate: Implications for Mixed Methods Research. *Quality and Quantity*, 36: 43-53. Kluwer Academic Publishers: Netherlands.

Saunders, M., Lewis, P. and Thornhill, A. 2003. *Research method for business students.* 3rd ed. New York: Prentice Hall.

Saunder-Staudt, M. 2011. In James Fieser & Bradley Dowdon (eds). Available: http://www.iep.utm.edu/care-eth/#H12 (Accessed 21 March 2017).

Saunders, M., Lewis, P. and Thornhill, A. 2007. *Research Methods for Business Students*. 4th ed. London: Prentice Hall.

Scandura, T. A., & Williams, E. A. 2000. Research Methodology in Management: Current Practices, Trends, and Implications for Future Research. *Academy of Management Journal*, 43: 1248–1264.

Scally, G., Donaldson, L.J. 1998. Clinical governance and the drive for quality improvement in the new NHS in England. *British Medical Journal,* 317(7150): 61-65. Available: https://www.bmj.com/content/317/7150/61 (Accessed 14 April 2017).

Schindel, TJ., Breault, RR., Hughes, CA. 2019. "It Made a Difference to Me": A Comparative Case Study of Community Pharmacists' Care Planning Services in Primary Health Care. *Pharmacy Basel*. 7(3):90. Available: https://doi.org/10.3390/pharmacy7030090 (Accessed 8 February 2020).

Schmidt, C.E., Bottoni, T. 2003. Improving medication safety and patient care in the emergency department. *J Emerg Nurs,* 29(1): 12-16. doi: 10.1067/men.2003.19. Available: https://www.ncbi.nlm.nih.gov/pubmed/12556823 (Accessed 17 June 2016).

Schneider, H., Hlophe, H. & van Rensburg, D., 2008. Community health workers and the response to HIV/AIDS in South Africa: tensions and prospects. Health Policy and Planning, 23(3): 179–187.

Schuler, R.S., Aldag, R., Brief, A. 1977. Role Conflict and Ambiguity: A Scale Analysis. *Organizational Behaviour and Human Performance,* 20:111-128.

Seale, C. 1999. *The quality of qualitative research*. London: Sage.

Sekaran, U. 2000. *Research Methods for Business: A Skill-Building Approach*. 3rd ed. New York: John Wiley.

Sekaran, U. 2006. *Research methods for business, a skill building approach*. India: Willey Publications.

Sekhejane, P. 2013. *South African National Health Insurance (NHI) Policy: Prospects and Challenges for its Efficient Implementation*. Policy Brief. Africa Institute of South Africa Briefing NO 102, December. Available: http://www.ai.org.za/wp-content/uploads/downloads/2013/12/South-African-National-Health-Prospects-and-Challenges-for-its-Efficient-Implementation.pdf (Accessed 12 June 2017).

Serfontein, J. 2017. Public health is in critical condition, and the NHI cannot save it. We cannot afford to wait to arrest the steady decline in the quality of healthcare offered to SA's poor. *BusinessDay*, 21April. Available: https://www.businesslive.co.za/bd/opinion/2017-04-21-for-friday-public-health-is-in-critical-condition-and-the-nhi-cannot-save-it/ (Accessed 15 May 2017).

Sharp, M. Enhancing Interdisciplinary Collaboration in Primary Health Care Initiative. 2005. The principles and framework for interdisciplinary collaboration in primary health care. PubMed. Available: https://www.ncbi.nlm.nih.gov/pubmed/17020643 (Accessed 15 May 2017).

Shellack, N. 2015. 'Esprit de corps': Towards collaborative integration of pharmacists and nurses into antimicrobial stewardship programmes in South Africa*. South African Medical Journal (SAMJ).* 106(10): 973-974.Available: https://www.ajol.info/index.php/samj/article/view/146543 (Accessed 23 May 2017).

Shellack, N. 2016. 'Searching for a caring face of pharmacy'. *Second Annual Pharmacy Conference*. COMMISSION 6: Clinical Practice and Science, 23 October. International Conference Centre- Durban.

Schellack, N., Bronkhorst, E., Coetzee, R., Godman, B., Gous, A.G.S., Kolman, S., Labuschagne, Q., Malan, L., Messina, A.P., Naested, C., Shellack, G., Skosana, P., Van Jaarsveld, A. 2018. SASOCP position statement on the pharmacist's role in antibiotic stewardship 2018. *SAJEI*, 5; 33(1): 28-35.

Shenton, A.K. 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22: 63-75.

Shneiderman, B., and Plaisant, C. 2005. *Designing the User Interface: Strategies for Effective Human Computer Interaction*. 4th ed. Boston: Addison-Wesley.

Shuttleworth, M. 2008. How to choose between different research methods. Experiment Resources. Available: https://explorable.com/different-research-methods (Accessed 28 July 2018).

Shuttleworth, M. 2008. Case Study Research Design. Experiment Resources. Available: http://www.experiment-resources.com/case-studyresearch-design.html(Accessed 1 June 2017).

Sieber, S.D. 1974. Toward a Theory of Role Accumulation. *American Sociological Review*,39(4): 567-578.

Silverman, D. 2013. *Doing Qualitative Research. A practical handbook*. London: Sage Publications.

Silcock, J., Raynor, D.K., Petty, D. 2004. The organisation and development of primary care pharmacy in the United Kingdom. Health Policy, 67: 207-214. Available: https://www.ncbi.nlm.nih.gov/pubmed/14720638 (Accessed 21 May 2017).

Sinclair, S., Norris, J.M., McConnell., S.J., Chochinov, HV., Hack, TF., Hagen, NA., McClement, S., Bouchal, SR. 2016. Compassion: a scoping review of the healthcare literature. *BMC Palliative Care,* 15: 6.

Smith, P. and Ragan, T. 2005. *Instructional design*. 3rd ed. New York: John Wiley and Sons.

South Africa, eThekwini Municipality. 2016. *SA Adopts "Test and Treat" to Combat AIDS*. Available: http://architecture.durban.gov.za/Resource_Centre/new2/Pages/SA-adopts-%E2%80%9Ctest-and-treat%E2%80%9D-to-combat-AIDS.aspx (Accessed 1 September 2018).

South Africa, *General household survey*. 2012. Statistics South Africa. Available: https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/445 (Accessed 28 May 2016).

South Africa, *General household survey*. 2014. Statistics South Africa. Available: http://www.statssa.gov.za/publications/P0318/P03182014.pdf (Accessed 28 May 2016).

South Africa, *General household survey*. 2015. Statistics South Africa. Available: http://www.statssa.gov.za/?p=7765 (Accessed 28 May 2016).

South Africa, *General household survey*. 2017. Statistics South Africa. Available: http://www.statssa.gov.za/publications/P0318/P03182017.pdf (Accessed 6 January 2019).

South Africa, *General Regulations made in terms of the Medicines and Related Substances Act, 1965(Act No. 101 of 1965), as amended. R510*. Government Gazette, No. 24727, 10 April.

South Africa, *Bill of Rights*. 1996. *The Constitution of the Republic of South Africa Act 108 of 1996.* Government Gazette 17678. Pretoria: Government Printer.

South Africa, National Coordinating Committee for the Millennium Development Goals. 2015. *Millennium Development Goals: Country Report 2015*. Pretoria: Statistics South Africa.

South Africa, National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP). 1995. Available: http://www.nccmerp.org/ (Accessed 1 May 2017).

South African Health Review. 2011. *Health Systems Trust*. Available at: https://www.wits.ac.za/media/migration/files/sahr2011.pdf (Accessed 28 May 2016).

South African Health Review. 2013/14.*Health Systems Trust*. Available at: http://www.hst.org.za/publications/south-african-health-review-201314 (Accessed 11 February 2017).

South African Health Review. 2016. *Health Systems Trust*. Available:https://www.health-e.org.za/wp-content/uploads/2016/05/South-African-Health-Review-2016.pdf (Accessed 16 February 2017).

South African Pharmaceutical Journal. 2010. *PSSA Perspectives. What do we know about the proposed National Health Insurance scheme?* Available: http://www.sapj.co.za/index.php/SAPJ/article/viewFile/841/776 (Accessed 29 July 2017).

South African Pharmaceutical Journal. 2012. 79(1*). PSSA Perspectives. PSSA comments on policy and draft legislation.* Available: http://www.sapj.co.za/index.php/SAPJ/article/viewFile/1213/1662 (Accessed 28 July 2017).

South African Pharmaceutical Journal. 2014. 81(5). *PSSA Perspectives. Harnessing the power of pharmacy: expanding the cube Impressions from Port Elizabeth: The 69th Annual General Meeting and National Conference of the PSSA*. Available at: http://sapj.co.za/index.php/SAPJ/article/viewFile/1838/3087. (Accessed 30 July 2017).

South African Pharmacy Council- SAPC. 1994. Historic developments in primary care drug therapy (PCDT). Pharmaciae, 15.

South African Pharmacy Council. 1995a.The pharmacist and the nurse: A primary health-care team. Pharmaciae, April-July, 7.

South African Pharmacy Council. 1995b. Pharmacist and nurse: A team approach towards primary health care. Discussion document, Workshop3.

South African Pharmacy Council.2000. Regulation R1158 Government Gazette No. 21754: 20 November 2000. Pretoria: Pharmacy Council.

South African Pharmacy Council. 2010. Good Pharmacy Practice in South Africa. Fourth Edition. Arcadia, Pretoria. Available: http://apps.who.int/medicinedocs/documents/s19633en/s19633en.pdf (Accessed 16 June 2018).

South African Pharmacy Council. 2016. Continuing Professional Development(CPD). Available at: http://www.pharmcouncil.co.za/B_CPD_Brochure.asp. (Accessed 13 August 2017).

South African Pharmacy Council. 2017. PRIMARY HEALTH CARE CLINICS INSPECTION QUESTIONNAIRE. Pretoria: Government Printer.

South African Pharmacy Council. 2018. Application For The Registration Of A Primary Healthcare Clinic Dispensary Or Facility Approved By Council, It's Supervising Pharmacist And Pharmacist's Assistant (Post-Basic) In Terms Of The Pharmacy Act 53 Of 1974 As Amended. Available: https://www.mm3admin.co.za/documents/docmanager/0C43CA52-121E-4F58-B8F6-81F656F2FD17/00133611.pdf (Accessed 18 May 208).

South African Pharmacy Council. 2018. Vision and Mission. Available: https://www.pharmcouncil.co.za/a_vision_mission.asp (Accessed 19 June 2018).

Sprinthall, R. C., Schmutte, G. T. and Surois, L. 1991. *Understanding educational research*. Englewood Cliffs, NJ: Prentice Hall.

Stainback, S.B. and Stainback, W.C. 1988. *Understanding & Conducting Qualitative Research*. Council for Exceptional Children.Dubuque, IA: Kendall/Hunt.

Stake, R. E. 1995. *The art of case study research*. Thousand, Oaks CA: Sage.

Stjernswärd, J. 2013. *Personal reflections on contributions to pain relief, palliative care and global cancer control JLL Bulletin: Commentaries on the history of treatment evaluation.* Available at: https://www.jameslindlibrary.org/articles/personal-reflections-on-contributions-to-pain-relief-palliative-care-and-global-cancer-control/ (Accessed 25 May 2018).

Strasser, R. 200. Rural health around the world: challenges and solutions. *Family Practice,* 20: 457–463. Available: http://www.fammed.wisc.edu/files/webfm-uploads/documents/outreach/rural/ruralhealtharoundtheworld.pdf (Accessed 27 March 2017).

Strauss, A. and Corbin, J. 1990. *Basics of qualitative research: Grounded theory procedures and techniques.* Newbury Park, CA: Sage

Suleman, F. 2010.Pharmacovigilance – who is responsible and why should we care?.*SA Pharmaceutical Journal*: 56-58. Available: https://www.sapj.co.za/index.php/SAPJ/article/viewFile/892/822 (Accessed 24 April 2017).

Sunpath, H. 2014.*INTEGRATED CLINICAL SYSTEMS MANAGEMENT QUALITY IMPROVEMENT OF CARE OF PLWHA*. Available: http://www.sahivsoc.org/Files/Thurs_Henry_Sunpath%20Reducing%20loss%20to%20follow%20up%20after%20diagnosis.pdf (Accessed 7 may 2017).

Taghavi, A. 2015. A ROLE CLARITY FRAMEWORK FOR GATHERING BUSINESS ACTIVITIES. Available: https://open.library.ubc.ca/cIRcle/collections/ubctheses/24/items/1.0132750 (Accessed 5 May 2018).

Tann, J., Blenkinsopp, A., Allen, J. and Platts, A. 1996. Leading edge practitioners in community pharmacy: approaches to innovation. *The International Journal of Pharmacy Practice*, 4(4): 235-245.

Terre Blanche, M., Kelly, K. and Durrheim, K. 2006. Why qualitative research? In M Terre Blanche & K, Durrheim (Eds.). *Research in practice: Applied methods for the social sciences,* 271-284. Cape Town: University of Cape Town Press.

Thamby, S.A. and Subramani, P. 2014. Seven-Star Pharmacist concept of WHO.*Journal of Young Pharmacists*, 6(2): 1-3. Available at: http://www.jyoungpharm.org/article/703 (Accessed 24 June 2017).

The American Geriatrics Society Foundation for Health in Aging (AGSFHA). 2012. American Geriatrics Society Updated Beers Criteria. Available: https://consultgeri.org/try-this/general-assessment/issue-16.pdf (Accessed 25 May 2018).

The Belmont Report. *Ethical Principles and Guidelines for the Protection of Human Subjects of Research*. 1979. U.S. Department of Health, Education, and Welfare (DHEW) Publication.

The Hilton Head Conference. 1985. Directions for clinical practice in pharmacy. *AJHP*, 85(42): 1287-342.

The South African Nursing Council-SANC. 2012. *Advanced Practice Nursing Position Pape*r. Available: http://www.sanc.co.za/position_advanced_practice_nursing.htm (Accessed 20 June 2018).

The University of Lowa. College of Pharmacy. What does a pharmacist do? Available: https://pharmacy.uiowa.edu/what-does-pharmacist-do (Accessed 31 October 2018).

Thobeli, M.S. 2007. *Investigation of factors influencing pharmaceutical services and their relation to quality pharmaceutical service delivery in hospitals of a private health care provider group.* Available: http://etd.uwc.ac.za/bitstream/handle/11394/3414/Thobeli_MPharm_2009.pdf?sequence=1 (Accessed 25 March 2018).

Thomas, C. G. 2009. Ubuntu. The missing link in the rights discourse in post-apartheid transformation in South Africa. *International Journal of African Renaissance Studies – Multi -, Inter – and Transdisciplinarity*, 3(2): 39-62.

Thomas, P.Y. 2010. *Towards developing a web-based blended learning environment at the University of Botswana*. Available at: http://uir.unisa.ac.za/handle/10500/4245 (Accessed 26 August 2017).

Thomas, J., and Harden, A. 2008. Methods for the thematic synthesis of qualitative research in systematic reviews. *Economic and Social Research Council- ESRC. Research Methods.* ESRC National Centre for Research Methods NCRM Working Paper Series Number (10/07). Available: http://eprints.ncrm.ac.uk/468/1/1007_JTAHthematic_synthesis.pdf (Accessed 6 September 2017).

Thompson, C.A. 2008. Palliative care pharmacists consider patients' psychosocial issues. *Am J Health Syst Pharm,* 65(6): 500, 502. Available: https://academic.oup.com/ajhp/article/65/6/500/5128193 (Accessed 25 May 2018).

Thomsen, LA, Winterstein, AG, Sondergaard, B., Haugbolle, LS., Melander, A. 2007. Systematic review of the incidence and characteristics of preventable adverse drug events in ambulatory care. *Ann. Pharmacoth,* 41(9): 1411-1426. Available: https://www.ncbi.nlm.nih.gov/pubmed/17666582 (Accessed 12 March 2016).

Thorogood, M., Connor, M., Tollman, S., Hundt, GL., Fowkes, G. and Marsh, J. 2007. A cross-sectional study of vascular risk factors in a rural South African population: data from the Southern African Stroke Prevention Initiative (SASPI). *BMC Public Health, 7:326*. Available: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-7-326 (Accessed 16 June 2018).

Trochim, W. M. K. 2002a. Ethics in research. Available: http://www.socialresearchmethods.net/kb/ethics.htm (Accessed 12 June 2017).

Tronto, J. C. and Fisher, B. 1990. Toward a Feminist Theory of Caring. In E. Abel, & M. Nelson (Eds.), *Circles of Care:* 36-54. Albany, NY: SUNY Press.

Tronto, JC. 1994. *Moral Boundaries: A Political Argument for an Ethic of Care*. New York, NY: Routledge.

Truter, A., Scheallck, N. and Meyer, J.C. 2017.Identifying medication errors in the neonatal intensive care unit and paediatric wards using a medication error checklist at a tertiary academic hospital in Gauteng, South Africa. *The South African Journal Of Child Health (SAJCH),* 11: 5-10.

Tshehla, B. 2015. Traditional health practitioners and the authority to issue medical certificates. *S Afr Med J*, 105(4): 279-280. Available: http://www.samj.org.za/index.php/samj/article/view/9217 (Accessed 15 May 2017).

UK Clinical Pharmacy Association. Statement on Pharmaceutical Care. *The Pharmaceutical Journal,* 256: 345-46.

USAID Center for Development Information and Evaluation. 1996. Conducting Key Informant Interviews *Performance Monitoring & Evaluation TIPS*. Washington DC, USAID. Available: http://pdf.usaid.gov/pdf_docs/PNABS541.pdf (Accessed 21 June 2017).

Vaismoradi, M., Jordan, S., Turunen, H., Bondas., T. 2014. Nursing students' perspectives of the cause of medication errors. *Nurse Educ Today*. Available: https://www.sciencedirect.com/science/article/abs/pii/S0260691713001408?via%3Dihub (Accessed 13 October 2017).

Vaismoradi, M. 2011. Patient safety is not just about medication errors. *International Nursing Review,* 58(3): 286. Available: https://www.ncbi.nlm.nih.gov/pubmed/21848771 (Accessed 14 August 2018).

Van Zyl, J. 2016.The cost of Health care in South Africa. Cipla SA. *Health24*- 29 November. Available : http://www.health24.com/Medical-schemes/the-cost-of-healthcare-in-south-africa-20161129 (Accessed 17 June 2017).

Vangen, S., and Huxham, C. 2010. *Introducing the theory of collaborative advantage*. *Osborne, S., (Ed.)* The new public governance? Emerging perspectives on the theory and practice of public governance. Routledge: 163-184.

Van Nuys K, Globe D, Ng-Mak D., Cheung, H., Sullivan, J., Goldman, D. 2014). The association between employee obesity and employer costs: Evidence from a panel of US employers. *Am J Health Promot*, 28(5): 277-285. http://dx.doi.org/10.4278/ajhp.120905-QUAN-428 (Accessed 7 May 2017).

Van Royen, P., Rees, C.E., Groenewegen, P. 2014. Patient-centred interprofessional collaboration in primary care: Challenges for clinical, educational and health services research. An EGPRN keynote paper. *The European Journal of General Practice*, 20(4):1-6.

Viktil, K.K., Blix, H.S. 2008. The impact of clinical pharmacists on drug-related problems and clinical outcomes. *Basic Clin Pharmacol Toxicol*., 102(3): 275-280.

Viljoen, C., and Wesso, A. 2017. Facilitating self-management by patients with chronic disease. *Medical Chronicle*. The Doctor's Newspaper. May 2017. Available at:

https://www.medicalchronicle.co.za/wp-content/uploads/2017/05/MC-May-2017.pdf. (Accessed 13 May 2017).

Wagner, E.H. 1998. Chronic disease management: what will it take to improve care for chronic illness?.Eff Clin Pract, 1: 2-4. Available: http://www.improvingchroniccare.org/index.php?p=Using_the_CCM_in_your_work&s=170 (Accessed 10 March 2017).

Wagner, E.H., Davis, C., Schaefer, J., Von Korff., M, Austin B, 1999. A survey of leading chronic disease management progress: are they consistent with the literature? *Manag Care Q,* 7: 56-66. Available: https://www.ncbi.nlm.nih.gov/pubmed/10620960 (Accessed 10 March 2017).

Wagner, E.H., Austin, B.T., Davis, C., Hindmarsh, M., Schaefer, J. and Bonomi, A. 2001. Improving Chronic Illness Care. Translating Evidence Into Action. *Health Affairs*, 20(6): 64-78. Available: http://content.healthaffairs.org/content/20/6/64.full (Accessed 12 March 2017).

Walsham, G. 1993. *Interpreting Information Systems in Organizations.* Wiley, Chichester. Wand, Y. and Weber, R. 1993. “On the ontological expressiveness of information systems analysis and design grammars,” *Journal of Information Systems,* (3:4): 217-237.

Warne, T., McAndrew, S., King, M and Holland, K. 2007. Learning to listen to the organisational rhetoric of primary health and social care integration, *Nurse Education Today*, 27: 947-954.

Weyers, M., Strydom, H. and Huisamen, A. 2014. Triangulation in Social work Research: the theory and examples of its practical application. Socialwork Journals, 44(2). Available: http://socialwork.journals.ac.za/pub/article/viewFile/251/233 (Accessed 8 October 2017).

"What is Public Health". *Centers for Disease Control Foundation*. Atlanta, GA: *Centers for Disease Control*. Available: https://www.cdcfoundation.org/content/what-public-health (Accessed 25 March 2017).

White, T.L. and McBurney, D.H. 2012. *Research Methods*. 9th ed. Cengage learning.

Wiedenmayer, K., Summers, R.S., Mackie, C.A., Gous, A.G.S., Everard, M., Tromp, D. 2006. Developing pharmacy practice A focus on patient care Handbook– 2006 EDITION. Available: https://www.fip.org/files/fip/publications/DevelopingPharmacyPractice/DevelopingPharmacyPracticeEN.pdf (Accessed 9 August 2017).

Wiles, R., Crow, G., & Pain, H. 2011. Innovation in qualitative research methods: a narrative review. Qualitative Research, 11(5): 587-604.

Williams, P. 2012. Integration of health and social care: a case of learning and knowledge. *Health and Social Care in the Community*, 20(5): 550-560. Available: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2524.2012.01076.x (Accessed 2 June 2018).

Williams, C. 2015. Perceptions and experiences of reporting of adverse drug reactions by public sector pharmacists in a rural district in the Western Cape. Available: file:///C:/Users/hifi%20corp/Downloads/Williams_cj_mph_chs_2015.pdf (Accessed 28 April 2017).

Wolf, Z.R., Hicks. R., Serembus, J.F. 2006. Characteristics of medication errors made by students during the administration phase: a descriptive study. *J Prof Nurs,* 22(1): 39-51.
Wood, L. 2012. Editorial Action Research: Its Transformative Potential. *Educational Research for Social Change (ERSC),* 1(1): 1-4.

World Health Organization. 1946. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference. International Health Conference, New York, 19–22 June, 2: 100. Available: https://hero.epa.gov/hero/index.cfm/reference/details/reference_id/80385 (Accessed 20 June 2018).

World Health Organization. (2014). *The role of WHO in public health*. Available at: https://www.who.int/about/role/en/ (Accessed 3 Mar. 2018).

World Health Organization. *Alma-Ata 1978: Primary Health Care*. Report of the International Conference on Primary Health Care, Alma-Ata, Union of Soviet Socialist Republics, 6–12 September. Geneva: World Health Organization.

World health Organization. 1978. The promotion and development of traditional medicine: report of a WHO meeting (held in Geneva from 28 November to 2 December 1977).

World Health Organization. 1997. Erice Declaration, International Conference on Developing Effective Communication in Pharmacovigilance.

World Health Organization. 1997. *The Role of The Pharmacist in The Health Care System. Preparing the Future Pharmacist: Curricular Development*. Vancouver. Canada. 27-29 August. Available: http://apps.who.int/medicinedocs/pdf/s2214e/s2214e.pdf. (Accessed 14 May 2016).

World Health Organization. 1998.*The Role of the Pharmacist in Self-care and Self-medication*. Report of the 4th WHO Consultative Group on the Role of the Pharmacist-The Hague, The Netherlands 26-28 August. Available: http://apps.who.int/medicinedocs/en/d/Jwhozip32e/ (Accessed 11 June 2017).

World Health Organisation. 2002. *Innovative care for chronic conditions: building blocks for action*; Global Report. Noncommunicable Diseases and Mental Health; Geneva: World Health Organisation. Report No.: ISBN 92 4 159 017 3.

World Health Organisation. 2002. T*he Importance of Pharmacovigilance: Safety Monitoring of medicinal products*. Available: http://apps.who.int/medicinedocs/pdf/s4893e/s4893e.pdf?ua=1(Accessed 26 April 2017).

World Health Organization. 2002. Patient Safety Program in Response to a World Health Assembly. Available: https://www.who.int/patientsafety/about/en/ (Accessed 7 February 2019).

World Health Organization. 2002. Traditional Medicine Strategy 2002-2005. Geneva: WHO. Available: https://apps.who.int/medicinedocs/en/d/Js2297e/ (Accessed 4 July 2018).

World Health Organization.2006. Quality of care. *a process for making strategic choices in Health Systems*. Available: http://www.who.int/management/quality/assurance/QualityCare_B.Def.pdf (Accessed 31 May 2018).

World Health Organization.2006. The World Health Report 2006 - *working together for health*. Available:http://www.who.int/whr/2006/en/ (Accessed 22 April 2018).

World Health Organization. 2007. Everybody's business: strengthening health systems to improve health outcomes. Geneva: WHO`s Framework for action.

World Health Organisation.2008. *Task Shifting: Rational Redistribution of Tasks Among Health Workforce Teams: Global Recommendations and Guidelines*. Geneva, Switzerland.

World Health Organization.2008. *Guide for Documenting and Sharing "Best Practices" in Health Programmes. Brazzaville*. Available:

http://afrolib.afro.who.int/documents/2009/en/GuideBestPractice.pdf (Accessed 12 May 2017).

World Health Organization. 2008. *INTEGRATED HEALTH SERVICES - WHAT AND WHY?*. Technical Brief No.1. May. Available: http://www.who.int/healthsystems/technical_brief_final.pdf (Accessed 16 September 2018).

World Health Organization. 2008b. *2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Non-communicable Diseases*. Available: https://www.who.int/nmh/publications/ncd_action_plan_en.pdf (Accessed 5 May 2017).

World Health Organization. 2009. *Conceptual framework for the International Classification for Patient Safety*: 32-47 and 90-95. Available: https://www.who.int/patientsafety/implementation/taxonomy/ICPS-report/en/ (Accessed 1 May 2017).

World Health Organization.2009. *Continuity and change: Implementing the third WHO Medicines Strategy 2008-2013*. WHO/EMP/20091. Geneva.

World Health Organization. 2010. *Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations.* Available:http://www.searo.who.int/nepal/mediacentre/2010_increasing_access_to_health_workers_in_remote_and_rural_areas.pdf (Accessed 25 July 2016).

World Health Organization. 2010. *Framework for Action on Interprofessional Education and Collaborative Practice. Health Professions Networks Nursing & Midwifery Human Resources for Health*. Available: http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf?ua=1. (Accessed 15 May 2017).

World Health Organization.2010. *Global Status Report on Noncommunicable Diseases*. Available: https://www.who.int/nmh/publications/ncd_report2010/en/ (Accessed 5 May 2017).

World Health Organisation. 2011.*Health Professions Unite to Issue Warning on Global Epidemic of Non-Communicable Diseases*. Available: http://www.wma.net/en/40news/20archives/2011/2011_10/(Accessed 24 May 2016).

World Health Organization. 2011. *Patient safety in developing and transitional countries, New insights from Africa and the Eastern Mediterranean*: 5-6.

World Health Organization (WHO). 2011. *Health Systems Strengthening Glossary. Geneva, Switzerland.* Available: http://www.who.int/healthsystems/hss_glossary/en/index5.html. (Accessed 21 January 2018).

World Health Organization. 2011. *Rapid Advice: Diagnosis, Prevention and Management of Cryptococcal Disease in HIV-infected Adults, Adolescents and Children*. Geneva: World Health Organization. Available: www.who.int/hiv/pub/cryptococcal_disease2011/en/ (Accessed 6 April 2018).

World Health Organization. 2013. World Bank Ministerial-level Meeting on Universal Health Coverage 18–19 February. Geneva, Switzerland. Geneva: World Health Organization; 2013. Available: http://www.who.int/health_financing/ministerial_meeting_report20130328.pdf. (Accessed 30 April 2017).

World Health Organization. 2013. *Inter professional Collaborative Practice in Primary Health Care: Nursing and Midwifery Perspectives. Six Case Studies*. Available: http://www.who.int/hrh/resources/IPE_SixCaseStudies.pdf?ua=1. (Accessed 15 May 2017).

World Health Organization. 2013. *Global Action Plan for the Prevention and Control of Noncommunicable Diseases (2013- 2020).*
Available: https://www.who.int/nmh/events/ncd_action_plan/en/ (Accessed 5 May 2017).

World Health Organization. 2014. *Regulation a top priority agree global health professionals., Geneva 21 May* - "Health professional regulation – *facing challenges to acting in the public interest".* Available: http://www.whpa.org/Press_release_WHPA_Regulation_21May2014.pdf (Accessed 24 May 2016).

World Health Organization. 2014. *Global Status Report on Noncommunicable Diseases. Available:* https://apps.who.int/medicinedocs/en/m/abstract/Js21756en/ (Accessed 5 May 2017).

WHO. 2015. "Global Health Observatory." Available: http://apps.who.int/gho/data/?theme=main. (Accessed 19 June 2017).

World Health Organization. 2016. *Data and Statistics*. Available: http://www.euro.who.int/en/health-topics/Health-systems/patient-safety/data-and-statistics (Accessed 7 May 2017).

World Health Organization. 2016. "*Beyond Fragmentation and Towards Universal Coverage: Insights from Ghana, South Africa and the United Republic of Tanzania*." Available: http://www.who.int/bulletin/volumes/86/11/08-053413/en/ (Accessed 19 June 2017).

World Health Organization. 2016. *Cancer*. World Health Organization. Available at: http://who.int/cancer/palliative/definition/en (Accessed August 16 2017).

World Health Organization. 2017. *Universal health coverage (UHC).* Available: http://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc). (Accessed 14 June 2018).

World Health Organization. 2018. *Guidelines For The Diagnosis, Prevention And Management Of Cryptococcal Disease In Hiv-Infected Adults, Adolescents And Children.* Available at: http://apps.who.int/iris/bitstream/handle/10665/260399/9789241550277-eng.pdf;jsessionid=7D3F78515AE6234DE99EFA33337D0888?sequence=1 (Accessed 9 June 2018).

Yin, R.K. 2003). *Case Study Research: Design and Method*. 3rd ed. London: Sage.

Yin, R. K. 2009. *Doing case study research*. 4th ed. Thousand Oaks, CA: Sage.

Yong, A.G., Pearce, S. 2013. *A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis.* Available: http://www.tqmp.org/RegularArticles/vol09-2/p079/p079.pdf (Accessed 25 June 2018).

Youngberg, B.J. 2012. *Patient Safety handbook*, Chapter 13: 178.

Yuksel, C.A., Bulut, D., Tuzuner, V.L. 2013. Corporate Social Responsibility Progress in Turkey: A Content Analysis.

Zeeman, H. 2016. CCMDD: A vehicle towards universal access to AntiRetrovirals and other chronic medicines in South Africa. *Health Systems Trust*. Available: http://webcache.googleusercontent.com/search?q=cache:Vwv6-vMLrH4J:hstconference2016.org.za/sites/default/files/downloads/hst_conf_ccmdd_h_zeeman_28_04_2016.pdf+&cd=3&hl=en&ct=clnk&gl=za (Accessed 7 May 2017).

Zuma, T., Wight, D., Rochat, T., and Moshabela, M. 2016. The role of traditional health practitioners in Rural KwaZulu-Natal, South Africa: generic or mode specific? *BMC*

Complement Altern Med. Available:

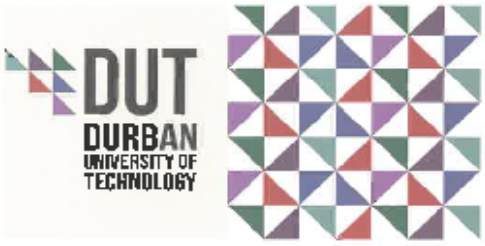
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4994274/ (Accessed 16 June 2018).

Zweigenthal, V., London, L., Pick, W. (2016). South African Health Review. 2016. *Health Systems Trust*. Available:https://www.health-e.org.za/wp-content/uploads/2016/05/South-African-Health-Review-2016.pdf (Accessed 16 February 2017).

APPENDICES

APPENDICES

Appendix 1



Institutional Research Ethics Committee
Research and Postgraduate Support Directorate
3rd Floor, Berea Court
Steve Biko Campus
Durban University of Technology

P O Box 1334, Durban, South Africa 4001

Tel: 031 373 2375
Email: [illegible]
http://www.dut.ac.za/research/irec/institutional_research_ethics

www.dut.ac.za

13 October 2017

IREC Reference Number: **REC 55/17**

Mrs N Pillay
5 Jacaranda Avenue
Mobeni Heights
Durban
4092

Dear Mrs Pillay

Integration of Pharmaceutical Care in Rural Public Health: A case study of the Ugu and Umzimyathi Districts in KwaZulu-Natal

The Institutional Research Ethics Committee acknowledges receipt of your notification regarding the piloting of your data collection tool.

Kindly ensure that participants used for the pilot study are not part of the main study.

In addition, the IREC acknowledges receipt of your gatekeeper permission letters.

Please note that FULL APPROVAL is granted to your research proposal. You may proceed with data collection.

Yours Sincerely.

Professor C E Napier
Chairperson: IREC (Acting)

Appendix 2

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:
Health Research & Knowledge Management

Physical Address: 330 Langalibalele Street, Pietermaritzburg
Postal Address: Private Bag X9051
Tel: 033 395 2805/ 3169/ 3123 Fax: 033 394 2782
E-mail:
www.kznhealth.gov.za

HRKM Ref: 362/17
NHRD Ref: KZ_201709_039

Date: 27 September 2017
Dear Ms N. Pillay
Durban University of Technology

Approval of research

1. The research proposal titled **'Integration of Pharmaceutical care in rural public health: A case study of the Ugu and uMzinyathi Districts in KZN'** was reviewed by the KwaZulu-Natal Department of Health.

   The proposal is hereby **approved** for research to be undertaken at the following clinics: Gamalakhe, Izingolweni, Khayelihle, Cwaka, Empathe, Hlathi Dam, Greylown Gateway, Pine Street, Qinelani, Siphimpilo, Ukuthula, Wasbank Pomeroy CHC, Braemar clinic and Turton Clinic.

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba on 033-395 2805.

Yours Sincerely

Dr E Lutge
Chairperson, Health Research Committee
Date: 29/09/17

Fighting Disease, Fighting Poverty, Giving Hope

Appendix 3

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE:
UGU HEALTH DISTRICT OFFICE

Physical Address: 41 Bisset Street, Nelson Mandela Drive
Postal Address: P/Bag X 735 Port Shepstone 4240
Tel: 0306983000 Fax: 0305920296 Email: ntokozo.mkhize@kznhealth.gov.za
www.kznhealth.gov.za

Enquiries: Mrs N.C Mkhize

Date: 15/08/2017

To:

Ms NALEENI PILLAY

PERMISSION TO CONDUCT REASERCH IN UGU DISTRICT

Dear NALEENI PILLAY

I have the pleasure in informing you that permission has been granted to you by Ugu District office to conduct research on "Integration of Pharmaceutical Care in Rural Public Health: A case study of the Ugu and uMzinyathi Districts in KwaZulu-Natal".

Please note the following:
a) Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health.

b) This research will only commence once this office has received full approval and confirmation from the Health Research and Knowledge Management Committee in the KZN Department of Health.

c) Please ensure that this office is informed before you commence with your research

d) The District Office/ Facility will not provide any resources for this research

e) You will be expected to provide feedback on your findings to the District Office/ Facility

Thank you

Mrs N.C Mkhize
Ugu District Director

Fighting Disease, Fighting Poverty, Giving Hope

Appendix 4

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

34 Wilson Street, Dundee, 3000
Private Bag X2002, Dundee, 3000
Tel:0342991000 Fax:0342124900 Email: charlene.vanrooi@kznhealth.gov.za
www.kznhealth.gov.za

DIRECTORATE:
Umzinyathi District Office

Enquiries: Mrs. G.C. Shabangu
Date: 22nd August 2017

Mrs. N. Pillay
Pharmacy Manager
GJ Crookes Hospital
Ugu District

RE: PERMISSION TO CONDUCT RESEARCH AT UMZINYATHI DISTRICT FACILITIES

This letter serves to confirm that your application to conduct the research study titled, "*Integration of Pharmaceutical Care in Rural Public Health*," in the UMzinyathi District has been recommended.

Please also note the following:

1. This research project should only commence after final approval by the KwaZulu- Natal Health Research and Knowledge Unit, and full ethical approval has been granted.
2. That you adhere to all the policies, protocols and guidelines of the Department of Health with regards to this research.
3. All research activities must be conducted in a manner that does not interrupt clinical care at the health care facility.
4. Ensure that this office is informed before you commence your research.
5. The District Office / Facility will not provide any resources for this research.
6. All logistical details must be arranged with CEO/ Medical Manager/ Operational Manager of the facility.
7. You will be expected to provide feedback on your findings to the District Office / Facility.

Yours sincerely

Appendix 5

LETTER OF INFORMATION

Title of the Research Study: Integration of Pharmaceutical Care in Rural Public Health: A case study of the Ugu and Umzinyathi Districts in KwaZulu-Natal

Principal Investigator/s/researcher: NALEENI PILLAY (BSC PHARMACY, MBA-HEALTH)

Co-Investigator/s/supervisor/s: PROF JK ADAM (PHD, FABAP)

Brief Introduction and Purpose of the Study:

As healthcare workers, we are all mandated to embrace the NHI initiatives and contribute to its success. Primary Health Care re-engineering is currently the focus of transformation. The research study is aligned to guide the development of a Collaborative Pharmaceutical Care Model (CPCM) at the rural PHC clinics by introducing the Primary Care Drug Therapy (PCDT) Pharmacist as a member of the inter-professional team to achieve quality patient-centered care. However, to accomplish this, the perceptions of the collaborative team, namely, the visiting Doctors, pharmacists, and authorized nurse prescribers need to be investigated against the background of Role and Collaborative Advantage Theory.

Outline of the Procedures:

All district participants, Doctors, Pharmacists, and authorized prescribing Nurses will be personally introduced to the research study by way of a stakeholder engagement, arranged at the respective District offices, Ugu and Umzinyathi. At this engagement, the research structure and the responsibilities of the participants will be explained in detail. They will each be issued with a letter of information and consent form, detailing all the verbal explanations given. The consent letters will be collected at the end of the engagement. Opportunity will be afforded to clear any misconceptions and queries regarding the participant's involvement.

You will be required to complete in a self–administered structured questionnaire. Depending on your availability arrangements will be made by the researcher to meet with you for this purpose. A sample of Doctors and nurses will undergo a focus group in-depth interview at the District office. The face-to-face interview will last 45 to 60 minutes. Secondly, the nurses will before the interview be required to fill in a questionnaire, expected to take 10 to 15 minutes.

Risks or Discomforts to the Participant:

There are no foreseeable risks or discomforts or adverse reactions to you.

Benefits:

The outcomes of the research will firstly impact on the upliftment of the rural society we as public healthcare workers serve. This will ultimately be achieved by inspiring health care and education policy towards strengthening a pharmaceutical care approach from the researcher's 'Ubuntu' philosophical paradigm. And secondly, publication of the research will inform the ultimate aim of the study.

Reason/s why the Participant May Be Withdrawn from the Study:

Participation is totally voluntary and you may withdraw from the research study at any time and for any reason. There will be no adverse consequences for withdrawal.

Remuneration:

Participation in the research study is without remuneration.

Costs of the Study:

No costs will be incurred from you for this study.

Confidentiality:

All the information collected will be kept confidential. You will be allocated a number and all details will be recorded under that number. This means that anyone who looks at my records will not be able to trace it to you. Data that may be reported in the scientific journals or published will not include information that will identify you as a participant in this study. This is done to protect your privacy.

Research-related Injury:

As a participant you will be engaging in answering a questionnaire and an interview process. No risk or research- related injury or adverse reaction is anticipated.

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher (0842072237), my supervisor (0827860682) or the Institutional Research Ethics administrator on 031 373 2900. Complaints can be reported also to Prof S Moyo (Director: Research & Postgraduate Support) on 031 373 2577.

Appendix 6

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Naleeni Pillay (name of researcher), about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: _____,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____ _____ _____

Full Name of Participant **Date** **Time** **Signature / Right Thumbprint**

I, Naleeni Pillay, herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____ _____ _____

Full Name of Researcher **Date** **Signature**

_____ _____ _____

Full Name of Witness (If applicable) **Date** **Signature**

_____ _____ _____

Full Name of Legal Guardian (If applicable) **Date** **Signature**

Key Informant Interview Guide

Appendix 7

What are the factors to consider when devising a Collaborative Pharmaceutical Care Model? Furthermore, from a Role Clarity and Collaborative Advantage theoretical perspective, what are the perceptions of the roles and responsibilities of the PCDT pharmacist in rural PHC to guide the development of a Collaborative Pharmaceutical Care Model?

Participant(s)	**ITEMS/Themes**	**Research Method**
Key Informants	Perceptions of in-professional collaboration Identify factors that contribute to achieving the collaborative advantage What can be done to realize the full advantage of collaboration? Is collaboration better than the efforts by single agents in improving the capacity of communities to achieve health and health-systems goals-NCD?	Telephonic/face-to-face in-depth interview

Adapted: (Lasker et al. 2001)

1. Opening questions

First of all, I would like to ask you a few questions about the pharmaceutical care concept in the rural context and the feasibility of such a study, focusing on your perceptions.

2.Transition questions

i). Do you believe that there is a need for a pharmaceutical care model in our current health care system?
Yes ( ) No ( )

3. Key questions

i). Please explain the need to develop a pharmaceutical care model in a rural context?

ii). In your opinion how will a pharmaceutical care model transform the health care delivery in our community?

iii). Explain your perceptions on inter-professional collaboration?

4. Ending questions

i) With your expertise in research and policy development, what factors contribute to achieving a collaborative advantage with such a proposed model of care?

ii) Are there any strengths, weaknesses, and recommendations for the proposed model?

iii). We have talked about several of the elements that is of importance with regards to the delivery of a quality pharmaceutical service viz. (list some of them). How would you rank them in terms of importance? Of all the questions we discussed, which one is most important to you?

iv). Is there anything that we should have talked about but did not? Are there any additional issues that you would like to raise or address?

Summary

Let me briefly give a summary of the main issues that we discussed and may I ask if this summary is accurate. Are there any additions or changes that you would like to make? The aim of the discussion is to gather information that will help craft a collaborative pharmaceutical care model specific for the rural context aimed to ultimately improve the quality of pharmaceutical services rendered and patient outcomes. Have we missed anything?

Closing

Thank you very much for your time. Your knowledge and insights will be very helpful to me. When the process is complete, a summary of the results will be gladly shared. Thank you again.

Collaboration in Tasks Self-Administered Questionnaire

Collaboration in Tasks – Doctors, PCDT Pharmacists and Prescribing Nurses **Appendix 8**

District _____

Indicate Current Profession _____

Rate <u>all</u> 3- the Doctors, PCDT Pharmacists and Authorized Prescribing Nurses (Authorized PN) in the Following Tasks

Lead Role: 1
Shared Role: 2
Supportive Role: 3
Minor Role: 4
No Role: 5

Diagnosis & Prescribing :	**Doctor**	**Pharmacist**	**Authorized PN**
Make a diagnosis			
Determine if drug therapy needed			
Select best drug for Patient			
Involve patient in decision making regarding medication choices			
Select best regimen			
Decide whether to continue, alter or discontinue medication			

Monitoring and Patient Safety:	**Doctor**	**Pharmacist**	**Authorized PN**
Monitor effectiveness and safety			
Monitor compliance			
Institute compliance, interventions as needed			
Receive and organize requests for script renewals			

Administrative / Documentation :	**Doctor**	**Pharmacist**	**Authorized PN**
Fill in required patient forms. (Records, Blood tests)			
Update patient's medication profile and allergies in medicine charts			
Document medication-related information in patient's medicine chart			

Education and Training :	**Doctor**	**Pharmacist**	**Authorized PN**
Educate the patient about the chronic medication			
Provide group education and training regarding medications			
Provide drug information to prescribers			

Medication Review :	**Doctor**	**Pharmacist**	**Authorized PN**
Identify prescribing errors			
Screen patient's medication lists			
Provide complete medication overview			
Identify adverse drug reactions			

Adapted: (Journal of Interprofessional Care, Farrel et al. 2008:17-29)

Authorized Nurse Administered Questionnaire

Appendix 9

Determining the extent to which either PCDT Pharmacists or PHC Professional Nurse will engage in various activities

Please indicate who would perform the allocated activity. The PCDT pharmacist or the Primary Healthcare Nurse

	Activities	PCDT Pharm	PHC Prof Nurse
1	Prescribe and dispense according to diagnosis		
2	Council patients about prescribed drug		
3	Monitor drug therapy of chronic patients		
4	Assess the patient's problem and refer to other health Professionals		
5	Advise patients in regards to their personal health		
6	Provide drug information to other health professionals		
7	Educate patients (STD's, diet)		
8	Participate in health promotion programmes in the community		
9	Training of home care patients		
10	Blood pressure monitoring		
11	Cholesterol monitoring/testing		
12	Order laboratory tests		
13	Glucose monitoring/testing		
14	Immunisation		
15	Developmental screening		
16	Administer injections		
17	Prescribe/administer contraceptives		
18	Attend to emergencies/casualties		
19	Prescribe in case of acute illness		
20	Manage the pharmacy - Medicine Supply Management		

Adapted: (Adamick et al, 1986:1194 & Gilbert, 1997:194)

Focus group discussions guide for Doctors and Authorized Nurse Practitioners

Appendix 10

Relationships between the structure of the theoretical framework and the Research Instrument

What are the factors to consider when devising a Collaborative Pharmaceutical Care Model? Furthermore, from a Role Clarity and Collaborative Advantage theoretical perspective, what are the perceptions of the roles and responsibilities of the PCDT pharmacist in rural PHC to guide the development of a Collaborative Pharmaceutical Care Model?

Participant(s)	Questions/Themes	Research Method
Visiting Doctors and authorized prescribing Nurses	1.What is your understanding of the concept of Pharmacist integration into PHC 2. How do you foresee or visualize your role 3.How do you see the Pharmacists functioning as a member of the PHC team (barriers and/or opportunities) 4. What are your ideas on how the Pharmacist can become an effective member of the PHC team 5. Talk through the impact of the following: Vision/objective/aims Relationship & Trust Accountability and Responsibility Knowledge and learning Resources & location Working processes Communication & information sharing	Face-to-face in-depth interviews

Adapted: (Canadian Society of Hospital Pharmacist, 2003; Bradley, 2008; Vangen & Huxham, 2010)

INTERVIEW SCHEDULE **Appendix 10**

Introduction

Good day and welcome. I am Naleeni Pillay, Pharmacy Manager at GJ Crookes Hospital of the Ugu District in the South Coast of Kwa-Zulu Natal.

I am engaging in a research study to explore the perceptions of Doctors, authorized Nurses, and pharmacists on the integration of the Primary Care Drug Therapy Pharmacist (PCDT) into PHC teams. This study aims to guide the development of a rural collaborative pharmaceutical care model to improve patient care and outcomes in a rural context. As part of the study, I've included a tool to guide the discussions to determine key factors that should be considered and included in the study. Your input will help decide on how best to approach the study and factors that may be considered in the development and implementation of the model, with you the healthcare professional, who are ideally placed to identify the roles and responsibilities for such a pharmacist integration. You have been chosen as vital participants for this study, owing to your experiences, expertise and the context in which you conduct your day to day professional activities. I value your input and please feel free to share both positive and negative views and opinions regarding the pharmaceutical services you are rendering and the proposed model you wish to assist craft. You each have been given a letter of information detailing the study and your involvement in it. There are no right or wrong answers. I trust that you may have varied view-points that I encourage you to share despite it being different from your colleagues.

I will be tape-recording the sessions and also taking notes because I don't want to overlook any of your valuable comments. No names will be included in any reports. Your comments are confidential and may I request that you maintain confidentiality within the group as well. Let us view this interaction as a conversation with one another and ensure all are given a fair opportunity to engage.

Before we get started, kindly sign the consent form, should you wish to participate.
Should you have any concerns or enquires after the interaction, please contact DUT – Professor JK Adam at 082 786 0682 or on 031 373 3093 or me on 084 207 2237**.**

Let us begin.

Discussion questions

1. Opening questions
i). Let us introduce ourselves to one another and share how long we have been in our professions and how long we have been working at the public PHC or CHC facility.

2. Introductory questions
i). As an authorized prescriber, please explain your role at the facility and list your activities?

ii). Being an authorised prescriber, have you experienced any challenges? Please explain?

3. Transition questions

i) What is your understanding of providing pharmaceutical services?

ii) Can you please explain your understanding of the concept of pharmacist integration into PHC clinics?

5. Key questions

i). Do you believe that there is a need for a pharmaceutical care model in our current health care system?
Yes ( ) No ( )
If yes, please explain the need to develop a pharmaceutical care model in a rural context?

ii). How do you foresee or visualize your role with the PCDT pharmacist?

iii). What are your expectations of a pharmacist joining the PHC team?

(Barriers and/or opportunities)?

iv). Please describe or explain your ideas of how a pharmacist can become an effective member of the PHC clinical team?

6. *Ending questions*

i). Explain your perceptions on inter-professional collaboration?

ii). Please talk through the impact of the following on (in the context) professional collaboration?

- Vision/objective/aims
- Communication & information sharing
- Relationship & Trust
- Accountability and Responsibility
- Knowledge and Learning
- Resources & location/ Working processes

iii). We have talked about several of the elements that is of importance with regards to the delivery of a quality pharmaceutical service viz. (list some of them). How would you rank them in terms of importance? Of all the questions we discussed, which one is most important to you?

iv). Is there anything that we should have talked about but did not? Are there any additional issues that you would like to raise or discuss?

Summary

Let me briefly give a summary of the main issues that we discussed and may I ask if this summary is accurate. Are there any additions or changes that you would like to make? The aim of the discussion is to gather information that will help craft a collaborative pharmaceutical care model specific for the rural context in which you work aimed to ultimately improve the quality of pharmaceutical services you render and patient outcomes. Have we missed anything?

Closing

Thank you very much for your time. Your knowledge and insights will be very helpful to me. When the process is complete, I would be happy to share a summary of the results with you. Thank you again.

The South African Pharmacy Council Inspection Guide

Appendix 11

What are the Pharmaceutical legislative gaps that need to be addressed to allow for an ideal clinic concept of the PCDT pharmacist at PHC?

Organization structure	**ITEMS/Themes**	**Research Method**
Primary Healthcare Clinics of 'ideal' status	Clinic staffing General, premises and layout Equipment Storage Thermolabile medicines References Control of medicines/record keeping Written standard operating procedures	On site Self-evaluation- SAPC inspection tool

Adapted: (SAPC inspection questionnaire, 2017)

CONFIDENTIAL

PRIMARY HEALTH CARE CLINICS INSPECTION QUESTIONNAIRE

TO ESTABLISH THE NATURE, EXTENT AND STANDARD OF PHARMACEUTICAL SERVICES AND PROPOSED WEIGHTING

South African Pharmacy Council

Registered Office
SAPC Building
591 Belvedere Street
Arcadia, Pretoria,0083

Postal Address
Private Bag X40040
Arcadia, 0007

Customer Care Line
0861 7272 00

Fax
(27)12-321 1492 /1479

E-mail
customercare@sapc.za.org

Website
www.sapc.za.org

PHC NAME					
Y NUMBER	Y				
CASE NUMBER					
INSPECTION TYPE	Monitoring	Training	New Premises	Disciplinary	Follow-up

PLEASE NOTE:
The confidentiality of this document may be withdrawn should the information furnished lead to further investigation(s)

Please refer this questionnaire for special attention: YES NO

ALL CORRESPONDENCE TO BE ADDRESSED TO THE REGISTRAR

Table of Contents

NOTE: Throughout this questionnaire all questions carry a specific weighting and the questions in sections (B) and (C) marked with an ** carry a weighting of 3.

WEIGHTING KEY	
1.	**Not at all important but necessary to document**
2.	**Low importance**
3.	**Slight importance**
4.	**Neutral importance**
5.	**Moderate important**
6.	**Very important**
7.	**Extremely important**

Responsible Pharmacist or Pharmacist Initials/signature

(A) INSPECTION DETAILS

1.	Date of inspection	D	D	/	M	M	/	Y	Y	Y	Y			
2.	Name of inspector *(in block capitals)*									Inspector P number	P			
3.	Type of inspection	Monitoring	Training	New Premises	Disciplinary	Follow-up				Insp ction start :ime	H	H	M	M

(B) CLINIC DETAILS

4.	Name of Primary Healthcare Clinic (PHC) *(in block capitals)***					0	3	Y			
		Region:		District:		Sub-District/LSA:[1]		Sub-LSA:			
5.	Authority	Provincial:		Local Authority:		Shared		Provincially Aided		NGO	
6.	Communication Equipment (No.)	Phone Lines =		Phones =		Fax Machine =		Photocopier =			
7.	Telephone number(s)									Ext.	
8.	Cellphone number										
9.	Fax number										
10.	Pharmacy and/or Responsible Pharmacist e-mail address if not the same										
11.	PHC: Registered postal address							Postal code			
12.	PHC: Registered physical address**							Street code		0	3
13.	Services rendered?	Outpatients		Mobile		Other(s) (e.g. other clinics, school outreach programmes):					
14.	In which province is the PHC situated?	Eastern Cape		Free State		Gauteng		KwaZulu-Natal			
		Mpumalanga		Northern Cape		Limpopo		North West			
		Western Cape									
14.	Where is the clinic situated?	City centre [2]		City suburb[3]		Town[4]		Township [5]		Rural[6]	
15.	GPS Co-ordinates.	X (Latitude):				Y (Longitude):					

Responsible Pharmacist or Pharmacist Initials/signature

[1] Local service authority
[2] Refers to the central business district area.
[3] A residential area within the boundaries of a town or city.
[4] Usually a town or part of a town.
[5] 'township' in South Africa referred to an urban residential area created for migrant labour, usually beyond the town or city limits. Generally, every town/city has one or several townships associated with it.
[6] Any area that is not classified *urban*. Rural areas are subdivided into tribal areas and commercial farms.

16. Name and designation of person in charge of the Dispensary**									PB no:					
	Pharmacist's Assistant (Post-Basic)		Other (Specify)									0	3	
17. Name and designation of person in charge of the medicine room									Reg no with relevant authority					
	Clinical Nurse Practitioner		Registered Nurse		Other: Specify									
18. Name of person in charge of the PHC at time of the inspection														
19. Areas where medicines are stored	(a) Dispensary/medicine room		(b) Consulting Room (state number)											
	(c) Store Room		(d) Other(s) (specify):											
20. Supervising Pharmacy linked to PHC**			Y									0	3	
21. Supervising Pharmacy: Registered postal address			Postal code											
22. Supervising Pharmacy: Registered physical address			Postal code											
23. Supervising Pharmacist: **			P									0	3	

24. When last was the Supervising pharmacy inspected?[7]	C	C	Y	Y	D	D								
25. The dispensary/medicine room is under the indirect supervision of a pharmacist	Yes											No		
26. If Yes to 25, Type of facility where the supervising pharmacist is located:														
Hospital		District office		Local authority office		Other specify								

[7] The office of the Registrar to confirm information when processing inspection report

Responsible Pharmacist or Pharmacist Initials/signature

(C) CLINIC STAFFING

Personnel involved in the Dispensing of Medicine [1]

Licensed Dispenser				**Pharmacy Support Personnel**			
Surname, Initials	Proof of Authorization	Designation[9]	Wearing Name Badge (Yes/No/N/A)	Surname, Initials	Currently Registered with SAPC (Yes/No)	Proof of registration	Wearing Name Badge (Yes/No)
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							

[8] Inspector to capture all names and all other details as indicated on the table of all personnel in the pharmacy that are concerned with the handling of pharmaceuticals and delivery of pharmaceutical services.

Comments and/or corrective action

(D) GENERAL, PREMISES AND LAYOUT

		N/A	Does not comply	Partially complies	Complies	Weight
27.	A pharmacist visit and documents the visits to the clinic for purposes of monitoring, supervision and support at least once a month.		0		3	**5**
28.	The premises are clean.		0	1	3	**5**
29.	The premises are orderly and tidy.		0	1	3	**5**
30.	The dispensary or medicine room is suitably located in the institution.		0	1	3	**5**
31.	The dispensary or medicine room is accessible to persons with disabilities.		0	1	3	**5**
32.	The floor surface in the dispensary or medicine room is of impermeable material.		0	1	3	**5**
33.	All working surfaces are finished with a smooth, impermeable and washable material.		0	1	3	**5**
34.	Countertops are finished with a smooth, impermeable and washable material, which is easy to maintain in a hygienic condition.		0	1	3	**5**
35.	Shelves are finished with a smooth, impermeable and washable material, which is easy to maintain in a hygienic condition.		0	1	3	**5**
36.	Walls are finished with a smooth, impermeable and washable material, which is easy to maintain in a hygienic condition.		0	1	3	**5**
37.	The pharmacy premises are clearly identified and demarcated from premises of any other business or practice.	***N/A***	0		3	**5**
38.	In order to comply with the requirement of accessibility to pharmaceutical services, a pharmacist must have an unfettered 24 hour access to the pharmacy.		0		3	**5**

Comments and/or corrective action required for all items marked 'does not comply'

Responsible Pharmacist or Pharmacist Initials/signature

D) GENERAL, PREMISES AND LAYOUT (Continued)

	N/A	not comply	y complies	nplies	Weight
39. The lighting is suitable and effective.		0	1	3	5
40. The temperature in the dispensary is controlled 24 hours a day using a suitable temperature recording instruments that complies with or meets WHO specifications		0	1	3	5
41. There is an air conditioning system in the dispensary or medicine room		0	1	3	5
42. The air conditioning system is in good working condition to be effective to keep the temperature at and below 25 degrees Celsius.		0	1	3	5
43. The air conditioning system in the dispensary or medicine room is in good working condition to be effective to keep the temperature at and below 25°C.		0	1	3	5
44. The temperature in the dispensary or medicine room is recorded on a daily basis		0	1	3	5
45. There is at least one fire extinguisher or fire hose in the pharmacy, dispensary or medicine room.		0		3	5
46. If there is a fire extinguisher, it has been serviced within the last year (as indicated on the cylinder).		0		3	5
47. The electrical equipment is regularly maintained and safe.		0	1	3	5
48. The dispensing surface area is sufficient for the volume of prescriptions dispensed (a clear working surface area of at least 90cm to 1m must be provided for each pharmacist or other persons registered with Council who work in the pharmacy, dispensary or medicine room.).		0	1	3	5
49. The total floor area is sufficient for the efficient operation of dispensary staff.		0	1	3	5
50. The design and layout of the dispensary permit a logical flow of work and minimise risk of errors.		0	1	3	5
51. There is a suitable semi-private area for the provision of information and advice, in accordance with GPP standards.		0	1	3	5
52. The waiting area is situated near the dispensary.		0	1	3	5
53. There is a "no smoking" sign in the waiting area.		0	1	3	5
54. The waiting area has comfortable seating available/provided.		0	1	3	5
55. There is a suitable waiting area.		0	1	3	5
56. The waiting area is under cover.		0	1	3	5
57. Key, key card or other device or the combination of any device, which allows access to a dispensary or medicine room when it is locked, is kept in person of the pharmacist's assistant (post-basic), Pharmacy Technicians or licensed dispenser or a pharmacist (as applicable) at all times.		0	1	3	5
58. Only the pharmacist's assistant (post-basic), Pharmacy Technicians or licensed dispenser or a pharmacist (as applicable) at all times has keys to the dispensary or medicine room area where schedules 1 – 6 items are kept.		0	1	3	5
59. Control of access to pharmacy, dispensary or medicine room, which include the design and layout of the pharmacy, dispensary or medicine room, is of such a nature that only registered pharmaceutical services personnel have direct access to medicine.		0	1	3	5
60. There is sufficient security to prevent unauthorised access to medicines.		0	1	3	5

Responsible Pharmacist or Pharmacist Initials/signature

61.	The dispensary or medicine room is designated as a non-smoking area.		0	1	3	5
62.	The dispensary/medicine room is designated as a non-eating area.					
63.	There is a separate facility for washing hands.		0	1	3	5
64.	There is a separate facility for cleaning of equipment.		0	1	3	5

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

(E) EQUIPMENT

		N/A	Does not comply	Partially complies	Complies	Weight
65.	The dispensary or medicine room or consulting room has:					
65.1	adequate spatulas.		**0**	**1**	**3**	**2**
68.2	adequate graduated measures.		**0**	**1**	**3**	**2**
68.3	adequate medicine containers for the dispensing of medicines.		**0**	**1**	**3**	**2**
68.4	adequate warning labels or **clearly noticeable** warning indications on the label.		**0**	**1**	**3**	**2**
68.5	sufficient counting apparatus for tablets and capsules.		**0**	**1**	**3**	**2**
69	Counting trays are cleaned in order to **prevent cross-contamination** as per SOP.		**0**	**1**	**3**	**2**
70	All the equipment in the dispensary or medicine room or consulting room is clean.		**0**	**1**	**3**	**2**
71	All the equipment in the dispensary or medicine room or consulting room is in good working order.		**0**	**1**	**3**	**2**
72	The dispensary or medicine room or consulting room has suitable refuse receptacles (with closing lids where applicable).		**0**	**1**	**3**	**2**

Responsible Pharmacist or Pharmacist Initials/signature

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

(F) STORAGE

		N/A	Does not comply	Partially complies	Complies	Weight
73.	There is a separate bulk store.		No		Yes	
74.	The storage area is large enough to allow for orderly arrangement of stock and proper stock rotation.		0	1	3	3
75.	The dispensary or medicine room is kept locked at all times when not in use.		0	1	3	3
76.	There are no cracks, holes or sign of water damage in the facility.		0	1	3	3
77.	The ceiling is in good condition.		0	1	3	3

Responsible Pharmacist or Pharmacist Initials/signature

78.	The floor is swept daily.		0	1	3	3
79.	Shelves are dusted daily.		0	1	3	3
80.	Walls are clean.		0	1	3	3
81.	There are no signs of pest infestations (e.g. cockroaches and rats). in accordance with SOP.		0	1	3	3
82.	Dispensary or medicine room is situated so that products are protected from potentially harmful influences.		0	1	3	3
83.	All medicine and medical devices are stored off the floor in accordance with SOP.		0	1	3	3
84.	Supplies are stored neatly on shelves on boxes, in accordance with SOP.		0	1	3	3
85.	There are no expired medicines on the shelves *(as observed)*.	N/A	0	1	3	3
86.	Expired, damaged and/or contaminated stock is clearly separated.	N/A	0	1	3	3
87.	Expired, damaged and/or contaminated stock is destroyed in a safe manner *(e.g. returned to supplier or waste disposal company) (refer also SOP section and Regulation 21 of Act 101 of 1965).*	N/A	0	1	3	3
88.	There is a separate and secure receiving area, which is under cover.		0	1	3	3

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

Responsible Pharmacist or Pharmacist Initials/signature

(G) THERMOLABILE MEDICINES

		N/A	Does not comply	Partially complies	Complies	Weight
89.	Are thermolabile medicines purchased, stored or supplied at any time?	No			Yes	
90.	All thermolabile medicines are stored in a refrigerator.	N/A	0	1	3	6
91.	Only medicines are stored in the refrigerator.	N/A	0	1	3	6
92.	Medicines are stored in the refrigerator according to a system.	N/A	0	1	3	6
93.	The refrigerator is suitable and in good working order.	N/A	0	1	3	6
94.	The refrigerator is fitted with a warning system to indicate that refrigeration has failed or temperatures are above or below 2□C and 8□C[2]		0	1	3	6
95.	The temperature of the refrigerator is between 2□C and 8□C *(as checked with a thermometer).*	N/A	0	1	3	6
96.	The temperature of the refrigerator is controlled 24 hours a day by a maximum/minimum thermometer as demonstrated by the use of either chart recorders, or electronic recorders to continuously record the temperatures.[11]	N/A	0	1	3	6
97.	The temperature of the refrigerator is recorded twice daily in accordance with GPP standards.	N/A	0	1	3	6
98.	Thermolabile medicines are stored/supplied maintaining the cold chain.	N/A	0	1	3	6

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

[10]This refers to continuous temperature monitoring to alert the pharmacist even when they are off-site of the variations in temperatures.
[11] EPI provisions applies

Responsible Pharmacist or Pharmacist Initials/signature

(H) CONTROL OF MEDICINES, SCHEDULED SUBSTANCES AND ACTIVE PHARMACEUTICAL INGREDIENTS/MEDICINES

		N/A	Does not comply	Partially complies	Complies	Weight
99.	A computerised programme is used for dispensing.[3]		No		Yes	
100.	An effective stock control system is in place that ensures that there is no damaged, expired stock. (*refer to relevant SOP)*.		0	1	3	7
101.	A prescription book/permanent record for S1-S6 medicines is kept as required in Regulation 11 (1) and (2) of Act 101 of 1965.		0	1	3	7
102.	A prescription record is kept for 5 years as required in Regulation 11(3) of Act 101 of 1965.		0	1	3	7
103.	Original prescriptions are kept in a safe place and are easily retrievable (in a case where the original prescriptions are kept off-site, an electronic copy of the prescription should be available on inspection and the original be made available in 48 hours.)		0	1	3	7
104.	Are S6 medicines ordered, stored or supplied at any time?[4]		No		Yes	
105.	There is a system in place for the correct handling of S6 medicines *(refer also SOP section)* by an authorised person in terms the Medicines Act.	N/A	0	1	3	7
106.	S6 medicines are locked away and the key is under the control of the pharmacist or authorized person	N/A	0	1	3	7
107.		N/A	0	1	3	7
108.	There is an up-to-date register of all **S6 purchases and sales** as required in Regulation 30 of Act 101 of 1965.	N/A	0	1	3	7
109.	The **S6 substances register** was balanced on the last day of March, June, September and December of each year or within 14 days as required in Regulation 30(2) of Act 101 of 1965.	N/A	0	1	3	7

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

[12] For Information only
[13] For Information only

Responsible Pharmacist or Pharmacist Initials/signature

(I) WRITTEN STANDARD OPERATING PROCEDURES

There are written standard operating procedures for:	*N/A*	Does not comply	Partially complies	Complies	Weight
110. good housekeeping (*cleaning procedures etc*.).		0	1	3	3
111. pest (*insects, rodents etc*.) elimination.		0	1	3	3
112. receipt of stock.		0	1	3	3
113. effective stock rotation (*FEEFO – First entry, expiry, first out*).		0	1	3	3
114. disposal or removal of S1 – S6 expired, damaged and/or contaminated stock as required in Regulation 27 of Act 101 of 1965.		0	1	3	3
115. product types requiring special storage or handling instructions.		0	1	3	3
116. separation and handling of goods returned from patients.		0	1	3	3
117. recall of medicine.		0	1	3	3
118. delivery of medicines.	N/A	0	1	3	3
119. procedures to be followed regarding the handling of keys, money, etc for a locum or relief pharmacist(s) (where applicable).	N/A	0	1	3	3
120. cold chain management (*including procedures to be followed in the event of a power failure*).	N/A	0	1	3	3
121. daily routine and working hours.		0	1	3	3
122. enquiry or complaint procedure		0	1	3	3
123. stock-taking.		0	1	3	3
124. obsolete or unusable stock.		0	1	3	3
125. storage of medicine.		0	1	3	3

Responsible Pharmacist or Pharmacist Initials/signature

126.	procurement of medicine.		0	1	3	**3**
127.	handling of product complaints.		0	1	3	**3**
128.	handling of S5 and S6 medicines.		0	1	3	**3**
129.	SOPs are reviewed/updated on a regular basis, and staff trained on the SOP's.		0	1	3	**3**

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

Responsible Pharmacist or Pharmacist Initials/signature

(J) REFERENCES

The pharmacy has copies of, or electronic access to: (Responsible pharmacist or pharmacist must provide proof of subscription if they have electronic access)	*N/A*	Does not comply	Partially complies	Complies	Weight
130. - the latest edition of the Good Pharmacy Practice (GPP) Manual.		0	1	3	3
131. - the latest edition of Daily Drug Use (Tincture Press Publications) or other Drug Interactions reference source.		0	1	3	3
132. - the latest edition of either MDR or SAMF.		0	1	3	3
133. - NDOH- Adult Standard Treatment Guidelines for Hospital.		0	1	3	3
134. - NDOH-Paediatric Standard Treatment Guidelines for Hospital.		0	1	3	3
135. - NDOH-Primary Health Care Standard Treatment Guidelines.		0	1	3	3
136. a list of authorized prescribers.		No		Yes	
137. Do you have access to a medical information centre		No		Yes	

Comments and/or corrective action required for all items marked 'does not comply' or 'partially complies'

Responsible Pharmacist or Pharmacist Initials/signature

(K) SIGNATURES

I, THE UNDERSIGNED, AM FAMILIAR WITH THE CONTENTS OF THIS INSPECTION REPORT. THE RECOMMENDED CORRECTIVE ACTION TO BE TAKEN IN INSTANCES WHERE A QUESTION WAS ANSWERED AS EITHER 'DOES NOT COMPLY' OR 'PARTIALLY COMPLIES' HAS BEEN EXPLAINED AND WRITTEN IN THIS REPORT, IN EVERY SUCH INSTANCE.										
138. Signature of **pharmacist or authorized person in charge during inspection:**										
139. Name and P number of above (131) **pharmacist in charge during inspection** *(in block capitals)*										
	P									
140. Signature of **inspector:**										
141. Duration of inspection: *(refer inspection start time on page 2)*		Duration (no. of hours)		Inspection end time	H	H	M	M		

Responsible Pharmacist or Pharmacist Initials/signature

FURTHER COMMENTS

Responsible Pharmacist or Pharmacist Initials/signature

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Appendix 12

DIRECTORATE:

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Postal Address: Private Bag X5501, Scottburgh, 4180
Tel: 039 978 7185 Fax: 039 978 1295 Email: naleeni.pillay@kznhealth.gov.za
www.kznhealth.gov.za

Mrs. N Pillay
GJ Crookes Hospital
Scottburgh
4180

5 June 2018

Mrs. S. Mabaso

Ugu District Pharmacy Manager

Ugu District

RE: PCDT Pharmacist integration into Primary Health Care: A Rural Public Intervention

Background

South Africa's Healthcare system, like many developing nations is in a transitional phase. There is a huge burden of both communicable and non-communicable conditions leading to ill-health, disabilities and premature deaths. Clearly, most of these are preventable through health promotion interventions (NDOH, 2010). In response, the National Health Insurance mandate and the growing emphasis on primary healthcare (PHC) re-engineering, has strengthened the emphasis of many healthcare professionals towards equitable and quality healthcare service delivery, among them pharmaceutical services. This mandate leaves a window of opportunity to be explored for the integration of pharmaceutical care at rural public primary healthcare clinics. The following areas were identified as seeking the public pharmacist intervention within the PHC context, these include:

- The Central Chronic Medicine Dispensing and Distribution (CCMDD) program afforded by a National pharmacy service provider, which is decanting the majority of stable chronic patients to be remotely dispensed by the service provider pharmacist, questioning and imposing stricter management and quality of chronic patient's care offered

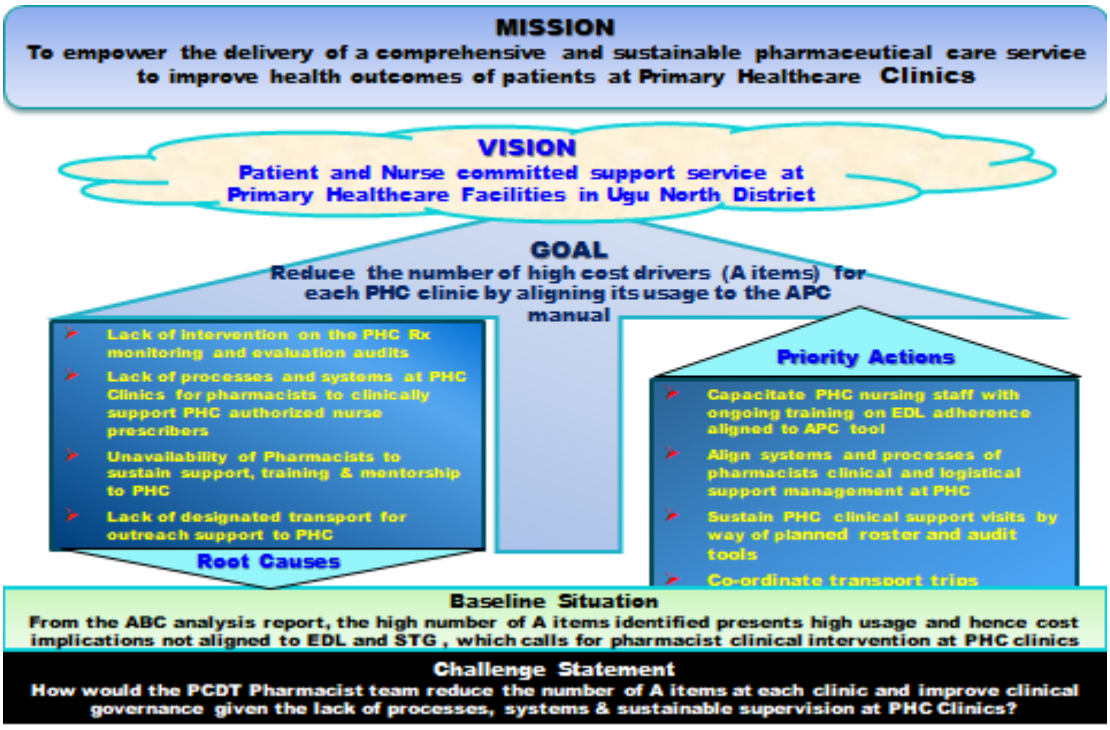
- Medicine Supply Management (MSM) responsibility at the clinics, which has been extended to the Pharmacist Assistant and strengthened in monitoring and evaluation by the ideal clinic concept to ensure availability of medication.
- The World Health Organisation, (2014) call for professional collaboration in managing non-communicable diseases also presents opportunities and imperatives for such exploration
- The lack of Antibiotic stewardship resulting in alarming resistance patterns
- The concomitant use of conventional medication with herbal medication
- Lack of pain management in chronic terminally-ill patients
- Increasing numbers of non-adherence of ARV patients, who are virally unsuppressed, whom require a switch to secondary treatment
- Concern over the paediatric ARV patients managed at PHC level with lack of dose alterations with weight band changes
- Increasing number of adverse drug reactions with ARV treatment management reported for PHC managed patients
- Undetected Cryptococcal meningitis despite the availability of the algorithm
- ABC analysis report for PHC clinics, showing high cost drivers, thereby impacting on scarce pharmaceutical budget and most importantly questioning EDL adherence and rational prescribing

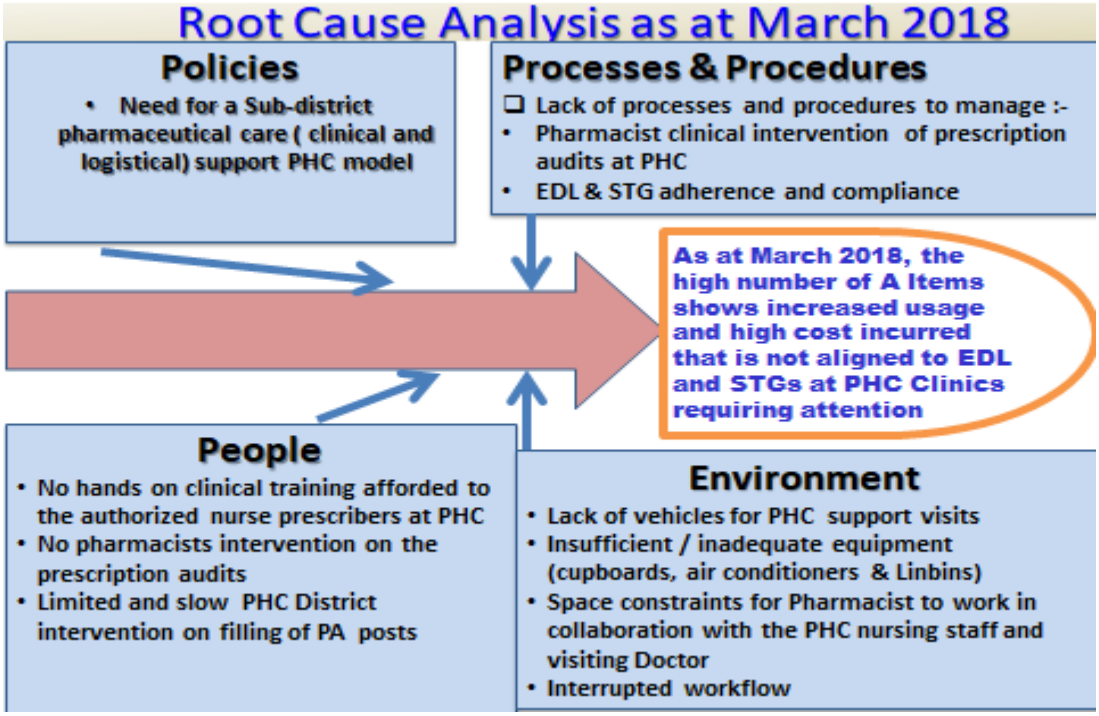
The need for healthcare reform strategies alluded to, implicitly positions the focus of the proposed intervention of the pharmacist within the PHC context. Hence, the rationale of the intervention encapsulates filling a void in firstly the pharmaceutical care at the clinics and secondly the new expanded roles and responsibilities of the public pharmacist by way of a compelling philosophical paradigm of 'Ubuntu' and 'Care' to improve on patient care outcomes.

The proposed QIP intervention

Introduction

The PCDT pharmacist, having advanced clinical knowledge and having practically trained within the public PHC context, finds themselves fortified to work in collaboration with the authorized nurse prescribers and the occasional visiting doctors within the PHC clinics. Before commencement of a Quality improvement strategy the challenge model and fish bone- root cause analysis was conducted as indicated below. An outline of the intervention is provided. The ABC analysis forms the basis for such a needed intervention. The majority of the high cost driver pharmaceuticals and those of increased usage impact negatively on the scarce Primary Health Care Clinic and Hospital budgets. Rational usages of pharmaceuticals will in event contain this budget and hence, ensure EDL adherence and most importantly afford quality and optimal patient care. However, for this to ensue, monitoring and evaluation is paramount to its delivery.


MISSION
To empower the delivery of a comprehensive and sustainable pharmaceutical care service to improve health outcomes of patients at Primary Healthcare Clinics
VISION
Patient and Nurse committed support service at Primary Healthcare Facilities in Ugu North District
GOAL
Reduce the number of high cost drivers (A items) for each PHC clinic by aligning its usage to the APC manual
Lack of intervention on the PHC Rx monitoring and evaluation audits
Lack of processes and systems at PHC Clinics for pharmacists to clinically support PHC authorized nurse prescribers
Unavailability of Pharmacists to sustain support, training & mentorship to PHC
Lack of designated transport for outreach support to PHC
Root Causes
Priority Actions
Capacitate PHC nursing staff with ongoing training on EDL adherence aligned to APC tool
Align systems and processes of pharmacists clinical and logistical support management at PHC
Sustain PHC clinical support visits by way of planned roster and audit tools
Co-ordinate transport trips
Baseline Situation
From the ABC analysis report, the high number of A items identified presents high usage and hence cost implications not aligned to EDL and STG , which calls for pharmacist clinical intervention at PHC clinics
Challenge Statement
How would the PCDT Pharmacist team reduce the number of A items at each clinic and improve clinical governance given the lack of processes, systems & sustainable supervision at PHC Clinics?


Root Cause Analysis as at March 2018
Policies
Need for a Sub-district pharmaceutical care (clinical and logistical) support PHC model
Processes & Procedures
Lack of processes and procedures to manage :-
Pharmacist clinical intervention of prescription audits at PHC
EDL & STG adherence and compliance
As at March 2018, the high number of A Items shows increased usage and high cost incurred that is not aligned to EDL and STGs at PHC Clinics requiring attention
People
No hands on clinical training afforded to the authorized nurse prescribers at PHC
No pharmacists intervention on the prescription audits
Limited and slow PHC District intervention on filling of PA posts
Environment
Lack of vehicles for PHC support visits
Insufficient / inadequate equipment (cupboards, air conditioners & Linbins)
Space constraints for Pharmacist to work in collaboration with the PHC nursing staff and visiting Doctor
Interrupted workflow

The detailed methodology adopted is provided below as follows: -

Activities	Person/s responsible	Date of start & completion of each activity	Resources
• Request quarterly ABC reports from PPSD through the DPM • Analyse the ABC reports quarterly per PHC clinic • Identify the high cost drivers to centre training around • Schedule training with OM's of clinics • Schedule transport support visits to PHC clinics • Commence training • Share feedback from the multiple choice & feedback questionnaires	• Mrs N Pillay • Rehana Govender • Marita Luthuli • Pharmacists- Supporting PHC	• April 2018- ongoing	• ABC analysis report • Multiple Choice question • Feedback questionnaires • Availability of authorized nurse prescribers • Telephone • Transport for support PHC visits

GJ Crookes Hospital is proud to announce and has the privilege of three qualified PCDT pharmacists. From a sub- district PHC support model perspective I've, engaged and proposed a quality improvement strategy, whereby guidance on the analysis of the ABC report per clinic was shared with the PCDT pharmacists. This report was furnished by you, the District Pharmacy Manager and obtained from PPSD. We then micro-analysed the A items presented. A Medicine usage Review (MUR) was then conducted, which was thereafter aligned to the Adult Primary Care manual to foster an understanding of the EDL and STG adherence and compliance per clinic per pharmaceutical item. During this exercise, antibiotics were also highlighted. The stakeholders listed below will play a vital role in achieving the desired outcomes.

Stakeholder Analysis Worksheet

Stakeholder group or Individual	WHY DO WE NEED SUPPORT
Hospital Management – CEO – Medical Manager – Nursing Manager – Quality Assurance Manager	• For approval of recommendations • Infrastructure, equipment, space
PHC Coordinator PHC Supervisors PHC OM PHC Nurse -in-charge of ART PHC Nurse -in-charge of MSM	• To effect change • To induce improvement • To train • To sustain quality
Patients	• To adhere/conform to processes and systems
Transport Officers	• To avail /reserve vehicles for support trips
Pharmacy Personnel- PCDT Pharmacists & Clinic support Pharmacists	• To train nursing personnel • To drive the change process • To monitor and evaluate PHC progress
NGO- Broadreach	• To train , supply resources & support to empower PHC authorized nurse prescribers
Human Resources	• To assist, identify and recruit for vacant PHC posts • Fill vacant PHC PA posts

Method

The focus adopted was to involve the nurse prescribers in this intervention of training to arouse ownership and commitment to the learning process.

Training sessions were then scheduled with the authorized nurse prescribers, mainly professional nurses (PN) per clinic. The individual clinic analysis was shared and the rational use of the identified pharmaceuticals then highlighted with reference to the APC manual.

This proposed intervention has been piloted at Umzinto clinic, one of the busiest, challenging and demanding of all the PHC clinics. The results are shared below.

Each item on the report was investigated per Clinic and the first questionnaire was designed based on this information. The questions were based on the medication being over-prescribed and the applicable condition or diagnosis. Ten questions were formulated in a Multiple Choice Question format (see attached sample).

The first pilot training was held at Umzinto Clinic on the 20 April 2018. There were eight PN's in attendance. The average mark obtained in the questionnaire was 39%. Thereafter training was held at Scottburgh Clinic on the 16 May 2018. There were three PN's in attendance. The average mark obtained in the questionnaire was 57%. It was therefore apparent that this training intervention is required.

A feedback questionnaire (see attached sample) was designed for the PN's to rate the PCDT training on a scale of 1 (being excellent) to 4 (being poor) and also to note any comments and recommendations that the PN's would have from their side towards the training.

All the feedback questionnaires were returned with excellent scores in all three categories;

1. Did you find the content of the presentation applicable to your daily work?

2. Did you feel you benefited from the presentation?

3. Would you like to attend further PCDT training?

The 3 comments/suggestions were as follows:

1. "Training is good for us because it keeps us updated"
2. "Very interesting and important workshop"
3. "We need to have this kind of presentation once in two months"

Subsequent trainings will involve antibiotics and other pharmaceuticals that they, the sisters deem challenging in their prescribing.

Results

Hence the training was viewed by the PN's as beneficial to them and they were optimistic to further trainings. They welcomed the mentorship offered by the PCDT pharmacists.

The questionnaire, along with direct feedback from the PN's, provided a guideline on which conditions the trainings should be prioritized. For example, if all three questions on Asthma received an average score of less than 30%, then Asthma should be given priority (high usage of Budesonide and Salbutamol inhaler on ABC analysis), whereas the average score for Diabetes was 65%.

During the upcoming trainings, a presentation on the relevant condition will be given, followed by a questionnaire to assess the impact of the training, as well as a feedback questionnaire to further guide the training.

Challenges encountered

The challenges encountered was that it is difficult to train all the PN's in a clinic due to shift duties, unavailability of the PN's (either on sick leave, annual leave or scheduled training), staff shortages and the clinics being too busy. Time constraints, inadequate facilities for training and lack of equipment (projectors, laptops) are definitely difficulties.

It is clear that the PN's are welcoming this training and feel as if they are being supported by the pharmacy personnel. Strong professional relationships are being built. With continued training, it is envisaged that there will be more rational prescribing and thus the overuse of medication should decrease. The ABC analysis is usually done annually but will be requested quarterly to monitor any changes.

Conclusion

The PCDT pharmacist can add value to the clinical governance of the PHC re-engineering strategy. With this PHC clinical support intervention, came respect, acknowledgment and appreciation for the pharmacist knowledge and expertise by healthcare professionals, among them the ones closely working in collaboration, the authorized nurse prescribers and the medical visiting doctors. This has also empowered other pharmacists in the GJC team to adopt the clinical realm to instituting pharmaceutical care, both in wards and in the OPD pharmacy. Similarly, ward pharmacy has strengthened, with clinical ward rounds, prescription audits with intervention and antibiotic stewardship. Being a training institution with an A grading from the SAPC, GJC has raised the bar affording a comprehensive training to the Pharmacist interns and many learners annually. Therefore, there is room for expanding the pharmacist's role towards a more clinical path. Ongoing sustainability of this intervention is paramount with regular monitoring and evaluation of the progress and impact made. This will be documented and shared.

In conclusion, this case study can be similarly rolled out to other sub-districts and can pave the way for the new cadre of professional- the Primary Care Drug Therapy (PCDT) pharmacist or a Pharmacist who is confident, who is mentored, guided and empowered by policy and structured processes and procedures to deliver clinical governance within the rural public Primary health care clinics.

The results and recommendations thereof can inform relevant stakeholders in South Africa such as policy makers of both National Department of Health and higher Education, towards NHI and future pharmacist training and development with regards to inter-professional collaboration and pharmaceutical care in patient-centred care and outcomes.

Yours sincerely

Date: 5 June 2018

Assistant Manager- Pharmaceutical Services

PCDT FEEDBACK QUESTIONNAIRE

Appendix 12 A

Name : _____

Date : _____

	1	2	3	4
1. Did you find the content of the presentation applicable to your daily work				
2. Did you feel you benefited from the presentation				
3. Would you like to attend further PCDT training				
Scale :				
1 - Excellent				
2 - Good				
3. Fair				
4. Poor				

Do you have any Suggestions/Comments in order to improve the training

_____

_____

_____

PCDT FEEDBACK QUESTIONNAIRE

Name : _____

Date : _____

	1	2	3	4
1. Did you find the content of the presentation applicable to your daily work				
2. Did you feel you benefited from the presentation				
3. Would you like to attend further PCDT training				
Scale :				
1 - Excellent				
2 - Good				
3. Fair				
4. Poor				

Do you have any Suggestions/Comments in order to improve the training

_____

_____

_____

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Appendix 12 B

Name: _____ **Qualification:** _____
Clinic: _____ **Date:** _____

PRIMARY HEALTHCARE TRAINING QUESTIONNAIRE

Instructions: Please ring the most correct option

Case study 1:
A 28 year old male with no co-existing disease or risk factors comes in for a review. His Blood pressure (BP) reading on the first visit (1 week ago) was 154/96 mmHg. On this visit the BP is still high at 158/92 mmHg. What would be the correct treatment of choice?

a) Lifestyle modifications and HCT 12.5mg mane
b) Lifestyle modifications, HCT 12.5mg daily and Enalapril 5mg bd
c) Lifestyle modifications, HCT 12.5mg mane and Amloc 5mg daily
d) Lifestyle modifications and Aspirin 150mg daily
e) Lifestyle modifications

Case study 2:
A 42 year old male patient presents with chest pain for the past week. He experiences it mostly whilst at the gym. There is no associated abdominal pain. Pain is not worse at night or when lying down. He smokes 10 cigarettes per day, no previous history. The patient is not coughing. BP= 132/86 mmHg Temp: 36.4 degrees celcius

a) Treat with Aspirin, TNT, Amloc 5mg daily
b) Treat with Lansoloc 30mg d x 14/7
c) Treat with Amoxil 500mg tds x 5/7
d) Refer patient to the Doctor

Case study 3:
A 34 year old male patient with a history of epilepsy comes in for a review. He is currently taking Phenytoin 200mg nocte. He had 2 seizures in the past week. What would you do?

a) Increase the Phenytoin dose to 300mg nocte and review the patient in a week.
b) Keep the phenytoin dose at 200mg and add Carbamazepine 100mg bd and review in a week.
c) Change treatment to Lamotrigine 25mg daily
d) Refer the patient to the Doctor

Case study 4:

A 24 year old female presents with a non-productive cough, fever of 38˚C, runny nose with clear discharge. Patient is RVD –ve. How would you manage this patient?

i. Panado 1g 6 hourly
ii. Amoxil 500mg 8 hourly
iii. Bed rest and increase fluid intake
iv. Homemade cough syrup (weak tea with lemon/ honey and lemon)

Choose the correct option:

a) i and ii
b) i, iii, and iv
c) i, ii, iii, and iv

Case study 5:

A patient presents with a painful left ear x 2/7, no discharge. On examination a lesion is seen in the external auditory canal. The entire canal and ear drum is not inflamed and there is no pain on chewing. What treatment would you choose?

a) Amoxil 500mg 8 hourly x 5/7 and Panado 1g 6 hourly
b) Flucloxacillin 500mg 6 hourly x 5/7 and Panado 1g 6 hourly
c) Acetic acid ear drops 2%, 2 drops tds
d) Dry mopping of ear.
e) Cephalexin 500mg 6 hourly x 5/7

Case study 6:

A 38-year-old male presents with an itchy nose and eyes x 4/7, sneezing very often, body temperature of 36˚C, no headache, no nasal discharge, no body pain and has a blocked nose with watery discharge. How would you manage this patient?

a) Amoxil 500mg 8 hourly x 5/7 or Azithromycin 500mg daily x 3/7, Paracetamol 1g 6 hourly prn and oxymetazoline nose drops – 2 drops 6 hourly.
b) Limit strenuous activity, ensure adequate hydration Sodium chloride nose drops 2 drops prn, instilled into each nostril, paracetamol 1g 6 hourly prn.
c) Oxymetazoline 0.05% intranasally nocte for 5 days, chlorpheniramine 4mg tds for 5/7. Thereafter Fluticasone nasal spray – 2 sprays into each nostril daily and Cetirizine 10mg daily.

Case study 7:

A 29-year-old female patient presents with pain on swallowing x 2/7, temperature of 36.5˚C, runny nose, dry cough) on examination; swollen cervical lymph nodes, and large inflamed tonsils with yellow exudates. What treatment would you prescribe?

a) Pen VK 500mg bd x 10/7 or penicillin allergy Azithromycin 500mg daily x 3/7 and panado 1g 6 hourly x 5/7.
b) Flucloxacillin 500mg qid, Chlorhexidine mouthwash use bd and adequate hydration
c) Amoxil 500mg 8 hourly x 5/7, panado 1g 6 hourly and Chlorhexidine mouthwash use bd.
d) Homemade salt mouthwash, gargle for 1 minute bd, adequate hydration and avoid irritants.

Case study 8:

A male RVD +ve patient who is 26 years old presents with a productive cough with yellow sputum x4/7. He has no night sweats. Temperature is 36.9˚C. How would you treat this patient?

a) Paracetamol 1g 6 hourly, bed rest, flucloxacillin 500mg qid x5/7.
b) Amoxil 500mg tds and panado 1g 6 hourly for 5 days.
c) Homemade cough syrup, bed rest, panado 1g 6 hourly.

Case study 9:

A known asthmatic patient, 26 year old male, is on prednisone tablets prn when he gets an attack and on Asthavent prn. He has 1 wheeze per week, a night time wheeze once a month, no recent hospital admissions due to asthma and no night time awakenings. He has come in today as his chest is tight. What is the treatment?

a) Initiate treatment. Budesonide 2 puffs bd, continue asthavent prn, stop prednisone. Assess PEFR
b) Continue on asthavent, initiate budesonide 2 puffs bd, use prednisone as needed and give the patient Duolin nebs. Assess PEFR
c) Refer the patient to the doctor. Assess PEFR
d) Continue with asthavent as needed, if the patient has more than 2 attacks per week or more than 2 night time wheezes or awakenings, to come back to clinic. Assess PEFR and review inhaler technique

Case study 10:

A 24 year old female patient presents to the clinic for refill of her chronic medication. On history taking, she reports that she has not had any asthmatic attack in the last 6 months. She is on Asthavent 2 puffs prn and Budesonide 2 puffs BD. How would you manage the patient?

a) Issue Asthavent and Budesonide as normal, no intervention is needed.
b) Gradually reduce the dose or stop Budesonide inhaler.
c) Advise the patient to continue using Budesonide as normal and Asthavent as needed.
d) Refer patient to Doctor to change treatment.

Total = 10
Good Luck

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Health
PROVINCE OF KWAZULU-NATAL

Appendix 12 C

Name: **Qualification:**
Clinic: **Date:**

PRIMARY HEALTHCARE PCDT TRAINING

ASTHMA TRAINING

Advise the patient with Asthma

- Stop smoking
- Adherence even when asymptomatic
- Inhaler technique
- Avoid irritants - cigarette smoke, animals, dust, chemicals, pollen and grass.
- Patient must understand the need for medication received:

  Salbutamol – only relieves symptoms, does not control asthma

  Beclomethasone – prevent symptoms and control asthma but do not give instant relief
- Corticosteroids – oral thrush, rinse mouth

Mild Intermittent Asthma ▪ ≤ 2 episodes of daytime cough / wheeze per week ▪ ≤ 1 night time cough/wheeze per month ▪ No admission to hospital in the last year for asthma	▪ Salbutamol inhalation, 100-200mcg 6-8 hourly as needed
Mild Persistent Asthma ▪ 3-4 wheezes / cough per week ▪ 2-4 night time wheeze / cough per month	▪ Salbutamol inhalation, 100-200mcg 6-8 hourly as needed

Moderate Persistent Asthma ▪ > 4 day time wheezes, tightness / cough per week ▪ > 4 night time awakenings per month	▪ Children – Beclomethasone inhalation 100mcg 12 hourly ▪ Adults - Beclomethasone inhalation 200mcg 12 hourly
Severe Persistent Asthma ▪ Continuous day time wheeze, tightness or cough ▪ Frequent night time awakenings	
Exercise – Induced Asthma	▪ Use Salbutamol inhalation, 100-200mcg before exercise

Controlled	**Step-Up**	**Step-Down**
▪ ≤ 2 episodes of daytime cough / wheeze per week ▪ No night time cough/wheeze ▪ 2 episodes of daytime cough / wheeze per week	<u>Children:</u> Beclomethasone inhalation, 200mcg 12 hourly <u>Adults:</u> Beclomethasone inhalation 400mcg 12 hourly If still inadequate control, refer to doctor	Reduce therapy if no acute exacerbation in the past 6 months Gradually reduce the dose or stop regular inhaled corticosteroid therapy If symptoms are seasonal, stop corticosteroids until the next season

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Health
PROVINCE OF KWAZULU-NATAL

Appendix 12 D

Name: _____ **Qualification:** _____
Clinic: _____ **Date:** _____

PCDT ASTHMA TRAINING QUESTIONNAIRE

Question 1

A 19 year old asthmatic patient comes in complaining of having a tight chest for the past 2 days. She is not actively coughing but feels like her chest is tight. There are no night time symptoms and no recent admission to hospital. The temperature is normal with no signs of infection. She is taking Asthavent prn.

a) Initiate treatment with Beclomethasone inhalation at 100mcg 12 hourly
b) Continue with Asthavent prn and if she has 3 or more day time cough or wheeze or 2-4 night time symptoms, to come back to the clinic.
c) Refer to the doctor

Question 2

A male patient is having wheezes throughout the day (at least 3 wheezes per week) and has had 2 night time awakenings. He is currently taking Asthavent 200mcg prn and Beclomethasone 200mcg 12 hourly

a) Check compliance to treatment and inhaler technique and if correct, step up treatment of the beclomethasone to 400mcg 12 hourly.
b) Leave the treatment as it is and prescribe a course of Prednisone for 7 days
c) Refer to doctor to initiate treatment with Sereflo(salmeterol/fluticasone 50/250mcg 12 hourly

Question 3

A 34 year old known asthmatic comes in for a review. She wheezes about three times a week , has about two night time symptoms per month and is currently taking Asthavent prn

a) Check compliance and inhaler technique, if correct, add beclomethasone 200mcg 12 hourly.
b) Check compliance and inhaler technique, if correct, add beclomethasone 400mcg 12 hourly.
c) Check compliance and inhaler technique, if correct, add theophylline 200mg bd

Question 4

A known asthmatic patient is currently taking beclomethasone 400mcg 12 hourly and Asthavent prn.

He suffers from wheezes only in the day time about 1 wheeze per week.

a) The patient is controlled so continue with treatment
b) Reduce the beclomethasone dose to 200mcg 12 hourly and monitor the patient. If the patient is still controlled after 3 months, stop the beclomethasone and review in months.
c) Stop the Asthavent and the Beclomethasone

Question 5

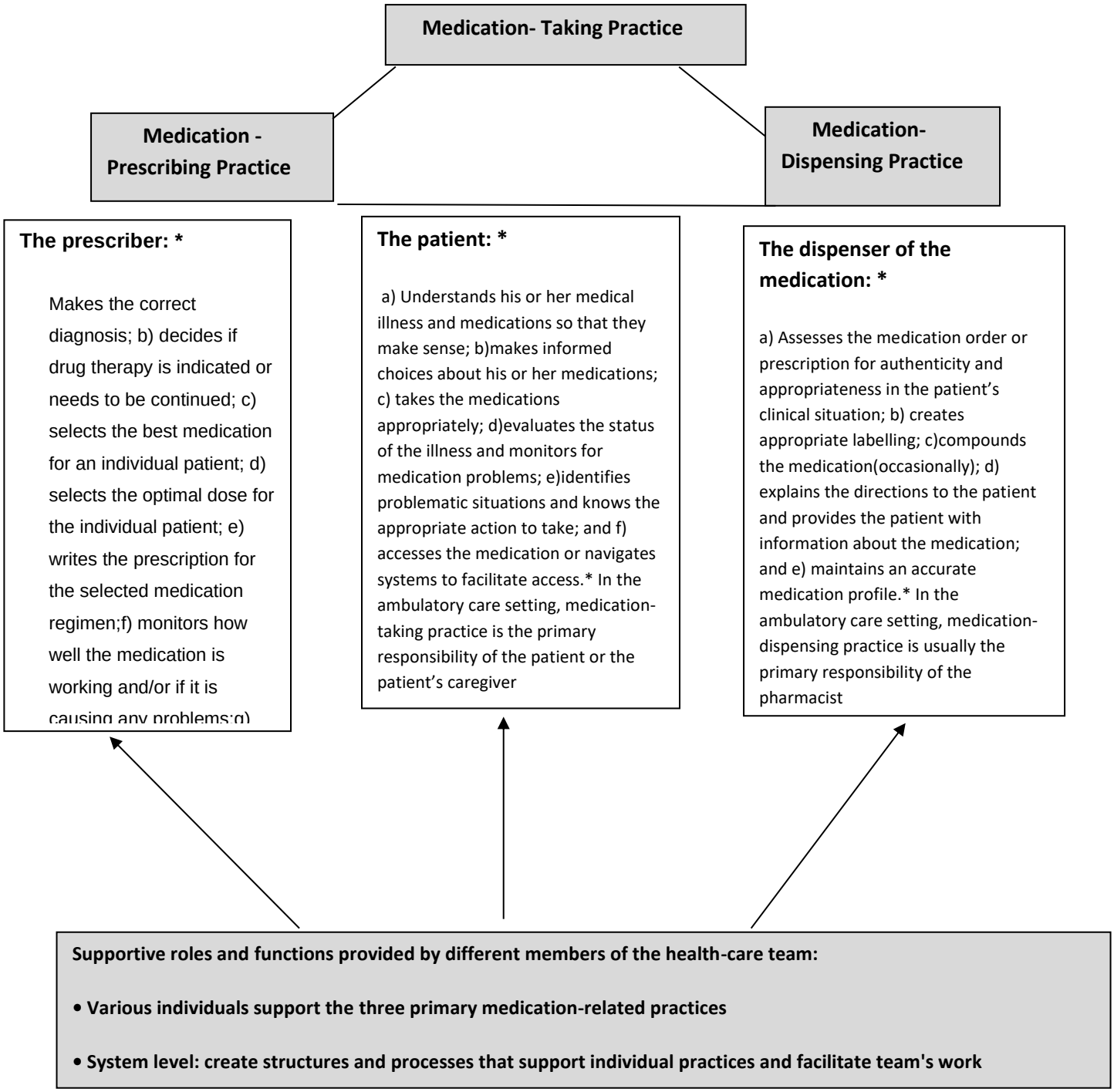
A 3 year old child comes in complaining of difficulty of breathing. On auscultation of the lungs, you hear clear wheezes. Her mother says that she always has chest tightness and it comes on suddenly.

a) Refer to doctor

Treat with Oxygen, and give 4 doses of asthavent via a spacer

Conceptual framework for a Team Approach to Medication Management (TeAMM) Model

Appendix 13



Source: (Conceptual framework for a Team Approach to Medication Management TeAMM Model, Bajcar et al. 2005)

Key elements of the Conceptual framework of Collaborative Medication Management

Appendix 14

Drug use Process (Smith & Knapp, 1992)	Medication use Process(Bates et al. 1995)	Pharmaceutical Care (Cipolle et al. 1998)
Purpose **Describes key components of drug (product) use process.**	Analyzes medication use process from the perspective of medication errors.	Prescribes a patient-centered approach to patient care process that can be used by pharmacists.
Elements **Steps in the process of drug use**	Stages in which medication errors may be corrected	Activities and responsibilities in the patient care process
1 Perception of a need for a drug	Prescribing	Assessment (meet patient, elicit relevant information, make rational drug therapy decisions)
2 Selection of a specific drug product	Transcribing	Care plan (establish goals, select appropriate intervention, schedule follow-up)
3 Choice of a treatment regimen	Dispensing	Follow-up evaluation (elicit evidence to determine effectiveness or safety of drug therapy, document changes of clinical status, assess for new problems, schedule for follow-up)
4 Acquisition of the drug product	Administration of drug	
5 Administration/ consumption of the drug product	Carer assistance	
6 Effect of drug therapy	The patient who may take or frequently does not take the medication according to instruction	

Source: (Key elements of the frameworks assessed- Bajcar et al. 2005)

Appendix 15

Certain components divided into finer components. This is explained below in the rotated component matrix.

Rotated Component Matrix

Rotated Component Matrix[a]

Diagnosis & Prescribing	Component		
	1	2	3
D1D			0.815
D1P		0.603	
D1A	0.754		
D2D			0.797
D2P		0.624	
D2A	0.840		
D3D			0.738
D3P		0.757	
D3A	0.895		
D4D			.539
D4P		0.735	
D4A	0.657		
D5D			0.713
D5P		0.734	
D5A	0.780		
D6D			0.658
D6P		0.645	
D6A	0.783		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Rotated Component Matrix[a]

Monitoring	Component		
	1	2	3
M1D			0.755
M1P	0.734		
M1A		0.719	
M2D			0.769
M2P	0.884		
M2A		0.862	
M3D			0.840
M3P	0.886		
M3A		0.684	
M4D	0.573		
M4P			.500
M4A		0.647	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Rotated Component Matrix[a]

Administrative / Documentation	Component 1	2	3
A1D			0.522
A1P		0.630	
A1A	0.788		
A2D			0.870
A2P		0.874	
A2A	0.811		
A3D			0.841
A3P		0.855	
A3A	0.839		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Rotated Component Matrix[a]

Education and Training	Component 1	2	3
E1D			0.510
E1P		0.834	
E1A			0.887
E2D	0.855		
E2P	0.692		
E2A			0.595
E3D	0.768		
E3P		0.812	
E3A	0.598		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Rotated Component Matrix[a]

Medication Review	Component 1	2	3
MED1D	0.758		
MED1P			0.781
MED1A		0.759	
MED2D	0.875		
MED2P			0.788
MED2A		0.865	
MED3D	0.895		
MED3P			0.714
MED3A		0.798	
MED4D	0.790		
MED4P			0.680
MED4A		0.785	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Appendix 16

Kruskal Wallis Test: Perceptions of doctor, authorized nurse prescriber and pharmacist contributions to Medication Use Process subscales in Ugu and Umzinyathi Districts									
	Ugu			Kruskal Wallis	Umzinyathi			Kruskal Wallis	OVERALL
	Doctor	PCDT Pharmacist	Authorized PN	p-value	Doctor	PCDT Pharmacist	Authorized PN	p-value	Kruskal Wallis p-value
D1D	5.00	5.00	5.00	1.000	5.00	4.60	4.47	0.036	0.000
D1P	3.00	3.60	2.89	0.160	2.63	1.50	3.63	0.000	0.021
D1A	3.41	3.67	4.84	0.000	3.75	4.10	4.32	0.027	0.000
D2D	4.65	5.00	4.89	0.019	5.00	4.60	4.42	0.010	0.010
D2P	4.18	4.67	4.47	0.106	3.25	3.80	3.94	0.018	0.102
D2A	3.82	3.87	4.68	0.003	4.13	4.40	4.19	0.483	0.061
D3D	5.00	4.60	4.89	0.007	4.63	4.60	4.40	0.471	0.016
D3P	4.35	4.53	4.53	0.392	4.25	3.90	4.13	0.370	0.817
D3A	3.65	3.47	4.42	0.007	4.13	4.30	4.21	0.891	0.029
D4D	3.94	4.47	4.74	0.056	4.63	3.90	4.18	0.185	0.894
D4P	3.29	4.00	4.47	0.011	4.00	3.60	3.76	0.562	0.409
D4A	4.18	3.67	4.53	0.046	4.00	4.00	4.34	0.587	0.125
D5D	4.76	4.27	4.84	0.011	4.38	4.50	4.40	0.862	0.273
D5P	4.41	4.60	4.21	0.037	4.38	3.50	4.00	0.071	0.159
D5A	3.65	3.60	4.53	0.012	3.88	4.30	4.23	0.341	0.009
D6D	4.82	4.73	4.95	0.513	4.75	4.40	4.58	0.474	0.460
D6P	3.94	4.20	3.74	0.182	4.13	3.80	4.02	0.460	0.768
D6A	3.29	2.20	4.21	0.001	3.38	3.90	4.06	0.098	0.000
M1D	4.41	3.73	4.89	0.000	4.75	3.90	4.06	0.026	0.008
M1P	4.06	4.53	4.42	0.072	4.25	4.00	4.00	0.665	0.438
M1A	3.53	3.40	4.61	0.000	3.88	4.20	4.48	0.198	0.000
M2D	4.12	3.80	4.47	0.047	4.75	4.00	3.95	0.016	0.176
M2P	4.06	4.53	4.21	0.147	4.38	3.80	3.71	0.060	0.039
M2A	4.18	3.87	4.68	0.003	4.00	4.50	4.60	0.116	0.000
M3D	4.18	4.00	4.37	0.446	4.75	4.20	4.32	0.269	0.410
M3P	4.00	4.53	4.00	0.048	4.00	3.60	3.73	0.494	0.129
M3A	4.41	4.07	4.68	0.030	4.13	4.70	4.63	0.140	0.035
M4D	3.88	3.87	4.53	0.014	4.13	3.50	3.90	0.436	0.273
M4P	4.59	4.33	4.11	0.263	4.75	4.30	4.21	0.330	0.140
M4A	4.24	4.00	4.47	0.038	3.88	3.60	4.03	0.306	0.171
A1D	4.24	3.93	4.42	0.054	4.75	4.30	3.84	0.011	0.080
A1P	2.88	2.27	2.83	0.394	3.63	2.00	3.35	0.004	0.002
A1A	3.76	3.80	4.58	0.018	4.13	4.20	4.45	0.474	0.003
A2D	4.06	3.53	4.58	0.001	4.38	4.10	4.50	0.697	0.001

A2P	3.47	2.93	3.68	0.417		4.38	3.20	3.60	0.086		0.133
A2A	4.12	3.47	4.21	0.716		4.13	4.50	4.52	0.341		0.095
A3D	4.12	3.47	4.58	0.002		4.38	4.50	4.37	0.818		0.033
A3P	3.35	3.20	3.74	0.405		4.25	3.90	4.19	0.873		0.052
A3A	4.00	3.87	4.37	0.114		4.00	4.20	4.44	0.156		0.004
E1D	4.18	3.40	4.58	0.000		4.38	3.80	3.90	0.380		0.008
E1P	4.47	5.00	4.37	0.006		4.13	4.40	4.23	0.626		0.005
E1A	4.00	4.27	4.84	0.002		4.13	4.40	4.44	0.207		0.008
E2D	3.12	2.80	3.26	0.563		4.00	3.10	3.92	0.105		0.003
E2P	3.65	4.27	3.84	0.232		4.13	4.60	4.47	0.141		0.054
E2A	4.12	3.80	4.26	0.289		4.38	4.60	4.66	0.259		0.014
E3D	2.88	2.13	4.16	0.000		4.00	3.30	3.98	0.542		0.000
E3P	4.76	4.87	4.63	0.751		4.75	5.00	4.56	0.105		0.071
E3A	2.41	2.20	3.58	0.005		3.25	1.40	4.05	0.000		0.000
MED1D	4.06	2.73	4.42	0.000		3.75	3.30	4.18	0.011		0.000
MED1P	4.94	4.93	4.89	0.860		5.00	5.00	4.56	0.014		0.002
MED1A	2.88	2.93	3.74	0.034		3.00	3.70	4.13	0.001		0.000
MED2D	4.24	3.13	4.47	0.001		4.50	4.30	4.40	0.953		0.010
MED2P	4.71	4.93	4.84	0.184		5.00	4.70	4.48	0.126		0.190
MED2A	3.71	3.27	4.21	0.065		3.63	3.80	3.97	0.548		0.057
MED3D	4.35	3.53	4.89	0.000		4.38	4.30	4.47	0.703		0.001
MED3P	4.41	4.33	4.84	0.043		5.00	4.60	4.60	0.117		0.691
MED3A	3.41	3.27	4.05	0.048		3.50	3.90	3.84	0.664		0.059
MED4D	4.47	3.93	4.95	0.000		4.75	4.20	4.45	0.478		0.012
MED4P	4.47	4.27	4.79	0.065		4.63	4.80	4.47	0.385		0.778
MED4A	3.59	3.60	4.53	0.004		3.13	3.40	4.27	0.000		0.000

Basic Indicators for Pharmaceutical Care

Appendix 17

Performance Indicators for Pharmaceutical Care		
NO	**INDICATOR**	**COMMENT**
1	Number of pharmaceutical care interventions delivered per standardised denominator, such as 1000 prescriptions dispensed or 1000 patients.	These interventions need to be formally documented and audited and are intended to improve the safe and effective use of medicines. Interventions can suggest a change in the way medicines are prescribed, dispensed, administered or monitored. They may also confirm treatment decisions, foster patients' agreement and adherence to therapeutic plans, promote medication-related health literacy in patients, and support the joint development, agreement and follow-up (monitoring) of treatment plans by patients and health professionals.
2	Number of patients counselled about their medicines per standardised denominator, such as 1000 prescriptions dispensed or 1000 patients.	Formally documented and audited. Counselling comprises information given to an individual patient as part of the medication process that is adequate to ensure his/her ability to use the medication and to adapt his/ her lifestyle in such a way as to have the best possible medication outcome.
3	Number of formal written feed-back responses from patients during treatment per 1000 prescriptions or 1000 patients about patients' specific medication-related literacy, concerns, life-quality needs/expectations, and satisfaction.	Formally documented and audited. This feedback should be preferably encouraged at an early stage of the therapeutic plan in order to better implement and monitor the therapeutic plan. For examples of this indicator, see Item 5.2.2.
4	Number of adverse drug event reports (to include both adverse drug reactions and medication errors) per year.	Formally documented and audited and reported to recognised regional/national organisations and there must be documented evidence of local learning and systems' improvement.

Source: (Kijlstra et al. 2009)

Appendix 18

Phases of Thematic Analysis	
PHASES	**DESCRIPTION OF ANALYSIS PROCESS**
Familiarizing myself with data	Narrative preparation, i.e. transcribing data (Re)reading the data and noting down initial ideas
Generating initial codes	Coding interesting features of data in a systematic fashion across entire data set Collating data relevant to each code
Searching for themes	Collating codes into potential themes Gathering all data relevant to each potential theme
Reviewing themes	Checking if themes work in relation to the coded extracts Checking if themes work in relation to the entire data set Reviewing data to search for additional themes Generating a thematic 'map' of the analysis
Defining and naming themes	On-going analysis to refine the specifics of each theme and the overall story the analysis tells Generating clear definitions and names for each theme
Producing the report	Selection of vivid, compelling extract examples Final analysis of selected extracts Relating the analysis back to the research questions, objectives and previous literature reviewed

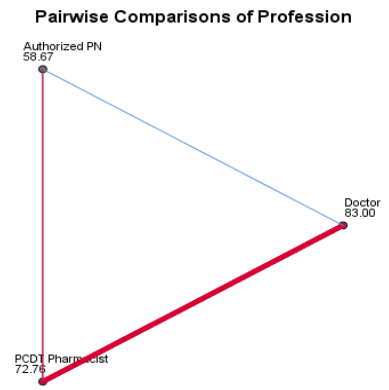
Adapted: (Braun & Clarke, 2006)

Appendix 19

The Pairwise Comparisons Using Kruskal Wallis 1-way ANOVA				
	Authorized PN-PCDT Pharmacist	Authorized PN-Doctor	PCDT Pharmacist-Doctor	
D1D	0,033	0,000	0,211	
D1P	0,837	0,021	0,040	
D1A	0,361	0,000	0,001	
D2D	0,047	0,007	0,561	
D2P	Multiple comparisons are not performed because the overall test does not show significant differences across samples.			
D2A	Multiple comparisons are not performed because the overall test does not show significant differences across samples.			
D3D	0,659	0,004	0,049	
D3P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D3A	0,963	0,034	0,039	
D4D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D4P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D4A	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D5D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D5P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D5A	0,164	0,003	0,196	
D6D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D6P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
D6A	0,589	0,000	0,001	
M1D	0,022	0,002	0,130	
M1P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
M1A	0,927	0,000	0,000	
M2D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
M2P	0,078	0,027	0,721	
M2A	0,516	0,001	0,008	
M3D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
M3P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
M3A	0,877	0,034	0,053	
M4D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
M4P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
M4A	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
A1D	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
A1P	0,007	0,001	0,928	
A1A	0,163	0,001	0,107	
A2D	0,238	0,000	0,032	
A2P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
A2A	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
A3D	0,358	0,013	0,175	
A3P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
A3A	0,763	0,005	0,016	
E1D	0,004	0,008	0,681	
E1P	0,833	0,001	0,016	
E1A	0,040	0,002	0,578	
E2D	0,301	0,001	0,056	
E2P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
E2A	0,844	0,016	0,030	
E3D	0,330	0,000	0,004	
E3P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
E3A	0,036	0,000	0,000	
MED1D	0,010	0,000	0,032	
MED1P	0,005	0,005	1,000	
MED1A	0,174	0,000	0,001	
MED2D	0,175	0,003	0,190	
MED2P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
MED2A	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
MED3D	0,189	0,000	0,046	
MED3P	Multiple comparisons are not performed because the overall test does not show significant differences across samples.			
MED3A	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
MED4D	0,037	0,003	0,714	
MED4P	Multiple comparisons are not performed because the overall test does not show significant differences across samples			
MED4A	0,876	0,000	0,000	

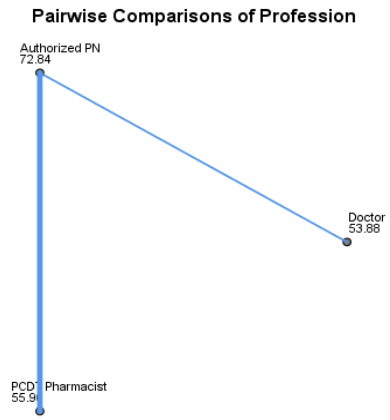
Appendix 20

Median and Interquartile Range- Perceptions of doctor, authorized nurse prescriber and pharmacist contributions to Medication Use					
	Median	Interquartile Range		Median	Interquartile Range
D1D	5	1	A1D	4	1
D1P	3.5	1	A1P	3	2
D1A	4	1	A1A	4	1
D2D	5	1	A2D	4.5	1
D2P	4	1	A2P	4	2
D2A	4	1	A2A	4.5	1
D3D	5	1	A3D	4	1
D3P	4	1	A3P	4	2
D3A	4	1	A3A	4	1
D4D	5	1	E1D	4	1
D4P	4	2	E1P	4	1
D4A	4	1	E1A	4	1
D5D	5	1	E2D	4	2
D5P	4	1	E2P	5	1
D5A	4	1	E2A	5	1
D6D	5	1	E3D	4	2
D6P	4	0	E3P	5	0
D6A	4	1	E3A	4	2
M1D	4	1	MED1D	4	1
M1P	4	1	MED1P	5	0
M1A	4	1	MED1A	4	1
M2D	4	1	MED2D	4	1
M2P	4	2	MED2P	5	0
M2A	5	1	MED2A	4	2
M3D	4	1	MED3D	5	1
M3P	4	2	MED3P	5	1
M3A	5	1	MED3A	4	1
M4D	4	2	MED4D	5	1
M4P	5	1	MED4P	5	1
			MED4A	4	1



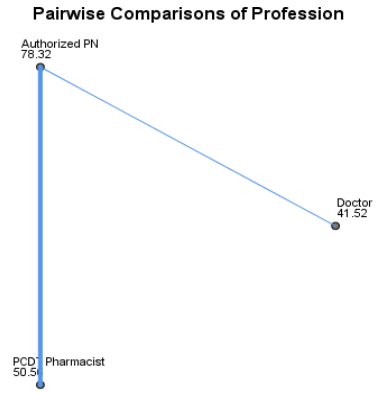
Each node shows the sample average rank of Profession.

D1D



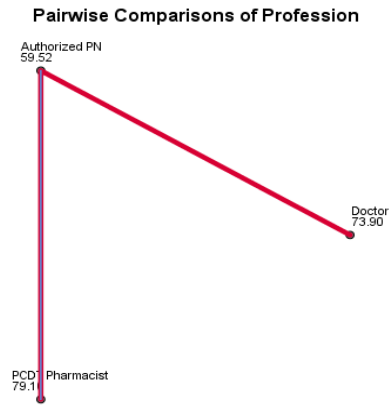
Each node shows the sample average rank of Profession.

D1P



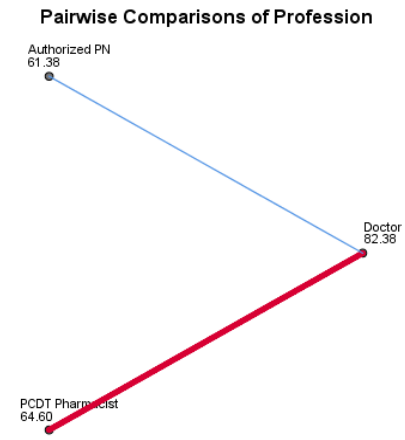
Each node shows the sample average rank of Profession.

D1A



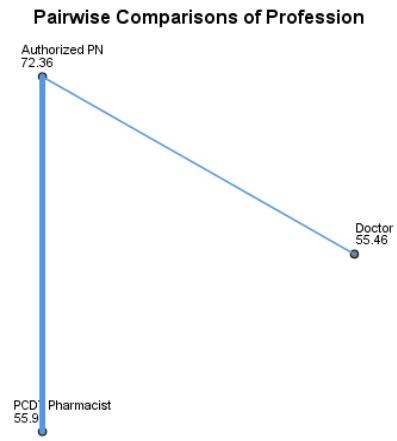
Each node shows the sample average rank of Profession.

D2D



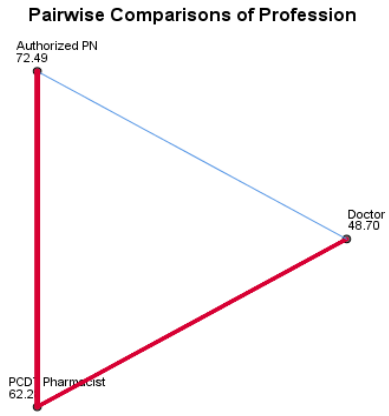
Each node shows the sample average rank of Profession.

D3D

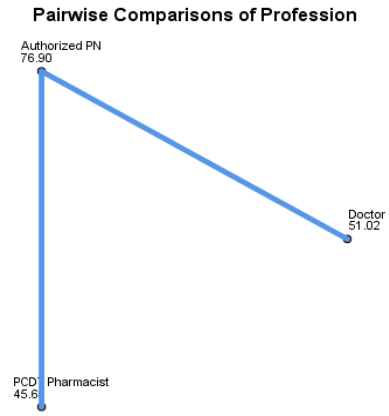


Each node shows the sample average rank of Profession.

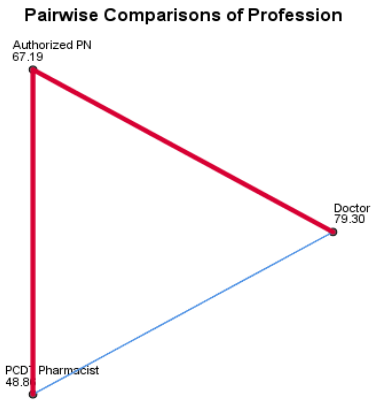
D3A



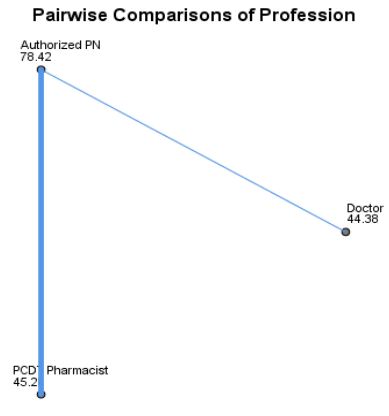
D5A



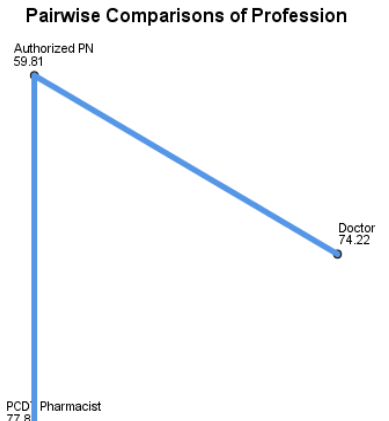
D6A



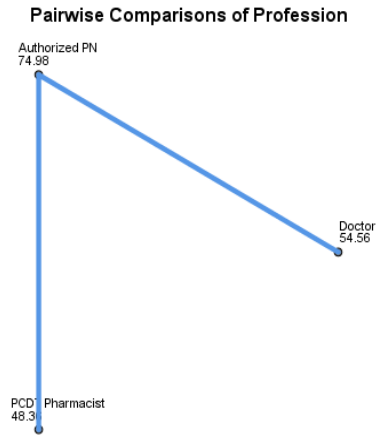
M1D



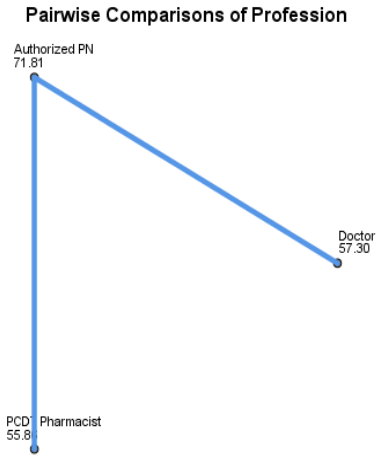
M1A



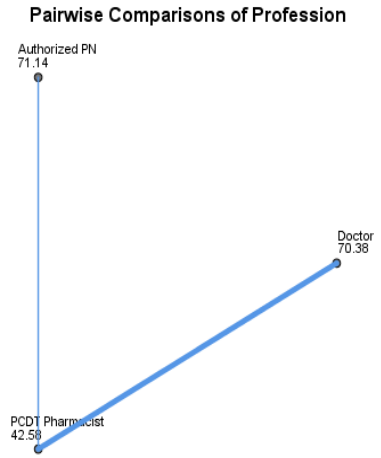
M2P



M2A



M3A



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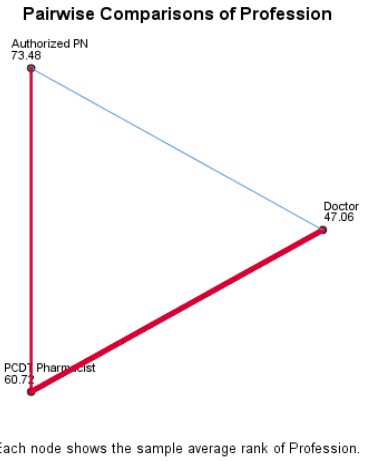

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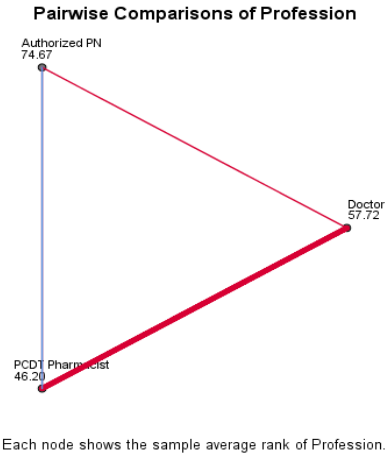

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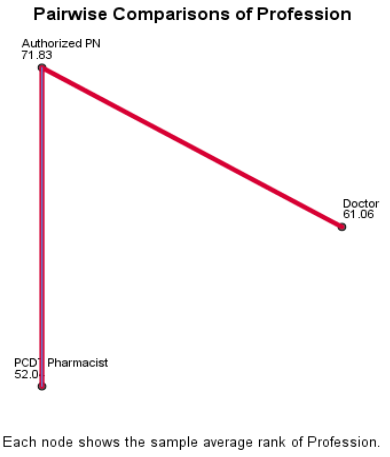

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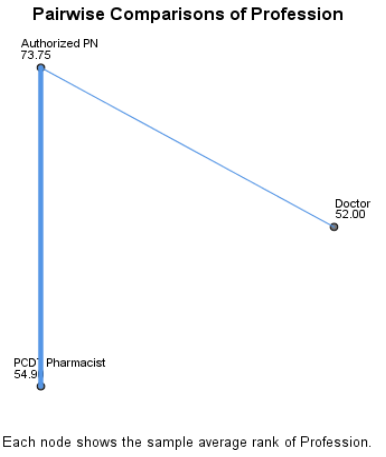

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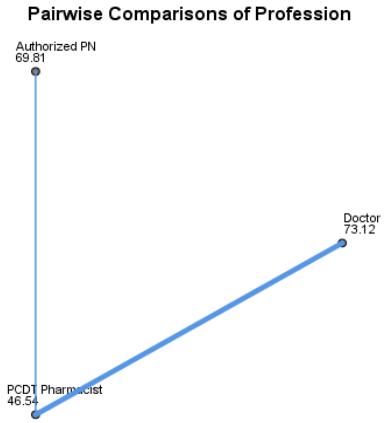

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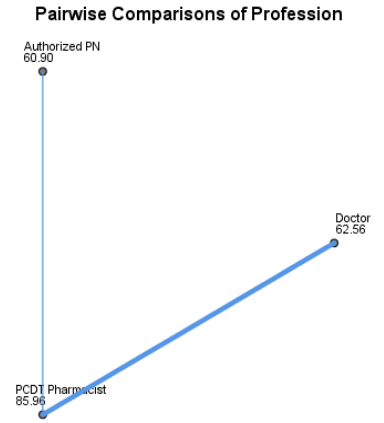

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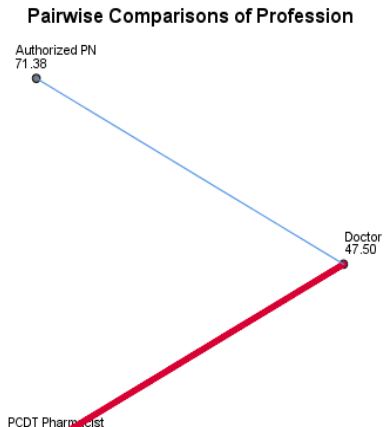

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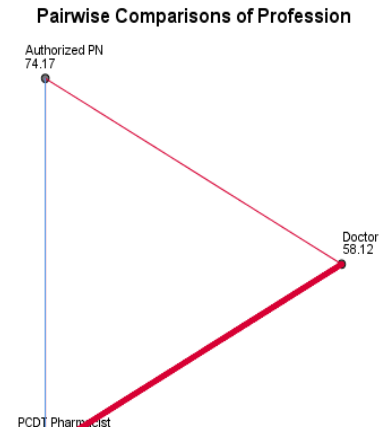

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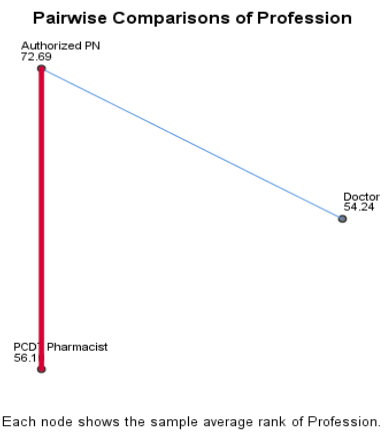

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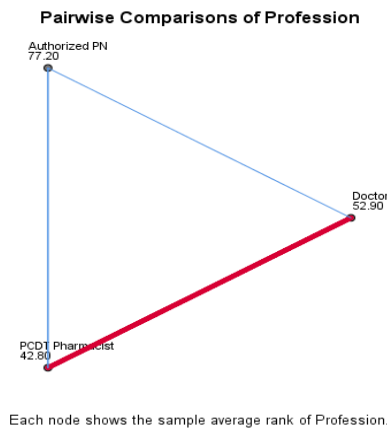

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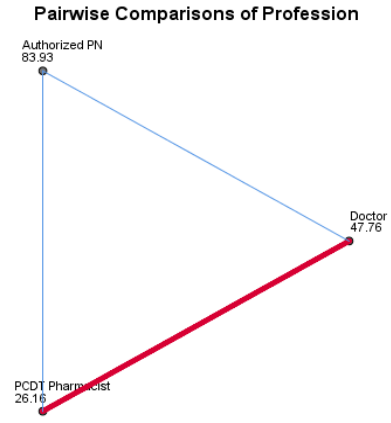

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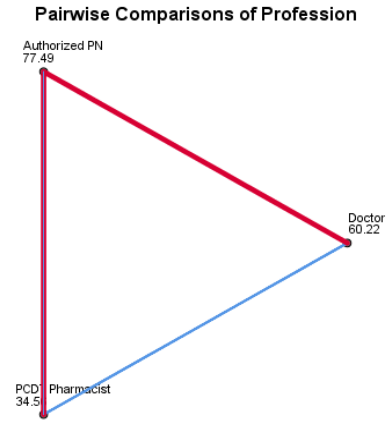

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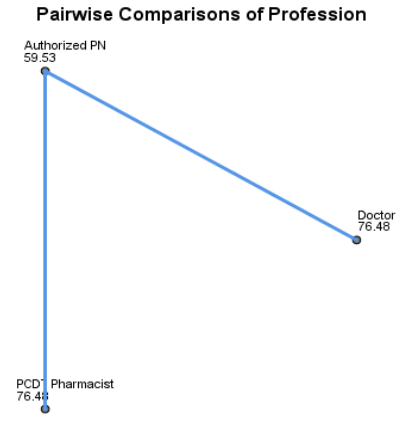
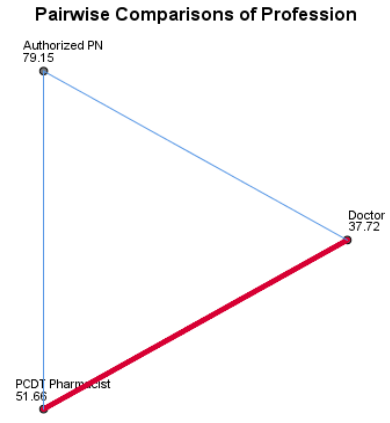


MED1P



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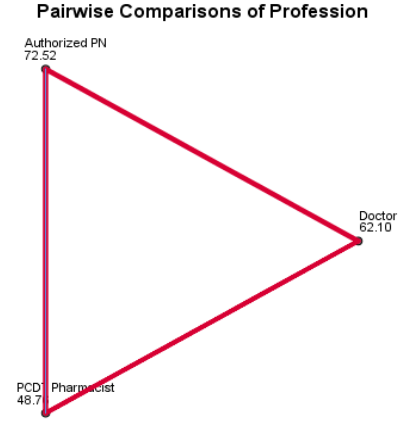

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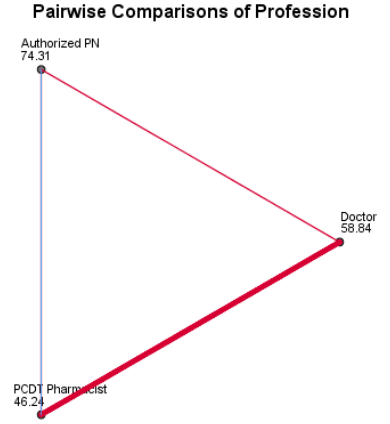

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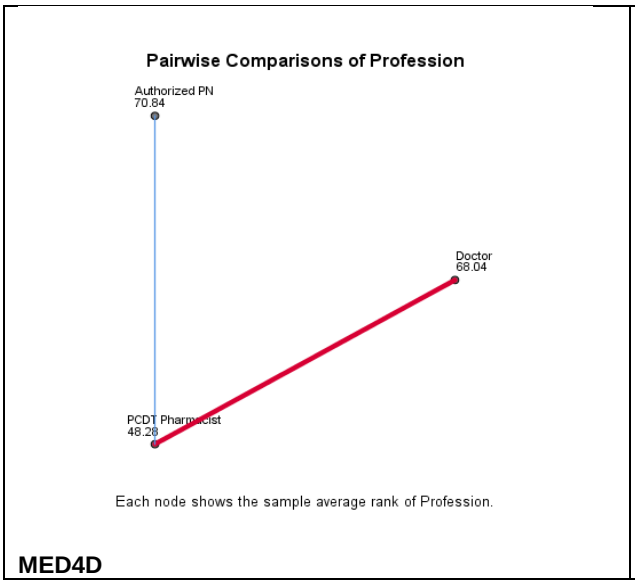
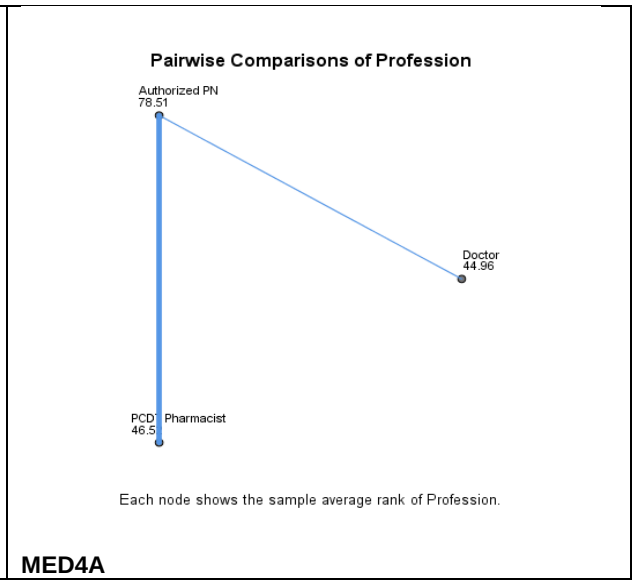

Pairwise Comparisons of Profession
Authorized PN
70.84
Doctor
68.04
PCDT Pharmacist
48.28
Each node shows the sample average rank of Profession.

MED4D


Pairwise Comparisons of Profession
Authorized PN
78.51
Doctor
44.96
PCDT Pharmacist
46.5
Each node shows the sample average rank of Profession.

MED4A