THE USE OF STANDARD TREATMENT GUIDELINES AND ESSENTIAL MEDICINES LIST BY REGISTERED NURSES AT PRIMARY HEALTH CARE CLINICS IN THE UMGUNGUNDLOVU DISTRICT, SOUTH AFRICA

BY

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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Durban University of Technology or to any other institution for assessment or for any other purpose.

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ABSTRACT

Background

One of the major challenges for the Department of Health in South Africa today is inequity and the need to provide quality integrated health care for all its citizens. Primary Health Care (PHC) has been declared as the way to achieve this goal, through the District Health System. Standard Treatment Guidelines (STGs) and the Essential Medicines List (EML) have been developed and are used at PHC clinics and hospitals. This study explored the use of STGs and the EML by professional nurses at PHC clinics in the UMgungundlovu District, KwaZulu-Natal, South Africa.

Methods

A quantitative descriptive research design was used. Questionnaires were used to collect data from respondents at the PHC clinics. A retrospective review of facility registers kept by the respondents on the rational use of drugs was also carried out by the researcher.

Results

The findings of the study revealed that the respondents had a good understanding of the use of the STGs and the EML. There was no evidence of polypharmacy, and medications were prescribed according to guidelines. Areas that were suboptimal were related to prescription writing in writing of schedules and routes of medication as indicated in facility records. The results further showed that training on the use of the STGs and EML were inadequate, which implies the need for strengthening of training programmes.

DEDICATION

This study is dedicated to my son Tharish, family and friends for their constant support and encouragement in my studies. They were the sources of inspiration and motivation during this study.

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ACRONYMS

AP EML : Andhra Pradesh Essential Medicines List

BI : Bamako Initiative

BNF : British National Formulary

CHC : Community Health Centre

CHW : Community Health Worker

COPC : Community Oriented Primary Care

DCCTs : District Clinic Specialist Teams

DHS : District Health system

DoH : Department of Health

EML : Essential Medicines List

EMLc : Essential Medicines List for Children

LGA : Local Government Area

MDG : Million Development Goal

NHI : National Health Insurance

PALSA : Practical Approach to Lung Health in South Africa

PCN : Primary Clinical Nurse

PHC EML : Primary Health Care Essential Medicines List

PHC : Primary Health Care

PHCN : Primary Health Care Nurse

RSA : Republic of South Africa

SANC : South African Nursing Council

STGs : Standard Treatment Guidelines

UNICEF : United Nations Children's Fund

USSR : United Soviet Socialite Republic

WHO : World Health Organisation

GLOSSARY

Primary health care: is essential 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 (WHO, 1978).

Community health centre: is a health centre where there is a 24 hour maternity service, a referral section with specialists and an outpatient department to service the local catchment area (Department of Health 2001).

Gateway clinic: is a primary health care clinic just outside the entrance to a hospital.

Mobile clinic: is a doctor's office and clinic on wheels. A specially outfitted truck which provides examination rooms, laboratory services, and special medical tests to those in remote areas who have access to little or no medical facilities, and to patients who do not have the resources to travel to obtain care (The Mobile Health Clinic 2009).

Essential drugs: have been defined as those that satisfy the priority health-care needs of the population (WHO 1978).

Rational use of drugs: is when patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (WHO 1985).

Essential medicines: are those that satisfy the priority health care needs of the population. They are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost effectiveness. Essential medicines are intended to be available within the context of functioning health systems at all times, in adequate amounts, in the appropriate dosage forms, with assured quality, and at a price the individual and the community can afford. The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations; exactly which medicines are regarded as essential remains a national responsibility (WHO 1978).

Registered nurse: is a person who is qualified and competent to independently practice comprehensive nursing in the manner and to the level prescribed and is capable of assuming responsibility and accountability for such practice (SANC 2005:25). The term 'registered nurse' may be used interchangeably with the term 'professional nurse'.

CHAPTER 1

1.1 INRODUCTION AND BACKGROUND TO THE STUDY

The quality of health care services is very important for people of a country. An individual's first stop is at a primary health care (PHC) clinic, when in search of health services. It is vital that the PHC practitioner renders the best service. There are guidelines and protocols that assist the registered nurse whilst working at the clinic, in assessing, diagnosing, prescribing and treating clients seeking health care, the main one being the PHC Standard Treatment Guidelines (STGs) and Essential Medicines list (EML). This study focused on the use of STGs and the EML by professional nurses in the UMgungundlovu District, South Africa.

Essential medicines have been defined as 'those that satisfy the priority health-care needs of the population' and this is one of the eight elements of PHC as stated in the Declaration of Alma-Ata (WHO 1978: 1). The idea behind an essential medicines is that a list of a few selected medicines will help meet the priority health needs of populations, resulting in better health care, improved medicine management, better use of financial resources and greater access to care (Quick 2003: 1).

In 1977 the World Health Organisation (WHO) produced the first Model List of Essential Drugs. The Model List of Essential Drugs ensures that at least one half of the world's population has access to essential medicines (Quick 2003: 1).

There has been an increase in the number of people who have regular access to essential drugs from 2.1 billion in 1977 to over 4 billion today. These figures are remarkable, yet 2 billion people (one third of the world's population) still lack regular access to essential medicines. This may be attributable to economic, social and educational factors that lie beyond the health sector (Quick 2003: 1).

Four serious problems need to be overcome in the health sector that impact on essential medicines. These are the irrational use of medicines, unfair financing for health care including medicines, unreliable delivery systems and high medicines prices (Quick 2003: 1).

Studies from developed and developing countries indicate that there is overuse, underuse and misuse of medicines which is detrimental to health, for example inappropriate use of antibiotics, unnecessary and unsterile administration of injections, and less than 50% of patients on chronic treatment adhere to their treatment (Quick 2003: 1).

In South Africa a National Essential Drug Programme was introduced in 1996. This was followed by the presentation of the Essential Drug List (EDL) and STGs for PHC, which were developed for the most common diseases that patients were treated for at PHC clinics. In 1998 the EDL and STGs were revised, ensuring the availability of essential drugs to all South African citizens at all times at the PHC clinics (Republic of South Africa 2000: 18).

PHC was introduced to South Africa in April 1994 by the Department of Health, to cater for the health needs of all South Africans. During this period two government policies were implemented, firstly, free health service for pregnant mothers and children under six years and, secondly, universal access to PHC for all South Africans. This gave rise to the development of a number of clinics and basic health care programs (Republic of South Africa 2000: 3).

At the Alma-Ata conference, PHC was defined as:

> "*Essential 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 the 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 service" (WHO 1978: 428).

According to section VII of the Declaration of Alma-Ata, PHC includes at least:

1. Education about prevailing health problems and methods of preventing and controlling them.
2. Promotion of food supply and proper nutrition.
3. An adequate supply of safe water and basic sanitation.
4. Maternal and child healthcare, including family planning.
5. Immunization against the major infectious diseases.
6. Prevention and control of locally endemic diseases.
7. Appropriate treatment of common diseases and injuries
8. The provision of essential drugs (WHO 1978: 428).

Following the introduction of PHC, a policy document was formulated by the South African Department of Health in 1996, called '*Restructuring the National Health System for Universal Primary Health Care'*. This document stated that a specialised group of professional nurses, Primary Clinical Nurses (PCN), would function independently as frontline providers of clinical PHC services within the public health facilities. This group of nurses were previously known as Primary Health Care Nurses (PHCN) (Department of Health 1996). This is an extended role of the registered nurse and is recognised and regulated by the South African Nursing Council (SANC) through the Nursing Act, No. 33 of 2005 as amended. The PCN examines every patient that comes to the clinic, and treats and discharges those patients she/he is able to treat. If the PCN cannot make a

diagnosis or cannot treat the patient, the patient is referred to a doctor or to the next level of care (Magobe, Beukes and Muller 2010:1).

One of the major challenges for the Department of Health in South Africa today is inequity and the need to provide quality integrated health care for all its citizens. PHC was declared as the way to achieve this goal, through the District Health System. Hundreds of clinics have been built and access to free health care has been made available, thus increasing the use of these clinics. EDLs and STGs have been developed and used at PHC and hospitals (Department of Health 2000: 3).

1.2 PROBLEM STATEMENT

Global studies in Peru (Kristiansson, Reilly, Gotuzzo, Rodriguez, Bartoloni, Thorson, Falkenberg, Bartalesi, Tomson and Larsson 2008), Kuwait (Awad and Al-Saffar 2010), and Egypt (El Mahalli and Akl 2011) have shown that medicines are not used rationally. According to the WHO (1985: 1), the definition of the rational use of medicines is when 'patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community'. Studies by Kristiansson et al. (2008), Awad and Al-Saffar (2010) and many others have shown that guidelines are not followed by nurses and doctors when consulting with clients, for example, practicing polypharmacy or administering an antibiotic when it was not recommended. This results in ineffective treatment. In South Africa there is little evidence of studies in this field which is why this study explored the use of STGs and the EML by professional nurses at PHC clinics.

1.3 PURPOSE OF THE STUDY

The purpose of the study was to examine the use of STGs and the EML by professional nurses at PHC clinics in the UMgungundlovu District, in order to find out whether these guidelines are used effectively.

1.4 OBJECTIVES OF THE STUDY

The objectives of the study were to:

- Explore the use of STGs and the EML by professional nurses working at PHC clinics.
- Review the rational use of medicines at the clinics by auditing clinic registers kept by the professional nurses.

1.5 RESEARCH METHODOLOGY

In this study a quantitative descriptive research design was used, whereby a survey was carried out amongst the professional nurses at the PHC clinics. A self-administered questionnaire was used, exploring the use of the STGs and the EML. Further the professional nurses registers was reviewed retrospectively, regarding the medication that they prescribed. The instrument was pre- tested during the pilot study contributing to its validity. The questionnaire was further tested and adapted with reference to the literature and in consultation with experts in the field, ensuring reliability. The sample consisted of 120 professional nurses, who were from PHC clinics, Community Health Centres (CHC), Mobile clinics and Gateway clinics. The researcher visited 48 clinics and collected the data. Data was analysed using descriptive statistics, use of frequencies, cross tabulation tables and various types of graphs.

1.6 SIGNIFICANCE OF THE STUDY

This study highlights the use of the STGs and EML by professional nurses working at clinics in the UMgungundlovu District. Positive aspects and gaps have been identified and recommendations to relevant stakeholders have been made to improve the use of these guidelines. The results of this study can assist in empowering professional nurses to obtain greater job satisfaction, knowing

that they are knowledgeable and can be confident in consulting with clients and providing the best possible care to them when they visit PHC clinics.

1.7 THEORETICAL FRAMEWORK

Ida Jean Orlando's Nursing Process theory was selected as a framework for this study. This study is based on PHC, which is seen not only as the first point of contact care, but also as a point of entry for the patient into the health system as a whole. Care is on-going until the problem is resolved or the patient is referred to a secondary service. Orlando describes the nursing process as a systematic approach to identifying and satisfying patient needs. Nursing Process theory is inclusive of five logical steps or phases:

1. The assessment phase;
2. Formulation of a nursing diagnosis;
3. Planning;
4. Implementation; and
5. Evaluation.

During all phases recording is important, documenting all the care and treatment that is given. Each step in the nursing process is part of an on-going process, and if necessary, reassessment of each step or phase can be undertaken (Watson1979: 7). This theoretical framework will be discussed in detail in Chapter 3.

1.8 STRUCTURE OF THE DISSERTATION

- Chapter 1: Introduction and background to the study.
- Chapter 2: Literature review.
- Chapter 3: Research methodology.
- Chapter 4: Presentation of results.
- Chapter 5: Discussion of results, conclusion, limitations, recommendations and references.

1.9 CONCLUSION

STGs and the EML help health professionals to decide on correct treatment regimens for specific clinical problems. There is a link between STGs and essential medicines (Van den Ham et al. 2011: 2); the link is that medicines are prescribed according to the recommendations in the guidelines. Analysing the implementation of STGs and essential medicines is important because this ensures that clients receive the appropriate treatment thus ensuring quality health care.

This chapter outlined the introduction and background to the study, the problem statement, the purpose, objectives and significance of the study. The theoretical framework was introduced and the structure of the dissertation was explained. The following chapter focuses on previous studies conducted and available literature on the STGs and the EML in order to gain a broader perspective on the topic under study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter explains the concepts of STGs and EML. It explores studies on the use of STGs and the EML, in countries like, Britain, India, Peru, Kuwait, Nigeria, Egypt, United Republic of Tanzania, Botswana and South Africa.

2.2 STANDARD TREATMENT GUIDELINES AND ESSENTIAL MEDICINES

Evidenced-based STGs are developed when frequently occurring health problems in a country are identified. These guidelines assist prescribers to decide on the correct treatment for specific health problems. They usually indicate the first treatment of choice, diagnostic criteria and alternative therapies. Medicines listed in the STGs should be consistent with the list in the National medicines list (Van den Ham, Bero and Laing 2011: 3). At PHC clinics in South Africa, professional nurses and doctors make use of many guidelines, most important being the STG and EML, produced by the Department of Health. These guidelines assist in the management and referral of common and uncommon conditions (Department of Health 2008: iv). The link with the nursing process as theoretical framework may be explored, since the process is patient-focused on clinical reasoning and assessment of patient problems, planning, implementation and evaluating with referral to the STGs and EML.

Higher education institutions ensure comprehensive training of PHC nurses, where they undertake a post-basic diploma in Clinical Nursing Science, Health Assessment, Treatment and Care (SANC 1982). The course provides the professional nurses with clinical knowledge and skills in patient assessment, diagnosis, treatment and care. It also incorporates clinical competencies such as

prescribing and issuing of schedule 1-4 drugs from the STGs and EML (SANC 1984).

In the 1950's, 60's and 70's, new drugs were discovered which cured illnesses successfully in developing countries. The WHO was questioned by developing countries on the names and quantities of drugs needed. In 1975 the Director General of the WHO reviewed the main drug related problems facing the developing countries, namely, funding to buy drugs, and which drugs contributed to curing prevalent illnesses. The World Health Assembly thus outlined possible new drug policies, and the essential drugs concept was born in the mid 1970's (Weerasuriya, n.d). The WHO defines essential medicines as:

> "*those that satisfy the priority health-care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. Essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford. The implementation of the concept of essential medicines is intended to be flexible and adaptable to many different situations; exactly which medicines are regarded* as *essential remains a national responsibility."* (WHO 1978: 429).

According to Van den Ham, Bero and Laing (2011: 2), this definition has evolved over time from an expert-based approach to one that is evidence-based. At the declaration of Alma-Ata in 1978, the provision of essential drugs was one of the components of PHC necessary to achieve optimum health (WHO 1978: 429). PHC nurses make use of the EML, together with STGs, to guide them in assessing, diagnosing, prescribing and treating patients to combat disease.

2.3 THE WHO MODEL LIST OF ESSENTIAL DRUGS

The first WHO Model List of essential drugs was published in 1977, and is revised every two years by the WHO Expert Committee for the selection and use of essential medicines. The latest revision was in 2010. The committee provides countries with the Model List and process so that they can draw up their own national list (Van den Ham, Bero and Laing 2011: 2). The Model List consists of a core list which has medicines for a basic health care system and a complementary list for priority diseases where specialised care is needed. The emphasis in 1977 was on the selection of low priced medicines. Today it is the effectiveness of the drug and not the cost which is considered most important.

According to WHO statistics, over 8 million children under the age of five die each year due to diseases such as malaria, pneumonia, tuberculosis, diarrhoea and HIV related diseases. These diseases can be prevented if essential drugs for children are available. A meeting was held in 2006 involving the WHO and UNICEF to address issues regarding the lack of medicines for children. The outcome of this meeting was to update the WHO model list with a list of children's medicines (Van den Ham, Bero and Laing 2011: 6). In 2007 the first essential medicines list for children (EMLc) was created (Van den Ham, Bero and Laing 2011: 5).

According to Hogerzeil and Mirza (2011: 1), as cited in the WHO publication *The World Medicines Situation 2011*, "access to essential medicines is part of the right to health". These authors highlight access to essential medicines as a fundamental human right in order to achieve optimum health. One third of the world's population has no access to essential medicines. In many developing countries, people are demanding their health rights through the courts. To prevent this, health policy makers are requested to incorporate human right principles in medicine programs from the outset.

At the declaration of Alma-Ata in 1978, the provision of essential drugs was one of the necessary components of PHC to achieve optimum health. In 2000 the United Nations Human Rights Council obtained a mandate to appoint rapporteurs to monitor and report back on special human rights issues such as the right to essential medicines. Guidelines and simple indicators were used to measure progress (Hogerzeil and Mirza 2011: 4).

2.4 THE UNITED NATIONS MILLENNIUM DECLARATION

The United Nations Millennium Declaration was signed in September 2000 by 191 United Nations member states. The Declaration committed world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation and discrimination against women by the year 2015 (United Nations 2010).

The Millennium Development Goals (MDGs) are eight international development goals, namely:

1. Eradicating extreme poverty and hunger.
2. Achieving universal primary education.
3. Promoting gender equality and empowering women.
4. Reducing child mortality rates.
5. Improving maternal health.
6. Combating HIV/AIDS, malaria, and other diseases.
7. Ensuring environmental sustainability.
8. Developing a global partnership for development.

All the goals have specific targets and indicators. The fourth target in the eighth development goal impacts on PHC. This target is: “to develop a global partnership for development in cooperation with the pharmaceutical companies, to provide access to affordable essential drugs in developing countries”. This goal is directed towards treating disease by prescribing essential drugs (United Nations 2010: 1).

2.5 GLOBAL STUDIES

Global studies have been conducted on the rational use of drugs and standard treatment guidelines in Peru (Kristiansson et al. 2008); Kuwait (Awad and Al-Saffar 2010); Egypt (El Mahalli and Akl 2011); Botswana (Boonstra, Lindbaek, Khulumani, Ngome and Fugelli 2005); Nigeria (Uzochukwu, Onwujekwe and Akpala 2002) and the United Republic of Tanzania (Walter, Lyimo, Skarbinski, Metta, Kahigwa, Flannery, Dowell, Abdulla and Kachur 2009). The results of these studies showed that nurses and doctors were not adhering to guidelines and were prescribing drugs inappropriately.

2.5.1 Use of the national formulary in Britain

British nurses also follow guidelines whilst nursing and prescribing treatment for their patients (Wagle 2011: 43). The British National Formulary (BNF) empowers nurses and other users daily during their prescribing of drugs. The formulary is updated every six months. Wagle discusses the BNF and how it is used in the management of common diseases, as well as: changes in prescribing; classification; new and discontinued preparations, and; changes in legalities and policies (Wagle 2011: 43). The BNF also includes learning activities, where scenarios are given, and treatment options are evaluated. These learning activities helps the nurses keep updated with the BNF. The editorial team identified that nurses are willing to learn how to use the BNF effectively (Wagle 2011: 48).

2.5.2 Availability of essential drugs in Andhra Pradesh

A study in Andhra Pradesh was carried out by Dixit, Vinay, Jayshree, Ubedulla, Manohar and Chandrasekar (2011: 599) to assess the availability of essential medicines to the people of Kunijarla. The study was conducted in two parts; firstly, the PHC essential medicines list (PHC-EML) was compared with the Andhra Pradesh essential medicines list (AP-EML) and the National Essential

Medicines List (NEML). Secondly the listed medicines were assessed for their availability and quantity. The results showed that the hospital had 100% stock of medicines available but they needed to add on a few more drugs (Dixit et al. 2011: 599). This study illustrates that health services of Andhra Pradesh are in keeping with the Alma Ata declaration of 1978 and the MDG's regarding the provision of essential medicines.

2.5.3 Health seeking behaviour and antibiotic use in Peru

A research study was carried out on the urban community of Yurimaguas in an underprivileged area of Peru on their health seeking behaviour and the use of antibiotics (Kristiansson et al. 2008: 434). In Peru children die of acute respiratory tract infections and diarrhoea. The study describes the health seeking behaviour and symptoms in children, and whether antibiotics were prescribed according to the children's signs and symptoms. Caregivers of 800 children were interviewed about information on antibiotic use. If the carer did not know the name of the antibiotic the interviewer showed them containers of the antibiotics for them to identify. Treatment that was taken was that which was prescribed by health providers as well as that bought by the carer without the advice of a pharmacist. The principle of the integrated management of childhood illnesses (IMCI) was used to classify all the symptoms given by the caregiver. The results of this study showed that many doctors and nurses prescribed antibiotics when they were not indicated. They did not follow the proper IMCI guidelines on the treatment of illnesses (Kristiansson et al. 2008: 437).

2.5.4 Prescribing and dispensing practices in Kuwait

Awad and Al-Saffar (2010: 1247) carried out a study in Kuwait on prescribing and dispensing practices using the WHO drug use indicator. Fifty PHC centres across five governorates were chosen to participate in this study. In each centre 100 prescriptions were chosen for review. Consultation time and dispensing time

was counted for 50 patients and 30 patients were interviewed to assess dispensing practices and patient knowledge. The results of the study with regard to all indicators showed a significant difference between the governorates. The findings revealed that where the patient numbers were low and the workload less, the consultation time, prescribing, dispensing practice and patient education was better than where the patient numbers and workload was high. Electronic physician orders, dispensing software, and pre-labelled and pre-packed drugs also made dispensing practice efficient at some governorates. Reasons provided for the ineffective practices were that, because patients were given free treatment or treated for a small fee, their demands increased for drugs and their mentality was that 'there is a pill for every ill', resulting in polypharmacy. Misdiagnosis was another problem, as patients were diagnosed just by symptoms instead of accurate diagnosis by proper examination and proper use of STGs, thus leading to incorrect prescribing (Awad and Al-Saffar 2010: 1252). The outcome of this study showed that there are problems in prescribing and dispensing in health centres in Kuwait and strategies need to be implemented to ensure quality care (Awad and Al-Saffar 2010: 1253).

2.6 STUDIES IN AFRICAN COUNTRIES

2.6.1 The Bamako Initiative in Nigeria

Africa is the poorest of all continents in the world according to health and socio-economic indicators. In 1985 a commitment was made by Ministers of Health of the African region of the WHO to use the PHC approach to strengthen their health systems. This led to community based health care which was influenced by regional initiatives, as per the study below, called the Bamako Initiative (BI) (Dennill, King and Swanepoel 2000: 29).

A study was carried out in South-East Nigeria at BI PHC clinics. The BI aims "to ensure a steady supply of the most basic essential drugs, prescribed under

generic names at affordable prices and at the same time improving prescribing practices" (Uzochukwu, Onwujekwe and Akpala 2002: 378). A fund called the 'drug revolving fund' is used in this initiative. To ensure there are adequate funds for the supply of generic drugs at PHC clinics, patients are required to pay a small fee to ensure a regular supply of drugs. In Nigeria patients stopped visiting clinics when there was no stock of the common drugs used. An adequate stock of drugs is important, but using it rationally is of even more importance. The aim of this study was to assess the availability and the rational use of essential drugs at BI PHC clinics and compare it with non-BI PHC facilities. It was carried out in the local government area (LGA) in Oji River, where the BI was carried out and the Enugu East LGA, where the BI was not carried out. Data was collected from 33 PHC clinics, prescriptions were analysed and patients interviewed on their knowledge of their dosing schedules. The results showed greater availability of drugs at BI clinics as compared to non-BI clinics, but the problem was over-prescription of drugs at BI clinics, which may have been due to patient demands. The low prescription in the non-BI clinics was not due to better practice of staff in prescribing but because of low stock levels of drugs. Patients did not remember the dose of their medications as they had too many drugs prescribed for them. The rational use of drugs is important in any situation, and the recommendation from this study was that strategies should be implemented to strengthen the BI by ensuring the use of STGs, training, supervision and regulatory frameworks (Uzochukwu, Onwujekwe and Akpala 2002: 382).

2.6.2 Health Care Strategy in Egypt

One of the strategies for the treatment of childhood illnesses is the IMCI guidelines, which is used at PHC clinics. This strategy was implemented in Egypt in 1997 for the treatment of children under five years (El Mahalli and Akl 2011: 118). A comparative study was carried out in Alexandria between one clinic using the (IMCI) guidelines (clinic A), and one not using the guidelines (clinic B). Medical records were analysed for drug choice, dose, dosage form,

route of administration, documentation of health education instructions and follow up. The results showed the assessment and treatment was better in clinic B than in clinic A, except for the percentage of injections and antibiotics given for coughs and the common cold. The study showed the positive effect of adopting IMCI guidelines on improving drug use (El Mahalli and Akl 2011: 121). It showed that one third of the consultations had no drugs prescribed in clinic B, as compared to 6% in clinic A, which demonstrates that you don't 'need a pill for every ill', as also explained by Awad and Al-Saffar (2010: 1247) in their study. Clinic B used the IMCI guidelines, thus the choice of the correct drug, dose, dosage form, route of administration was better than in clinic A. According to IMCI principles, health education is a vital aspect, where parents readily accept this knowledge to improve the well-being of their children, and this was evident in clinic B.

This study further shows the importance of following guidelines, the rational use of drugs and the training of health personnel on their use. Due to the increase on costs due to the number of drugs prescribed, the Egyptian health services drew up a policy for the maximum prescription of three drugs only to prevent polypharmacy (El Mahalli and Akl 2011: 121). Similar studies were carried out in Nigeria (Uzochukwu, Onwujekwe and Akpala 2002); Kuwait (Awad and Al-Saffar 2010) and Peru (Kristiansson et al. 2008), all of which showed that health workers were not following guidelines.

2.6.3 Implementation of Guidelines in United Republic of Tanzania

A study by Walter et al. (2009: 99) in the Coast Region of the United Republic of Tanzania showed the failure of health workers to follow IMCI guidelines and to refer severely ill children. The study was carried out in the districts of Kisarawe, Kibaha urban and rural, and South West Bagamoyo. Malaria is endemic and transmission occurs throughout the year. Retrospective and prospective case reviews were carried out on severely ill children, where questionnaires and interviews were carried out with parents and health workers. In the case review,

health workers identified 5% of patients who were below five years old, who presented with severe, potentially life threatening illnesses. The health worker was prompted with a list of IMCI danger signs (Walter et al. 2009: 100). In retrospective case reviews, treatment and referral by health workers was compared, where severely ill children were followed up and parents were given a questionnaire on their child's current health status. Barriers that were identified by parents as very important were the availability and costs of transport, waiting lines at the hospital, cost of treatment and poor quality of service at the hospital (Walter et al. 2009: 102). Questionnaires were also given to 81 health care workers on their beliefs and practices on the management of severe illnesses of children. In addition to this, qualitative interviews were carried out on 30 health workers to find out their decision making processes in their management of ill children (Walter et al. 2009: 101). Results of the study showed that health workers only recorded specific diagnoses, not IMCI classified in registers. The results further indicated that 98% of the children were diagnosed with severe malaria or pneumonia and none received IMCI appropriate therapy. They failed to give antibiotics when indicated, and they felt that chloramphenicol was "too toxic" (Walter et al. 2009: 105).

The results of this study revealed that health workers were not adhering to IMCI guidelines. In order to implement corrective strategies, the Ministry of Health and Social Welfare of the United Republic of Tanzania engaged in reassessment of National adaptation and implementation of IMCI guidelines (Walter et al. 2009: 105).

2.6.4 Health Care Delivery in Botswana

Health care in Botswana is delivered through a decentralised model, with primary health care being the basis of care. It is integrated within hospital services and is working very well (Botswana Ministry of Health 2011). A study was carried out by Boonstra et al. (2005: 178) on the adherence to treatment guidelines at PHC

facilities. The main objective of this study was to evaluate the quality of prescribing by nurses in terms of their degree of adherence to national treatment guidelines, and drug use in Botswana. Three administrative districts and 30 PHC clinics were used, where a prospective survey was carried out on 2994 consultations by professional nurses. Consultations were observed through participatory observation by a nurse from the research team. The questionnaire included the main diagnosis made during consultation, additional and symptom diagnoses, drug prescription, consultation time and the nurse's adherence to national treatment standards (Boonstra et al. 2005: 179).

The results of the study with regards to diagnosis reveal that nurses made 30% symptomatic diagnoses and 70% specific diagnoses. Full adherence to national treatment guidelines was higher in clinics than in health posts. Drug prescription indicators like the average number of drugs; number of antibiotics and injections prescribed was used as an indicator and generic prescriptions, which was more common in clinics than in health posts (Boonstra et al. 2005: 181). The overall findings of this study were that the adherence to national treatment guidelines was better in clinic staff than in health post staff, and this could be attributed to qualifications of clinic staff, which was better than the staff at health posts. Prescriptions needed to be improved as this was based on a number of factors, namely, diagnostic quality, nurses training, experience and the availability of drugs. It was concluded that training and supervision of nurses was important to strengthen their diagnostic and treatment skills (Boonstra et al. 2005: 185).

2.7 THE SOUTH AFRICAN SITUATION

2.7.1 Guideline implementation in PHC settings

Mayers (2010: 61) carried out a study on nurses' experience of guideline implementation in PHC settings involving three linked sub-studies. The first sub-study was on the Practical Approach to Lung Health (PALSA) in South Africa

guidelines. The second was on the description and review of guidelines in PHC settings and the third was on observation of nurses in practice. Results of the study showed that nurses were confident in using guidelines, after being trained, but at some clinics their use of guidelines was inconsistent, out-dated and contradictory. Two guidelines were compared, the South African Tuberculosis control guidelines and the PALSA guidelines. Nurses preferred the PALSA guideline because it was user friendly and colourful. The study concluded that nurses make their decisions "based on experience, alternative knowledge, intuitive responses, in consultation with colleagues and through the use of guidelines" (Mayers 2010: 84).

2.7.2 Pharmacy and Development Project

In May 2004 the pharmacy and development project was introduced when a dispensing licence was required for doctors and nurses who dispense medicines. This learning project was approved by the South African Pharmacy Council. This is a self-learning distance learning package, where the participants complete learning activities on their own time, thereafter an assessment is carried out on proficiency (Dispensing course 2009: 1).

The course includes:

- Evaluating prescriptions and accessing patient profiles or records.
- Dispensing prescriptions and issuing medicines to patients with appropriate advice and possible side effects to observe.
- Ensuring that dispensing records were maintained.
- Proper procurement and storage of medicines (Dispensing course 2009: 1).

All professional nurses working at PHC clinics have to ensure that they undergo this training and obtain the dispensing licence in order to dispense medication effectively.

2.7.3 Keeping, supply, administering or prescribing of medicines by professional nurses

The SANC regulations relating to the keeping, supply, administering or prescribing of medicines by professional nurses, regulation number R.2418, stipulates that an authorised nurse may keep, supply, administer or prescribe an unscheduled medicine or any medicine or substance listed in schedule 1, 2, 3 or 4 to a person for use (SANC 1984).

According to Regulation R.2418, conditions under which an authorised nurse may supply, administer or prescribe a prescribed medicine must follow a specific procedure, namely:

a) Directly after supplying, administering or prescribing, enter:
    i) The diagnosis made by the nurse in respect of the health condition of the patient;
    ii) The name, quantity, strength and dosage of the medicine supplied, administered or prescribed, as the case may be;
    iii) The number of the schedule to the Medicines Control Act in which such medicine is listed (if any);
    iv) The date and time of supply, administering or prescribing (SANC 1984).

The above information is entered on the patient's file or treatment record with the date and time of the entry. The medicine name and category, and the name of the prescriber, should be written in block letters by the prescriber, followed by the signature of the prescriber (SANC 1984).

Further, Regulation R.2418 states:

b) The medicine that is supplied to the patient must be in an original or in a repacked form. The container in which the medicine is supplied must be labelled with:
    i) The approved name, quantity and strength of the medicine;

ii) The number of the Schedule to the Medicines Control Act (if any) in which such medicine is listed;
iii) The name of the patient and his file or treatment record number, as the case may be;
iv) The dosage of the medicine; and
v) The address of the body which supplies the medicine (SANC 1984).

Professional nurses working at clinics need to abide by this regulation when supplying, administering or prescribing medication.

2.7.4 Clinical Nursing Science, Health Assessment, Treatment and Care

Clinical Nursing Science, Health Assessment, Treatment and Care is a post basic course which is regulated by the SANC, R.48 as amended (SANC 1982). Any nurse who is registered as a general nurse may apply to an approved school to undertake this course. The course duration is one academic year of at least two hundred days, excluding days off (SANC 1982).

The curriculum includes ethical foundations, laws governing the practice of nursing, and medico-legal risks. The social, psychological, cultural and physical relationships in health and disease are emphasised. Prevention, promotion, curative and rehabilitation science principles are highlighted. Microbiology, parasitology and pharmacology as well as general disease conditions, clinical nursing in health assessment, treatment and care, health care systems and research are included in the curriculum (SANC 1982).

Students receive lectures, clinical and practical instruction throughout the course. The examination consists of a written and a practical portion. The candidate who is successful in the exams will be issued with a certificate of registration of an additional qualification in Clinical Nursing Science, Health Assessment, Treatment and Care (SANC 1982).

2.7.5 Special provisions relating to certain nurses

In Chapter Five of the Nursing Act, 2005 (Act No. 33 of 2005), there are special provisions made for certain nurses (registered nurse, staff nurse, and midwives) to assess, diagnose, prescribe treatment, keep and supply medication for prescribed illness and health related conditions (SANC 2005: 39). These nurses must provide proof of completing the prescribed qualification and training, pay the prescribed registration fee and be in the service of a national, provincial or municipal department or an organisation performing any heath service (SANC 2005: 39).

Persons registered to assess, diagnose, prescribe treatment, keep and supply medication for prescribed illness and health related conditions may acquire, use, possess or supply medicines subject to the provisions of the Medicines and Related Substances Act, 1965 (Act No. 101 of 1965). These persons may dispense medicines subject to the provisions of the Medicines and Related Substances Act of 1965 (SANC 2005: 39).

Nurses in the service of the national, provincial, municipal department or an organisation performing any heath service and who have the authority from the respective departments, may in the course of their service perform:

- The physical examination of any person;
- The diagnosing of any physical defect, illness or deficiency in any person; and
- The keeping of prescribed medicines and their supply, administering or prescribing on the prescribed conditions (SANC 2005: 39).

Professional nurses who possess this qualification make use of it to effectively assess and manage patients who visit PHC clinics. The nursing process meets the requirements for the special provisions of certain nurses, as it is based on the five cyclical phases or steps of the nursing process, assessment, nursing

diagnosis, planning, implementation and evaluation. The professional nurse assesses the patient's needs, makes a nursing diagnosis based on her assessment, and plans nursing interventions with reference to the STGs and EML. Implements nursing interventions, including prescribing schedules 1, 2, 3, 4 medicines and thereafter evaluating the care that was given.

2.8 STANDARDS

2.8.1 Nursing Practice standards

Standards of practice are guidelines used to define what a nurse should or should not do. It may be defined as 'a benchmark of achievement which is based on a desired level of excellence' (McMahon n.d). Standards of care measure the degree of excellence in nursing care and describe a competent level of nursing care. A standard is a model of established practice that is commonly accepted as correct. They are developed and carried out to determine the quality of care that is provided by nurses. Nurses are guided by standards of care in their careers. In order to practice safely standards provide guidance to knowledge, skills, judgement and attitudes that are needed in practice (McMahon n.d).

Standards of nursing practice as identified by the SANC indicate what desirable practice is for all nurses in the country as a whole. Basic, post basic and supervision on what constitutes a standard of care should be emphasized to nurses. In well run health institutions, there are policy manuals and written guidelines on expected standards and how these have to be maintained and tested. Nurses have a legal and ethical duty to observe standards to ensure the safety and well-being of the patient (Searle 2000: 228).

2.8.2 Nursing education and training standards

The SANC sets standards for nursing education, training and clinical learning programmes that meet the requirements of the Nursing Act (No.33 of 2005). As the regulator of nurses and midwives in South Africa, the mission of the SANC is to:

- Safeguard the health and wellbeing of the public.
- Maintain a register of nurses and midwives.
- Set and maintain standards of education, training and practice.
- Ensure that nurses and midwives keep their skills and knowledge up to date, and uphold the standards of their professional code.
- Ensure that nurses and midwives are safe to practice by setting legal ethical framework for their practice.
- Provide mandatory guidance and additional advice to people designing and developing education programmes (SANC 2005: 1).

2.8.3 Standards of practice for registered nurses

In countries like Nova Scotia, the professional practice of nursing is defined in the Registered Nurses Act (Nova Scotia 2006). It is also reflected in the Standards of Practice for Registered Nurses and the code of Ethics for Registered Nurses. Through this act the nursing profession has the authority to set standards for the practice and education of its members and also to protect and serve the public interest (Nova Scotia 2006). According to the Registered Nurses Act, standards for nursing practice means the minimal professional practice expectations for any registered nurse, any setting or role, approved by the Council or otherwise inherent in the nursing profession (Nova Scotia 2006). The main reason for having standards is to promote, guide, direct and regulate professional nursing practice. They set out the legal and professional basis for nursing practice. Standards describe the desirable and achievable level of performance against

which actual performance can be measured. They also act as a guide to professional knowledge, skill and judgement needed to practice nursing safely (Nova Scotia 2006). In Nova Scotia the Standards of Practice for Registered Nurses is a benchmark for assessing the professional practice of all registered nurses.

2.8.4 Guidelines and audit standards for cardiac rehabilitation

In the United Kingdom a multidisciplinary workshop was held to discuss clinical guidelines and audit standards in cardiac rehabilitation (Thompson, Bowman, Kitson, de Bono and Hopkins 1996: 89). The workshop developed a three element model of the rehabilitation process, and identified needs relating to medical and psychosocial care. It also included education, exercise, secondary prevention and vocational advice.

The rehabilitation process was divided into four phases, in-hospital, early post discharge, later post discharge and long term follow up. Inclusive in these phases were three essential elements which were inter- related and may overlap. The first element encompassed the process of explanation and understanding; the second element included specific rehabilitation interventions, including secondary prevention, exercise training and psychological support. The third element included the long term process of re-adaption and re- education (Thompson et al. 1996:89).

In general the cost effectiveness of cardiac rehabilitation had shown that medical costs were lower in patients who participated in these programmes. Conclusions drawn at the workshop was that for phase one of the rehabilitation process rested with all those who treated cardiac patients whether in a hospital or a primary care setting. Phase two and three of the rehabilitation required facilities that provided secondary care and should have a policy for cardiac rehabilitation,

which should be open for auditing. Phase four of the rehabilitation fell within the primary care setting.

To maintain standards clinical standards are available from the Research Unit of the Royal College of Physicians on medical care, psychological care, education, and exercise (Thompson et al. 1996:89).

2.8.5 Hand hygiene standards

A study was conducted by Kelcikova, Skodova and Straka (2011: 152) on the effectiveness of basic nursing education and the compliance with hand hygiene standards during practical training of nursing students. It also focused on examining the level of knowledge and attitudes towards hand hygiene among the students in the clinical field. A cross sectional research design was used; where content on hand hygiene was analysed using essential curricula documents in basic education. A questionnaire was handed out to the students assessing their knowledge on hand hygiene compliance and an observation study was done in the clinical settings Kelcikova, Skodova and Straka (2011: 153).

The results of the study showed with regards to curriculum content analysis, that all curricular documents on hand hygiene topics were marginally covered. In the survey analysis of the questionnaire it was noted that students had insufficient knowledge of hand hygiene related issues. The observational analysis of student's compliance with the hand hygiene standards in the clinical practice revealed that in some areas they were competent like having short nails and not wearing artificial nails. In other areas where there was a shortfall was students were wearing wrist watches during hand hygiene, poor hand hygiene before and after nursing procedures and incorrect hand hygiene techniques was observed (Kelcikova, Skodova and Straka 2011: 155).

This study indicated that hand hygiene relevant information was lacking in the basic nursing educational programmes which may impact negatively on nursing students and health professionals. Other factors that might have impacted negatively on hand hygiene was that working conditions like the unavailability of washbasins, paper towels, disinfectants and protective creams. The authors of the study proposed that effective hand hygiene education be in cooperated in the basic nursing school curricula, as it may impact on their hand hygiene compliance later on during clinical practice Kelcikova, Skodova and Straka (2011: 158).

2.9 CONCLUSION

Findings from the studies and related articles on PHC, STGs and EML, have indicated problem areas in the use of STGs and on prescribing and dispensing practices. The dispensing license course, SANC, regulations on keeping, supplying, administering and prescribing of medicines, and the course on Clinical Nursing Science, Health Assessment, Treatment and Care were highlighted. The following chapter will describe the research methodology that will be used to explore the use of STGs and the EML at PHC clinics in UMgungundlovu District in South Africa.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter presents the research methodology; ethical considerations adhered to during this study, and the theoretical framework that was used to guide the study. The researcher collected data from five Local Municipalities in the UMgungundlovu District. The Districts were Impendle, Mkhambathini, Richmond, Msunduzi and uMngeni Local Municipalities. Data collection commenced in the month of February 2013. A total of 48 clinics were visited and random samples of 120 professional nurses were chosen to participate in the study.

3.2 RESEARCH DESIGN

Research design is the overall plan of the study that describes the strategies and approach used in obtaining data about the phenomenon of interest. In addition, it also provides the structure that the research follows in terms of data collection and analysis (Tredoux and Smith 2008: 161). In this study, a quantitative descriptive research design was used, whereby a survey was carried out amongst the professional nurses at the PHC clinics. The use of the STGs and the EML by professional nurses was explored by means of a self-administered questionnaire. A retrospective review of facility registers was also carried out by the researcher to see whether the professional nurses were prescribing medication rationally. Retrospective studies begin with an effect and works backwards to establish what influenced this effect in the past (Brink, van der Walt and van Rensburg 2012: 115).

3.3 THEORETICAL FRAMEWORK

This study is based on Ida Jean Orlando's Nursing Process theory. The purpose of the nursing process is to diagnose and treat human responses to actual or potential health problems. Clients are helped to meet agreed upon outcomes to improve their health. A systematic approach is used where client data is gathered and critically examined, priorities are established, and appropriate action is carried out and thereafter evaluated (Potter and Perry 2005: 268). The professional nurses working at the PHC clinics use the steps in the nursing process (Figure 3.1) during their interaction with patients.

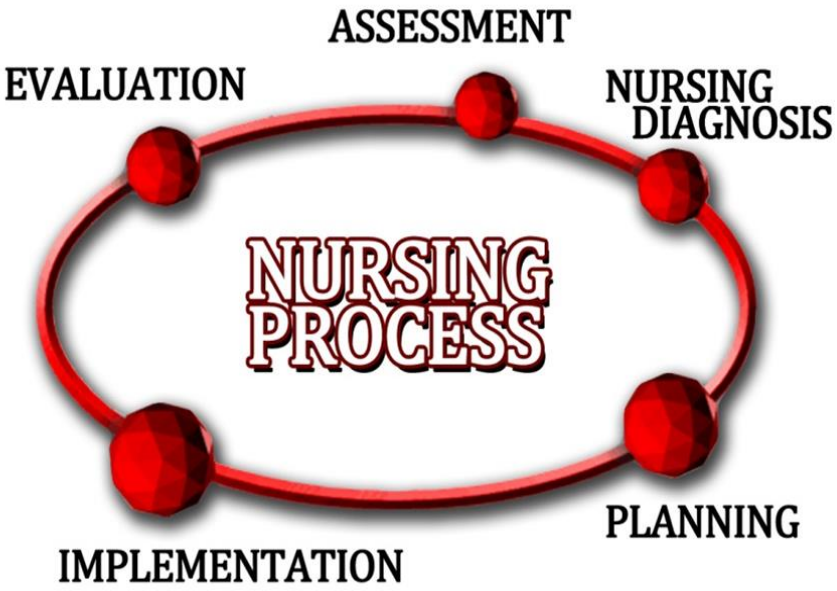

Figure 3.1: The Nursing Process

The assessment phase is the first phase where there is interaction between the nurse and the patient. The patient's current and past health status is determined by deliberate and systematic data collection. The nurse collects analyses and interprets data by observation, diagnostic procedures, physical examination, interviewing skills, and referral to 'description' as annotated in the STGs and EML

which describe various disease conditions and their clinical features. The patients' needs are thus identified and a nursing diagnosis is formulated.
The nursing diagnosis focuses on patients' needs or responses to health care alterations. It is based on clusters of clinical criteria and patterns of data often containing defining characteristics (Potter and Perry 2005: 304). The goal of a nursing diagnosis is to direct patients in adapting to their illness and resolving their health care problems.

The planning phase flows from the nursing diagnosis. Planning is a category of nursing action whereby patient centred goals and expected outcomes are established. Nursing interventions based on deliberate problem solving and decision making skills are selected by the nurse together with the patient to resolve the patient's problems. Planning is based on priorities and decisions that are individualised and patient centred. Patient centred goals are specific and measurable, reflecting a patient's highest possible level of functioning (Potter and Perry 2005: 320). Planning of treatment and care, 'drug' and 'non-drug', is done in conjunction with the STGs and EML.

Implementation is the fourth phase, following the planning phase, and is where plans are put into action. The nurse together with the patient selects and initiates interventions to improve the patients' health status. A nursing intervention is any treatment, based on clinical judgement and knowledge that a nurse performs to improve patient well-being (Potter and Perry 2005: 340). Implementation is a continuous process that interacts with all the steps of the nursing process, as reassessment may be necessary if the patient's condition worsens or responds to the planned treatment. The nurse must be an expert in her/his field in order for the implementation process to be effective, carrying out direct and indirect care interventions (Potter and Perry 2005: 341). The registered nurse at the PHC clinic implements the planned care for her/his client, and offers the client a time period for recovery.

The evaluation phase is the last phase. The nurse conducts evaluation measures to see whether the expected outcomes are met. The expected outcomes are the standards against which the nurse measures against to see whether care was effective. To best meet the patients' needs the nurse may need to redirect nursing care. Positive evaluations occur when desired results are met leading the nurse to conclude that the interventions are effective. Negative evaluations occur when the expected outcome is not met necessitating revision of care plans. Evaluating and revising strategies of care continue until the patient's problems as defined by the nursing diagnosis are suitably resolved. Evaluation is on-going whenever the nurse is in contact with the patient (Potter and Perry 2005: 356). The registered nurse at the PHC clinic may evaluate care on the return visit of the client. If the problem is not resolved, she/he may repeat the nursing process, or if necessary may refer the client to the next level of care.

During all phases recording is important, in which the nurse documents all the care and treatment that was given. The nursing process is cyclic, each step of which is part of an on-going process, involving reassessment of each step or phase if necessary (Watson 1979: 7).

The PHC practitioner uses the whole nursing process during her/his encounter with clients on a daily basis. However due to the limited objectives of this study, and that it is based on the retrospective review of records, data was only gathered relating to the assessment (nursing diagnosis) planning and implementation phases of the nursing process.

3.4 STUDY SETTING

The study took place at PHC clinics in the UMgungundlovu District in KwaZulu-Natal (KZN), South Africa. There are 11 Health Districts in the KZN province, and there are 646 clinics in this province (KZN Department of Health, 2009). KZN has a total population of 10.6 million. Pietermaritzburg is the capital city and

falls under the UMgungundlovu district. There are three CHCs, three Gateway clinics, fourteen Mobile clinics, and nine hospitals, all of which function at different levels and specialise in different areas of health. There are 71 PHC clinics, and this is the patient's first entry into the health system. All of these health facilities cater for the health needs of the people in the UMgungundlovu District.

3.5 DEVELOPMENT OF THE INSTRUMENT

The researcher read through the Department of Health's book on PHC STGs and the EML and drew up the questionnaire on important aspects from the book, like calculation of dosage of medication, patient education on chronic disease, use of flow diagrams, disease notification procedures and on guidelines for adverse drug reaction reporting. The researcher together from recommendations and advice from the statistician drew up the likert scale to best answer the research question. The record review was drawn up after looking at the requirements as indicated in the PHC nurses registers and from advice and recommendations from experts in the PHC field.

3.6 SAMPLING PROCESS

The total number of professional nurses working at the clinics in the UMgungundlovu District is 445. A total of 120 nurses were sampled, which was calculated as the minimum sample required (94 plus 20% to allow for non-response). Cochran's sample size formula for continuous data: Alpha=0.05; margin of error = 0.03; based on continuous 5-point scale response, was used. In order to have a representative sample from all types of clinics, the sample was a proportional random sample from the different types of clinics as follows, 103 professional nurses from PHC clinics, five from Mobile clinics, six from CHC and six from Gateway clinics.

The researcher obtained a list of names of all the professional nurses working at these clinics from the PHC manager of the UMgungundlovu District. The nurses' names were not used in this study, but they were given codes. The researcher established a sampling frame where all the different types of clinics were listed, and the code names of all the professional nurses working at these clinics were written down. The code names of the professional nurses were numbered consecutively. A table of random numbers was then used to draw the recommended sample size from each clinic with an overall total of 120 professional nurses. The researcher then blindly placed a finger at a starting point on the table of random numbers; the registered nurse corresponding to that number was then selected to participate in the study. The researcher then circled that number and continued to move fingers on the random table, until the desired sample was chosen for that clinic. The nurses were requested not to write their names on the questionnaires but to use the codes they were given, thus ensuring their anonymity. They were also requested not to write the name of the clinic that they were working at, just the type of clinic.

The required sample size for the review of registers, population: 71 clinics with 800-1000 records per month at each clinic = 56800-71000 records in total. Using an alpha level of 0.05 and an acceptable margin of error of 0.05, the total number of records needed was 382. This number was divided amongst the 120 nurses, five entries per nurse was sampled. Each registered nurse keeps their own register, where they record patient details, diagnosis and the treatment that was prescribed. To ensure representativeness, the researcher sampled five entries per nurse, per register, using systematic random sampling, where every tenth entry in each register for that particular month was reviewed. The sample size was chosen in consultation with a professional statistician (Appendix 6).

Inclusion criteria:

- All consenting fulltime professional nurses employed at provincial clinics in the UMgungundlovu District.

Exclusion criteria:

- Professional nurses in private PHC clinics.

3.7 DATA COLLECTION PROCESS

The researcher carried out a survey, according to Polit & Beck (2012: 264) a survey is designed to obtain information about the prevalence, distribution and interrelations of phenomena within a population. The researcher obtained the assistance of the transport driver at the researcher's workplace who knew the whereabouts of the various clinics in the UMgungundlovu District very well. The researcher together with the driver, travelled to the various clinics collecting the data.

Data collection commenced on the 4th February 2013, and it occurred in two phases. During phase 1, the researcher visited the clinics. After explaining the purpose of the study and obtaining informed consent from the participants (Appendix 3), a self-administered questionnaire was handed to the participants (Appendix 4). The researcher was in close proximity, so that any queries from the participants regarding the questionnaire could be answered. The completed questionnaires were collected immediately after completion from each of the professional nurses in the sample.

During Phase 2, a retrospective review of facility registers on the rational use of drugs was carried out. A tool for the record review was used (Appendix 5). The record review was carried out simultaneously with the administration of the questionnaire. The participants were informed from the outset that all information taken from the registers was being handled with utmost confidentiality because

codes were being used instead of names. The researcher reassured the participants that no one would have access to this information except the researcher and that it would be stored in a locked cupboard. The participants were informed that they could withdraw from the study at any time if they wished to do so. There were no conflicting issues during the collection of the data. The researcher adhered to the principle of beneficence, ensuring that no harm came to the participants.

To ensure representativeness, the researcher sampled five entries per nurse, per register, using systematic random sampling, where every tenth entry in each register for that particular month was reviewed. The researcher documented the age, gender, diagnosis, and the names of the medication prescribed, schedule, dose, route, and frequency and quantity of drugs issued on the audit tool. A total of 565 entries were reviewed. The researcher matched the record reviews with the answered questionnaires and stapled them together so that during analysis of data the information would be linked. The data gave the researcher an indication about the participants' understanding of the EDL and STGs, and whether treatment was prescribed appropriately or not. The efficacy and appropriateness of initiated treatment was then determined by reviewing the treatment prescribed, against the STGs and the EML. The patient carrier card was not accessed. Only details regarding age, gender, diagnosis, medication prescribed, as annotated in the register by the registered nurse was used.

3.8 PILOT STUDY

A pilot study was conducted in a facility which included professional nurses who were not part of the sample, and with experts in the area of PHC, and lecturers who had qualifications in clinical nursing science, health assessment, treatment and care. Minor changes were made to the questionnaire after the pilot study.

3.9 DATA ANALYSIS

Data was analysed using descriptive statistics, using frequency and cross tabulation tables and various types of graphs. Inferential statistical methods like Chi-square tests for categorical data and t-tests/ANOVA for continuous data was used. Pearson's correlation coefficient, Fishers Exact test, non-parametric tests and parametric tests was also used. The data was reduced and analysed with the help of a statistician, using the statistical software SPSS version 20.0.

3.10 VALIDITY

According to Polit and Beck (2012: 336), validity is the degree to which an instrument measures what it is supposed to measure. Pre-testing the instrument during the pilot study contributed to the validity of the instrument.

3.9.1 CONTENT VALIDITY

According to Polit and Beck (2012: 336), content validity concerns the degree to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain. The researcher designed a new instrument conceptualizing the construct domain by examining the Department of Health STGs and EML and consulting experts in the field of study. Questions were based from areas in the STGs and EML.

3.9.2 FACE VALIDITY

Face validity refers to whether the instrument looks like it is measuring what it supposed to measure, the target construct, Polit and Beck (2012: 336). The researcher ensured that the questionnaire that was used had all the relevant questions pertaining to the effective use of the STGs and EML by the professional nurses. Pre-testing the instrument during the pilot study contributed to the validity of the instrument

3.9.3 CONSTRUCT VALIDITY

Construct validity is an important factor for assessing the quality of a study Polit and Beck (2012: 339). The researcher fostered construct validity by ensuring that the population and sample was targeting the professional nurses working at the PHC clinics in the UMgungundlovu District. The everyday use of the STGs and the EML by the professional nurses was used as an exemplar to explore the effectiveness of its use.

3.9.4 RELIABILITY

Reliability is the consistency with which an instrument measures the target attribute (Polit and Beck 2012: 331). The researcher tested and adapted the questionnaire with reference to the literature and in consultation with experts in the field, ensuring reliability.

3.11 ETHICAL CONSIDERATIONS

The Durban University of Technology Ethics Committee cleared the research proposal (Appendix 7). The Health Research and Knowledge Management Committee of the KZN Department of Health (Appendix 1), and the District Manager of the UMgungundlovu District (Appendix 2), granted permission to conduct the study. A request was also forwarded to the PHC Manager seeking permission, names of professional nurses and clinics to be visited.

Explanation was given to all participants and the letter of information was handed to them to peruse, thereafter informed consent was obtained (Appendix 3). The operational managers were reassured that that there would be no interruption of work processes, as the researcher saw one participant at a time, and the questionnaire was not lengthy. Participants were informed that participation was voluntary, and that they could withdraw at any stage without any penalty. They were further informed that confidentiality and anonymity would be adhered to at

all times, as no names were written on any research documents. Responses to questionnaires and register entries were also kept confidential. The professional nurses were also informed that names of clinics would not be written on any research documents, only the type of clinic. Participants were informed that the completed study would be available to the Department of Health KZN.

3.12 CONCLUSION

This chapter deliberated on the research methodology, ethical considerations and the theoretical framework that was used in the study. The following chapter will present the results of the study.

CHAPTER 4

PRESENTATION OF RESULTS

4.1 INTRODUCTION

The previous chapter outlined the methodology adopted in conducting the study. This chapter presents the results of the study. As stated in Chapter 1, the objectives of the study were to:

- Explore the use of STGs and the EML by professional nurses working at PHC clinics.
- Review the rational use of medicines at the clinics by auditing clinic registers kept by the professional nurses.

4.2 PRESENTATION OF THE RESULTS

The following statistical tests were used to analyse data:

- Chi-square goodness of fit test which tests whether the response options are selected equally, as expected under the null hypothesis. A significant result indicates that responses are NOT selected equally and we can conclude that one or more options are selected significantly more or less often than expected.
- Wilcoxon Signed Ranks test tests whether the mean or median of a sample is significantly different from a neutral score of 3. This is a non-parametric equivalent to a one-sample t-test.
- The Chi-square test of independence is applied to contingency tables when both variables are categorical. This tests whether a significant relationship exists between the two variables represented in the cross tabulation. Where the conditions of the chi-square are violated, Fisher's Exact test is used instead.
- Kruskal-Wallis, the non-parametric equivalent to ANOVA, tests whether significant differences exist for an ordinal test variable for different

categories of another variable, for example, type of clinic. When a significant result was found, Mann-Whitney U test was applied to pairs of categories to test for the specific location of these significant differences.

4.3 DEMOGRAPHICS

4.3.1 Types of clinics

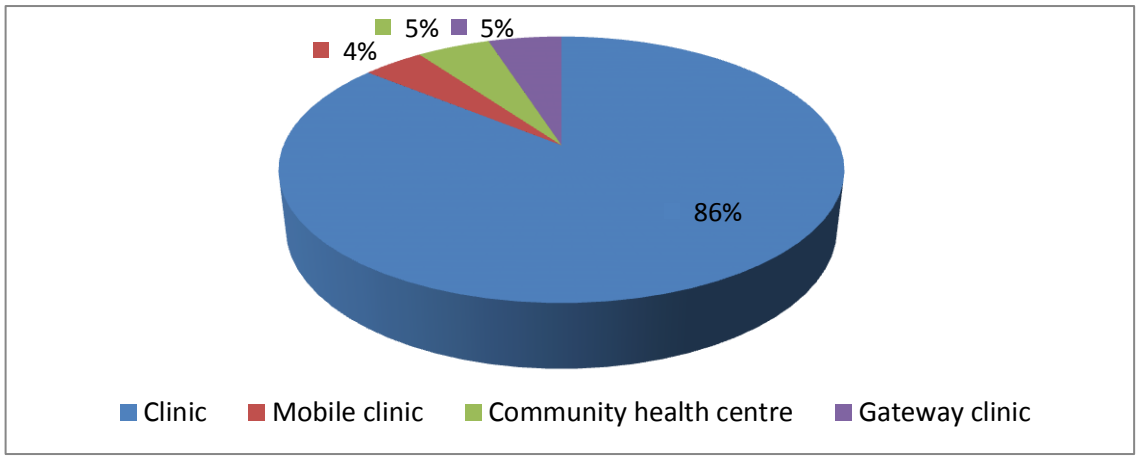

Figure 4.1: Types of clinics

Four types of health centres were sampled, namely PHC clinics, Mobile clinics, CHCs and Gateway clinics. The largest sample was taken from the PHC clinics totalling 86% (n=103), followed by 5% (n=6) from Gateway clinics, 5% (n=6) from CHCs and 4% (n=5) from Mobile clinics (See Figure 4.1).

4.3.2 Race, age and gender

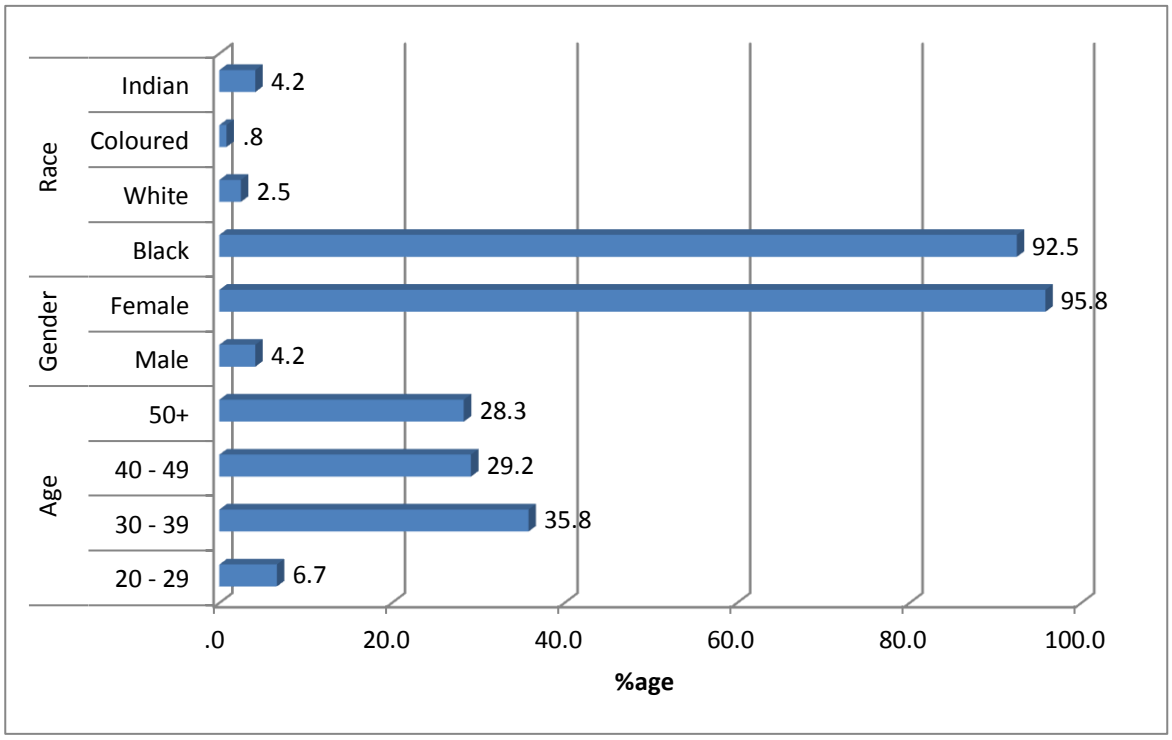

Figure 4.2: Race, age and gender

The sample consisted of participants of various races namely Whites 2.5% (n=3), Blacks 92.5% (n=111), Indians 4.2% (n=5) and Coloureds 0.8% (n=1) (see Figure 4.2). The age of participants ranged from 20 to 55 years. The age groups of the participants were as follows, 6.7% (n=8) were in the 20-29 years age group, 35.8% (n=43) were in the 30-39 years age group, 29.2% (n=35) were in the 40-49 years age group and 28.3% (n=34) were in the 50+years age group. Both males and females were part of the study sample, which consisted of 95.8% (n=115) females and 4.2% (n=5) males (see Figure 4.2).

4.3.3 Qualifications

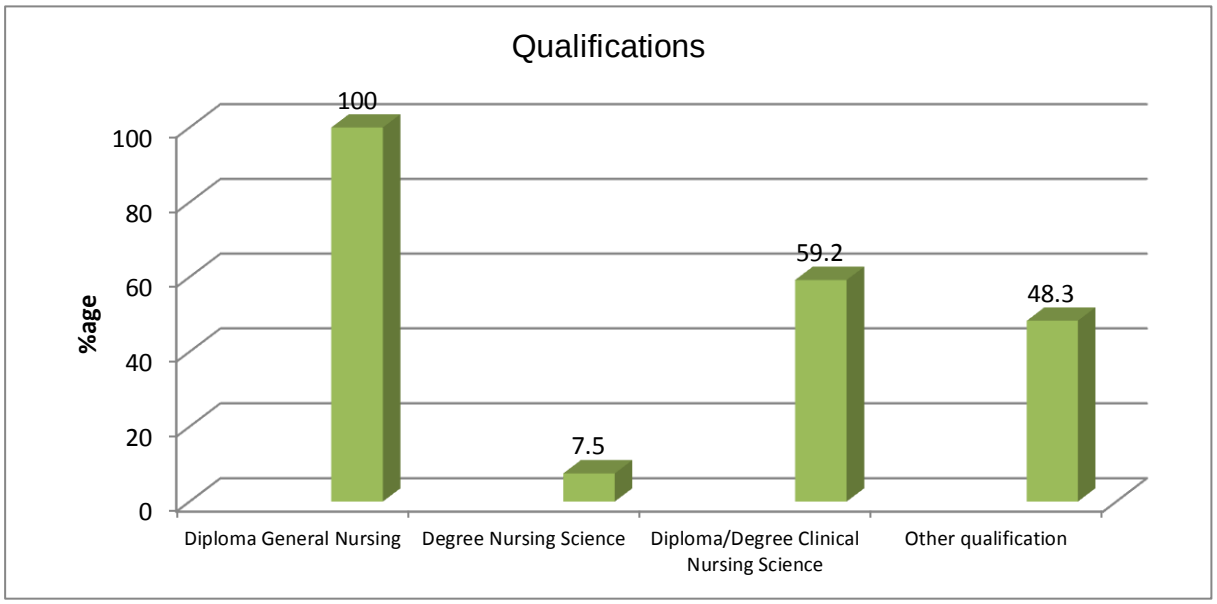

Figure 4.3: Qualifications

The qualifications of the participants in the study were as follows: 100% (n=120) had a diploma in General Nursing; 59.2% (n=71) had a diploma in Clinical Nursing Science, Health Assessment, Treatment and Care, other qualifications stood at 48.3% (n=58) and 7.5% (n=9) of the participants had a degree in Nursing Science (see Figure 4.3).

4.3.4 Experience

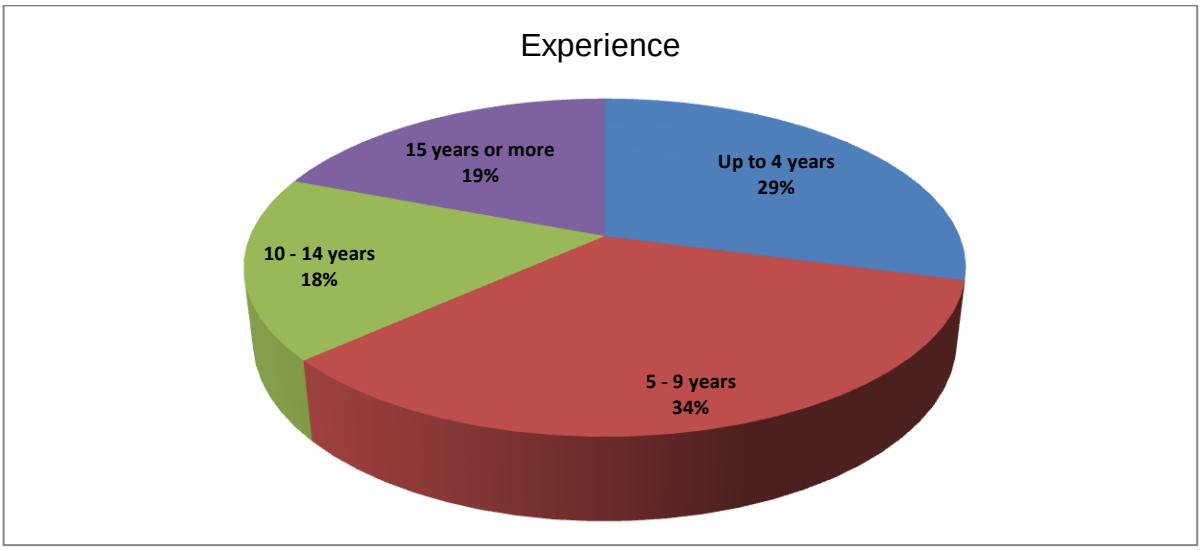

Figure 4.4: Experience

Figure 4.4 shows that 19% (n=23) of the sample had 15 years and more experience in the PHC setting, followed by 18% (n=21) having 10-14 years of experience, 34% (n=41) having 5-9 years of experience and 29% (n=35) up to 4 years.

4.4 STGS AND THE EML

Table 4.1: Availability of guidelines

		Frequency	Percent
Valid	Yes	120	100%

Table 4.1 shows that all the respondents (n=120) stated that copies of the STGs and EML guidelines were available at the PHC clinics.

(Refer appendix 8 - A)

Table 4.2: Latest and updated copies of guidelines

		Frequency	Percent
Valid	Yes	118	98.3%
	No	2	1.7%
	Total	120	100%

Table 4.2 shows that 98.3% (n=118) of respondents indicated that the guidelines were the latest updated copies (2008), whilst 1.7% (n=2) indicated that the guidelines were not the latest and updated copy. Analysis (chi-square goodness-of-fit) shows that significantly more than expected individuals (98.3%) responded that they do have access to latest and updated copies of the guideline **(χ^2 (N = 120, 1) = 112.133, p < .000).**

(Refer appendix 8 - A)

Table 4.3: Notification about amendments to guidelines

		Frequency	Percent
Valid	Yes	74	61.7%
	No	45	37.5%
	Total	119	99.2%
Missing	System	1	0.8%
Total		120	100%

Table 4.3 shows that of the 120 respondents, 61.7% (n=74) answered 'Yes' that they were notified about amendments to the guidelines, whilst 37.5% (n=45) answered 'No' that they were not notified and 0.8% (n=1) did not answer the question. Nearly 61.7%of respondents agreed that they received notice about amendments to the guidelines timeously. Analysis (chi-square goodness-of-fit) shows that this is a significant result **(χ^2 (N = 119, 1) = 7.067, p = 0.008).**

(Refer appendix 8 - A)

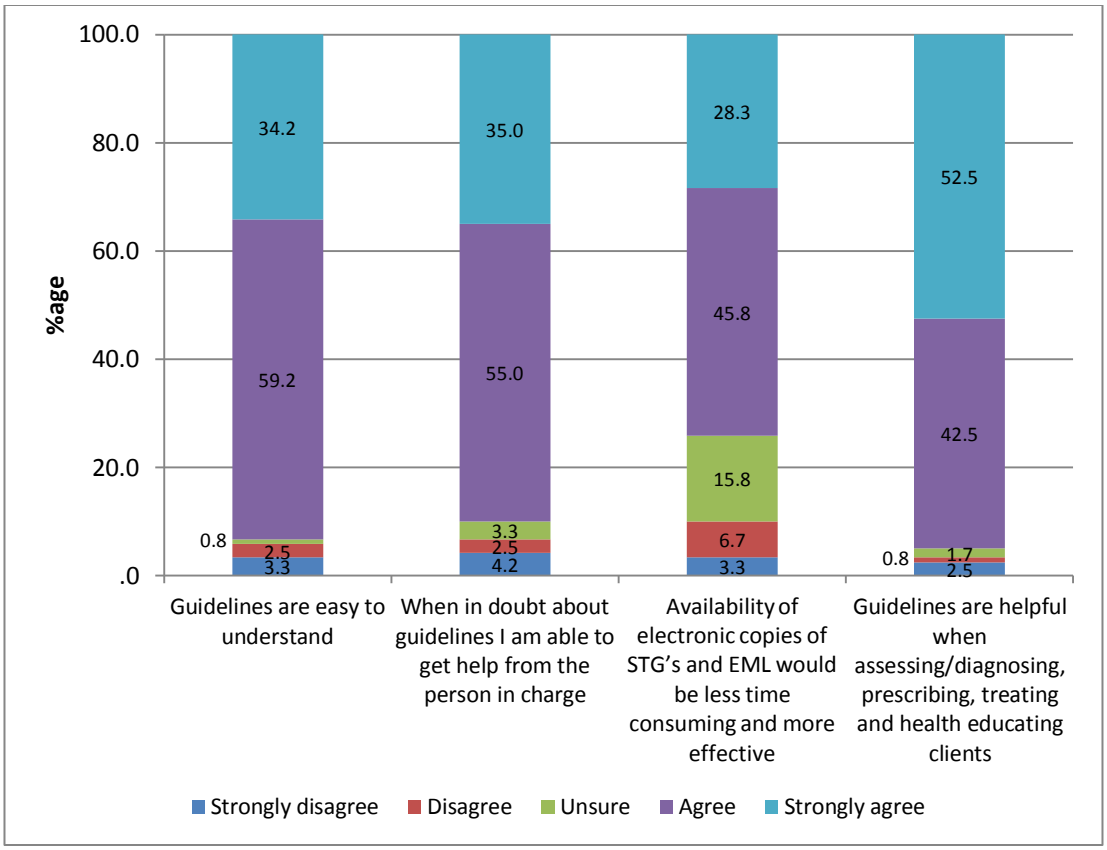

Figure 4.5: The STGs and EML

Figure 4.5 shows that 59.2% (n=71) of the respondents agreed that the guidelines were easy to understand, whilst 34.2% (n=41) strongly agreed, 0.8% (n=1) were unsure, 2.5% (n=3) disagreed and 3.3% (n=4) strongly disagreed that the guidelines were easy to understand. Analysis from the Wilcoxon Signed Ranks Test shows that there is significant agreement to this question **(Z (N = 120) = -8.453, p < .0005).**

The results further show that 55% (n=66) of the nurses agreed that when they were in doubt about the guidelines they could obtain assistance from the person in charge, whilst 35% (n=42) strongly agreed, 3.3% (n=4) were unsure, 2.5% (n=3) disagreed and 4.2% (n=5) strongly disagreed. Analysis from the Wilcoxon Signed Ranks Test reveals that there is significant agreement to this question **(Z (N = 120) = -8.057, p < .0005)**.

The results of the study further indicated that 45.8% (n=55) of the nurses agreed that it would be less time consuming and more effective if electronic copies of the STGs and EML was available, whilst 28.3% (n=34) strongly agreed, 15.8% (n=19) were unsure, 6.7% (n=8) disagreed and 3.3% (n=4) strongly disagreed. Analysis from the Wilcoxon Signed Ranks Test shows that there was significant agreement **(Z (N = 120) = -7.000, p < .0005)**, about the potential advantage of electronic copies of the STG's and EML.

The results of the study show that 52.5% (n=63) of the nurses strongly agreed and 42.5% (n=51) agreed, 1.7% (n=2) were unsure, 0.8% (n=1) disagreed and 2.5% (n=3) strongly disagreed that the guidelines were helpful when assessing, diagnosing, prescribing, treating and health educating clients. Analysis from the Wilcoxon Signed Ranks Test revealed that there was significant agreement **(Z (N = 120) = -8.960, p < .0005),** that the guidelines are helpful when assessing, diagnosing, prescribing, treating and health educating clients.

(Refer appendix 8 - A)

4.5 TRAINING

There was no significant difference in the frequency with which the 'Yes' (n=68) and 'No' (n=52) responses were selected amongst the participants on the reception of in-service training on the use of STGs and the EML at the PHC clinic they were working at.

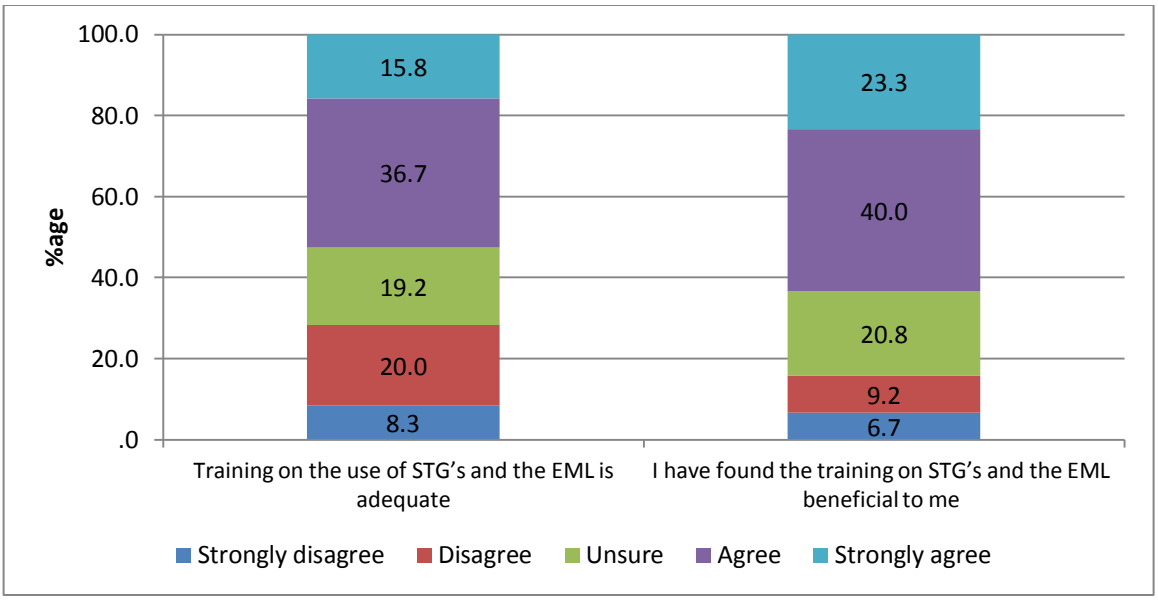

Figure 4.6: Training

Figure 4.6 shows where the Wilcoxon Signed Ranks test was applied to analyse the response to whether training on the use of STGs and the EML was adequate. The results reflect that 36.7% (n=44) of the participants agreed that the training was adequate, 15.8% (n=19) strongly agreed, 19.2% (n=23) were unsure, 20% (n=24) disagreed and 8.3% (n=10) strongly disagreed. The Wilcoxon Signed Ranks Test concluded that there was significant agreement **(Z (N= 120) = -2.712, p <. 0005)**, on the adequacy of training on the use of the STG's and the EML.

(Refer appendix 8 - B)

Analysis from the Wilcoxon Signed Ranks test showed that 40% (n=48) of the participants agreed, 23.3% (n=28) strongly agreed, 20.8% (n=25) were unsure, 9.2% (n=11) disagreed and 6.7% (8) strongly disagreed that the training on the STGs and the EML was beneficial to them. There was significant agreement, **(Z (N= 120) = -5.126 p <. 0005).**

(Refer appendix 8 - B)

4.6 DOSE CALCULATION OF MEDICINES

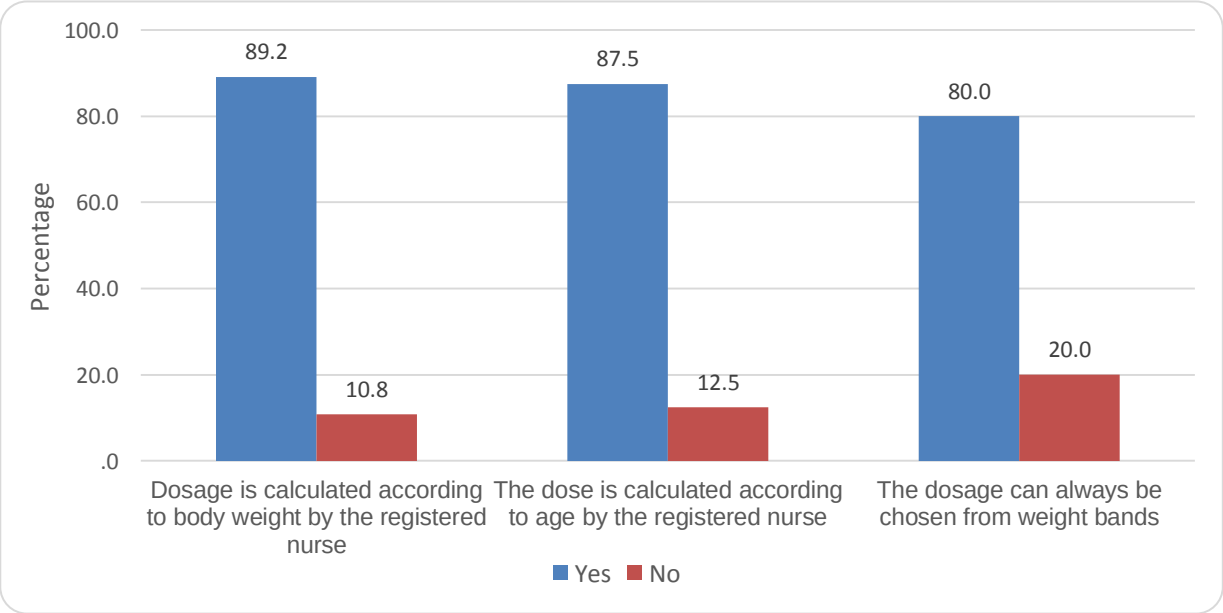

Figure 4.7: Dose calculation of medicines

Chi-square goodness-of-fit test was applied to see whether the professional nurses used body weight to calculate dosage of medicines, and it found that significantly more respondents 89.2% (n=107) answered 'Yes' to this question than 'No' 10.8% (n=13), **(χ^2 (N = 120, 1) = 73.633, p < .0005).**

Age together with weight is an indication for correct calculation of doses of drugs. The majority (87,5percent) of the respondents indicated that dose is calculated according to age by the registered nurse. This is a significant result **(χ^2 (N = 120, 1) = 67.500, p <.0005),** and 12.5% (n=15) answered negatively.

The Chi-square goodness-of-fit test was conducted on whether dosage can always be chosen from weight bands and the results concluded that the majority of individuals, 80% (n=96) answered 'Yes' to this question this was significant **(χ^2 (N = 119, 1) = 43.200, p < .0005),** and 20% (n=24) answered 'No'.

Table 4.4: Calculation of doses for medicines is easily understood

		Frequency	Percent
Valid	Strongly disagree	7	5.8%
	Disagree	5	4.2%
	Unsure	7	5.8%
	Agree	75	62.5%
	Strongly agree	26	21.7%
	Total	120	100.0%

Table 4.4 shows the results from the Wilcoxon Signed Ranks test which reveal that 62.5% (n=75) of the sample agreed that they understood the calculation of medicines, which is significant **(Z (N = 120) = -7.039, p <.0005),** whilst 21.7% (n=26) strongly agreed, 5.8% (n=7) were unsure, 4.2% (n=5) disagreed and 5.8% (n=7) strongly disagreed.

(Refer appendix 8 - C)

4.7 PRESCRIPTION WRITING

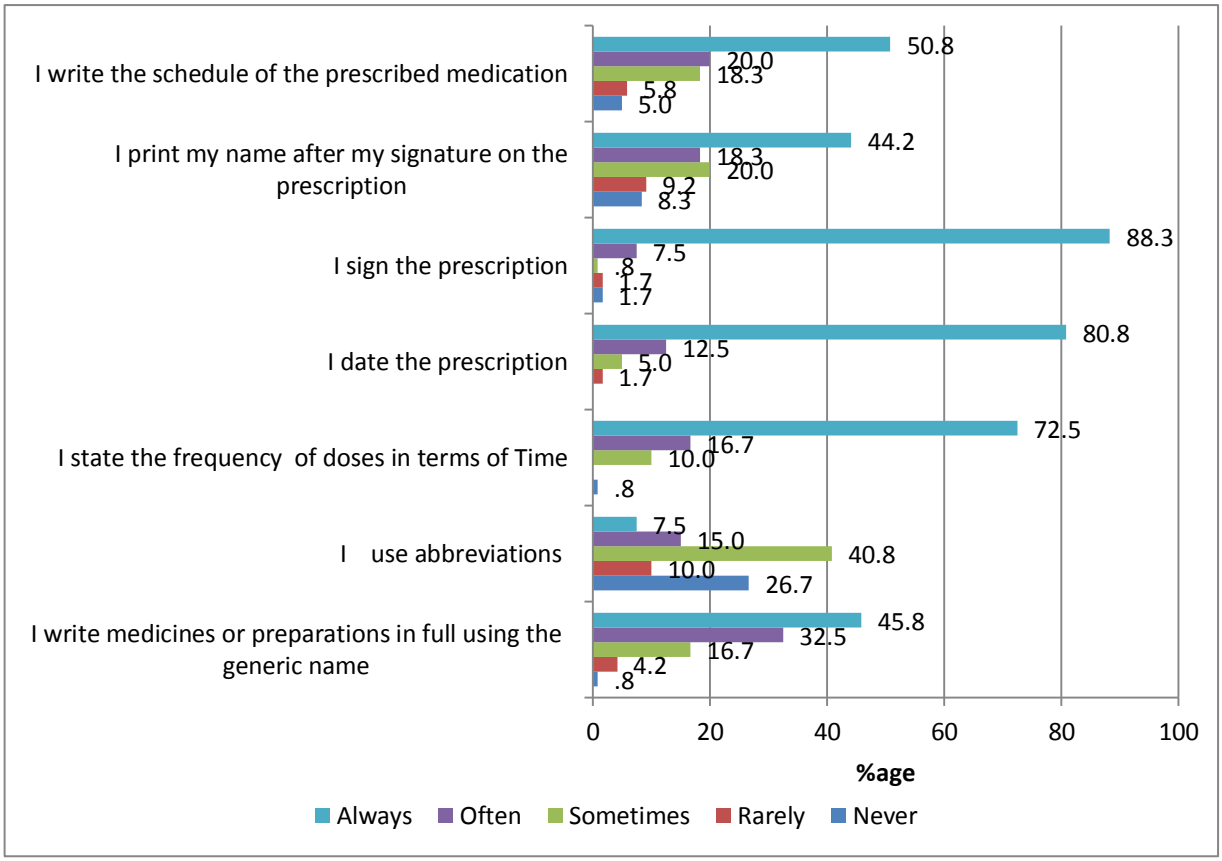

Figure 4.8: Prescription writing

Figure 4.8 shows the results of Chi-square goodness-of-fit tests related to prescription writing.

Writing the schedule of the prescribed medication, the results show that 50.8% (n=61) of the respondents answered 'Always', this response was selected significantly more often than the other responses **(χ^2 (N = 120, 4) = 82.750, p < .0005)**, whilst 20% (n=24) of the respondents answered 'Often'; 18.3% (n=22) answered 'Sometimes' and 5.8% (n=7) answered 'Rarely' and 5.0% (n=6) answered 'Never'.

The sample showed that 45,8percent replied that they “always” write medicines or preparations in full using the generic name A Chi-square goodness of fit test shows that the choice of the response “always” is significant **(χ^2 (N = 120, 4) = 87.167, p < .0005)**, whilst 32.5percent responded that they “often” do this, 16.7% (n=20) choosing ‘Sometimes’, 4.2% (n=5) choosing ‘Rarely’, and 0.8% (n=1) choosing ‘Never’.

In regard to printing their names after their signature on prescriptions, the results show that 44.2% (n=53) answered ‘Always’, 18.3% (n=22) answered ‘Often’; 20% (n=24) answered ‘Sometimes’; 9.2% (n=11) answered ‘Rarely’ and 8.3% (n=10) answered ‘Never’. A Chi-square goodness of fit test was conducted on the responses to this statement, and it concluded that the choice of the response ‘always’ was significant **(χ^2 (N = 120, 4) = 50.417, p < .0005).**

Signing of prescriptions, the results showed that 88.3% (n=106) of respondents answered ‘Always’ the Chi-square goodness of fit test concluded that it was a significant choice **(χ^2 (N = 120, 4) = 351.917, p < .0005)**, 7.5% (n=9) answered ‘Often’, 0.8% (n=1) answered ‘Sometimes’, 1.7% (n=2) answered ‘Rarely’ and 1.7% (n=2) answered ‘Never’.

In regard to dating of prescriptions, the results show that 80.8% (n=97) of the respondents answered ‘Always’, which the Chi-square goodness of fit test showed was significant **(χ^2 (N = 120, 4) = 283.083, p < .0005),** 12.5% (n=15) answered ‘Often’, 5% (n=6) answered ‘Sometimes’, and 1.7% (n=2) answered ‘Rarely’.

Stating the frequency of dose in terms of time, the results show that 72.5% (n=87) of the respondents answered ‘Always’, the Chi-square goodness of fit test concluded that this is a significant choice **(χ^2 (N = 120, 4) = 218.083, p < .0005)**,

16.7% (n=20) answered ‘Often’; 10% (n=12) answered ‘Sometimes’ and 0.8% (n=1) answered ‘Never’.

In regard to usage of abbreviations whilst writing prescriptions, the results show that 40.8% (n=49) of the respondents answered ‘Sometimes’, the Chi-square goodness of fit test concluded that this was significant (**χ^2 (N = 120, 4) = 45.583, p < .0005),** 26.7% (n=32) answered ‘Never’, 15% (n=18) answered ‘Often’, 10% (n=12) answered ‘Rarely’ and 7.5% (n=9) answered ‘Always’.

Table 4.5: Confidence in prescription writing

		Frequency	Percent
Valid	Strongly disagree	2	1.7%
	Disagree	3	2.5%
	Unsure	4	3.3%
	Agree	70	58.3%
	Strongly agree	41	34.2%
	Total	120	100.0%

As can be seen from Table 4.5, the Wilcoxon Signed Ranks test concluded that there was significant agreement **(Z (N = 120) = -8.852, p < .0005)** to this statement that the respondents were confident about prescription writing, where 58.3% (n=70) answered ‘Agree’, 34.2% (n=41) answered ‘Strongly agree’, 3.3% (n=4) answered ‘Unsure’, 2.5% (n=3) answered ‘Disagree’ and 1.7% (n=2) answered ‘Strongly disagree’.

(Refer appendix 8 - D)

4.8 CHRONIC ILLNESS

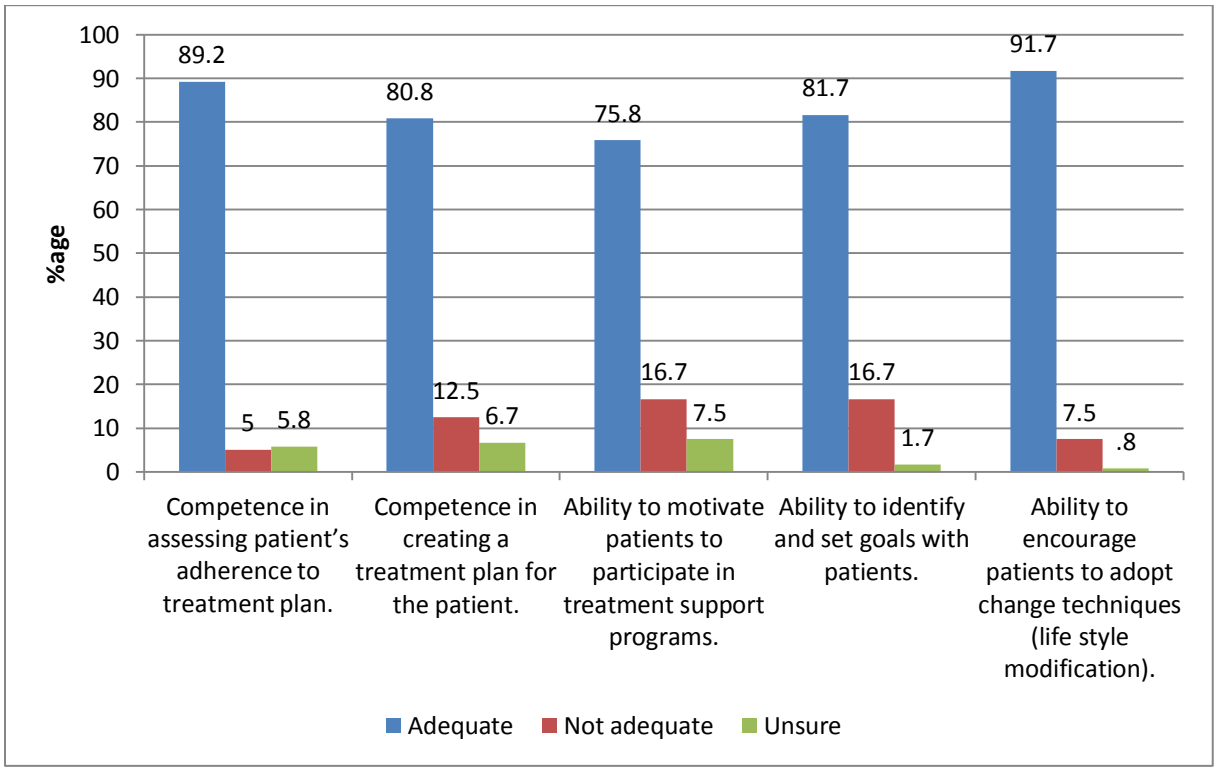

Figure 4.9: Chronic illness

Figure 4.8 shows the results of Chi-square goodness-of-fit tests regarding treatment and management of chronic illness.

In regard to whether the participants were competent in assessing patients adherence to treatment plans**,** the results showed that a significant number of respondents 89.2% (n=107) **(χ^2 (N = 120, 2) = 168.350, p < .0005)** answered 'Adequate' to this question, 5% (n=6) answered 'Not adequate' and 5.8% (n=7) answered 'Unsure'.

In regard to competency in creating a treatment plan for the patient, the study results showed that 80.8% (n=97) **(χ^2 (N = 120, 2) = 122.450, p < .0005)** of respondents answered 'Adequate', 12.5% (n=15) answered 'Not adequate', and 6.7% (n=8) answered 'Unsure'.

The ability to motivate patients to participate in treatment support programmes, the results show that significantly more than expected respondents 75.8% (n=91) **(χ^2 (N = 120, 2) = 99.050, p < .0005)** answered 'Adequate', whilst 16.7% (n=20) answered 'Not adequate, and 7.5% (n=9) answered 'Unsure'.

In regard to respondents' ability to identify and set goals for patients the results show that 81.7% (n=98) **(χ^2 (N = 120, 2) = 130.200, p < .0005** respondents answered 'Adequate', 16.7% (n=20) answered 'Not adequate' and 1.7% (n=2) answered 'Unsure'.

The ability to encourage patients to adopt to change techniques (lifestyle modification), 91.7% (n=110) **(χ^2 (N = 120, 2) = 184.550, p < .0005)** of respondents in the study answered 'Adequate', 7.5% (n=9) answered 'Not adequate' and 0.8% (n=1) answered 'Unsure'.

(Refer appendix 8 - E)

4.9 DISEASE NOTIFICATION PROCEDURES

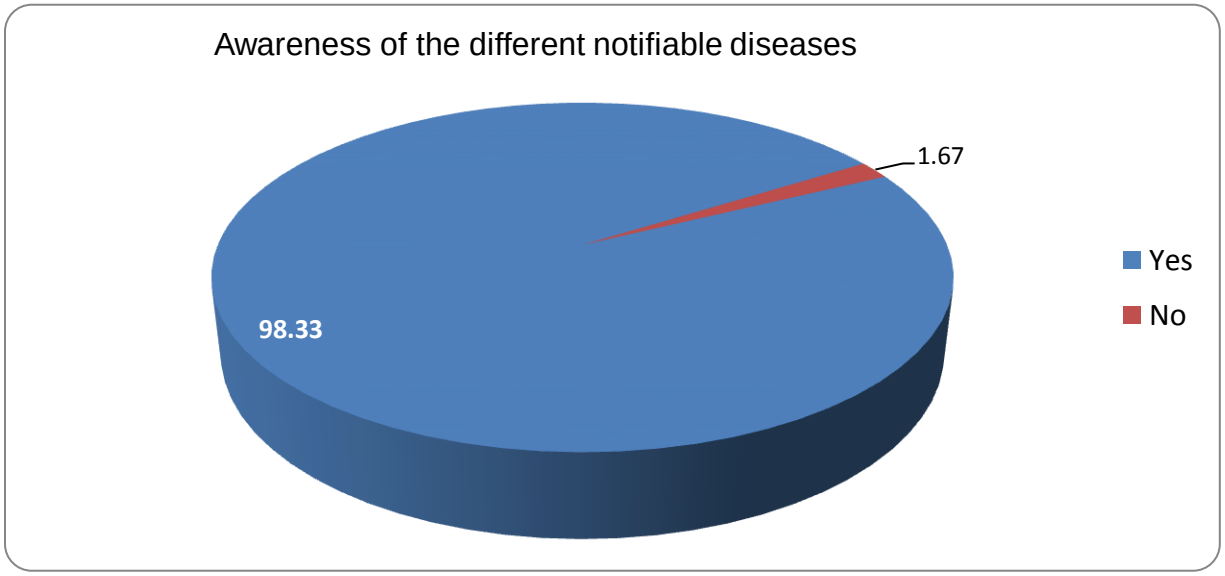

Figure 4.10: Disease notification

As can be seen from Figure 4.10, results of the Chi-square goodness-of-fit test regarding disease notification procedures were significant **(χ^2 (N = 120, 1) = 112.133, p < .0005)**, with 98.3% (n=118) of respondents answering 'Yes' to being aware of the different notifiable diseases, and only 1.67% (n=2) of respondents answering 'No'.

Table 4.6: Understanding of the notification procedure of notifiable diseases

		Frequency	Percent
Valid	Yes	111	92.5%
	No	9	7.5%
	Total	120	100.0%

As can be seen from Table 4.6, the Chi-square goodness-of-fit test regarding understanding of the notification procedure for notifiable diseases shows that a

significant number of respondents 92.5% (n=111) answered 'Yes' and 7.5% (n=9) answered 'No'. This is significant **(χ^2 (N = 120, 1) = 86.700, p<0005)**.

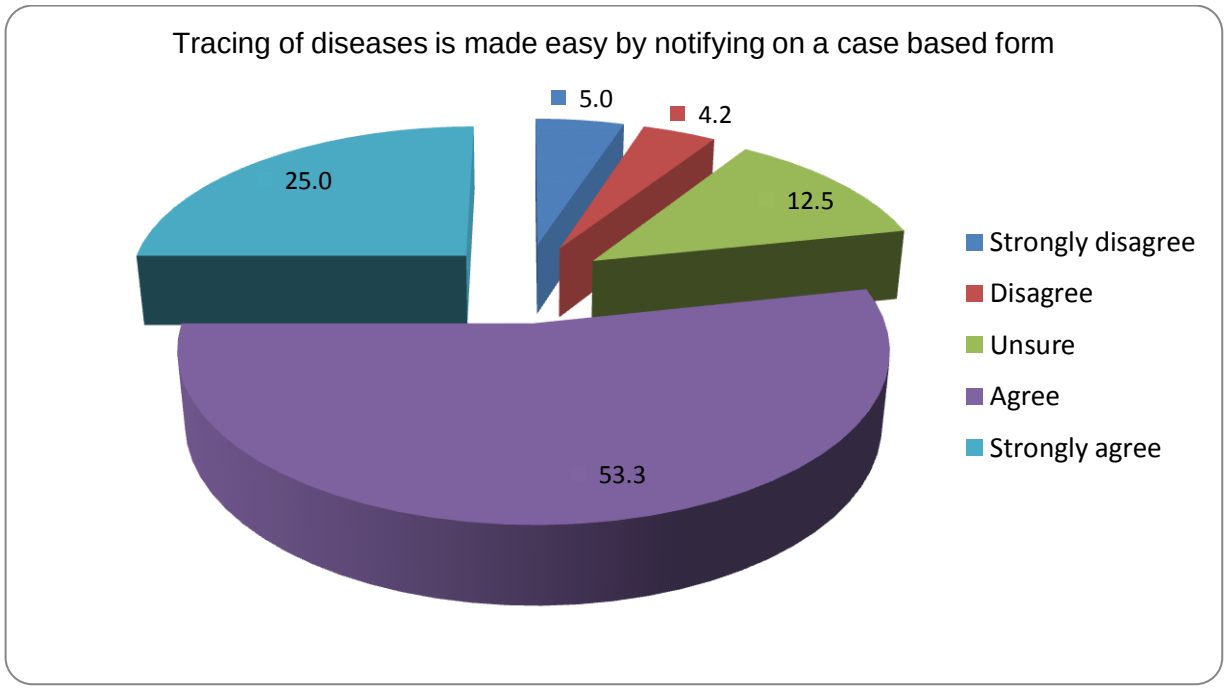

Figure 4.11: Tracing of diseases

Figure 4.11 shows the results of the Wilcoxon Signed Ranks test indicating that there was significant agreement with the statement that 'Tracing of diseases is made easier by notifying on a case based form', with 53.3% (n=64) answering 'Agree'; 25% (n=30) answering 'Strongly agree', 12.5% (n=15) answering 'Unsure', 4.2% (n=5) answering 'Disagree' and 5% (n=6) answering 'Strongly disagree'. The Wilcoxon Signed Ranks Test revealed that there was significant agreement with this statement **(Z (N = 120) = -6.940, p < .0005)**.

(Refer appendix 8 - F)

4.10 ADVERSE DRUG REACTION REPORTING

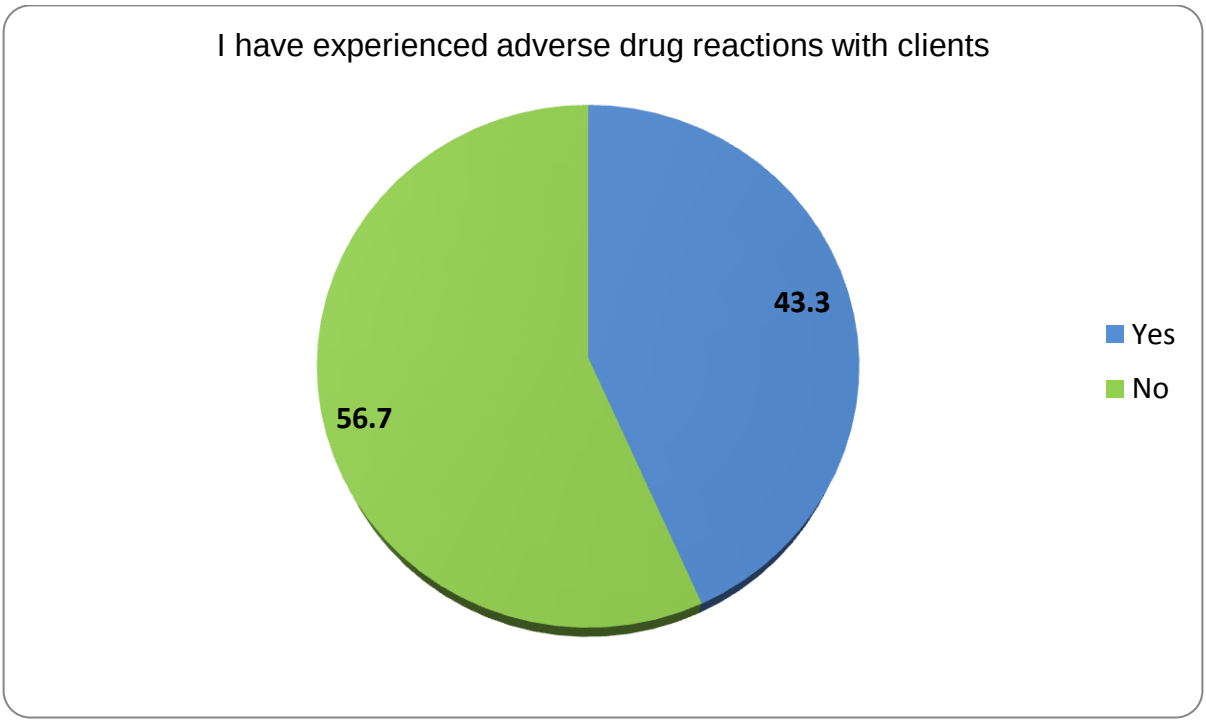

Figure 4.12: Adverse drug reactions

Figure 4.12 shows that there was no significant difference in the choice of yes/no with regards to having experienced adverse drug reactions, with 43.3% (n=52) of the respondents answering 'Yes' to this question and 56.7% (n=68) answering 'No'.

Table 4.7: Confidence in understanding the management of drug reactions

		Frequency	Percent
Valid	Strongly disagree	4	3.3%
	Disagree	3	2.5%
	Unsure	17	14.2%
	Agree	71	59.2%
	Strongly agree	25	20.8%
	Total	120	100.0%

As can be seen from Table 4.7, the Wilcoxon Signed Ranks test results show that there was significant agreement **(Z (N = 120) = -7.649, p < .0005)** regarding the understanding of the management of drug reactions, with 59.2% (n=71) of respondents answering ‘Agree’, 20.8% (n=25) answering ‘Strongly agree’, 14.2% (n=17) answering ‘Unsure’, 2.5% (n=3) answering ‘Disagree’ and 3.3% (n=4) answering ‘Strongly disagree.

Table 4.8: Confidence in knowing how to report an adverse drug reaction

		Frequency	Percent
Valid	Strongly disagree	4	3.3%
	Disagree	4	3.3%
	Unsure	14	11.7%
	Agree	68	56.7%
	Strongly agree	30	25.0%
	Total	120	100.0%

As can be seen from Table 4.8, the Wilcoxon Signed Ranks test regarding confidence in knowing how to report an adverse drug reaction showed that

56.7% (n=68) answered ‘Agree’, 25% (n=30) answered ‘Strongly agree’ these results are significant **(Z (N = 120) = -7.684, p < .0005)**, 11.7% (n=14) answered ‘Unsure’, 3.3% (n=4) answered ‘Disagree’ and 3.3% (n=4) answered ‘Strongly disagree’.

(Refer appendix 8 - G)

4.11 FLOW CHARTS

Table 4.9: Flow charts are easy to follow

		Frequency	Percent
Valid	Strongly disagree	1	0.8%
	Disagree	3	2.5%
	Unsure	15	12.5%
	Agree	61	50.8%
	Strongly agree	40	33.3%
	Total	120	100.0%

As shown in Table 4.9, results of the Wilcoxon Signed Ranks test regarding flow charts being easy to follow show that 50.8 % (n=61) of respondents answered ‘Agree, 33.3% (n=40) ‘Strongly agree’, these results are significant **(Z (N = 120) =-8.621, p < .0005)**, 12.5% (n=15) ‘Unsure’, 2.5% (n=3) ‘Disagree’ and 0.8% (n=1) ‘Strongly disagree’.

Table 4.10: Accessibility of the flow charts

		Frequency	Percent
Valid	Strongly disagree	5	4.2%
	Disagree	6	5.0%
	Unsure	18	15.0%
	Agree	62	51.7%
	Strongly agree	29	24.2%
	Total	120	100.0%

As shown in Table 4.10, results of the Wilcoxon Signed Ranks test, regarding accessibility of the flow charts show that 51.7% (n=62) of respondents answered 'Agree', 24.2% (n=29) answered 'Strongly agree', these results are significant **(Z (N = 120) = 6.941, p < .0005)**, 15% answered (n=18) answered 'Unsure', 5% (n=6) answered 'Disagree' and 4.2% (n=5) answered 'Strongly disagree'.

(Refer appendix 8 - H)

4.12 CROSS-TABULATIONS AND ANALYSIS OF THE QUESTIONNAIRE

Analyses from cross-tabulations of the different types of clinic, age, experience and qualifications with specific questions in the questionnaire were carried out. The analyses included the Chi-square goodness-of-fit test of independence and, when conditions were not met, the Fishers Exact test was carried out. The Kruskal Wallis test was applied to questions whose responses were ordinal. These analyses were applied to evaluate whether responses differed significantly for the different categories. Only significant results from the analyses are shown below.

4.11.1 By clinic

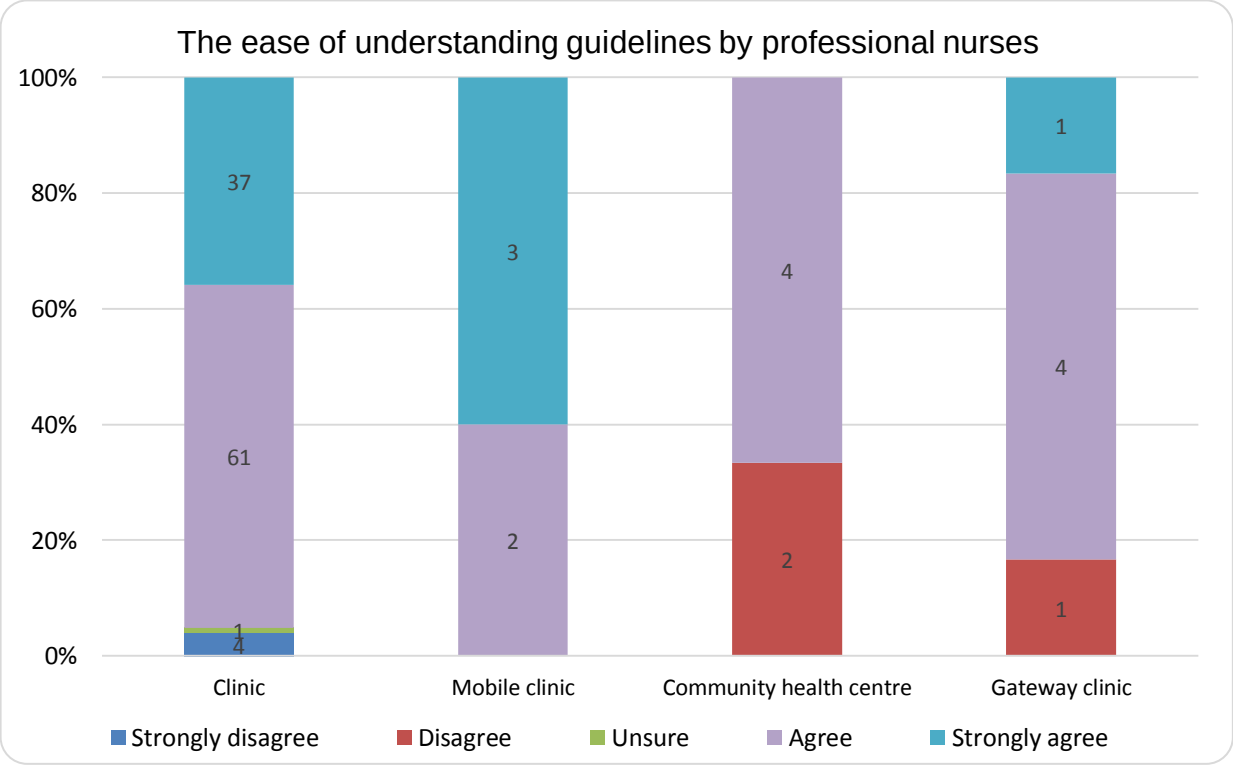

Figure 4.13: The ease of understanding guidelines by professional nurses

As can be seen in Figure 4.13, analysis from the Kruskal-Wallis test regarding ease of understanding guidelines indicate that the difference in responses of respondents from different types of clinics to the question on whether the guidelines were easy to understand was significant **(χ^2 (N = 120, 3) = 8.717, p = .033)** with 36% (n=37) of PHC clinic respondents, 60% (n=3) of Mobile clinic respondents and 17% (n=1) of Gateway clinic respondents answering 'Strongly agree'. Further analysis (Mann Whitney U test), concluded that respondents from clinics showed significantly more agreement than respondents from Community health centre **(Z (N=109) = -2.441, p = .015)**.

Other results are as follows:

- 59% (n=61) of PHC respondents, 40% (n=2) of Mobile clinic respondents, 67% (n=4) of CHC and Gateway clinic respondents answered ‘Agree’;
- 1.0% (n=1) of the respondents at the PHC respondents answered ‘Unsure’;
- 33% (n=2) of CHC respondents and 1.0% (n=1) of Gateway clinic respondents answered ‘Disagree’; and
- 4% (n=4) of PHC respondents answered ‘Strongly disagree’.

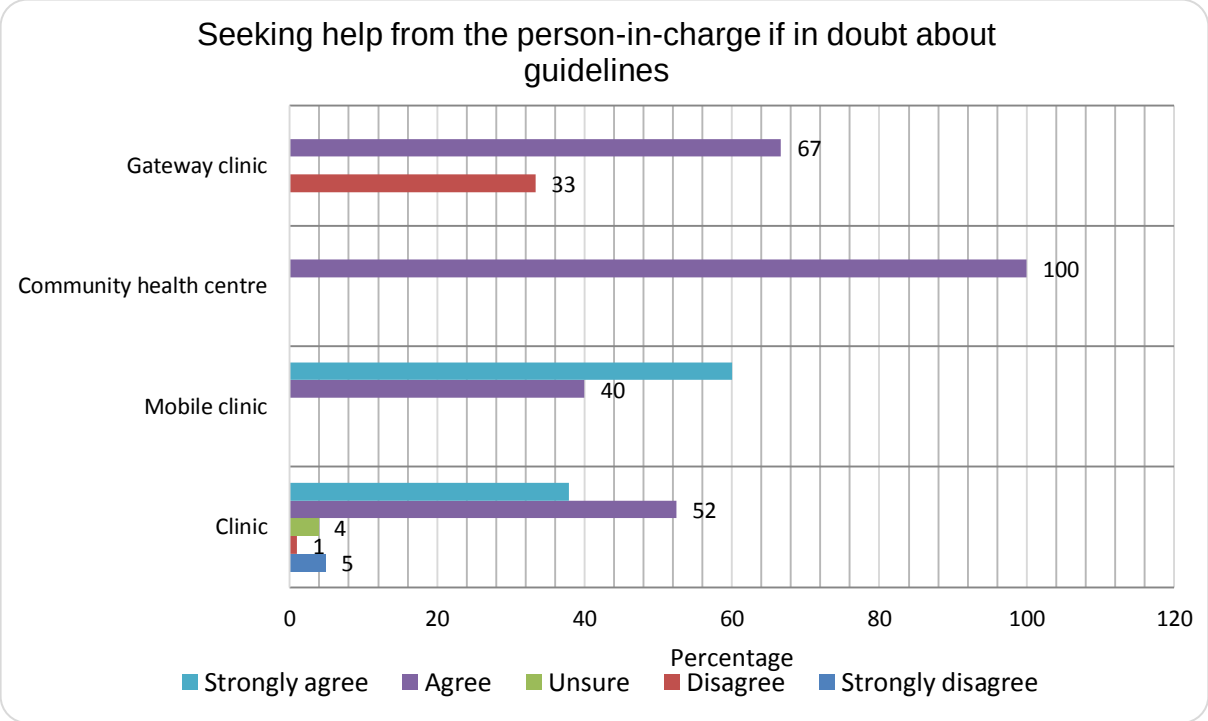

Figure 4.14: Seeking help from the person-in-charge if in doubt about guidelines

As can be seen in Figure 4.14, results are as follows:

- 60% (n=3) of Mobile clinic respondents and 35% (n=36) of PHC respondents answered ‘Strongly agree’;
- 100% (n=6) of CHC respondents, 67% (n=4) of the Gateway clinic respondents, 40% (n=2) of Mobile clinic respondents and 52% (n=54) of PHC respondents answered ‘Agree’;
- 4% (n=4) of PHC respondents answered ‘Unsure’;
- 1% (n=1) of PHC respondents answered ‘Disagree’; and
- 1% (n=1) of PHC respondents answered ‘Strongly disagree’.

Analysis from the Kruskal-Wallis Test showed that there was a significant difference between responses from the different types of clinics **(χ^2 (N = 120, 3) = 8.145, p = .043)** when the professional nurses were in doubt about guidelines**.** Further analysis (Mann Whitney U test), concluded that there was more agreement from respondents at clinics than from those at Gateway clinics **(Z (N=109) = -2.223, p =.026).**

(Refer appendix 8 - l)

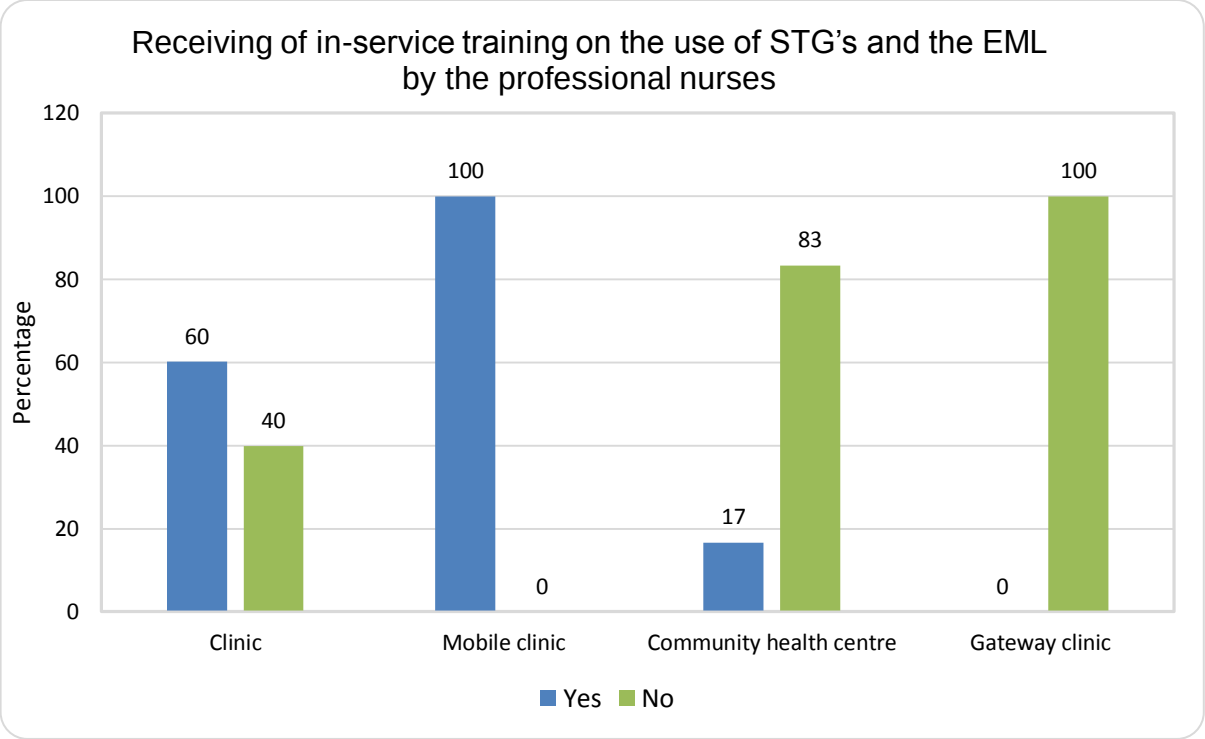

Figure 4.15: Receiving of in-service training on the use of STGs and the EML by the professional nurses

Figure 4.15 shows results of analyses from Fisher's exact test.

Results are as follows:

- 100% (n=5) of Mobile clinic respondents, 60% (n=62) of PHC respondents and at the 17% (n=1) of CHC respondents answered 'Yes'; and
- 100% (n=6) of Gateway clinic respondents, 83% (n= 5) of CHC respondents and 40% (n= 41) of PHC respondents answered 'No'.

There was a significant relationship between responses of respondents from different types of clinic and in-service training received (**Fisher's Exact (N=120) = 15.638, p<.0005)**. More than expected from the mobile clinics had training and more than expected from Community health centre and Gateway Clinic did not receive in-service training.

(Refer appendix 8 - J)

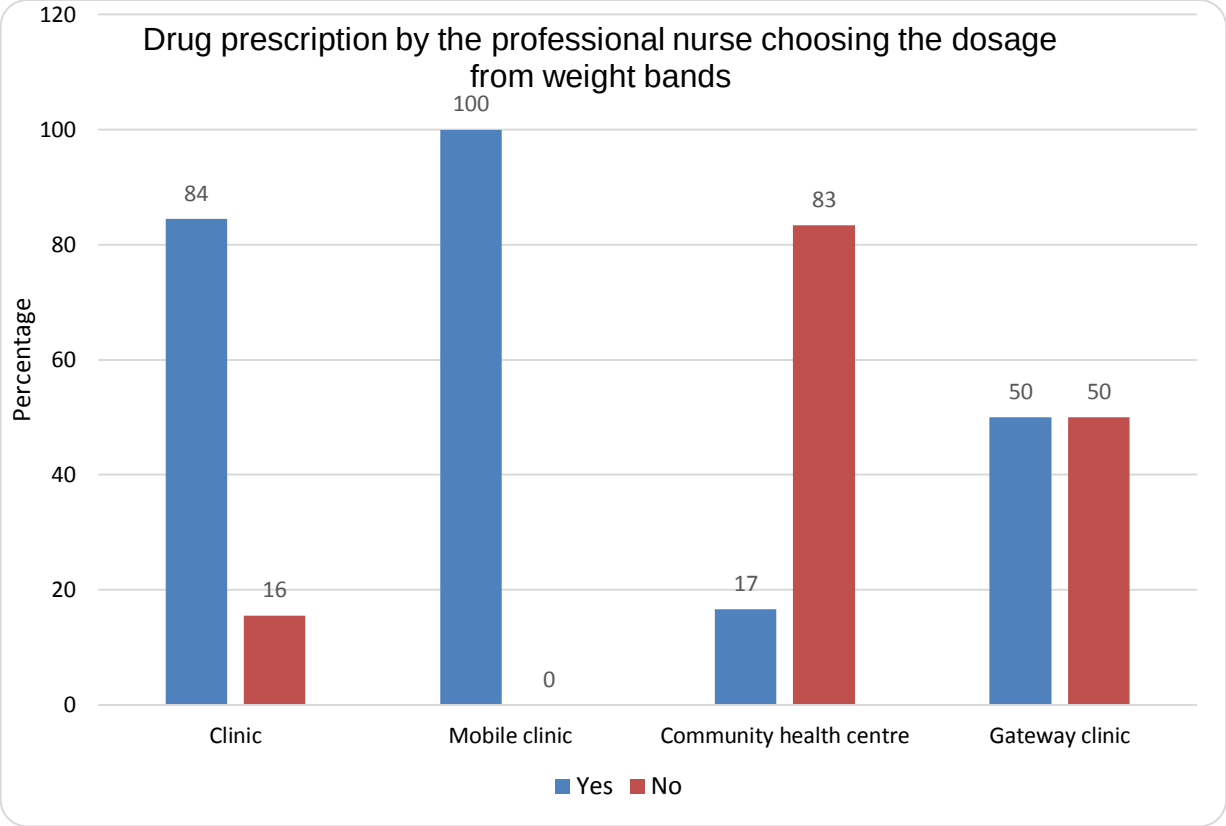

Figure 4.16: Drug prescription by the professional nurse choosing the dosage from weight bands

Figure 4.16 shows results from the Fisher's Exact Analysis on prescribing of drugs using the dosage from weight bands by the professional nurses.

Results are as follows:

- 100 % (n=5) of Mobile clinic respondents, 84% (n= 87) of PHC respondents, 50% (n=3) of Gateway respondents and 17% (n=1) of CHC respondents answered 'Yes'; and
- 83% (n= 5) of CHC respondents, 50% (n=3) of Gateway respondents and 16% (n=16) of PHC respondents answered 'No'.

There was a significant relationship between responses from respondents from the different types of clinic on prescribing drugs using the dosage from weight bands, as identified by the Fisher's Exact test **(Fisher's Exact(N=120) = 16.154, p=.001).** Specifically, more than expected from Community health centre and Gateway Clinic responded 'No'. (Refer appendix 8 - K)

4.11.2 By age

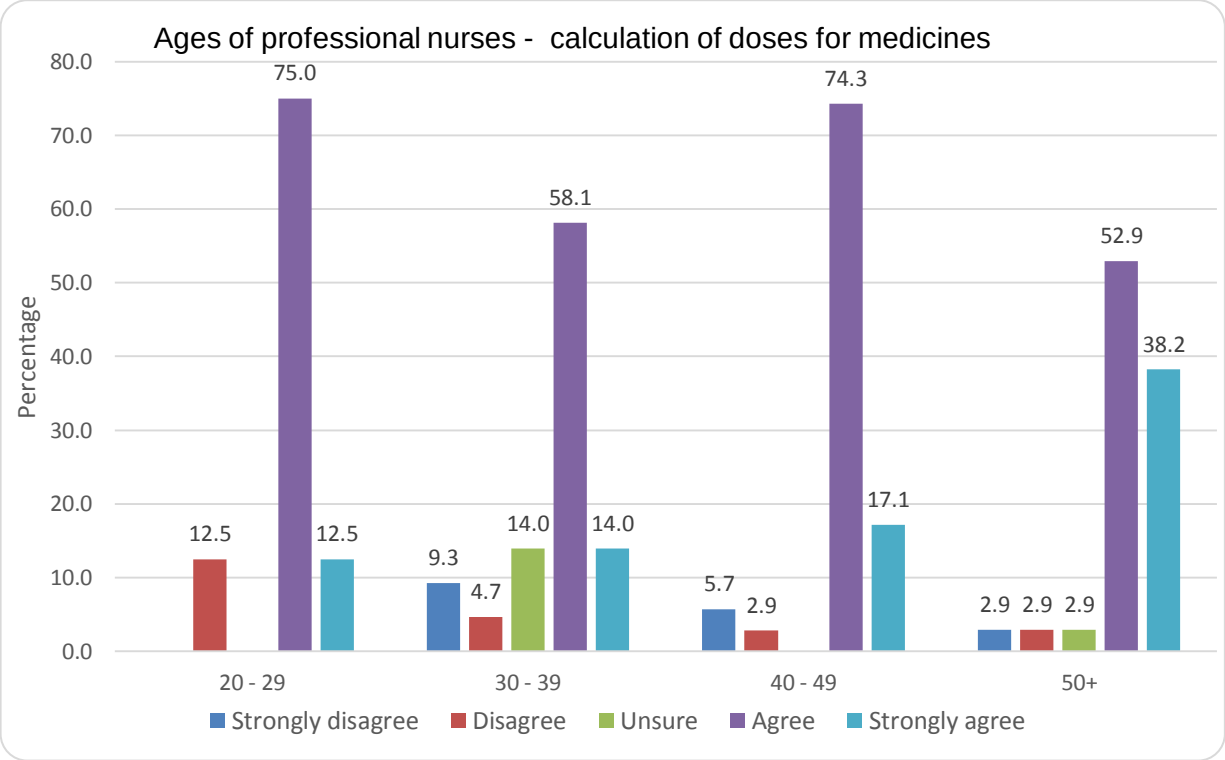

Figure 4.17: Ages of professional nurses and the calculation of doses for medicines

Figure 4.17 shows the results of the Kruskal-Wallis test.

Results are as follows:

- 75% (n=6) of the age group 20-29 years, 74.3% (n=26) of the age group 40-49 years, 58.1% (n=25) of the age group 30-39 years and 52.9% (n=18) of the 50+ age group answered ‘Agree’;
- 38.2% (n=13) in 50+ age group, 17.1% (n= 6)in 40-49 years age group, 14% (n= 6) of the 30-39 years age group and 12.5% (n=1) of the 20-29 age group answered ‘Strongly agree’;
- 14% (n=6) of the 30-39 years age group, and 2.9% (n=1) of the 50+ age group answered ‘Unsure’.

- 12.5% (n=15) of the 20-29 age group, 4.7% (n=6) of the 30-39 age group, 2.9% (n=3) of the 40-49 age group and of the 50+ age group answered 'Disagree'; and
- 9.3% (n=11) of the 30-39 years age group, 5.7% (n=7) of the 40-49 age group and 2.9% (n= 3) of the 50+ age group answered 'Strongly disagree'.

The Kruskal-Wallis test conducted on the various age group samples, found that there was a significant difference **(χ2 (N = 120, 3) = 9.351, p = .025)** between responses from the different age groups on the understanding of calculation of medicines. Specifically the 50+ age group indicated significantly higher understanding **(Z (N = 42) = -2.804, p = .005)** than the 30-39 age group.

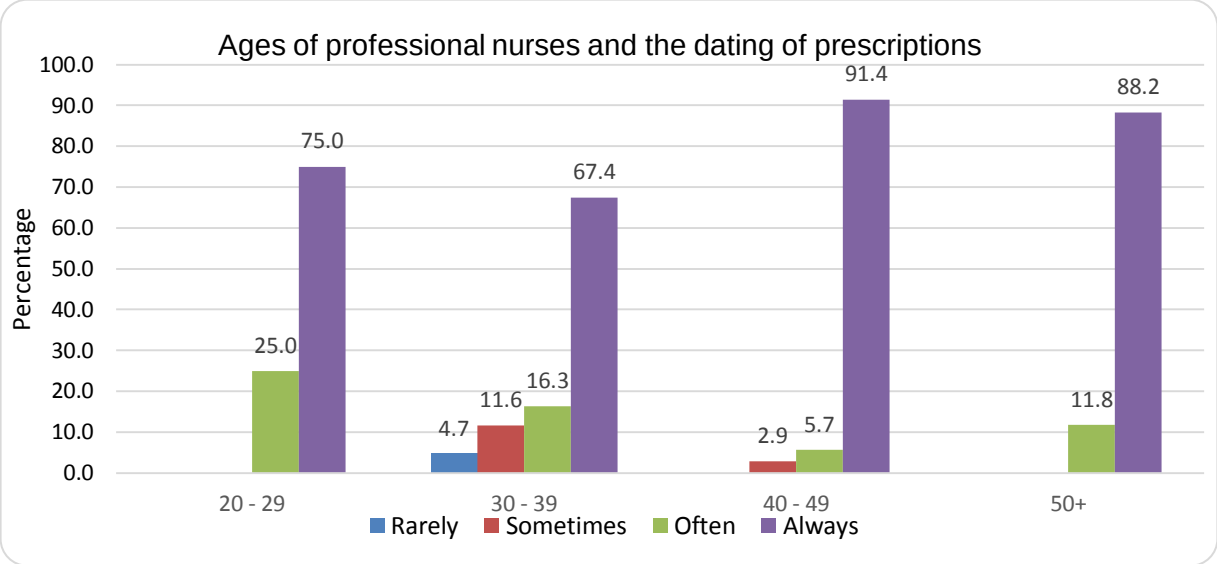

Figure 4.18: Ages of professional nurses and the dating of prescriptions

Figure 4.18 shows the following results regarding age of respondents and dating of prescriptions:

- 91.4% (n=110) of the 40-49 years age group, 88.2% (n=106) of the 50+ years age group; 75% (n=90) of the 20-29 years age group and 67.4% (n=81) of the 30-39 years age group answered 'Always';

- 25% (n=30) of the 20-29 years age group, 16.3% (n=20) of the 30-39 years age group, 5.7% (n=3) of the 40-49 years age group and 11.8% (n=14) of the 50+ age answered ‘Often’;
- 11.6 % (n=14) of the 30-39 years age group and 2.9% (n=3) of the 40-49 years age group answered ‘Sometimes’; and
- 4.7% (n=6) of the 30-39 years answered ‘Rarely’.

A significantly higher than expected number of respondents in the **40 – 49 years** age group showed a higher frequency **(Z (N = 42) = -2.578, p = .010)** in dating prescriptions.

(Refer appendix 8 - L)

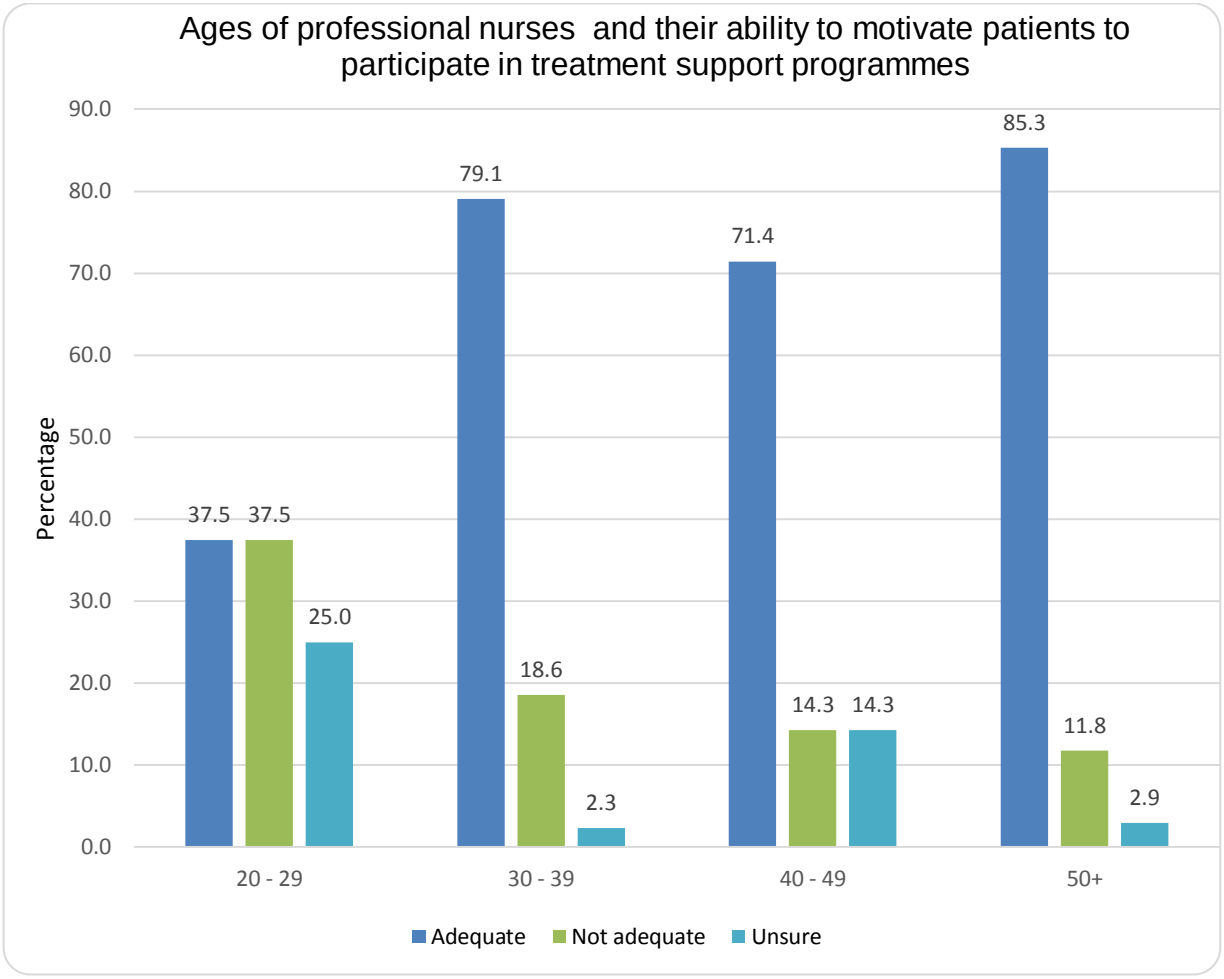

Figure 4.19: Ages of professional nurses and their ability to motivate patients to participate in treatment support programmes

Figure 4.19 shows the results from Fisher's Exact test regarding respondents' ability to motivate patients to participate in treatment support programmes.
Results are:

- 85.3% (n=29) of the 50+ age group, 79.1% (n=34) of the 30-39 years age group, 71.4% (n=25) of the 40-49 years age group and 37.5% (n=3) of the 20-29 years age group answered 'Adequate';
- 37.5% (n=3) of the 20-29 years age group, 18.6% (n=8) of the 30-39 years age group, 14.3 % (n=5) of the 40-49 years age group and 11.8% (n=4) of the 50+ age group answered 'Not adequate'; and
- 25% (n=2) of the 20-29 years age group, 14.3% (n=5) of the 40-49 years age group, 2.9% (n=1) of the 50+ age group and 2.3% (n=1) of the 30-39 years age group answered 'Unsure'.

The results revealed that significantly more than expected of the **20- 29** age group indicated that they were unable to motivate patients to participate in treatment programs while more than expected of the 40 – 49 age group were unsure of their competence in this area **(Fisher's Exact (N = 120) = 11.944, p = .039).**

(Refer appendix 8 - M)

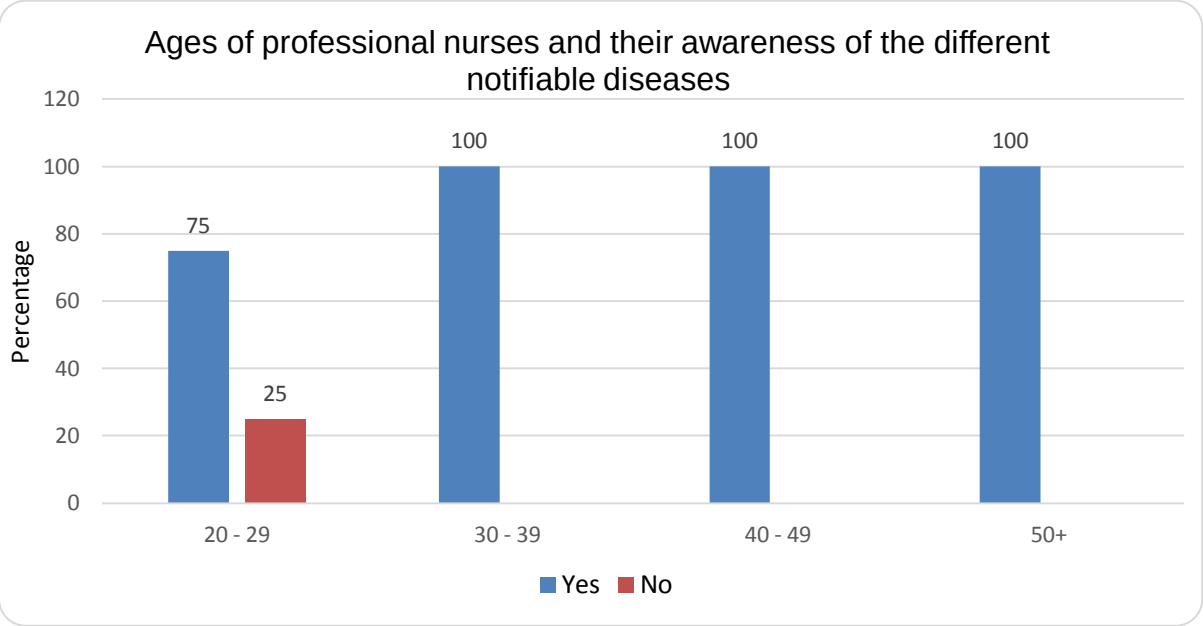

Figure 4.20: Ages of professional nurses and their awareness of the different notifiable diseases

Figure 4.20 shows the results from Fisher's Exact test regarding awareness of the notifiable diseases by the different age groups of professional nurses.

Results are:

- 100% (n=43, n=35, n=34) of the 30-39 years age group and the 40-49 years and the 50+ years age group, and 75% (n=6) of the 20-29 years age group answered 'Yes'; and
- 25% (n=2) of the 20-29 years age group answered 'No'.

The Fisher's Exact test showed that significantly more than expected respondents from the **20- 29** age group indicated that they were unaware **(Fisher's Exact (N = 120) = 9.767, p = .004),** of the different notifiable diseases.

(Refer appendix 8 - N)

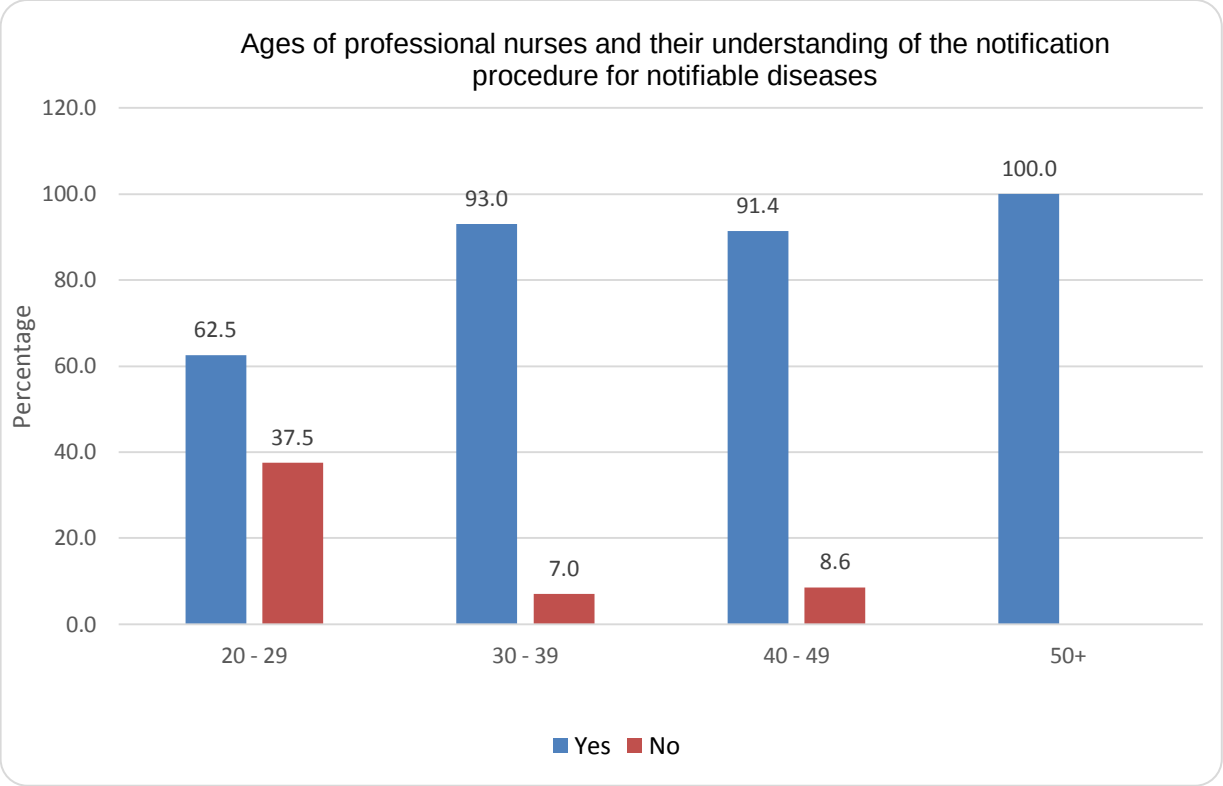

Figure 4.21: Ages of professional nurses and their understanding of the notification procedure for notifiable diseases

Figure 4.21 shows the results from Fisher's Exact test regarding the understanding of the notification procedure for notifiable diseases by the professional nurses of different age groups.

Results are:

- 100% (n=34) of the 50+years age group, 93% (n=40) of the 30-39 years age group, 91.4% (n=32) of the 40-49 years age group and 62.5% (n=5) of the 20-29 years age group answered 'Yes'; and
- 37.5% (n=3) of the 20-29 years age group, 7.0% (n=3) of the 30-39 years age group and 8.6% (n=3) of the 40-49 years age group answered 'No'.

The test revealed that significantly more than expected respondents in this age group (20 – 29) didn't understand the notification procedure **(Fisher's Exact (N = 120) = 9.848, p = .008**).

(Appendix 8- O)

4.11.3 By experience

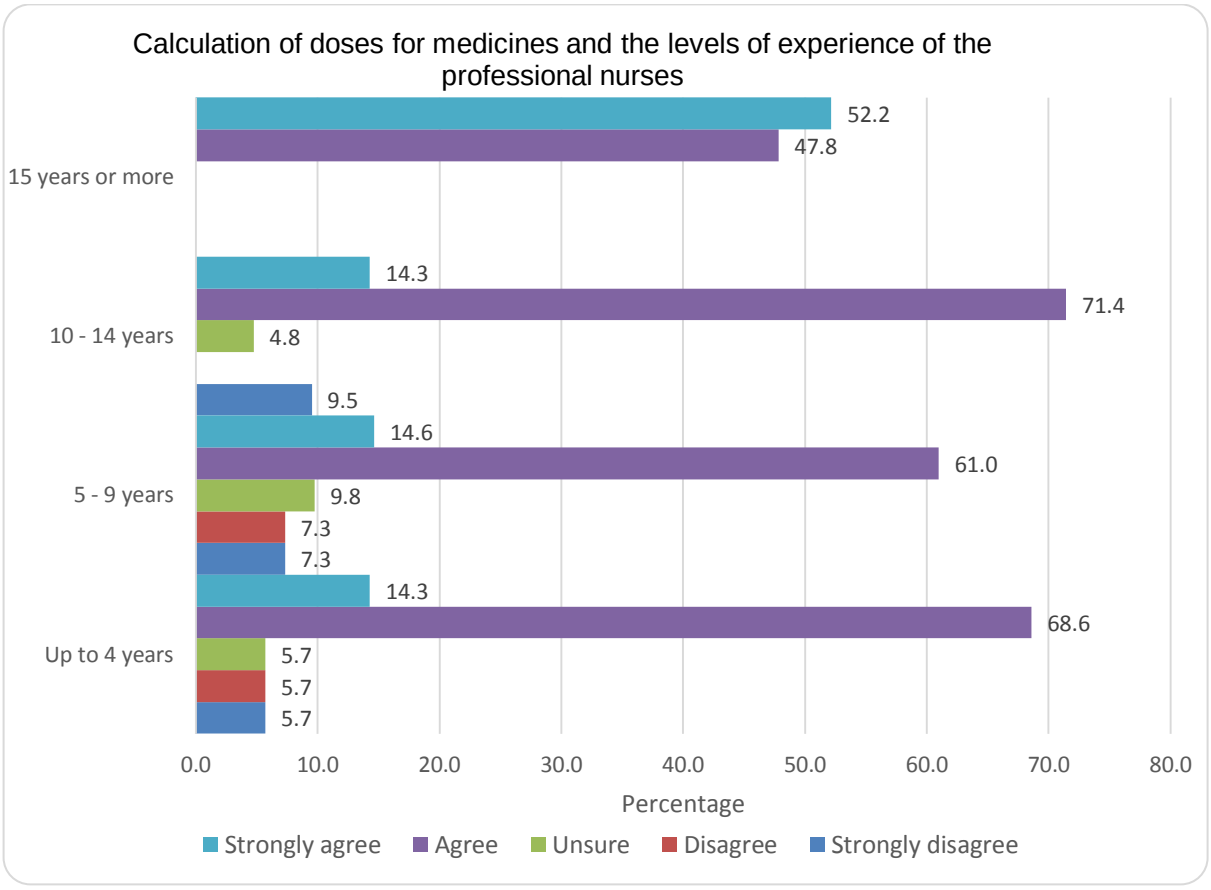

Figure 4.22: Calculation of doses of medicines and the levels of experience of the professional nurses

Figure 4.22 shows the results of the Kruskal-Wallis test regarding calculation of medicine dosages and different levels of experience in terms of years in practice. Results are:

- 52.2% (n=12) of respondents who had 15 years and more experience,14.3% (n=3) who had 10-14 years of experience, 14.6% (n=6)

who had 5-9 years of experience and 14.3% (n=5) who had four years of experience answered ‘Strongly agree’;

- 47.8% (n=11) of respondents who had 15 years and more experience, 71.4% (n=15) who had 10-14 years of experience, 61% (n=25) who had 5-9 years of experience and 68.6% (n=24) who had four years of experience answered ‘Agree’;
- 4.8% (n=1) of respondents who had 10-14 years of experience, 9.8% (n=4) who had 5-9 years of experience and 5.7% (n=2) who had four years of experience answered ‘Unsure’;
- 7.3% (n=3) of respondents who had 5-9 years of experience and 5.7% (n=2) who had four years of experience answered ‘Disagree’; and
- 9.5% (n=2) of respondents who had 10-14 years of experience, 7.3% (n=3) who had 5-9 years of experience and 5.7% (n=2) who had four years of experience answered ‘Strongly disagree’.

Kruskal-Wallis Test showed that there was a significant difference between responses from the different experience groups for this question **($\chi 2$ (N = 120, 3) = 16.806, p = .001)**. Further statistical analysis (Mann Whitney U test), concluded that there was significantly higher agreements for 15+ years than up to 4 years **(Z (N=76) = -3.393, p=.001)**; for 15+ years than 5-9 years **(Z (N=76) = -3.630, p<.0005)**; and for 15+ years than 10-14 years **(Z (N=76) = -2.922, p=.003).**

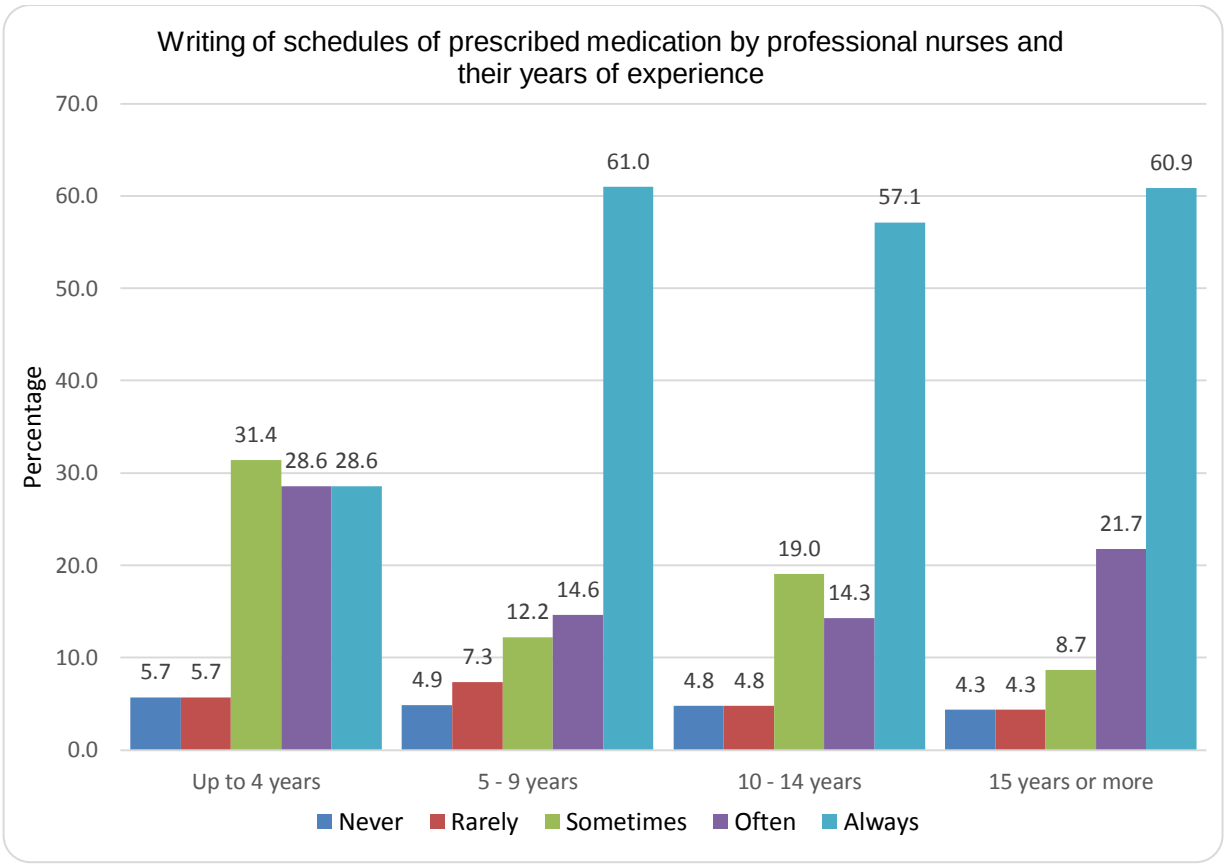

Figure 4.23: Writing of schedules of prescribed medication by professional nurses and their years of experience

Figure 4.23 shows the results of the Kruskal-Wallis test regarding writing of the schedules of the medicines they were prescribing and different levels of experience in terms of years in practice. Results are:

- 60.9% (n=14) of respondents who had 15 years and more experience, 57.1% (n=12) who had 10-14 years of experience, 61% (n=25) who had 5-9 years of experience and 28.6% (n=10) who had four years of experience answered ‘Always’;
- 21.7% (n=5) of respondents who had 15 years and more experience, 14.3% (n=3) who had 10-14 years of experience, 14.6% (n=6) who had 5-9 years of experience and 28.6% (n=10) who had four years of experience answered ‘Often’;

- 8.7% (n=2) of respondents who had 15 years and more experience,19% (n=4) who had 10-14 years of experience, 12.2% (n=5) who had 5-9 years of experience and 31.4% (n=11) who had four years of experience answered ‘Sometimes’.
- 4.3% (n=1) of respondents who had 15 years and more experience, 4.8% (n=2) who had 10-14 years of experience, 7.3% (3) who had 5-9 years of experience and 5.7% (n=2) who had four years of experience answered ‘Rarely’; and
- 4.3% (n=1) of respondents who had 15 years and more experience, 4.8% (n=1) who had 10-14 years of experience, 4.9% (n=2) who had 5-9 years of experience and 5.7% (n=2) who had four years of experience answered ‘Never’.

Kruskal-Wallis Test concluded that there was a significant difference between responses from the different levels of experience of the sample **($\chi 2$ (N = 120, 3) = 7.959, p = .047)**. Further statistical analysis ((Mann Whitney U test), concluded that there was a significantly higher frequency for 5-9 years than up to 4 years **(Z (N=76) = -2.340, p+.019)** and also for 15+ years than up to 4 years. **(Z (N=76) = -2.353, p=.019),** in the writing of schedules of medicines and the level of experience in practice.

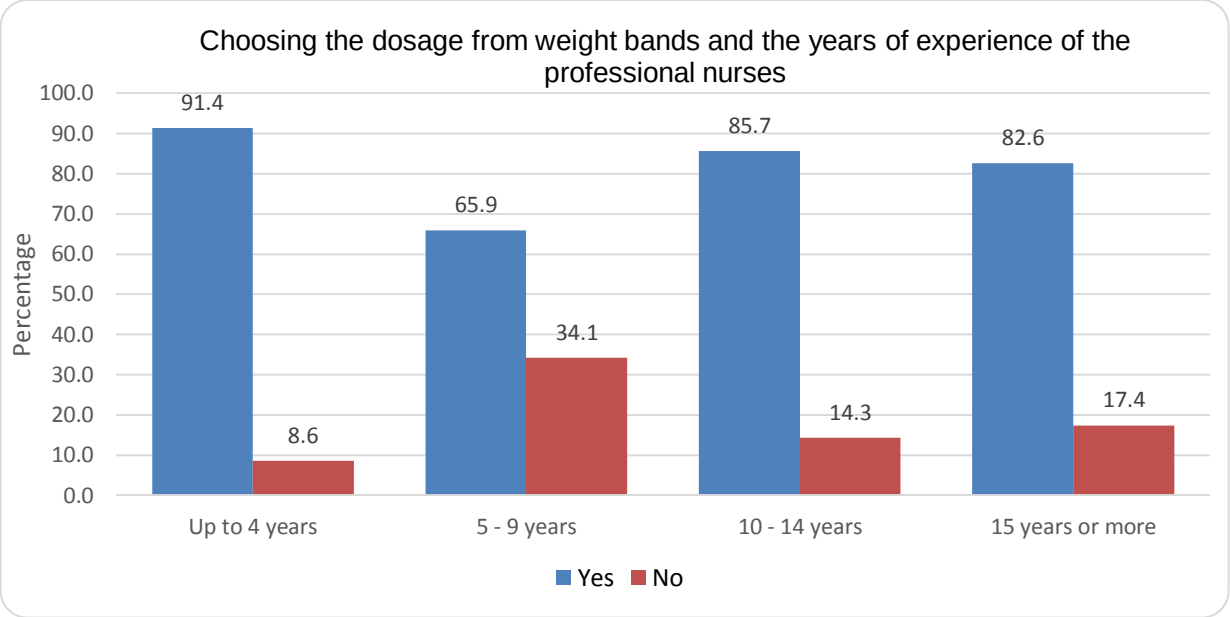

Figure 4.24: Choosing the dosage from weight bands and the years of experience of the professional nurses

Figure 4.24 shows the results of the Fisher's Exact test regarding choosing of dosage from weight bands and different levels of experience in terms of years in practice. Results are:

- 82.6% (n=19) of the respondents who had 15 years and more experience, 85.7% (n=18) who had 10-14 years of experience, 65.9% (n=27) who had 5-9 years of experience and 91.4% (n=32) who had four years of experience answered 'Yes'; and
- 17.4% (n=4) of respondents who had 15 years and more experience, 14.3% (n=3) who had 10-14 years of experience, 34.1% (n=14) who had 5-9 years of experience and 8.6% (n=3) who had four years of experience answered 'No'.

The Fischers Exact test concluded that significantly (**(N = 120) = 7.912, p = .046)** more than expected of the respondents in the 5-9 years' experience group and fewer than expected of the 4 years' experience group indicated that dosage could not always be chosen from weight bands.

(Refer appendix 8 - P)

4.11.4 By qualification

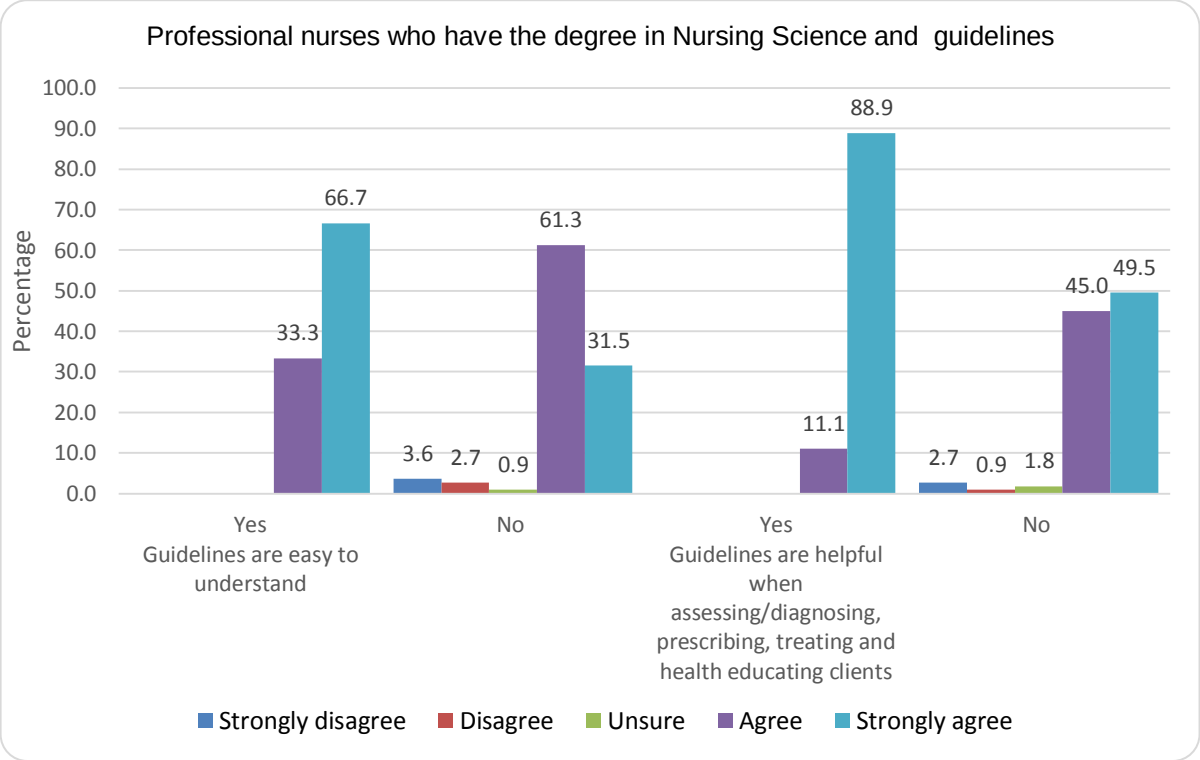

Figure 4.25: Professional nurses who have the degree in Nursing Science and guidelines

Figure 4.25 shows the results of the Kruskal-Wallis test regarding ease of use of guidelines and having a degree in Nursing Science. The results indicate that 66.7% (n=6) answered 'Strongly agree', 33.3% (n=3) answered 'Agree', 3.6 % (n=1) answered 'Strongly disagree', 2.7% (n=1) answered 'Disagree' and 0.9% (n=1) answered 'Unsure'. Those respondents who had this degree responded significantly higher (showing more agreement), **($\chi 2$ (N = 120, 4) = 4.635, p < .0005)** than those without the degree**.**

Figure 4.25 also shows the results of the Kruskal-Wallis test regarding whether the guidelines were perceived as helpful and having a degree in Nursing Science. Results are that 89.9% (n=8) answered 'Strongly agree', 11.1% (n=1) answered 'Agree', 2.7 % (n=1) answered 'Strongly disagree', 0.9% (n=1)

answered ‘Disagree’ and 1.8% (n=1) answered ‘Unsure’. Those respondents who had the degree in Nursing Science, showed significantly more agreement, than those without the degree, that the guidelines are helpful, when assessing/diagnosing, prescribing, treating and health educating clients , as shown by the Kruskal-Wallis Test **(χ2 (N = 120, 4) = 5.075, p < .0005).**

(Refer appendix 8 - Q)

4.13 RECORD REVIEWS

The Wilcoxon Signed Ranks test was applied to each of the five areas in the record review to see whether average percentage scores were significantly different from an average score of 50%. This test was carried out to conclude whether the correct drug was prescribed, and whether the schedule, dose, route and the frequency were recorded. It showed that the percentage scores are all significantly different from an average score of 50%. The percentage score for drugs, dose and frequency are all significantly higher than 50percent, while the percentage score for schedule and route are both significantly lower that 50%.

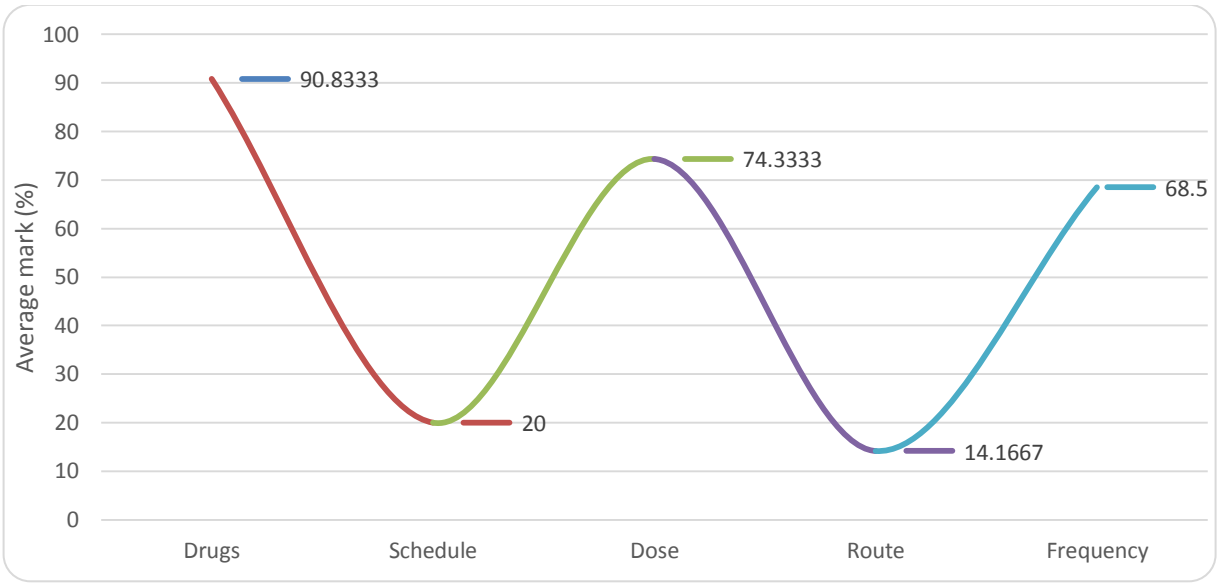

Figure 4.26: Five areas in the record reviews- Drugs, schedule, dose, route and frequency

Figure 4.26, shows the results from the Wilcoxon Signed Ranks test for the following record review elements:

- The average score for correct drugs was 90.8%. The study results **(Z (N=120) = -9.809, p < .0005),** revealed that the registered nurses were prescribing drugs rationally.
- The average score for schedule was significantly lower than 50% with the average mark being 20%. Wilcoxon Signed Ranks Test analysis, concluded that the average percentage score **(Z (N=120) = -7.345, p<.0005),** was significantly lower than 50percent.
- The average score for dosage was 74% which was significantly higher than of 50%. Wilcoxon Signed Ranks Test analysis indicated the average percentage score **(Z (N=120) = -6.342, p< .0005),** was significantly higher than 50percent.
- The average score of 14% for route of medicines was significantly lower than 50%. The Wilcoxon Signed Ranks Test analysis showed the average percentage score was significantly lower than 50percent **(Z (N=120) =-8.787, p<.000).**
- The average score of 68.5% for the frequency of medicines was significantly higher than 50%,as shown by the Wilcoxon Signed Ranks Test analysis, was significantly **(Z (N=120) =-5.440[a], p<.0005)** higher than 50percent.

(Refer appendix 8 - R)

4.14 CROSS TABULATION OF THE RECORD REVIEWS

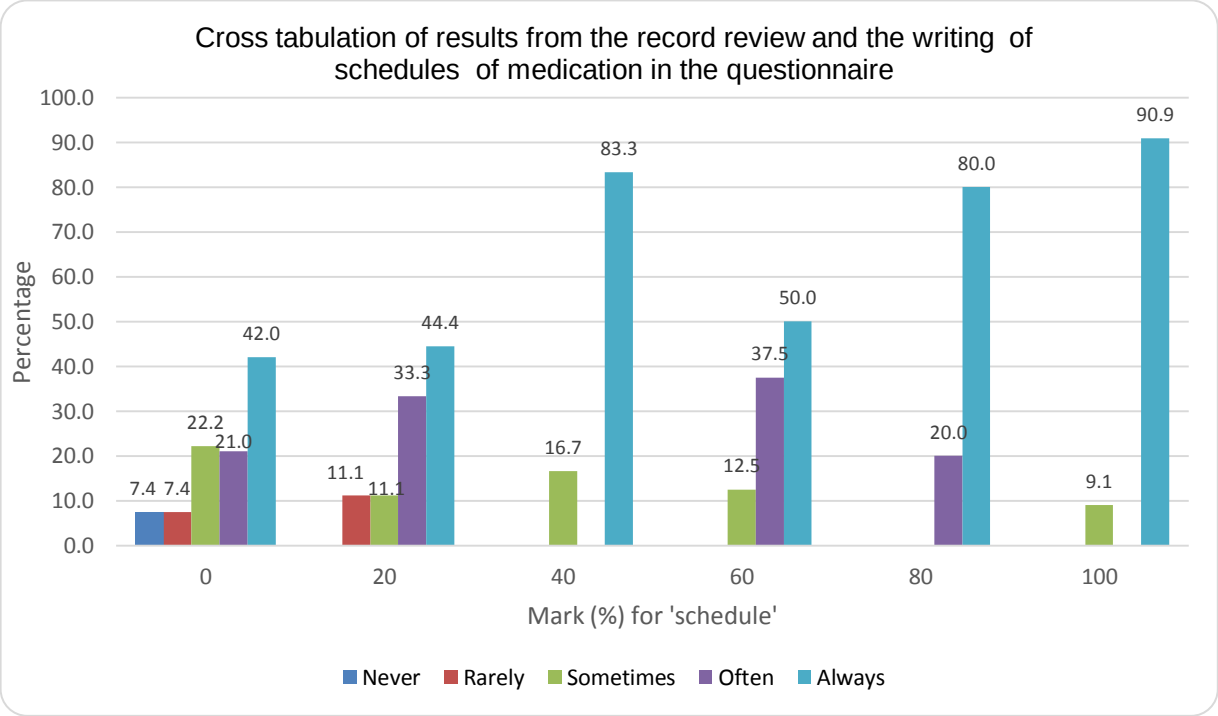

Figure 4.27: Cross tabulation of results from the record review and the writing of schedules of medication in the questionnaire

There were five areas in the participant's records that were reviewed namely prescribing of the correct drug, dose, route, frequency and the writing of the schedule of the medication prescribed. For each of the five areas, a mark was calculated that indicated the percentage of each time that the participant got the specific area correct. These marks were cross tabulated with the response obtained from the participants in the questionnaire on prescription writing, which asked whether the participants wrote the schedule of the prescribed medication. As shown by Figure 4.27, the following results were obtained:

- Of those respondents who received a mark of 100% (five areas correct), 90.9% (n=109) answered 'Always' and 9.1% (n=6) answered 'Sometimes';
- Of those respondents who achieved 80% (four areas correct), 80% (n=96) answered 'Always' and 20% (n=45) answered 'Often';

- Of those respondents who achieved 60% (three areas correct), 50% (n=60) answered ‘Always’, 37.5 % (n=24) answered ‘Often’ and 12.5% (n=15) answered ‘Sometimes’;
- Of those respondents who achieved 40% (two areas correct), 83.3% (n=100) answered ‘Always’ and 16.7% (n=20) answered ‘Sometimes’;
- Of those respondents who achieved 20% (one area correct), 44.4% (n=53) answered ‘Always’, 11.1% (n=13) answered ‘Sometimes’, 33.3% (n=40) answered ‘Often’ and 11.1% (n=13) answered ‘Rarely’;
- Of those respondents who achieved 0% (no areas correct), 42% (n=50) answered ‘Always’’, 22.2% (n=27) answered ‘Sometimes’, 21% (n=26) answered ‘Often’, 7.4% (n=9) answered ‘Rarely’ and 7.4% (n=9) answered ‘Never’.

(Refer appendix 8 - S)

During cross-tabulation analysis with regards to the clinic type and the record review regarding schedule, the Kruskal Wallis analysis showed that percentage marks for schedule differed significantly amongst the respondents from the different types of clinics **(χ^2 (N = 120, 3) = 13.254, p = .004).** Further analysis, (Mann-Whitney U test), showed that respondents from mobile clinics scored significantly higher than those from clinics **(Z (N = 108) = -2.403, p = 0.016)**.The sample from gateway clinics scored higher than those from clinics **(Z (N = 108) = -2.311, p = 0.021).** The respondents from gateway clinics also scored significantly higher than those from Community health centre **(Z (N = 108) = -2.309, p = 0.021).**

(Refer appendix 8 - T)

4.15 CONCLUSION

This chapter presented the study results. The results will be discussed in the following chapter.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 INTRODUCTION

In this chapter the results presented in the previous chapter will be discussed. The discussion is based on the study objectives, namely to:

- Explore the use of STGs and the EML by professional nurses working at PHC clinics; and
- Review the rational use of medicines at the clinics by auditing clinic registers kept by the professional nurses.

Conclusions will be drawn and limitations to the study as well as recommendations will be presented.

5.2 DEMOGRAPHICS

The study results showed that the majority of participants were females 95.8% (n=115) as compared to males 4.2% (n=5). This reflects the broader social impression and employment reality that nursing is a female dominated profession. Several reasons why there are so few males in nursing emerged from a study by Vere-Jones (2008) in which she interviewed males regarding nursing as a career choice. Some of the reasons were that nursing is still seen as the 'the Florence Nightingale profession'; that it is female-dominated; low pay, and; the sceptical perception of the public when they see men as nurses. These reasons are barriers which prevent men from entering the profession. Areas that attract male nurses are theatre and intensive care and surgical nursing as these areas are seen as more 'macho' than other areas like midwifery (Vere-Jones 2008).

The study results further revealed that the proportion of the younger generation is low, with the proportion of participants in 20-29 age group being only 6.7% (n=8). According to Gilles (2013), in her article on addressing the generation gap in nursing, the reasons why the younger generation is not choosing nursing as a career include the increased number of career options now for the younger generation compared to the past, and that the younger generation wish to choose fields that have more exciting reputations with better salaries. Gilles suggested ways to attract younger people to the profession include publicising nursing as a career choice, informing the public about the numerous exciting opportunities that nursing offers, allowing nurses more say in patient care decisions and providing innovative employment benefits (Gilles 2013).

To qualify as a registered nurse, one has to obtain a diploma or degree in General Nursing (SANC 2005: 25). This diploma entitles one to practice as an independent practitioner in the PHC setting. The results of the study showed 59.2% (n=71) of the respondents possessed the Diploma in Clinical Nursing Science, Health Assessment, Treatment and Care. This is significant in that, apart from the diploma in General Nursing, these professional nurses have an added qualification which assists them in improving their knowledge and skills, whilst working in the PHC setting, assessing, diagnosing, prescribing and treating patients in their care. This is a short course, of one year duration, offered at higher education institutions and recognised by the SANC, (SANC 1982).

The results of the study showed a small percentage 7.5% (n=9) of the respondents had a degree in Nursing Science. This degree is studied at a higher education institution, for four or more years. Most nurses who undertake this degree usually register for a part time, distance education course, as they cannot leave their families and jobs to attend full-time courses (Ehlers 2000: 29). The reality is that professional nurses who wish to study advanced degrees find difficulty in finding appropriate and accessible programmes to suit their family

and employment obligations (Johnston and Lewis 1995: 237 cited by Ehlers 2000: 29). This prevents them from growing in their professions (Ehlers 2000: 29).

Other qualifications obtained by respondents such as nurse initiated anti-retroviral therapy (NIMART), integrated management of childhood illnesses (IMCI), paediatric nursing, advanced midwifery, and many other additional courses stood at 48.3% (n=58). This is significant, in that many professional nurses study many other courses to update their knowledge, thus ensuring that patients receive optimum services. This observation is supported by Riddell (2013), where the author states that short courses provide an opportunity to update skills in a short period of time, and to formalise skills gained in the workplace or to build upon qualifications gained through university (Riddell 2013). Short courses are also a way to fill gaps in knowledge and are a way forward to job promotions. Further, with the evolvement of technology, it is important for employees to refresh their skills and keep abreast with knowledge and development (Riddell 2013).

The results of the study revealed that 19% (n=23) of the sample had 15 and more years of experience in the PHC setting, followed by 18% (n=21) having 10-14 years of experience. This reflects a small proportion of experienced nurses in the PHC setting. This was followed by 34% (n=41) having 5-9 years of experience and 29% (n=35) less than four years. According to findings of a study by Boonstra et al. (2005: 60), health workers with three to 11 years training performed better than those with less than three years or more than 11 years of training. The authors attributed this to their lack of experience in implementing National Treatment Guidelines. Those with 12-30 years of experience lacked opportunities for updating their knowledge (Boonstra et al. 2005: 60).

5.3 STGS AND THE EML

The results of the study revealed that all respondents possessed copies of the STGs and EML. This observation is noted in the study by Patel (2012: 67), where the author collected retrospective data from health care facilities in Grahamstown in South Africa and Belgaum in India on facilitating and restraining factors on the rational use of antibiotics. The results of the study revealed that there was 100% availability of the STGs and EML in Health care facilities in Grahamstown and 0% in Belgaum. Thus the facilitating factor in Grahamstown was the availability of the STGs and the EML, and the constraining factor was that pharmacists were not available at the PHC facilities and there was lack of regular training, monitoring and evaluation on the rational use of antibiotics. In Belgaum the restraining factors were the lack of generic prescribing and the unavailability of the STGs and the EML (Patel 2012: 67).

The study results further indicated that respondents were adhering to the guidelines for diagnosis and that there was no evidence of polypharmacy, as compared to global studies in places like Egypt (El Mahalli and Akl 2011: 118) and in other countries, where guidelines were not followed, and nurses and doctors were prescribing medicines and injections when they were not required. The cyclic characteristics of the nursing process, guides the professional nurses in nursing practice in their management of patients. The second phase of the nursing process is the nursing diagnosis. The professional nurses together with their knowledge and skills were referring to the guidelines whilst they were making a diagnosis. During the implementation phase they ensured that the correct drugs were prescribed according to the STGs and the EML. The cyclic nature of the nursing process ensures that if the implemented treatment does not resolve the patient's problem then the cycle is repeated and the patient may be referred to the next level of care.

This study found that nearly all respondents 98.3% (n=118) had access to the latest edition (2008) of the Essential Drug Programme – South Africa guideline.

Health care workers need to be informed about amendments to guidelines and treatment protocols. In this study, 61.7% (n=74) of the respondents agreed that they were timeously notified of any changes in guidelines and treatment protocols. This observation is supported by the study by Boonstra et al. (2005: 72) who state that STGs are important tools used for prescribing and management, but they should not be a replacement for sound clinical judgement or experience. They further state that STGs should be regularly revised and amended as new information or deficiencies become apparent (Boonstra et al. 2005: 72).

The simple text and the layout of the guideline make it easy for professional nurses to use. The results of the study indicate that 59.2% (n=71) of the nurses agreed that the guideline was easy to understand, whilst 34.2% (n=41) strongly agreed. This finding is supported by Mayers (2010: 63) in her study on guideline implementation in PHC settings, who also found that nurses base their decisions on guidelines which are user friendly.

Teamwork, supervision and mentoring are essential in a work situation. Searle (2000: 171) discusses the functions of the nurse and emphasizes the interdependent function of the nurse and various members of the health team and the patient. The nurse is ultimately responsible and accountable for her/his own actions (Searle 2000: 172). Analysis of the study results show that 55% (n=66) of respondents agreed that when they were in doubt about the guideline they could obtain assistance from the person in charge and 35% (n=42) strongly agreed. This suggests that respondents feel comfortable seeking a second opinion and assistance from somebody more experienced and knowledgeable.

This collaboration is valuable when there is doubt regarding the appropriate diagnosis and treatment of a client, according to the guidelines.

During cross tabulation analysis, a significant difference was noted between responses from the different clinics. There was more agreement from respondents at PHC clinics than from those at Gateway clinics, that when they were in doubt about the guidelines, they could obtain help from the person in charge. A possible explanation could be that there are sound interpersonal relationships and there is strong team morale amongst the staff at the PHC compared to Gateway clinics.

Advancement in technology and computer science enhances work quality and productivity. Analysis from the study results showed 45.8% (n=55) of respondents agreed and 28.3% (n=34) strongly agreed that the availability of electronic copies of the STGs and EML in the workplace would be less time consuming and be more effective during consultation with clients. The professional nurses could type key words regarding signs and symptoms that the patient was presenting with into the computer then be guided by the resultant diagnosis treatment guidance. This observation is supported by Awad and Al-Saffar (2010: 1247) who studied prescribing and dispensing practices in Kuwait. They found electronic physician orders, dispensing software, pre-labelled and pre-packed drugs made dispensing practice efficient at some governorates.

The results of the study further revealed that there was significant agreement that the guidelines were helpful when assessing, diagnosing, prescribing, treating and health educating clients, with 52.5% (n=63) of respondents strongly agreeing and 42.5% (n=51) agreeing. This observation is supported by the findings of a study by Elovainio et al. (2000: 117). The aim of the study was to form and test a model of the antecedents and possible moderators on the use of clinical guidelines amongst health professionals. The results revealed positive and

negative attitudes towards guidelines related to the usefulness, reliability, practicality and availability of guidelines. It was also vital for the individual, team and organisation to be competent in order to follow recommended procedures in the guidelines. Moreover those health workers who showed strong motivation towards their job were more ready to use the guidelines even when their attitudes towards the guidelines were the same (Elovainio et al. 2000: 122).

Cross-tabulation analysis by clinic type showed that there was more agreement from respondents from the PHC clinics than from respondents from CHCs regarding ease of understanding of the guidelines. This shows that there may be a gap in training, education, and experience at the CHCs. This finding is supported by Boonstra et al. (2005: 60) who found better adherence to national treatment guidelines in clinics than in health posts, which they attributed to clinics having better qualified staff than health posts.

Further cross tabulation analyses between clinics and questions from the questionnaire showed that there was more agreement from respondents at PHC clinics than from Gateway clinics about getting help from the person in charge when there was doubt about the guidelines. Possible explanations for this may be influx of patients, shortage of staff and poor interpersonal relationships between the person in charge and the staff below her/him.

Regarding cross tabulation analysis by qualification, the results of the study showed that those respondents who had a degree in Nursing Science responded significantly higher, that is showing more agreement than those without a degree that they understood the guidelines. A possible explanation for this may be that their cognitive skills are higher leading to better understanding of the guidelines. They also showed significantly more agreement than those without a degree, that the guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients. This observation is supported by results of the study

conducted by Boonstra et al. (2005: 60), who found that qualification and years of experience of nurses impacted on adherence to guidelines.

5.4 TRAINING

There were 68 respondents in the study who agreed that they received in-service training and 52 respondents disagreed. In-service training is vital in employment, as it keeps employees up-to-date with knowledge and current trends in their professions. This observation is noted in the study by Norushe, Rooyen and Strumper (2004: 63) who found that professional nurses perceived in-service programmes as inadequate and ineffectively implemented thus leading to decreased job satisfaction (Norushe, Rooyen and Strumper 2004: 66). The authors suggested guidelines to improve in-service training programmes for professional nurses (Norushe, Rooyen and Strumper 2004: 69).

Analysis of the study results further shows that there was agreement on the existence of training in the use of the STGs and the EML, where 36.7% (n=44) of the participants agreed and 15.8% (n=19) strongly agreed that the training was adequate. These results reflect a small percentage of the respondents agreeing that training was adequate. The results from numerous studies reveal the importance of training for health care workers to improve knowledge and adherence to guidelines (Wagle 2011; Kristiansson et al. 2008; Awad and Al-Saffar 2010; Uzochukwu, Onwujekwe and Akpala 2002; El Mahalli and Akl 2011; and Boostra et al. 2005).

The study results further showed that 59.2% (n=71) of respondents had the added qualification of a diploma in Clinical Nursing Science, Health Assessment, Treatment and Care. This qualification is specifically designed for nurses working in the PHC setting. professional nurses undertake this course for one year at a higher education institution and qualify as Primary Clinical Nurses, obtaining a certificate from the SANC (SANC, 1982). They are equipped with extensive knowledge in assessing, diagnosing, and treating patients and are

proficient with the STGs and the EML. Nurses who don't have this qualification and are working at a PHC clinic are orientated and supervised by the registered nurse in charge and learn 'on the job', by experience.

The results of the study further revealed that 40% (n=48) of respondents agreed and 23.3% (n=28) strongly agreed that training was beneficial to them. It helped them become familiar with all the disease conditions and guidelines to follow in treatment regimes.

Training is advantageous in the health setting as health workers need to be proficient in the care they render to patients. The importance of training has been noted in a study by Hlahane, Greeff and du Plessis (2006: 82) on perceptions by professional nurses on their skills to render comprehensive PHC services. The results of the study showed that the more comprehensively the professional nurses were trained the more competent they felt, and the less comprehensively trained, the more negatively they experienced their work.
The analysis from cross tabulations by clinic type showed that more than the expected number of respondents from mobile clinics had in-service training and more than the expected number of respondents from CHCs had not received in-service training. Possible explanations for this, as discussed by Norushe, Rooyen and Strumper (2004: 63), could be related to in-service programmes not being adhered to, poor planning of in-services, staff shortages, and increased workload which contributes to the training not being carried out.

5.5 DOSAGE CALCULATION OF MEDICINES

Calculation of medicines is imperative for effective treatment of conditions and diseases and preventing over and under dosage of medicines. Weight bands are written out dosages of medication in the tablet and syrup form for approximate age groups. The use of weight bands for dosage of medication was noted in a study conducted out by Weidle et al. (2006: 59) where antiretroviral dosing charts

were developed in weight bands to assist with proper dosing of HIV infected children in areas where resources were limited. The results showed that weight bands provided reasonably precise dosing as compared with body surface area-based dosing (Weidle et al. 2006: 59).

Analyses of the study results indicate that the majority of respondents agreed that they calculated the dosage of medication by age, weight and on the basis of referral to weight bands. The respondents also reiterated positively that they understood the calculation of medicines. The nursing process as a framework for nursing practice is a systematic, patient - centred and goal oriented method of care and it is indicative that during the implementation phase, the professional nurses were ensuring that correct dose of medicines was given to the patient.

Cross tabulation analysis by type of clinics, revealed that specifically more than expected respondents from CHCs and Gateway clinics responded that dosage cannot always be chosen from weight bands. A probable explanation for their negativity could be their misinterpretation of the question, as most dosages are chosen from weight bands which are readily available in the STGs and EML for the prescriber (Department of Health 2008).

Regarding cross tabulation analysis by age, there was a significant difference between responses from the different age groups on the understanding of calculation of medicines. Specifically the 50+ age group indicated significantly higher understanding on the calculation of medicines than the 30-39 age groups. A possible explanation for this could be their seniority, experience and their higher cognitive skills.

Regarding cross tabulation analysis by experience, the sample of nurses with different experience levels showed that there was a significant difference between responses on whether the calculation of dosage of medicines was

easily understood. There was significantly higher agreement from the respondents who had 15 and more years' of experience, than those respondents who had 4-14 years' of experience. This may be attributed to length of experience in the clinical field.

Respondents in the 4-9 years' experience group indicated that dosage could not always be chosen from weight bands. A possible explanation to this may be that they lacked the insight and experience in understanding the guidelines, as dosages are clearly annotated in weight bands and easily available for the nurse to use.

5.6 PRESCRIPTION WRITING

A generic drug is a copy of a brand name drug. It has the same active ingredients as the brand name drug and it is cheaper (Generic Drugs 2013: 1). The study results revealed that 45.8% (n=55) of nurses always wrote medicines or preparations in full using the generic name.

According to this study 40.8% (n=49) of the respondents sometimes wrote out prescriptions using abbreviations. Abbreviations are not acceptable due to misinterpretations, as found in the study by Dooley, Wiseman and Gu (2012: 19), who evaluated three Australian hospitals were evaluated regarding the prevalence of error-prone abbreviations used in medication prescribing for hospital patients. Patients records were audited and the results revealed that 76.9% (n=369) of the patients had one or more error-prone abbreviations used in prescribing, and 8.4% of orders contained at least one error-prone abbreviation. Of the prescriptions evaluated, 29.6% were deemed to be high risk for causing significant harm (Dooley, Wiseman and Gu 2012: 19).

Dose frequency of medicines is stated in terms of time. The study results revealed that 72.5% (n=87) of respondents always stated the doses in terms of

time. It is important to be specific when writing out the frequency of doses in full, to prevent any misunderstanding. This finding is supported by SANC regulation R.2418 on the keeping, supply, administering or prescribing of medicines by professional nurses. This regulation stipulates that an authorised nurse must write in the patients record the name, quantity, strength and dosage of the medicine supplied, administered or prescribed, and must also write down the dosage on the container in which the medicine is supplied (SANC 1984).

Writing the date on prescriptions is noteworthy and a legal requirement, as it reflects that the drugs are in current use and that the prescription is valid and not an out-dated prescription. The majority of respondents 80.8% (n=97) emphatically responded that they always write the date on the prescriptions. This finding is supported by SANC regulation R.2418 which states that an authorised nurse may supply, administer or prescribe a prescribed medicine. This section specifies that the date and time of supply, administering or prescribing must be written in patients file or treatment record (SANC 1984).

A signature on prescriptions is a legal requirement. It must always be signed by a qualified health care worker, or else it is invalid. The study results showed that 88.3% (n=106) of respondents responded that they always signed their prescriptions. An unsigned prescription is poor practice and the prescriber if traced may be liable in a court of law for any malpractice, if medicines were prescribed irrationally. According to regulation R.2418 an authorised nurse who supplies, administers or prescribes a prescribed medicine to a patient in terms of this regulation shall write her/his name and category of registration in block letters, as well as her/his signature (SANC 1984).

The practice of printing one's name after signing a prescription is important, as most signatures of prescribers are illegible. The rationale behind printing of names is that if there is an enquiry about a prescription, the prescriber can easily

be traced. The results of the study revealed that 44.2% (n=53) of the nurses printed their name after their signatures on a prescription. Observations from the study results revealed that this area needs to be improved, as SANC regulation R.2418 specifies that the prescriber must write her/his name and category of registration in block letters in addition to their signature (SANC 1984).

The writing down of schedules of drugs is a reminder to prescribers of the lethality, toxicity and dependency state of specific drugs, and the vigilance that is required in the handling and control of them. The results of the study revealed that 50.8% (n=61) of the respondents always wrote down the schedule of the prescribed medication. This is an indication that respondents needed to improve in this area, as SANC regulation R.2418 stipulates that the prescriber shall write the number of the schedule to the Medicines Control Act in which such medicine is listed (if any) (SANC 1984).

The study results revealed that the respondents were in agreement that they were self-assured that they were knowledgeable about prescription writing, and that medicines were prescribed rationally. However it is clear from the study results that not all respondents were abiding by the SANC, regulations relating to the keeping, supply, administering and prescribing of medicines by professional nurses (SANC 1984). Further, studies by other authors also showed that health care workers were not prescribing medicines effectively (El Mahalli and Akl 2011; Uzochukwu, Onwujekwe and Akpala 2002; Awad and Al-Saffar 2010; and Kristiansson et al. 2008).

After cross tabulation analysis by age and experience in prescription writing, the study results indicate that respondents in the 40-49 years age group showed a higher frequency of dating prescriptions. The analysis of respondents by experience level showed that there was a significantly higher agreement for those who had 15 and more years of experience, than those who had 4-14 years

of experience. Once again this may be attributed to the nurses' knowledge and experience in the clinical field. This observation is supported by the study by Boonstra et al. (2005:60) who found that nurses who lacked experience didn't implement national guidelines effectively.

5.7 CHRONIC ILLNESS

The results of the study showed that 89.2% (n=107) of respondents possessed adequate knowledge in assessing the patients adherence to treatment plans. It is vital that the nurse is competent in assessing patient's adherence to treatment plans, as this will result in optimal clinical management and control of illnesses (Department of Health 2008: xxiii). The nursing process is patient centred, and all care that is meted out to the patient is in collaboration with the patient. In the planning, implementing and evaluating phases of the nursing process the professional nurse together with the patient discuss treatment plans and implement them.

Results of the study further showed that 80.8% (n=97) of respondents were competent in creating a treatment plan for their patient. This observation is supported by the SANC regulation R.2598 of 1991 which regulates the scope of practice of persons who are registered or enrolled under the Nursing Act of 2005 and stipulates that a registered nurse shall diagnose a health need, prescribe, provide and execute a nursing regime to meet the needs of the patient (SANC 1991). It is essential to create a treatment plan together with the patient, with information on how to take her/his medication and advice on life-style change, so that that compliance is optimal and complications are prevented (Department of Health 2008: xxiii).

Regarding the ability of respondents to motivate patients to participate in treatment support programs, the results of the study revealed that 75.8% (n=91) of respondents were competent in this regard. It is imperative that nurses have

the ability to motivate patients, as the patient needs all the support which she/he gains from interacting and learning from health team members and other patients with similar problems. This is supported by Funnel (2000: 48) who explains that in the treatment of chronic conditions a team effort is required, with the patient playing an active role with support from the other health care team members (Funnel 2000: 48).

Setting of goals is an important area in the treatment regime, where the nurse together with the patient sets goals and the patient becomes aware of expectations regarding her/his treatment regime. The results of the study showed that 81.7% (n=98) of respondents were competent in setting goals with patients regarding their chronic illnesses. This observation is supported by Funnel (2000: 48) who emphasizes the importance of empowering patients to take charge of their conditions. The patient is encouraged to take responsibility and take an active role in their own health care. The author further explains the importance of exploring patient concerns and developing a collaborative goal with the patient (Funnel 2000: 51).

It is vital that the nurse uses all her skills to encourage patients to change their behaviour towards healthy living. The nurse has to have skills to motivate clients to change their lifestyle in order to improve their health, such as changing their dietary habits or pursuing an exercise program. The results of the study revealed that 91.7% (n=110) of respondents agreed that they were competent in encouraging patients to adopt change techniques in coping with their chronic illnesses. This finding has been noted by epidemiological studies, prevention trials and short term studies conducted by Willet, Koplan, Nugent, Dusenbury, Puska and Gaziano (2006) on blood pressure and lipids which indicated specific dietary and lifestyle habits as major causes of chronic diseases. Their conclusion was that by reducing lifestyle risk factors through changing

behaviours such as diet, physical activity and smoking one can prevent chronic diseases (Willet et al. 2006).

The study results are consistent with Ida Jean Orlando's Nursing Process Theory regarding the assessment, nursing diagnosis, planning and implementation phases. professional nurses use the nursing process to assist patients to meet agreed upon outcomes to improve their health needs (Potter and Perry 2005: 268).

Cross tabulation analysis by age revealed that respondents in the 20-29 age group indicated that they were unable to motivate patients to participate in treatment programs. This may be attributed to their inexperience in this field. The 40-49 age group were unsure of their competence in this area. A possible explanation of this hesitancy may be attributed to it being very challenging to get the patient to change her/his lifestyle and due to their inexperience in this area, they may have found patients failing in this area although health education and motivational talks were given.

5.8 DISEASE NOTIFICATION PROCEDURES

It is imperative that the registered nurse be aware of all the notifiable diseases, as these must be reported to the Provincial Health Departments, so that the spread of the disease can be prevented (Department of Health 2008: xxxiii). The results of the study show that 98.3% (118) of respondents agreed that they were aware of the different notifiable diseases.

The results further showed that 92.5% (n=111) of respondents agreed that they understood the notification procedure. The notification procedure is important, as the disease reporting system is based on South African law (The Health Act, Act 63 of 1977). This needs to be done promptly so that measures can be taken to treat and prevent the spread of diseases (Department of Health 2008: xxxiii).

This observation is noted by the study in Gauteng-South Africa by Weber (2007: 51) who carried out a cross-sectional survey on knowledge and practices of doctors in the private sector regarding notifiable diseases. The results of the study revealed that the private general practitioners lacked motivation and compliance in respect of notification procedures due to time constraints, thus the burden of disease is not reported accurately in the province (Weber 2007: 61).

South Africa has a routine notification system for reporting notifiable diseases, where information is collected on notifiable medical conditions. The National Department of Health manages the disease notification system under the umbrella of the Directorate – epidemiology and surveillance. The initial notification of a medical condition is entered on a case-based form (GW 17/5). The case-based form is filled by health personnel, that is clinic personnel, infection control nurses, other hospital staff, public and private doctors (National Department of Health - Republic of South Africa). Filling the case based form is essential, as the patient's address and other important details are annotated on this form. This makes tracing of the case easy, as action needs to be taken to minimise the spread of the disease and decrease mortality and morbidity rates (National Department of Health - Republic of South Africa). The results of the study revealed that 53.3% (n=64) of the respondents agreed and 25.0% (n=30) strongly agreed that tracing diseases was easy when a case based form was used.

Cross tabulation analysis by age showed that respondents from the 20-29 age group indicated that they were unaware of the different notifiable diseases and that they also did not understand the notification procedure. A possible explanation for this may be due to their lack of experience in notification procedures.

5.9 ADVERSE DRUG REACTION REPORTING

The Medicines Control Council (MCC) defines an Adverse Drug Reaction (ADR), as “a response to a medicine which is noxious and unintended, including lack of efficacy, and which occurs at any dosage and can result from overdose, misuse or abuse of a medicine” (Department of Health 2008: 387).

MCC has a responsibility towards the South African public to ensure the safety, efficacy and quality of all medicines. All registered medicines in South Africa are monitored by the National Adverse Drug Event Monitoring Centre (NADEMC) for safety. The results of the study revealed that 52 respondents had experienced drug reactions with clients and 68 had not.

A total of 59.2% (n=71) of respondents agreed that they were confident in the management of drug reactions. According to studies carried out by Ruud, Srinivas and Toverud (2012: 1324) on healthcare provider’s experiences with adverse drug reactions and adherence challenges in antiretroviral therapy of HIV patients, health care workers at PHC clinics lack training in identifying, managing and treating ADRs on patients on antiretroviral therapy. The study further indicated that patients had difficulty verbalising the ADRs they were experiencing and that there was inadequate pharmacovigilance and inadequate attention to the role poverty played (Ruud, Srinivas and Toverud 2012: 1324). There are guidelines that are available on adverse drug reactions which assist health personnel in the management of adverse reactions (Department of Health 2008: 387).

The results of the study further showed that 56.7% (n=68) of respondents agreed and 25% (n=30) strongly agreed, that they were confident in the reporting of adverse drug reactions. All health workers are encouraged to report all suspected adverse reactions to medicines, including vaccines. Following this, all ADR reports are evaluated to assess the causal relationship between the event

and the medicine. This may result in investigations into the use of the medicine, educational initiatives, appropriate package insert changes and changes in the scheduling or manufacture of the medicine, in order to make it safer (Department of Health 2008: 387).

5.10 FLOW CHART

Flow charts are easy to understand diagrams showing how steps in a process fit together. They are helpful in conveying information on how processes work and how a particular job is done. Flow charts clarify an individual's understanding by means of mapping out the process (Mind Tools 2013).

The study results show that 50.8% (n=61) of respondents agree and 33.3% (n=40) strongly agree that flow charts are easy to follow. This observation is supported by the findings of the study by Mayers (2010: 84) where two guidelines were compared, namely, the South African Tuberculosis control guideline and the PALSA guideline. They found that nurses preferred the PALSA guideline as the flow charts were user friendly and colourful.

A positive response was obtained from respondents regarding the accessibility of flow charts. Flow charts are part of the STGs and EML and are thus easily accessible to nurses (Department of Health 2008). professional nurses have desk copies at hand whilst they are consulting with patients. The study results showed 51.7% (n=62) of the respondents agreed and 24.2% (n=29) strongly agreed that flow charts are accessible.

5.11 RECORD REVIEWS

The registered nurse's records were reviewed on their prescribing practices, and the results of the study showed that the professional nurses were prescribing drugs rationally. This means that they were prescribing the correct medication, according to the diagnosis, in doses that met patient needs for a correct period of time (WHO 1985). The study results were compared to other studies (Awad and Al-Saffar 2010; Uzochukwu, Onwujekwe and Akpala 2002; El Mahalli and Akl 2011) which showed that health workers were practicing polypharmacy and that they were not prescribing medicines according to guidelines. Rothmann, Gerber, Venter, Steyn and de K Monteith (2000: 49) conducted a study using a before and after experimental research design to evaluate the effect of a competency-based primary care drug therapy (PCDT) training programme for PHC nurses. Nurses were evaluated on the treatment of acute minor ailments. The results of the study showed that the prior to the training programme nurses were able to diagnose and treat common conditions but were confused with other common ailments. The nurses did not mention differential diagnosis thus the conditions were treated irrationally (Rothmann et al. 2000: 49). The post training test results of the experimental group showed that the competency-based PCDT programme was successful as it showed that there was a significant improvement in the correct diagnosis, differential diagnosis, and management of conditions (Rothmann et al. 2000: 49).

In the current study, the respondents were writing the correct dosage of drugs whilst they were prescribing treatment for their patients, as the study results showed the average percentage score for dosage was significantly higher than 50%. Writing the correct dosage whilst prescribing medication is supported by the SANC regulation R.2418 (SANC 1984).

The period that the medication needs to be taken is important for optimal healing. The results of the study revealed an average percentage score higher than 50%.

This means that the nurses are writing the frequency of the medication that the client needs to take. This is supported by the SANC regulation R.2418 (SANC 1984).

Medication route is the way a drug is introduced into the body, such as oral, enteral, mucosal, parenteral and percutaneous (Eure 2010). The study results showed that many nurses were not competent in this area, as analysis of the study showed the average percentage score was significantly lower than 50% for writing the route of medication.

The writing of schedules of drugs is imperative as it indicates the lethality, toxicity and dependency state of that specific drug and the vigilance that is required in the handling and control of such drugs. The results of the study showed that the percentage score was significantly lower than 50%, in writing of schedules of medication. This means that the nurses are omitting to write down the schedules of medication that they were prescribing in their registers. According to the SANC regulation R.2418 (SANC 1984), the number of the schedule to the Medicines Control Act in which such medicines is listed, must be written.

Furthermore, cross tabulation analyses showed that the percentage marks for schedule differed amongst the respondents from the different types of clinics. Respondents from Mobile clinics scored higher than those from the PHC clinics regarding writing down the schedules of prescribed medication. The sample from Gateway clinics scored higher than those from PHC clinics. The respondents from Gateway clinics also scored higher than those from CHCs. The results of the study revealed that the prescribing practices of the professional nurses at the Mobile and Gateway clinics are of a higher standard than the PHC clinics and CHCs.

Cross tabulations with the record review and the question on prescription writing in the questionnaire (which asked whether the participants wrote the schedule of the prescribed medication) revealed that of those respondents who received a mark of 100% in the record review (5 areas correct, that is correct drug, dose, frequency, route and schedule of the medication), 90.9% (n=109) chose the option 'Always', and 9.1% (n=6) chose the option 'Sometimes'. The respondent's marks corresponded with the options that they had chosen. This reflects their knowledge on prescribing of medicines.

5.12 CONCLUSION

Health care services at the PHC clinics in the UMgungundlovu District are rendered effectively, as demonstrated by the study results. The respondents attempt by all means to render the best service to their clients. The respondents had a good understanding regarding use of the STGs and the EML. There was no evidence of polypharmacy and medications were prescribed according to guidelines. Areas that were suboptimal were related to prescription writing and writing of schedules and routes of medication as indicated in facility records. The results further showed that training on the use of the STGs and EML were inadequate, which implies the need for strengthening of training programmes. The views of the professional nurses differed amongst the various clinics on some of questions in the questionnaire. Furthermore responses differed according to age, experience and qualification. Further prospective studies are recommended in the PHC setting to obtain a clearer view of professional nurses in practice.

5.13 LIMITATIONS OF THE STUDY

The retrospective study design made the study incomplete, in that the researcher did not obtain a complete picture of the consultation with the client, as only what was annotated in the professional nurses record was utilized as data. The assessment, nursing diagnosis, planning and implemented treatment as recorded in the nurses' records was used as data. Evaluation of implemented treatment was not feasible, as the researcher visited the clinics just once and did not do a follow up with patients that the professional had seen. Another limitation of the study was that the clinics were widespread and it was difficult to travel to remote clinics due to the poor condition of roads. Due to the influx of clients and the shortage of staff at some of the clinics, some nurses refused to participate in the study.

5.14 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

5.14.1 Nursing education

- Implementing educational approaches such as training staff by sending them to undertake the course in Clinical Nursing Science, Health Assessment, Treatment and Care, to reinforce and update their knowledge and skills in the clinical area.
- Provide opportunities for staff to undertake short courses to update their knowledge such as IMCI and NIMART.
- Provide opportunities and study leave for further development in advanced courses, such as pursuing the degree in Nursing Science.

5.14.2 Institutional management and practice

- Implement orientation programmes for all new staff members on the use of the STGs and EML and thereafter provide close supervision.
- Implement regular in-service training programmes by operational managers at the clinics on the use of the STGs and the EML to ensure competency of staff.
- Ensure monitoring and quality control by supervisors by carrying out regular audits on records.
- Identify deficits from audits and carry out corrective measures.
- Improve staffing at the clinics by recruiting professional nurses who can assist with the influx of patients and render the appropriate care that the patient deserves.

5.14.3 Further research

The researcher proposes a prospective study examining the practice of PHC nurses in the practical field and all the challenges that they are faced with on a daily basis.

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APPENDICES

APPENDIX 1: PERMISSION LETTER TO KZN DEPARTMENT OF HEALTH

70 Silver Road
Newholmes
Pietermaritzburg
3201
28 October 2012

Dr Elizabeth Lutge
Health KwaZulu-Natal
Health Research and Knowledge Management Secretariat
330 Langalibalele Street
Natalia Building
Pietermaritzburg
3200

RE: REQUEST FOR PERMISSION TO CONDUCT A NURSING RESEARCH STUDY AT PRIMARY HEALTH CARE CLINICS IN THE UMGUNGUNDLOVU DISTRICT.

My name is Umritha. Raj. Sooruth, I am currently employed at Greys Nursing Campus as a lecturer. I am presently registered for a Master's degree with the Durban University of Technology.
My study is titled "The use of Standard Treatment Guidelines (STGs) and the Essential Medicines List (EML) by professional nurses at primary health care clinics in UMgungundlovu District".

The objectives of the study are:

APPENDIX 2: PERMISSION LETTER TO THE DISTRICT MANAGER

70 Silver Road
Newholmes
Pietermaritzburg
3201
28 October 2012

The District Manager
Mrs MZ Mkhonza
UMgungundlovu District

RE: REQUEST FOR PERMISSION TO CONDUCT A NURSING RESEARCH STUDY AT PRIMARY HEALTH CARE CLINICS IN THE UMGUNGUNDLOVU DISTRICT.

My name is Umritha. Raj. Sooruth, I am currently employed at Greys Nursing Campus as a lecturer. I am presently registered for a Master's degree with the Durban University of Technology.
My study is titled "The use of Standard Treatment Guidelines (STGs) and the Essential Medicines List (EML) by professional nurses at primary health care clinics in UMgungundlovu District".

The objectives of the study are:

- To explore the use of STG's and the EML by professional nurses at clinics
- To review the rational use of medicines by auditing clinic registers used by the professional nurses.

APPENDIX 3: LETTER OF INFORMATION

LETTER OF INFORMATION

Title of the Research Study: The use of Standard treatment Guidelines and Medicines list by professional nurses at primary health care clinics in the Msunduzi District in Pietermaritzburg- South Africa.

Principal Investigator/s/researcher: Mrs. Umritha Raj Sooruth (Nursing lecturer/BA Cur)

Co-Investigator/s/supervisor/s: Prof MN. Sibiya (Supervisor, D Tech: Nursing) and Ms. DG. Sokhela (Co-supervisor, M Tech: Nursing)

Brief Introduction and Purpose of the Study: The client's first stop is at a primary health care setting when in search of health care. Standard Treatment Guidelines and the Essential Medicines List assist the professional nurses at the clinic, in assessing, diagnosing, prescribing and treating clients. The purpose of the study is to describe the use of these guidelines by the professional nurses at the clinics.

Outline of the Procedures: An explanation will be given to you about the study and your consent will be obtained. Your anonymity will be maintained at all times, as codes will be used, as your name will not appear in any of the research documents. The study will highlight positive aspects on how you use the guidelines and if there any deficiencies, strategies will be carried out to improve standards on the use of these guidelines. Secondly a retrospective review of five entries you record in the register you keep after prescribing medication will be carried out.

Risks or Discomforts to the Participant: This will be protected at all times by maintaining confidentiality and anonymity. The participants will be informed that all the information they provide or that is accessed from the registers will in no way jeopardize their employability.

Benefits: This study will identify positive aspects and gaps in the use of these guidelines. Recommendations based on the findings of this study will be used to improve the use of the STG's and the EML, thus improving management of patients at PHC settings.

Reason/s why the Participant May Be Withdrawn from the Study: Participation is voluntary and you may withdraw at any stage with no penalty should you request to do so.

Remuneration: The participant will not receive any monetary or other types of remuneration.

Costs of the Study: The participant will not be expected to cover any costs towards the study

Confidentiality: This will be maintained at all times. Anonymity will be adhered at all times as, no names will be written on any research documents. Responses to questionnaires and register entries will be kept confidential. No name of participants or clinics will be mentioned.

Research-related Injury: Not applicable.

Persons to Contact in the Event of Any Problems or Queries :(Supervisor, Prof MN Sibiya Tel: 031-373 2606) Co-supervisor, Ms DG Sokhela Tel: 031-373 2292. Please contact the researcher (Mrs UR Sooruth Tel: 033-897 3566) or the Institutional Research Ethics administrator on 031-373 2900. Complaints can be reported to the DVC: TIP, Prof F. Otieno on 031-373 2382 or dvctip@dut.ac.za.

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, _____ (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, _____ (name of researcher) 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**

APPENDIX 4: QUESTIONNAIRE

QUESTIONNAIRE ON DESCRIBING THE USE OF STANDARD TREATMENT GUIDELINES (STG's) AND THE ESSENTIAL MEDICINES LIST (EML)

Type of Clinic: **Code:**

Tick ONE box only

Provincial: ☐ Fixed ☐ Mobile ☐ CHC ☐ Gateway

State Aided: ☐ Fixed ☐ Mobile

Local Government: ☐ Fixed ☐ Mobile

Date:_____/_____/_____

Please fill in personal details in the boxes below:

Age: ☐ 20-29 years ☐ 30-39 years ☐ 40-49 years ☐ 50 years or older

Gender: ☐ Male ☐ Female

Race: ☐ Black ☐ White ☐ Coloured ☐ Asian

Qualifications: Please tick all the appropriate boxes that apply -

1. Diploma General Nursing ☐
2. Degree in Nursing Science ☐
3. Diploma in clinical Nursing Science, Health Assessment, Treatment and Care ☐

4. Other:……

……

Years of experience in primary health care nursing:

☐ 0-4 years ☐ 5-9 years ☐ 10-14 years ☐ 15 years or above

In each case, select only <u>one</u> option from the possible responses.

A STG's and the EML

		YES	NO
1	Copies of the STG's & EML guidelines are available at the clinic		
2	The guidelines are the latest and updated copies (2008)		
3	Notification about amendments to the guidelines are made timeously		

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
4	Guidelines are easy to understand					
5	When in doubt about guidelines I am able to get help from the person in charge					
6	Availability of electronic copies of STG's and EML would be less time consuming and more effective					
7	Guidelines are helpful when assessing/diagnosing, prescribing and treating clients					

B Training

		YES	NO
1	I have received in-service training on the use of STG's and the EML at the clinic where I am working		

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
2	Training on the use of STG's and the EML is adequate					
3	I have found the training on STG's and the EML beneficial to me					

C Dose calculation of medicines

		YES	NO
1	Dosage is calculated according to body weight		
2	The dose is calculated according to age		
3	The dosage can always be chosen from weight bands		

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
4	Calculation of doses for medicines is easily understandable					

D Prescription Writing

	When writing out prescriptions…	Never	Rarely	Sometimes	Often	Always
1	I write medicines or preparations in full using the generic name					
2	I use abbreviations					
3	I state the frequency of doses in terms of Time (e.g. 8 hourly or 3x a day)					
4	I date the prescription					
5	I sign the prescription					

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
6	I feel confident that I know about prescription writing					

E Chronic Illness

State your adequacy, with regard to the following items, when dealing with patients suffering from chronic conditions: 1 = Not at all adequate; 5 = Very adequate

		Adequacy score
1	Assessment of patient adherence.	
2	Creation of a treatment plan for the patient	
3	Encouragement of patients to participate in treatment support programs	
4	Identification of goals with patients	
5	Encouragement of patients to adopt change techniques (life style modification)	

F Disease notification procedures

		YES	NO
1	I am aware of the different notifiable diseases		

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
2	Tracing is made easy by notifying on a case based form					

G Adverse Drug Reaction Reporting

		YES	NO
1	I have experienced adverse drug reactions with clients		

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
2	I am confident that I understand the types of drug reactions that should be reported.					
3	I am confident that I know how to report an adverse drug reaction					

H Flow Chart

		Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1	Flow charts are easy to follow					

APPENDIX 5: TOOL FOR RECORD REVIEW

Retrospective review of facility registers on the rational use of drugs

Date: ……

Type of Health Facility: ……

Researcher: ……

Code: ……

	Age	Sex	Diagnosis	Drug	Schedule	Dose	Route	Frequency	Quantity Issued	No of drugs	√ Drug
1											
2											
3											
4											
5											

Sex: M/F

√ Drug (Prescribed drugs correct according to the EML): √ = YES X = N

Route: PO = Orally INJ = Injection

APPENDIX 6: LETTER FROM STATISTICIAN

Gill Hendry B.Sc. (Hons), M.Sc. (Wits)

Mathematical and Statistical Services

Cell: 083 300 9896
Email:hendryfam@telkomsa.net

To whom it may concern

Please be advised that Umritha Raj Sooruth (Student number – 212 371 83) who is presently studying for a Master of Technology: Nursing has consulted me regarding the sampling process she will use for her study.

Once the proposal is accepted, the Department will release a breakdown of population figures for each clinic, and the final details of the sampling calculations will be completed.

Yours sincerely

Gill Hendry (Mrs)

13/7/2012

APPENDIX 8 – STATISTICAL ANALYSIS

APPENDIX A – STG's and EML

Copies of the STG's & EML guidelines are available at the clinic

	Observed N	Expected N	Residual
Yes	120	120.0	.0
Total	120[a]		

a. This variable is constant. Chi-Square Test cannot be performed.

Notification about amendments to the guidelines are made timeously e.g. weekly, via a circular, or an in-service training session.

	Observed N	Expected N	Residual
Yes	74	59,5	14.5
No	45	59.5	-14.5
Total	119		

The guidelines are the latest and updated copies (2008)

	Observed N	Expected N	Residual
Yes	118	60.0	58.0
No	2	60.0	-58.0
Total	120		

Test Statistics

	The guidelines are the latest and updated copies (2008)	Notification about amendments to the guidelines are made timeously e.g. weekly, via a circular, or an in-service training session.
Chi-Square	112.133[a]	7.067[b]
df	1	1
Asymp. Sig.	.000	.008

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 59.5.

Ranks

		N	Mean Rank	Sum of Ranks
three - Guidelines are easy to understand	Negative Ranks	112[a]	59.28	6639.50
	Positive Ranks	7[b]	71.50	500.50
	Ties	1[c]		
	Total	120		
three - When in doubt about guidelines I am able to get help from the person in charge	Negative Ranks	108[d]	57.56	6216.00
	Positive Ranks	8[e]	71.25	570.00
	Ties	4[f]		
	Total	120		
three - Availability of electronic copies of STG's and EML would be less time consuming and more effective	Negative Ranks	89[g]	51.29	4565.00
	Positive Ranks	12[h]	48.83	586.00
	Ties	19[i]		
	Total	120		
three - Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients	Negative Ranks	114[j]	59.11	6738.00
	Positive Ranks	4[k]	70.75	283.00
	Ties	2[l]		
	Total	120		

Ranks

		N	Mean Rank	Sum of Ranks
three - Guidelines are easy to understand	Negative Ranks	112[a]	59.28	6639.50
	Positive Ranks	7[b]	71.50	500.50
	Ties	1[c]		
	Total	120		
three - When in doubt about guidelines I am able to get help from the person in charge	Negative Ranks	108[d]	57.56	6216.00
	Positive Ranks	8[e]	71.25	570.00
	Ties	4[f]		
	Total	120		
three - Availability of electronic copies of STG's and EML would be less time consuming and more effective	Negative Ranks	89[g]	51.29	4565.00
	Positive Ranks	12[h]	48.83	586.00
	Ties	19[i]		
	Total	120		
three - Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients	Negative Ranks	114[j]	59.11	6738.00
	Positive Ranks	4[k]	70.75	283.00
	Ties	2[l]		
	Total	120		

a. three < Guidelines are easy to understand

b. three > Guidelines are easy to understand

c. three = Guidelines are easy to understand

d. three < When in doubt about guidelines I am able to get help from the person in charge

e. three > When in doubt about guidelines I am able to get help from the person in charge

f. three = When in doubt about guidelines I am able to get help from the person in charge

g. three < Availability of electronic copies of STG's and EML would be less time consuming and more effective

h. three > Availability of electronic copies of STG's and EML would be less time consuming and more effective

i. three = Availability of electronic copies of STG's and EML would be less time consuming and more effective

j. three < Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients

k. three > Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients

l. three = Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients

Test Statistics

	three - Guidelines are easy to understand	three - When in doubt about guidelines I am able to get help from the person in charge	three - Availability of electronic copies of STG's and EML would be less time consuming and more effective	three - Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients
Z	-8.453[a]	-8.057[a]	-7.000[a]	-8.960[a]
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

APPENDIX B – TRAINING

Ranks

		N	Mean Rank	Sum of Ranks
three - Training on the use of STG's and the EML is adequate	Negative Ranks	63[a]	49.13	3095.00
	Positive Ranks	34[b]	48.76	1658.00
	Ties	23[c]		
	Total	120		
three - I have found the training on STG's and the EML beneficial to me	Negative Ranks	76[d]	47.50	3610.00
	Positive Ranks	19[e]	50.00	950.00
	Ties	25[f]		
	Total	120		

a. three < Training on the use of STG's and the EML is adequate

b. three > Training on the use of STG's and the EML is adequate

c. three = Training on the use of STG's and the EML is adequate

d. three < I have found the training on STG's and the EML beneficial to me

e. three > I have found the training on STG's and the EML beneficial to me

f. three = I have found the training on STG's and the EML beneficial to me

Test Statistics[b]

	three - Training on the use of STG's and the EML is adequate	three - I have found the training on STG's and the EML beneficial to me
Z	-2.712[a]	-5.126[a]
Asymp. Sig. (2-tailed)	.007	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

APPENDIX C – DOSAGE CALCULATION OF MEDICINES

Frequencies

	Dosage is calculated according to body weight by the registered nurse				The dose is calculated according to age by the registered nurse				The dosage can always be chosen from weight bands			
	Category	Observed N	Expected N	Residual	Category	Observed N	Expected N	Residual	Category	Observed N	Expected N	Residual
1	Yes	107	60.0	47.0	Yes	105	60.0	45.0	Yes	96	60.0	36.0
2	No	13	60.0	-47.0	No	15	60.0	-45.0	No	24	60.0	-36.0
Total		120				120				120		

Test Statistics

	Dosage is calculated according to body weight by the registered nurse	The dose is calculated according to age by the registered nurse	The dosage can always be chosen from weight bands
Chi-Square	73.633[a]	67.500[a]	43.200[a]
df	1	1	1
Asymp. Sig.	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

Calculation of doses for medicines is easily understood

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	5.8	5.8	5.8
	Disagree	5	4.2	4.2	10.0
	Unsure	7	5.8	5.8	15.8
	Agree	75	62.5	62.5	78.3
	Strongly agree	26	21.7	21.7	100.0
	Total	120	100.0	100.0	

Ranks

		N	Mean Rank	Sum of Ranks
three - Calculation of doses for medicines is easily understood	Negative Ranks	101[a]	55.04	5559.50
	Positive Ranks	12[b]	73.46	881.50
	Ties	7[c]		
	Total	120		

a. three < Calculation of doses for medicines is easily understood

b. three > Calculation of doses for medicines is easily understood

c. three = Calculation of doses for medicines is easily understood

Test Statistics[b]

	three - Calculation of doses for medicines is easily understood
Z	-7.039[a]
Asymp. Sig. (2-tailed)	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

APPENDIX D – PRESCRIPTION WRITING

Test Statistics

	I write medicines or preparations in full using the generic name	I use abbreviations	I state the frequency of doses in terms of Time (e.g. 8 hourly or 3x a day)	I date the prescription	I sign the prescription	I print my name after my signature on the prescription	I write the schedule of the prescribed medication
Chi-Square	87.167[a]	45.583[a]	218.083[a]	283.083[a]	351.917[a]	50.417[a]	82.750[a]
df	4	4	4	4	4	4	4
Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 24.0.

I feel confident that I know about prescription writing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.7	1.7	1.7
	Disagree	3	2.5	2.5	4.2
	Unsure	4	3.3	3.3	7.5
	Agree	70	58.3	58.3	65.8
	Strongly agree	41	34.2	34.2	100.0
	Total	120	100.0	100.0	

Ranks

		N	Mean Rank	Sum of Ranks
three - I feel confident that I know about prescription writing	Negative Ranks	111[a]	58.42	6485.00
	Positive Ranks	5[b]	60.20	301.00
	Ties	4[c]		
	Total	120		

a. three < I feel confident that I know about prescription writing

b. three > I feel confident that I know about prescription writing

Ranks

		N	Mean Rank	Sum of Ranks
three - I feel confident that I know about prescription writing	Negative Ranks	111[a]	58.42	6485.00
	Positive Ranks	5[b]	60.20	301.00
	Ties	4[c]		
	Total	120		

a. three < I feel confident that I know about prescription writing

b. three > I feel confident that I know about prescription writing

c. three = I feel confident that I know about prescription writing

Test Statistics[b]

	three - I feel confident that I know about prescription writing
Z	-8.852[a]
Asymp. Sig. (2-tailed)	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

APPENDIX E – CHRONIC ILLNESS

Test Statistics

	Competence in assessing patient's adherence to treatment plan.	Competence in creating a treatment plan for the patient.	Ability to motivate patients to participate in treatment support programs.	Ability to identify and set goals with patients.	Ability to encourage patients to adopt change techniques (life style modification).
Chi-Square	168.350[a]	122.450[a]	99.050[a]	130.200[a]	184.550[a]
df	2	2	2	2	2
Asymp. Sig.	.000	.000	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 40.0.

APPENDIX F – DISEASE NOTIFICATION PROCEDURES

Test Statistics

	I am aware of the different notifiable diseases.	I understand the notification procedure of notifiable diseases.
Chi-Square	112.133[a]	86.700[a]
df	1	1
Asymp. Sig.	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

Ranks

		N	Mean Rank	Sum of Ranks
three - Tracing of diseases is made easy by notifying on a case based form.	Negative Ranks	94[a]	51.76	4865.00
	Positive Ranks	11[b]	63.64	700.00
	Ties	15[c]		
	Total	120		

a. three < Tracing of diseases is made easy by notifying on a case based form.

b. three > Tracing of diseases is made easy by notifying on a case based form.

c. three = Tracing of diseases is made easy by notifying on a case based form.

Test Statistics

	three - Tracing of diseases is made easy by notifying on a case based form.
Z	-6.940[a]
Asymp. Sig. (2-tailed)	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

APPENDIX G – ADVERSE DRUG REACTION REPORTING

Ranks

		N	Mean Rank	Sum of Ranks
three - I am confident that I understand the management of drug reactions.	Negative Ranks	96[a]	50.91	4887.50
	Positive Ranks	7[b]	66.93	468.50
	Ties	17[c]		
	Total	120		
three - I am confident that I know how to report an adverse drug reaction.	Negative Ranks	98[d]	52.72	5167.00
	Positive Ranks	8[e]	63.00	504.00
	Ties	14[f]		
	Total	120		

a. three < I am confident that I understand the management of drug reactions.

b. three > I am confident that I understand the management of drug reactions.

c. three = I am confident that I understand the management of drug reactions.

d. three < I am confident that I know how to report an adverse drug reaction.

e. three > I am confident that I know how to report an adverse drug reaction.

f. three = I am confident that I know how to report an adverse drug reaction.

Test Statistics

	three - I am confident that I understand the management of drug reactions.	three - I am confident that I know how to report an adverse drug reaction.
Z	-7.649[a]	-7.684[a]
Asymp. Sig. (2-tailed)	.000	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

APPENDIX H – FLOW CHARTS

Ranks

		N	Mean Rank	Sum of Ranks
three - Flow charts are easy to follow e.g. sexually transmitted infections, neonatal resuscitation, trauma and emergencies.	Negative Ranks	101[a]	53.29	5382.50
	Positive Ranks	4[b]	45.63	182.50
	Ties	15[c]		
	Total	120		
three - Flow charts are accessible.	Negative Ranks	91[d]	50.75	4618.50
	Positive Ranks	11[e]	57.68	634.50
	Ties	18[f]		
	Total	120		

a. three < Flow charts are easy to follow e.g. sexually transmitted infections, neonatal resuscitation, trauma and emergencies.

b. three > Flow charts are easy to follow e.g. sexually transmitted infections, neonatal resuscitation, trauma and emergencies.

c. three = Flow charts are easy to follow e.g. sexually transmitted infections, neonatal resuscitation, trauma and emergencies.

d. three < Flow charts are accessible.

e. three > Flow charts are accessible.

f. three = Flow charts are accessible.

Test Statistics

	three - Flow charts are easy to follow e.g. sexually transmitted infections, neonatal resuscitation, trauma and emergencies.	three - Flow charts are accessible.
Z	-8.621[a]	-6.941[a]
Asymp. Sig. (2-tailed)	.000	.000

a. Based on positive ranks.

b. Wilcoxon Signed Ranks Test

CROSS TABULATION ANALYSIS

APPENDIX I – BY CLINIC

Ranks

	Type of clinic	N	Mean Rank
Guidelines are easy to understand	Clinic	103	62.16
	Mobile clinic	5	77.60
	Community health centre	6	31.33
	Gateway clinic	6	47.00
	Total	120	
When in doubt about guidelines I am able to get help from the person in charge	Clinic	103	62.15
	Mobile clinic	5	77.90
	Community health centre	6	45.50
	Gateway clinic	6	32.67
	Total	120	

	Guidelines are easy to understand	When in doubt about guidelines I am able to get help from the person in charge
Chi-Square	8.717	8.145
df	3	3
Asymp. Sig.	.033	.043

APPENDIX J

Crosstab

Count

		I have received in-service training on the use of STG's and the EML at the clinic where I am working		Total
		Yes	No	
Type of clinic	Clinic	62	41	103
	Mobile clinic	5	0	5
	Community health centre	1	5	6
	Gateway clinic	0	6	6
Total		68	52	120

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	16.101[a]	3	.001	.000		
Likelihood Ratio	20.332	3	.000	.000		
Fisher's Exact Test	15.638			.000		
Linear-by-Linear Association	9.137[b]	1	.003	.002	.002	.001
N of Valid Cases	120					

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is 2.17.

b. The standardized statistic is 3.023.

APPENDIX K

Count

		The dosage can always be chosen from weight bands		Total
		Yes	No	
Type of clinic	Clinic	87	16	103
	Mobile clinic	5	0	5
	Community health centre	1	5	6
	Gateway clinic	3	3	6
Total		96	24	120

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	20.951[a]	3	.000	.000		
Likelihood Ratio	17.409	3	.001	.000		
Fisher's Exact Test	16.154			.001		
Linear-by-Linear Association	12.261[b]	1	.000	.001	.001	.001
N of Valid Cases	120					

a. 6 cells (75.0%) have expected count less than 5. The minimum expected count is 1.00.

b. The standardized statistic is 3.502.

APPENDIX L

Ranks

	Age	N	Mean Rank
Calculation of doses for medicines is easily understood	20 - 29	8	57.44
	30 - 39	43	51.21
	40 - 49	35	61.29
	50+	34	72.16
	Total	120	
I state the frequency of doses in terms of Time (e.g. 8 hourly or 3x a day)	20 - 29	8	34.88
	30 - 39	43	59.19
	40 - 49	35	60.96
	50+	34	67.72
	Total	120	
I date the prescription	20 - 29	8	58.00
	30 - 39	43	51.87
	40 - 49	35	66.90
	50+	34	65.41
	Total	120	
I feel confident that I know about prescription writing	20 - 29	8	39.88
	30 - 39	43	53.31
	40 - 49	35	62.10
	50+	34	72.79
	Total	120	

	Calculation of doses for medicines is easily understood	I state the frequency of doses in terms of Time (e.g. 8 hourly or 3x a day)	I date the prescription	I feel confident that I know about prescription writing
Chi-Square	9.351	9.577	9.684	11.776
df	3	3	3	3
Asymp. Sig.	.025	.023	.021	.008

APPENDIX M

Count

		Ability to motivate patients to participate in treatment support programs.			Total
		Adequate	Not adequate	Unsure	
Age	20 - 29	3	3	2	8
	30 - 39	34	8	1	43
	40 - 49	25	5	5	35
	50+	29	4	1	34
Total		91	20	9	120

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	12.783[a]	6	.047	.047		
Likelihood Ratio	11.787	6	.067	.091		
Fisher's Exact Test	11.944			.039		
Linear-by-Linear Association	2.651[b]	1	.103	.107	.061	.017
N of Valid Cases	120					

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is .60.

b. The standardized statistic is -1.628

APPENDIX N

Crosstab

Count

		I am aware of the different notifiable diseases.		Total
		Yes	No	
Age	20 - 29	6	2	8
	30 - 39	43	0	43
	40 - 49	35	0	35
	50+	34	0	34
Total		118	2	120

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	28.475[a]	3	.000	.004		
Likelihood Ratio	11.346	3	.010	.004		
Fisher's Exact Test	9.767			.004		
Linear-by-Linear Association	7.486[b]	1	.006	.004	.004	.004
N of Valid Cases	120					

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .13.

b. The standardized statistic is -2.736.

APPENDIX O

Crosstab

Count

		I understand the notification procedure of notifiable diseases.		
		Yes	No	Total
Age	20 - 29	5	3	8
	30 - 39	40	3	43
	40 - 49	32	3	35
	50+	34	0	34
Total		111	9	120

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	13.210[a]	3	.004	.006		
Likelihood Ratio	11.110	3	.011	.012		
Fisher's Exact Test	9.848			.008		
Linear-by-Linear Association	6.991[b]	1	.008	.008	.006	.004
N of Valid Cases	120					

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .60.

b. The standardized statistic is -2.644.

APPENDIX P

Ranks

	Experience	N	Mean Rank
Calculation of doses for medicines is easily understood	Up to 4 years	35	56.16
	5 - 9 years	41	53.07
	10 - 14 years	21	57.21
	15 years or more	23	83.35
	Total	120	
I write the schedule of the prescribed medication	Up to 4 years	35	47.76
	5 - 9 years	41	65.72
	10 - 14 years	21	63.52
	15 years or more	23	67.83
	Total	120	

	Calculation of doses for medicines is easily understood	I write the schedule of the prescribed medication
Chi-Square	16.806	7.959
df	3	3
Asymp. Sig.	.001	.047

Crosstab

Count

		The dosage can always be chosen from weight bands		Total
		Yes	No	
Experience	Up to 4 years	32	3	35
	5 - 9 years	27	14	41
	10 - 14 years	18	3	21
	15 years or more	19	4	23
Total		96	24	120

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8.512[a]	3	.037	.035		
Likelihood Ratio	8.498	3	.037	.044		
Fisher's Exact Test	7.912			.046		
Linear-by-Linear Association	.114[b]	1	.736	.753	.406	.078
N of Valid Cases	120					

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 4.20.

b. The standardized statistic is .337.

Cross- tabulation – qualification

APPENDIX Q

Ranks

	Qual - Degree Nursing Science	N	Mean Rank
Guidelines are easy to understand	Yes	9	81.33
	No	111	58.81
	Total	120	
Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients	Yes	9	82.67
	No	111	58.70
	Total	120	

	Guidelines are easy to understand	Guidelines are helpful when assessing/diagnosing, prescribing, treating and health educating clients
Chi-Square	4.635	5.075
df	1	1
Asymp. Sig.	.031	.024

Record Reviews

APPENDIX R

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Drugs	120	20.00	100.00	90.8333	14.64328
Schedule	120	.00	100.00	20.0000	33.80617
Dose	120	.00	100.00	74.3333	32.61008
Route	120	.00	100.00	14.1667	25.32423
Frequency	120	.00	100.00	68.5000	32.34920

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Drugs	120	20.00	100.00	90.8333	14.64328
Schedule	120	.00	100.00	20.0000	33.80617
Dose	120	.00	100.00	74.3333	32.61008
Route	120	.00	100.00	14.1667	25.32423
Frequency	120	.00	100.00	68.5000	32.34920
Valid N (listwise)	120				

Drugs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20.00	1	.8	.8	.8
	60.00	11	9.2	9.2	10.0
	80.00	29	24.2	24.2	34.2
	100.00	79	65.8	65.8	100.0
	Total	120	100.0	100.0	

Schedule

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	81	67.5	67.5	67.5
	20.00	9	7.5	7.5	75.0
	40.00	6	5.0	5.0	80.0
	60.00	8	6.7	6.7	86.7
	80.00	5	4.2	4.2	90.8
	100.00	11	9.2	9.2	100.0
	Total	120	100.0	100.0	

Dose

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	11	9.2	9.2	9.2
	20.00	7	5.8	5.8	15.0
	40.00	4	3.3	3.3	18.3
	60.00	16	13.3	13.3	31.7
	80.00	27	22.5	22.5	54.2
	100.00	55	45.8	45.8	100.0
	Total	120	100.0	100.0	

Route

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	81	67.5	67.5	67.5
	20.00	16	13.3	13.3	80.8
	40.00	10	8.3	8.3	89.2
	60.00	7	5.8	5.8	95.0
	80.00	2	1.7	1.7	96.7
	100.00	4	3.3	3.3	100.0
	Total	120	100.0	100.0	

Frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	10	8.3	8.3	8.3
	20.00	8	6.7	6.7	15.0
	40.00	13	10.8	10.8	25.8
	60.00	23	19.2	19.2	45.0
	80.00	22	18.3	18.3	63.3
	100.00	44	36.7	36.7	100.0
	Total	120	100.0	100.0	

Ranks

		N	Mean Rank	Sum of Ranks
fifty - Drugs	Negative Ranks	119[a]	60.79	7233.50
	Positive Ranks	1[b]	26.50	26.50
	Ties	0[c]		
	Total	120		
fifty - Schedule	Negative Ranks	24[d]	41.13	987.00
	Positive Ranks	96[e]	65.34	6273.00
	Ties	0[f]		
	Total	120		
fifty - Dose	Negative Ranks	98[g]	61.15	5993.00
	Positive Ranks	22[h]	57.59	1267.00
	Ties	0[i]		
	Total	120		
fifty - Route	Negative Ranks	13[j]	32.92	428.00
	Positive Ranks	107[k]	63.85	6832.00
	Ties	0[l]		
	Total	120		
fifty - Frequency	Negative Ranks	89[m]	63.74	5672.50
	Positive Ranks	31[n]	51.21	1587.50
	Ties	0[o]		
	Total	120		

Route

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	81	67.5	67.5	67.5
	20.00	16	13.3	13.3	80.8
	40.00	10	8.3	8.3	89.2
	60.00	7	5.8	5.8	95.0
	80.00	2	1.7	1.7	96.7
	100.00	4	3.3	3.3	100.0

a. fifty < Drugs

b. fifty > Drugs

c. fifty = Drugs

d. fifty < Schedule

e. fifty > Schedule

f. fifty = Schedule

g. fifty < Dose

h. fifty > Dose

i. fifty = Dose

j. fifty < Route

k. fifty > Route

l. fifty = Route

m. fifty < Frequency

n. fifty > Frequency

o. fifty = Frequency

Test Statistics

	fifty - Drugs	fifty - Schedule	fifty - Dose	fifty - Route	fifty - Frequency
Z	-9.809[a]	-7.345[b]	-6.342[a]	-8.787[b]	-5.440[a]
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000

a. Based on positive ranks.

b. Based on negative ranks.

c. Wilcoxon Signed Ranks Test

Polypharmacy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	36	30.0	30.0	30.0
	No	84	70.0	70.0	100.0
	Total	120	100.0	100.0	

Test Statistics

	Polypharmacy
Chi-Square	19.200[a]
df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 60.0.

APPENDIX S

Ranks

	I write the schedule of the prescribed medication	N	Mean Rank
Schedule	Never	6	41.00
	Rarely	7	47.43
	Sometimes	22	51.50
	Often	24	56.81
	Always	61	68.61
	Total	120	

	Schedule
Chi-Square	11.488
df	4

Ranks

	I write the schedule of the prescribed medication	N	Mean Rank	Sum of Ranks
Schedule	Never	6	20.50	123.00
	Always	61	35.33	2155.00
	Total	67		

Test Statistics

	Schedule
Mann-Whitney U	102.000
Wilcoxon W	123.000
Z	-2.010
Asymp. Sig. (2-tailed)	.044

a. Not corrected for ties.

b. Grouping Variable: I write the schedule of the prescribed medication

Ranks

	I write the schedule of the prescribed medication	N	Mean Rank	Sum of Ranks
Schedule	Sometimes	22	33.48	736.50
	Always	61	45.07	2749.50
	Total	83		

Test Statistics

	Schedule
Mann-Whitney U	483.500
Wilcoxon W	736.500
Z	-2.232
Asymp. Sig. (2-tailed)	.026

a. Grouping Variable: I write the schedule of the prescribed medication

Ranks

	Type of clinic	N	Mean Rank	Sum of Ranks
Schedule	Clinic	103	53.17	5477.00
	Mobile clinic	5	81.80	409.00
	Total	108		

APPENDIX T

Test Statistics

	Schedule
Mann-Whitney U	121.000
Wilcoxon W	5477.000
Z	-2.403
Asymp. Sig. (2-tailed)	.016

a. Grouping Variable: Type of clinic

Ranks

	Type of clinic	N	Mean Rank	Sum of Ranks
Schedule	Clinic	103	53.60	5521.00
	Gateway clinic	6	79.00	474.00
	Total	109		

Test Statistics

	Schedule
Mann-Whitney U	165.000
Wilcoxon W	5521.000
Z	-2.311
Asymp. Sig. (2-tailed)	.021

a. Grouping Variable: Type of clinic

Ranks

	Type of clinic	N	Mean Rank	Sum of Ranks
Schedule	Mobile clinic	5	8.40	42.00
	Community health centre	6	4.00	24.00
	Total	11		

Test Statistics

	Schedule
Mann-Whitney U	3.000
Wilcoxon W	24.000
Z	-2.538
Asymp. Sig. (2-tailed)	.011

a. Not corrected for ties.

b. Grouping Variable: Type of clinic

Ranks

	Type of clinic	N	Mean Rank	Sum of Ranks
Schedule	Community health centre	6	4.50	27.00
	Gateway clinic	6	8.50	51.00
	Total	12		

Test Statistics

	Schedule
Mann-Whitney U	6.000
Wilcoxon W	27.000
Z	-2.309
Asymp. Sig. (2-tailed)	.021

a. Not corrected for ties.

b. Grouping Variable: Type of clinic