

**Knowledge, utilisation and perceptions of the
chiropractic profession by general practitioners in
Harare, Zimbabwe**

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of Technology in Chiropractic in the Faculty of Health Sciences at the Durban
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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is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources).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.

Signature of student

Date

Approved for final submission

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ABSTRACT

Background:

There have been an increased number of patients using complementary alternative medicine (CAM), including chiropractic care. All population age groups are utilising chiropractic treatment for various ailments. Research has shown that general practitioners have limited knowledge and perception about chiropractic in many countries. Their perception towards other health care professionals is important, particularly in their role as gatekeepers in the health care system. The current perception in Zimbabwe is thought to be no referral of patients between general practitioners and chiropractors and a low degree of knowledge amongst general practitioners about chiropractic.

Aim: The aim of this study was to determine the knowledge, utilisation and perceptions of general practitioners in Harare, Zimbabwe.

Objectives:

- To establish the knowledge about chiropractic amongst general practitioners in Harare, Zimbabwe.
- To determine perceived role and utilisation of chiropractic by general practitioners in Harare, Zimbabwe.
- To determine the relationships, if any, between knowledge, perception, and utilisation of chiropractic by general practitioners in Harare, Zimbabwe.

Methods: The study was a descriptive, quantitative, cross-sectional study using a structured questionnaire adapted from similar studies. The questionnaire was validated by means of a focus group discussion. The survey was conducted on a random sample of 72 general practitioners practising in the Avenues area of Harare, Zimbabwe. A single stage sampling techniques was used to select participants from a list of 88 registered general practitioners from the Medical and Dental Practitioners Council of Zimbabwe who met the inclusion criteria.

Questionnaires were provided to general practitioners who were in private practice in the Avenues area of Harare, Zimbabwe at the time of the study by the researcher. The data collected was analysed using the Statistical Package for Social Science (SPSS)[®] 2.4 (IBM, Armonk, NY. USA) software at a statistical significance of $p < 0.05$. Pearson's correlation was used to assess the relationship between continuous variables, while the t test was used to compare the mean scores between independent binary variables.

Results: Many of the participants had some kind of knowledge regarding chiropractic modalities, areas of chiropractic specialisation but only a few had adequate knowledge and a good perception of it. General practitioners who were knowledgeable about chiropractic tended to have a positive perception and were more likely to refer patients to a chiropractor.

A response rate of 54.5 percent was achieved. Most of the respondents tended to be in the age group of 35-54 and most were female (54.2 percent). Over 90 percent of the participants referred patients with musculoskeletal complaints to physiotherapists while only 16.67 percent referred to chiropractors. More than 65 percent of the participants responded that they knew something about chiropractic, and of these almost 50 percent obtained their information from the media. Over 80 percent of the participants who knew something about chiropractic thought that extremities, neuro-musculoskeletal system, rehabilitation and sports injuries were areas chiropractors can specialise in. Almost all the participants who knew something about chiropractic were aware of adjustments or manipulation of joints as modalities of chiropractic treatment.

Majority (75.8 percent) of the participants who knew something about chiropractic thought that chiropractic could help selected conditions, while only 3 percent felt it was not effective and 21.2 percent felt they were not informed enough to comment. GP's surveyed considered chronic back pain (91 percent), sports trauma (85 percent), shoulder/knee problems (79 percent), arthritis (76 percent), back and pelvic problems during pregnancy (70 percent), nerve root entrapment (70 percent) and carpal tunnel syndrome (70 percent) as some of the appropriate conditions

for chiropractors to treat. Forty two percent of the GP's referred patients to chiropractors mostly on both the patient's request and their own judgment. The main reason for not referring patients to chiropractors cited by most (70 percent) of the GPs was limited knowledge about chiropractic care.

There was a statistically significant and moderately high positive correlation between knowledge and perception scores ($r=0.668$). This study suggests that GP's who have a higher degree of knowledge about chiropractic tend to have a positive perception of chiropractic. There was a non-significant difference in knowledge between those who refer patients and those who do not ($p=0.425$). In this study knowledge about chiropractic did not significantly influence referral to chiropractors. There was however a statistically significant difference in perception between those who refer patients and those who do not ($p=0.006$). The perceptions were higher in those who refer patients compared to those who do not refer patients. Perceptions were found to determine utilisation rather than knowledge even though there was a correlation between the two.

DEDICATION

I dedicate this dissertation in loving memory of my late brother Silver Stallon Thondhlana and my family for their unwavering support, love and care. Thank you for affording me the opportunity to complete this degree.

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DEFINITION LIST

Chiropractic:

A health profession specialising in the diagnosis, treatment and prevention of disorders of the musculoskeletal system and the effects of these disorders on the function of the nervous system and general health (World Federation of Chiropractic 2009).

Chiropractor:

A practitioner registered with the Allied Health Profession Council of South Africa (AHPCSA), who has studied for five years in diagnosing musculoskeletal disorders, specifically of the spinal system, and in providing treatment through the use of manual manipulation (World Federation of Chiropractic 2009).

Complementary and Alternative Medicine:

Complementary and alternative medicine is a group of diverse medical and health care systems and practices that are not considered to be part of conventional medicine (NCCAM 2008).

Demographics:

A statistical term used to categorise differences within a sample group of a given population, (for example: ethnic group, gender, age, economic status, highest level of education) (The South African Concise Oxford Dictionary 2002).

Environment:

The surroundings in which an individual lives or functions (The South African Concise Oxford Dictionary 2002). In the context of this research, the environment is the Zimbabwean health care setting in which the GPs function.

General practitioner:

A medical doctor who provides primary care and specialises in family medicine. They treat patients with minor or chronic illnesses, refers patients who need further management, provides preventive care and health education for all (Pedersen, Andersen and Sondergaard 2012).

Knowledge:

In the context of this study, knowledge means the cognitive state of comprehending information or having acquired an understanding through personal experience, listening to others and / or practical experience (Pintrich 2002).

Osteopath:

A complementary health care practitioner who practices osteopathy. A system based on a theory that diseases are due to chiefly to loss of structural integrity which can be restored by manipulation (Merriam-Wester Dictionary 2018).

Perception:

Is the process by which people select, organise and interpret information to form a meaningful picture of their environment (Hayes 1994).

Perceptual set:

The state of awareness, based on previous learning that prepares a person to anticipate what to expect so that they can take effective action (Hayes 1994).

Physiotherapist:

A person qualified to treat disease, injury, or deformity by physical methods such as massage, heat, movement and exercise and advice (Chartered Society of Physiotherapy 2018).

Practitioner:

A qualified person who practices their learned profession (The South African Concise Oxford Dictionary 2002) (for example: a General practitioner).

Professional:

A member of a profession, a specialised group of people, (for example: members of the chiropractic profession) (The South African Concise Oxford Dictionary 2002).

ACRONYM LIST

AHPCSA	Allied Health Professions Council of South Africa
CASA	Chiropractic Association of South Africa
CAM	Complementary Alternative Medicine
DUT	Durban University of Technology
GP	General Practitioner
MBChB	Bachelor of Medicine and Bachelor of Surgery degrees
MDPCZ	Medical and Dental Practitioners Council of Zimbabwe
NCCAM	National Center for Complementary and Alternative Medicine
SPSS	Statistical Package for Social Science
UK	United Kingdom
US	United States
WFC	World Federation of Chiropractic
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Chiropractic is classified under the umbrella term of complementary alternative medicine (CAM) (Brown *et al.* 2014). This group of medicine has stirred up a lot of controversies regarding its definition, scientific evidence and effectiveness (Giannelli *et al.* 2014; Verhoef and Sutherland 1995). According to Rosner 2016, CAM is an adjunct to conventional medicine because it is widely regarded as having little or no scientific evidence to prove its effectiveness. CAM includes a diversity of diagnostic and therapeutic practices in which the fundamental theory or explanatory mechanisms do not adapt to existing medical thinking (National Centre for Complementary and Alternative Medicine (NCCAM) 2008; Giannelli *et al.* 2007). CAM includes therapies such as acupuncture, homeopathy, manipulative therapies (including chiropractic and osteopathy), Bach flower therapy, Shiatsu, plantar reflexology, Ayurveda, mesotherapy (technique where medication is injected into the mesoderm) using unconventional medications, and pranotherapy (energy healing based on the laying-on of hands) (Rosner 2016; Brown *et al.* 2014; Bjersa, Victorin and Olsen 2012; Maha and Shaw 2007).

International use of CAM is high and increasing (Bjersa, Victorin and Olsen 2012; Flannery *et al.* 2006; Astin *et al.* 1998; Eisenberg *et al.* 1993). This could be due to the advances in medical practices in which further research into its benefits demonstrate its effectiveness (Giannelli *et al.* 2014). Other reasons that may attribute to its increased utilisation include: patient dissatisfaction with conventional medicine to treat chronic illness effectively, and patients wanting a more holistic approach to health that is less medically invasive (Brown *et al.* 2014; Astin *et al.* 1998).

Wardle, Sibbritt and Adams (2013); Greene *et al.* (2006) as well as Konrad, Fletcher and Carey (2004) found chiropractic care to be one of the most frequently sought-after CAM options because their studies reported a high level of patient satisfaction in several countries. However, the acceptance of CAM therapies such as chiropractic is still low in many countries such as Indonesia, Japan, Korea and Taiwan (Tetrault, Auerbach and Durrett 2017; Bjersa, Victorin and Olsen 2012; Chapman-Smith 2009; Goldrteszmidt *et al.* 1995).

Chiropractic is a health care profession specialising in the diagnosis, treatment, and prevention of mechanical conditions of the neuro-musculoskeletal system and the effects of these conditions on the function of the nervous system and general health (Chiropractic Association of South Africa (CASA) 2017; Chapman-Smith 2009; Heslop 2008; Brussee, Assendelft and Breen 2001). Chiropractors use non-invasive manual treatment methods such as joint manipulation, with a focus on joint dysfunction (CASA 2017; LeFebvre, Peterson and Haas 2012). Patients are subsequently referred to medical practitioners should medication or surgery be indicated (Rosner 2016; Chapman-Smith 2009). The promotion of healthy lifestyles further supports the treatment approach such as the avoidance of smoking, reduced stress levels, dietary changes, and physical activity (CASA 2017).

In some countries and over the past five decades, the chiropractic profession has expanded as a valuable discipline in the healthcare system (Meeker and Haldeman 2002). In countries such as Australia, United Kingdom, and Norway, chiropractic is a legislated profession that is well integrated in the public health sector (Brown *et al.* 2014; Westin *et al.* 2013; Maha and Shaw 2007), but in, Indonesia, South Korea and Taiwan chiropractic is still legally unrecognized (Tetrault, Auerbach and Durrett 2017; Chapman-Smith 2009). Consequently, a doctor of chiropractic (once qualified, graduate chiropractors are entitled to use the term Doctor), runs the risk of prosecution for practicing chiropractic in these countries (WHO 2001). However, some countries recognise chiropractic as a legal but private health care option which is minimally integrated in the public health care

system. These countries include: Sweden, South Africa, and Zimbabwe (Tetrault, Auerbach and Durrett 2017). In South Africa, chiropractic is not integrated into mainstream healthcare although it is available for public consultation at Kimberley Hospital, a government hospital (Meyer 2009). This means it is a wanted or needed treatment within the South African healthcare system. In the case of Zimbabwe, chiropractic is a legally recognised profession as per the Chiropractic Act of 1981.

Knowledge, perceptions and utilisation on the role of chiropractic by other health professionals vary in many countries due to differences in the scope of practice and level of integration into the health care system (Westin *et al.* 2013; Bjersa, Victorin and Olsen 2012; Joos *et al.* 2008). General practitioners' (GPs) knowledge and opinions of chiropractic is especially important as they would most often receive positive or negative feedback from their patients (Pedersen, Andersen and Sondergaard 2012; Pirota *et al.* 2010). As such, GPs act as 'gatekeepers' in the health care system and have the power to refer or not to refer patients to chiropractors (Westin *et al.* 2013; Pedersen, Andersen and Sondergaard 2012). But according to previous research, GPs' knowledge of chiropractic may vary from not knowing anything about the discipline to knowing exactly the role chiropractors undertake in the health care system (Westin *et al.* 2013; Bjersa, Victorin and Olsen 2012; Giannelli *et al.* 2007, Louw and Myburgh 2007). For example, most GPs correctly perceive chiropractic as a drug-free complementary alternative medicine for the treatment and management of musculoskeletal conditions (Westin *et al.* 2013; Maha and Shaw 2007). But, some GPs see it as a replacement and threat to the medical field (Pirota *et al.* 2010). Little is known about how Zimbabwean GPs perception of chiropractors or even what knowledge they have of this CAM. Therefore, this study aimed to investigate their knowledge, utilisation and perceptions of chiropractic professions.

1.2 Research Aim and Objectives

The aim of this study was to investigate the knowledge, perceptions, and utilisation of the chiropractic profession by general practitioners in Harare, Zimbabwe.

1.3 Objectives

1. To establish general practitioners, who practice in Harare, Zimbabwe knowledge about chiropractic.
2. To determine general practitioners, who practice in Harare, Zimbabwe perceived role of chiropractors and utilisation thereof.
3. To determine the associations, if any, between knowledge, perception, and utilisation of chiropractic by general practitioners in Harare, Zimbabwe.

1.4 Rationale for the Study

An effective and holistic health care delivery system occurs when conventional and complementary care practitioners, communicate with each other, and combine their observations, expertise and decision-making responsibilities to optimise patients' care (Barbiker *et al.* 2014). This is temporally important as patients rarely consult just one health care professional (Barbiker *et al.* 2014; Gaylord and Mann 2007; Maha and Shaw 2007; Eisenberg *et al.* 1993). In the setting of a complex health care system, effective communication is vital for patient safety as it reduces adverse effects due to miscommunication with others managing the patient, and misunderstandings of roles and responsibilities (Barbiker *et al.* 2014; Barwell, Arnold and Berry 2013). In essence there is great need to ascertain and improve GPs' knowledge of chiropractic to offer optimum patient benefits (Brown 2012).

Although research on GPs knowledge and perceptions of chiropractic has previously been undertaken in other countries such as Canada, Germany, Norway, South Africa, Sweden, the Netherlands and the United Kingdom (Westin *et al.* 2013; Bjersa, Victorin and Olsen 2012; Joos *et al.* 2008; Louw and Myburgh 2007;

Brussee, Assendelft and Breen 2001), it is evident from these studies that different factors influence their thinking and utilisation of chiropractic. Furthermore, perception is subjective and attributable to factors in the chiropractic profession and the Zimbabwean health care setting (Bergh and Theron 1999; Maund 1999; Eysenck and Keane 1996; Hayes 1994). However, no research, to our knowledge, has been conducted amongst medical doctors in Zimbabwe.

This research is important to reveal the perceptions and knowledge that general practitioners in Harare, Zimbabwe have of the chiropractic profession. In so doing, this study seeks to determine the current level of knowledge, utilisation and perception of chiropractic by general practitioners and to identify the associations between these, if any. This could lead to a more comprehensive approach to patient care as well as an overall increased awareness and improved inter-professional communication. It will also help identify ways of integrating chiropractic into the public health care system in Zimbabwe.

1.5 Significance of the Study

The study would provide insight into the knowledge, utilisation and perceptions of the chiropractic profession by general practitioners in Harare, Zimbabwe. It would also identify any associations between them. Consequently, this could lead to more holistic care for patients as well as an overall increased awareness and improved inter-professional communication. It will also help pave the way for chiropractic acceptance and integration into the public health care system in Zimbabwe.

1.6 Assumptions and Delimitations

- Although the sampling process was carefully chosen to represent the total population as much as possible, it cannot be assumed to be representative of the total population no matter how carefully the research process was carried out (Mouton, 1996).
- Although a focus group and a pilot study was employed to the questionnaire to limit misunderstandings with interpreting the questions, it cannot be assumed that all GPs interpreted the questions equally (Weber and He 2010). There was an assumption that all participants answered the questions honestly, according to their perceived reality (Brink 2007).

1.7 Outline of the Dissertation

Chapter One provides a brief introduction to the research. It contextualises the study in relation to chiropractic care and the potential limitations amongst general practitioners' in Harare, Zimbabwe knowledge, perceptions and utilisation of chiropractors. The chapter also presents the aim and objectives of the study.

Chapter Two provides a detailed review of the related literature. It outlines the outcomes of similar studies conducted as well as the unique setting of the Zimbabwean health care system.

Chapter Three presents a detailed description of how a quantitative questionnaire research methodology was structured and applied to gain information from general practitioners in Harare, Zimbabwe. It also explains the ethical considerations around the study and how they were addressed.

Chapter Four gives a description of the participants' demographics, the level of knowledge about chiropractic and the views of the general practitioners practising in the Avenues area of Harare, Zimbabwe. It provides an analysis of the associations between the knowledge, utilisation and perception of general practitioners about chiropractic and their statistical significance.

Chapter Five compares the demographics, level of knowledge, perceived role of chiropractic and utilisation of chiropractic by general practitioners who took part in this study against similar documented literature. It gives possible reasons for the differences and similarities of this study against other studies. The chapter also highlights the conclusions drawn from the study and provides some strengths of the study. In addition, recommendations for future studies will be highlighted.

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition of Chiropractic

Chiropractic is defined as a health care profession that specialises with the diagnosis, treatment and prevention of conditions affecting the nerves and the musculoskeletal system and the effect of these conditions on the nervous system and general health (World Federation of Chiropractic (WFC) 2009). Chiropractic treatments are highly individualised and utilises an integrated, holistic approach (CASA 2017). Even so, Chiropractic has been classified by the World Health Organisation (WHO) as complimentary or alternative medicine (CAM) (WHO 2001). Chiropractic care is generally accepted by patients and the public for its ability to provide a readily available, caring and sympathetic, low cost, low risk, non-invasive and natural healing approach to relieving symptoms of back pain, neck pain and certain types of headache (CASA 2017; LeFebvre, Peterson and Haas 2012).

2.2 Scope of Chiropractic Practice

The scope of practising chiropractic in Zimbabwe is parallel to that in South Africa. (In terms of the Allied Health Professions Act 1982 chiropractors in South Africa can physically examine and diagnose patients of any age. They can also offer treatment or prevention of any physical defect, illness specially related to spinal, pelvic, spino-visceral and general neuro-musculoskeletal conditions in any person (CASA 2017). The modalities of chiropractic care can be grouped into four main broad categories which are manipulation or adjustment and mobilisation of joints, soft tissue manipulation and massage, exercise and physical rehabilitation and home activity changes and dietary therapy (LeFebvre, Peterson and Haas 2012). Other electro modalities and procedures such as dry needling, ice, ultrasound,

bracing and heat are also employed in the treatment of patients by chiropractors (Department of Chiropractic and Somatology 2017).

2.3 Efficacy of Chiropractic

Chiropractic spinal manipulation is generally safe, although it has been associated with mild, transient adverse effects and cerebrovascular accidents (Salehi *et al.* 2015; Ernst 2002; Meeker and Haldeman 2002). According to Ernest (2001), no serious adverse events have been noted after spinal manipulation. Spinal manipulation was found to be effective for mainly musculoskeletal conditions such as acute, subacute and chronic neck pain, acute cervicogenic headache, whiplash and non-musculoskeletal complains such as cervicogenic dizziness in various randomised clinical trials (Salehi *et al.* 2015; LeFebvre, Peterson and Haas 2012; Ernst 2002). Effectiveness was also found when spinal manipulation is combined with exercise and massage therapy (LeFebvre, Peterson and Haas 2012). Some medical practitioners who are aware of the effectiveness of chiropractic have embraced chiropractic care for their patients. However, other medical practitioners remain sceptical or refuse to accept chiropractic as an evidence-based profession (Grace 2012; Ernst 2002; Meeker and Haldeman 2002).

Alternative modalities such as dry needling, massage and mobilisation are often used by chiropractors, osteopaths and physiotherapists in their treatment protocols (Solihull Chiropractic Clinic 2018; CASA 2017). Dry needling is often referred to acupuncture as it is parallel to acupuncture but different in certain aspects (Dorsher 2008). These two needling techniques overlap in terms of the needling instrument (solid filiform needles) and technique used, popular use in musculoskeletal disorders as well as some fundamental theories (Zhou, Ma and Brogan 2015; Dorsher 2008). Use of dry needling by manual therapists including chiropractors is based on an understanding of human anatomy and physiology regarding myofascial pain and trigger points which are indirectly reinforced by an expanding volume of clinical research on the therapeutic effectiveness of dry needling for various types of musculoskeletal pain (Zhou, Ma and Brogan 2015). Acupuncture

involves the stimulation of specific points on the body using filiform needles. Its classical theories and principles of point selection are based on historical concepts of balancing Yin and Yang and dredging 'meridians' which differentiate acupuncture from dry needling (Zhou, Ma and Brogan 2015).

Massage therapy account for several different techniques in which practitioners manually manipulate the soft tissue of the body (NCCAM 2008). Massage has been found to be beneficial for patients with persistent subacute and chronic nonspecific low back pain, chronic neck pain especially when combined with exercise and education (LeFebvre, Peterson and Haas 2012; Peters *et al.* 2002). Empirical evidence shows that this form of therapy is effective in the reduction of pain, improving alertness and immune function as well as diminishing depression (Maharaj 2015). Mobilisation technique involves passive repetitive movements of a joint within its physiological range (CASA 2017). It is very similar to manipulation except that mobilisation is a slow amplitude manoeuvre compared to manipulation which is a high velocity thrust (CASA 2017; NCCAM 2008). It is commonly indicated to restore movement of a joint, relief pain and improve physiological function (Peters *et al.* 2002).

Chiropractors, osteopaths and physiotherapists are manual therapies that share common practices but are distinctly different from each other (Solihull Chiropractic Clinic 2018). Both chiropractors and osteopaths use mainly use drug-free manipulative therapy in the treatment of conditions (CASA 2017). A chiropractor focuses on the spinal and muscular systems while an osteopath employs a more holistic approach by examining the rest of the body to determine more 'cryptic' possible causes for the patient's problem (Solihull Chiropractic Clinic 2018; CASA 2017; LeFebvre, Peterson and Haas 2012). Physiotherapy is a broad scope of practice that includes manual therapy, exercise and movement, electrotherapy and other physical approaches (Chartered Society of Physiotherapists 2018). It plays a key role in enabling people to improve their health, wellbeing and quality of life. Thus, although these professions are different in their scope of practices and point of view, they use similar techniques in treating patients.

2.4 Development of Chiropractic

Like medicine and philosophy, the practice of chiropractic was developed through apprenticeship and clinical experiential models in times when clinical trials and observational research were absent (CASA 2017, WHO 2001). The advent of chiropractic is dated back to 1895 when David Daniel Palmer performed his first chiropractic adjustment to restore the hearing of a partially deaf janitor, Harvey Lillard. The success of this treatment led to the opening of chiropractic schools two years later. Since then, the chiropractic profession has spread worldwide incorporating 50 countries (CASA 2017; LeFebvre, Peterson and Haas 2012).

The practice of chiropractic differs in its official recognition from a fully legislated profession in 50 countries (for example: US, Zimbabwe and United Kingdom) to being tolerated without full legislation (for example: France, Greece and Hungary) to where there is a risk of harassment or oppression (for instance South Korea) (Tetrault, Auerbach and Durrett 2017; Chapman-Smith 2009). Chiropractic practice in Italy only became fully legislated after a year of proposals by the Italian Chiropractic Association (Chapman-Smith 2009). In countries such as Thailand, China and Greece where the chiropractic legislation has not yet been granted, the practice of chiropractic is still in the tolerance phase where it is allowed for as long as people do not complain they have been harmed (Tetrault, Auerbach and Durrett 2017; WHO 2001).

According to the 2001 WHO world review, WHO encourages and supports the integration of allopathic and complementary/alternative medicine into the national healthcare system (WHO 2001). But, there still remains prejudicial attitudes towards CAM including chiropractic by some members of society (Grace 2012). In some countries, the medical profession still fails to accept the potential contribution of chiropractic to mainstream health care organisations. An example is the Friends of Science in Medicine (FSM); this Australian organisation only supports evidence-based medicine and is totally against the promotion and practice of therapies that have little or not been scientifically researched. This organisation aims to remove CAM such as chiropractic courses from universities as its members' view CAM

therapies including chiropractic as pseudoscience and unworthy to be included in the higher education curricula (Grace 2012).

Despite these challenges, the chiropractic profession, together with other CAM therapies, has witnessed a stable growth in popularity over the past few decades. In Australia, even with the FSM against CAM, the number of chiropractors, osteopaths and physiotherapists has doubled in the last decade. In 1998, there were 2 053 registered chiropractors compared to 4 221 in 2012 (Engel *et al.* 2014). Brown *et al.* (2014) also noted 4 432 chiropractors in 2012, a 78 percent increase in contrast to figures reported in 2006. In South Africa, the number of chiropractors is estimated to be over 300 (CASA 2017).

Chiropractic treatment has gained popularity because of its benefits gained by patients (Engel *et al.* 2014; Pirota *et al.* 2010). Health insurance officials recognise it as an important health benefit and therefore it is accepted in most medical aids (Grace 2012). Chiropractors are delivering more services to people with private health cover compared to physiotherapists and osteopaths (Brown *et al.* 2014).

2.5 Chiropractic in Zimbabwe

Chiropractic has been a legislated healthcare option since 1981 in Zimbabwe. But, it is not integrated within the public health sector (Tetrault, Auerbach and Durrett 2017; Debas, Laxminarayan and Straus 2006). Registered chiropractors in Zimbabwe can identify, analyse and diagnose any malfunction of the joints of the human body by physical examination and use of X-rays or any other instrument used for identification or analysis (Chiropractors Act of 1981). They are allowed to treat any malfunctions of the nervous system by manipulating any joints of the human body or the adjacent tissues, without the use of any medicine and without operative surgery (Department of Chiropractic and Somatology 2017). In Sweden chiropractors are not allowed to treat paediatric patients (Westin *et al.* 2013).

In 2017, there are seven registered chiropractors in Zimbabwe whereas in the early 1980s, there were only four registered chiropractors (Tetrault, Auerbach and

Durrett 2017; Debas, Laxminarayan and Straus 2006; WHO 2001). The reason for such a slow increase in numbers may be because, in 1981 a Chiropractic Act was formed that legalised chiropractic in Zimbabwe. Since the late 1990s to early 2000s the Zimbabwean health care system declined due to economic and political sanctions (Jonsson and Sapir 2009).

In 2004, over 80 percent of Zimbabweans were living below the international poverty line of two United States (U.S.) dollars a day which is equivalent to 27.20 South African rand (ZAR) (Stilwell *et al.* 2003). Since then the situation has further worsened with an extreme inflation and an unemployment rate above 80 percent (WHO 2001). Many Zimbabwean nationals have migrated to other countries including Botswana, United Kingdom, U.S. and South Africa in search of better career opportunities (Jonsson and Sapir 2009).

Amongst the migrants from Zimbabwe are health care professionals including anaesthesiologists, GPs, haematologists, nurses, pharmacists, radiographers and surgeons (Stilwell *et al.* 2003). It is possible that Zimbabweans who have studied chiropractic in other countries such as China and South Africa will practice in those countries given the situation in their home country (Stilwell *et al.* 2003). The total number of Zimbabweans who have left the country is not known as many are migrating without proper documentation. Approximately one to three million people between 2000 and 2007 have migrated from Zimbabwe (Jonsson and Sapir 2009). This may have discouraged migration of foreign chiropractors from other countries to Zimbabwe.

Furthermore, there are no universities that offer chiropractic training in Zimbabwe (Tetrault, Auerbach and Durrett 2017). Zimbabwean nationals who wish to pursue careers in chiropractic, study chiropractic in foreign countries such as U.S., United Kingdom, and South Africa (Louw and Myburgh 2007). This limits the number of students who can study chiropractic as it is often expensive to study in a foreign country due to high tuition fees for foreign students and visa requirements which are often expensive. South Africa is one of the closest countries to Zimbabwe and fees for Zimbabwean students are similar to local South African students

(Department of Finance 2017). This favours Zimbabwean students to study at universities in South Africa such as at the DUT (Meya 2016). These are some of the possible reasons for the slow growth of chiropractors in Zimbabwe.

2.6 Public Demand and Use of Chiropractic

The traditional chiropractic approach which utilises natural and less invasive methods has gained worldwide acceptance as the first point of contact for people with low back pain (LeFebvre, Peterson and Haas 2012). Neck and back problems are amongst the most commonly encountered symptoms in the general U.S. population (Barnes *et al.* 2004). Other countries According to (Brown *et al.* 2014), patients with back pain have more comorbidity, greater pharmaco-therapeutic use and a higher overall healthcare cost. But, research has found that chiropractic spinal manipulation is a useful non-invasive alternative therapy for specific low back and neck problems in various randomised controlled clinical (CASA 2017; LeFebvre, Peterson and Haas 2012). Therefore, as chiropractic is relatively inexpensive, yet effective in the management of spine related disorders, its utilisation and perception is of paramount importance.

The general public's perception and attitude towards chiropractic is more favourable than before in countries such as Australia, U.S. and South Africa (Brown *et al.* 2014; Peterson and Haas 2012; Meyer 2009). The public continues to use chiropractic care mainly for spinal pain syndromes and seemed to be very satisfied with the outcome (Barnes *et al.* 2004). With some patients regarding it as the first choice in the management of health issues (Brown *et al.* 2014).

Astin *et al.* (1998) revealed that 30 to 50 percent of the adult population used chiropractic in developed countries between 1982 and 1995. Between 52 percent and 68 percent of Australians consult a CAM therapist including chiropractors each year. A significant number of Australian patients stated that chiropractors were the most commonly consulted CAM practitioner after massage therapists (Brown *et al.* 2014; Engel *et al.* 2014). In the US, nearly eight percent of adults are expected to

consult a chiropractor per year (Barnes *et al.* 2004). The private health care insurance rebates and health care costs spent on chiropractic treatment are also continuously growing because of the demand for chiropractors (Brown *et al.* 2014).

Chiropractic is utilised for the prevention of disease, treatment of conditions (back and neck pain, joint pain and joint stiffness, allergies, arthritis, headaches and sprains or muscle strains) and general self-care (Barnes *et al.* 2004; Gaylord and Mann 2007). The disappointment with the ability of conventional medicine to treat chronic conditions sufficiently is one of the reasons patients utilise chiropractic (Brown *et al.* 2014; Astin *et al.* 1998). Patients with acquired immune deficiency syndromes, Alzheimer's disease, anxiety, cancer, chronic pain, back problems, headaches, multiple sclerosis, and rheumatoid arthritis make high use of chiropractic care (Astin *et al.* 1998). However, spinal pain remains the main reason for patients to seek chiropractic care with 64 to 86 percent of the patients reporting spine-related symptoms (LeFebvre, Peterson and Haas 2012).

Many users of chiropractic care also use conventional care, frequently for the same condition (Brown *et al.* 2014; Gaylord and Mann 2007). According to Eisenberg *et al.* (1993), many people (10% in 1990 and 11% in 1997) are seeing multiple healthcare providers for conditions that are considered ongoing. Astin *et al.* (1998) showed that there is an increased frequency of chiropractic appointments, some of which are not limited to musculoskeletal conditions, but rather general preventative, immediate and long-term care services. A study by Brown *et al.* (2014), indicated that 64 percent of patients used conventional medicine simultaneously with chiropractic care, but 30 percent said that they did not use conventional medicine in the management of their current condition(s). This suggests that the current model of people having a single point of basic healthcare is failing to meet the health needs of the general population.

Most patients who use both chiropractic and conventional care often for the same condition do not disclose their use of chiropractic to GPs (Brown *et al.* 2014; Gaylord and Mann 2007). Astin *et al.* (1998) reports that approximately seven out of 10 patients do not disclose chiropractic use to their GPs for various reasons

(Gaylord and Mann 2007, Maha and Shaw 2007). These reasons include the following:

- the belief that it was unnecessary for the doctor to know;
- the doctor never asked;
- it was not the doctor's business;
- the doctor would not understand;
- the doctor would disapprove, and
- the doctor would discourage use.

Part of the role of the consulting GP is to enquire about patient use of other health care modalities to ensure high standards of patient care. However, research confirms that conventional practitioners did not or rarely inquire about their patients use of chiropractic treatment (Bjersa, Victorin and Olsen 2012; Gaylord and Mann 2007; Maha and Shaw 2007). This seemed to indicate that GPs tend to avoid discussing chiropractic with their patients because they lack adequate knowledge to help their patients make informed choices regarding its utilisation.

The high use of chiropractic care, renewed emphasis on patient-centred care and shared decision making, and the surplus of treatment modalities patients can choose from increasingly places GPs in a position of needing to have a basic understanding and knowledge of chiropractic (Brown *et al.* 2014; Joos *et al.* 2008; Maha and Shaw 2007).

2.7 General Practitioners' Knowledge of Chiropractic

The role of a general practitioner is to provide continued and comprehensive medical care to persons, families, and societies (Medical and Dental Practitioners Council of Zimbabwe (MDPCZ) 2017). They are perceived and accepted as legitimate primary health care providers fully integrated in mainstream medicine (Pedersen, Andersen and Sondergaard 2012).

Earlier studies have shown that the majority of GP's do not know enough about chiropractic and as a result are hesitant to refer patients for chiropractic treatment (Brussee, Assendelft and Breen 2001; Verhoef and Page 1996). Eisenberg *et al.* (1993), found that GPs had relatively low knowledge about chiropractic and lacked understanding of chiropractic. Westin *et al.* (2013) conducted a comparative study in Sweden (where chiropractic is not a part of mainstream health care) and Norway (where it is integrated into mainstream health care) and reported that only seven percent of the Swedish GPs stated having good knowledge of chiropractic compared to 22 percent of Norwegian GP's. This study indicated that more than half (53%) of Swedish GP's and almost a tenth (12%) of Norwegian GP's had poor knowledge on chiropractic. Forty percent of Swedish GPs and 66 percent of Norwegian GPs reported that they knew something about chiropractic care. In Norway, where chiropractic is integrated into the public health sector, GPs had better knowledge regarding chiropractic compared to Swedish GPs where chiropractic is not part of mainstream health care. Almost all Norwegian GPs were familiar with chiropractic treatment whilst a fairly large number of the Swedish GPs claimed that they were not familiar with chiropractic (Westin *et al.* 2013). This translated into Norwegian GPs referring patients for chiropractic care almost double the number of times compared to their Swedish counterparts.

Physicians who claimed to be confident in their medical knowledge were inclined to inquire openly about their patient's use of CAM therapies including chiropractic (Flannery *et al.* 2006). They, therefore, would be more likely to refer their patients because they understood the various roles each healthcare practitioner plays in their treatment. On the contrary, GP's who knew little about chiropractic to have an opinion or did not view chiropractic as a legitimate health profession are less likely to refer their patients for chiropractic care (Greene *et al.* 2006). Many GPs who reported that they were undecided or sceptical about chiropractic care, had little or no knowledge regarding safety of chiropractic, believed that the scientific evidence for chiropractic was not solid and a lack of interest as reasons for not initiating discussions about chiropractic during consultations (Giannelli *et al.* 2007; Maha and Shaw 2007).

In South Africa, most GP's (80.5%) claimed to know something about chiropractic and the remainder (19.5%) did not know anything about chiropractic (Louw and Myburgh 2007). These findings indicated that only a few GPs have some knowledge on chiropractic. In studies conducted by Bjersa, Victorin and Olsen (2012) and Meyer (2009) in Sweden and South Africa respectively it was found that hospital medical staff including GPs, surgeons and nurses reported having very little knowledge about chiropractic. Bjersa, Victorin and Olsen (2012) also found that about ten percent of physicians in Swedish surgical university hospital wards reported no knowledge of CAM including chiropractic. Majority (over 80 percent) had minor knowledge of chiropractic. A few (less than 10%) rated their knowledge of chiropractic as good.

Brown *et al.* 2014; Flannery *et al.* 2006; Greene *et al.* 2006; van Haselen *et al.* 2004 and Corbin-Winslow and Shapiro 2002 found that mainstream medical providers who rated their knowledge of chiropractic as insufficient, were motivated to learn more about it to effectively communicate with their patients. Sixty percent of GPs who reported knowing something about chiropractic attained their knowledge from patients who were treated by a chiropractor (Louw and Myburgh 2007). More than 30 percent had been to a chiropractor themselves and hence experienced being a patient (Louw and Myburgh 2007). This suggests that some GPs are eager to learn and accept chiropractic care because they are aware of its health benefits.

A GP's knowledge is acquired through a Bachelor of Medicine degree (MBChB) studied at a University affiliated medical school (Annon 2016; Pedersen, Andersen and Sondergaard 2012; Maharajh 2010). In Zimbabwe, medical studies run for five and a half years. The programme structure focuses on basic medical science, social medical science, primary health care, occupational safety, health medical information systems and research method modules. The division of clinical practice and patient care covers medicine, surgery, anaesthetics, psychiatry, paediatrics, obstetrics and gynaecology, pharmacology and radiology (Department of Medicine 2017). The University of Zimbabwe is the only university that offers a

Bachelor of Medicine or surgery in Zimbabwe (MDPCZ 2017). This is consistent with the qualification requirements for medical doctors in other countries such as South Africa (Maharajh 2010). However, these modules do not include the study of CAM which could be the reason graduate GPs or experienced GPs have no to very little knowledge of such treatment (Heslop 2008).

Seventy-one percent of GPs in an Australian study by Cohen *et al.* (2005) rated the importance of CAM education for the undergraduate curriculum as important. According to Maha and Shaw (2007), 66 percent of the academic doctors surveyed had a significant interest in more training or information and only six percent were against any CAM integration into mainstream health care. Regardless of the varied opinions about the importance of professional development in CAM, there was a consensus about the necessity to include CAM within the undergraduate medical curriculum (Maha and Shaw 2007; Cohen *et al.* 2005).

Many medical bodies such as the Australian Medical Association have advocated that CAM education should be included in the university curriculum so that they do become knowledgeable and can refer their patients if necessary (Grace 2012; Pirota *et al.* 2010). Government policies which overlook the CAM workforce alienate it against the medical profession, and by doing so restrict patients from receiving a multidisciplinary, team-based care (Grace 2012). Chiropractic care is important as it assists in the treatment of most non-communicable diseases (NCDs) that are associated with modern day lifestyles and longer lives (Brown 2012). Chiropractic offers treatment that satisfies patients, is effective and relatively inexpensive for most of these conditions (Brown *et al.* 2014; LeFebvre, Peterson and Haas 2012). Meaning there is need for GPs to have an understanding of chiropractic as many patients are using it (Maha and Shaw 2007). Additionally, for GPs and chiropractors to achieve their goals on patients there is need for integrated communication between them which also requires knowledge of each other's roles and responsibilities (Green and Johnson 2015)

Maha and Shaw (2007) stated that medical doctors were generally conscious of a range of teaching options for doctors in chiropractic. Most indicated that they had

no formal training, and the few who possessed qualifications in chiropractic had been driven by their own personal desire to practice it sought training in chiropractic (Pirodda *et al.* 2010). The majority of GPs had general awareness of chiropractic, instead of detailed knowledge which was frequently gained through their research interests rather than their clinical practice (Gaylord and Mann 2007). There was acknowledgment that only those with specific interests in chiropractic sought education. GPs with no education in chiropractic conveyed different levels of eagerness to get educated on it (Cohen *et al.* 2005). Those eager to learn something suggested short introductory courses that gave a brief outline of chiropractic therapy to improve their general knowledge, rather than detailed training (Gaylord and Mann 2007).

Many doctors cited lack of interest in CAM such as chiropractic, lack of proof that it works, concerns with safety of chiropractic, limited awareness among doctors and lack of statutory regulation for chiropractic as some of the reasons for not supporting its integration in medical curriculum (Maha and Shaw 2007). Inclusion of chiropractic education in the medical curriculum can potentially change these perspectives.

Many health care practitioners still have limited knowledge hence poor perception of chiropractic despite its worldwide popularity and use (Westin *et al.* 2013, Brussee, Assendelft and Breen 2001). Considering the number of GPs who refer to chiropractors, who practice manipulative therapy, and who are eager to learn manipulative therapy, it is significant that present medical education gives little focus to manipulative practices (Verhoef and Page 1996).

The degree of knowledge or understanding of chiropractic is closely associated with general practitioner's utilisation and perception (Meyer 2009; Louw and Myburgh 2007; Brussee, Assendelft and Breen 2001). Heslop (2008) found a statistically significant association between knowledge and perception. Louw and Myburgh (2007) reported that a high level of knowledge regarding chiropractic amongst general practitioners in South Africa was significantly associated with a corresponding high frequency of referral of patients by GP's to chiropractors. It

was noted that most GP's referred to physiotherapists because they had a better knowledge of the treatment used. This proposes that if general practitioners have in-depth knowledge of chiropractic treatment protocols and its benefits, they are more likely to refer patients to chiropractors.

2.8 General Practitioners Perceptions of Chiropractic

General practitioners' perception of chiropractic influences not only the level of integration of chiropractic in conventional health care but also shapes their patients' perceptions of chiropractic (Westin *et al.* 2013; Heslop 2008; Louw and Myburgh 2007; Brussee, Assendelft and Breen 2001). Therefore, general practitioner's perception of chiropractic influences patient perception of chiropractic. As such, a greater perception of chiropractic amongst general practitioners could, in turn, widen the level of public awareness and access to chiropractic.

2.8.1 Perception Definition

Perception is an active psychological process whereby individuals (for example a general practitioners) organise and interpret their sensory impressions to give meaning to their environment in a way which is relevant to them (Robbins and Judge 2013). Individual perception can be significantly different from the reality of the situation and two general practitioners exposed to the same chiropractic profession may have different perceptions. (Robbins and Judge 2013; Atkinson *et al.* 2000; Maund 1999; Hayes 1994).

The process of perceiving others starts with the object or target (for example chiropractic in this study) being perceived (Hayes 1994). The perceiver, being the GPs goes through a phase of reception, followed by a phase of selection, resulting in organisation and interpretation of the object i.e. perceptions about the chiropractic profession (Robbin and Judge 2013). Individual experiences, which

include emotions and memories that were formed from previous encounters in their psychosocial environment, have “set” an individual to perceive the world around them in a particular way; this is known as a “perceptual set” (Maund, 1999). According to Robbin and Judge (2013), a perceptual set was believed to be the tendency of an individual to perceive only certain aspects of what they see and ignore all others. An individual tends to perceive, select, order and interpret the world according to their individual background, experiences and assumptions. The perceiver’s (GPs) experience, culture and education “sets” them to see much of what they observe (Coren and Ward, 1989).

2.8.2 Factors That Influence Perception

The factors that shape or distort perception can be grouped into three main categories (Bergh and Theron 1999). These are factors in the perceiver (GPs), factors in the object being observed (the chiropractic profession) and factors in the context of the situation or environment (Zimbabwean setting) (Robbins and Judge 2013; Hayes 1994). Table 2.2 illustrates the factors that influence perception.

When general practitioners view chiropractic, and attempt to interpret what they see, personal characteristics heavily influence their interpretation such as attitude, motives, past experiences, and expectations (Hayes 1994). A good example is if GPs expected chiropractors to be expensive to consult, they may perceive them as such regardless of whether they are actually expensive to consult. This means GPs may hold false perceptions based on preconceptions (Eysenck and Keane 1995). The context or situation in this instance the Zimbabwean setting also played an important part in shaping the perceptions of GPs about chiropractic (Robbins and Judge 2013).

Table 2.1: Factors that influence perception

<p>Factors in the perceiver (which in the context of this research, relate to the factors influencing GP's views of Chiropractic):</p> <ul style="list-style-type: none"> • Experience. • Beliefs / attitudes • Motivation • Knowledge / interests • Expectations and values • Culture • Personal demographics • Level of education 	<p>Factors in the object or target that is being perceived (in the context of this research, factors influencing the Chiropractic profession):</p> <ul style="list-style-type: none"> • Novelty • Motion • size • Sounds • Background • Proximity • Similarity • Development in the country • Accessibility • Public Relations
<p>Factors in the situation or environment (which are factors that could influence the object (i.e. Chiropractic profession) or the individual and a change in their perception (i.e. GP's knowledge and perception) in the context of this study):</p> <ul style="list-style-type: none"> • Zimbabwean setting • Media • Medical • Accessibility • Training • Nomenclature or jargon related to the chiropractic profession 	

Adapted from Robbins and Judge (2013)

2.8.3 Personal Demographics of General Practitioners

Greene *et al.* (2006) found that GPs in private practice generally have positive referral attitudes towards chiropractors. This means GPs refer patients more often if they are in private practice, Verhof and Page (1996) found that physicians in individual practice practised CAM more than those in other types of practices (groups, clinics, or partnerships). This is evidence to suggest that GPs in private practice refer their patients more often to chiropractors.

Some studies have revealed that age and gender influence medical practitioners' perceptions of effectiveness of CAM (Westin *et al.* 2013; Heslop 2008; Louw and

Myburgh 2007; Goldrteszmidt *et al.* 1995). According to an analysis by Astin *et al.* (1998), referral rates of patients to chiropractors were higher among young GPs. Giannelli *et al.* (2007) also reported young (< 54) and female GPs having a greater chance of recommending and practicing CAM. Goldrteszmidt *et al.* (1995) showed that female GPs tend to perceive chiropractic care as more effective than male GPs. However, some studies found that GP age and gender were not significant predictors for perception of and referral to chiropractors (Flannery *et al.* 2006; Greene *et al.* 2006).

The ethnicity of a GP may influence their opinions on chiropractic. Differences in traditional norms (cultural), income, health insurance cover and socio-economic differences have been thought to affect healthcare access between various population groups (Van As 2005). The previously disadvantaged are still believed to have little knowledge and understanding of chiropractic (Rattan 2007).

2.8.4 General Practitioners Beliefs and Values

Values of GPs represent basic opinions that a specific way of behaviour or character is personally and socially acceptable to other behaviours (Robbins and Judge 2013). They shape the judgmental element of GP ideas as to what is right, good, or desirable. GPs are known to refer patients who wish to utilise chiropractic care even though they may not know or understand it (Gaylord and Mann 2007; Maha and Shaw 2007). However, they often refer the patient because they value the act of respecting their patients' choices.

2.8.5 General Practitioners' Experiences

Often medical practitioners who viewed chiropractic as a useful therapy had had particular experiences of where chiropractic had changed their views (Pirootta *et al.* 2010). GPs either had prior positive experiences of chiropractic had assisted patients; or negative experiences of conventional medicine failing to treat patients (Giannelli *et al.* 2007). GPs had encountered both of these experiences with some of the experiences changing their life and career causing them to become chiropractic therapy practitioners in order to offer their patients alternative therapy to mainstream care (Maha and Shaw 2007).

2.9 General Practitioners' Utilisation of Chiropractic

The precise role of chiropractic in health care is still very controversial in many countries as its scope of practice differs in many countries (LeFebvre, Peterson and Haas 2012; Chapman-Smith 2009). Chiropractic is generally regarded as complementary to and not a replacement for conventional medicine (Rosner 2016). GPs' accepted chiropractic as an appropriate alternative care, generally for musculoskeletal problems (Blanchette 2015; Westin *et al.* 2013; Giannelli *et al.* 2007; Louw and Myburgh 2007). GP's in Canada found chiropractic generally useful for back and neck problems (Verhoef and Page 1996). Chiropractors in Canada reported treating on average 15.6 patient referrals from medical doctors per year and close to one third of the chiropractors did not receive any referred patients by medical doctors (Blanchette *et al.* 2015). Blanchette *et al.* (2015) concluded that Canadian chiropractors who focused on treatment of musculoskeletal conditions and interacted with other healthcare practitioners acknowledged more referrals from medical doctors than those who did not. In this country many GPs referred patients with musculoskeletal conditions to chiropractors since their scope of practice mainly centres around such conditions. In a questionnaire study conducted amongst GPs in South Africa, one-third of the participants thought that chiropractic was effective for some neuro-

musculoskeletal conditions, while 27 percent felt it may be effective for some patients. Fifteen percent thought it may be effective for some neuro-musculoskeletal and visceral conditions, while 13 percent were uncomfortable with it and ten percent did not know enough to comment. Thus, more than three quarters of the GPs questioned thought that chiropractic could help selected patients or conditions, while only one quarter felt it could not help (Louw and Myburgh 2007). The GPs who thought chiropractic could help their patients referred patients for chiropractic care and those who were uncomfortable with chiropractic did not refer their patients even though they may benefit from it. They referred instead to other healthcare practitioners such as physiotherapist and acupuncturist whose scope of practice they fully understood (Langworthy and Birkelid 2001; Louw and Myburgh 2007).

In another similar study, Norwegian GPs that were questioned agreed that referring patients to chiropractors for low back pain (97 percent), neck and/or shoulder pain (59 percent), cervicogenic headaches (56 percent) and tension headaches (44 percent) was appropriate (Westin *et al.* 2013). Acute and chronic low back pain with or without radiating leg pain were also the conditions chiropractors were believed competent to treat, which agrees with the available evidence and for the scope of chiropractic care (Westin *et al.* 2013; Langworthy and Birkelid 2001). Hence many patients with these conditions are referred to chiropractors by their GPs in Norway. However, the scope of practice of chiropractic is not limited to purely neuro-musculoskeletal conditions, for example: in Norway, more than 20 percent of the GPs referred babies with colic to chiropractors (Westin *et al.* 2013). Compared to GPs in Sweden where, chiropractors did not manage paediatric patients (Westin *et al.* 2013). Therefore, GPs in Sweden did not refer paediatrics to chiropractors. Additionally, chiropractic is thought to benefit the adult population rather than the paediatric population hence few GPs in South Africa referred paediatric patients to chiropractors (Heslop 2008).

GPs also agreed that osteoporosis (84 percent), chronic asthma (71 percent), disc herniations or protrusions (61 percent) and sprains/strains (57 percent) were not options for chiropractic referral (Langworthy and Birkelid 2001). GPs in South Africa did not think that chiropractors are competent to treat most of these conditions (Louw and Myburgh 2007) and therefore, they do not refer patients with such complaints to chiropractors.

Several studies have revealed that in certain countries more than half of the GPs referred to chiropractors for musculoskeletal conditions such as back and neck pain (Blanchette *et al.* 2015; Westin *et al.* 2013; Louw and Myburgh 2007; Flannery *et al.* 2006; Verhoef and Sutherland 1995) and especially chronic musculoskeletal pain that does not respond to medical treatment (Greene *et al.* 2006). The most common reasons for referring patients to chiropractors was no response to conventional treatment (51 percent), patient request (21 percent), and belief in usefulness for certain disorders (21 percent) (Louw and Myburgh 2007; Verhoef and Page 1996). Maha and Shaw (2007) also stated that some GPs only referred on their patient's request. GPs seemed to utilise chiropractic for their patients as a last resort and to respect their patient wishes. This is possibly due to their limited knowledge and poor perception of the contraindications and indications of chiropractic treatment.

GPs who were undecided about chiropractic hardly initiated its discussion during consultation (Maha and Shaw 2007). They acknowledged that it was not essential to focus on chiropractic during consultation because the scientific evidence was not solid (Giannelli *et al.* 2007; Maha and Shaw 2007). Enquiry about chiropractic modality use was just to check if the patient was using something rather than supporting it ref. The few GPs that initiated the discussion about chiropractic did so later in the consultation as a backup after conventional medicine had failed (Joos *et al.* 2008).

More than half of chiropractic appointments resulted from self-referrals (Maha and Shaw 2007). Only a few of the appointments resulted from referrals by conventional physicians (Astin *et al.* 1998). Other chiropractic patients have been

referred to a chiropractor by a friend or family member with a small number of referrals coming from advertising such as Yellow Pages or Internet sites and medical doctors (Brown *et al.* 2014). Although limited numbers of GPs are initiating referrals to chiropractors due to their limited knowledge and poor perception, patients find chiropractic useful and continue to use it.

A small percentage of GPs reported practising CAM including chiropractic themselves (Joos *et al.* 2008; Giannelli *et al.* 2007). These GPs performed manipulative therapy on their patients as part of their treatment protocol (Maha and Shaw 2007). Manipulative therapy was mainly indicated for pain syndromes, psychological conditions, and chronic illnesses (Giannelli *et al.* 2007; Astin *et al.* 1998). This is consistent with the chiropractic scope of practice in most countries (WHO 2001). Utilisation of chiropractic by GPs is greatly influenced by their knowledge and opinion.

The main reasons for not referring to a chiropractor include limited knowledge about chiropractic, uncertainty with the effectiveness of chiropractic care and being unaffordable for the patients (Westin *et al.* 2013). Even in countries where chiropractic is well integrated into the mainstream healthcare system such as Norway, GPs still doubt the efficacy of chiropractic treatment and report that they had inadequate knowledge about chiropractic (Langworthy and Birkelid 2001). In many countries, GPs mainly refer patients to physiotherapists followed by chiropractors and naprapaths (Giannelli *et al.* 2007; Maha and Shaw 2007; Astin *et al.* 1998). These include Norway, South Africa and Sweden. This suggests that there is a need to educate GPs on the indications and contraindications of chiropractic to increase the number of referrals from GPs to chiropractors.

With the burden of non-communicable diseases (NCDs) increasing in Zimbabwe and shifting health seeking trends (Tadyanemhandu *et al.* 2016), it is important that GPs are knowledgeable about CAM therapies such as chiropractic to inform and refer patients adequately (Brown *et al.* 2014). Studies conducted reveal increased appointments to chiropractors in the last decade (Westin *et al.* 2013; Meyer 2009; Heslop 2008; Louw and Myburgh 2007). It was stated in these studies

that GPs should be aware of chiropractic usage among patients to provide integrated health care.

2.10 Summary

Studies on GPs knowledge and perceptions on chiropractic in Australia, Canada, Europe, South Africa and the United States, have shown that they have a low to moderate degree of knowledge regarding chiropractic care. Medical education offers only a few short modules on CAM education to medical students. Integration of CAM education in the medical curriculum has a positive impact in improving acceptance of CAM amongst medical practitioners. GPs knowledge of chiropractic affects perception and perception affects utilisation. These findings suggest that in order to promote the growth and integration of chiropractic profession within the public health sector, there is a need to establish the current knowledge, perception and utilisation of chiropractic.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

This study employed a quantitative research approach. A quantitative research is systematic, formal approach for testing objective theories by examining the relationship among variables (Creswell 2013; Mouton 2001). These variables in turn can be measured typically on instruments so that numbered data can be analysed using statistical procedures (Creswell 2013). Survey research provides a quantitative or numeric description of trends, opinions of a population by studying a sample of that population. Among these are cross-sectional and longitudinal studies where questionnaires or structural interviews are used for data collection, with the intention to generalise from a sample to a population (Brink 2007). In this study a cross-sectional questionnaire method was employed. A structured questionnaire (Appendix B) adapted from similar studies and validated by means of a focus group was used to collect the data.

3.2 Study Setting and Target Population

General practitioners in the Avenues area of Harare, Zimbabwe (Figure 3.1) comprised the sample population. This study focused on GPs in the private sector because chiropractic is still a private health care option in Zimbabwe (Debas, Laxminarayan and Straus 2006). The Avenues area was selected because it is a geographical area in Harare, Zimbabwe that is densely populated by medical practices and located within the heart of Harare (MDPCZ 2017).

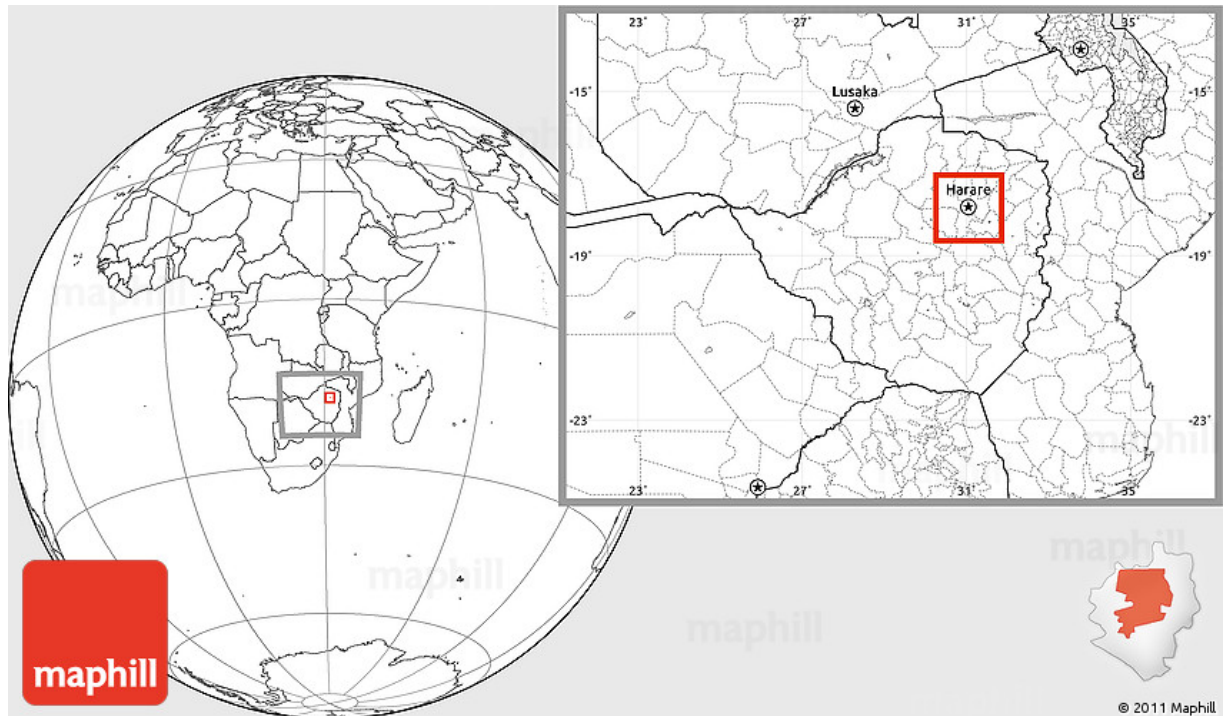


Figure 3.1: Location of the Avenues area of Harare, Zimbabwe (Maphill 2013)

3.3 Sampling Method

A single-stage sampling procedure is one in which the researcher has access to names in the population and can sample them directly (Creswell 2013). The website information of the MDPCZ, showed that there are 88 general practitioners practicing in the Avenues area of Harare, Zimbabwe. The entire population of GPs in the Avenues area of Harare, Zimbabwe were targeted. A random sample, in which each individual in the population has an equal probability of being selected was used. With randomisation, the representative sample from the population provided the ability to generalise to the entire population. Using a sample size calculator at 95% confidence interval, a sample size of 72 was utilised.

3.3.1 Inclusion Criteria:

- Qualified GPs registered with the Medical and Dental Practitioner's Council of Zimbabwe (MDPZ);
- General practitioners who were practicing in the Avenues area in Harare, Zimbabwe;
- General practitioners who completed the Informed Consent Form.

3.3.2 Exclusion Criteria:

- General practitioners not complying with the above stated inclusion criteria;
- The researcher's difficulty/inability to deliver the questionnaire to a GP because they were on sick leave, annual leave or maternity leave;
- General practitioners who were unwilling to participate.

3.4 Data Collection Tool

A questionnaire was used as the research tool. The questionnaire consisted of four main sections. The first section included demographical information. The second section included work experience and educational background. Section three assessed GPs knowledge of chiropractic. Section four covered GPs awareness of chiropractic. The questionnaire consisted of closed-ended questions and space for comments after each section. The researcher reviewed similar perception-related questionnaires to determine what the outcomes of the research were to identify areas in which questions should be developed (Westin *et al.* 2013; Meyer 2009; Heslop 2008; Louw and Myburgh 2007). Questions (Appendix A) were then developed using questions from similar studies (Appendix I). The compiled questionnaire comprised of 22 questions in four sections. According to Creswell (2013), when one modifies an instrument or combines instruments in a study, the original validity and reliability may not hold for the new instrument, and it becomes important to re-establish validity and reliability during data analysis. Prior to the study, the questionnaire was presented to a selected focus group for review and

discussion in order to re-establish reliability and validity. Reliability refers to the reproducibility of the data collection tool whereas validity can be defined as how well the data collection tool measures what it is supposed to measure (Hicks 2009; Brink 2007; Berry, Zeithaml and Parasuraman 1985).

3.5 Focus Group Discussion

A focus group was conducted on the 15th of May 2017. The purpose of the focus group was to analyse the proposed questionnaire (Appendix A) with regards to how specific the questions are, phrasing, context and validity (Foster 2010). The focus group consisted of a group of individuals, experienced in a specific area, to provide opinions and recommendations for the study.

The focus group in this study consisted of the following:

- The researcher;
- The research supervisor and co-supervisor;
- A PhD student who is the current President of the Durban University of Technology Postgraduate Association and a part-time lecturer from the department of language practice;
- A chiropractic student who is conducting a similar perception-based questionnaire;
- A completed questionnaire (Appendix A) and feedback from a Zimbabwean general practitioner.

Each respondent in the focus group read the letter of information (Appendix E) and signed the confidentiality statement (Appendix F), Code of Conduct Statement (Appendix H) and informed consent form (Appendix G) before commencement of the meeting (Nardi 2016). Focus group participants were excluded from the pilot study and main study.

Changes/modifications on the research questionnaire were made by the focus group resulting in a modified questionnaire (Appendix B).

3.6 Pilot Study

A pilot study was conducted subsequent to the focus group discussion. Five GPs in Harare were approached to complete the questionnaire. This was conducted to establish how long it would take to complete the questionnaire and to identify aspects of the questionnaire that could be modified (Mouton 2001). It took approximately six minutes for each participant to complete the questionnaire (Appendix B). No changes were made except the addition of page numbers. The pilot study participants were drawn from outside the Avenues geographical area and were excluded from the main study. Questionnaires were handed to the GPs and completed at the same time. The researcher collected the questionnaire.

3.7 Data Collection

The questionnaire (Appendix B), along with a letter of information (Appendix C) and an informed consent form (Appendix D) were personally handed to the GPs by the researcher for completion. The researcher fully explained that they could either complete the informed consent form and letter of information and the questionnaire if they were willing to participate in the study or return the documents without completing them. The completed informed consent form and questionnaire were placed in two separate ballot boxes by the GP to ensure confidentiality. The data was gathered and the results of the questionnaire was subsequently entered onto an excel spreadsheet by the researcher, for statistical analysis.

3.8 Limitations

The researcher could not determine the exact number of qualified general practitioners practicing in the Avenues area of Harare, Zimbabwe. General practitioners who were still listed as active Harare members on the MDPCZ's online register who were deceased and/or have relocated outside the Avenues area of Harare Zimbabwe were identified and removed from the total number (target population).

3.9 Statistical Analysis

The questionnaire data was transferred to a Microsoft Excel spread sheet by the researcher. The data were cross-checked by the statistician for consistency and accuracy prior to statistical analysis. The data collected were analysed using the latest SPSS® 2.4 (IBM, Armonk, NY. USA) by a professional biostatistician. Statistical significance was set at $p < 0.05$.

Descriptive statistics were used to summarise results and presented in frequency tables or bar charts. Categorical variables were reported as frequency counts and/or percentages. Continuous variables were summarised using means and standard deviations. Pearson's correlation was used to assess relationships between two continuous variables, while the t test was used to compare means of scores between independent binary variables.

3.10 Ethical Considerations

Permission to conduct this study was obtained from the Durban University of Technology Ethics committee (Appendix J). All participants were required to read the letter of information (Appendix C) and sign the informed consent form (Appendix D) attached to the letter (Groenewald 2004) before completing the questionnaire. This was done to allow the participants to express their autonomy. Autonomy refers to the right of a person to determine what activities they will or

will not participate in. Implicitly, full autonomy requires that a person be able to understand what they are being asked to do, make a reasoned judgment about the effect participation will have on them, and decide to participate free from coercive influence (Nardi 2016). The GPs could ask the researcher to further explain if they did not understand what was expected of them and its implications. They could also return the documents without completing them if they were not interested without any consequence. This was explained to the participant by the researcher.

Confidentiality of the participants' identity and information was maintained by placing the completed questionnaires and signed informed consent forms in different ballot boxes. A numbering system was used during data collection and analysis to ensure no breach of confidentiality. All personal information recorded on the participant information sheet was kept strictly confidential, and used only for the purpose outlined in the participant information sheet. Furthermore, only the researcher and authorised personnel had access to any data that may link back to the research participant at all times.

3.11 Summary

A quantitative, descriptive, cross-sectional study, involving the sampling of qualified general practitioners practising in the Avenues area of Harare, Zimbabwe was conducted. All the participants were contacted in their personal capacity to ask if they would complete the questionnaire for research purposes.

CHAPTER FOUR

RESULTS

4.1 Response Rate

According to the Medical and Dental Practitioners council of Zimbabwe there were 88 registered GPs in the Avenues area of Harare, Zimbabwe who made up the sample group as of June 2017. There were 13 of the participants who replied indicating their unwillingness to take part in the study. Eleven of these GPs had changed their practice address or retired. Sixteen of the GPs did not respond within the stipulated data collection period. Forty-eight questionnaires were returned completed. Thus, a response rate 54.5 percent was achieved.

4.2 Demographics and Personal Information

The demographic information of the 48 participants in the study is shown in Table 1. A slightly larger percentage (54 percent (n=26)) of participants were female than male (46 percent (n=22)). The majority of the participants were black and studied medicine (MBChB) in Zimbabwe, with only 18.8 percent (n=9) of the participants completing their studies outside of Zimbabwe. Of the participants who studied outside of Zimbabwe, 34 percent (n=3) qualified in China, 22 percent (n=2) in Russia, 11 percent (n=1) qualified in Cuba, 11 percent (n=1) qualified in Germany, 11 percent (n=1) qualified in Pakistan and 11 percent (n=1) qualified in Zambia. Less than half of the participants (43.8 percent (n=21)) reported being in a group practice while 29.2 percent (n=14) were in individual practice. Fifteen percent (n=7) of the participants had another qualification besides MBChB. Nine out of the 48 participants had practiced in one or more countries besides Zimbabwe. These included Botswana, Canada, China, Germany, Ghana, South Africa, United Kingdom and Zambia. Of these South Africa was the most common country where GPs reported practising medicine followed by China.

Table 1: Participants' demographic and personal information (n=48)

Variables		Count (n)	Percent
Gender	Female	26	54.2
	Male	22	45.8
Ethnicity	Black	46	95.8
	Indian	1	2.1
	White	1	2.1
Country of MBChB study	Other	9	18.8
	Zimbabwe	39	81.3
Other qualification besides MBChB	No	41	85.4
	Yes	7	14.6
Type of practice	Individual	14	29.2
	Group practice	21	43.8
	Group practice (multidisciplinary)	9	18.8
	Corporate/Industrial environment	2	4.2
	Group practise and other	2	4.2
Country of medicine practice	Zimbabwe	39	81.3
	Other	9	18.8

The mean age of participants was 39 years (SD 12 years) with a range from 22 to 71. Figure 1 shows the age distribution of the participants.

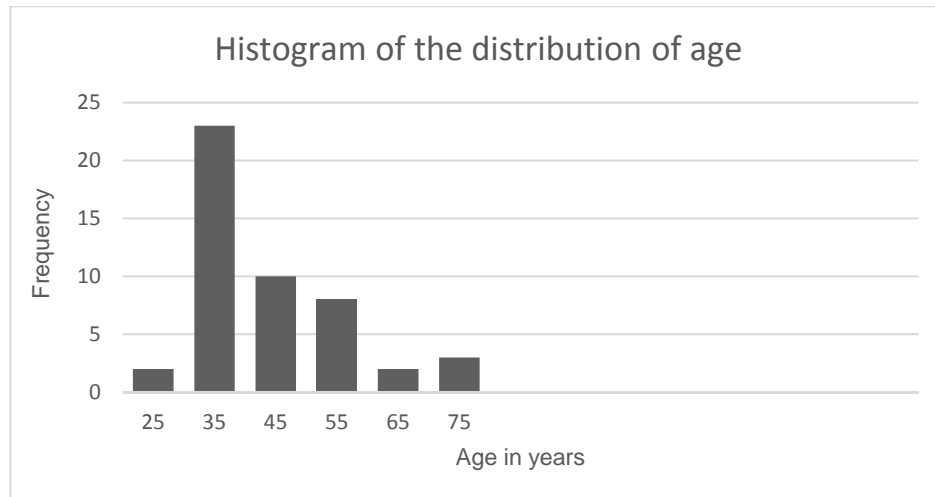


Figure 1: Age distribution of participants (n=48)

4.3 Chiropractic Facilities

Only 29.2 percent (n=14) of the participants were aware of the presence of a chiropractic practice in the Avenues area of Harare. Most (39.6 percent, n=19) of the participants believed there was no chiropractic practice in this area. The remainder (31.3 percent, n=15) of the participants were unsure.

4.4 Referral of Musculoskeletal Complaints

The participants' responses to the question, "who do you refer musculoskeletal complaints to?" is shown in Figure 2. Only 16.67 percent (n=8) of the participants referred patients to a chiropractor, while 93.75 percent (n=45) referred to a physiotherapist. Acupuncturist, osteopaths and orthopaedic surgeons were the other health care professionals to whom some GPs referred patients.

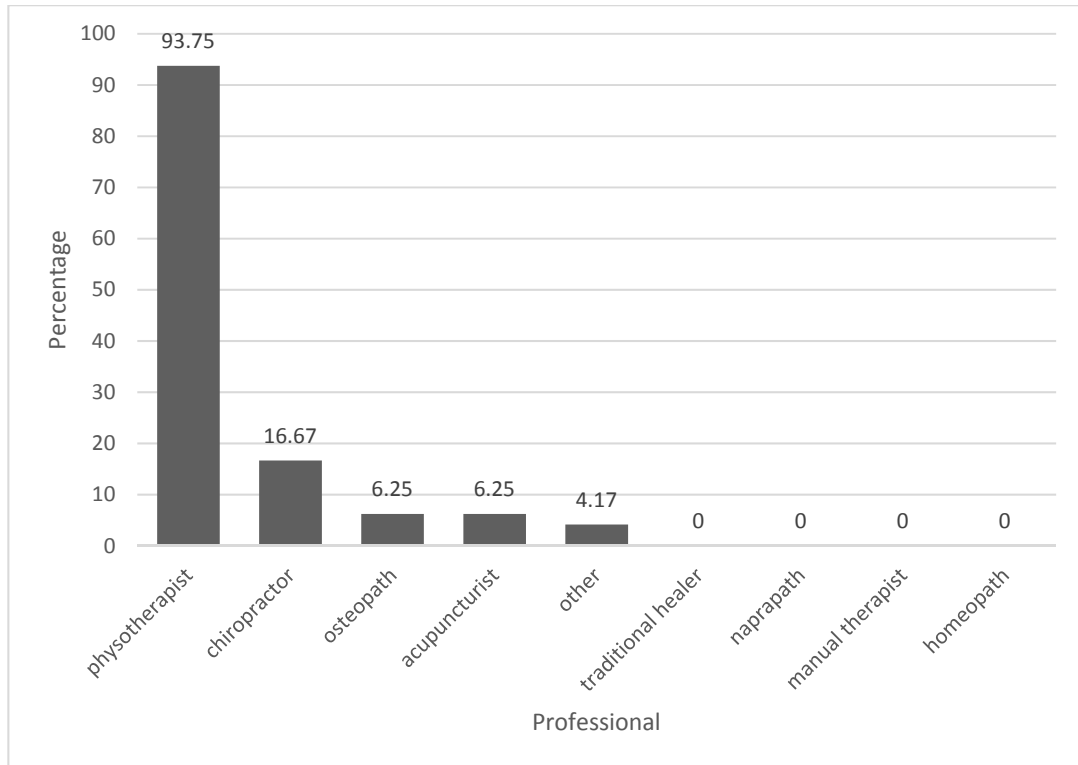


Figure 2: “who do you refer musculoskeletal complaints to?”

4.5 Knowledge Regarding Chiropractic

Only 12.5 percent (n=6) of the participants considered their knowledge of chiropractic to be good. A quarter of the participants reported having heard of chiropractic but considered their knowledge to be poor. Most participants reported either knowing something about chiropractic or never hearing about chiropractic. Those participants who reported never hearing about chiropractic only completed the questionnaire (Appendix B) up to Question 3.3. Table 2 shows the responses to the question, “How would you describe your knowledge regarding chiropractic?”.

Table 2: GPs knowledge regarding chiropractic (n=48)

	Count (n)	percent
-I consider my knowledge about chiropractic to be good	6	12.5
-I know something about chiropractic	15	31.3
-I have heard of chiropractic; however, I consider my knowledge to be poor	12	25.0
-I have never heard of chiropractic (End here)	15	31.3

4.6 Sources of Information

Thirty-three of the 43 participants knew something about chiropractic care and completed the entire questionnaire. Of the participants who knew something about Chiropractic, only two participants (6.1 percent) had been treated by a chiropractor. The majority (48.5 percent, n=16) had obtained this information from the media while 27.3 percent (n=9) obtained their information from other GPs and or health practitioners. Equal number of participants (18.2 percent, n=6) had either heard from patients, who were treated by chiropractors, or learnt at medical school. A single participant (3 percent) reported attaining knowledge of chiropractic from a lecture conducted by a local chiropractor in the area.

4.7 Areas of Chiropractic Specialisation

Rehabilitation and sports injuries were recognised as areas of chiropractic specialisation by most (87.9 percent, n=29) of the GPs. This was closely followed by neuro-musculoskeletal and extremity injuries as 84.8 percent (n=28) of the GPs stated they were aware that these are areas of chiropractic specialisation. A few of the GPs, knew that anaesthetics (12.1 percent, n=4) and dermatology (15.2

percent, n=5) were areas that chiropractors can specialise in. Table 3 illustrates the results of the participants' awareness of chiropractic specialisations.

Table 3: Areas of chiropractic specialisation (n=33)

Area of Specialisation	Yes		No	
	Count (n)	percent	Count (n)	percent
Anaesthetics	4	12.1	29	87.9
Dermatology	5	15.2	28	84.8
Extremities (e.g. knee, elbow, wrist)	28	84.8	5	15.2
Neuro-musculoskeletal system	28	84.8	5	15.2
Paediatrics	8	24.2	25	75.8
Rehabilitation	29	87.9	4	12.1
Sports injuries	29	87.9	4	12.1
Radiology	12	36.4	21	63.6

4.8 Modalities of Chiropractic Treatment

Almost all (97 percent, n=32) the participants who knew something about chiropractic were aware chiropractors undertook adjustments or manipulation of joints as a modality of chiropractic care. Massage was also widely regarded as a modality of chiropractic care by 87.5 percent (n=28) of the participants. More than half of the participants were unaware of dry needling as a modality used by chiropractors in their treatment protocols. The percentages of the participants' awareness to the modalities of chiropractic are shown in Table 4.

Table 4: Modalities of chiropractic treatment (n=33)

Modality	Yes		No	
	Count (n)	percent	Count (n)	percent
Adjustments or manipulation of joints	32	97.0	1	3.0
Dry needling	13	40.6	19	59.4
Electro-modalities (e.g. ultrasound, Interferential current (IFC))	14	42.4	19	57.6
Heat	21	63.6	12	36.4
Ice	23	69.7	10	30.3
Ischemic compression	23	71.9	9	28.1
Massage	28	87.5	4	12.5

4.9 Composite Knowledge

Knowledge was scored using Questions 3.5 to 3.6 (Appendix B) with a score of one for each correct answer. The total was divided by 15 and expressed as a percentage. The mean knowledge score in the sample was 60 percent (SD 20.2 percent). The distribution for all the participants is shown in Figure 3. The composite knowledge ranged from 20 percent to 100 percent.

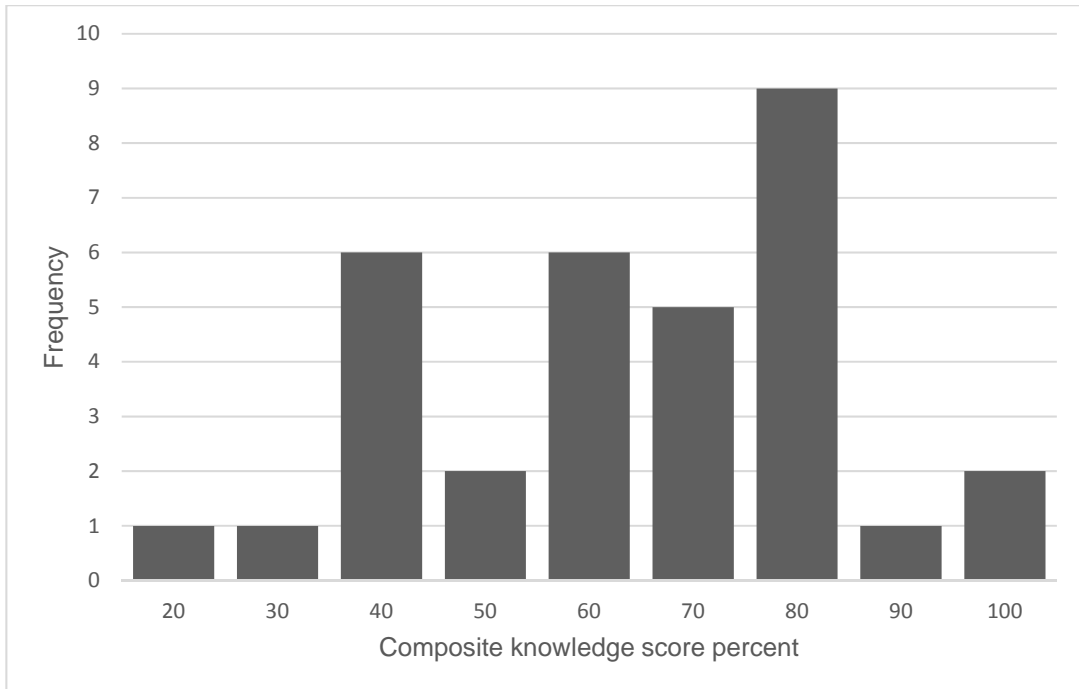


Figure 3: Histogram of the distribution of composite knowledge score

4.10 Scope of Chiropractic Practice

Majority of the GPs thought chiropractic was effective for some neuro-musculoskeletal conditions while nine percent felt it may be effective for some patients. Twenty one point two percent (n=7) and three percent (n=1) of the GP felt they were not informed enough and viewed it as not effective respectively.

Table 5a: Views on competency of chiropractors and role of chiropractic (n=33)

		Count (n)	percent
Which one of the following best reflects your view of chiropractic?	-Not informed enough to comment	7	21.2
	-Not effective	1	3.0
	-May be effective for some patients	9	27.3
	-Effective for some neuro-musculoskeletal conditions	16	48.5
Do you believe chiropractors are competent in neuro-musculoskeletal examination and diagnosis?	-yes	20	60.6
	-no	1	3.0
	-unsure	12	36.4
Do you believe chiropractors are competent in general medical management of patients?	-yes	17	51.5
	-no	4	12.1
	-unsure	12	36.4

Table 5b: Views on competency of chiropractors and role of chiropractic (n=33)

		Agree	Disagree	Unsure
Chiropractors have a satisfactory education to be part of mainstream medicine	Count (n)	13	3	17
	percent	39.4	9.1	51.5
Chiropractors are competent in the treatment of musculoskeletal complaints	Count (n)	22	1	10
	percent	66.7	3.0	30.3
Chiropractic care is effective in the treatment of neurological disturbances	Count (n)	17	4	12
	percent	51.5	12.1	36.4
Chiropractors adequately report to the general practitioner in their findings	Count (n)	8	6	19
	percent	24.2	18.2	57.6
Chiropractors use unknown terminology in their report findings	Count (n)	8	8	17
	percent	24.2	24.2	51.5

When asked if they believed chiropractors to be competent in the neuro-musculoskeletal examination and diagnosis, more than half (60.6 percent, n=20) of the participants were confident about the competency of chiropractors. Slightly fewer (51.5 percent, n=17) participants believed chiropractors were competent in the general medical management of patients. A total of 12 (36.4 percent) participants were unsure of chiropractors' competency in neuro-musculoskeletal diagnosis and examination. The same number of participants were unsure of chiropractors' competency in the general medical management of patients. Only one participant (3 percent) believed that chiropractors were incompetent in neuro-musculoskeletal examination and diagnosis.

When the participants were asked if chiropractors are competent in the treatment of musculoskeletal complaints most (66.7 percent, n=22) responded positively. Approximately half (51.5 percent, n=17) of the participants thought chiropractic is effective in the treatment of neurological disturbances. Nevertheless, about a quarter (24.2 percent, n=8) of the GPs thought chiropractors used unknown terminology in their report findings. Table 5a and 5b illustrates their views on the competency of chiropractors and their roles.

4.11 Referral Between General Practitioners and Chiropractors

The GPs were asked which specific conditions were appropriate for chiropractic treatment. The results are shown in Table 7 and Figure 7. Most (90.9 percent, n=30) of the GPs agreed that chronic back pain was appropriate for chiropractic referral whereas 9.1 percent (n=3) were not sure. However, 27.3 percent (n=9) of the participants were uncomfortable referring patients with acute back pain to a chiropractor. Even so, 63.6 percent (n=21) stated they would refer patients with acute back pain to chiropractors.

Table 6: Chiropractic referral for specific conditions (n=33)

Condition		Agree	Disagree	Unsure
Acute back pain	Count (n)	21	9	3
	percent	63.6	27.3	9.1
Attention deficit disorder	Count (n)	2	18	13
	percent	6.1	54.5	39.4
Appendicitis	Count (n)	0	28	5
	percent	0.0	84.8	15.2
Arthritis	Count (n)	25	3	5
	percent	75.8	9.1	15.2
Asthma	Count (n)	5	20	8
	percent	15.2	60.6	24.2
Back and pelvic problems during pregnancy	Count (n)	23	2	8
	percent	69.7	6.1	24.2
Benign paroxysmal positional vertigo	Count (n)	10	12	11
	percent	30.3	36.4	33.3
Carpal Tunnel syndrome	Count (n)	23	4	6
	percent	69.7	12.1	18.2
Chronic back pain	Count (n)	30	0	3
	percent	90.9	0.0	9.1
Chronic visceral disorders (responding poorly to medical intervention)	Count (n)	17	5	11
	percent	51.5	15.2	33.3
Disc herniation	Count (n)	22	7	4
	percent	66.7	21.2	12.1
Infantile colic	Count (n)	8	12	13
	percent	24.2	36.4	39.4
Lateral/medial epicondylitis	Count (n)	18	8	7
	percent	54.5	24.2	21.2
Migraine	Count (n)	12	12	9
	percent	36.4	36.4	27.3
Nerve entrapment syndromes	Count (n)	23	6	4
	percent	69.7	18.2	12.1
Nocturnal enuresis	Count (n)	10	12	11
	percent	30.3	36.4	33.3
Prolapse with uncomplicated neurological findings	Count (n)	22	6	5
	percent	66.7	18.2	15.2
Shoulder/knee problems	Count (n)	26	3	4
	percent	78.8	9.1	12.1
Sports trauma	Count (n)	28	1	4
	percent	84.8	3.0	12.1
Tension/cervicogenic headaches	Count (n)	17	8	8
	percent	51.5	24.2	24.2
Whiplash	Count (n)	13	8	12
	percent	39.4	24.2	36.4

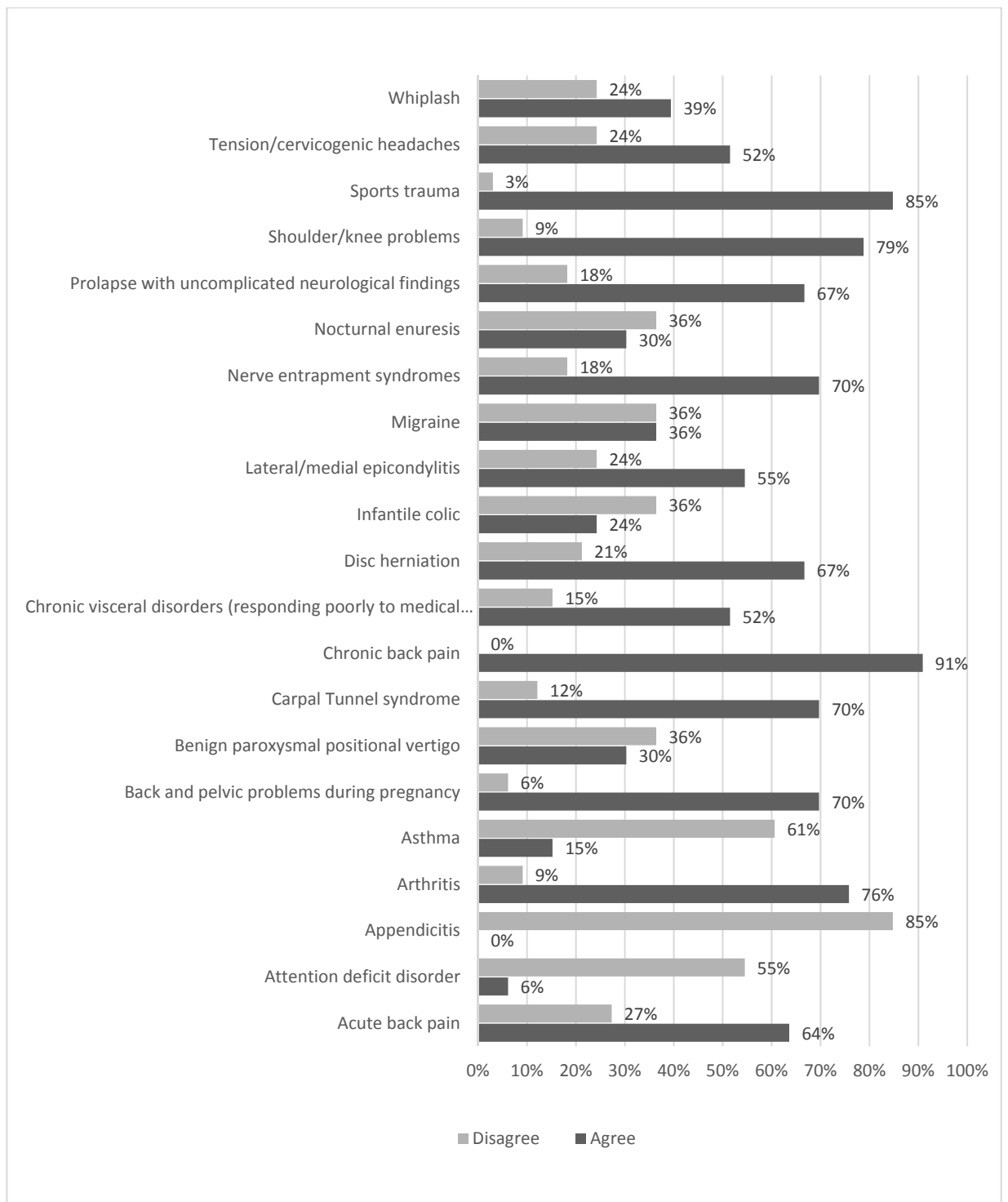


Figure 4: Percentage of participants who agreed and disagreed with chiropractic referral for specified conditions (n=33)

Less than half (42.4 percent, n=14) of the participants referred their patients to a chiropractor. Fifty seven point six percent (n=19) of the participants reported not referring patients to chiropractors.

GPs referred patients for chiropractic care both at their own judgement and at the patient's request. Eight (57.1 percent) of the GP's who reported referring patients, did so at both the patients request and at their own judgement. Four (28.3 percent) of the GPs reported only referring to a chiropractor at the request of the patient. Only a few (14.3 percent, n=2) of the participants referred patients to a chiropractor on their own judgement.

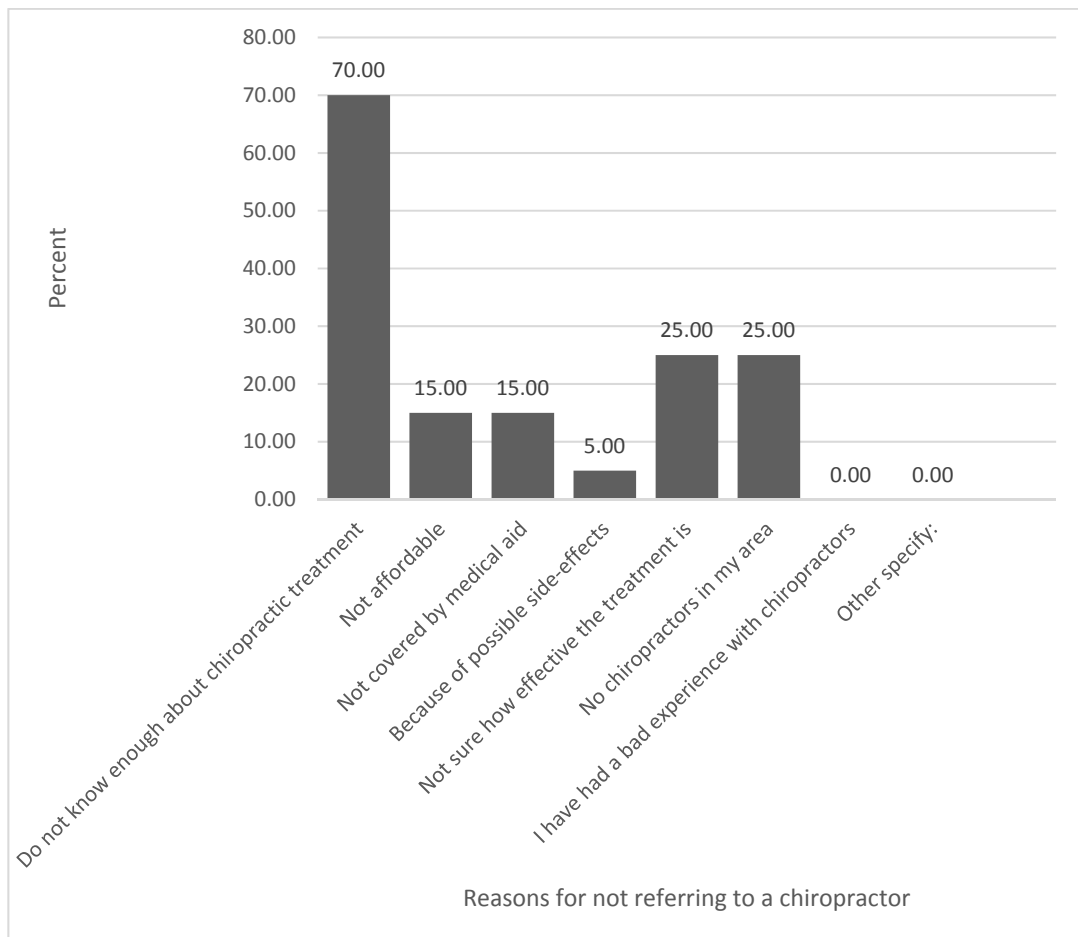


Figure 5: Reasons for participants not referring to a chiropractor

Many participants cited poor level of knowledge as the main reason for not referring to a chiropractor. Some of participants reported not being sure of the effectiveness of chiropractic and lack of chiropractors as the reasons for not referring to a chiropractor. Lack of medical aid cover, not being affordable and the possibility of possible side effects were some of the least common reasons for GPs not referring to chiropractors. None of the participants reported having a bad experience with a chiropractor or any other reason as reasons for not referring to a chiropractor. Figure 6 shows the reasons of participants not referring to a chiropractor.

Question 4.7 “Should a patient ask you for advice regarding chiropractic treatment, do you feel you know enough to adequately inform them on the subject?” This question assessed the participants view of their own knowledge regarding chiropractic care if asked for advice by their patients. The participants either answered “yes” or “no”. Nine participants (27.3 percent) were confident with their own knowledge if asked for advice by their patients. Almost three quarters of the participants (72.7 percent, n=24) did not view their own knowledge of chiropractic as adequate to give advice concerning chiropractic.

4.12 Perception Score

Perceptions were scored by the sum of the positive perceptions in Questions 4.4 to 4.5 (Appendix B) and divided by the maximum score of 26 and expressing the result as a percentage. The higher the perceptions score, the more positive the perceptions about chiropractic. In this study a perception score above 50 percent was considered good.

The mean perception score was 52.6 percent with a standard deviation of 24.7 percent. It ranged from 0 to 96 percent. Figure 7 shows the distribution of the perception scores. The participants generally had a favourable opinion of chiropractic. The lowest score of perception meant no opinion on chiropractic.

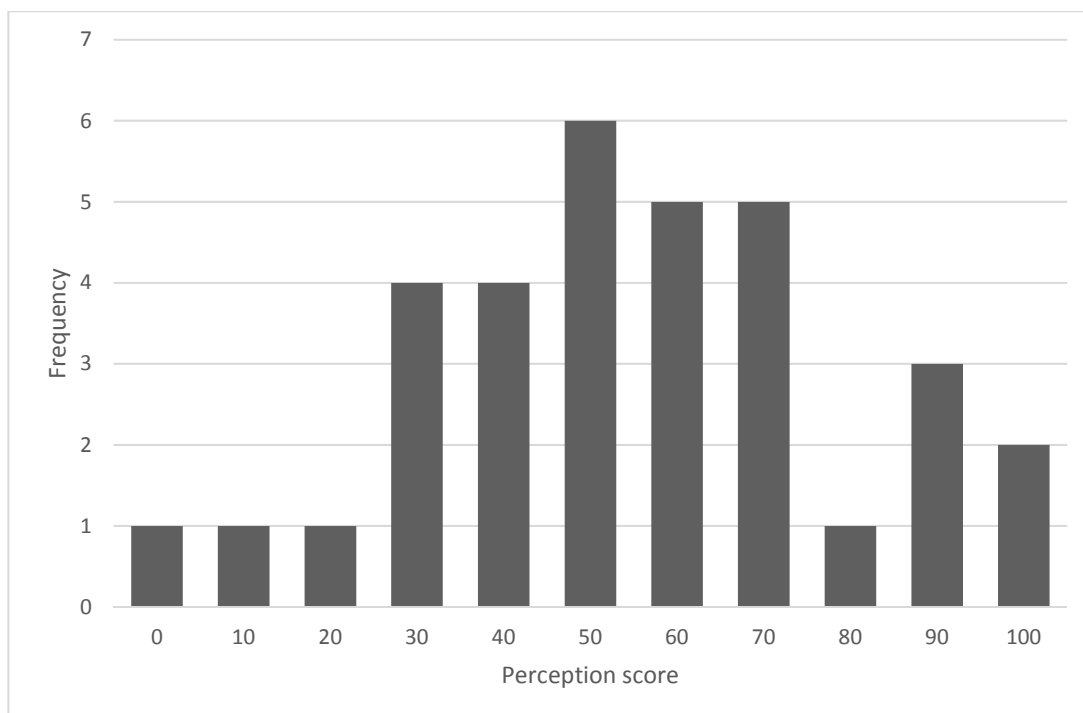


Figure 6: Distribution of the perception score

4.13 Relationship Between Knowledge Versus Perception of Chiropractic

Figure 8 shows the correlation between knowledge and perception of chiropractic. There was a statistically significant and moderately high positive correlation between knowledge and perception scores ($r=0.668$). As a participant's knowledge of chiropractic increased, perception also increased, but there was a wide range of scatter points especially around the middle ranges of knowledge and perception. This suggests that even though a participant had good knowledge regarding chiropractic it was not always true that their perception would be good and vice versa. There were instances when GPs had a low level of knowledge but a favourable perception of chiropractic. Knowledge is not a good predictor of perception. In other instances, participants reported a high degree of knowledge about chiropractic care yet their opinions of chiropractic care were low. It is important to note that the correlation can be statistically significant but clinically there might be no relation.

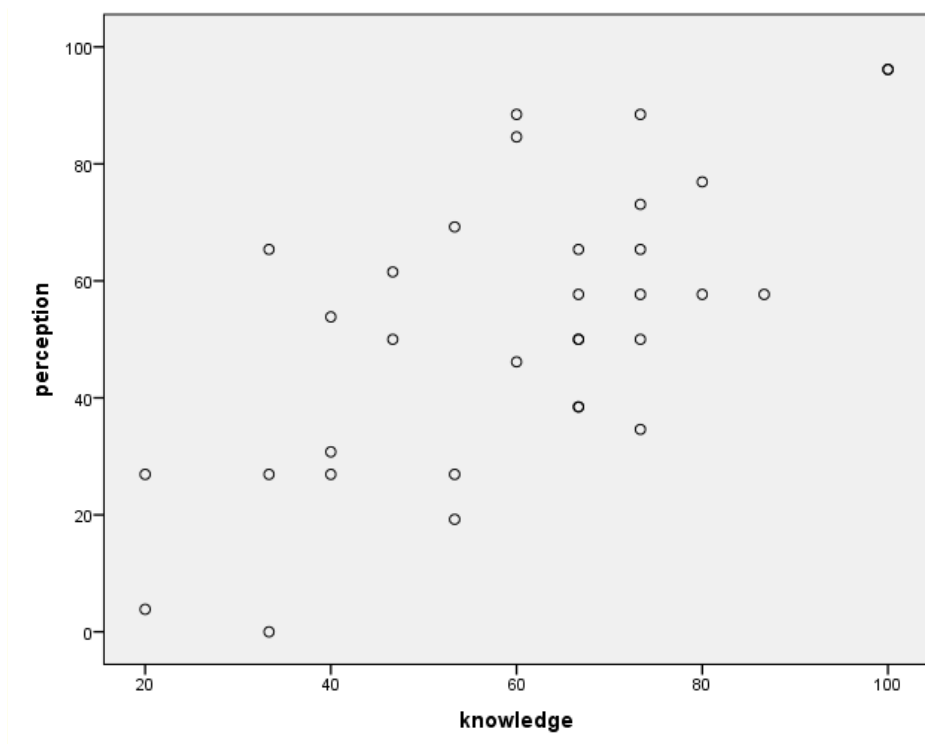


Figure 7: Correlation between knowledge and perception

4.14 Association Between Knowledge and perception Versus Utilisation of Chiropractic

To test this hypothesis, the mean composite knowledge score and mean perception score was compared between the two independent groups, GPs who had referred patients to a chiropractor and GPs who had not. Question 4.6 (Appendix B), “Do you refer patients for chiropractic care?” was taken as measurement of utilisation. Participants that answered “yes”, utilised chiropractic whilst those who answered “no”, did not utilise chiropractic. This was a binary measure, and therefore associations were tested between knowledge and utilisation and between perception and utilisation using t-tests. The results are shown in Table 9. The correlation between knowledge and utilisation was statistically significant and moderately high. Perception and utilisation had a low statistically non-significant correlation. This suggests that the level of knowledge

as opposed to perception about chiropractic influenced a GP's referral of patients to a chiropractor.

Table 7: Group Statistics

	Do you refer patients for chiropractic care?	Count (n)	Mean	Std. Deviation	Std. Error Mean	P value
Knowledge	Yes	14	63.33	22.608	6.042	0.425
	no	19	57.54	18.487	4.241	
Perception	yes	14	65.93	23.510	6.283	0.006
	no	19	42.71	21.062	4.832	

4.15 Summary

A response rate of 54.5 percent was achieved. Most of the participants studied their medical degree in Zimbabwe. The mean age of participants was 39 years. More of the GPs referred their patients with musculoskeletal complaints to physiotherapists. Thirty-one percent of the GPs had never heard of chiropractic. Many of the participants had a low degree of knowledge regarding chiropractic modalities, areas of chiropractic specialisation but only a few had adequate knowledge and a good perception of it. There was a statistically significant correlation between knowledge and perception. General practitioners who were knowledgeable about chiropractic tended to have a positive perception and were more likely to refer patients to a chiropractor.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Demographics

A larger percentage of the participants were females (54.2 percent, n=26). This was a higher female to male ratio compared to similar studies (Louw and Myburgh 2007; Brussee, Assendelft, and Breen 2001; Langworthy and Birkelid 2001). In a study by Louw and Myburgh (2007) amongst South African GP's, 38 percent of the participants were female, and 62 percent were male. In Norway, Langworthy and Birkelid (2001) also found 33 percent of the participants to be female. Another study conducted in Netherlands by Brussee, Assendelft, and Breen (2001) found an even lower percentage (11 percent) of female participants. Being female has been associated with positive perceptions towards CAM (Brown *et al.* 2014), hence female GPs would be eager to participate in CAM studies. The year of data collection, different methodological choices and sampling methods can account for some of the difference (Giannelli *et al.* 2007).

The sample population in this study may not be a representative of the general practitioner population in Zimbabwe which is largely male dominated (MDPCZ 2017). A possible reason to explain the variation could be that many of the male doctors may have migrated to other countries in search of better prospects due to the economic hardships that the country has been experiencing (Jonsson and Sapir 2009; Stilwell *et al.* 2003). Males in the Zimbabwean society are usually the breadwinners of the family while females care for the children at home. Even though females may have full time jobs and pursue careers, it is their responsibility to care for the children. Caregivers are known to be more open to CAM therapies including chiropractic as they are widely regarded as safe because it is more non-invasive (Tatalias 2006; Durant, Verhoef, Conway and Sauve 2001; MacLennan and Wilson 1996). Since the majority of GPs in this study were female, the likelihood of exposure to the chiropractic profession is expected to be higher and

therefore, the good knowledge on chiropractic and positive perception of chiropractic found in this study could be accounted for by this.

The mean age of participants was 39 years with most participants between the ages of 25 and 35. In contrast to Louw and Myburgh's (2007) study, most of the participants were older aged between 45 and 54 years of age. Young GPs tend to be more open to new ideas and are eager to learn new treatment protocols, compared to older GPs who are often rigid. This could account for the good knowledge and positive perception findings in this study.

Group practice was the most common type of practice setting at 49 percent, followed by individual practice at 29 percent and multidisciplinary group practice was 18 percent. This is contrary to the related literature in which solo practice was the most common type of practice (Louw and Myburgh 2007; Brussee, Assendelft, and Breen 2001). Louw and Myburgh (2007) found that the majority of the GP's worked in solo practice (42 percent) followed by employment in health care centers (25 percent). Furthermore, Brussee, Assendelft and Breen (2001), reported that half of their participants were in solo practice and a quarter were in a partnership type of practice setting. The economic and health care system crisis in Zimbabwe might be the reason influencing doctors to practice in groups. Group practice is ideal in that it shares expenses, promotes team work, allowing recent graduates to learn from the experienced senior doctors. Many medical doctors from developing countries like Zimbabwe are known to migrate to developed countries in search of better employment opportunities and to further their education (Stilwell *et. al* 2003). Many doctors work long periods of time to attend to their patients and to make enough income to earn a living. These factors favor group practices in that the practitioners can roster themselves to attend to the practice while the others get enough time to rest and attend to other business while maintaining their income. Additionally, the questionnaire was given door to door to the participants. General practitioners within the same premises may have encouraged each other to have an interest to participate in the research study. Hence many general practitioners in group practices may have participated in the study.

Nine percent of the participants studied MBChB outside of Zimbabwe. Another nine percent of the participants had practiced in other countries such as South Africa or Zambia. Of these countries South Africa was the most common country where GPs reported practicing medicine besides Zimbabwe. The second most common country was China. The GPs reported knowing about chiropractic when they were studying or practicing in these countries. They seemed to be uninformed of the availability of chiropractic care locally due to few numbers of chiropractors in Zimbabwe, no colleges that offer chiropractic training and not being integrated into the public health care system. In all the countries besides Zimbabwe where general practitioners have studied or practiced medicine, chiropractic is a legal and recognised profession (Tetrault, Auerbach and Durrett 2017). In China chiropractic is a recognised profession fully integrated into the mainstream medical care and many schools and universities offer training in alternative care (Tetrault, Auerbach and Durrett 2017). Although in South Africa chiropractic is not integrated in mainstream medical care, there are two major universities where chiropractic training is offered and a permanent post for a chiropractor at a public hospital (CASA 2017; Till and Till 2000). General practitioners who have studied in these countries are more likely to have been exposed to chiropractic in these countries.

5.2 General Practitioner Knowledge of Chiropractic

Fifteen participants (31.2 percent) claimed to have never heard about chiropractic. This is a high percentage in comparison to the findings of Louw and Myburgh (2007) who found 20 percent of the participants to be unaware of chiropractic. This could be due to Zimbabwean GPs limited exposure to chiropractic. The medical curriculum in Zimbabwe does not include any education on chiropractic and there is no chiropractic training offered in the country. Unlike in south Africa where a full time post for a chiropractor is available at Kimberly public hospital and informal teaching of CAM education at medical schools (Till and Till 2000).

In this study 12.5 percent (n=6) of the participants considered that they had good knowledge of chiropractic, 31.3 percent (n=15) reported knowing something about chiropractic and 25 percent (n=12) had poor knowledge of chiropractic. Westin *et al.* (2013) found that seven percent of the Swedish GPs said that they had good knowledge of chiropractic and 53 percent said that they had poor knowledge. The other 40 percent reported knowing something about chiropractic. In Norway where there are many accredited chiropractic training colleges and a fully functional chiropractic council, 22 percent of the GPs said that they had good knowledge of chiropractic, 12 percent said that they had poor knowledge of chiropractic and 66 percent reported knowing something about chiropractic. The GPs in this study who reported having good knowledge of chiropractic was almost twice the number of Swedish GPs and half the number of Norway GPs who reported being knowledgeable about chiropractic. Few Norwegian GPs reported having poor knowledge of chiropractic compared to both Swedish and participants of this study. Many Norwegian GPs knew something about chiropractic compared to the numbers reported in Sweden and the GPs who participated in this study. These variations can be explained by the fact that chiropractic is well integrated into the mainstream health care in Norway. In Zimbabwe and Sweden chiropractic is a private healthcare option not integrated in the mainstream healthcare although it is a recognised legal profession. The numbers of general practitioners who reported having knowledge about chiropractic in Sweden are also fewer compared to the numbers reported in this study. This is attributed to the fact that in Sweden GPs did not refer directly to a chiropractor, they can only recommend to their patients (Westin *et al.* 2013), whereas in Zimbabwe, GPs refer directly to a chiropractor.

Almost half (48.5 percent, n=16) of those who had heard about chiropractic prior to the study had read about it in media including journals, social platforms, newspapers and television. This reinforces Langworthy and Smink's (2000) suggestion that use of journals is one way to increase awareness between professionals. The continued and increased publishing of chiropractic research in multidisciplinary publications could account for the gain in knowledge by general

practitioners who read more broadly (Louw and Myburgh 2007). Advances in technology and use of websites and social platforms such as Facebook by councils to provide information to healthcare practitioners and the public may account for the awareness about chiropractic. Publishing of articles in major Zimbabwean newspapers such as the article on Alister Makowe which highlights his achievements of a young Zimbabwean chiropractor who attended the Durban University of Technology could also account for the interest of doctors to want to know more about chiropractic (Meya 2016).

Over a quarter (27.3 percent, n=9) of the participants obtained their information from other general practitioners and or health practitioners. This indicated that many Zimbabwean GPs communicate and share their knowledge with each other. As earlier noted most participants of this study reported being in a group practice and a good number are in multidisciplinary practice. This entailed that chiropractic awareness in Zimbabwe can be potentially spread through word of mouth amongst health care practitioners. A single participant (three percent) reported attaining knowledge of chiropractic from a lecture conducted by a chiropractor in the area. Equal number of participants (18.2 percent, n=6) had heard from patients who were treated by chiropractors and at medical school (18.2 percent, n=6). Since there is little to no education on chiropractic at medical school in Zimbabwe, the participants who stated that they learnt their information from medical school had studied outside of Zimbabwe. Only two participants (6.1 percent) had consulted a chiropractor and as such experienced being a chiropractic patient. This is attributable to the few numbers of chiropractors in Zimbabwe. This was a reverse pattern according to previous studies (Brussee, Assendelft, and Breen 2001; Langworthy and Birkelid 2001; Langworthy and Smink 2000). Louw and Myburgh (2007) found that 60 percent of their participants received their information of chiropractic from patients treated by a chiropractor and more than 30 percent had experienced being a patient themselves. These studies were conducted in geographical locations where there are vast numbers of chiropractors practicing and at least a few chiropractic training colleges. Since chiropractors are primary care providers, many patients are more likely to access chiropractic services in

areas with large numbers of practicing chiropractors. In these areas it is probable that chiropractors and GPs treating the same patient may have at some point communicate with each other on telephone or reports. As noted by Brussee, Assendelft, and Breen (2001), GPs correspondence with chiropractors about patients to be a preferable source of gaining information on chiropractic.

The mean knowledge score in the sample was 60 percent with a standard deviation of 20.2 percent. This is a larger mean composite knowledge score compared to South African GPs who had a mean composite knowledge score of 44 percent with a standard deviation of 28 percent. The composite knowledge ranged from 20 percent to 100 percent whilst among South African GPs had a range of zero percent to 90 percent. This can be attributed to the growth of chiropractic since the study conducted amongst South African GPs was done in 2005 and published in 2007. Additionally, these measurements are not accurate and can be misleading since different methods were used to attain the knowledge score in each study.

5.3 Utilisation and Perceived Role of Chiropractic Care

There were 14 of 33 general practitioners (42 percent) who referred patients for chiropractic care. This corresponds well with the South African GPs (47 percent) and the Swedish GPs (43 percent) who reported referring or recommending their patients for chiropractic care (Westin *et al.* 2013, Louw and Myburgh 2007). A higher number of Norwegian GPs (79 percent) referred patients to a chiropractor than in Sweden and South Africa (Westin *et al.* 2013). Chiropractic is a private health care option in South Africa and Sweden yet in Norway, it is well integrated within the mainstream health care. This suggests that integration of chiropractic into the mainstream health care influences referrals from GPs to chiropractors.

Over half of the general practitioners (57.1 percent, n=8) referred patients at both their own judgement and at the request of the patient. This is similar to the findings of Louw and Myburgh (2007) who reported that 50 percent of the general

practitioners in South Africa referred patients in the same circumstance. Forty percent referred at their own judgement yet in this study only 14.3 percent (n=2) reported doing so. A greater number (28.6 percent, n=4) of the participants of this study referred at the patient's request to a chiropractor than in South Africa where only 10 percent of the general practitioners reported a similar answer. Giannelli *et al.* (2007) explained that the frequency of referral to chiropractors by GPs may also be linked to the extent to which it is requested by patients and also to different medical aid coverages across countries. In Zimbabwe the majority of the population cannot afford the medical aid schemes that cover private health care options such as chiropractic due to the economic hardships the country has been experiencing. The doctor is therefore often hesitant to refer their patients to a chiropractor in Zimbabwe due to the financial burden hence referral is frequently initiated by the patient if they think they can afford it. Furthermore, this study focused on GPs in the private sector so it is more likely that the patients they consult afford other private health care alternatives.

Sixteen (48.5 percent) of the GPs thought chiropractic was effective for some neuro-musculoskeletal conditions while 27.3 percent (n=9) felt it may be effective for some patients. Seven (21.2 percent) and one (three percent) of the GPs felt they were not informed enough to comment and viewed it as not effective respectively. Three quarters of South African GPs also seemed to think that chiropractic is effective in the treatment and management of neuro-musculoskeletal conditions and some visceral conditions and maybe effective for some patients (Louw and Myburgh 2007).

More than half the participants (60.6 percent, n=20) believed that chiropractors were competent in the neuro-musculoskeletal examination and diagnosis. Slightly fewer participants (51.5 percent, n=17) believed chiropractors were competent in the general medical management of patients. A total of 12 participants (36.4 percent) were unsure of chiropractors' competency in neuro-musculoskeletal diagnosis and examination. An equal number of participants were unsure of chiropractors' competency in the general medical management of patients as well.

Only three percent (n=1) believed that chiropractors were incompetent in neuro-musculoskeletal examination and diagnosis. It seemed general practitioners accepted chiropractic as an alternative therapy especially in the treatment and management of musculoskeletal complaints, but they did not fully understand the treatment modalities.

Zimbabwean GPs seemed to agree with their American, European and South African counterparts on the basic scope of practice for chiropractic care (Westin *et al.* 2013; Louw and Myburgh 2007; Langworthy and Birkelid 2001; Verhoef and Sutherland 1995). Many agreed that arthritis, chronic back pain, migraines, neck pain, sports trauma and whiplash were appropriate conditions for chiropractic referral. This is in agreement with the actual scope of chiropractic practice in Zimbabwe.

Despite this 93.8 percent (n=45) of the participants in this study referred their patients to physiotherapy for musculoskeletal complaints whereas 16.7 percent (n=8) referred their patients to a chiropractor. Physiotherapy is well accepted and integrated into the public health care system in Zimbabwe. The major universities in Zimbabwe such as the University of Zimbabwe offer training in physiotherapy. Its scope of practice is well understood and there is less scepticism towards it. Since physiotherapy is well integrated in the public health system, many patients are exposed to it and can afford its services. General practitioners feel more comfortable referring to it. This suggests that GPs are not fully aware and do not understand chiropractic scope of practice enough to refer patients appropriately.

5.4 Perceptions About Chiropractic

The mean perception score was 53 percent. It ranged from zero percent to 90 percent. The higher the perception score, the more positive the perceptions about chiropractic. This entails that general practitioners in this study perceived chiropractic on a scale that varied from no opinion to a positive opinion towards chiropractic; however, an average positive opinion resulted. The scores cannot be compared to other studies because of different questions and methods used to calculate the scores. However, studies show that general practitioners perceived chiropractors as generally competent in musculoskeletal diagnosis, management and treatment in the general population (Westin *et al.* 2013; Louw and Myburgh 2007).

There was a non-significant difference in knowledge between those who refer patients and those who do not ($p=0.425$). There was also a statistically significant difference in perception between those who refer patients and those who do not ($p=0.006$). The perception scores were higher for GPs who referred patients compared with the GPs who did not refer patients. Perception was found to determine utilisation rather than knowledge even though there was a correlation between the two. Knowledge is not the only factor that influences perception, other factors play an important role in shaping the perception of general practitioners in Zimbabwe. Additionally, even though a good perception determines utilisation in terms of referral of patients to chiropractors, poor knowledge on the location and availability of chiropractors in the Avenues area of Harare, Zimbabwe results in no utilisation of these chiropractic services.

Chiropractors practice in over 100 countries all over the world and practitioner numbers are continuing to grow. However, the majority of people (76 percent), only see a ratio of one chiropractor per one hundred thousand to ten million patients. In Zimbabwe there are seven chiropractors currently registered (Tetrault, Auerbach and Durrett 2017). This low doctor to patient ratio could impact on the poor knowledge and perception of chiropractic. Taking into account, that the majority of the participants were of Black ethnicity, were young (under 40 years of age), and

were from the allopathic medical field, this could explain why they did not refer their patients to chiropractors. Furthermore, the fact that chiropractic is not a mainstream healthcare option limits exposure of GPs and negatively impacts its acceptance in Zimbabwe. There is no college or university that currently offer a chiropractic qualification in Zimbabwe. This limits the exposure of the public to chiropractic. The fact that chiropractic is not studied in Zimbabwe, may be a major contributing factor to a lack of interest, and therefore, a lack of knowledge about chiropractic. The study of chiropractic at Zimbabwean colleges could influence the public's level of knowledge and perception due to increased exposure to the profession by larger numbers of practicing Zimbabwean chiropractors. Chiropractic caters for middle- and high-income earners. It possible that a few medical aid schemes may cover chiropractic care. Given the economic strains in the country and high unemployment it is difficult for most Zimbabweans to have medical aid cover or pay for health services (Maushe and Mugumbate 2015). Therefore, many Zimbabweans, and hence general practitioners, may not have been exposed to chiropractic.

Chiropractors and physiotherapists both treat musculo-skeletal conditions to increase movement and strength, relief pain and help return you to full function. The two disciplines use similar techniques such as mobilisation, dry needling, stretches, massage, exercise, ice and heat to variable degrees. Since both physiotherapist and chiropractors treat musculoskeletal pain conditions using alternative procedures they can complement each other in the treatment and management of certain musculoskeletal conditions (Solihull Chiropractic Clinic 2018). A chiropractor traditionally uses manipulation and believes subluxation of spinal joints is the cause of disorders (CASA 2017) as compared to a physiotherapist who commonly uses mobilisation techniques for the same conditions to improve motion and function. However, even though similar techniques are used in treating and managing musculoskeletal complains, the philosophy behind each profession is different. This may result in contradiction of the two disciplines, creating an opportunity for medical doctors to disregard either of the professions based on their own knowledge and perceptions.

The physiotherapy profession is in a referral relationship with medical doctors while chiropractors are direct-access providers in Zimbabwe. This is known to have created a historical misconception that physiotherapists are therefore “better” than chiropractors. Yet originally, they started out as direct-access providers only to give up this right to gain support from medical physicians in their drive for governmental and societal recognition of the profession (Huijbregts 2007). It is therefore necessary for the GP to fully understand the differences and similarities between chiropractic and other unconventional practitioners to fully utilise chiropractic as an alternative therapy for their patients.

5.5 Conclusions

The knowledge of General Practitioners about chiropractic care in the Avenues area of Harare Zimbabwe was relatively moderate. The level of knowledge about chiropractic influences the perception of the general practitioners with regards to chiropractic. Perception in turn determines utilisation of chiropractic in terms of referral of patients to chiropractors. The findings of this study indicate that knowledge is not adequate to determine perception. Perception is influenced by other factors, such as general practitioner characteristics (experiences, gender, age) word of mouth, economic situation of a country, chiropractic integration within the mainstream health care, accessibility of chiropractors and chiropractic training facilities. Chiropractic education in general practitioners in Zimbabwe is of paramount importance to enable growth of the chiropractic profession. This could improve the coordination and the quality of patient care towards a more holistic and integrated approach. It would also improve the competency of general practitioners to be able to advise patients who can benefit from chiropractic care. This study gives useful information which could influence future referral and teamwork between GP’s and chiropractors in the Zimbabwean health care system. This study has shed light on inter-professional knowledge and perception being very important in utilisation of chiropractic care.

5.6 Limitations of the Study

- The sample used was taken from one geographical area. This may have biased the study towards more extreme (negative or positive) outcomes, as those with an interest in the topic, or very strong views would be likely to participate. Those with neutral views may not have participated. Thus, one cannot extrapolate the results to the whole country (Louw and Myburgh 2007).
- This study only focused on a total of 88 general practitioners in the Avenues area of Harare Zimbabwe. Although the response rate was high (54.5 percent), these results are not a representative and cannot be extrapolated to the whole population of general practitioners in Harare Zimbabwe.
- The study used a cross-sectional study design: exposures and outcomes measured at the same point in time. Therefore, we cannot be certain if knowledge influenced perception or perception influenced knowledge (reverse causality) (Heslop 2008).

5.7 Strengths of the Study

- The response rate was high, hence the results could be more generalisable to the Avenues area of Harare, Zimbabwe.

5.8 Recommendations

- Future studies could be conducted in other geographical areas in Harare Zimbabwe to provide more representative data.
- Study designs that measure exposures and outcomes at least two points in time could be employed in further studies.
- Efforts and intervention programs to inform and raise awareness of chiropractic amongst general practitioners and the public to increase the market share of chiropractors could be done.

- Further research on the public's knowledge and perceptions could also be conducted. It would be exciting to know what the public's awareness is of chiropractic compared with that of general practitioners.

REFERENCES

- Annon. 2016. *Medical Definition of MBChB*. Available: <https://www.medicinenet.com/script/main/art.asp?articlekey=33443> (Accessed 21 November 2017).
- Allport, G. W. 1995. *Becoming-basic considerations for psychology of personality*. Yale University Press. New Haven: Connecticut.
- Astin, J. A., Marie, A. Pelletier, K. R., Hansen, E. and Haskell, W. L. 1998. A review of the incorporation of complementary alternative medicine by mainstream physicians. *Archive of Internal Medicine*, 158: 2303-2330.
- Atkinson, R.L., Atkinson, R.C., Smith, E.E., Bem, D.J. and Nolen-Hoeksema, S. 2000. *Hilgard's Introduction to Psychology*. 13th ed. Florida: Harcourt Inc.
- Barbiker, A., El Hussein, M. E., Al Nemri, A., Al Frayh, A., Al Juryyan, N., Faki, M. O., Assiri, A., Al Saadi, M. and Al Zamil, F. 2014. Health care professional development: Working as a team to improve patient care. *Sudan Journal of Paediatrics*, 14(2): 9-16.
- Barnes, P. M., Powell-Griner, E., McFann, K., Nahin, R. L. 2004. Complementary and alternative medicine use among adults: United States, 2002. *Seminars in Integrative Medicine*, 2(2): 54-71.
- Barwell, J., Arnold, F. and Berry, H. 2013. How inter-professional learning improves care. *Nursing Times*, 109(21): 14-16.
- Bergh, Z.C. and Theron, A.L. 1999. *Psychology in the work context*. South Africa: International Thompson Publishing.
- Berry, L. L., Zeithaml, V. A. and Parasuraman, A. 1985. Quality Counts in Services, Too. *Business Horizons*, 28(3): 44.
- Bjersa, K., Victorin, E. S. and Olsen, M. F. 2012. Knowledge about complementary, alternative and integrative medicine (CAM) among registered health care providers

in Swedish surgical care: a national survey among university hospitals. *BioMedical Central Complementary and alternative medicine*, 12(1): 42.

Blanchette, M., Rivard M., Dionne, C. E., Cassidy, J. D. 2015. Chiropractors' characteristics associated with physician referrals: Results from a survey of Canadian doctors of chiropractic. *Journal of Manipulative and Physiological Therapeutics* 38(6): 395-406.

Brink, H. 2007. *Fundamentals of research methodology for health care practitioners*. Cape Town: Junta and Co.

Brown, B. T., Bonello, R., Fernandez-Caamano, R., Eaton, S., Graham, P. L. and Green, H. 2014. Consumer characteristics and perceptions of chiropractic and chiropractic services in Australia: results from a cross-sectional survey. *Journal of Manipulative and Physiological Therapeutics*, 37(4): 219-229.

Brown R. A 2012. Health care system in transformation: making the case for chiropractic. *Chiropractic & Manual Therapies*, 20:37.

Brussee, W. J., Assendelft, W. J. J. and Breen, A. C. 2001. Communication between general practitioners and chiropractors. *Journal of Manipulative and Physiological Therapies*, 24(1): 12-16.

Chapman-Smith, D. 2009. CAM or Mainstream? Where is the Chiropractic Profession, why is This Important? *The Chiropractic Report*, 23(1): 1-8.

Chartered Society of Physiotherapy. 2018. What is physiotherapy. <http://www.csp.org.uk/your-health/what-physiotherapy> (Accessed 12 April 2018).

Chiropractors Act 46 of 1981. Harare: Government Printer

Chiropractic Association of South Africa. 2017. Chiropractic in South Africa. Available: <http://www.chiropractic.co.za/chiropractic/index.html> (Accessed 10 July 2017).

- Cohen, M. M., Penman, S., Pirotta M. and Da Costa, C. 2005. The Integration of Complementary Therapies in Australian General Practice: Results of a National Survey. *The journal of alternative and complementary medicine*, 11(6): 995-1004.
- Corbin-Winslow, L. and Shapiro, H. 2002. Physicians want education about complementary and alternative medicine to enhance communication with their patients. *Archives of Internal Medicine*, 162(10): 1176-1181.
- Coren, S. and Ward, L. M. 1989. *Sensation and Perception*. 3rd ed. Orlando, Florida: Harcourt Brace Jovanovich Inc.
- Creswell, J. W. 2013. *Research design: qualitative, quantitative, and mixed methods approaches*. 4th ed. Los Angeles: SAGE.
- Debas H. T., Laxminarayan, R. and Straus S. E. 2006. *Disease Control Priorities in Developing Countries*. 2nd edition. Washington: World Bank
- Department of Chiropractic and Somatology. General Handbook for Students. 2017. Durban University of Technology.
- Department of Finance. Fees and Finance Rules. 2017. Durban University of Technology.
- Department of Medicine. 2017. University of Zimbabwe. Available: <http://www.uz.ac.zw/index.php/faculties-units/chs> (Accessed 29 May 2017)
- Dorsher, P. T. 2008. Can classical acupuncture points and trigger points be compared in the treatment of pain disorders? Birch's analysis revisited. *Journal of Alternatie Complementary Medicine*, 14: 353–9.
- Durant, C.L., Verhoef, M.J., Conway, P.J. and Sauve, R.S. 2001. Chiropractic treatment of patients younger than 18 years of age: Frequency, patterns and chiropractors' beliefs. *Paediatrics and Child Health*, 6(7): 433-38.
- Eisenberg, D. M., Kessler, R. C., Foster, C., Norlock, F. E., Calkins, D. R. and Delbanco, T. L. 1993. Unconventional medicine in the United States: prevalence, costs and patterns of use. *The new England journal of medicine*, 328(4): 246-252.

- Engel, R. M., Brown, B. T., Swain, M. S. and Lystad, R. P. 2014. The provision of chiropractic, physiotherapy and osteopathic services within the Australian private health-care system: a report of recent trends. *Chiropractic and Manual Therapies*, 22(3).
- Ernst, E. 2002. Chiropractic Care: Attempting a Risk–Benefit Analysis. *American Journal of Public Health*, 92(10): 1603–1604.
- Ernst, E. 2001. Prospective investigations into the safety of spinal manipulation. *Journal of Pain Symptom Management*, 21(3): 238–242.
- Eysenck, M.W. and Keane, M.T. 1996. *Cognitive Psychology: A Students Handbook*. United Kingdom: Psychology Press.
- Flannery, M. A., Love, M. M., Pearce, K. A., Kevin, A., Jingyu, L. and Elder, W. G. 2006. Communication about complementary and alternative medicine: perspectives of primary care clinicians. *Alternative therapies in health and medicine*, 12(1): 56.
- Foster, S. T. 2010. *Managing quality integrating the supply chain*. 4th ed. New Jersey: Pearson Education Inc.
- Gaylord, S. A. and Mann, J. D. 2007. Rationales for CAM Education in Health Professions Training Programs. *Academic Medicine*, 82(10): 927-933.
- Giannelli, M., Cuttini, M, Da Fre, M. and Buiatii, E. 2007. General practitioners' knowledge and practice of complementary/alternative medicine and its relationship with life-styles: a population-based survey in Italy. *Biomedical central*, 8 (30).
- Goldrteszmidt, M., Levitt, C., Duarte-Franco, E. and Kaczorowski, J. 1995. Complementary health care services: a survey of general practitioners' views. *Canadian Medical Association*, 153(1): 29-35.
- Grace, S. 2012. CAM practitioners in the Australian health workforce: an underutilised resource. *BioMedical Central Complementary and Alternative Medicine*, 12(205).

- Green, B. N. and Johnson, C. D. 2015. Inter-professional collaboration in research, education, and clinical practice: working together for a better future. *Journal of Chiropractic Education*, 29(1): 1–10.
- Greene, B. R., Smith, M., Allareddy, V. and Haas, M. 2006. Referral patterns and attitudes of primary care physicians towards chiropractors. *Biomedical Central Complementary and Alternative Medicine*, 8(5).
- Groenewald, T. 2004. A phenomenological research design illustrated. *International Journal of Qualitative Methods*, 3(1).
- Hayes, N. 1994. *Foundations of Psychology - An Introductory Text*. London: Routledge.
- Heslop, J. 2008. The knowledge and perceptions of paediatricians in South Africa with respect to chiropractic.
- Hicks, C. M. 2009. *Research methods for clinical therapists: applied project design and analysis*. London: Elsevier Health Sciences.
- Jönsson, M. and Sapir, D. G. 2009. Trends of health indicators in Zimbabwe, a CE-DAT technical brief. Centre for Research on the Epidemiology of Disasters (CRED).
- Huijbregts, P. A. 2007. Chiropractic Legal Challenges to the Physical Therapy Scope of Practice: Anybody Else Taking the Ethical High Ground? *The Journal of Manual & Manipulative Therapy*, 15(2): 69–80.
- Joos, S., Musselmann, B., Miksch, A., Rosemann, T. and Szecsenyi, J. 2008. The role of complementary and alternative medicine (CAM) in Germany – A focus group study of GPs. *BioMedical Central Health Services Research*, 8:127.
- Konrad, T. R., Fletcher, G. S. and Carey, T. S. 2004. Inter-professional collaboration and job satisfaction of chiropractic physicians. *Journal of Manipulative and Physiological Therapies*, 27(4): 245-52.

- Langworthy, J. M. and Birkelid, J. 2001. General Practice and chiropractic in Norway: How well do they communicate and what do GP's want to know? *Journal of Manipulative and Physiological Therapeutics*, 24(9): 576-581.
- Langworthy, J. M. and Smink, R. D. 2000. Chiropractic through the eyes of Physiotherapists, Manual Therapists, and Osteopaths in the Netherlands. *The Journal of Alternative and Complementary Medicine*, 6(5): 437-443.
- LeFebvre, R, Peterson, D and Haas, M. 2012. Evidence-Based Practice and Chiropractic Care. *Journal of Evidence-based Complementary and Alternative medicine*, 18(1): 75-79.
- Louw, J. and Myburgh. 2007. The Knowledge of General Practitioners about Chiropractors as a factor that may influence health care integration in South Africa. *Journal of Inter-Professional Care*, 21(2): 221-224.
- MacLennan, A. and Wilson, D. 1996. Prevalence and Cost of Alternative Medicine in Australia. *Lancet* 347(9001): 569
- Maha, N. and Shaw, A. 2007. Academic doctors' views of complementary and alternative medicine (CAM) and its role within the NHS: an exploratory qualitative study. *BioMedical Central Complementary and Alternative Medicine*, 7(17).
- Maharaj, L. 2015. Perceptions of professional nurses towards alternative therapies in the uMgungundlovu district, South Africa. M. Tech. Chiropractic Thesis. Durban University of Technology, Durban.
- Maharajh, S. 2010. The knowledge and perception of second and third year medical students at the Nelson Mandela School of Medicine towards chiropractic. M. Tech. Chiropractic Thesis. Durban University of Technology, Durban.
- Maphill. 2013. Available: <http://www.maphill.com/zimbabwe/harare/harare-urban/avenues/location-maps/political-map/free/> (Accessed 12 April 2018).
- Maund, L. 1999. *Understanding People and Organizations - An introduction to organizational behavior*. United Kingdom: Stanley Thorne Publishers Ltd.

Maushe, F. and Mugumbate, J. 2015. We are on our own: Challenges facing child headed households (CHH), a case of Seke rural area in Zimbabwe. *African journal of social work*; 5(1): 33-61.

Medical and Dental Practitioners Council of Zimbabwe (MDPCZ). 2017. Available: <http://www.mdpcz.co.zw> (Accessed 19 April 2017).

Meeker, W. C. and Haldeman, S. 2002. Chiropractic: A profession at the crossroads of mainstream and alternative medicine. *Annals of Internal Medicine*, 136(3): 216-27.

Merriam-Webster dictionary. 2018. <https://www.merriam-webster.com/dictionary/osteopathy> (Accessed 12 April 2018).

Meya, L. 2016. Makowe: breaking new ground in medicine. *The Herald*, 9 January. Available: <http://www.herald.co.zw/makowe-breaking-new-ground-in-medicine/> (Accessed 28 September 2017).

Meyer, J. 2009. The knowledge and perception of the medical staff about chiropractic at the Kimberly hospital complex. A dissertation submitted in partial compliance with the requirements for the Master's Degree in Technology of

Mouton, J. 2001. *How to succeed in your Master's & Doctoral Studies*. Pretoria: Van Schaik.

Mouton, J. 1996. *Understanding Social Research*. Pretoria: J.L. van Schaik Publishers.

Nardi, P. M. 2016. *Doing survey research: A guide to quantitative methods*. 3rd ed. New York: Routledge.

National Centre for Complementary and Alternative Medicine (NCCAM). 2008. The uses of complementary and alternative medicine in the United States. Available http://nccam.nih.gov/news/camsurvey_fsl.htm (Accessed 28 May 2017).

- Pedersen, K. M., Andersen, J. S. and Sondergaard J. 2012. General Practice and Primary Health Care in Denmark. *Journal of American Board Family Medicine*, 25(1): S34-S38.
- Peters, D., Chaitow, L., Harris, G. and Morrison, S. 2002. Integrating Complementary Therapies in Primary Care. New York: Churchill Livingstone.
- Pintrich, P. R. 2002. The role of metacognitive knowledge in learning, teaching, and assessing. *Theory into practice*, 41(4): 219-225.
- Pirotta, M., Kotsirilos, V., Brown, J., Adams, J., Morgan, T. and Williamson, M. 2010. Complementary medicine in general practice: a national survey of GP attitudes and knowledge. *Australian Family Physician*, 29(12): 946-951.
- Rattan, A. 2007. A knowledge and perception study of Grade 12 learners from selected secondary schools in the Durban Metropolitan Region on the Chiropractic Profession. M. Tech. Chiropractic Thesis. Durban University of Technology, Durban.
- Robbins, S. P. and Judge, T. A. 2013. *Organizational behavior*. 15th ed. Boston: Pearson.
- Rosner, L. A. 2016. Chiropractic Identity: A neurological, professional, and political assessment. *Journal of Chiropractic Humanities*, 23(1): 35-45.
- Salehi, A., Hashemi, N., Imanieh, M. H., and Saber, M. 2015. Efficacy of chiropractic in disease treatment: a systematic review. *Avicenna Journal of Phytomedicine*, 5:18.
- Solihull Chiropractic Clinic. 2018. What is the difference between a chiropractor, osteopath and physiotherapist? <http://www.solihullchiropractic.co.uk/difference-between-chiropractors-osteopaths-and-physiotherapists/> (Accessed 12 April 2018).
- Stilwell, B., Diallo, K. Zurn, P., Dal Poz, M. R, Adams, O. and Buchan, J. 2003. Developing evidence-based ethical policies on the migration of health workers: conceptual and practical challenges. *Human Resources for Health*, 1(8).

Tadyanemhandu, C., Nyazika, B., Nhunzvi, C., Chengetanai, S. and Chibhabha, F. 2016. Physical activity practices of final year medical students in a population with high burden of non-communicable diseases- survey of University of Zimbabwe students. *International Journal of Scientific and Research Publications*, 6(10): 351-356.

Tatalias, J.A. 2006. A prospective, epidemiological pilot study to investigate the level of knowledge of homeopathy and its contextualization in health shops in the Gauteng area. M. Tech. Homeopathy Thesis. Durban University of Technology.

Tetrault, M., Auerbach, G. and Durrett, S. 2017. Chiropractic diplomatic corps. Global statistics. Zimbabwe. Available

<http://www.chiropracticdiplomatic.com/global-stat-country/zimbabwe/> (Accessed 16 June 2017).

The Allied Health Professions Council of South Africa (AHPCSA) Act 63 of 1982 (as amended 2001). Pretoria: Government Printer.

The South African Concise Oxford Dictionary. 2002. Cape Town: Oxford University Press.

Till, A.G. and Till, H. 2000. Integration of chiropractic education into a hospital setting: a South African experience. *Journal of Manipulative and Physiological Therapeutics*, 23(2).

Van As, R.K. 2005. The Knowledge and Perception of Vocational Councillors in South Africa with Respect to Chiropractic. A dissertation submitted in partial compliance with the requirements for the Master's Degree in Technology of Chiropractic. Durban Institute of Technology, South Africa.

van Haselen, R. A., Reiber, U., Nickel, I., Jakob, A. and Fisher, P. A. G. 2004. Providing complementary and alternative medicine in primary care: The primary care workers' perspective. *Complementary Therapies in Medicine*, 12(1): 6-16.

Verhoef, M. J. and Page, S. A. 1996. Physicians' perspectives on chiropractic treatment. *Journal Canadian Chiropractic Association*, 40(4): 214-219.

- Verhoef, M. J. and Sutherland, L. R. 1995. General practitioners' assessment of and interest in alternative medicine in Canada. *Social Science and Medicine* 41(4): 511-515.
- Wardle, J. L., Sibbritt, D. W. and Adams, J. 2013. Referrals to chiropractors and osteopaths: a survey of general practitioners in rural and regional New South Wales, Australia. *Chiropractic and Manual Therapies*, 21(5).
- Weber, K. A., II and He, X. 2010. Chiropractic students and research: assessing the research culture at a North American chiropractic college. *Journal of Chiropractic Education*, 24(1): 35-45.
- Westin, D., Tangberg, T., John, C. and Axen, I. 2013. GPs opinions and perceptions of chiropractic in Sweden and Norway: A descriptive survey. *Chiropractic and Manual Therapies*, 21(29).
- World Federation of Chiropractic. 2009. Definitions of Chiropractic. Available: <https://www.wfc.org/website/index.php?option=comcontent&view=article&id=90&Itemid=110> (Accessed 14 October 2017).
- World Health Organisation. 2001. *Legal Status of Traditional Medicine and Complementary/Alternative Medicine: A Worldwide Review*. Geneva: World Health Organisation.
- Zhou K, Ma Y, Brogan MS. 2015. Dry needling versus acupuncture: the ongoing debate. *Acupuncture in Medicine* 33 (6):485-490.

APPENDICES

APPENDIX A

PRE-FOCUS GROUP PARTICIPANT QUESTIONNAIRE

Participant Number:		
1. Demographics		
1.1 Gender	a. Male	b. Female
1.2 Ethnicity (<i>for statistical purposes</i>)	a. Black	
	b. Coloured	
	c. Indian	
	d. White	
	e. Other specify	
1.3 State your age in years:		
2. Personal information		
2.1 In what type of practice do you work?	a. Solo practice	
	b. Partnership	
	c. Group practice (3 or more GP's in 1 practice, no other disciplines)	
	d. Health care centre (more disciplines in 1 practice)	
	e. Corporate/Industrial environment	
2.2 Do you possess another qualification besides M.B.Ch.B?	a. Yes	b. No
2.3 In which country did you study your M.B.Ch.B?		
3. General knowledge about chiropractic		
3.1 Is there a chiropractic practise in your area?	a. Yes	
	b. No	
	c. I do not know	
3.2 Who do you often refer you patients with musculoskeletal complaints to?	a. Acupuncturist	
	b. Chiropractor	
	c. Homeopath	
	d. Manual therapist	
	e. Naprapath	
	f. Osteopath	
	g. Physiotherapist	
	h. Other:	
3.3 How would you describe your knowledge regarding chiropractic?	a. I consider my knowledge about chiropractic to be good	
	b. I know something about chiropractic	
	c. I have heard of chiropractic; however I consider my knowledge to be poor	

	d. I have never heard of chiropractic (skip to Q 4.1)		
3.4 How did you attain your knowledge about chiropractic?	a. I have been treated by a chiropractor		
	b. A member of my family has been treated by a chiropractor		
	c. I have read about chiropractic in a medical journal		
	d. I have read about chiropractic in a magazine or journal		
	e. From the patients who have been treated by a chiropractor		
	f. From other general practitioners, paediatricians physiotherapists, etc.		
	g. At medical school		
	h. Others specify		
3.5 Are you aware that chiropractors can specialise in the following areas?	a. Anaesthetics	1. Yes	2. No
	b. Dermatology	1. Yes	2. No
	c. Extremities (e.g. Knee, elbow, wrist)	1. Yes	2. No
	d. Neuromusculoskeletal system	1. Yes	2. No
	e. Paediatrics	1. Yes	2. No
	f. Rehabilitation	1. Yes	2. No
	g. Sports injuries	1. Yes	2. No
	h. Radiology	1. Yes	2. No
	i. Surgery	1. Yes	2. No
3.6 Some modalities of chiropractic treatment include? (more than 1 block may be ticked)	a. Adjustments or manipulation of joints	1. Yes	2. No
	b. Dry needling	1. Yes	2. No
	c. Electro-modalities(e.g. ultrasound, IFC)	1. Yes	2. No
	d. Heat	1. Yes	2. No
	e. Ice	1. Yes	2. No
	f. Injection of anti-inflammatory	1. Yes	2. No
	g. Injection of corticosteroids	1. Yes	2. No
	h. Ischemic compression	1. Yes	2. No
	i. Surgery	1. Yes	2. No
4. Utilisation and perceived role of chiropractic			
4.1 Which one of the following best reflects your view of chiropractic?	a. Not informed enough to comment		
	b. Chiropractic is not effective		
	c. It may be effective for some patients		
	d. Chiropractic is effective for some neuromusculoskeletal conditions		

4.2 To what extent do you believe chiropractors to be competent in neuromusculoskeletal examination and diagnosis? (Please tick one box only)	a. Very competent			
	b. Moderately competent			
	c. Competent			
	d. Incompetent			
	e. Very incompetent			
4.3 To what extent do you believe chiropractors to be competent in general medical management of patients? (Definition of general medical management: The ability to diagnose, treat and refer the patient for optimum patient benefit.)	a. Very competent			
	b. Moderately competent			
	c. Competent			
	d. Incompetent			
	e. Very incompetent			
4.4 In your opinion which of these statements do you agree with?	a. Chiropractors have a satisfactory education to be part of mainstream medicine	1. Agree	2. Disagree	3. I do not know
	b. Chiropractors are competent in the treatment of musculoskeletal complaints	1. Agree	2. Disagree	3. I do not know
	c. Chiropractors are competent in the treatment of neurological disturbances	1. Agree	2. Disagree	3. I do not know
	d. Chiropractors adequately report to the general practitioner in their findings	1. Agree	2. Disagree	3. I do not know
	e. Chiropractors use unknown terminology in their report findings	1. Agree	2. Disagree	3. I do not know
4.5 Chiropractic referral is an option for patients with:	a. Acute back pain	1. Agree	2. Disagree	3. I do not know
	b. Attention deficit disorder	1. Agree	2. Disagree	3. I do not know
	c. Appendicitis	1. Agree	2. Disagree	3. I do not know
	d. Arthritis	1. Agree	2. Disagree	3. I do not know
	e. Asthma	1. Agree	2. Disagree	3. I do not know
	f. Back and pelvic problems during pregnancy	1. Agree	2. Disagree	3. I do not know
	g. Benign paroxysmal positional vertigo	1. Agree	2. Disagree	3. I do not know

	h. Carpal Tunnel syndrome	1. Agree	2. Disagree	3. I do not know
	i. Chronic back pain	1. Agree	2. Disagree	3. I do not know
	j. Chronic visceral disorders (responding poorly to medical intervention)	1. Agree	2. Disagree	3. I do not know
	k. Disc herniation	1. Agree	2. Disagree	3. I do not know
	l. Infantile colic	1. Agree	2. Disagree	3. I do not know
	m. Lateral/medial epicondylitis	1. Agree	2. Disagree	3. I do not know
	n. Migraine	1. Agree	2. Disagree	3. I do not know
	o. Nerve entrapment syndromes	1. Agree	2. Disagree	3. I do not know
	p. Nocturnal enuresis	1. Agree	2. Disagree	3. I do not know
	q. Prolapse with uncomplicated neurological findings	1. Agree	2. Disagree	3. I do not know
	r. Shoulder/knee problems	1. Agree	2. Disagree	3. I do not know
	s. Sports trauma	1. Agree	2. Disagree	3. I do not know
	t. Tension/cervicogenic headaches	1. Agree	2. Disagree	3. I do not know
u. Whiplash	1. Agree	2. Disagree	3. I do not know	
4.6 Do you refer patients to a chiropractor yourself	a. Yes		b. No	
4.6.1 If yes	a. Only at the patient's request			
	b. On my own judgement			
	c. At the patient's request and on my own judgement			
4.6.2 If no, what are your reasons for not referring to a chiropractor?	a. Do not know enough about chiropractic treatment			
	b. They charge too much			
	c. Because of possible side-effects			
	d. Not sure how effective the treatment is			
	e. No chiropractors in my area			
	f. I have had a bad experience with chiropractors			
	g. Other:			

4.7 Have you ever personally been treated by a chiropractor?	a. Yes	b. No
4.7.1 If yes, was it a positive or negative experience?	a. Positive	
	b. Negative	
	c. Both (If you have been treated multiple times)	
4.8 Has a member of your family been treated by a chiropractor?	a. Yes	b. No
4.9 Should a patient ask you for advice regarding Chiropractic treatment, do you feel you know enough to adequately inform them on the subject?	a. Yes	b. No

Thank you for taking the time to complete this questionnaire.

APPENDIX B
POST-PILOT PARTICIPANT QUESTIONNAIRE

(tick answers)

A. Participant Number:			
5. Demographics			
1.1 Gender		1. Male	0. Female
1.2 Ethnicity <i>(for statistical purposes)</i>	1. Black		
	2. Coloured		
	3. Indian		
	4. White		
	5. Other specify:		
1.3 Age			
Comments:			
6. Personal information			
2.1 In which country did you study your MBChB?		1. Zimbabwe	0. other
2.2 Do you possess another qualification besides MBChB?		1. Yes Specify:	0. No
2.3 In what type of practice do you work? (more than 1 block may be ticked)	1. Individual		
	2. Group practice (2 or more GP's in 1 practice, no other disciplines)		
	3. Group practice (2 or more GP's in 1 practice, multidisciplinary)		
	4. Corporate/Industrial environment		
	5. Other specify:		
2.5 have you practiced medicine in another country?		1. Yes Specify:	0. No
Comments:			
7. General knowledge about chiropractic			
3.1 Is there a chiropractic practice in your area?	1. Yes		
	2. No		
	3. Unsure		
3.2 Who do you refer patients with musculoskeletal complaints to? (more than 1 block may be ticked)	1. Acupuncturist		
	2. Chiropractor		
	3. Homeopath		
	4. Manual therapist		
	5. Naprapath		
	6. Osteopath		
	7. Physiotherapist		
	8. Traditional healer		
	9. Other specify:		
3.3 How would you describe your knowledge regarding chiropractic?	1. I consider my knowledge about chiropractic to be good		
	2. I know something about Chiropractic		

	c. I have heard of chiropractic; however, I consider my knowledge to be poor		
	d. I have never heard of chiropractic (End here)		
3.4 How did you attain your knowledge about chiropractic? (more than 1 block may be ticked)	a. I have been treated by a chiropractor		
	b. A member of my family has been treated by a chiropractor		
	c. I have read about chiropractic in media		
	d. From the patients who have been treated by a chiropractor		
	e. From other general practitioners, paediatricians physiotherapists, etc.		
	f. At medical school		
	g. Others specify:		
3.5 Are you aware that chiropractors can specialise in the following areas?	a. Anaesthetics	1. Yes	2. No
	b. Dermatology	1. Yes	2. No
	c. Extremities (e.g. Knee, elbow, wrist)	1. Yes	2. No
	d. Neuro-musculoskeletal system	1. Yes	2. No
	e. Paediatrics	1. Yes	2. No
	f. Rehabilitation	1. Yes	2. No
	g. Sports injuries	1. Yes	2. No
	h. Radiology	1. Yes	2. No
3.6 Some modalities of chiropractic treatment include?	a. Adjustments or manipulation of joints	1. Yes	2. No
	b. Dry needling	1. Yes	2. No
	c. Electro-modalities (e.g. ultrasound, Interferential current (IFC))	1. Yes	2. No
	d. Heat	1. Yes	2. No
	e. Ice	1. Yes	2. No
	f. Ischemic compression	1. Yes	2. No
	g. Massage	1. Yes	2. No

Comments:

8. Utilisation and perceived role of chiropractic

4.1 Which one of the following best reflects your view of chiropractic? (Please tick one box only)	a. Not informed enough to comment	
	b. Chiropractic is not effective	
	c. It may be effective for some patients	
	d. Chiropractic is effective for some neuro-musculoskeletal conditions	
4.2 Do you believe chiropractors are competent in neuro-musculoskeletal examination and diagnosis?	a. Yes	
	b. No	
	c. Unsure	
4.3 Do you believe chiropractors are competent in general medical management of patients? (Definition of general medical management: The ability to diagnose, treat and refer the patient for optimum patient benefit.)	a. Yes	
	b. No	
	c. Unsure	

4.4 Which of these statements do you agree with?	a. Chiropractors have a satisfactory education to be part of mainstream medicine	1. Agree	2. Disagree	3. Unsure
	b. Chiropractors are competent in the treatment of musculoskeletal complaints	1. Agree	2. Disagree	3. Unsure
	c. Chiropractic care is effective in the treatment of neurological disturbances	1. Agree	2. Disagree	3. Unsure
	d. Chiropractors adequately report to the general practitioner in their findings	1. Agree	2. Disagree	3. Unsure
	e. Chiropractors use unknown terminology in their report findings	1. Agree	2. Disagree	3. Unsure
4.5 Chiropractic referral is appropriate for patients with:	a. Acute back pain	1. Agree	2. Disagree	3. Unsure
	b. Attention deficit disorder	1. Agree	2. Disagree	3. Unsure
	c. Appendicitis	1. Agree	2. Disagree	3. Unsure
	d. Arthritis	1. Agree	2. Disagree	3. Unsure
	e. Asthma	1. Agree	2. Disagree	3. Unsure
	f. Back and pelvic problems during pregnancy	1. Agree	2. Disagree	3. Unsure
	g. Benign paroxysmal positional vertigo	1. Agree	2. Disagree	3. Unsure
	h. Carpal Tunnel syndrome	1. Agree	2. Disagree	3. Unsure
	i. Chronic back pain	1. Agree	2. Disagree	3. Unsure
	j. Chronic visceral disorders (responding poorly to medical intervention)	1. Agree	2. Disagree	3. Unsure
	k. Disc herniation	1. Agree	2. Disagree	3. Unsure
	l. Infantile colic	1. Agree	2. Disagree	3. Unsure
	m. Lateral/medial epicondylitis	1. Agree	2. Disagree	3. Unsure
	n. Migraine	1. Agree	2. Disagree	3. Unsure
	o. Nerve entrapment syndromes	1. Agree	2. Disagree	3. Unsure
	p. Nocturnal enuresis	1. Agree	2. Disagree	3. Unsure
	q. Prolapse with uncomplicated neurological findings	1. Agree	2. Disagree	3. Unsure
	r. Shoulder/knee problems	1. Agree	2. Disagree	3. Unsure
	s. Sports trauma	1. Agree	2. Disagree	3. Unsure
t. Tension/cervicogenic headaches	1. Agree	2. Disagree	3. Unsure	
u. Whiplash	1. Agree	2. Disagree	3. Unsure	
4.6 Do you refer patients for chiropractic care?		a. Yes		b. No
4.6.1 If yes	a. Only at the patient's request			
	b. On my own judgement			
	c. At the patient's request and on my own judgement			
4.6.2 If no, what are your reasons for not referring for chiropractic care? (more than 1 block may be ticked)	a. Do not know enough about chiropractic treatment			
	b. Not affordable			
	c. Not covered by medical aid			
4.6.2 If no, what are your reasons for not referring for chiropractic care? (more than 1 block may be ticked)	a. Do not know enough about chiropractic treatment			
	b. Not affordable			
	c. Not covered by medical aid			
	d. Because of possible side-effects			

	e. Not sure how effective the treatment is	
	f. No chiropractors in my area	
	g. I have had a bad experience with chiropractors	
	h. Other specify:	
4.7 Should a patient ask you for advice regarding Chiropractic treatment, do you feel you know enough to adequately inform them on the subject?	a. Yes	b. No
Comments:		

Thank you for taking the time to complete this questionnaire.



APPENDIX C LETTER OF INFORMATION TO PARTICIPANTS

Dear Participant: Thank you for showing interest in this study.

Title of the Research Study: Knowledge, perceptions and utilisation of the chiropractic profession by general practitioners in Harare, Zimbabwe.

Principal Investigator/researcher: Sylvia Thondhlana (MTech: Chiropractic) (+263 776 479 312/ +27 73 882 6079)

Supervisor/s: Prof JD Pillay (PhD: Physiology) (+27 313732398)
Dr C Kell (MTech: Homeopathy) (+27 313 732393)

Brief Introduction and Purpose of the Study:

The study seeks to investigate the level of knowledge, utilisation and perception of chiropractic care in Harare, Zimbabwe. General practitioners play an important role in the health care sector, as such their knowledge of other alternative or unconventional medicine such as chiropractic is relevant. there is also a gap in literature on chiropractic in Zimbabwe in general.

The aim of this study is to determine the level of knowledge, utilisation and perceptions of general practitioners in Harare, Zimbabwe.

Outline of the Procedures:

- All general practitioners who meet the inclusion criteria are invited to take part in this study by completing the given questionnaire.
- This is voluntary and the participant may at any time withdraw from the study.
- The questionnaire will take approximately 5 minutes to complete.

- The questionnaire will be collected with the consent form in two different boxes (Ballot Box Method) to ensure the participant remains anonymous.
- The researcher will capture the data and have it analysed, and a conclusion will be drawn

Inclusion criteria:

- General practitioners in the Avenues area Harare, Zimbabwe,
- Medical doctors registered with the Medical and Dental Practitioners Council of Zimbabwe,
- Informed consent provided.

Exclusion criteria:

- Not complying with the inclusion criteria above,
- The researcher is unable to deliver the questionnaire to a participant (e.g. in the case of sick leave, annual leave, maternity leave etc.),
- Unwillingness to participate.

Risks or Discomforts to the Participant:

None

Benefits:

Your participation in this study will assist in the generation of new understanding regarding knowledge and perceptions of general practitioners about chiropractic. This may contribute to the integration of chiropractic in the public healthcare system in the future.

Reason/s why the Participant May Be Withdrawn from the Study:

If the participant does not sign the informed consent.

Remuneration:

None

Costs of the Study:

None

Confidentiality:

All forms of consent and questionnaires will be collected in separate boxes to ensure that the participant remains anonymous. The information obtained will be available in the form of a dissertation at the Durban University of Technology.

Research-related Injury:

None

Persons to Contact in the Event of Any Problems or Queries:

Please contact the researcher, Sylvia Thondhlana (+263 776 479 312), my supervisors, Prof Pillay (+27 82 603 9111) or Dr Kell (+27 730 199 799) or the Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Director: Research and Postgraduate Support, Prof S Moyo on 031 373 2577 or moyos@dut.ac.za.

General:

Participation is totally voluntary. Participants may also choose to withdraw from the study at any time without penalty. Participation of this study will ensure total confidentiality of the questionnaires.



APPENDIX D
INFORMED CONSENT OF PARTICIPANTS

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, **Sylvia Shamiso Thondhlana**, about the nature, conduct, benefits and risks of this study.

Research Ethics Clearance Number: **IREC 029/17**

- 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 and opinions 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 electronically 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

Signature / Right Thumbprint

I, **SYLVIA SHAMISO THONDHLANA** (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

SYLVIA SHAMISO THONDHLANA

Full name of researcher

Date

Signature / Right Thumbprint

Full Name of Witness

Date

Signature / Right Thumbprint



APPENDIX E LETTER OF INFORMATION- FOCUS GROUP

Dear participant, I would like to welcome you into the focus group of my study, the title of my research project is: **Knowledge, perceptions and utilisation of the chiropractic profession by general practitioners in Harare, Zimbabwe.**

Background to the study: The international utilisation of complementary alternative medicine (CAM) is high and increasing. Chiropractic care was found to be one of the most frequently sought after alternative care to conventional medicine and resulted in a high level of patient satisfaction and continuous utilisation in several countries. In South Africa the utilisation of chiropractic is growing and Zimbabwe is expected to have a similar trend. Numerous studies found that mainstream medical providers rated their knowledge of Chiropractic as limited or inadequate and were motivated to learn more about it in order to effectively communicate with their patients. This study seeks to ascertain the knowledge and perceptions of medical doctors in Harare Zimbabwe.

The aim of this study is to determine the level of knowledge, perceptions and utilisation of general practitioners in Harare, Zimbabwe

Objective of the study:

The data obtained by means of this questionnaire will allow for further assessment of the knowledge and perceptions of medically qualified doctors of chiropractic in Harare, Zimbabwe. The questions are concerned with your knowledge of chiropractic, the role of chiropractic in the patient, inter-professional communication between medically qualified doctors and chiropractors, as well as your personal experience with chiropractors in Zimbabwe. The questionnaire will only take a few minutes to complete, as most of the questions require you to tick or circle the appropriate answer. There are only a few short written responses that are required. As you complete the questionnaire please note any concerns you have, questions that are vague and the general flow of questions. All participants are expected to discuss and recommend any changes to the questionnaire.

Your participation in this study is much appreciated and you are assured that your comments and contributions to the discussion will be kept confidential. The results of the discussion will only be used for research purposes.

If you have any further questions, please feel free to contact either my supervisor/ co-supervisor or myself.

The researcher: Sylvia Thondhlana
+27 73 882 6079, or email: sylviethondhlana@gmail.com

The Supervisor: Prof. D. J. Pillay (PHD Physiology)
(+27) 031 3732398 or email: pillayjd@dut.ac.za

The Co-supervisor: Dr C. Kell (MTECH HOM)
(+27) 031 3732393 or email: colette.kell@gmail.com



**APPENDIX F
CONFIDENTIALITY STATEMENT – FOCUS GROUP DECLARATION**

IMPORTANT NOTICE: THIS FORM IS TO BE READ AND FILLED IN BY EVERY MEMBER PARTICIPATING IN THE FOCUS GROUP, BEFORE THE FOCUS GROUP MEETING CONVENES.

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.
2. The returned questionnaires will be coded and kept anonymous in the research process.
3. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.
4. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Once this form has been read and agreed to, please fill in the appropriate information below and sign to acknowledge agreement.

Please print in block letters:

Focus Group Member: _____ Signature:

Witness Name: _____ Signature:

Researcher's Name: SYLVIA S. THONDHLANA Signature:

Supervisor's Name: PROF J. D. PILLAY Signature:



**APPENDIX G
INFORMED CONSENT FORM**

(TO BE COMPLETED BY THE PARTICIPANTS OF THE FOCUS GROUP)

DATE:

TITLE OF RESEARCH PROJECT: Knowledge, perceptions and utilisation of the chiropractic profession by general practitioners in Harare, Zimbabwe.

NAME OF SUPERVISOR: Prof D. J. Pillay (PhD Physiology)

NAME OF RESEARCH STUDENT: Sylvia Thondhlana

Please circle the appropriate answer

YES/NO

1. Have you read the research information sheet? Yes No
2. Have you had an opportunity to ask questions regarding this study? Yes No
3. Have you received satisfactory answers to your questions? Yes No
4. Have you had an opportunity to discuss this study? Yes No
5. Have you received enough information about this study? Yes No
6. Do you understand the implications of your involvement in this study? Yes No
7. Do you understand that you are free to;
 - Withdraw from this study at any time? Yes No
 - Withdraw from the study at any time, without reasons given? Yes No
8. Do you agree to voluntarily participate in this study? Yes No

If you have answered NO to any of the above, please obtain the necessary information from the researcher and / or supervisor before signing.

Thank You.

Please Print in block letters:

Focus Group Member: _____

Signature:

Witness Name: _____

Signature:

Researcher's Name: SYLVIA S. THONDHLANA

Signature:

Supervisor's Name: PROF J. D. PILLAY

Signature:



**APPENDIX H
Code of Conduct-Focus Group**

This form needs to be completed by every member of the Focus Group prior to the commencement of the focus group meeting. As a member of this committee I agree to abide by the following conditions:

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.
2. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.
3. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Member represents	Member's name	Signature	Contact details

APPENDIX I

Questionnaire development

Question 1

- 1.1 Heslop Q1.1
- 1.2 Heslop but modified Q1.3 Less options
- 1.3 Heslop Q1.2

Question 2

- 2.1 louw 1.4 and heslop Q1.7 but modified
- 2.2 louw Q1.6
- 2.3 reseachers own

Question 3

- 3.1 Heslop Q2.6
- 3.2 westin Q 3.3
- 3.3 westin Q2.1
- 3.4 Heslop Q2.2 and louuw 2.2
- 3.5 louw Q2.6 and Heslop Q2.9 modified
- 3.6 Heslop Q2.10 modified

Question 4

- 4.1 louw q3.1 and Heslop .1 modified
- 4.2 louw q6.1
- 4.3 louw q6.2
- 4.4 Westin Q2.3
- 4.5 heslop 3.9 and louw 6.4
- 4.6Louw Q 5.4
- 4.6.1 louuw Q5.4
- 4.6.2 westin Q3.4
- 4.7 heslop 5.1
- 4.8 heslop 5.2
- 4.9 heslop 5.8