A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the eThekwini municipality

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Dissertation submitted in partial compliance with the requirements for the Master's Degree in Technology: Chiropractic
at the Durban University of Technology.

I, Caitlyn Koekemoer, do declare that this dissertation is representative of my own work in both conception and execution, except where specific assistance is sought and duly acknowledged.

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DEDICATION

It is with great pleasure that I dedicate this dissertation to my parents, Shaun and Sandra Koekemoer. You have supported me above and beyond the call of duty. Thank you very much for being my anchor and for believing that I could make my dream come true. I am truly blessed to have you in my life.

ACKNOWLEDGEMENTS

Firstly and most importantly, thank you to my Lord and Saviour for giving me the strength, perseverance, belief and the ability to make such a dream become a reality. You have always been there when I needed you most.

To my parents, thank you for your constant support and encouragement throughout my academic career and for affording me the opportunities to reach for the stars.

To Kevin, you are my love, my life, my rock. Thank you for knowing when to push and when to quietly support me. You are a gift from God.

Many thanks to the rest of my family, especially my grandparents and brother. Thank you to all my close friends, especially Devon Daniel, for your support and encouragement over the years. The drive to succeed was made possible by you. I love you all dearly.

To my friends and colleagues, we went through everything side by side. I thank you for the laughs and support that made the journey more achievable. I wish you all the best of luck as you go into practice. May you all be successful doctors.

To the lecturers, teachers, clinicians and staff who have led me through my academic career. Your knowledge, guidance and support has made me into the doctor I am today.

To my supervisor and co–supervisor, Drs O'Connor and Padayachy respectively, thank you for all the patience, support, advice and guidance you have given me throughout this study and for aiding me in making it a success.

To Divashni, thank you for agreeing to do this buddy study with me. Your support and friendship is much appreciated.

To Linda, thank you for your help in collecting the questionnaires. Without your assistance data collection would have been a tedious process.

Last but not least, thank you to all of the chiropractors and general practitioners who volunteered and sacrificed their time to be involved in this study. Without you, the study would not have been possible.

ABSTRACT

Background:

Medicine was the first profession to embrace evidence-based practice (EBP) and has subsequently been the leading profession with its implementation. Many other healthcare professions, including chiropractic, have since embraced the EBP movement. Despite this acceptance, many practitioners report difficulty implementing it into practice. This study aimed to compare the perceptions, use and barriers to EBP by chiropractors and general practitioners (GPs) in private practice within the eThekwini municipality.

Method:

The study utilised a quantitative paradigm and a cross-sectional descriptive survey design. Once the Durban University of Technology (DUT) Institutional Research Ethics Committee (IREC) approval was obtained, chiropractors (n = 101) and GPs (n = 289) in private practice within the eThekwini municipality were invited to participate. A pre-validated questionnaire and letter of information and consent were administered by electronic mail or hand delivery. The data was analysed using SPSS Version 24.0, (IBM, Armonk NY, U.S.A.) and Statgraphics Centurion (Statgraphics Technologies Inc, Warrenton, Virginia, U.S.A.). A *p*-value <0.05 was considered as statistically significant. Descriptive and inferential statistics such as cross-tabulations, chi-squared and fisher's exact tests were utilised.

Results:

A 50.5% (n = 51) response rate from the chiropractor respondents and 50.9% (n = 147) with regards to the GP respondents was achieved with respondents having an overall positive perception of EBP, its necessity, use and benefit in patient care. The respondents also displayed a willingness to adopt and improve their use of and skills in EBP. The GP respondents' perceptions were more favourable towards the necessity of the application of EBP and the use of literature and research findings in daily practice when compared to those of the chiropractic respondents.

The majority of respondents from both professions reported to read and use scientific literature and databases on a regular basis. Most of the GP respondents read scientific

literature two to five times per week, while less than half of the chiropractic respondents reported to do the same.

The greatest barrier to the use of EBP reported by both professions was insufficient time with significantly more GPs than chiropractors reporting it as their top barrier. Inability of the professional to generalise literature findings to their patient population and inability of the professional to apply research findings to individual patients with unique characteristics were the next main barriers experienced by both professions. Significantly more chiropractic than GP respondents ranked their inability to apply research findings to individual patients with unique characteristics as their top barrier to EBP. Lastly, significantly more chiropractic than GP respondents ranked a lack of collective support among their colleagues in their facility as their greatest barrier to EBP.

Conclusion and Recommendations:

Both professions were found to have a positive perception of EBP and to be utilising scientific literature and databases regularly. A lack of time was the greatest barrier to the use of EBP, a finding similar to studies conducted with other healthcare professionals. Mechanisms need to be developed to aid practitioners to make time for EBP.

Key Words:

Chiropractor, General practitioner, Evidence-based practice, Evidence-based medicine, Perception, Use, Barrier.

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DEFINITIONS

Barrier

A barrier is a problem, rule or situation that prevents somebody from doing something, or that makes something impossible (Oxford Learner's Dictionaries 2017a). For the purpose of this study a barrier was defined as a problem or situation that obstructs the practitioners' practice of EBP.

Chiropractor

A chiropractor is a healthcare professional concerned with the diagnosis, treatment and prevention of disorders of the neuromusculoskeletal system and the effect of these disorders on general health. There is an emphasis on manual techniques, including joint adjustment and/or manipulation with a particular focus on subluxations (World Health Organisation 2005).

Evidence-based medicine

Evidence-based medicine (EBM) is the conscientious, explicit, and judicious use of current best evidence by a practitioner in making decisions about the care of individual patients (Sackett *et al.* 1996).

Evidence-based practice and evidence-informed practice

The definition for EBM by Sackett *et al.* (1996) has become synonymous with the term EBP and has since been utilised as such my many authors (Chronister *et al.* 2008; Isetta 2008; Leach and Gillham 2008; Oliver 2009; Petrie and Sabin 2009; de Wet 2010; Hall 2011; Heiwe *et al.* 2011; Keller 2012; Madhavji *et al.* 2011; Nevo and Slonim-Nevo 2011; Graham *et al.* 2013; Maaskant *et al.* 2013; Roecker *et al.* 2013; Weng *et al.* 2013; Diermayr *et al.* 2015; Bussières *et al.* 2016). Evidence-informed practice (EIP) is the combination of clinical experience with research evidence, in addition to the values of the patient (Oliver 2009). Often these two terms are used interchangeably (Melnyk 2014; Woodbury and Kuhnke 2014). For the purpose of this study, EBP was referred to as the incorporation and integration of the practitioner's individual clinical expertise and the current external clinical evidence from systematic research, in addition to patient values.

General Practitioner

A general practitioner (GP) is a healthcare professional who is the only clinician who operates at the nine levels of care: prevention, pre-symptomatic detection of disease, early diagnosis, diagnosis of established disease, management of disease, management of disease complications, rehabilitation, palliative care and counselling (Atun 2004).

Knowledge

Knowledge is understanding, information and skills acquired through experience or education; practical, medical or scientific knowledge (Oxford Learner's Dictionaries 2017b). For the purpose of this study knowledge referred to the understanding of, information and skills with regards to EBP.

Perception

Perception is the way in which something is regarded, understood, or interpreted (Oxford Dictionaries 2017c). For the purpose of this study perception referred to the way in which EBP is regarded by the chiropractor and GP respondents.

Use

To use something is to put something into action for the purpose for which it is meant to be utilised (Bradbery *et al.* 2006). For the purpose of this study use referred to how EBP is put into action by the chiropractor and GP respondents.

Skill

A skill is the ability to do something well; expertise in something (Oxford Learner's Dictionaries 2017d). For the purpose of this study skill was considered as the expertise possessed by the chiropractor and GP respondents with regards to EBP.

ABBREVIATIONS

%	Percentage
<	Refers to a figure “less than” the reported figure.
=	Refers to “equals to”.
>	Refers to a figure “more than” the reported figure.
AHPCSA	Allied Health Professions Council of South Africa
BHF	Board of Healthcare Funders of South Africa
CAM	Complementary and alternative medicine
CASA	Chiropractic Association of South Africa
CEUs	Continuing Education Units
CMSA	The Colleges of Medicine of South Africa
CPD	Continuing professional development
DUT	Durban University of Technology
EBC	Evidence-based chiropractic
EBM	Evidence-based medicine
EBP	Evidence-based practice
EIP	Evidence-informed practice
E-mail	Electronic mail
GP	General practitioner
GPs	General practitioners
HPCSA	Health Professions Council of South Africa
IREC	Institutional Research Ethics Committee
KZN MCC	Kwazulu-Natal Medical Care Coalition
MBBS	Medicinae Baccalaureus, Baccalaureus Chirurgiae
MBChB	Bachelor of Medicine and Bachelor of Surgery
MEDLINE	Medical Literature Analysis and Retrieval System Online
N	Population
n	Refers to the sample size.
p	Refers to the *p*-value or probability value.
PhD	Doctor of Philosophy
RCT	Randomised clinical trial
S.A.	South Africa(n)
SD	Standard deviation
U.K.	United Kingdom
U.S.A.	United States of America
WFC	World Federation of Chiropractic

CHAPTER ONE: INTRODUCTION

1.1 Introduction

In this chapter a brief overview of the research study will be described and the rationale for the study will be discussed. Following on from this discussion the aim and objectives of the study will be stated and the delimitations of the study will be reviewed.

1.2 Introduction to the study

The advancement of healthcare professions towards evidence-based practice (EBP) started as evidence-based medicine (EBM) (Barnard and Wiles 2001; Dawes *et al.* 2005; Guyatt 1991; Guyatt 2016). The purpose of such a movement was to bridge the gap between what was being proven through research and that which was being implemented in daily clinical practice by medical practitioners (Dawes *et al.* 2005; Haneline 2007; Asadoorian *et al.* 2010). According to Sackett *et al.* (1996), EBM was defined as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. Therefore, the practice of EBM means incorporating the integration of individual clinical expertise and current external clinical evidence from systematic research. Although this definition of EBM is dated, it is one of the most widely accepted definitions utilised by many authors (Chronister *et al.* 2008; Isetta 2008; Leach and Gillham 2008; Oliver 2009; Petrie and Sabin 2009; de Wet 2010; Hall 2011; Heiwe *et al.* 2011; Keller 2012; Madhavji *et al.* 2011; Nevo and Slonim-Nevo 2011; Graham *et al.* 2013; Maaskant *et al.* 2013; Roecker *et al.* 2013; Weng *et al.* 2013; Diermayr *et al.* 2015; Bussières *et al.* 2016).

In this era of EBM there has been increasing pressure on all healthcare professions, especially complementary and alternative medicine (CAM) professions, to apply EBM to their practices (Berman and Strauss 2004). The term EBM evolved into EBP in order to generate a generic term that incorporated the interventions of all healthcare professionals (Barnard and Wiles 2001; Dawes *et al.* 2005). Evidence-based practice has become a widely accepted and utilised approach within healthcare professions (Chronister *et al.* 2008, Pericas-Beltran *et al.* 2014). As a result, EBP is considered the gold standard for scientific clinical practice (Haneline 2007; Hadley *et al.* 2008; Isetta 2008; Prasun 2013) as it has affected a shift among healthcare professionals from basing their clinical practice on authoritative opinions to emphasising on clinically-relevant research to guide clinical

decision-making (Jette *et al.* 2003; Majid *et al.* 2011). This leads to higher quality care and improved healthcare outcomes (Asadoorian *et al.* 2010; Boström *et al.* 2013; Pericas-Beltran *et al.* 2014). Therefore, it is necessry to establish healthcare professionals' perceptions of EBP and to determine if they have the necessary skills to practice in an evidence-based manner. Understanding how EBP is perceived and used across health care professions can assist in identifying educational needs and outcomes, and predict where new research evidence is more likely to be implemented (Shi *et al.* 2014).

1.3 Rational for the study

The widespread acceptance of EBP by healthcare professions can be seen in the favourable attitudes towards EBP by chiropractors (Suter *et al.* 2007; Roecker *et al.* 2013; Walker *et al.* 2013; Bussières *et al.* 2015; Schneider *et al.* 2015; Bussières *et al.* 2016), dieticians (Heiwe *et al.* 2011), GPs both internationally (McColl *et al.* 1998; Young and Ward 2001) and locally (de Wet 2010), massage therapists (Suter *et al.* 2007), nurses (Majid *et al.* 2011; Thorsteinsson and Sveinsdòttir 2013), occupational therapists (Bennett *et al.* 2003; Heiwe *et al.* 2011; Graham *et al.* 2013), physiotherapists (Barnard and Wiles 2001; Jette *et al.* 2003; Iles and Davidson 2006; Heiwe *et al.* 2011) and primary care professionals including GPs and nurses (O'Donnell 2004). However, there are reports to suggest that the positive attitudes of these professionals do not translate into EBP utilisation in practice (McColl *et al.* 1998; Young and Ward 2001; Bennett *et al.* 2003; Jette *et al.* 2003; Palfreyman *et al.* 2003; O'Donnell 2004; Iles and Davidson 2006; de Wet 2010; Hall 2011; Majid *et al.* 2011; Graham *et al.* 2013; Thorsteinsson and Sveinsdòttir 2013; Walker *et al.* 2013; Walker *et al.* 2014; Bussières *et al.* 2015; Schneider *et al.* 2015; Bussières *et al.* 2016). A lack of knowledge and skills of EBP has been associated with the under-utilisation of EBP in various professions including chiropractic (Roecker *et al.* 2013; Walker *et al.* 2013; Bussières *et al.* 2015; Schneider *et al.* 2015; Bussières *et al.* 2016), general medicine (McColl *et al.* 1998; de Wet 2010), nursing (Majid *et al.* 2011), occupational therapy (Bennett *et al.* 2003) and physiotherapy (Jette *et al.* 2003; Iles and Davidson 2006). Another frequently identified barrier to the utilisation of EBP is lack of or insufficient time (McColl *et al.* 1998; Young and Ward 2001; Bennett *et al.* 2003; Jette *et al.* 2003; Palfreyman *et al.* 2003; O'Donnell 2004; Koehn and Lehman 2008; de Wet 2010; Hall 2011; Heiwe *et al.* 2011; Majid *et al.* 2011; Roecker *et al.* 2013; Walker *et al.* 2014; Bussières *et al.* 2015; Schneider *et al.* 2015; Bussières *et al.* 2016).

The above studies have been conducted on international populations, with the exception of the study by de Wet (2010) who surveyed GPs in Gauteng, S.A. In the S.A. context,

how chiropractors perceive and use EBP has been under investigated. Similarly, it is not known if the barriers to EBP identified internationally are also experienced by S.A. chiropractors or if they are different. Chiropractic is a growing profession in S.A. with approximately 800 currently registered practitioners (e-mail communication, 31 January 2018, Camillle Terry). As a CAM profession, chiropactic has been embracing of EBP and S.A. chiropractors are schooled in EBP (Durban University of Technology 2017; University of Johannesburg 2017). Therefore, making the chiropractic profession a relevant healthcare profession to survey with regards to perceptions, use and barriers to EBP.

Evidence-based practice has its origins in medicine and has been integrated into medical education since 1992 (Evidence-based Medicine Working Group 1992; Guyatt *et al.* 1992; Guyatt 2016). It has been shown that S.A. GPs are accepting of EBP yet they also experience barriers to its implementation (de Wet 2010). In the current study a comparison between chiropractic and general medical practitioner perceptions, use and barriers to EBP will be made. This will provide valuable information to both professions as recommendations can be made to professional bodies to address barriers and provide workshops or seminars to aid practitioners in the application of EBP if necessary.

1.4 Aim and objectives of the study

1.4.1 Aim of the study

The aim of this study was to compare the perceptions, use and barriers to EBP by chiropractors and GPs in private practice in the eThekwini Municipality.

1.4.2 Objectives of the study

Objective One:
To determine and compare the perceptions of chiropractors and GPs towards EBP.

Objective Two:
To determine and compare the utilisation of EBP by assessing the level of knowledge and skills required for utilising EBP by chiropractors and GPs.

Objective Three:
To determine and compare the perceived barriers to EBP by chiropractors and GPs.

Objective Four:

To determine if age, sex, years in practice and previous personal involvement in conducting research are factors associated with perceptions of, use of and perceived barriers to EBP by chiropractors and GPs.

1.5 Delimitations of the study

This study was limited to chiropractors and GPs practicing in private practice within the eThekwini Municipality. In S.A. chiropractors do not work in the government sector. This makes practitioners in private practice a suitable population for this study in order to allow comparison with the GP profession. The study was also limited to those practicing within the eThekwini Municipality as a larger population would not have been viable due to both financial and time constraints.

1.6 Flow of dissertation

Chapter One

Chapter One provides an overview of the research study together with rationale for, the aim and objectives of and the delimitations of the study.

Chapter Two

Chapter Two is a review of the literature pertinent to this study. This chapter discusses the growth of EBM and its advancement into EBP. The perceptions, knowledge and skills, utilisation of and perceived barriers to EBP application and what influences them are discussed.

Chapter Three

Chapter Three describes the methodology utilised in this study. This included the study design, population and sample characteristics, research tool development and research procedures utilised to collect the data. The data synthesis and analysis, as well as the ethical considerations for the study, are also described.

Chapter Four

Chapter Four presents the results of the statistical analysis.

Chapter Five

Chapter Five contextualises the results in relation to the existing literature.

Chapter Six

Chapter Six describes the conclusion, highlights the important findings and also provides recommendations for future studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the literature related to EBP. The development of EBM into EBP will be discussed along with factors that could influence a chiropractor or GPs perceptions, knowledge, skills and utilisation of EBP. The literature regarding barriers to EBP will also be presented.

To obtain the literature for this review, the researcher consulted books and journals in the DUT libraries along with the DUT institutional repository. An Internet search was also conducted using the following search engines: Academic Search Complete, Google Scholar, Medical Literature Analysis and Retrieval System Online (MEDLINE), Proquest, PubMed, Science Direct, SpringerLink. The following research terms were utilised during the searches: evidence-based medicine, evidence-based practice, general practitioner, general medicine, chiropractor, chiropractic, knowledge, skills, utilisation, use, barriers, attitudes and perceptions.

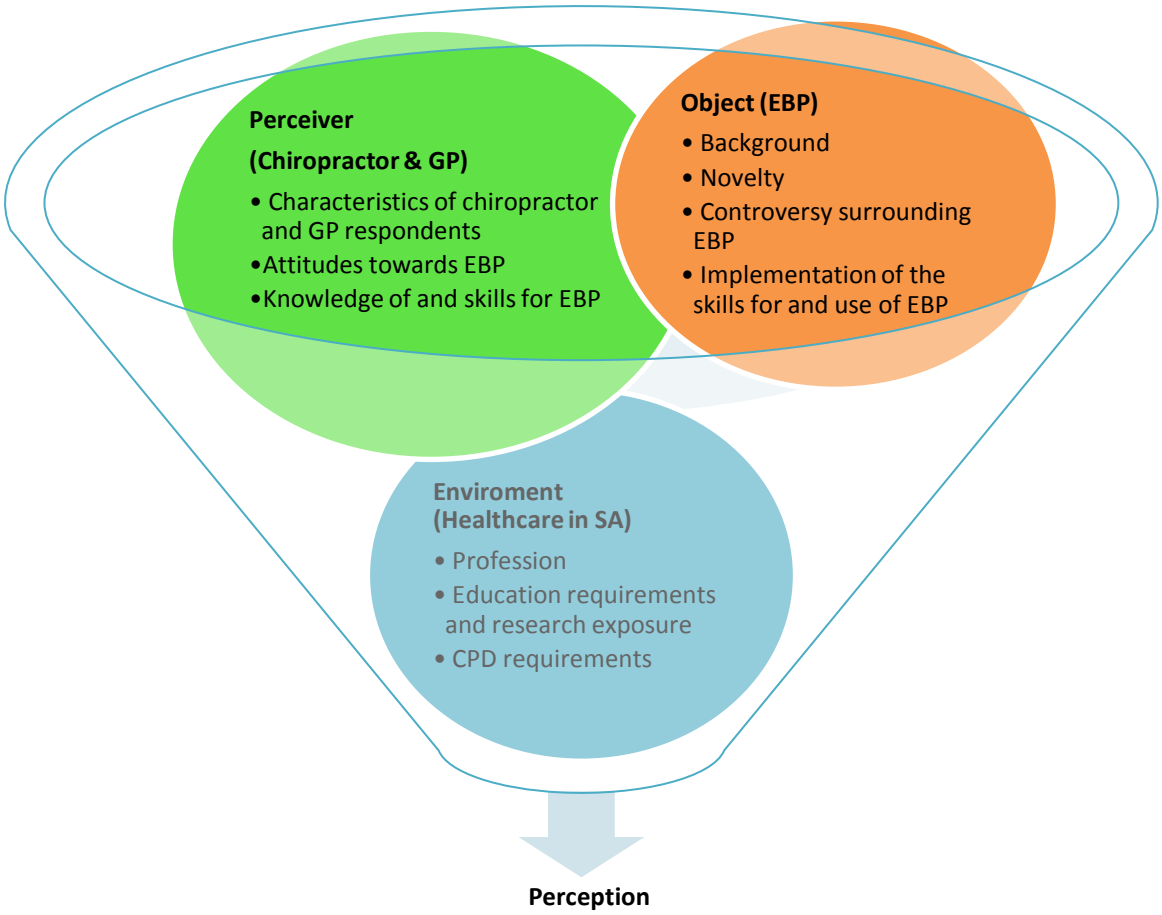
2.2 Perception

Perception is defined as the manner in which something is regarded, understood or interpreted (Oxford Dictionaries 2017c). The formation of perceptions occurs through an automatic process of information interpretation (Bergh and Theron 2009: 116; Webber 2013). Whereas attitude can be defined as a feeling or opinion about something that tends to influence behaviour (Collins Dictionary 2017). Attitudes, negative or positive, guide information processing and so influence behaviour (Bohner and Dickel 2011) and perceptions (Bergh and Theron 2009: 186).

2.3 Factors influencing perception

Numerous factors can influence perception. A model by Bergh and Theron (2009: 128) proposes that these factors are relative to: the perceived object, the perceiver's environment and the perceiver. The perceived object in the current study is EBP, the perceiver's environment is the healthcare environment in S.A. and the perceiver is the chiropractor and the GP respondent. **Figure 2.1** shows selected factors that could influence perception formation relative to each of these three aspects of a perception.

Figure 2.1: Factors influencing perception (Adapted from Bergh and Theron 2009)



2.3.1 The object: Evidence-based practice

2.3.1.1 Background

The transformation towards EBP started in 1972 by Scottish epidemiologist, Archie Cochrane, who advocated that research should be used to determine the effectiveness and efficiency of medical interventions (Starr *et al.* 2009; Flanagan 2013). In 1991 the term EBM was first used (Guyatt 1991; Dawes *et al.* 2005; Guyatt 2016). Evidence-based medicine was later described by Sackett *et al.* (1996) as the conscientious, explicit, and judicious use of current best evidence by the practitioner in making decisions about the care of individual patients. In addition, Sackett *et al.* (1996) described the practice of EBM as the incorporation and integration of the practitioner's individual clinical expertise and the current external clinical evidence from systematic research.

The motivation behind the development of the evidence-based approach was that physicians recognised a gap between the quality of care and healthcare outcomes being

achieved in clinical practice compared to what was being shown by research (Dawes *et al.* 2005; Haneline 2007; Asadoorian *et al.* 2010). It was identified that the delayed implementation of effective treatment methods and/or the continued practice of ineffective or harmful ones was negatively impacting healthcare delivery (Asadoorian *et al.* 2010). Realising that current research needed to be more frequently utilized in clinical practice decision-making, Gordon Guyatt and David Sackett, at McMaster's University, started to educate physicians on the importance of incorporating the latest research evidence with their clinical skills to enhance healthcare delivery (Evidence-based Medicine Working Group 1992; Guyatt *et al.* 1992; Guyatt 2016). They also incorporated teaching the knowledge and skills necessary to understand research findings

2.3.1.2 Novelty

Evidence-based medicine was developed to enhance the education of medical students (Guyatt *et al.* 1992; Guyatt 2016) resulting in medicine becoming the leaders in EBM, but soon as other healthcare professions recognised the importance of it, its acceptance grew (Sackett *et al.* 1996; Villanueva-Russell 2005; Chronister *et al.* 2008, Pericas-Beltran *et al.* 2014). The novel concept and benefits of EBM lead to its widespread acceptance across allopathic medicine and CAM and so the term then evolved into EBP in order to generate a generic term that incorporated the interventions of all healthcare professionals (Barnard and Wiles 2001; Dawes *et al.* 2005). The definition for the practice of EBM became synonymous with the term EBP and has since been utilised as such by many authors (Chronister *et al.* 2008; Isetta 2008; Leach and Gillham 2008; Petrie and Sabin 2009; Oliver 2009; de Wet 2010; Hall 2011; Heiwe *et al.* 2011; Keller 2012; Madhavji *et al.* 2011; Nevo and Slonim-Nevo 2011; Graham *et al.* 2013; Maaskant *et al.* 2013; Roecker *et al.* 2013; Weng *et al.* 2013; Diermayr *et al.* 2015; Bussières *et al.* 2016). Evidence-based practice has become the gold standard for quality healthcare (Prasun 2013).

2.3.1.3 Controversy surrounding evidence-based practice

Over the years, EBP was criticized for its lack of addressing the patient as a key role player and partner in the journey of healthcare (Nevo & Slonim-Nevo 2011; Bolton 2014; Wardle 2015;). Many healthcare practitioners, particularly CAM professionals, feared that the application of an EBP approach to clinical practice would result in a reductionist rather than holistic approach to patient care thereby limiting individualised care (Wardle 2015). In addition, the increasing acceptance by all health care professionals of the biopsychosocial model, as opposed to the traditional biomedical model, of patient assessment and care

has also highlighted the patient as a pivotal role in healthcare (Gliedt *et al.* 2017). This has lead to evidence-informed practice (EIP) which is the combination of clinical experience, research evidence and patient preferences (Dawes *et al.* 2005; Oliver 2009). As noted by Umscheid (2009), “Patient preferences are critically important to clinical decision-making and patient care. Few clinicians practicing modern day medicine would argue otherwise”. Highlighting that to deliver optimal healthcare, patients’ preferences are to be integrated with research evidence and clinical experience. Patient preferences include the patient’s personal values, concerns and expectations with regards to the care they are to receive or are considering receiving (Straus *et al.* 2005). Thus a patients personal values such as their beliefs about their healthcare, whether philosophically- or religiously-based, as well as a patient’s financial and time constraints and expectations should be accounted for in healthcare decision-making (Haneline 2007). In addition, EIP is supported by the South African National Health Act (Act No. 61 of 2003) whereby “A user has the right to participate in any decision affecting his or her personal health and treatment”.

According to definition, EBP is the interaction of research and clinical experience whereas EIP combines EBP with patient preferences. As a result, these two terms are often used interchangeably (Melnyk 2014; Woodbury and Kuhnke 2014). For the purpose of this study EBP will refer to the incorporation and integration of the practitioner’s individual clinical expertise and the current external clinical evidence from systematic research, in addition to patient values.

2.3.1.4 Implementation of the skills for and use of evidence-based practice

The following five-step process has been advocated for practitioners to utilise when implementing EBP (Straus *et al.* 2005; Nevo and Slonim-Nevo 2011). Firstly, the practitioner formulates a practice-based question. This is the question to which the practitioner searches for answers in the scientific literature. Secondly, the practitioner should search for the best research evidence and thirdly, appraises the evidence. Critical appraisal requires that the practitioner evaluates the literature for validity and usefulness in solving the practice-based question. The fourth step is the application of the results in clinical practice (clinical decision-making). This step requires the practitioner to decide how to integrate the appraised evidence with their clinical experience and patient preferences. Lastly, the practitioner should monitor and evaluate the outcome of the intervention and, in doing so, keep a record of this. Hence, the necessity for healthcare professionals to be proficient in the knowledge and skills of formulating a practice-based question, locating, critically appraising and then applying research findings to their patient

care (Haneline 2007; Banzai *et al.* 2011). The integration of research findings with clinical expertise for the treatment of patients makes the assumption that the clinician has the will (positive attitude), training (knowledge and skills) and accessibility to resources to implement research evidence (Barnard and Wiles 2001). A lack of any of these would be a barrier to EBP utilisation and may result in a negative attitude towards EBP.

Studies across a variety of healthcare professions have reported that while the majority of respondents report to be utilising EBP, the frequency of application of research in clinical practice was limited (McColl *et al.* 1998; Young and Ward 2001; Jette *et al.* 2003; O'Donnell 2004; Iles and Davidson 2006; Hadley *et al.* 2008; de Wet 2010; Hall 2011; Majid *et al.* 2011; Roecker *et al.* 2013; Thorsteinsson and Sveinsdòttir 2013; Walker *et al.* 2013; Walker *et al.* 2014; Bussières *et al.* 2015; Schneider *et al.* 2015; Bussières *et al.* 2016). The healthcare professionals also indicate that they read research literature, but the number of articles read and the frequency of reading were low (Jette *et al.* 2003; Iles and Davidson 2006; Hadley *et al.* 2008; Roecker *et al.* 2013; Thorsteinsson and Sveinsdòttir 2013; Walker *et al.* 2013; Bussières *et al.* 2015; Schneider *et al.* 2015). Jette *et al.* (2003) and Walker *et al.* (2013) proposed that experienced clinicians and/or those who treat patients with similar conditions on a daily basis might not require the need to frequently refer to the literature and read widely. However, no statistical correlation was found between the amount of time the chiropractors (Walker *et al.* 2013) and physiotherapists (Jette *et al.* 2003) had been in practice and their use of literature. Furthermore, since most healthcare related journals are published monthly, it is possible that clinicians read literature when these journals are released.

Reading research literature requires that the practitioner have access to information resources. Journals are one such means but are often expensive especially in S.A. with the rand-dollar/euro exchange rate. American physiotherapists (96%, n = 468) (Jette *et al.* 2003) and Swedish dieticians, occupational therapists and physiotherapists (93%, n = 211) (Heiwe *et al.* 2011) reported having access to journals in contrast to only 47.4% (n = 193) of American nurses (Koehn and Lehman 2008). These findings indicated that journal access may differ between professions. Furthermore, the move to open access articles and journals will aid in dispersing research findings more widely (Swartz 2015).

Practice guidelines are a useful source of information for practitioners. Their purpose is to improve the quality of patient care, decrease practice variation and reduce the cost of care by providing healthcare professionals with graded recommendations that reflect best practice (Hakkennes and Dodd 2008; Raveesh *et al.* 2016). Practice guidelines are

important for transferring research findings into clinical practice and assisting the application of EBP (Bernhardsson *et al.* 2014; Raveesh *et al.* 2016). Chiropractors (Suter *et al*. 2007; Walker *et al.* 2013), GPs (McColl *et al.* 1998) massage therapists (Suter *et al*. 2007) and physiotherapists (Jette *et al.* 2003; Iles and Davidson 2006) have reported accessing and utilising practice guidelines. de Wet (2010) reported that 37% (n = 46) of Gauteng GPs made use of use of clinical practice guidelines.

Since the introduction of the Internet in 1993, there has been an increase in research literature availability especially through medical databases (Bennett *et al.* 2003; Young and Ward 2001; Heiwe *et al.* 2011; Graham *et al.* 2013; Thorsteinsson and Sveinsdòttir 2013; Al-Ansari and EITantawi 2014; Bussières *et al.* 2015; Schneider *et al.* 2015). Thus not having Internet access could be a barrier to EBP. Jette *et al.* (2003) found 89% (n = 434) of U.S.A. physiotherapists to have access to online databases at home and other locations and 65% (n = 317) at work. In S.A. only 54.7% (n = 116) of GPs in Gauteng had online database access at home, 40.6% (n = 86) and at their surgery and 22% (n = 46) at other locations (de Wet 2010). Both of these studies reported a lower access to online databases at their practices than at home. It is possible that this was due to clinicians not allowing Internet access on computers that held patient information. While this is a possibility, insufficient time to read literature at their practice is another potential reason for this finding.

When assessing the frequency of accessing the Internet and databases the majority of chiropractors (Suter *et al.* 2007; Gordon 2011; Walker *et al.* 2013; d'Hotman de Villiers 2014; Bussières *et al.* 2015), massage therapists (Suter *et al.* 2007), occupational therapists (Bennett *et al.* 2003) and physiotherapists (Jette *et al.* 2003; Iles and Davidson 2006) reported to utilise such sources at least monthly or less than once a month. Roecker *et al.* (2013) and Schneider *et al.* (2015) reported chiropractors with membership to the Academy of Chiropractic Orthopedists and American chiropractors respectively to utilize databases one to five times in the last month. These findings are in contrast to those reported by de Wet (2010) who found that 43% (n = 92) of GPs who accessed databases did so 'almost daily' and 'very often'. It is possible that due to the wide variety of conditions (Atun 2004) presenting at GP offices, they are required to search for literature more widely and so more frequently where as in a chiropractic practice the majority of patients present with neuromusculoskeletal conditions (World Health Organisation 2005) thus narrowing the amount of literature that chiropractors would be required to access.

2.3.2 The environment: Healthcare in South Africa

2.3.2.1 Profession

The chiropractic profession is a CAM profession and is one of the largest and most widely utilised CAM disciplines (Meeker and Haldeman 2002). Traditionally, medicine and CAM professions have been perceived to be in competition (Brussee *et al.* 2001; Meeker and Haldeman 2002). However, more patients are visiting complementary healthcare practitioners, often in addition to conventional medicine (Brussee *et al.* 2001). Similar to the GPs, S.A. chiropractors are legislated as primary healthcare providers. Primary care providers are required to know which effective diagnostic and therapeutic interventions to use and which to avoid (Feise 2002).

The continuing and increasing influence of EBP in the chiropractic profession demands that in order to remain a competitive healthcare profession, chiropractors need to embrace EBP (Haneline 2007). Therefore, the future of the chiropractic profession lies in its ability to become evidence-based (Meeker and Haldeman, 2002) and as such research into treatments offered by chiropractors is necessary (Hall 2011).

Chiropractic research, especially in the last 20-30 years has increased exponentially (Hall 2011; Meeker and Haldeman 2002; Newell and Cunliffe 2003; Villanueva-Russell 2005; Perle 2014). Research not only generates new knowledge of diagnostic and therapeutic interventions in order to improve patient care, but also grows the credibility and cultural authority of the profession concerned (Redwood *et al.* 2003; Gordon 2011; Hall 2011). This is supported by the concurrent increased influence and acceptance of EBP by the profession and the growth in acceptance of the chiropractic profession by the medical fraternity and public (Meeker and Haldeman 2002). The widespread acceptance of EBP by the chiropractic profession has led to the development of the term evidence-based chiropractic (EBC). Evidence-based chiropractic is defined as the active pursuit of support for and the advancement of chiropractic clinical practices through the integration of the best available research evidence, clinical expertise and patient values (Haneline 2007). It encompasses the same philosophy and process as EBP but involves subjects pertinent to the chiropractic profession.

d'Hotman de Villiers (2014) (n = 140), reported that chiropractic attendees at the World Federation of Chiropractic (WFC) Congress agreed that research was essential to the progression of the profession (97.5%, n = 136) with 95% (n = 133) reporting to practice

EBP. There has been much progress in chiropractic research and the acceptance of EBP within the profession, however, research and EBP will continue to have an increasingly important role in defining the profession's future (Redwood *et al.* 2003).

2.3.2.2 Education requirements and research exposure

The existence of EBP and 'research as evidence' within any healthcare professional setting indicates the necessity to distinguish between these terms (Shirey *et al*. 2011). Research is a scientific process that aims to validate and refine existing knowledge and to generate new knowledge. The scientific process is systematic and methodical (Shirey *et al*. 2011). Evidence-based practice aims to integrate the best evidence from research with clinical experience (Haynes and Haines 1998) in order to improve healthcare delivery (Iles and Davidson 2006). However, the challenge lies in determining what is considered evidence (Rycroft-Malone 2004; Chronister *et al.* 2008). Higgs and Jones (2000) suggest that evidence in EBP should be defined as knowledge resulting from a variety of sources that has been subjected to testing and in so doing has been found to be credible. This is in agreement with what Sackett *et al.* (1996) meant as external research evidence: Healthcare research evidence involves patient-centred research into the accuracy of diagnostic tests and prognostic markers and the efficacy and safety of therapeutic, rehabilitative and preventative procedures.

The gold standards of research evidence are considered to be meta-analyses and systematic reviews of randomised clinical trials (RCTs) followed by RCTs (Haneline 2007; Chronister *et al.* 2008; Petrie and Sabin 2009). However, not all healthcare conditions can be subject to RCT and meta-analysis, such as effective treatments for otherwise fatal disorders and conditions that cannot wait for trials to be conducted (Sackett *et al*. 1996). Research evidence is also rarely absolute and is altered with new research (Rycroft-Malone *et al.* 2004). Dopson *et al.* (2002) established that precise clinical topics that were scientifically tested were found to have differing bodies of evidence that were often conflicting. Although research evidence is important to EBP, it is often less definite than is acknowledged and, therefore, should not be utilised in isolation in clinical decision-making (Rycroft-Malone e*t al.* 2004).

Both medical and chiropractic students in S.A. are exposed to research and EBP as part of their undergraduate educational training. Medical students studying for a Bachelor of Medicine and Bachelor of Surgery (MBChB) are required to compile a research assignment and are educated in EBP (Stellenbosch University 2018; University of Cape

Town 2018; University of Kwa-Zulu Natal 2018; University of Pretoria 2018; University of Free-State 2018; University of the Witwatersrand, Johannesburg 2017). Furthermore, the training of GPs in S.A. allows for additional non-degree qualifications including diplomas and higher diplomas through The Colleges of Medicine of South Africa (CMSA) that are registerable with the HPCSA (The Colleges of Medicine of South Africa 2018). These non-degree qualifications include training in EBP and have a research component (The Colleges of Medicine of South Africa 2018). South African chiropractic students are educated in an EBP approach to healthcare (Durban University of Technology Faculty of Health Sciences Chiropractic and Somatology Handbook 2017; University of Johannesburg Faculty of Health Sciences Yearbook 2017) but are also required to complete a Master's degree in chiropractic to be able to register with the Allied Health Professions Council of South Africa (AHPCSA) (1982). While a research assignment and a Master's qualification do not involve EBP it exposes the student to research methodology and critical thinking. When considering the five-step process of EBP (Straus *et al.* 2005; Nevo and Slonim-Nevo 2011), it is possible that research exposure can enhance the knowledge and skills required to be able to implement EBP.

Postgraduate qualifications have been found to be associated with positive perceptions of EBP. Koehn and Lehman (2008) (n = 422) found American nurses with a Master's degree had more positive attitudes towards EBP. More recently, Bussières *et al.* (2015) (n = 554) found that as Canadian chiropractors' level of education increased (from an associated degree to PhD) their attitudes towards EBP also improved ($p < 0.001$). Gordon (2011) (n = 174) reported that S.A. chiropractors expressed a positive attitude to research and those with an additional diploma or a Master's degree had higher research utilisation than those without. Gordon (2011) suggested that by conducting their own research they acquired research knowledge and first-hand experience on how research findings can influence clinical practice, leading them to perceive research positively and as a beneficial tool and, therefore, utilised it more frequently. In contrast, d'Hotman de Villiers (2014) found that chiropractic respondents with a doctor in chiropractic or bachelor's degree had a more favourable perception of research than those with a Master's in chiropractic qualification. Furthermore, chiropractors qualifying in Africa with a Master's degree were found to report the poorest levels of research utilisation and those possessing a non-chiropractic postgraduate qualification (Master's or PhD) had higher levels of research utilisation (d'Hotman de Villiers 2014). It was proposed that the findings were due to the Master's students' overwhelming experience in conducting their research resulting in the practitioners' negative perception of the research process and so of research in general leading to poorer research utilisation in clinical practice (d'Hotman de Villiers 2014; Rieder

2010). This indicates that if one's experience with a certain phenomenon, in this case the Master's degree research, is negative this may result in a negative perception of research thereby reducing the clinicians' utilisation of research in clinical practice. Furthermore, d'Hotman de Villiers (2014) proposed that the lower utilisation of research in clinical practice by S.A. chiropractors might be attributed to them experiencing more difficulties than their European colleagues in accessing international journals due to their high subscription costs as a result of the poor currency exchange rate.

2.3.2.3 Continuing professional development requirements

The HPCSA Act (Act No. 56 of 1974) (as amended) describes Continuing Professional Development (CPD) as the means for maintaining and updating professional proficiency, to ensure promotion and protection of the public's interest, as well as ensuring the best possible service to the community. The purpose of CPD is to assist healthcare professionals to maintain and acquire new and up to date knowledge and skills relative to their professional practice. According to the HPCSA CPD Guidelines for the Health Care Professional (2014) CPD should enhance and promote professional integrity in promoting and protecting the patients' interest and should address emerging health needs and be relevant to the health priorities of the country. The HPCSA CPD Guidelines for the Health Care Professional (2014) further explains that Continuing Education Units (CEUs) are the value attached to a learning activity for CPD.

Since 2007 the medical profession in S.A. has had CPD as a requirement of the Health Professions Council of South Africa (Act 56 of 1974) (as amended). According to the HPCSA CPD Guidelines for the Health Care Professional (2014) professionals registered with the HPCSA are required to complete 30 CEUs per 12 month cycle and at least 5 of those CEUs should be for ethics, human rights and medical law.

As of the first of July 2015 the Allied Health Professions Council of South Africa (Board Notice 85 of 2015) (Board Notice 178 of 2015) requires that all professionals (including chiropractors) registered with the AHPCSA have been required to complete 40 Continuing Education Units (CEUs), of which a minimum of two CEUs must be in AHPCSA specific Jurisprudence and Ethics, in a two year cycle.

The advent of CPD aligns with EBP, whereby professional associations ensure that their members keep up to date. None of the reviewed studies investigated how CPD could or has influenced EBP, nor inter-professional differences in obtaining CEUs or lack thereof.

The eight year difference between the HPCSA and AHPCSA institution of the CPD requirements may be a factor to take into consideration when making such comparisons between the chiropractic and GP respondents.

2.3.3 The perceiver: The chiropractor and general practitioner

2.3.3.1 Characteristics of chiropractor and general practitioner respondents

Sex

Historically, both the chiropractic (Suter *et al.* 2007; Roecker *et al.* 2013; Walker *et al.* 2013; Walker *et al.* 2014; Bussieres *et al.* 2015) and GP (McColl *et al.* 1998; Young and Ward 2001; Johnson and Green 2012; Goetz *et al.* 2013; Lheureux 2016) professions worldwide have been male dominated. However, recent trends show that more females are joining these professions. Newell and Cunliffe (2003) reported that 63% (n = 75) of U.K. undergraduate chiropractic students were female and Banzai *et al.* (2011) found that 51.1% (n = 243) of international chiropractic students were male. d'Hotman de Villiers (2014) found that 52.2% (n = 72) of the chiropractic respondents attending an international congress, of which the majority were South African, were male. Studies on GPs show similar trends. Charles *et al.* (2006) found that 48.2% (n = 174) of Australian GPs under 35 years of age were male with the percentage of males increasing as the age increased with the great majority of those older than 65 years old being male (92%, n = 448). Riisgaard *et al.* (2017) found 52% (n = 648) of Danish GPs to be female.

In the S.A. context, survey studies show that there are more male (ranging from 54.7% to 58%) than female practitioners (Khoosal 2007; Keyter 2010; Gordon 2011; Kleingeld 2016). In the GP profession this split is approximately 60-40 in favour of the male practitioners (Louw 2005; de Wet 2010; Hongoro *et al.* 2015).

This data has been obtained through survey research, which can be subject to bias, including response error (Dew 2011: 467). Gordon (2011) and d'hotman de Villiers (2014) suggested that more male respondents are likely to respond as they spend more time in practice than females due to their family commitments. Furthermore, males are likely to have different approach to their practice, focusing more on their practice than family life.

Age

Studies on chiropractic populations have reported mean ages ranging from 36.4 to 46.7 years (Gordon 2011; d'Hotman de Villiers 2014; Bussieres *et al.* 2015; Schneider *et al.* 2015; Kleingeld 2016) and overall ages ranging from 23 to 85 years old (Khoosal 2007; Suter *et al.* 2007; Keyter 2010; Gordon 2011; Walker *et al.* 2013; d'Hotman de Villiers 2014; Walker *et al.* 2014; Schneider *et al.* 2015).

The GP profession has generally been found to consist of an older population than the chiropractors with mean reported ages ranging from 43.3 to 51.3 years (Young and Ward 2001; Goetz *et al.* 2013; Lheureux 2016; Hongoro *et al.* 2015) and total ages ranging from 30 to 73 years (Louw 2005; Charles *et al.* 2006; de Wet 2010; Hongoro *et al.* 2015; Lheureux 2016; van Wyk *et al.* 2016).

Older Australian chiropractors (n = 584) were found to be less likely to agree that EBP was necessary in clinical practice and were less likely to have: learned the foundations of EBP during their undergraduate training; to have received formal search strategies; be familiar with medical databases; and to have received formal critical appraisal training (Walker *et al.* 2013). Jette *et al.* (2003) (n = 488) reported that younger American physiotherapist were more likely to agree that EBP is necessary and improves patient care. Furthermore, the younger physiotherapists (20 to 29 years of age) were more likely than the older practitioners (50 or more years of age) to have: received EBP training, been taught skills in search strategies and critical appraisal and to have confidence in their critical appraisal skills (Jette *et al.* 2003). The findings were attributed to the then recent move to using EBP within the education of physiotherapists.

These findings suggest that younger healthcare professionals are more likely to have a positive perception to EBP. However, they are more likely to have received training in EBP through their undergraduate degrees. Practitioners graduating prior to 1992, after the start of the EBM (Evidence-based Medicine Working Group 1992; Guyatt *et al.* 1992; Guyatt 2016), would not have received EBM training as part of their undergraduate studies. As a result, these practitioners would have had to rely on self-education and/or conference and workshop attendance to up skill themselves in this new trend. Therefore, the younger healthcare professionals' greater undergraduate exposure to EBP could be the reason for their positive attitudes towards EBP.

Jette *et al.* (2003) also reported that younger physiotherapists were more likely to utilise databases. Since the Internet and web browser were only released in 1993, many currently practicing healthcare professionals who trained before the information technology era would not have grown-up with and have been trained with regards to databases in their undergraduate training. Therefore, older practitioners are most likely less informed with regards to the Internet and databases. In addition to the younger generation is more technology savvy, their undergraduate exposure to the skills necessary in search strategies and databases would equip them to have enhanced EBP skills.

In contrast, d'Hotman de Villiers (2014) found that there was increased research utilisation with increasing age. It is possible that younger practitioners perceive themselves to be current in their knowledge (Walker *et al*. 2014) and, therefore, less inclined to search for current literature. Alternatively, older practitioners may search for the latest literature to ensure that they are up to date with the latest knowledge. It was also proposed that the under-utilisation of research by younger practitioners, especially in the African context, could be due to them feeling overwhelmed by the research component of their qualification (Rieder 2010).

Clinical experience

As cited by Gordon (2011), chiropractic has been taught in S.A. since 1989, with the first graduates in 1994 from the Technikon Natal. Prior to this date, chiropractic qualification would have been obtained internationally. In contrast, medicine has been taught in South Africa since 1912 at the University of Cape Town (van Niekerk 2012). Thus, the first cohort of South African taught chiropractors should have only been in practice for 22 years and the GPs are more likely to have a larger percentage of older practitioners. This is supported by the findings of Louw (2005), Hongoro *et al.* (2015) and Kleingeld (2016). Chiropractors practicing in the greater Durban area were found to mostly have been in practice six to nine years (20.6%, n = 13) with only 4.8% (n = 3) having been in practice 20 or more years (Kleingeld 2016). General practitioners from the Eastern Cape had been in practice an average of 12.7 years (ranging from one to 37 years) (Hongoro *et al.* 2015). Louw (2005) reported that most S.A. GPs had been in practice 21 years or more (40.3%, n = 31).

Clinical experience has been found to influence healthcare professionals' perceptions of EBP. Jette *et al.* (2003) established that physiotherapists with a fewer years in practice (5

years and less) were more likely to agree that EBP was necessary and improved patient care than practitioners with more than 15 years of experience. It can also be noted that physiotherapists who had been in practice for less than five years were more likely to have received undergraduate EBP training, received training in and be confident in search strategies and critical appraisal and have more knowledge of research terms (especially 'meta-analysis', 'confidence interval') than those with more than 15 years of experience. More recently, Iles and Davidson (2006) reported that physiotherapists who had been in practice for five years or less to perceive themselves as possessing better EBP skills and they were more likely to understand research related terms like 'publication bias' and 'confidence interval' than those who had been in practice longer. These findings were reportedly due to the shift in all physiotherapy education programmes, irrespective of level, to emphasise skills for EBP.

Walker *et al.* (2013) found that Australian chiropractors who had been in practice for longer periods were less likely to agree on the necessity of EBP and less likely to express interest in improving their EBP skills. It is likely that those respondents would not have been exposed to the foundations of EBP during their undergraduate studies and not have received formal search strategies and critical appraisal training.

A clinician's number of years in practice has also been shown to influence database usage with more recent graduates accessing information more frequently (Bennett *et al.* 2003; Jette *et al.* 2003) than their older colleagues (Palfreyman *et al.* 2003). With the age associations and study findings above in mind, it must be considered that not all professionals have received training in EBP skills and therefore this could influence their perceptions of EBP. In addition, a novice practitioner may feel that they need to consult the literature more often to assure themselves that the correct decisions are being made. However, experienced clinicians may often rely on past treatment outcomes to guide decision-making, therefore placing less emphasis on EBP.

2.3.3.2 Attitude towards evidence-based practice

A positive attitude towards EBP is considered an enhancer of EBP (Asadoorian *et al.* 2010; Ruzafa-Martinez *et al.* 2013). In international studies, the majority of healthcare practitioners reported a generally positive attitude towards EBP by being in agreement with statements such as but not limited to: "EBP is necessary for their practice", "literature and research findings are useful in daily practice", "utilisation of EBP improves patient care" (McColl *et al.* 1998; Barnard and Wiles 2001; Young and Ward 2001; Bennett *et al.*

2003; Jette *et al.* 2003; O'Donnell 2004; Iles and Davidson 2006; Suter *et al.* 2007; Heiwe *et al.* 2011; Majid *et al.* 2011; Graham *et al.* 2013; Roecker *et al.* 2013; Walker *et al.* 2013; Bussières *et al.* 2015; Schneider *et al.* 2015; Bussières *et al.* 2016).

Similarly, in S.A. GPs (n = 221) were found to have a positive attitude towards EBM as the majority were welcoming of EBM, found research useful in daily practice and perceived EBM to improve patient care (de Wet 2011). Gordon (2011) (n = 174) conducted a study in S.A. that explored the perceptions of chiropractors towards research and found that it was generally a positive one. In addition, chiropractor attendees at the World Federation of Chiropractic Biennial Conference (WFC) in Durban, in which the majority of the respondents were South African, reported a favourable perception of research and its role within the profession. Their perceptions of EBP were not explored.

2.3.3.3 Knowledge of and skills for evidence-based practice

Knowledge is described as the information, understanding and skills acquired through experience or education; practical, medical or scientific knowledge (Oxford Learner's Dictionaries 2017b). A skill is defined as the ability to do something well; expertise in something (Oxford Learner's Dictionaries 2017d). In order to assist the development of knowledge and skills for EBP, many undergraduate and postgraduate training programmes have incorporated the education of evidence-based principals, particularly in healthcare education (Ruzafa-Martinez *et al.* 2013). As discussed earlier, both medical and chiropractic students in S.A. are also exposed to research and EBP as part of their minimum qualification requirement. Similarly, chiropractors (Walker *et al.* 2014; Bussières *et al.* 2015); dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011) and physiotherapists (Jette *et al.* 2003) all reported learning the foundations of EBP as part of their academic training. The increasing response from these studies with regards to this statement also indicates a growing inclusion of such training at an undergraduate level.

A basic knowledge of research terminology is required to have the skills to search for and critically appraise the evidence for accuracy, therefore a lack of research terminology knowledge could lead to incorrect appraisal and incorrect conclusions, leading to poor practice (Hagino 2003). A generally good understanding of research terminology has been reported by dentists (Al-Ansari and ElTantawi 2014), dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011); GPs (McColl *et al.* 1998) and physiotherapists (Iles and Davidson 2006). Heiwe *et al.* (2011) attributed this finding to the increased focus

on teaching skills with regards to interpretation of evidence as well as the greater focus by healthcare professionals on EBP. The following terms were best understood in each study; 'heterogeneity' and 'number needed to treat' (McColl *et al.* 1998); 'randomized controlled trial' (Young and Ward 2001); 'clinical effectiveness' (O'Donnell 2004); 'statistical significance' (Iles and Davidson 2006); 'validity' (Heiwe *et al.* 2011) and 'randomisation' (Al-Ansari and ElTantawi 2014). In addition, the following terms were least understood in each study; 'publication bias' (McColl *et al.* 1998); 'publication bias', 'level of evidence', 'positive predictive value' and 'confidence interval' (Young and Ward 2001); 'purposive sampling' (O'Donnell 2004); 'forest plot' (Iles and Davidson 2006); 'odds ratio' (Heiwe *et al.* 2011) and 'likelihood ratio' (Al-Ansari and ElTantawi 2014). It can be noted that all these terms are statistical terms, which are not easy to understand if one is not exposed to them.

Once one has knowledge of EBP, it is important to develop skills or expertise to implement EBP. Search strategies and the critical appraisal of research literature are such skill requirements highlighted in the five step process of EBP (Straus *et al.* 2005; Nevo and Slonim-Nevo 2011). The majority of respondents from studies across various healthcare professions and countries have indicated that they have received search strategy and critical appraisal training (Jette *et al.* 2003; Heiwe *et al.* 2011; Walker *et al.* 2014; Schneider *et al.* 2015). Similarly, the majority of respondents to various studies also indicted a confidence in their skills for search strategies and/or critical reviewing (Jette *et al.* 2003; O'Donnell 2004; Graham *et al.* 2013; Walker *et al.* 2014; Bussières *et al.* 2015; Farokhzadian *et al.* 2015; Schneider *et al.* 2015).

While none of the GP studies reviewed investigated critical appraisal training, McColl *et al.* (1998) found that only 16% (n=47) of GPs practicing in England had received formal search strategy training and noted that those GPs who had received such training were more likely to have access to databases. More recently, de Wet (2010) had the same finding with 16% (n = 46) of GPs practicing in Gauteng, S.A., having received search strategy training. de Wet (2010) related the results to the poor utilisation (43%, n = 92, utilised frequently) of databases by these practitioners. Therefore, if GPs who had received search strategy training were more likely to access databases but still reported low database utilization, it must be considered that there could remain a deficit in the skills to access and search databases or there are other barriers. However, there exists a lack of literature to confirm this. Only 56.8% (n = 314) of Canadian chiropractors (Bussières *et al.* 2015), 58.9% (n = 774) of U.S.A. chiropractors (Schneider *et al.* 2015) and 59.5% (n =

85) of U.S.A. chiropractors (Roecker *et al.* 2013) perceived themselves to have good or above average skills in Internet and database searching.

Palfreyman *et al.* (2003) (n = 90) found that U.K. nurses were more likely to perceive themselves as having poor EBP skills than their physiotherapy colleagues. This was attributed to the physiotherapists having a higher level of entry requirements into their course and most nursing respondents would have possessed a diploma qualification as the nursing degree in England was only recently introduced (Palfreyman *et al.* 2003). Suter *et al.* (2007) found both Canadian chiropractors and massage therapists (n = 483) had poor confidence in their research skills (skills in the application of research findings in practice and utilisation of peer review journals) but that the chiropractors reported higher skills confidence, accessed information sources more frequently and reported more consistent use of EBP. These differences in skills confidence, frequency of accessing information and use of EBP were attributed to the chiropractor undergraduate education focusing on scientific research and research skills (Suter *et al.* 2007). Similarly, Hadley *et al.* (2008) (n = 193) found that the U.K. health professionals such as chiropodists, dentists, nurses, pharmacists and physiotherapists reported requiring additional training in EBP when compared with the CAM practitioners (such as acupuncturists, chiropractors, homoeopaths and reflexologists).

In contrast, O'Donnell (2004) (n = 289) conducted a comparison study of primary care professionals' attitudes, knowledge and skills of EBP in Scotland. It was found that the GP respondents were less likely than the other professionals (mostly nurses) to agree that they had the necessary skills to conduct a literature review and appraise evidence. O'Donnell (2004) noted that the GPs had to juggle two commitments, one to the hospital and the other to their private practice and so proposed that due to the GPs having less time than their colleagues to conduct literature reviews and appraise evidence. Therefore, due to the reduced of use of their skills, due to insufficient time, they lost confidence in their skills. Hence, differing professional demands could also influence a professional's perception of skills for EBP.

With regards to perceptions of skills for EBP, such as accessing databases, nurses (Majid *et al.* 2011), occupational therapists (Bennett *et al.* 2003) and physiotherapists (Jette *et al.* 2003; Iles and Davidson 2006) who had obtained postgraduate degrees were more confident in their EBP skills. Jette *et al.* (2003) attributed their findings to mirror the focus of these programmes on research and critical appraisal skills. Therefore, it is possible that

research involvement in a Master's or doctoral degree can be an enhancer to perceptions of EBP skills.

Postgraduate education has also been found to have positive associations with utilisation of databases and EBP. Bennett *et al.* (2003) and Graham *et al.* (2013) reported Australian and New Zealand occupational therapists respectively, with a postgraduate education to be more likely to utilise databases. Australian physiotherapists with a Master's or doctoral degree were also found to be more likely to utilise databases as well as EBP (Iles and Davidson 2006). Therefore, postgraduate education can be a promoter of database utilisation.

Similarly, the understanding of research related terms such as 'confidence interval', 'meta-analysis', 'odds ratio', 'publication bias' and 'relative risk' have been reported to be better understood by professionals with postgraduate qualifications (Master's and PhD degrees) (Jette *et al.* 2003; Iles and Davidson 2006). Likewise, Newell and Cunliffe (2003) and Banzai *et al.* (2011) (n = 674) found that U.K. and international chiropractic students', respectively, understanding of research terminology grew relative to their level of study increasing as they progressed through their training. This highlights the role between training and the attainment of the knowledge and skills for EBP.

2.4 Barriers to evidence-based practice

A barrier can be defined as a problem, rule or situation that prevents somebody from doing something, or that makes something impossible (Oxford Learner's Dictionaries, 2017a). A barrier is also a problem or situation that prevents a practitioner from practising EBP. Although now widely accepted, research shows that EBP can be difficult to establish in many professions (Palfreyman *et al.* 2003). A lack of uptake and failure to make use of the best available evidence by various healthcare professionals is due to a wide variety of reasons (Suter *et al* 2007; Hall 2011). Several problems and situations have been found common to healthcare professions. The barrier most commonly reported by healthcare professionals' globally, is insufficient or lack of time (McColl *et al.* 1998; Barnard and Wiles 2001; Young and Ward 2001; Bennett *et al.* 2003; Jette *et al.* 2003; Palfreyman *et al.* 2003; O'Donnell 2004; Koehn and Lehman 2008; de Wet 2010; Hall 2011; Heiwe *et al.* 2011; Majid *et al.* 2011; Graham *et al.* 2013; Roecker *et al.* 2013; Al-Ansari and ElTantawi 2014; Walker *et al.* 2014; Bussières 2015; Schneider *et al.* 2015).

It is reasonable to expect that there exists a range of other factors that influence difficulties in the adoption and use of EBP. Other barriers to the use of EBP, as perceived by various healthcare professionals include a lack of skills including research skills (Young and Ward 2001; Bennett *et al.* 2003; O'Donnell 2004; Koehn and Lehman 2008; Wike *et al.* 2014), critical appraisal skills (Young and Ward 2001; Jette *et al.* 2003; de Wet 2010; Majid et al. 2011; Wike *et al.* 2014), difficulty in judging the quality of research (Farokhzadian *et al.* 2015) and skills to understand statistical jargon and research terms (Majid *et al.* 2011; Wike *et al.* 2014). Practitioners also expressed concern over their inability to apply research findings to individual patients (Jette *et al.* 2003; Majid *et al.* 2011; Walker *et al.* 2014; Schneider *et al.* 2015) and insufficient skills in communicating the implications of research to patients (Young and Ward 2001). A lack of research or evidence to support EBP (Young and Ward 2001; Bennett *et al.* 2003; Jette *et al.* 2003; Palfreyman *et al.* 2003; Graham *et al.* 2013) and a lack of generalisability or applicability of research findings the patient population (Jette *et al.* 2003; O'Donnell 2004; Heiwe *et al.* 2011; Walker *et al.* 2014) are also reported barriers to EBP. Insufficient resources (Palfreyman *et al.* 2003; Majid *et al.* 2011), lack of access to research literature (Barnard and Wiles 2001; Bennett *et al.* 2003) and a lack of IT skills (Hall 2011) are also inhibitors of EBP implementation. Attitudes of colleagues or lack of collegial support (McColl *et al.* 1998; Barnard and Wiles 2001; Jette *et al.* 2003; Graham *et al.* 2013; Aasekjaer *et al.* 2016) and inter-professional boundaries (O'Donnell 2004) have also been noted to reduce the use and implementation of EBP. Healthcare professionals have also expressed concern over increased financial costs by implementing EBP (Barnard and Wiles 2001; Young and Ward 2001; Hall 2011) and concern that EBP will reduce the number of patients that one can see in a session (Young and Ward 2001).

Bennett *et al. (*2003) made three observations with regards to perceived barriers to EBP. Firstly, occupational therapists with previous EBP training perceived fewer barriers to EBP than those without such training and secondly, those without previous EBP training were more likely to perceive a lack of skills for locating the best evidence as a barrier. Secondly, those with more years in practice were less concerned about time as a barrier and those with fewer years in practice more likely to identify lack of computing resources. Thirdly, occupational therapists with fewer qualifications were more likely to perceive a lack of skill as a barrier. Majid *et al.* (2011) found that nurses in Singapore with a degree or higher qualification and those who had attended EBP training were less likely to perceive barriers to EBP. Therefore, a comprehensive undergraduate EBP training and additional postgraduate training increases the clinicians' research skills and reduces the number of barriers perceived by them. In addition, clinicians with fewer years in practice

lack computing resources most likely due to the financial constraints they face. Lastly, clinical experience improves time management.

2.5 Conclusion

Healthcare professionals must be able to gain access to, be able to assess and then apply and integrate new knowledge and skills and have the ability to adapt to the changing circumstances throughout their professional life (Dawes *et al.* 2005). Djulbegovic *et al.* (2009) stated that "we should regard EBP as a constantly evolving heuristic foundation for optimising clinical practice, rather than a new scientific or philosophical theory that changes the nature of medicine".

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter will describe the study design, population and sample characteristics, questionnaire background and the research procedure. The statistical analysis, as well as the ethical considerations for the study will also be described.

3.2 Study design

This study was conducted in a quantitative paradigm using a cross-sectional descriptive design. The study made use of a structured, pre-validated, self-complementing questionnaire. The questionnaire was developed and utilised by Jette *et al.* (2003) and was utilised in the current study to collect data with regards to selected demographic characteristics, perceptions towards, knowledge and skills of, utilisation of, and perceived barriers towards EBP by chiropractors and GPs in private practice within the eThekwini Municipality.

A descriptive design allows a researcher to collect information from a sample of a population and does not aim to show cause and effect but rather to describe a phenomenon as it naturally occurs (Brink *et al*. 2012: 102-104). A structured questionnaire allows for the collection of quantitative data, ensures that responses are consistent and that the data obtained can provide meaningful statistics that can be used for comparisons (Layder 2013: 100; Denscombe 2014: 166; Floyd and Fowler 2014: 3; Rowley 2014; Babbie 2016: 279). Questionnaire-based research is a method of collecting information from a large, dispersed group of people allowing descriptive and analytical statistical information to be collected (Wisker 2008: 121; Rowley 2014). According to Denscombe (2014: 166) and Rowley (2014) questionnaires can be utilised to reliably establish the attitudes, perceptions, opinions and experiences of a population about a chosen subject. Studies similar to this one have utilised a questionnaire design to solicit perceptions, utilisation and barriers from healthcare professionals with regards to EBP (McColl *et al.* 1998; Young and Ward 2001; Bennett *et al.* 2003; Jette *et al*. 2003; Newell and Cunliffe 2003; Palfreyman *et al.* 2003; O'Donnell 2004; Iles and Davidson 2006; Suter *et al.* 2007; Hadley *et al.* 2008; Koehn and Lehman 2008; de Wet 2010; Nilsagard and Lohse 2010; Banzai *et al.* 2011; Heiwe *et al.* 2011; Majid *et al.* 2011; Graham *et al.* 2013; Roecker *et al.* 2013; Walker *et al.* 2013; Al-Ansari and ElTantawi 2014; Walker *et al.* 2014; Bussières *et al.* 2015; Schneider *et al.* 2015).

This study was approved by the DUT IREC (REC 140/15) **(Appendix A)**.

3.3 Study population

The population being investigated in this study consisted of registered chiropractors and GP's, of any age or gender, whom were working in private practices within the '031' telephone dialling code of the eThekwini Municipality.

3.4 Study sampling

3.4.1 Chiropractors

Permission was sought from the Allied Health Professions Council of South Africa (AHPCSA) **(Appendix B)** to access the contact details of chiropractors in private practice within the '031' telephone dialling code of the eThekwini Municipality. This list was cross-checked against a publically available list of practitioners on the Chiropractic Association of South Africa's (CASA) website (Find a Chiropractor 2016). This resulted in a population size of 135 chiropractors. The total population of chiropractors meeting the inclusion criteria were invited to participate in the study, with participation through self-selection. A minimum response rate of 50% (n = 68) was required for the study results to be considered acceptable for analysis and reporting (Groves 2006).

3.4.2 General practitioners

Permission was sought from the Health Professions Council of South Africa (HPCSA) **(Appendix B)** and the Board of Health Care Funders (BHF) **(Appendix B)** to access the contact details of GPs practising in the private sector within the '031' telephone dialling code of the eThekwini Municipality. A list of contact details was provided by the BHF, which was cross-checked against a publically-available list of practitioners on the HPCSA website (iRegister 2016). This resulted in a population of 1 148. Using Raosoft Statistical Software 23.0 with a 95% confidence level, an error margin of 5% and a 50% response distribution **(Appendix C)** the sample size required for this study was 289. A minimum response rate of 50% (n = 145) was required for the study results to be considered acceptable for analysis and reporting (Groves 2006).

In order to obtain the sample size (n = 289), probability sampling was used. This allows for confidence that a sample is not biased, as all individuals from the potential population have an equal chance for selection. A simple random probability sampling method with replacement was utilised in this study. This was conducted by placing the names of the 1 148 GPs into a container, then randomly drawing out 289 practitioner names. The selected 289 practitioners were then contacted to participate in the study. If the selected GP declined participation or was not contactable, an additional name was drawn to replace him/her until 289 GPs were selected to participate.

3.5 Sample characteristics

In order to be eligible to participate, the chiropractors and GPs had to meet the following criteria:

3.5.1 Inclusion criteria

- Participants had to be currently registered with the AHPCSA as a chiropractor or the HPCSA as a GP.
- Participants must have been in practice for a minimum of six months since qualifying.
- Participants must have currently been in private practice within the eThekwini municipality (telephone dialling code 031).
- Participants must have provided written informed consent **(Appendix D)** to participate in the study.

3.5.2 Exclusion criteria

- Chiropractic or medical students, interns, assistants or administrative staff.
- Participants who participated in the expert group or during pilot testing.
- A majority incomplete questionnaire.

3.6 Questionnaire background and design

In order to find a suitable questionnaire, the researcher conducted an Internet search using the following search terms: evidence-based practice, knowledge, skills, utilisation, use, barriers, attitudes and perceptions. A questionnaire utilised by Jette *et al.* (2003) **(Appendix E)** to survey 'Evidence-based practice: beliefs, attitudes, knowledge and

behaviours of physical therapists' was selected as it addressed participants' personal perceptions and attitudes toward EBP; personal use of, knowledge of and skills for EBP; personal use and understanding of clinical practice guidelines; availability of resources to access information and personal skills in using those resources; understanding of terms related to EBP; and perceived barriers to EBP. Permission to use the questionnaire in the current study was obtained from Dr Diane Jette **(Appendix B).** Jette *et al.* (2003) did not make any recommendations for changes to the questionnaire post their study. The questionnaire was modified by the researcher to suit the S.A. chiropractic and GP populations **(Appendix F)**. The amendments can be found in **Appendix E**. Table 3.1 indicates the validity and reliability results reported in studies that utilised the same questionnaire.

Table 3.1: Questionnaire validity and reliability results

Article Title	Author(s)	Validity	Reliability
Evidence-based practice: Beliefs, attitudes, knowledge, and behaviors of physical therapists	Jette *et al.* (2003)	10 experienced physical therapists gave feedback on the questionnaire and their recommended changes were made.	A subsample of the survey respondents (n = 54) completed the questionnaire twice between two weeks and two months apart. Intraclass correlation co-efficients (ICCs) were determined for ordinal items and ranged from 0.37 to 0.90 with 50% of the items having ICCs of >70. Percentages of agreement were determined for categorical and ranked items. The percentage of agreement ranged from 86% to 93% for dichotomous items and from 59% to 80% for ranked items.
A survey of Australian chiropractor's attitudes and beliefs of research literature and clinical practice guidelines	Walker *et al.* (2013)	A Content Validity Index (CVI) was used to determine the relevance of each question among chiropractors. A CVI of more than 0.79 allowed the questions to be retained and was achieved by 27 of the 32 questions.	The following Cronbach's alpha co-efficients were determined and indicated acceptable reliability: - Attitudes and beliefs: 0.89 - Attention to literature: 0.80 - Use of clinical practice guidelines: 0.77 - Access to research evidence: 0.73 - EBP knowledge and skills: 0.79

Following DUT IREC approval **(Appendix A)**, each of the adapted questionnaires was subjected to an expert group. The purpose of the expert group was to ensure correct comprehension of questions and to ensure consistency, face and content validity of the questionnaire (Floyd and Fowler 2014: 100-101). Validation of a questionnaire confirms that the questions produce data that is accurate and intended (Sapsford 2008: 11). Face

validity ensures that, on the face of it, the measuring instrument, in this case the questionnaire, tests what it is aimed to test (Sapsford 2008: 138). Content validity confirms that the content of the measuring instrument, in this case the questionnaire, is comprehensive of the topic being measured (Fink 2013: 108). In this case the topic being measured includes the perceptions of, use of and barriers inhibiting EBP. Two separate expert groups were conducted. The expert group to validate the questionnaire for the chiropractors consisted of the following members: the researcher, the research supervisor and co-supervisor, first research assistant who was registered for the chiropractic Master's degree and was conducting survey research, three qualified and practising chiropractors and one chiropractic student who was registered for the chiropractic Master's degree. The GP expert group included the supervisor, researcher, two qualified and practising chiropractors, one chiropractic student who was registered for the chiropractic Master's degree and had conducted survey research and two qualified and practising GPs.

At the expert group meeting, the participants were welcomed and required to read and complete a letter of information and consent **(Appendix D)**, an attendance register **(Appendix F)** and a confidentiality statement and code of conduct **(Appendix F)**. The questions were then systematically discussed and critiqued and feedback was given about the relevance of the question to the aims and objectives of the study. The meeting was voice recorded and transcribed post-expert group **(Appendix G)**, all recommended changes were implemented resulting in the post-expert group questionnaires **(Appendix H)**. The aim of an expert group is to ensure correct comprehension of questions, consistency and face and content validity of the questionnaire (Floyd and Fowler 2014: 100-101).

Pilot testing was conducted on the post-expert group questionnaires to ensure that the questionnaires were user-friendly, understandable and easy to complete with no grammatical or editorial errors and to ensure that they were comprehended in the same manner (Fink 2013: 7). Five chiropractors and five GPs completed the questionnaire. All of the pilot study participants were practitioners in private practice within the uMgungundlovu Municipality, with a practice telephone dialling code (033). The participants met all the inclusion and exclusion criteria of the main study, so as to be as representative of the target population without removing potential participants from the study sample. Each participant read and signed a letter of information and consent **(Appendix D)** and a confidentiality statement and code of conduct **(Appendix H)** completed the relevant questionnaire **(Appendix H)**. The amendments recommended by

the pilot testing participants were made to the questionnaires **(Appendix I)** resulting in the final questionnaire for distribution **(Appendix J)**.

3.7 Research procedure

Once DUT IREC approval was granted for the study, the researcher met with the two research assistants who were then trained to assist with data collection, thus ensuring all potential participants were contacted in a similar manner and that no coercion was utilised. Both of the research assistants also signed a letter of agreement of participation in the research study **(Appendix K and L**). The researcher contacted the GPs and the first research assistant contacted the chiropractors. The second research assistant e-mailed and received all e-mail communications from both the chiropractor and GP participants; this was done to ensure anonymity of the respondents. The mode of contact with each professional was dependent on the contact details available.

Potential participants were, where possible, first contacted telephonically to request permission to e-mail or hand-deliver the questionnaire. If no telephone number was provided or available but an e-mail address was provided, the potential participants were e-mailed. The e-mail lists were supplied to the second research assistant by the researcher. This allowed the second research assistant to track respondents. If there was no response to the e-mails or if no other contact information was provided or available, the practitioner's practice was visited. The questionnaire was either delivered or an appointment was scheduled to meet with the practitioner.

All deliveries and appointments were made according to the practitioner's convenience. Practitioners, with whom an appointment was made, were handed the documents and the research study was explained to them. The practitioners were then offered the opportunity to complete the consent and questionnaire either at the time of the appointment or for the documents to be left and collected at a later date once completed.

In instances where all of the provided or available contact details (telephone number, e-mail address and practice address) for a professional were incorrect, it was noted as such. The GP was removed from the sample list and replaced with another randomly selected potential participant. In the case of the chiropractor practitioners, the lack of feasible contact details was just noted.

If a response had not been received after two weeks, the potential participants were sent a reminder e-mail with a second reminder being sent a week later if still no response had been received. These reminders were made either telephonically where the documents where hand-delivered, or via e-mail where the documents were e-mailed.

Once contacted, all of the potential participants were provided with a letter of information and consent **(Appendix D)**, along with the relevant questionnaire **(Appendix J)**. Practitioners were asked to complete the documentation at their own convenience. The documents were given to the potential participants with the instructions that they should not place any identifiable information (name, surname and practice details) on the questionnaire, thus ensuring their anonymity**.** The process of contacting the professionals, manner of delivery and collection of the questionnaire response is schematically shown in Figure 3.1.

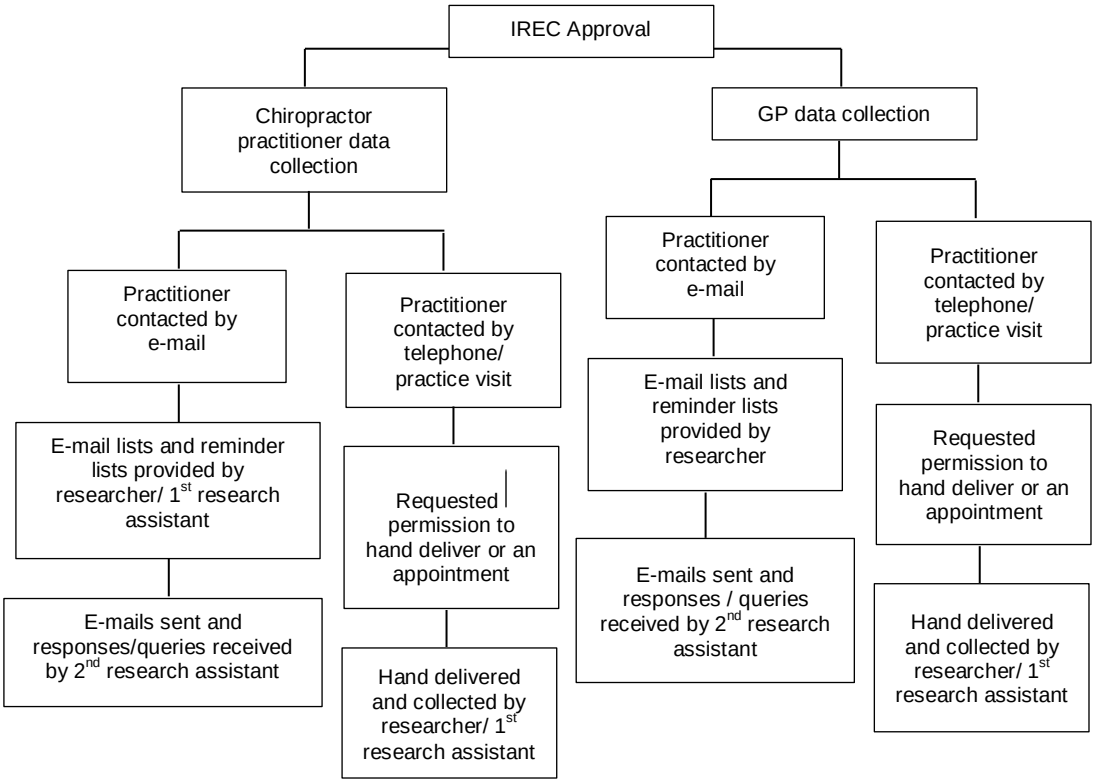


Figure 3.1 Method of research participant recruitment

In addition, the researcher received permission from the organisers of the KwaZulu-Natal Managed Care Coalition (KZN MCC) Congress to attend the congress **(Appendix M)** at which the researcher could approach GPs in attendance to participate in the study. Approval for this amendment to the original research proposal was approved by DUT IREC **(Appendix A)**. The amended IREC approval required that a new letter of

information for the potential GP participants was drawn-up **(Appendix D)**. This amended letter of information was given to all potential GP participants at the conference and all practitioners who were contacted to participate in the study from that point onwards.

The signed consent forms and completed questionnaires were collected according to the practitioner's preference. The collection was done either personally by the researcher or the first research assistant or sent via e-mail to the second research assistant. All returned documents were separated into two of four ballot boxes: chiropractor consent box, chiropractor questionnaire box, GP consent box, GP questionnaire box. The electronically-received consent forms and questionnaires were printed by the second research assistant, placed directly into separate ballot boxes and remained in the possession of the second research assistant until data collection was complete. Once data collection was complete, the ballot boxes were given to the researcher. This procedure ensured that confidentiality of the practitioner was maintained. The procedure of collection was decided on either on delivery or when the researcher or first research assistant was contacted with regards to the completed documents.

In order to track respondents during the study, the researcher and research assistants marked-off the respondents on the list of potential participants. This was to keep track of the respondents ensuring that practitioners who had responded were not inconvenienced by reminders. These lists were compared and updated at the end of each week in order to track both respondents and non-respondents.

Once data collection was complete, the ballot boxes were opened and the number of returned questionnaires was compared to the tracking lists and the number of consents to ensure that all of the documentation was accounted for.

3.8 Data synthesis and analysis

3.8.1 Data synthesis

The questionnaires were scanned for completeness, where the majority of the information was missing the questionnaire was to be excluded. No questionnaires were excluded in this study. In order to enable the procedure of turning responses into numeric data, the respondents' answers were coded and synthesised in terms of pre-determined categories (Layder 2013: 100). Therefore, the data from this study was then extracted, coded and captured in an Excel spread sheet. All data that was incomplete was noted as 'missing' or

'unknown' for the purpose of data analysis. During data coding, the following data synthesis occurred:

- **Question Two:** Age – The actual reported age was recorded and a mean age was calculated. The ages were also categorised into the following categories: 20–29, 30–39, 40–49, 50–59, 60-69 and 70+.
- **Question Four:** Years in practice - The actual reported number of years in practice was recorded and a mean number of years in practice was calculated. The number of years in practice was also categorised as follows: 6 months–9 years, 10–19 years, 20–29 years, 30-39 years, 40–49 years and 50-59 years.
- **Question Five:** Number of hours practised per week - The actual reported number of hours practised were recorded and a mean number of hours were calculated. The number of hours practised was also categorised into the following categories: 1–9, 10-19, 20-29, 30–39, 40-49, 50–59, 60-69 and 70+.
- **Question Six:** Role in profession – Here respondents could select more than one answer and therefore the following combinations were supplemented for coding purposes:
  - Academic and full-time practice.
  - Full-time practice and research.
  - Academic, full-time practice, research and other.
- **Question Seven:** Formal post-graduate training – Here respondents could select more than one answer where appropriate. The following combinations were added for coding purposes:
  - Epidemiology, research methods and statistics
  - Research methods and statistics
  - Epidemiology and research methods
- **Question 8.2:** Nature of research involvement – Here respondents could select more than one answer and consequently the following combinations were added for coding purposes:
  - Undergraduate and postgraduate (Master's/ PhD)
  - Postgraduate (Master's/ PhD) and supervisor
- **Question 19** (Chiropractor questionnaire) and corresponding **Question 15** (GP questionnaire): Three greatest barriers to the use of EBP in clinical practice – In this instance, each of the 10 available options was numbered as sub-questions **19.1–19.10** or **15.1–15.10** respectively. **Questions 15.10a** and **19.10a** were further added to allow for the qualitative answer for **15.10 and 19.10**.

3.8.2 Data analysis

The data was described, organised and analysed using descriptive and inferential statistics, using SPSS version 24.0, (IBM, Armonk NY, U.S.A.) and Statgraphics Centurion (Statgraphics Technologies Inc., Warrenton, Virginia, U.S.A.). Descriptive statistics are the basic units used to describe the responses of a survey (Fink 2013: 116-119). Descriptive statistics allow simple organisation and summarisation of the quantitative data using univariate (measuring frequency, the central tendency by determining the mean and variation by determining the range and standard deviation) and bivariate (measuring two variables at a time) analysis (Fink 2013: 116-119). This was conducted by investigating the distribution of scores on each variable, and by determining whether the scores on different variables are related to each other. Descriptive statistics can also be demonstrated using various types of tables, graphs and pie charts (Fink 2013: 116-119; Lind *et al.* 2015: 6).

Inferential statistics are utilised to make judgments on whether or not the probability that an observed difference between groups is a dependable difference or one that may have occurred by chance (Lind *et al.* 2015: 6-7). The probability calculation allows for quantifying of the level of certainty of the observed difference (Davis *et al.* 2016:134). This is made using cross tabulations. Cross tabulations are a method used to describe two variables at the same time (Fink 2013: 127). The two variables are categorical data that can be numerical or ordinal (Davis *et al.* 2016: 529). The chi-squared test measures the difference between two variables and is used at a level of significance of 0.05 (Davis *et al.* 2016: 528). The Fischer's exact test can be used when chi-square is violated (Petrie and Sabin 2009), as was done in this study. A *p*-value of 0.05 was considered as statistically significant in this study.

3.9 Ethical considerations

- Permission to conduct the research was obtained from DUT IREC **(Appendix A)**. This committee conducts itself in accordance with the Deceleration of Helsinki, thus confirming that ethical standards are upheld and ensuring that the health, rights and respect for all human participants were maintained in this study.

- The ethical principle of autonomy was taken into consideration by means of informed consent obtained from all participants. None of the practitioners contacted during this study was coerced or forced into participating in this study.

- Justice was addressed as the study included a fair selection of participants and there were been no exclusions with regard to sex or race.

- The welfare of all participants was taken into consideration by allowing for participant self-selection and protection of personal information. None of the participants were required to include any identifiable information on the questionnaire and upon collection of completed questionnaires; the questionnaires and informed consents were separated and placed into sealed boxes. The sealed boxes were only opened once data collection was complete. Practitioners were also only consulted during times most convenient for them, so as to minimise inconvenience to them, their staff and their patients.

- All data was coded: each questionnaire was numbered with no personal information of the participant appearing on the questionnaire. All completed questionnaires and informed consent forms collected by the researcher or research assistants were be placed in sealed boxes (one box for the signed informed consent and the other for the completed questionnaire). The boxes were only opened once data collection had been completed and was only done so by the researcher. All information has and will be kept confidential, locked in a steel cupboard, and has and will be shared only with the research supervisors. All materials related to this research will be handed to the Chiropractic Department at the DUT for storage for five years. Thereafter, materials will be shredded.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter is a presentation of the results of the statistical analysis of the data from the questionnaires used in this study. The results from both the chiropractors and GPs will be presented together for ease of comparison. The response rate will be reported, followed by a description of the participants in terms of their demographic and practice characteristics. The results pertaining to the research objectives will be presented under each objective.

4.2 Response rate

4.2.1 Chiropractors

The total population of registered chiropractors within the eThekwini Municipality, as per correlation of the contact information received from the AHPCSA and checked against the public online CASA registry, was 135 (n = 135). A total of 31 chiropractors (n = 31) were excluded for the following reasons:

- Participation in the expert group (n = 6)
- No longer practising in the eThekwini municipality (n = 28)

This resulted in a population size of 101 (N = 101) chiropractors that were approached to participate in the study, 51 chiropractors (n = 51) opted to participate, resulting in a 50.5% response rate.

4.2.2 General practitioners

An attempt was made to contact a total of 396 GPs (n = 396). One hundred and seven of these GPs (n = 107) did not meet the inclusion or met the exclusion criteria for the following reasons:

- Participation in the expert group (n = 2)
- Were no longer practising in the eThekwini Municipality (n = 25)
- Were practicing in the government sector (n = 13)

- Were not practising at the time of the study (n = 3)
- Were retired (n = 8)
- Had specialised and were no longer practising as a GP (n = 4)
- Is deceased (n = 1)
- Were not contactable due to all available contact information being invalid (n = 27)
- Denied consent (n = 24)

Therefore, the remaining 289 contacted GPs met the required sample size for this study (N = 289). The 147 responses (n = 147) resulted in a 50.9% response rate, with the remaining 142 GPs (n = 142) being non-responders.

Data collection, for both the chiropractors and GPs, took place over a six month period.

4.3 Demographic characteristics of the participants

4.3.1 Sex

There were more male than female respondents, irrespective of the profession, with significantly more male GPs partaking in the study (p = 0.006; Fisher's exact test) **(Figure 4.1)**.

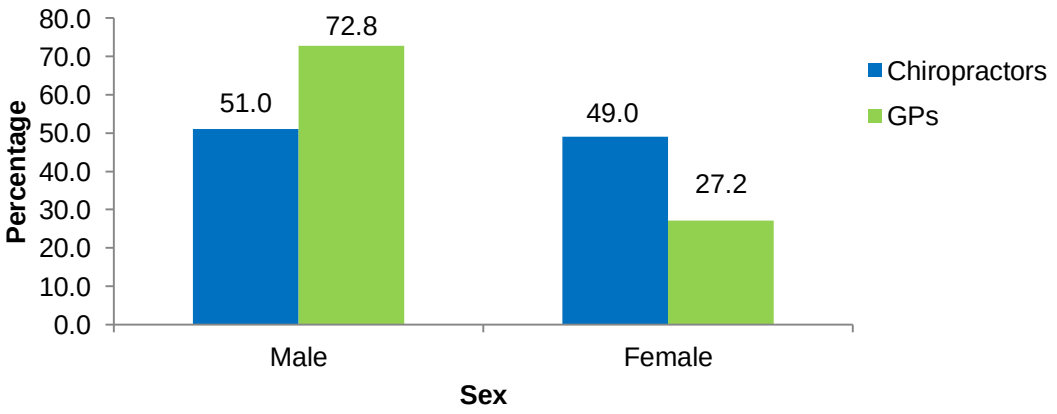


Figure 4.1 Sex distribution of the respondents (chiropractors, n = 51; GPs n = 147)

4.3.2 Age

The chiropractic respondents' had a mean age of 37.8 years, which was significantly younger than that of the GP respondents at 49.3 years (p < 0.001; ANOVA). The majority

of the chiropractors were aged 30–39 in contrast to the GPs who were mostly aged 40–49 years ($p < 0.001$; Fisher's exact test) **(Figure 4.2)**.

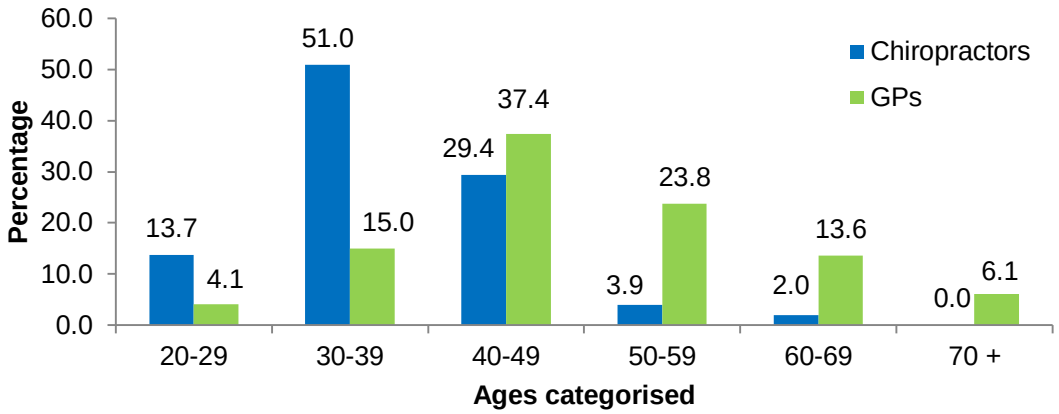


Figure 4.2 Age distribution of the respondents (chiropractors, n = 51; GPs n = 147)

4.4 Occupational characteristics of the participants

4.4.1 Highest academic qualification

The majority of the respondents reported having no additional qualifications over and above their professional qualification **(Figure 4.3)**. Only 2.0% (n = 1) of chiropractors reported having obtained a PhD, whereas 8.2% (n = 12) of the GPs had an additional Master's degree to their MBChB/MBBS ($p < 0.001$; Fisher's exact test).

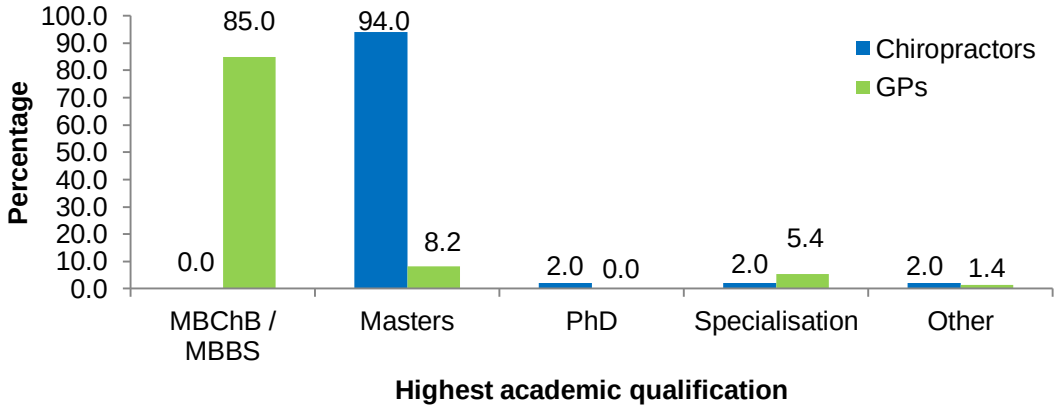


Figure 4.3 Highest academic qualification distribution of the respondents (chiropractors, n = 51; GPs n = 147)

4.4.2 Number of years in practice

The chiropractic respondents' mean number of years in practice was 11.5 years; this was significantly less than that of the GP respondents at 21.2 years ($p < 0.001$; ANOVA). The majority of chiropractic respondents had been in practice 19 years or less, in contrast to the GPs of whom most were in practice for 10-29 years ($p < 0.001$; Fisher's exact test) **(Figure 4.4)**.

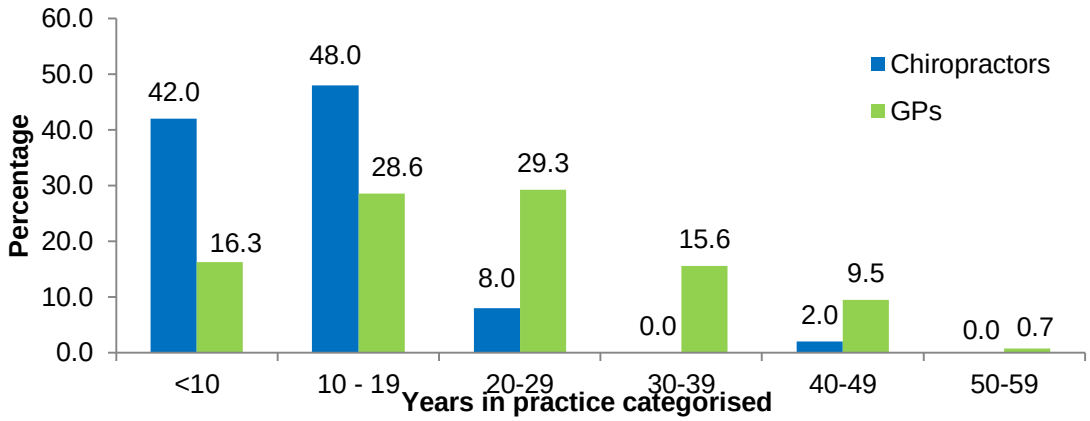


Figure 4.4 Number of years in practice of the respondents (chiropractors, n = 50; GPs n = 147)

4.4.3 Number of hours practised per week

The chiropractor respondents' mean number of hours practised per week was 37.1 hours. This was significantly less than the 42.4 hours reported by the GP respondents ($p = 0.008$; ANOVA). The majority of respondents from both professions practised 40-49 hours per week but the GPs reported working more over time ($p = 0.002$; Fisher's exact test) **(Figure 4.5)**.

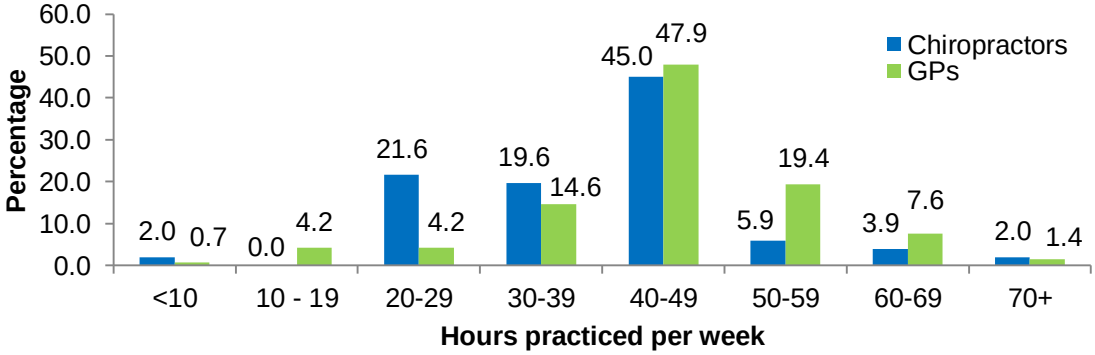


Figure 4.5 Number of hours practised per week by the respondents (chiropractors, n = 51; GPs, n = 144)

4.4.4 Role in the profession

The majority of respondents irrespective of their profession were practising full-time, with significantly more chiropractor respondents reporting having additional academic and/or research roles (p = 0.034; Fisher's exact test) **(Table 4.1)**.

Table 4.1: Professional roles of the chiropractic and GP respondents

Practice type	Chiropractors		GPs	
	n	%	n	%
Part-time	6	11.8	19	12.9
Full-time	39	76.4	125	85.0
Research	0	0.0	0	0.0
Academic & part-time	2	3.9	0	0.0
Academic and full-time	2	3.9	1	0.7
Academic, full-time, research & other	0	0.0	1	0.7
Part-time and other	1	2.0	0	0.0
Full-time practice and other	1	2.0	1	0.7
Total	51	100	147	100

4.4.5 Formal postgraduate training

A greater percentage of GPs (25.2%, n = 37) than chiropractors (15.7%, n = 8) reported having obtained postgraduate training in epidemiology, research methodology, statistics or a combination of these (p = 0.001; Fisher's exact test) **(Table 4.2)**.

Table 4.2: Formal postgraduate training of the chiropractic and GP respondents

Postgraduate training	Chiropractors		GPs	
	n	%	n	%
Epidemiology	0	0.0	2	1.4
Research methods	3	5.9	13	8.8
Statistics	2	3.9	0	0.0
Epidemiology, research methods & statistics	0	0.0	18	12.3
Research methods & statistics	3	5.9	1	0.7
Epidemiology & research methods	0	0.0	3	2.0
No training	43	84.3	110	74.8
Total	51	100	147	100

4.4.6 Research involvement

4.4.6.1 Previous personal research involvement

All of the chiropractic respondents had personally previously been involved in conducting research which was in contrast to only 38.8% (n = 57) of GPs ($p < 0.001$; Fisher's exact test) **(Figure 4.6)**.

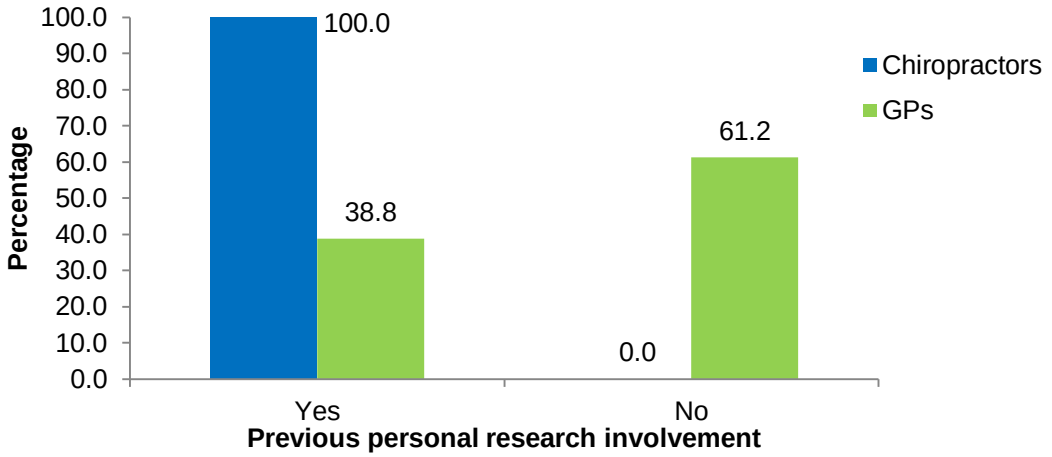


Figure 4.6: Research involvement by the respondents (chiropractors, n = 51; GPs, n = 147)

4.4.6.2 Nature of research involvement

The chiropractic respondents had partaken in research as part of a Master's degree and some in a supervisory capacity in contrast to the GPs **(Table 4.3)** whose research involvement varied from that done as part of either undergraduate or post-graduate training or through other activities ($p < 0.001$; Fisher's exact test).

Table 4.3: Nature of research involvement of the chiropractic and GP respondents

Research involvement	Chiropractors		GPs	
	n	%	n	%
Undergraduate	0	0.0	17	29.8
Postgraduate (Master's/PhD)	41	80.4	18	31.6
Supervisor	5	9.8	2	3.5
Other	1	2.0	17	29.8
Undergraduate and postgraduate	0	0.0	2	3.5
Postgraduate and supervisor	4	7.8	1	1.8
Total	51	100	57	100

4.4.7 Continuing education credits

The majority of respondents from both professions reported to have met or exceeded their CPD requirements **(Figure 4.7)**. A greater number of chiropractors reported acquiring less than the required CEUs (28.6%, n = 14) compared to the GPs (4.8%, n = 7) ($p < 0.001$; Fisher's exact test).

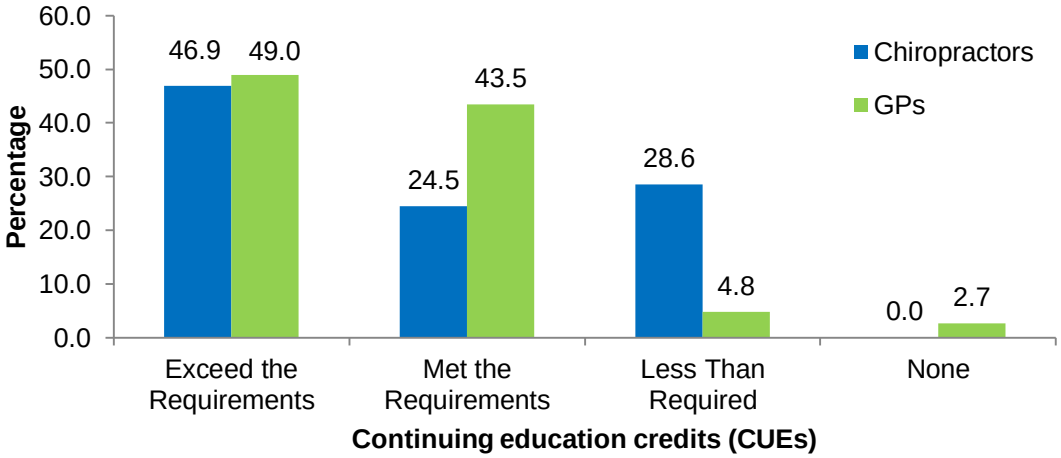


Figure 4.7: Continuing Education Credits (CEUs) of the respondents (chiropractors, n = 49; GPs, n = 147)

4.5 Objective One: To determine and compare the perceptions of chiropractors and general practitioners towards evidence-based practice

4.5.1 Statements associated with a positive perception towards evidence-based practice

The majority of the respondents from both professions had a favourable perception about EBP. The GPs showed strong agreement (66%; n = 97) that EBP is necessary to practice, whereas just more than half of the chiropractors (51%, n = 26) agreed with this statement ($p = 0.044$; Fischer's exact test) **(Table 4.4)**. When asked if they felt that literature and research findings were useful in their day-to-day practice, 45.6% (n = 67) of GPs strongly agreed with this statement compared to 23.5% (n = 12) of the chiropractors ($p = 0.023$; Fischer's exact test). There was no significant difference between the professions in their response to that the statement that EBP improves the quality of patient care ($p = 0.062$; Fischer's exact test) and that EBP assists in making decisions about patient care ($p = 0.160$; Fischer's exact test) with most respondents agreeing with these two statements.

Table 4.4: Responses of chiropractic and GP respondents to statements indicating a positive perception towards EBP and its use

Statements	Level of agreement	Chiropractors		GPs	
		n	%	n	%
Application of EBP is necessary for the practice of chiropractic/ medicine.	Strongly disagree	0	0.0	3	2.0
	Disagree	0	0.0	1	0.7
	Neutral	1	2.0	4	2.7
	Agree	26	51.0	42	28.6
	Strongly agree	24	47.0	97	66.0
	Total	**51**	**100**	**147**	**100**
Literature and research findings are useful in my day-to-day practice.	Strongly disagree	0	0.0	3	2.0
	Disagree	1	2.0	1	0.7
	Neutral	5	9.8	8	5.4
	Agree	33	64.7	68	46.3
	Strongly agree	12	23.5	67	45.6
	Total	**51**	**100**	**147**	**100**
EBP improves the quality of patient care.	Strongly disagree	0	0.0	4	2.7
	Disagree	1	2.0	0	0.0
	Neutral	3	5.9	2	1.4
	Agree	29	56.8	72	49.3
	Strongly agree	18	35.3	68	46.6
	Total	**51**	**100**	**146**	**100**
EBP helps me make decisions about patient care.	Strongly disagree	0	0.0	5	3.4
	Disagree	1	2.0	2	1.4
	Neutral	7	13.7	8	5.4
	Agree	31	60.8	84	57.1
	Strongly agree	12	23.5	48	32.7
	Total	**51**	**100**	**147**	**100**

No significant differences were found between the two professions for the statements in **Table 4.5**. (p = 0.236 and p = 0.109; Fisher's exact test respectively) with the majority agreeing or strongly agreeing with the statements.

Table 4.5: Responses of chiropractic and GP respondents to statements indicating a positive perception towards the use of and skills for EBP

Statements	Level of agreement	Chiropractors		GPs	
		n	%	n	%
I need to increase the use of evidence in my daily practice.	Strongly disagree	2	3.9	6	4.1
	Disagree	7	13.8	7	4.8
	Neutral	15	29.4	39	26.5
	Agree	22	43.1	71	48.3
	Strongly agree	5	9.8	24	16.3
	Total	**51**	**100**	**147**	**100**
I am interested in learning or improving the skills necessary to incorporate EBP into my practice.	Strongly disagree	0	0.0	3	2.0
	Disagree	1	2.0	3	2.0
	Neutral	13	25.5	18	12.3
	Agree	24	47.0	93	63.3
	Strongly agree	13	25.5	30	20.4
	Total	**51**	**100**	**147**	**100**

4.5.2 Statements associated with a negative perception towards evidence-based practice

Table 4.6 shows that most of the respondents from both professions disagreed that the adoption of EBP puts unreasonable demands on practitioners (p = 0.346; Fischer's exact test) and that there was a lack of strong evidence to support the interventions that they used (p = 0.676; Fischer's exact test). Most of the chiropractic respondents were neutral in their response to the statement that EBP does not take into account patient preferences while most of the GPs disagreed with this statement. However, this was not a statistically significant finding (p = 0.083; Fischer's exact test).

Table 4.6: Responses of chiropractic and GP respondents to statements indicating a negative perception towards EBP

Statements	Level of agreement	Chiropractors		GPs	
		n	%	n	%
The adoption of EBP places an unreasonable demand on chiropractors/ GPs.	Strongly disagree	11	21.6	24	16.3
	Disagree	23	45.0	71	48.3
	Neutral	14	27.5	32	21.8
	Agree	2	3.9	18	12.2
	Strongly agree	1	2.0	2	1.4
	Total	**51**	**100**	**147**	**100**
Strong evidence is lacking to support most of the interventions I use with my patients.	Strongly disagree	12	23.6	36	24.5
	Disagree	23	45.0	77	52.4
	Neutral	11	21.6	23	15.6
	Agree	5	9.8	11	7.5
	Strongly agree	0	0.0	0	0.0
	Total	**51**	**100**	**147**	**100**
EBP does not take into account patient preferences.	Strongly disagree	2	3.9	12	8.2
	Disagree	14	27.5	53	36.1
	Neutral	18	35.2	34	23.1
	Agree	12	23.6	44	29.9
	Strongly agree	5	9.8	4	2.7
	Total	**51**	**100**	**147**	**100**

4.6 Objective Two: To determine and compare the utilisation of evidence-based practice by assessing the level of knowledge of, and skills required for utilising evidence-based practice by chiropractors and general practitioners

4.6.1 Availability and utilisation of scientific or research literature

There were no significant differences between the professions in their use of scientific research findings when making clinical decisions (p = 0.227; Fisher's exact test) **(Table 4.7)** and their use of Medline or other databases to search for practice-relevant literature (p = 0.993; Fisher's exact test). However, their reading of scientific literature related to clinical practice differed with significantly more GP than chiropractic respondents reporting to have read 2-5 times per week (p = 0.020; Fischer's exact test).

Table 4.7: Usage of scientific literature by chiropractic and GP respondents

Statements		Chiropractors		GPs	
		n	%	n	%
Read scientific literature related to clinical practice.	None or 1	23	45.0	32	21.8
	2-5	21	41.2	92	62.6
	6-10	5	9.8	18	12.2
	11-15	1	2.0	2	1.4
	16+	1	2.0	3	2.0
	Total	**51**	**100**	**147**	**100**
Use scientific research findings in the process of clinical decision-making.	None or 1	15	29.4	40	27.2
	2-5	17	33.3	59	40.1
	6-10	10	19.6	24	16.3
	11-15	5	9.8	4	2.8
	16+	4	7.9	20	13.6
	Total	**51**	**100**	**147**	**100**
Use MEDLINE or other databases to search for practice-relevant literature/research.	None or 1	26	51.0	71	48.2
	2-5	19	37.1	53	36.1
	6-10	4	7.9	12	8.2
	11-15	1	2.0	5	3.4
	16+	1	2.0	6	4.1
	Total	**51**	**100**	**147**	**100**

4.6.2 Availability and utilisation of practice guidelines

4.6.2.1 Availability of practice guidelines

When compared to the chiropractic respondents, significantly more GPs reported knowledge of practice guidelines to inform their practice ($p < 0.001$; Fisher's exact test) **(Figure 4.8)**.

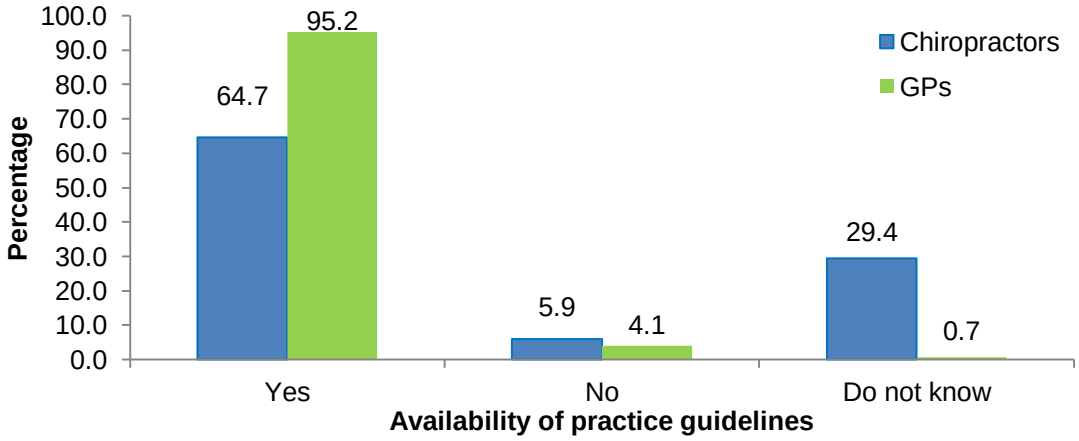


Figure 4.8: Availability of practice guidelines as perceived by the respondents (chiropractors, n = 51; GPs, n = 147)

4.6.2.2 Utilisation of practice guidelines

Figure 4.9 shows that significantly more GP than chiropractic respondents reported using practice guidelines in their practice ($p < 0.001$; Fisher's exact test) **(Figure 4.9)**.

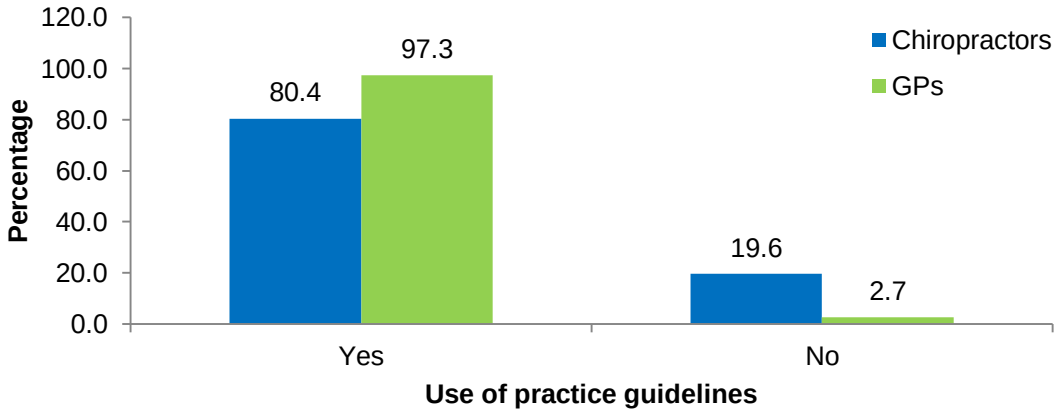


Figure 4.9: Utilisation of practice guidelines by respondents (chiropractors, n = 51; GPs n = 147)

4.6.3 Availability of and skills to access current research

Table 4.8 shows the chiropractor and GP responses to availability of, ability and skills to access research. Significantly more GP respondents (85.7%, n = 126) reported having access to paper-based journals compared to only 35.3% (n = 18) of the chiropractic respondents ($p < 0.001$; Fisher's exact test). When asked about their skills to use the Internet or databases, significantly more GP respondents (97.2%, n = 143) indicated that they had the necessary skills compared to 86.3% (n = 44) of the chiropractors ($p = 0.014$; Fischer's exact test). Both professions reported a high level of access to databases and the Internet either at their practice ($p = 0.052$; Fischer's exact test), home or other locations ($p = 0.216$; Fischer's exact test).

Table 4.8: Availability of, ability and skills to access current research as perceived by chiropractic and GP respondents

Statements		Chiropractors		GPs	
		n	%	n	%
I have access to current research through professional journals in their paper form.	Yes	18	35.3	126	85.7
	No	33	64.7	21	14.3
	Total	**51**	**100**	**147**	**100**
I have the ability to access relevant databases and the Internet at my facility.	Yes	42	82.4	135	92.5
	No	7	13.7	10	6.8
	Do not know	2	3.9	1	0.7
	Total	**51**	**100**	**146**	**100**
I have the ability to access relevant databases and the Internet at home or locations other than my facility.	Yes	44	86.3	137	93.2
	No	6	11.7	9	6.1
	Do not know	1	2.0	1	0.7
	Total	**51**	**100**	**147**	**100**
I have the skills to access relevant databases and the Internet.	Yes	44	86.3	143	97.2
	No	4	7.8	2	1.4
	Do not know	3	5.9	2	1.4
	Total	**51**	**100**	**147**	**100**

4.6.4 Education background, knowledge and skills of evidence-based practice

Table 4.9 shows that irrespective of profession most of respondents reported having learned the foundations for EBP during their academic training (p = 0.072; Fisher's exact test) but that they had not received formal training in search strategies for finding research relevant to their practice (p = 0.219; Fisher's exact test). More chiropractors (45.1%, n = 23) than GPs (19.7%, n = 29) agreed that they had been trained in critical appraisal techniques as part of their academic training (p = 0.017; Fischer's exact test).

Table 4.9: Education background, knowledge and skills of EBP as perceived by chiropractic and GP respondents

Statements		Chiropractors		GPs	
		n	%	n	%
I learned the foundations for EBP as part of my academic preparation.	Strongly disagree	2	3.9	7	4.8
	Disagree	2	3.9	28	19.0
	Neutral	11	21.6	21	14.3
	Agree	27	52.9	68	46.3
	Strongly agree	9	17.6	23	15.6
	Total	**51**	**100**	**147**	**100**
I have received formal training in search strategies for finding research relevant to my practice.	Strongly disagree	4	7.8	28	19.0
	Disagree	24	47.1	55	37.4
	Neutral	10	19.6	25	17.0
	Agree	10	19.6	22	15.0
	Strongly agree	3	5.9	17	11.6
	Total	**51**	**100**	**147**	**100**
I have received formal training in critical appraisal of scientific literature as part of my academic preparation.	Strongly disagree	6	11.8	19	12.9
	Disagree	11	21.6	47	32.0
	Neutral	7	13.7	33	22.4
	Agree	23	45.1	29	19.7
	Strongly agree	4	7.8	19	12.9
	Total	**51**	**100**	**147**	**100**

4.6.5 Knowledge of medical search engines

More than half of the chiropractic and GP respondents reported to 'agree' and 'strongly agree' that they knew about medical search engines (p = 0.757; Fisher's exact test) **(Figure 4.10)**.

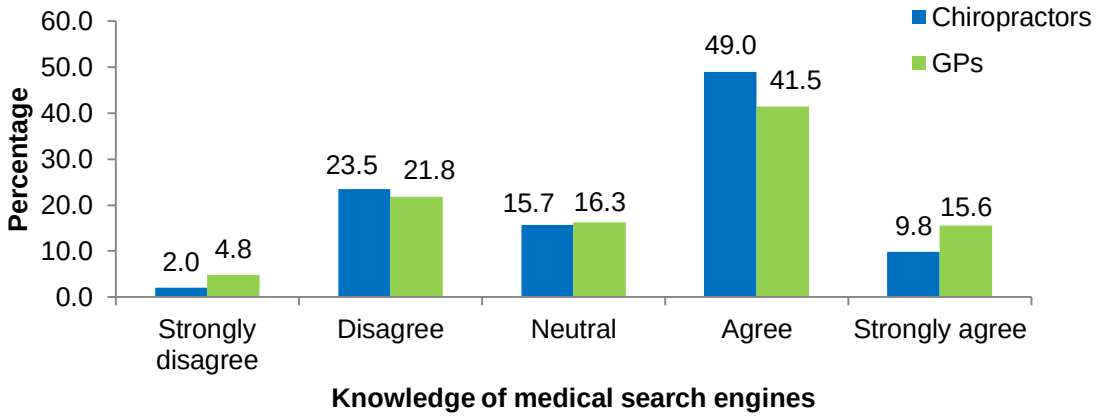


Figure 4.10: Knowledge of medical search engines by respondents (chiropractors, n = 51; GPs, n = 147)

4.6.6 Confidence with regards to the skills needed for evidence-based practice

Irrespective of profession, the respondents felt confident in their ability to both critically review research (p = 0.149; Fisher's exact test) and find clinically relevant research (p = 0.670; Fisher's exact test), as seen in **Table 4.10**.

Table 4.10: Chiropractic and GP responses to statements associated with a positive perception towards skills related to EBP

Statements		Chiropractors		GPs	
		n	%	n	%
I am confident in my ability to critically review the scientific literature.	Strongly disagree	2	3.9	8	5.4
	Disagree	3	5.9	15	10.2
	Neutral	12	23.5	41	27.9
	Agree	28	54.9	62	42.2
	Strongly agree	6	11.8	21	14.3
	Total	**51**	**100**	**147**	**100**
I am confident in my ability to find relevant research to answer my clinical questions.	Strongly disagree	1	2.0	2	1.4
	Disagree	2	3.9	4	2.7
	Neutral	12	23.5	16	10.9
	Agree	30	58.8	97	66.0
	Strongly agree	6	11.8	28	19.0
	Total	**51**	**100**	**147**	**100**

4.6.7 Level of understanding of terms associated with research

When the chiropractors and GPs were compared for the understanding of research terms **(Table 4.11)** there were no significant differences found between the professions ($p < 0.05$; Fisher's exact test), except for 'meta-analysis' where a greater number of chiropractors (36%, n = 18) than GPs (12.2%, n = 18) indicated that they did not understand this term ($p = 0.001$; Fisher's exact test)

Table 4.11: Level of understanding of terms associated with knowledge of research by chiropractic and GP respondents

Term	Level of understanding	Chiropractors		GPs		*p*-value
		n	%	n	%	
Absolute risk	Understand completely	28	56.0	80	54.4	0.320
	Understand somewhat	14	28.0	53	36.1	
	Do not understand	8	16.0	14	9.5	
	Total	**50**	**100**	**147**	**100**	
Confidence interval	Understand completely	16	32.0	52	35.4	0.359
	Understand somewhat	18	36.0	63	42.9	
	Do not understand	16	32.0	32	21.8	
	Total	**50**	**100**	**147**	**100**	
Heterogeneity	Understand completely	22	44.0	54	36.7	0.255
	Understand somewhat	15	30.0	63	42.9	
	Do not understand	13	26.0	30	20.4	
	Total	**50**	**100**	**147**	**100**	
Meta-analysis	Understand completely	17	34.0	77	52.4	0.001
	Understand somewhat	15	30.0	52	35.4	
	Do not understand	18	36.0	18	12.2	
	Total	**50**	**100**	**147**	**100**	
Odds ratio	Understand completely	12	24.0	48	32.7	0.423
	Understand somewhat	19	38.0	56	38.0	
	Do not understand	19	38.0	43	29.3	
	Total	**50**	**100**	**147**	**100**	
Publication bias	Understand completely	27	54.0	73	49.7	0.836
	Understand somewhat	15	30.0	51	34.7	
	Do not understand	8	16.0	23	15.6	
	Total	**50**	**100**	**147**	**100**	
Relative risk	Understand completely	24	48.0	85	57.8	0.357
	Understand somewhat	22	44.0	48	32.7	
	Do not understand	4	8.0	14	9.5	
	Total	**50**	**100**	**147**	**100**	
Systematic review	Understand completely	28	57.2	77	52.4	0.671
	Understand somewhat	18	36.7	54	36.7	
	Do not understand	3	6.1	16	10.9	
	Total	**49**	**100**	**147**	**100**	

4.7 Objective Three: To determine and compare the perceived barriers to evidence-based practice by the chiropractic and general practitioner respondents

Respondents were asked to rank their top three barriers to EBP from a provided list of ten potential barriers, to which 45 (six non-respondents) chiropractors and 143 (four non-respondents) GPs responded **(Appendix N)**. The data was synthesised to compare the top three barriers identified by each discipline **(Table 4.13)**. Both professions ranked the same top three barriers. However, they differed in their ranking of the second and third perceived barriers.

Table 4.13: Top three responses to perceived barriers to EBP by Chiropractic and GP respondents

Chiropractors (n = 45)	GPs (n = 143)
Insufficient time. (73.3%, n=33)	Insufficient time. (83.2%, n=119)
Lack of generalisability of the literature findings to my patient population. (55.6%, n=25)	Inability to apply research findings to individual patients with unique characteristics. (49.7%, n=71)
Inability to apply research findings to individual patients with unique characteristics. (51.1%, n=23)	Lack of generalisability of the literature findings to my patient population. (47.6%, n=68)

Insufficient time was seen as the biggest challenge to EBP for both professions. However, 60.8% (n = 87) of the GP respondents ranked it as their top barrier while only a third of the chiropractors (37.8%, n = 17) did the same (p = 0.037; Fisher's exact test) **(Table 4.14)**. Twelve (236.7%) chiropractic respondents ranked the statement 'Inability to apply research findings to individual patients with unique characteristics' as their top barrier in comparison to only 6.3% (n = 9) of the GPs (p = 0.001; Fisher's exact test). Significantly more chiropractors (13.3%, n = 6) than GPs (2.1%, n = 3) ranked lack of collective support among their colleagues in their facility as their greatest barrier to EBP (p = 0.010; Fisher's exact test).

Table 4.14 Significant differences in ranking of barriers to EBP between the chiropractic and GP respondents

Barrier	Ranking	Chiropractors		GPs		*p*-value
		n	%	n	%	
Insufficient time.	1	17	37.8	87	60.8	0.037
	2	10	22.2	20	14.0	
	3	7	15.6	12	8.4	
	Total	**34**	**75.6**	**119**	**83.2**	
Inability to apply research findings to individual patients with unique characteristics.	1	12	26.7	9	6.3	0.001
	2	6	13.3	34	23.8	
	3	5	11.1	28	19.6	
	Total	**23**	**51.1**	**71**	**49.7**	
Lack of collective support among my colleagues in my facility.	1	6	13.3	3	2.1	0.010
	2	3	6.7	15	10.5	
	3	2	4.4	14	9.8	
	Total	**11**	**24.4**	**32**	**22.4**	

Practitioners were also afforded the opportunity to list additional barriers that they may have experienced with regards to the use of EBP **(Table 4.15)**.

Table 4.15: Additional barriers to the use of EBP by chiropractor and GP respondents

Chiropractors	GPs
1. Lack of chiropractic research in the South African context. 2. Literature has not researched all aspects of clinical practice and is not always pragmatic in its approach. 3. Not enough technique specific research. 4. Lack of experience.	1. Patients' preconceived expectations. 2. Expectations of patients versus EBP. 3. Administration of EBP. Health Professions Council of South Africa seemingly approves talks/courses to organisations that do not convey such points. One is never credited appropriately. 4. Changing a mind-set/confidence to do so when a known method of treatment changes in the light of new evidence. 5. Medico-legal risk. 6. Interested in business and medical administration. 7. It is boring.

4.8 Objective Four: To determine if age, sex, years in practice and previous personal involvement in conducting research are factors associated with perceptions of, use of and perceived barriers to evidence-based practice by chiropractors and general practitioners

4.8.1 The relationship between perceptions of evidence-based practice and age, sex, years in practice and previous personal research involvement

The statements 'application of EBP is necessary for the practice of chiropractic/medicine' and 'literature and research findings are useful in my day-to-day practice' were selected to determine association with age, sex, years in practice and previous personal research involvement, as these statements were felt to best encapsulate perceptions of EBP.

There were no significant relationships between age and sex for the statements 'application of EBP is necessary for the practice of chiropractic/Medicine' and 'literature and research findings are useful in my day-to-day practice' irrespective of the profession of the respondents **(Table 4.16) (Appendix O)**. Similarly, no significant difference was found for years in practice for the chiropractic respondents and their responses to these statements.

However, years in practice was significantly associated with a perception statement of EBP with those GPs who had been in practice for 29 years or less being more likely to 'strongly agree' to the necessity of EBP in their practice than those practitioners who had been in practice longer (p = 0.015; Fisher's exact test) **(Appendix O)**. Previous personal research involvement could not be analysed for the chiropractors as all of the respondents had been involved in research previously. Previous personal research involvement was not found to be associated with the two perception statements for the GPs as most 'agreed' or 'strongly agreed' to these two statements **(Appendix O)**.

Table 4.16: The *p*-values generated by comparing age, sex, years in practice and previous personal research involvement to statements associated with perceptions of EBP by the chiropractic and GP respondents

		Statements	
		Application of EBP is necessary for the practice of chiropractic/medicine.	**Literature and research findings are useful in my day-to-day practice.**
Age (categorised)	**Chiropractors**	0.523*	0.761*
	GPs	0.100*	**
Sex	**Chiropractors**	0.404*	1.000*
	GPs	0.327*	0.544*
Years in practice (categorised)	**Chiropractors**	0.778*	0.808*
	GPs	0.015*	**
Previous personal research involvement	**Chiropractors**	n/a	n/a
	GPs	0.088*	0.369*

*Fisher's exact test

**Invalid Chi-square test

4.8.2 The relationship between use of evidence-based practice and age, sex, years in practice and previous personal research involvement

The statements 'read scientific literature related to clinical practice' and 'use scientific literature in the process of clinical decision-making were selected to determine whether or not age, sex, years in practice and previous personal research involvement had an influence on the use of EBP as these statements best encapsulate use of EBP.

Age, sex and years in practice did not influence the chiropractic or the GP participants' use of EBP **(Table 4.25) (Appendix P)**. Previous personal research involvement of the chiropractic respondents could not be analysed as all of the chiropractors had previously personally been involved in research. However, GPs who reported to not have previously personally been involved in research read research less often than those who had previous personal research involvement (p = 0.042; Fisher's exact test) **(Appendix P)**. Those who had prior research involvement reported using scientific literature in the process of clinical decision-making more frequently than those who did not have prior research exposure (p = 0.011; Fisher's exact test) **(Appendix P)**.

Table 4.25: The *p*-values generated by comparing age, sex, years in practice and previous personal research involvement to statements associated with use of EBP by the chiropractic and GP respondents

		Statements	
		Read scientific literature related to clinical practice.	**Use scientific literature in the process of clinical decision-making.**
Age (categorised)	**Chiropractors**	0.740*	0.632*
	GPs	**	**
Sex	**Chiropractors**	0.726*	0.430*
	GPs	0.873*	0.297*
Years in practice (categorised)	**Chiropractors**	0.897*	0.459*
	GPs	**	**
Previous personal research involvement	**Chiropractors**	n/a	n/a
	GPs	0.042*	0.011*

*Fisher's exact test

**Invalid Chi-square test

4.8.3 The relationship between perceived barriers to evidence-based practice and age, sex, years in practice and previous personal research involvement

The top three barriers (as described in Section 4.7) to the use of EBP as reported by both the chiropractic and GP respondents were used to determine any associations with age, sex, years in practice and previous personal research involvement.

There were no significant differences found between sex and years in practice and the top three barriers to EBP **(Table 4.34) (Appendix Q)**. Chiropractic respondents between the ages 30-39 were more likely to report 'lack of generalisability of the literature findings to their patient population' as a barrier to the use of EBP (p = 0.028; Fisher's exact test) **(Appendix Q)**. Previous personal research involvement was found to influence the GPs response to the barrier 'inability to apply research findings to individual patients with unique characteristics' with those GPs who had not personally previously been involved in research being more likely to report this statement as a barrier (p = 0.010; Fisher's exact test) **(Appendix Q**).

Table 4.34: The *p*-values generated by comparing age, sex, years in practice and previous personal research involvement to statements associated with barriers to the use of EBP by the chiropractic and GP respondents

		Statements		
		Inability to apply research findings to individual patients with unique characteristics.	**Insufficient time.**	**Lack of generalisability of the literature findings to my patient population.**
Age (categorised)	**Chiropractors**	0.697*	0.524*	0.028*
	GPs	0.562*	0.663*	0.871*
Sex	**Chiropractors**	0.160*	0.207*	0.580*
	GPs	0.557*	0.654*	0.882*
Years in practice (categorised)	**Chiropractors**	0.675*	0.598*	0.828*
	GPs	0.460*	0.146*	0.962*
Previous personal research involvement	**Chiropractors**	n/a	n/a	n/a
	GPs	0.010*	0.095*	0.258*

*Fisher's exact test

**Invalid Chi-square test

4.9 Reliability statistics

Reliability and validity are the two most important aspects of precision in a questionnaire survey (Hinton 2004: 301). Reliability is computed by taking several measurements on the same subjects (Field *et al.* 2012: 709). A Cronbach alpha test is a measure of internal consistency as it examines the average inter-question correlation of the questions in the questionnaire (Hinton 2004: 301-302). A reliability coefficient of 0.70 or higher is considered as 'acceptable' (Field *et al.* 2012: 709). The Cronbach alpha of different sections of the questionnaire was between 0.649 and 0.906, indicating that data collected through this questionnaire were reliable.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

Chapter Five discusses the results of the study and contextualises these results in relation to the existing literature. The findings under objective four (To determine if age, sex, years in practice and previous personal involvement in conducting research are factors associated with perceptions of, use of and perceived barriers to evidence-based by chiropractors and general practitioners) will be discussed under objectives one, two and three where relevant.

5.2 Response rate

Survey research is associated with response rate difficulties (Robson 2011: 261; Denscombe 2014: 22), especially with healthcare professionals (Burke and Hodgins 2015) where their response has been reported to be consistently lower than that of respondents in the general population (Martins *et al.* 2012). Babbie as cited by Groves (2006) suggests that a response rate of 50% or more is considered acceptable for analysis and reporting. Studies (Bennett *et al.* 2003; Palfreyman *et al.* 2003; O'Donnell 2004; Iles and Davidson 2006; Suter *et al.* 2007; Koehn and Lehman 2008; Heiwe *et al.* 2011; Walker *et al.* 2014) investigating evidenced-based practices of various healthcare professionals by means of surveys that were either posted, e-mailed or self-administered, produced response rates ranging from 13% to 74%. This study yielded a 50.5% (n = 51) from the chiropractic respondents and a 50.9% (n = 147) response rate from the GPs. This is similar to the response rates obtained by de Wet (2010), who surveyed South African GPs in Gauteng and yielded a response rate of 51% (n = 221). Gordon (2011) who surveyed S.A. chiropractors achieved a response rate of 35% (n = 174) while Kleingeld (2016) who survey chiropractors in the greater Durban area attained a 72% (n = 63) response rate. Thus, the response rates achieved are deemed acceptable for analysis and reporting.

Non-response bias is defined as the division of the anticipated value of appraisal from its true value (Groves 2006), may have contributed to under-or-over reporting. This would be particularly relevant if the research topic, namely EBP, was of interest to the respondents and if respondents had a positive perception of EBP. This may have resulted in skewed reflections of the sample populations and, thereby, skewed the results.

5.3 Demographic and professional characteristics of the respondents

The chiropractic profession has historically been male dominated (Johnson and Green 2012), with numerous studies surveying chiropractors finding that the majority of respondents were male (Suter *et al.* 2007; Roecker *et al.* 2013; Walker *et al.* 2013; Walker *et al.* 2014; Bussières *et al.* 2015). However, more females are being attracted to the profession with studies in S.A. (Khoosal 2007; Keyter 2010; Rieder 2010; Gordon 2011; Kleingeld 2016), the U.K. (Newell and Cunliffe 2003) and internationally (Banzai *et al.* 2011; d'Hotman de Villiers 2014) showing a more equitable response of female and male respondents, as was seen in this study (Section 4.3.1).

Similar trends have been reported with regards to the GP profession. International studies indicate a male dominance of the GP profession (McColl *et al.* 1998; Young and Ward 2001; Goetz *et al.* 2013; Lheureux 2016), but increasingly females are entering the profession (Charles *et al.* 2006; Riisgaard *et al.* 2017). The S.A. context is no different, with recent studies indicating a narrowing sex difference within the profession (Louw 2005; de Wet 2010; Hongoro *et al.* 2015). This trend was not observed in the current study as significantly more males responded (72.8%, n = 107) ($p = 0.006$; Fisher's exact test) (Section 4.3.1). However, this result was not shown to have an influence on the perceptions of, use of and barriers to EBP by the chiropractic and GP respondents (Section 4.8).

With regards to age, the chiropractic respondents were significantly younger than the GPs with most of the chiropractors being between the ages of 30 to 39 years with a mean age of 37.8 years and the GPs mostly aged 40 to 49 years with a mean age of 49.3 years ($p < 0.001$; Fisher's exact test and $p < 0.001$; ANOVA respectively) (Section 4.3.2). These age distributions were found in previous chiropractic (Khoosal 2007; Suter *et al.* 2007; Keyter 2010; Gordon 2011; Walker *et al.* 2013; Walker *et al.* 2014; Kleingeld 2016) and GP studies (Young and Ward 2001; Charles *et al.* 2006; de Wet 2010; Goetz *et al.* 2013; Hongoro *et al.* 2015; Lheureux 2016; van Wyk *et al.* 2016).

Similar results were found for years in practice with the GP respondents having been in practice longer than the chiropractic respondents ($p < 0.001$; ANOVA) (Section 4.4.2). In addition, most of the chiropractic respondents had been in practice 19 years and less, while most of the GPs had been in practice for a significantly longer 10 to 29 years ($p < 0.001$; Fisher's exact test) (Section 4.4.2). As cited by Gordon (2011), chiropractic has only been taught in S.A. since 1989, with the first graduates in 1994 from the Technikon

Natal. Thus, the first cohort of South African taught chiropractors could have only been in practice for 22 years. Prior to this date, chiropractic qualification would have been obtained internationally. Therefore, only a small number of chiropractors in S.A. have been found to have practiced for 20 years or more (Keyter 2010; Gordon 2011; Kleingeld 2016). The current study found 10% (n = 5) of chiropractic respondents reported having been in practice for 20 or more years (Section 4.4.2). In contrast medicine has been taught in South Africa since 1912 (van Niekerk 2012) and, therefore, a greater percentage of older GP practitioners would be found. Louw (2005) (n = 77) reported that 40.3% (n = 31) of S.A. GPs had been in practice 21 years or more, as was found in the current study (Section 4.4.2).

Most of the respondents from both professions worked 40 to 49 hours per week (Section 4.4.3) and the majority of them reported to be in full-time practice (Section 4.4.4). However, the GP respondents practiced significantly more hours per week (p = 0.002; Fishers exact test) (Section 4.4.3). Due to the greater over-time worked, time could more likely be a barrier to the EBP of the GP respondents than the chiropractors, as was found in the current study (Section 4.7). Insufficient time has also been described as a barrier to EBP by various healthcare professionals (Barnard and Wiles 2001; Bennett *et al.* 2003; Jette *et al.* 2003; Palfreyman *et al.* 2003; O'Donnell 2004; Koehn and Lehman 2008; Hall 2011; Heiwe *et al.* 2011; Majid *et al.* 2011; Roecker *et al.* 2013; Walker *et al.* 2014; Bussières 2015; Schneider e*t al.* 2015) including GPs (McColl *et al.* 1998; Young and Ward 2001; de Wet 2010).

Furthermore, more chiropractor than GP respondents reported additional academic and/or research roles within their profession (p = 0.034; Fisher's exact test) (Section 4.4.4). These findings highlight the barrier of insufficient time for additional professional activities. In addition, the demands of family life and other commitments create the impression that EBP may be a burden on healthcare professionals and raise concern for academic and research development within the professions. These findings of the current study indicate that few practitioners have academic exposure after their graduation and indicate the necessity for CPD requirements.

The AHPCSA has a Master's degree in chiropractic as the minimum qualification requirement to register and practice as a chiropractor in S.A. (Allied Health Professions Council of South Africa – Act 63 of 1982, as amended). Therefore, all of the chiropractic respondents to this study had a minimum of a Master's degree in chiropractic (Section 4.4.1). As a result, all of the chiropractic respondents had also previously personally

conducted research while significantly fewer GP respondents had done the same ($p < 0.001$; Fisher's exact test) (Section 4.4.6.1). Research exposure through postgraduate qualifications has been shown to have a positive influence on: perceptions of EBP (Koehn and Lehman 2008; Bussières 2015); perceptions of research (Newell and Cunliffe 2003; Gordon 2011); perceptions of skills for EBP (Bennett *et al.* 2003; Jette *et al.* 2003; Iles and Davidson 2006; Majid *et al.* 2011); greater EBP (Iles and Davidson 2006) and database (Bennett *et al.* 2003; Iles and Davidson 2006) utilisation and better understanding of research terminology (Jette *et al.* 2003; Iles and Davison 2006). Furthermore, all of the chiropractor respondents' previous personal research involvement came from their postgraduate studies or their capacity as a supervisor in contrast to the GPs whose involvement came from undergraduate, postgraduate or other unspecified activities ($p < 0.001$; Fisher's exact test) (Section 4.4.6.2). While all of the GP respondents had obtained a minimum of an MBChB/MBBS (Section 4.4.1), significantly more GPs had obtained an additional Master's qualification than chiropractors that had up skilled to an additional doctoral degree ($p < 0.001$; Fisher's exact test) (Section 4.4.1). International studies on chiropractors also found a low number of PhD graduates (Bussières *et al.* 2015; Schneider *et al.* 2015). These findings can be related to an earlier discussion by Slawson and Shaughnessy (2005) who suggest that divisions have been created between the expectations for healthcare practitioners to be consumers who use research rather than manufacturers who produce research.

Continuing professional development ensures that practitioners maintain and update their knowledge and skills in order to ensure ethical practice in promoting and protecting their patients' interest (HPCSA CPD Guidelines for the Health Care Professional 2014). Therefore, engagement with CPD is an avenue to improve one's knowledge and skills, thus facilitating an EBP approach. The majority of respondents from both professions reported to have met or exceeded their CPD requirements (Section 4.4.7), indicating their support of the initiative. However, a greater number of chiropractors than GPs reported less than their required number of CEUs ($p < 0.001$; Fisher's exact test) (Section 4.4.7). This finding is likely due to the medical profession in S.A. having had CPD as a requirement since 2007 (Health Professions Council of South Africa – Act 56 of 1974, as amended), whereas it has only been instituted in the chiropractic profession since 2015 (Allied Health Professions Council of South Africa – Board Notice 85 of 2015; Allied Health Professions Council of South Africa – Board Notice 178 of 2015; Allied Health Professions Council of South Africa Continuing Professional Development cycle: 2015 - 2017 guidelines for the professions of ayurveda, chinese medicine and acupuncture, chiropractic, homeopathy, naturopathy, osteopathy, phytotherapy, therapeutic

aromatherapy, therapeutic massage therapy, therapeutic reflexology and unani-tibb 2016). Therefore, the medical profession has had more time to develop CPD programmes and the individual professionals chance to accumulate their CEUs.

Furthermore, a greater number of GP than chiropractic respondents reported having obtained postgraduate training in epidemiology, research methodology, statistics or a combination there of (p = 0.001; Fisher's exact test) (Section 4.4.5). As discussed the GP's have had a longer period of having to attend CPD lectures/workshops/conferences and so have had a longer period to attain training on subjects such as epidemiology, research methodology and statistics. Better adherence of the GPs to their CPD requirements (Section 4.4.7) supports this reasoning. In addition, significantly more GPs had obtained an additional Master's qualification than chiropractors that had up skilled to an additional doctoral degree (p < 0.001; Fisher's exact test) (Section 4.4.1), indicating that the GPs had more postgraduate education and so once again were more likely to have received postgraduate education in epidemiology, research methodology and statistics.

5.4 Objective One: To determine and compare the perceptions of chiropractors and general practitioners towards evidence-based practice

Chiropractic and GP respondents expressed a positive perception of EBP and its use in clinical practice by sharing their agreement to: the necessity of the application of EBP in their practice; that the literature and research findings were useful in their practice; that EBP improved their patient care and assisted in patient care decision-making (Section 4.5.1). These results are comparable with findings of other studies on chiropractic populations in Australia (Walker *et al.* 2013), Canada (Bussières *et al.* 2015) and the U.S.A. (Schneider *et al.* 2015) and GP populations in England (McColl *et al.* 1998) and Australia (Young and Ward 2001) who also displayed positive perceptions towards EBP.

Other studies also had comparable findings. Bennett *et al.* (2003) (n = 649) and Hadley *et al.* (2008) (n = 317) found the majority of Australian occupational therapists and U.K. health and CAM professionals respectively, to perceive EBM or EBP to be necessary for their practice. Bennett *et al.* (2003) (n = 649), Graham *et al.* (2013) (n = 473) and de Wet (2010) (n = 221) reported the majority of occupational therapists and Gauteng, South African, GPs respectively to perceiving that literature and research findings were useful in their daily practice decision-making or management. Evidence-based practice or research was reported by the majority of occupational therapists (Bennett *et al.* 2003; Graham *et al.*

2013), massage therapists (Suter *et al.* 2007) and Canadian (Suter *et al.* 2007), international (d'Hotman de Villiers 2014) and South African (Gordon 2011) chiropractors to improve the quality of patient care. Suter *et al.* (2007) (n = 483) found the majority of chiropractors and massage therapists to perceive that research aids with the evaluation of existing treatments within the discipline. More recently, Gordon (2011) (n = 174) and d'Hotman de Villiers (2014) (n = 140) found the majority of South African and international chiropractors respectively to agree that EBP assists with patient care decision-making.

The general trend across all of these studies, with various healthcare professionals including chiropractors and GPs both locally and internationally, is that the percentage of professionals who have a positive perception of EBP increased as recent studies are published. These findings support those of the current study and indicate that local and international allopathic and CAM professionals recognise and accept the era of EBP.

Although the overall perception of EBP in the current study was a positive one, the GPs tended to strongly agree that EBP is necessary to practice and that research findings are useful in day-to-day practice while the chiropractors tended to agree (p = 0.044; Fischer's exact test) (Section 4.5.1). Hadley *et al.* (2008) (n = 193) found that health professionals (81.2%, n = 91) (including chiropodists, dentists, nurses and physiotherapists) when compared with CAM professionals (65%, n = 39) (including acupuncturists, chiropractors, homoeopaths and osteopaths) were more likely to report that they perceived EBM to be essential to their practice. When asked if they felt that literature and research findings were useful in their daily practice, more GPs than chiropractors strongly agreed with this statement (p = 0.023; Fischer's exact test) (Section 4.5.1). Chiropractic has a strong element of holism (Kimura *et al.* 2016) as opposed to reductionism with the medical profession starting to become more holistic in their approach to healthcare (Vogt *et al.* 2016). Holism considers the individual to be an assimilated unit consisting of the body, mind, spirit, interpersonal relationships, the physical environment and nature with the purpose of healthcare being to maintain the integrity of this unit so that when there is disease; care should restore all aspects of this unit and not isolated symptoms (Kimura *et al.* 2016). Therefore, holism places the patient as a pivotal part of the healing process. Despite the widely accepted definition by Sackett *et al.* (1996) stating that EBP is the combination of research evidence and clinical expertise in making decisions about the care of individual patients, EBP has been criticized for its lack of addressing the patient as a key role player in healthcare (Nevo & Slonim-Nevo 2011; Bolton 2014; Wardle 2015). Due to this, many healthcare practitioners, particularly CAM professionals including the chiropractic profession, are anxious that the application of EBP in their clinical practice will

result in a reductionist rather than a holistic approach to patient care thereby limiting individualised care (Wardle 2015). Consequently, the EIP philosophy was developed which is the combination of clinical experience, research evidence and patient preferences (Dawes *et al.* 2005; Oliver 2009). Although a definition for EBP was provided to the respondents, it is possible that the respondents, especially the chiropractors, may have applied the earlier mentioned understanding of EBP to not include patient preferences and therefore did not place EBP as high as EIP.

This reasoning is supported by the finding in the current study that most of the chiropractors reported to be neutral with regards to the statement 'EBP does not take into account patient preferences' and most of the GP respondents agreed (Section 4.5.2). However, 30% (n = 195) of occupational therapists reported not knowing if EBP is patient-centred (Bennett *et al.* 2003) (n = 649) while Jette *et al.* (2003) (n = 488) found 46% (n = 225) of U.S.A. physiotherapists to be neutral and Heiwe *et al.* (2011) (n = 227) found the majority of dietician, occupational therapist and physiotherapist respondents to be in agreement that EBP does not take patient preferences into account. However, 57.4% (n = 265) of New Zealand occupational therapists agreed that EBP is patient centred (Graham *et al.* 2013) (n = 473). Therefore, confusion may exist in that respondents consider EIP to take patient preference into account while EBP does not. This study did not investigate the practitioners understanding of either terms, and so this explanation of the findings cannot be substantiated. Therefore, further investigation into these areas is required.

When asked if they need to increase their use of evidence in their daily practice, most of the respondents, irrespective of profession, agreed (Section 4.5.1). Similar findings were reported by Jette *et al.* (2003) and O'Donnell (2004) with regards to physiotherapists and primary care professionals respectively. The level of agreement with this statement by the respondents of the current study may reflect that they felt that they were regularly engaging with scholarly literature and although they may have wanted to increase their use of EBP, their time constraints (insufficient time was found to be the greatest barrier to EBP by both professionals (Section 4.7) may have meant that they could not. Consequently, the practitioners would have had to rely on personal experience more than they would have preferred to. This is a juxtaposition, as EBP was developed to reduce reliance on personal experience.

The respondents in this study were embracing of learning or improving their skills in EBP into their practice (Section 4.5.1) which is similar to findings of previous studies on chiropractors (Walker *et al.* 2014; Bussières *et al.* 2015; Schneider *et al.* 2015); GPs (de

Wet 2010) and other healthcare professionals (Bennett *et al.* 2003; Jette *et al.* 2003; Heiwe *et al.* 2011). This further asserts their positive attitude towards EBP.

Further highlighting the respondents' positive attitude towards EBP, both the chiropractor and GP respondents to the current study disagreed that EBP places an unreasonable demand on them (Section 4.5.2). Therefore, despite the majority of respondents, especially GPs, reporting 'insufficient time' as their top barrier to EBP (Section 4.7), they still did not perceive EBP as placing an unreasonable demand on them. Similar findings have been noted by occupational therapists (Bennett e*t al.* 2003; Graham *et al.* 2013), physiotherapists (Jette e*t al.* 2003), dieticians, occupational therapists and physiotherapists (Heiwe e*t al.* 2011) and chiropractors (Bussières *et al.* 2015; Schneider *et al.* 2015). Conversely, de Wet (2010) (n = 221) found 70% (n = 157) of Gauteng GPs to be in agreement and Young and Ward (2001) (n = 60) found most Australian GPs to be neutral (median value of 50%) to the statement that EBP places another demand on already overloaded GPs. It must be noted that the statement in these studies focused on EBP being 'another demand' rather than 'an unreasonable demand' as in the current study. The response discrepancy between these studies and the current one is most likely accounted for by this difference in the statements.

Similarly, most respondents from both professions were in disagreement that strong evidence is lacking to support most of the interventions used with their patients (Section 4.5.2). The findings in this regard are consistent with the earlier mentioned agreement to the statement that the literature and research findings were useful in their practice by most of the chiropractor and GP respondents (Section 4.5.1). Similar findings have been reported by occupational therapists (Bennett e*t al.* 2003; Graham *et al.* 2013), physiotherapists (Jette e*t al.* 2003), dieticians, occupational therapists and physiotherapists (Heiwe e*t al.* 2011), nurses (Majid *et al.* 2011) and chiropractors (Bussières *et al.* 2015; Schneider *et al.* 2015). These findings indicate that sufficient research literature is available to these practitioners and that the literature is relevant to clinical practice, which is supportive of EBP.

When the relationship between perceptions of EBP and age, sex, years in practice and previous personal research involvement were explored, only one statistically significant finding was established. General practitioners who had been in practice 29 years or less were more likely to 'strongly agree' to the necessity of the application of EBP in their practice (p = 0.015; Fisher's exact test) (Section 4.8.1) **(Appendix O)**. This finding is consistent with number of years in practice of these professionals. Only 2% (n = 1) of

chiropractic respondents and 25.8% (n = 38) of GPs had been in practice for 30 or more years. Furthermore, most GPs had been in practice 10 to 29 years which was significantly more than the chiropractic respondents who mostly had been in practice for less than 19 years ($p < 0.001$; Fisher's exact test) (Section 4.4.2).

Evidence-based practice has been integrated into medical education since 1992, approximately 25 years ago (Evidence-based Medicine Working Group 1992; Guyatt *et al.* 1992; Guyatt 2016). Therefore, all practitioners qualifying 30 or more years ago would not have received undergraduate EBP training and are likely to be less familiar with the concept and benefits of EBP. Jette *et al.* (2003) (n = 488) noted that U.S.A. physiotherapist respondents with fewer years in practice (five years and less) were more likely to agree that EBP is necessary in practice than those who had been in practice more than 15 years. Furthermore, physiotherapists who had been in practice for less than five years were also more likely to have; received undergraduate foundational EBP training; received training in and be confident in search strategies and critical appraisal than those with more than 15 years of experience. Jette *et al.* (2003) attributed these findings to the then recent shift in all physiotherapy education programmes to emphasise EBP skills. Iles and Davison (2006) (n = 124) also found that Australian physiotherapists who had five or less years of clinical experience perceived themselves as possessing better EBP skills. Chiropractors in Australia who had been practicing for more years were less likely to agree that the application of EBP is necessary (Walker *et al.* 2013) (n = 584). It is also possible that young professionals may rely less on experiential knowledge and thus rely more on evidence, where as a practitioner with many years of experience may not feel such a need to regularly consult the literature.

5.5 Objective Two: To determine and compare the utilisation of evidence-based practice by assessing the level of knowledge of, and skills required for utilising evidence-based practice by chiropractors and general practitioners

5.5.1 Knowledge of evidence-based practice

Heiwe *et al.* (2011) (n = 227) found 90% (n = 204) of dietician, occupational therapist and physiotherapist respondents to 'agree' and 'strongly agree' to knowing about medical search engines. Roecker *et al.* (2013) (n = 144) reported 94.2% (n = 136) of Doctors of Chiropractic with a Diploma in orthopaedics in the U.S.A. and Bussières *et al.* (2015) (n =

554) found 92.2% (n = 511) of Canadian chiropractors to have used an online search engine, not specifically a medical one. With regards to the utilisation of Google as a search engine, 92.5% (n = 111) of international chiropractors reported utilising it (d'Hotman de Villiers 2014) (n = 140). Utilisation of the search engines would require knowledge thereof and so these respondents would also have had knowledge of search engines. The current study found that 58.8% (n = 30) of chiropractic respondents agreed and strongly agreed to possessing such knowledge, which was similar to that of GPs (57.1% (n = 84) (Section 4.6.5). Since just more than half of the respondents to the current study were aware of search engines yet the great majority of other healthcare professionals have been reported to have such awareness, it is possible that the respondents to the current study were unclear in their understanding of the term 'search engines' and/or were unsure as to what was and wasn't considered a search engine.

The level of understanding of research terms by respondents from both professions was average with just over half of chiropractor respondents completely understanding the terms 'absolute risk', 'publication bias' and 'systematic review', and GP respondents completely understanding the terms 'absolute risk', 'meta-analysis', 'relative risk' and 'systematic review' (Section 4.6.7). Similarly, Young and Ward (2001), O'Donnell (2004) and d'Hotman de Villiers (2014) found GPs, primary care professionals (including GPs) and chiropractors respectively to have an average understanding of research terms. The least understood term by both professions was 'odds ratio'. A poor understanding of the term 'odds ratio' has also been reported by GPs (McColl *et al.* 1998), physiotherapists (Jette *et al.* 2003; Iles and Davidson 2006), primary care professionals (O'Donnell 2004) and dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011). An odds ratio is the odds of an outcome event in one group divided by the odds of the event in another group (Persoskie and Ferrer 2017). Therefore, it is a statistical term. Statistical terms have been found to be the poorest understood research terms (McColl *et al.* 1998; Young and Ward 2001; O'Donnell 2004; Iles and Davidson 2006; Heiwe *et al.* 2011; Al-Ansari and ElTantawi 2014).

Meta-analysis was the only research term where the responses were statistically significant. A greater number of chiropractors than GPs reported that they did not understand this term (p = 0.001; Fisher's exact test) (Section 4.6.7). McColl *et al.* (1998) (n = 302) found this term to be the second best understood term along with 'relative risk'. However, Young and Ward (2001) (n = 60) found only 45% (n = 27) of GP respondents to have an understanding of this term. Meta-analysis is the methodology whereby several independent studies are analysed (Madden *et al.* 2016) and is considered the gold

standard of research evidence (Haneline 2007; Chronister *et al.* 2008; Petrie and Sabin 2009). Chiropractic research has only experienced significant growth in the last 20-30 years (Meeker and Haldeman 2002; Newell and Cunliffe 2003; Villanueva-Russel 2005; Hall 2011; Perle 2014) and therefore there has previously been limited research available with which to perform meta-analyses. Therefore, meta-analyses would be a developing methodology of research within the chiropractic profession and so would be less well known by the chiropractic respondents as compared to the GP respondents.

5.5.2 Skills required for using evidence-based practice

In order to implement EBP practitioners require certain skills (Haneline 2007; Banzai *et al.* 2011), which are mainly obtained through education. In order to implement EBP it is necessary for a practitioner to be able to search for and critically appraise research literature (Straus *et al.* 2005; Nevo and Slonim-Nevo 2011). A large percentage of respondents from both professions reported having learned the foundations for EBP as part of their academic preparation (Section 4.6.4). Both medical and chiropractic students in S.A. are exposed to research and EBP principles as part of their minimum qualification requirement as medical students studying for a MBChB are required to compile a research assignment and are educated in the principles of EBP (Stellenbosch University 2018; University of Cape Town 2018; University of Kwa-Zulu Natal 2018; University of Pretoria 2018; University Free-state 2018; University of the Witwatersrand, Johannesburg 2017). Similarly, S.A. chiropractic students are educated in the principles of EBP (Durban University of Technology 2017; University of Johannesburg 2017). Furthermore, EBP has been integrated into medical education since 1992 (Evidence-based Medicine Working Group 1992; Guyatt *et al.* 1992; Guyatt 2016). Therefore, those practitioners qualifying 30 or more years ago would not have been exposed in their undergraduate training, however, they could have attended lectures/workshops/conferences on EBP thereby up skilling themselves. Since only 2% (n = 1) of chiropractic respondents in the current study and 25.8% (n = 38) of the GPs had been in practice for 30 or more years (Section4.4.2), the great majority of respondents should report some undergraduate EBP training.

The majority of respondents from both professions agreed that they perceived themselves to have confidence in their ability to find clinically relevant research to answer their clinical questions (Section 4.6.6), yet most of the respondents from both professions were in disagreement with the statement ‘I have received formal training for search strategies for finding research relevant to their practice’ (Section 4.6.4). These findings are not unique as similar results have been reported by physiotherapists (Jette *et al.* 2003) and

chiropractors (Walker *et al.* 2014). McColl *et al.* (1998) (n = 302) found 27.5% (n = 28) of GPs practicing in England, to have received some training in database literature searching with only 16% (n = 47) of the respondents reporting to have received formal training in research strategies. It is possible that these skills have been self-taught, experiential and/or gained through CPD.

Furthermore, Jette *et al.* (2003), Banzai *et al.* (2011); Heiwe *et al.* (2011), Walker *et al.* (2014); Bussières *et al.* (2015) and Schneider *et al.* (2015) found that most of the healthcare professional respondents reported having received undergraduate search strategy training. Locally de Wet (2010) (n = 221) reported only 16% (n = 46) of GPs practicing in Gauteng to not have received training in search strategies, it was unspecified as to whether the training was under- or postgraduate. As discussed in section 5.5.1, just more than half of the respondents to the current study were aware of search engines (Section 4.6.5) yet the great majority of other healthcare professionals (Heiwe *et al.* 2011; Roecker *et al.* 2013; Bussières *et al.* 2015; d'Hotman de Villiers 2014) reported having had such awareness. It is possible that respondents were unsure of their understanding of the term 'search engine' and/or were unsure as to what was and wasn't considered a search engine. In addition, the majority of respondents from both professions indicated that they had the skills to access relevant databases and the Internet (Section 4.6.3). However, most of the respondents from both professions used MEDLINE or other databases to search for practice-relevant literature/research only one or none times per week (Section 4.6.1). In summary, the majority of respondents from both professions had skills to access the Internet and databases but did not or infrequently utilised databases. All of these findings are an indication that future CPD education for both professions needs to include the skills for use of search strategies, especially search engines.

Significantly more GP than chiropractic respondents in the current study indicated that they had the skills to access relevant databases and the Internet (p = 0.014; Fisher's exact test) (Section 4.6.3). It is likely that skills to access databases, as opposed to the Internet, played a greater role in this finding as the great majority of respondents from both professions reported access to relevant databases and the Internet (Section 4.6.3). Since EBP was first developed for medical students and professionals, they became the leaders in EBM (Sackett *et al.* 1996; Villanueva-Russell 2005; Chronister *et al.* 2008, Pericas-Beltran *et al.* 2014). As a result medical databases were developed long before chiropractic ones were. Therefore, GPs would have had more time to develop experience in accessing databases.

Most of the respondents from both professions agreed to have confidence in their ability to critically review literature (Section 4.6.6). However, significantly more chiropractors reported receiving training in critical appraisal techniques as part of their academic training (p = 0.017; Fisher's exact test) (Section 4.6.4). In addition, most GP respondents disagreed that they had received such undergraduate training. Therefore, is possible that the critical appraisal skills were self-taught, experiential and/or gained through CPD. Young and Ward (2001) (n = 60) reported that 55% (n = 33) of GPs practicing in Australia perceived themselves as possessing insufficient skills in appraising evidence as a barrier to practicing EBM. O'Donnell (2004) (n = 289) found Scottish GPs to be less likely to agree that they had the skills to conduct a literature review or appraise evidence than the nurses and public health facilitators. Therefore, historically critical appraisal skills have been lacking within the GP profession. It is possible that the chiropractic respondents gained critical appraisal training either during or in preparation for their research, which is part of their required minimum Master's qualification (Allied Health Professions Council of South Africa – Act 63 of 1982, as amended). While a Master's qualification does not involve EBP it exposes the student to research methodology and critical thinking. In addition, physiotherapists with a Master's degree or PhD (Jette *et al.* 2003), physiotherapists with a bachelors and Master's degree (Iles and Davidson 2006) and nurses with a Master's degree and PhD (Majid *et al.* 2011) were found to be more confident in their EBP skills. Jette *et al.* (2003) attributed these findings to the focus of these programmes on research and critical appraisal skills. Therefore, it can be said that research involvement in a Master's or doctoral degree can be an enhancer to perceptions of EBP skills and therefore can also be an enhancer of the actual skills as was found in the current study.

5.5.3 Use of evidence-based practice

Evidence-based medicine was developed for medical students and professionals and so they became the leaders in EBM. When other healthcare professions recognised the importance of it, its acceptance grew (Sackett *et al.* 1996; Villanueva-Russell 2005; Chronister *et al.* 2008, Pericas-Beltran *et al.* 2014) and the generic term of EBP was developed. In addition, S.A. GPs have a broader scope of practice (Health Professions Council of South Africa – Act 56 of 1974, as amended) than chiropractors (Allied Health Professions Council of South Africa – Act 63 of 1982, as amended; Allied Health Professions Council of South Africa – Board Notice 268 of 2015). Therefore, GPs have a requirement to read more broadly than chiropractors and so would have to read scientific literature more often to ensure EBP. Therefore, when considering that GPs have been

practicing EBP for a longer period than chiropractors in S.A. and have a broader scope of practice, the finding of the current study that significantly more GP than chiropractic respondents reported reading scientific literature related to their clinical practice two to five times per week (p = 0.020; Fischer's exact test) is not surprising. Most chiropractic respondents read literature none or one time per week (Section 4.6.1), in other words a maximum of four times per month. Similarly, the majority of chiropractic respondents in the studies by Roecker *et al.* (2013), Walker *et al.* (2014), Bussières *et al.* (2015) and Schneider *et al.* (2015) read one to five articles per month.

Most respondents from both professions used scientific research findings in the process of clinical decision-making two to five times per week (Section 4.6.1). Therefore, although chiropractors read the research literature less often than the GPs, they reported to utilise it in practice just as often. Walker *et al.* (2014) (n = 584) reported that 44% (n = 259) Australian chiropractors utilised scientific evidence in clinical decision-making two to five times per week. Other studies reported lower rates of research utilisation by chiropractors (Gordon 2011; Rocker *et al.* 2013; d'Hotman de Villiers 2014; Bussières *et al.* 2015; Schneider *et al.* 2015), chiropractors and massage therapists (Suter *et al.* 2007), dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011) and physiotherapists (Jette *et al.* 2003; Iles and Davidson 2006).

With online journals and increased access to the Internet, trends show that healthcare practitioners are using these sources for information in growing frequency (Bennett *et al.* 2003; Jette *et al.* 2003; Iles and Davidson 2006; Suter *et al.* 2007; Heiwe *et al.* 2011; Graham *et al.* 2013; Roecker *et al.* 2013; Al-Ansari and ElTantawi 2014; d'Hotman de Villiers 2014; Walker *et al.* 2014). Most respondents from both professions used MEDLINE or other databases to search for practice-relevant literature or research none or one time per week (Section 4.6.1). This level of utilisation can be related the other findings in this study. The majority of respondents from both professions reported access to the Internet and databases (Section 4.6.3) but most respondents from both professions had not received formal search strategy training (Section 4.6.4). These findings therefore present a growing indication that future CPD education for both professions needs to include the skills in search strategies and for the use of search engines in order to increase use of information sources such as databases.

Practice guidelines are another source of information for healthcare practitioners. The purpose of clinical practice guidelines are to improve the quality of patient care, decrease practice variation and reduce the cost of care by providing healthcare professionals with

graded recommendations that reflect best practice (Hakkennes and Dodd 2008; Raveesh *et al.* 2016) and thereby facilitate the application of EBP (Bernhardsson *et al.* 2014; Raveesh *et al.* 2016). Significantly more GP than chiropractic respondents reported knowledge of practice guidelines to inform their practice ($p < 0.001$; Fisher's exact test) (Section 4.6.2.1) and used practice guidelines in their practice ($p < 0.001$; Fisher's exact test) (Section 4.6.2.2). The consistency in findings between these two statements is encouraging. The majority of chiropractors (Suter *et al*. 2007; Gordon 2011; Walker *et al.* 2013; d'Hotman de Villiers 2014), dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011), GPs (McColl *et al.* 1998), massage therapists (Suter *et al*. 2007) and physiotherapists (Jette *et al.* 2003; Iles and Davidson 2006) have also reported access to and or utilised practice guidelines. In Australia, Young and Ward (2001) found that 87% (n = 52) of GP respondents perceived practice guidelines as useful resources to support their practice. Furthermore, the results of these studies indicate a continual growth in the use of practice guidelines which is a positive factor for EBP utilisation.

Significantly more GP respondents reported access to paper-based journals compared to the chiropractic respondents ($p < 0.001$; Fisher's exact test) (Section 4.6.3). The great majority of physiotherapists (Jette *et al.* 2003) and dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011) reported access to paper-based journals. A possible reason for the higher response of access to paper journals by the GP respondents to this study and the physiotherapists, dieticians and occupational therapists (Jette *et al.* 2003; Heiwe *et al.* 2011), is due to their exposure through delivered journals and articles from medical representatives from pharmaceutical and other medical companies. Chiropractors have much less exposure to such individuals as chiropractors cannot offer treatments that involve prescription of medications (Allied Health Professions Council of South Africa – Act 63 of 1982, as amended) and are thus reliant on self-funding to access scientific literature. The move to open access will facilitate improved knowledge and access (Swartz 2015).

Much literature has become available to healthcare practitioners via the Internet especially through databases. Therefore, access to the Internet and databases is important for EBP. Most respondents from both professions reported the ability to access relevant databases and the Internet at their practice, at home and other locations (Section 4.6.3). This finding is not limited to this study. Most GPs (McColl *et al.* 1998; de Wet 2010) and chiropractic respondents (Walker *et al.* 2014) have been found to report Internet access at their practice, at home and other locations. As a result, access to information resources should

not be and was not found to be a barrier to EBP for the respondents of the current study and, therefore, is an enhancer of EBP.

When considering the relationship between the use of EBP and age, sex, years in practice and previous personal research involvement, it was found that the GP respondents in the current study who reported no previous personal research experience were found to read scientific literature less often than those who had (p = 0.042; Fisher's exact test). Furthermore, those GPs who had prior personal research involvement also reported using scientific literature in the process of clinical decision-making more frequently than those who did not (p = 0.011; Fisher's exact test) (Section 4.8.2) **(Appendix P)**. While not established in the current study, postgraduate qualifications have been found to be associated with positive perceptions of EBP (Koehn and Lehman 2008; Bussières *et al.* 2015), positive attitudes towards research and higher research utilisation (Gordon 2011) and greater confidence in their EBP skills (Bennett *et al.* 2003; Jette *et al.* 2003; Iles and Davidson 2006; Majid *et al.* 2011). Therefore, research exposure is an enhancer of EBP as research exposure leads to improved understanding of research and how its findings can positively impact clinical decision-making. Research exposure can also lead professionals to perceive EBP more positively and as a beneficial tool, thereby increasing the frequency of its use.

5.6 Objective Three: To determine and compare the perceived barriers to evidence-based practice by the chiropractic and general practitioner respondents

While the majority of both chiropractic and GP respondents viewed insufficient time as their greatest barrier to their use of EBP, significantly more GPs than chiropractors ranked it as their top barrier (p = 0.037; Fisher's exact test) (Section 4.7). A lack of time or insufficient time was also found to be the greatest barrier to EBP by dentists (Al-Ansari and ElTantawi 2014), dieticians (Heiwe *et al.* 2011), nurses (Palfreyman *et al.* 2003; Koehn and Lehman 2008; Majid *et al.* 2011), occupational therapists (Bennett *et al.* 2003; Heiwe *et al.* 2011; Graham *et al.* 2013), physiotherapists (Jette *et al.* 2003; Palfreyman *et al.* 2003; Heiwe *et al.* 2011) and primary care professionals (including GPs) (O'Donnell 2004). Studies involving GPs (McColl *et al.* 1998; Young and Ward 2001; de Wet 2010) and chiropractors (Hall 2011; Roecker *et al.* 2013; Walker *et al.* 2014; Bussières 2015; Schneider e*t al.* 2015) reported similar findings. The GPs feeling more strongly about their lack of time can be related to more GPs than chiropractic respondents reporting practicing

overtime (50 or more hours per week) (p = 0.002; Fisher's exact test) (Section 4.4.3). Family commitments, busy and demanding practices leave little time for literature searching, critical appraisal of the found literature and so inhibits EBP implementation in daily practice.

The statement 'lack of generalisability of literature findings to my patient population', was found to be the second greatest barrier reported by the chiropractic respondents and the third by the GPs. Chiropractors (Walker *et al.* 2014), dieticians, occupational therapists and physiotherapists (Heiwe *et al.* 2011), physiotherapists (Jette *et al.* 2003), and primary care professionals (including GPs and nurses) (O'Donnell 2004) have also been found to report a lack of generalisability of the literature as a barrier to their EBP. In addition, the statement 'inability to apply research findings to individual patients with unique characteristics' was reported as the second greatest barrier by the GP respondents and the third by the chiropractors. It was also ranked as the top barrier to the use of EBP by more chiropractors than GPs (p = 0.001; Fisher's exact test) (Section 4.7). This barrier has been found to not be limited to these professions. Physiotherapists (Jette *et al.* 2003) and nurses (Majid *et al.* 2011) reported difficulty in determining the applicability of research findings and the inability to implement the recommendations of research studies into clinical practice as a barrier to their EBP.

According to the definition of EBP as proposed by Sackett *et al.* (1996), EBP encompasses the combination of the best available research evidence, clinical expertise and patient values. Therefore, when practicing with an EBP philosophy, the clinician must consider the patient's values. Consequently every patient will be treated uniquely. However, the research evidence aspect to EBP, especially RCTs and meta-analyses of RCTs which are considered the gold-standards of research (Haneline 2007; Chronister *et al.* 2008; Petrie and Sabin 2009), are not patient-centred (Bensing 2000) and so do not account for patients' unique characteristics. Oliver (2009) suggests two reasons for the difficulty in combining patients' values and research evidence: Firstly, it is challenging to integrate rather than choose between patient values and research evidence and secondly it is challenging to involve many clinicians and service users in decisions with wide-reaching consequences. Therefore, the implementation of EBP with individual patients with unique characteristics is a challenging task and the response of the professionals in the current study indicating this as a major barrier to EBP reveals that these practitioners also struggle with this divergent paradigm. This was especially for the chiropractic respondents, who are particularly challenged to provide individualised care by their professions' holistic philosophical approach to healthcare.

Furthermore, chiropractic respondents aged 30 to 39 were found to be more likely to report 'lack of generalizability of the literature findings to their patient population' as a barrier to EBP (p = 0.010; Fisher's exact test) (Section 4.8.3) **(Appendix Q)**. As cited by Gordon (2011), chiropractic has only been taught in S.A. since 1989, with the first graduates in 1994 from the Technikon Natal. Thus, the first group of South African taught chiropractors would have only been in practice for 22 years. Therefore, practitioners aged 30 to 39 are most likely to be among the first practitioners trained in S.A. and so would have research experience through their Master's qualification as is required (Allied Health Professions Council of South Africa – Act 63 of 1982, as amended). A Master's qualification exposes the student to research methodology and critical thinking but does not involve EBP. Therefore, a lack of EBP skills, especially in how to combine their research findings with their patient's individuality to allow for a holistic and EBP approach to patient care, is likely to be contributing towards this perceived barrier.

However, the research component in the Master's degree most likely does assist with EBP as the current study also found that the GPs respondents with no prior personal research involvement were more likely to report the inability to apply research findings to individual patients with unique characteristics as a barrier to their EBP (p = 0.010; Fisher's exact test) (Section 4.8.3) **(Appendix Q)**. Therefore, while research involvement does not involve EBP it does expose the student to critical thinking, which is a skill required for EBP (Haneline 2007; Banzai *et al.* 2011). Critical thinking is a mental process of active and skilful perception, investigation, synthesis and evaluation of information collected through observation, experience and communication that leads to a decision for action (Papathanasiou *et al.* 2014). As a whole, the GP respondents to the current study were found lacking in formal critical appraisal training (Section 4.6.4). A shortage of critical appraisal skills was also established by Young and Ward (2001) (n = 60) who reported that 55% (n = 33) of Australian GPs perceived themselves as possessing insufficient skills in appraising evidence as a barrier to practicing EBM. Furthermore, O'Donnell (2004) (n = 289) found Scottish GPs to be less likely to agree that they had the skills to conduct a literature review or appraise evidence than the nurses and public health facilitators. The lack of skills in critical thinking will inhibit the practitioner's ability to assess the applicability of the research study under review, and so will add to the difficulty in combining their research findings with their clinical experience and patient's values.

Lastly, significantly more chiropractors than GPs ranked a lack of collective support among their colleagues in their facility as their greatest barrier to EBP (p = 0.010; Fisher's exact test) (Section 4.7). Although not investigated by the current study, most international

(Young and Ward 2001; Risgaard *et al.* 2017) and local (Louw 2005; de Wet 2010) GPs have been found to not be in solo practice. Furthermore, Charles *et al.* (2005) (n = 5 013) found that few young Australian GPs were in solo practice and that the number of GPs in solo practice increased with age. Hereby, indicating a trend of GPs not practicing within a solo practice. However, Keyter (2010) and Gordon (2011) both found most of the South African chiropractic respondents to be in solo practice. It is possible that a group practice offers practitioners additional collegial support and a lack thereof may make it difficult for their colleagues to meet regularly to discuss challenging cases and research findings.

CHAPTER SIX : CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter highlights the important findings of the study and then draws conclusions from these findings. The chapter then discusses the limitations of the study and provides recommendations for future studies.

6.2 Summary of findings

The aim of this study was to compare the perceptions, use and barriers to EBP by chiropractors and GPs in private practice in the eThekwini Municipality. The demographic characteristics of the respondents showed that the majority of respondents were males, especially the GPs respondents. The chiropractic respondents were mostly between the ages 30 to 39 years and were significantly younger than the GPs, who were mostly between the ages 40 to 49 years.

With regards to occupational characteristics, most chiropractic respondents had been in practice for 19 or fewer years, which was significantly less than the GPs who had mostly been in practice for 10 to 29 years. The majority of respondents from both professions practiced full-time and between 40 to 49 hours a week, but significantly more GPs worked overtime (50 or more hours per week). More chiropractor respondents reported professional roles (academic and/or research) in addition to their full-time practice. The study results also showed that the majority of respondents did not have qualifications beyond their professional qualification; a Master's for the chiropractors and an MBChB/MBBS for the GPs. However, there were significantly more GPs who had upgraded their qualification to a Master's than chiropractors who had upgraded to a PhD. While the majority of respondents from both professions reported no additional training in epidemiology, research methodology or statistics, significantly more GPs did report such postgraduate training. All of the chiropractic respondents and the minority of GP respondents reported having previously personally been involved in conducting research. The majority of chiropractors had been involved in research as part of their postgraduate education and some in a supervisory capacity as opposed to the GPs whose research involvement ranged from undergraduate, postgraduate or ‘other’ unspecified activities. The majority of respondents from both professions reported having met or exceeded their

CPD requirements, with more of the chiropractors reporting to have obtained 'less than required' CEUs.

The majority of respondents from both professions reported a favourable perception towards the necessity of EBP, the use of literature and research findings in practice, the improvement of EBP on patient care and the assistance of EBP in clinical decision-making. Significantly more GPs 'strongly agreed' to the necessity of EBP in practice and that literature and research findings were useful in their daily practice. The majority of respondents from both professions indicated a positive willingness to use and learn or improve their skills for EBP. In addition, the majority of respondents from both professions reported that EBP does not place an unreasonable demand on them and that there is strong evidence to support most of the interventions used on their patients. However, most chiropractors were neutral and GPs disagreed that EBP does not take patient preference into account.

The only occupational characteristic found to be associated with perceptions of EBP was the number of years in practice. General practitioner respondents with 29 or less years in practice were more likely to 'strongly agree' to the necessity of EBP in their practice. Overall, these responses indicate a favourable perception to EBP by both professions.

Most of the respondents from both professions reported learning EBP as part of their undergraduate training. However, most chiropractic and GP respondents disagreed to having received formal training in search strategies, yet most of them also agreed to having confidence in their ability to find clinically relevant research to answer their clinical questions. Significantly more GPs indicated that they had necessary skills to access databases and the Internet while significantly more chiropractors agreed to having received formal training in critical appraisal of scientific literature as part of their academic preparation. However, most chiropractors and GPs reported confidence in their ability to critically review scientific literature.

In terms of utilisation of EBP, the majority of GP respondents read scientific literature and databases two to five time per week while most of the chiropractors did so none or one time per week. Most of the respondents from both professions then reported to use scientific literature two to five times per week and MEDLINE or other databases none or one time per week. Significantly more GPs reported access to journals in their paper-based form, while the majority of respondents from both professions reported access to the Internet and databases at their practice, at home or elsewhere. With regards to

awareness of availability and utilisation of practice guidelines to inform EBP, significantly more GP than chiropractic respondents reported awareness and utilisation.

More than half of the respondents from both professions agreed that they had knowledge of medical search engines and the majority had the necessary skills to access the Internet and databases. The majority of both professions reported to have learned the foundations for EBP during their academic training, but had limited formal training in search strategies to find clinically relevant research. Furthermore, more chiropractors than GPs reported receiving training in critical appraisal techniques. The term 'systematic review' was the best understood term by the chiropractic respondents while 'relative' risk was the best understood term by the GPs. Odds ratio was the least understood term by both groups of professionals. Significantly fewer chiropractors than GPs reported understanding the term 'meta-analysis'.

The only occupational characteristic to influence the use of EBP was previous personal research involvement. General practitioners who had not previously personally been involved in conducting research read research less often than those who had. In addition, those GP respondents who had prior personal research involvement reported using scientific literature in the process of clinical decision-making more frequently than those who had not.

The top three barriers to the use of EBP as reported by both groups of respondents were: 'insufficient time'; 'lack of generalisability of the literature findings to the patient population' and 'inability to apply research findings to individual patients with unique characteristics'. Significantly more GPs reported insufficient time as their top barrier, while significantly more chiropractors reported the 'inability to apply research findings to individual patients with unique characteristics' and 'lack of collective support among my colleagues in my facility' as their top barriers to the use of EBP.

Two associations were statistically significant between perceived barriers to the use of EBP and demographic or occupational characteristics. Chiropractor respondents between the ages 30 to 39 years were more likely to report a lack of generalisability of the literature findings as a barrier to the use of EBP. General practitioner respondents who had not previously personally been involved in conducting research were more likely to be unable to apply research findings to individual patients with unique characteristics.

6.3 Conclusion

Both professions had a generally positive perception of EBP, reported to read or use scientific literature, databases and practice guidelines. Chiropractors reported a lack of accessibility to paper-based journals but both professions reported access to databases and the Internet. Both professions had access to databases at their practices, at home or at other locations. Foundational EBP had been taught to both professions at an undergraduate level. Chiropractic and GP respondents indicated that they had not received formal search strategy training yet they also agreed to knowledge of medical search engines and reported confidence in their ability to find research relevant to their clinical questions. Furthermore, most GP respondents reported having not received formal undergraduate critical appraisal training, while most chiropractors did. However, most respondents from both professions indicated confidence in their critical appraisal skills. Insufficient time was the greatest barrier to EBP experienced by both groups of professionals

Therefore, accessibility to paper-based journals for chiropractors needs to be improved. Institutional and postgraduate education of both professions should focus on training in search strategies, medical search engines and time management. General practitioners require additional education with regards to critical appraisal skills.

The results from the current study are beneficial to both the chiropractic and GP professions in S.A.. It allows for statutory bodies and professional organisations as well as education institutions to have a greater understanding of how these professionals view and use EBP as well as the factors inhibiting its implementation. The results of this study, although not representative of the S.A. chiropractor or GP professions, should aid professional bodies and education institutions on where to focus their professional education.

6.4 Limitations of the study

Sampling is the selection of a small subset of a population that is representative of the total population (Floyd and Fowler 2014: 4). Sampling was necessary for this study due to financial and time constraints. However, sampling procedures must ensure that the sample population, who answer the questionnaire, must be carefully selected so as to serve to be as representative as possible of the wider target population from which they have been drawn (Layder 2013: 101). Probability sampling is a form of random sampling

that ensures minimal sample error (Floyd and Fowler 2014: 3). Therefore, in this study, it was assumed that the simple random probability sampling utilised to sample the GP population would ensure that respondents would be as representative of the larger target population as possible. The total Chiropractor population that met the inclusion criteria were invited to participate in the study.

This study also assumed that respondents would be open and honest when responding to the questions in the questionnaire and that their responses would be an accurate reflection of their views and experiences at the time of questionnaire completion. Response error refers to the deliberate or non-deliberate reporting of incorrect and dishonest responses to survey questions (Dew 2011: 467). Therefore, there is a possibility that the respondents may not have answered questions according to their true opinions or experiences but rather gave responses which they thought would be socially desirable (Dew 2011: 467). The Hawthorne effect could also have contributed to response error. The Hawthorne effect occurs when respondents know that they are participating in a research study and so react uncharacteristically (Fink 2013: 110). Nonresponse bias (separation of the anticipated value of estimation from its true value) may contribute to under or over reporting, particularly if the research topic is of interest to the respondents (Groves 2006). All this may have resulted in inaccurate reflections of the sample population and thereby skewed the results.

In an attempt to minimise response error, a pre-validated questionnaire was utilised (Jette *et al.* 2003). Validation of a questionnaire ensures that the questions produce accurate data of what is intended to be measured (Sapsford 2008: 11). Expert group and pilot studies were also conducted to ensure suitability of the questionnaires to the S.A. population. The aim of an expert group is to ensure correct comprehension of questions, consistency and face and content validity of the questionnaire (Floyd and Fowler 2014: 100-101). A pilot study ensures that the questionnaires were user-friendly, understandable and easy to complete with no grammatical or editorial errors and to ensure that they were comprehended in the same manner (Fink 2013: 7).

6.5 Recommendations

6.5.1 Recommendations to the chiropractic and general practitioner statutory bodies

- The favourable perceptions of EBP indicate that CPD training should no longer focus on promoting EBP but on skills for searching strategies, medical search engines, critical appraisal techniques and time management in EBP and how to apply research findings into daily practice to treat individual patients.
- Research involvement should also be promoted to assist the professions in generating clinically relevant research literature.

6.5.2 Recommendations to the chiropractic and general practitioner education fraternity

– Chiropractic and medical educational institutions should ensure that students have the necessary skills for EBP, particularly with regards to search strategies and critical appraisal techniques.
– Research involvement should also be promoted.

6.5.3 Recommendations regarding the methodology and questionnaire utilised in this study

- The following changes are recommended for the questionnaire:
    - **Question 3, 6 and 8.2:** Additional space should have been made available for practitioners to specify what they meant by ‘other’.
    - **Question 18** in the chiropractor questionnaire and **question 15** in the GP questionnaire: The question needs to be re-worded so as to allow for better comprehension. Many practitioners battled to understand what was required of them. A possible suggestion could be: From the list below, select the three greatest barriers you experience in using EBP and then rank them in terms of the greatest barrier, the second greatest barrier and the third greatest barrier.

6.5.4 Recommendations for future research

- A study such as this one but on a greater scale, especially a national one, would allow for better generalisation of these results.

- A qualitative study similar to the current one would allow for a greater understanding of the issues around EBP, particularly the use of, skills for and barriers to EBP.
- Future studies should investigate how skills such as search strategies and critical appraisal can be more efficiently taught so that research findings can be more effectively applied in clinical practice.

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APPENDICES

Appendix A: Institutional Research Ethics Committee approval letters (REC140/15)

Initial IREC approval letter

DUT
DURBAN
UNIVERSITY OF
TECHNOLOGY

Institutional Research Ethics Committee
Faculty of Health Sciences
Room MS 49, Mansfield School Site
Gate 8, Ritson Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2900
Fax: 031 373 2407
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

2 February 2016

IREC Reference Number: **REC 140/15**

Ms C Koekemoer
2 Greenwood Gardens
40 English Road
Chase Valley
Pietermaritzburg
3201

Dear Ms Koekemoer

A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the eThekwini municipality

The Institutional Research Ethics Committee acknowledges receipt of your final data collection tool for review.

We are pleased to inform you that the questionnaire has been APPROVED; you may now proceed with data collection on the proposed project.

Kindly ensure that participants used for the pilot study are not part of the main study.

Yours Sincerely

[redacted]

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2016 -02- 02
INSITUTUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

Amended IREC Approval

Institutional Research Ethics Committee
Faculty of Health Sciences
Room MS 49, Mansfield School Site
Gate 8, Ritson Campus
Durban University of Technology

P O Box 1334, Durban, South Africa, 4001

Tel: 031 373 2900
Fax: 031 373 2407
Email: lavishad@dut.ac.za
http://www.dut.ac.za/research/institutional_research_ethics

www.dut.ac.za

2 June 2016

Ms C Koekemoer
2 Greenwood Gardens
40 English Road
Chase Valley
Pietermaritzburg
3201

Dear Ms Koekemoer

Application for Amendment of Approved Research Proposal

A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the eThekwini municipality

I am pleased to inform you that your application for inclusion of a research site to your proposal has been Approved.

Please note that a gatekeeper permission letter for collection of data from this site has to be submitted to the IREC office as soon as possible.

Yours Sincerely

[redacted]

Professor J K Adam
Chairperson: IREC

DUT DURBAN UNIVERSITY OF TECHNOLOGY
2016 -06- 02
INSITUTUTIONAL RESEARCH ETHICS COMMITTEE
P O BOX 1334 DURBAN 4000 SOUTH AFRICA

Appendix B: Letters of permission

AHPCSA Permission

c8lynkoekemoer@yahoo.com
To
Dr. Louis Mullinder
BCC
c8lynkoekemoer@yahoo.com
Sep 1 at 8:05 AM
Morning Dr Mullinder

Thank you very much for your prompt reply and for the offer to send emails. Your approval and assistance is much appreciated.

Many Thanks
Caitlyn Koekemoer

On 01 Sep 2015, at 7:56 AM, Dr. Louis Mullinder <registrar@ahpcsa.co.za> wrote:

PREVIOUS EMAIL SENT WHILE DICTATING REPLY. FULL REPLY NOW BELOW.

From: Dr. Louis Mullinder [mailto:registrar@ahpcsa.co.za]
Sent: 01 September 2015 07:52 AM
To: 'Caitlyn Koekemoer'
Subject: RE: Fwd: Request for contact details

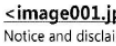
Dear Ms Koekemoer

Thank you for your email. You are welcome to use the information is provided to Ms Naidoo.

Council House is now able to send emails and I have this past year sent bulk emails for two other UJ research projects, so if you send me an explanatory text including a link to an electronic reply, we can assist you further. I do wish, however, to point out that we have not yet managed to achieve more than 25% reply as yet. Should you need to know more about this modus, contact Gheta Johl at gheta.johl@gmail.com, who is the last UJ student we assisted.

With kind regards

DR LOUIS MULLINDER
REGISTRAR: ALLIED HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA
6 CASTELLI, IL VILLAGGIO, 5 DE HAVILLAND CRESCENT SOUTH, PERSEQUOR PARK, PRETORIA
PRIVATE BAG X4, QUEENSWOOD 0121
TEL NUMBER: 012 349 2331/2332/2333, FAX NUMBER: 012 349 2327
FAX TO EMAIL: 086 507 4092
email: registrar@ahpcsa.co.za

Visit AHPCSA Facebook Page


From: Caitlyn Koekemoer [mailto:c8lynkoekemoer@yahoo.com]
Sent: 31 August 2015 08:43 PM
To: registrar@ahpcsa.co.za
Subject: Fw: Fwd: Request for contact details

Dear Dr Mullinder

I am a registered student pursuing a Master's Degree in Chiropractic at the Durban University of Technology. I would hereby like to seek permission to have access to the chiropractic practitioners and their contact details as given to Ms Divashni Naidoo in the below emails.

The study is titled: A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the greater Durban area.

The study will involve research on chiropractors and general practitioners in private practice in the greater Durban area. The aim is to determine their perceptions toward and barriers encountered with as well as their utilisation of evidence-based practice. The data obtained by means of a structured and pre-validated questionnaire will allow further assessment of the role of evidence-based practice in private chiropractic and general practitioner practices. The questions are concerned with demographic and practice data, the perceptions and attitudes towards, knowledge and use of evidence-based practice as well as barriers encountered with evidence-based practice. The questionnaire will only take a few minutes to complete, as most of the questions require participants to tick the appropriate answer. There are only a few short written responses required.

In this study, the data from Ms Divashni Naidoo's study will be utilised in order to make the comparison with the data collected by me with regards to general practitioners. Permission for me to access the data from Ms Divashni Naidoo's study will be asked from each practitioner who responds to her study. In the case of Ms Divashni Naidoo not being able to complete her data collection or any other complications that may arise, I may be required to have access to the data base of information given to her by you.

Prior to any practitioners being contacted approval will be obtained from the Institutional Research and Ethics Committee (IREC). Once IREC approval has been obtained, a letter of information, informed consent and questionnaire form will be sent to the practitioner either personally on appointment basis or e-mailed by the researcher. The practitioner may select to or not to complete the informed consent and questionnaire form. However, if the questionnaire is completed we ask that the informed consent form also be completed. Responses may be returned either by e-mail to the researcher or collected by the researcher from the practitioner's practice on appointment basis. As with all questionnaires, any of the information provided by the practitioner will be treated in the utmost confidence. All information will be kept confidential and any hard copies will be stored in a locked filing cabinet and will only be shared with the researcher's supervisors.

If you have any further information is required or there are any queries in this regard please contact any of the below.

Name of Supervisor: Dr. L. O'Conner (031 373 2923 / 084 848 0620)
M.Tech.: Chiropractic

Name of Co-supervisor: Dr. K. Padayachy (031 464 4057 / 084 371 6438)
M.Tech.: Chiropractic

Name of Research Student: Caitlyn Koekemoer (073 263 1812)
B. Tech.: Chiropractic

Your time and assistance in this with this approval is invaluable and greatly appreciated.

Yours sincerely,
Caitlyn Koekmoer

HPCSA Permission

On Mon, 09 Feb 2015 08:58:05 +0200, Yvette Daffue <YvetteD@hpcsa.co.za> wrote:

Dear Caitlyn

Your request for Practice Information has reference.

Kindly Note that the HPCSA does not record the Practice/Employment information on our Database.

Private Practices are registered with the Board of Healthcare Funders (BHF). They can be contacted on bhf@bhfglobal.com / www.bhfglobal.com / + 27 (11) 357 0200

For Practitioners Practicing in the Public Sector you may contact the South African National Dept of Health. Contact Details for DOH: www.doh.gov.za / + 27 (12) 395 8000

Although registration with MedPages is not compulsory you may find their Website helpful with regard to Practice & Contact information. Contact Details for MedPages: info@medpages.co.za / www.medpages.co.za / +27 (21) 441 9700

NB: MedPages also provides a Targeted Communication Service. Go to the "Products & Services" Link for more information.

Please do not hesitate in contacting me should any of the above be unclear.

Regards

Yvette Daffue
IT Dept (Statistics & Data Analysis)
HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA
553 Madiba Street (Previously Vermeulen), Arcadia, 0083 PO Box 205,
Pretoria, 0001
Tel: +27 (0) 12 338 9354
Fax: +27 (0) 12 338 9354
Web: http://www.hpcsa.co.za
Email: YvetteD@hpcsa.co.za

-----Original Message-----
From: Caitlyn Koekemoer [mailto:c8lynkoekemoer@yahoo.com]
Sent: Friday, February 06, 2015 08:13 AM
To: Yvette Meintjes
Subject: Approval for access to contact details for General Practitioners

Dear Mrs Meintjies

I am a registered student pursuing a Master's Degree in Chiropractic at the Durban University of Technology. I would hereby like to seek permission to be given the contact details (preferably practice telephone number, address and email address) for all general practitioners in private practice in the Durban area registered with HPCSA. With regards to the area of practice, more specifically all with a practice number with the 031 dialling code.

The study is titled: A comparison of the perceptions, use and barriers to evidence-based practice by

Chiropractors and General Practitioners in the greater Durban area.

The study will involve research on Chiropractors and General Practitioners in private practice in the greater Durban area. The aim is to determine their perceptions toward and barriers encountered with as well as their utilisation of evidence-based practice. The data obtained by means of a structured and pre-validated questionnaire will allow further assessment of the role of evidence-based practice in private Chiropractic and General Practitioner practices. The questions are concerned with demographic and practice data, the perceptions and attitudes towards, knowledge and use of evidence-based practice as well as barriers encountered with evidence-based practice. The questionnaire will only take a few minutes to complete, as most of the questions require participants to tick the appropriate answer. There are only a few short written responses required.

Prior to any practitioners being contacted approval will be obtained from the Institutional Research and Ethics Committee (IREC). Once IREC approval has been obtained, a letter of information, informed consent and questionnaire form will be sent to the practitioner either personally on appointment basis or e-mailed by the researcher. The practitioner may select to or not to complete the informed consent and questionnaire form.

However, if the questionnaire is completed we ask that the informed consent form also be completed. Responses may be returned either by e-mail to the researcher or collected by the researcher from the practitioner's practice on appointment basis.

As with all questionnaires, any of the information provided by the practitioner will be treated in the utmost confidence. All information will be kept confidential and any hard copies will be stored in a locked filing cabinet and will only be shared with the researcher's supervisors.

If you have any further information is required or there are any queries in this regard please contact any of the below:

Name of Supervisor: Dr. L. O'Conner (031 373 2923 / 084 848 0620) M.Tech.: Chiropractic

Name of Co-supervisor: Dr. K. Padayachy (031 464 4057 / 084 371 6438) M.Tech.: Chiropractic

Name of Research Student: Caitlyn Koekemoer (073 263 1812) B. Tech.: Chiropractic

Your time and assistance in this with this approval is invaluable and greatly appreciated.

Yours sincerely
Caitlyn Koekemoer

BHF data provision

Subject: Data-set for Active General Practitioners in KZN.xlsx

From: FlorenceC@bhfglobal.com
To: c8lynkoekemoer@yahoo.com
Cc: eirle@iqbusiness.net
Date: Wednesday, June 17, 2015, 11:08:28 AM GMT+2

Good Day Caitlyn

Find attached data-set for all General Practitioners registered in the KZN province with the 031 code as requested.

Please remember to send us the results of your research.

Regards

Data-set for Active General Practitioners in KZN.xlsx
238.5kB

Dr Jette permission

From: Laura Wilson <lauraw@dut.ac.za>
Date: Mon, Nov 24, 2014 at 11:22 PM
Subject: Durban University of Technology: Evidence based practice: Beliefs, Attitudes, Knowledge, and Behaviours of Physical Therapists
To: "DJETTE@mghihp.edu" <DJETTE@mghihp.edu>
Cc: "c8lynkoekemoer@yahoo.com" <c8lynkoekemoer@yahoo.com>, divashninaidoo18 <divashninaidoo18@gmail.com>

Dear Dr Jette

Thank you for allowing your contact details to be shared. I wanted to ask if you would be willing to allow my two masters research students to utilise and modify the questionnaire that was used in your study titled: Evidence based practice: Beliefs, Attitudes, Knowledge, and Behaviours of Physical Therapists (Physical Therapy, Vol 83, no. 9, Sept 2003. The two students are registered for a Masters in Chiropractic, the one will be investigating the knowledge, attitudes, perceptions and beliefs of Chiropractors on the use of evidence based medicine and supplementing it with qualitative interviews and the other will use the quantitative data and compare it to general practitioners in Durban, Kwa-Zulu Natal, South Africa. If you allow them to utilise your questionnaire it will be very beneficial as they can then compare their results with yours.

Looking forward to hearing from you.

Regards

Laura

From: Jette, Diane U. [mailto:DJETTE@MGHIHP.EDU]
Sent: 26 November 2014 03:45 AM
To: Laura Wilson
Subject: RE: Durban University of Technology: Evidence based practice: Beliefs, Attitudes, Knowledge, and Behaviours of Physical Therapists

Dear Laura,

I am pleased that you will be using the survey in your study. Good luck with your project.

Diane

From: Laura Wilson <lauraw@dut.ac.za>
Date: Tue, Nov 25, 2014 at 10:35 PM
Subject: RE: Durban University of Technology: Evidence based practice: Beliefs, Attitudes, Knowledge, and Behaviours of Physical Therapists
To: "Jette, Diane U." <DJETTE@mghihp.edu>
Cc: Nombeko Mshunqane <nombekom@dut.ac.za>, "c8lynkoekemoer@yahoo.com" <c8lynkoekemoer@yahoo.com>, divashninaidoo18 <divashninaidoo18@gmail.com>

Dear Dr Jette,

Thank you. Will reference the origin of the questionnaire in line with normal referencing techniques.

Regards,

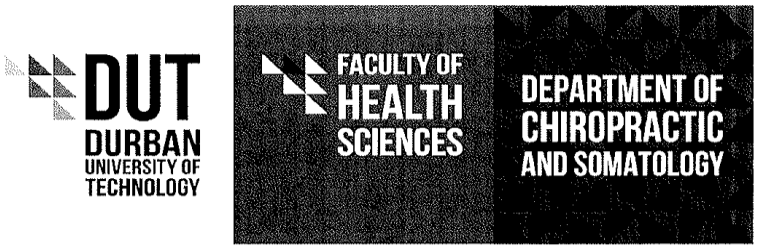
Laura

Appendix C: Raosoft Statistical Software 23.01 report

What margin of error can you accept? 5% is a common choice	5 %	The margin of error is the amount of error that you can tolerate. If 90% of respondents answer *yes*, while 10% answer *no*, you may be able to tolerate a larger amount of error than if the respondents are split 50-50 or 45-55. Lower margin of error requires a larger sample size.
What confidence level do you need? Typical choices are 90%, 95%, or 99%	95 %	The confidence level is the amount of uncertainty you can tolerate. Suppose that you have 20 yes-no questions in your survey. With a confidence level of 95%, you would expect that for one of the questions (1 in 20), the percentage of people who answer *yes* would be more than the margin of error away from the true answer. The true answer is the percentage you would get if you exhaustively interviewed everyone. Higher confidence level requires a larger sample size.
What is the population size? If you don't know, use 20000	1148	How many people are there to choose your random sample from? The sample size doesn't change much for populations larger than 20,000.
What is the response distribution? Leave this as 50%	50 %	For each question, what do you expect the results will be? If the sample is skewed highly one way or the other, the population probably is, too. If you don't know, use 50%, which gives the largest sample size.
Your recommended sample size is	**289**	This is the minimum recommended size of your survey. If you create a sample of this many people and get responses from everyone, you're more likely to get a correct answer than you would from a large sample where only a small percentage of the sample responds to your survey.

Appendix D: Chiropractor and GP letters of information and consent

Chiropractor letter of information



Department of Chiropractic and Somatology:
Chiropractic Clinic
Faculty of Health Sciences
Ritson Campus
Durban University of Technology

11 Ritson Road, Berea, Durban 4001

P O Box 1334, Durban, 4000, South Africa

Tel: (031)373 2205

www.dut.ac.za

Dear Doctor,

Thank you for your time and consideration to participate in this study.

Study Title:
The knowledge, attitudes, perceptions and perceived barriers of chiropractors within the eThekwini municipality towards evidence-based practice

Name of Supervisor:	Dr L. O' Connor (031 373 2923 / 084 848 0620) M.Tech: Chiropractic
Name of Co-supervisor:	Dr N. Mshunqane (031 373 2400 / 082 924 3773) PhD: Physiotherapy
Name of Research Student:	Divashni Naidoo (031 373 2205) B. Tech: Chiropractic

Purpose of the study:
Evidence-based practice (EBP) has become widely recognised amongst chiropractors as with other health care professionals. Internationally, studies show that health care practitioners support the use of EBP, but often have difficulty implementing it in practice. In the South African context, research into chiropractor's perceptions of research have been conducted, however the distinction between research and practicing EBP remains unclear. This information can be used by academic institutions and professional associations to determine if the practitioners have the necessary skills. If skills are seen to be lacking, then continuing professional development workshops can be arranged.

Please note the distinction between the terms "research" and "evidence-based practice". The difference in the context of this study will be discussed below:

Research:
The definition of scientific research is performing a methodical study in order to prove a hypothesis or answer a specific question. Finding a definitive answer is the central goal of any experimental process. The purpose of conducting research is to generate new knowledge or to validate existing knowledge based on a theory. Scientific research is organized and involves planning, performing literature reviews of past research and evaluating what questions need to be answered. While research is about investigation, exploration, and discovery, it also requires an understanding of the philosophy of science.

Evidence-based practice:
Evidence based practice is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. Unlike research, EBP is not about developing new knowledge or validating existing knowledge. It involves integrating individual clinical expertise with best available external clinical evidence and applying it to

clinical decision making. The purpose of EBP is to utilise the best evidence available to make patient care decisions by means of incorporating clinical expertise and patient preferences and values.

Outline of the procedures:
On agreeing to participate in this research study, you will be required to complete this letter of information, informed consent and questionnaire. The questionnaire will be hand delivered to you. Please complete the questionnaire at your own convenience and in full. Please provide the researcher with your email address so that a reminder email can be sent to you in two weeks. A second reminder will be sent to you a week later. The questionnaires will be collected according to your preference, either by personal collection or scanned and e-mailed to a neutral third party (lindat@dut.ac.za).

Benefits:
Once the study has been completed, the results will be made available on the DUT Institutional repository. Using this information, you will have the opportunity to identify the areas that they can improve on or seek further training in certain aspects of evidence-based practice. You will be given the opportunity to inform the researcher if you would like to be sent the results of this study upon completion.

Reason/s why the Participant May Be Withdrawn from the Study:
You are free to withdraw from the study at any time. There will be no adverse consequences for the participant should you choose to withdraw

Remuneration:
No participants will receive any form of remuneration.

Costs of the study:
No costs will be expected to be covered by you with regards to the study.

Confidentiality:
Any information provided by you will be treated in the utmost confidence. All completed questionnaires and informed consent forms will be placed in sealed boxes (one box for the signed informed consent and the other for the completed questionnaire), this will ensure anonymity. The boxes will only be opened once data collection has been completed. All data will be coded: each questionnaire will be numbered with no personal information of the participant appearing on the questionnaire. All information will be kept confidential, locked in a steel cupboard, and will only be shared with the research supervisors and fellow researcher. All data will be kept in storage for a period of five years. Thereafter, it will be shredded.

Additional consent:
Should you agree, the data generated in this research study (Ie. entire questionnaire) will be made available to a fellow Masters Chiropractic student registered at the Durban University of Technology, who will be comparing the perceptions, use and barriers to evidence-based practice by chiropractors to those of General Practitioners in the eThekwini municipality.

Study Title of fellow researcher:
A comparison of the perceptions, use and barriers to evidence-based practice by chiropractors and General Practitioners in the eThekwini municipality.

Name of Supervisor:	Dr L. O' Connor (031 373 2923 / 084 848 0620) M.Tech: Chiropractic
Name of Co-supervisor:	Dr K. Padayachy (031 373 2400 / 082 924 3773) M.Tech: Chiropractic
Name of Research Student:	Caitlyn Koekemoer (031 373 2205) B. Tech: Chiropractic

Risks/Discomforts/Research-related injury and costs:
There are no foreseeable risks/discomforts/research-related injuries or cost involved from participation in this study.

Persons to Contact in the Event of Any Problems or Queries:
If you require any further information or there are any queries in this regard, please contact the researcher, Divashni Naidoo (Tel no. 083 415 8391), my supervisor, Dr Laura O'Connor (Tel no. 031 373 2923), or the Institutional Research Ethics administrator on 031 373 2900.

Yours sincerely,

[redacted]

Divashni Naidoo
Researcher
B.Tech.: Chiropractic

[redacted]

Dr. L. O'Connor
Research supervisor
M.Tech.: Chiropractic

Chiropractor consent

CONSENT

Statement of Agreement to Participate in the Research Study:

I hereby confirm that I have been informed by the researcher/s, Miss Divashni Naidoo and/or Mrs Caitlyn Koekemoer, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: REC 94/15,
I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.

I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

I may, at any stage, without prejudice, withdraw my consent and participation in the study.
I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

I agree that my completed questionnaire can be made available to Mrs Caitlyn Koekemoer in order for her to conduct her research project titled: “A comparison of the perceptions, use and barriers to evidence-based practice by chiropractors and general practitioners in the eThekwini municipality’.

_____	_____	_____	_____
Full Name of Participant	**Date**	**Time**	**Signature / Right Thumbprint**

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

_____	_____	_____
Full Name of Researcher	**Date**	**Signature**
_____	_____	_____
Full Name of Witness (If applicable)	**Date**	**Signature**
_____	_____	_____
Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

Initial general practitioner letter of information

Department of Chiropractic and Somatology: Chiropractic Clinic
Faculty of Health Sciences
Ritson Campus
Durban University of Technology

11 Ritson Road, Berea, Durban 4001

P O Box 1334, Durban, 4000, South Africa

Tel: (031)373 2205

www.dut.ac.za

LETTER OF INFORMATION – General Practitioners

Dear Doctor

Thank you for your time and consideration to participate in this study.

Study Title: A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the eThekwini municipality.

Name of Supervisor:	Dr. L. O'Connor (031 373 2923 / 084 848 0620) M.Tech.: Chiropractic
Name of Co-supervisor:	Dr. K. Padayachy (031 464 4057 / 084 371 6438) M.Tech.: Chiropractic
Name of Research Student:	Caitlyn Koekemoer (073 263 1812) B. Tech.: Chiropractic
Name of Institution:	Durban University of Technology

Purpose of the study:
Evidence based practice (EBP) has become widely recognised amongst chiropractors and general practitioners as with other health care professionals. Research findings, knowledge from basic science, clinical knowledge, and expert opinion are all considered as evidence. The demands experienced due to evidence based practice are slowly changing the education of students, allowing for more practice-relevant research and a closer working relationship between clinicians and research students. Evidence based practice also provides opportunities for patient care to be more effective and dynamic in order to maximize effects of clinical judgment. When evidence is used to define best practices rather than to support existing practices, chiropractic and medical care keeps pace with the latest technological advances and takes advantage of new knowledge developments. This study aims to determine the perceptions of, use of and perceived barriers to EBP by chiropractors and general practitioners in private practice in the eThekwini municipality.

Please note the distinction between the terms "research" and "evidence based practice". The difference in the context of this study will be discussed below:

Research:
The definition of scientific research is performing a methodical study in order to prove a hypothesis or answer a specific question. Finding a definitive answer is the central goal of any experimental process. The purpose of conducting research is to generate new knowledge or to validate existing knowledge based on a theory. Scientific research is organized and involves planning, performing literature reviews of past research and evaluating what questions need to be answered. While research is about investigation, exploration, and discovery, it also requires an understanding of the philosophy of science

Evidence based practice:
Evidence based practice (EBP) is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. Unlike research, EBP isn't about developing new knowledge or validating existing knowledge. It involves integrating individual clinical expertise with best available external clinical evidence and applying it to clinical decision making. The purpose of EBP is to utilise the best evidence available to make patient care decisions by means of incorporating clinical expertise and patient preferences and values.

Outline of the procedures:
A cross sectional survey design will be utilised in the quantitative paradigm to chiropractors and general practitioners practicing in the eThekwini municipality. A descriptive survey will be utilised to gather demographic characteristics, level of knowledge of, skills for, perceptions of and perceived barriers to EBP by chiropractors and general practitioners. Potential participants will be contacted telephonically by the researcher prior to delivery of the questionnaire. On agreeing to participate in this study, the researcher will deliver the questionnaires either by hand delivery or e-mail to the potential participants. You will be given the letter of information and consent and a questionnaire to complete in full at your own convenience and will be requested to provide your e-mail address to the researcher if it has not already been made available to the researcher. You will be given an electronic reminder if after two weeks the questionnaire has not been returned. A second reminder will be sent to you a week later. The questionnaires will be collected according to your preference, either personally by the researcher or sent via e-mail to a neutral third party (lindat@dut.ac.za).

Benefits:
Once the study has been completed, the results will be made available on the DUT Institutional repository. Using this information, you will have the opportunity to identify the areas that can be improved on or seek further training in certain aspects of EBP. You will be given the opportunity to inform the researcher if you would like to be sent the results of this study upon completion.

Reason/s why the Participant May Be Withdrawn from the Study:
You are free to withdraw from the study at any time. There will be no adverse consequences for the participant should you choose to withdraw

Remuneration:
No participants will receive any form of remuneration.

Costs of the study:
No costs will be expected to be covered by you with regards to the study.

Confidentiality:
As with all questionnaires, any of the information provided by you will be treated in the utmost confidence. Any completed questionnaires and informed consent forms collected by the researcher in person will be placed in sealed boxes (one box for the signed informed consent and the other for the completed questionnaire). The sealed boxes will be in the possession of a third party to ensure anonymity. The boxes will only be opened once data collection has been completed and only done so by the researcher. All data will be coded: each questionnaire will be numbered with no personal information of the participant appearing on the questionnaire. The boxes will only be opened once data collection has been completed and only done so by the researcher. All information will be kept confidential, locked in a steel cupboard and will be shared only with the research supervisors. All data will be kept in storage for a period of five years. Thereafter, it will be shredded.

Risks/Discomforts/Research-related injury and costs:
There are no risks/discomforts/research-related injuries or cost involved from participation in this study.

Persons to Contact in the Event of Any Problems or Queries:
If you require any further information or there are any queries in this regard, please contact the researcher, Caitlyn (Tel no. 073 263 1812), my supervisor, Dr Laura O'Conner (Tel no. 031 373 2923), or the Institutional Research Ethics administrator on 031 373 2900.

Yours sincerely,

.....

Caitlyn Koekemoer
Researcher
B.Tech.: Chiropractic

Dr. L. O'Connor
Research supervisor
M.Tech.: Chiropractic

Amended general practitioner letter of information

LETTER OF INFORMATION – General Practitioners

Dear Doctor

Thank you for your time and consideration to participate in this study.

Study Title: A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the eThekwini municipality.

Name of Supervisor:	Dr. L. O'Connor (031 373 2923 / 084 848 0620) M.Tech.: Chiropractic
Name of Co-supervisor:	Dr. K. Padayachy (031 464 4057 / 084 371 6438) M.Tech.: Chiropractic
Name of Research Student:	Caitlyn Koekemoer (073 263 1812) B. Tech.: Chiropractic
Name of Institution:	Durban University of Technology

Purpose of the study:
Evidence based practice (EBP) has become widely recognised amongst chiropractors and general practitioners as with other health care professionals. Research findings, knowledge from basic science, clinical knowledge, and expert opinion are all considered as evidence. The demands experienced due to evidence based practice are slowly changing the education of students, allowing for more practice-relevant research and a closer working relationship between clinicians and research students. Evidence based practice also provides opportunities for patient care to be more effective and dynamic in order to maximize effects of clinical judgment. When evidence is used to define best practices rather than to support existing practices, chiropractic and medical care keeps pace with the latest technological advances and takes advantage of new knowledge developments. This study aims to determine the perceptions of, use of and perceived barriers to EBP by chiropractors and general practitioners in private practice in the eThekwini municipality.

Please note the distinction between the terms "research" and "evidence based practice". The difference in the context of this study will be discussed below:

Research:
The definition of scientific research is performing a methodical study in order to prove a hypothesis or answer a specific question. Finding a definitive answer is the central goal of any experimental process. The purpose of conducting research is to generate new knowledge or to validate existing knowledge based on a theory. Scientific research is organized and involves planning, performing literature reviews of past research and evaluating what questions need to be answered. While research is about investigation, exploration, and discovery, it also requires an understanding of the philosophy of science

Evidence based practice:
Evidence based practice (EBP) is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. Unlike research, EBP isn't about developing new knowledge or validating existing knowledge. It involves integrating individual clinical expertise with best available external clinical evidence and applying it to clinical decision making. The purpose of EBP is to utilise the best evidence available to make patient care decisions by means of incorporating clinical expertise and patient preferences and values.

Outline of the procedures:
A cross sectional survey design will be utilised in the quantitative paradigm to chiropractors and general practitioners practicing in the eThekwini municipality. A descriptive survey will be utilised to gather demographic characteristics, level of knowledge of, skills for, perceptions of and perceived barriers to EBP by chiropractors and general practitioners. Potential participants may be contacted telephonically by the researcher prior to delivery of the questionnaire. On agreeing to participate in this study, the researcher will deliver the questionnaires either by hand delivery or e-mail to the potential participants. Potential participants may also be requested by the researcher to participate in the study whilst attending a medical lecture/ conference. Permission will be obtained beforehand from the organising body(s). You will be given the letter of information and consent and a questionnaire to complete in full at your own convenience and will be requested to provide your e-mail address to the researcher if it has not already been made available to the researcher. You will be given an electronic reminder if after two weeks the questionnaire has not been returned. A second reminder will be sent to you a week later. The questionnaires will be collected according to your preference, either personally by the researcher or sent via e-mail to a neutral third party (lindat@dut.ac.za).

Benefits:
Once the study has been completed, the results will be made available on the DUT Institutional repository. Using this information, you will have the opportunity to identify the areas that can be improved on or seek further training in certain aspects of EBP. You will be given the opportunity to inform the researcher if you would like to be sent the results of this study upon completion.

Reason/s why the Participant May Be Withdrawn from the Study:
You are free to withdraw from the study at any time. There will be no adverse consequences for the participant should you choose to withdraw

Remuneration:
No participants will receive any form of remuneration.

Costs of the study:
No costs will be expected to be covered by you with regards to the study.

Confidentiality:
As with all questionnaires, any of the information provided by you will be treated in the utmost confidence. Any completed questionnaires and informed consent forms collected by the researcher in person will be placed in sealed boxes (one box for the signed informed consent and the other for the completed questionnaire). The sealed boxes will be in the possession of a third party to ensure anonymity. The boxes will only be opened once data collection has been completed and only done so by the researcher. All data will be coded: each questionnaire will be numbered with no personal information of the participant appearing on the questionnaire. The boxes will only be opened once data collection has been completed and only done so by the researcher. All information will be kept confidential, locked in a steel cupboard and will be shared only with the research supervisors. All data will be kept in storage for a period of five years. Thereafter, it will be shredded.

Risks/Discomforts/Research-related injury and costs:
There are no risks/discomforts/research-related injuries or cost involved from participation in this study.

Persons to Contact in the Event of Any Problems or Queries:
If you require any further information or there are any queries in this regard, please contact the researcher, Caitlyn (Tel no. 073 263 1812), my supervisor, Dr Laura O'Conner (Tel no. 031 373 2923), or the Institutional Research Ethics administrator on 031 373 2900.

Yours sincerely,

[redacted]

Caitlyn Koekemoer
Researcher
B.Tech.: Chiropractic

[redacted]

Dr L. O'Connor
Research supervisor
M.Tech.: Chiropractic

General practitioner consent

CONSENT – General Practitioners

Statement of Agreement to Participate in the Research Study:

I hereby confirm that I have been informed by the researcher, Miss Caitlyn Koekemoer, about the nature, conduct, benefits and risks of this study - Research Ethics Clearance Number: REC 140/15,
I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.

I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.

I may, at any stage, without prejudice, withdraw my consent and participation in the study.
I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____	_____	_____	_____
Full Name of Participant	**Date**	**Time**	**Signature / Right Thumbprint**

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

_____	_____	_____
Full Name of Researcher	**Date**	**Signature**
_____	_____	_____
Full Name of Witness (If applicable)	**Date**	**Signature**
_____	_____	_____
Full Name of Legal Guardian (If applicable)	**Date**	**Signature**

Appendix E: Questionnaire from Jette *et al.* (2003) and the chiropractor and GP questionnaire amendments

Jette *et al.* (2003) questionnaire

Appendix.
Evidence-Based Practice (EBP) Questionnaire[a]

This section of the questionnaire inquires about personal attitudes toward, use of, and perceived benefits and limitations of EBP.

For the following items, place a mark ☒ in the appropriate box that indicates your response.

1. Application of EBP is necessary in the practice of physical therapy.
   ☐ Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
2. Literature and research findings are useful in my day-to-day practice.
   ☐ Strongly disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
3. I need to increase the use of evidence in my daily practice.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
4. The adoption of EBP places an unreasonable demand on physical therapists.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
5. I am interested in learning or improving the skills necessary to incorporate EBP into my practice.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
6. EBP improves the quality of patient care.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
7. EBP does not take into account the limitations of my clinical practice setting.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
8. My reimbursement rate will increase if I incorporate EBP into my practice.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
9. Strong evidence is lacking to support most of the interventions I use with my patients.
   ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
10. EBP helps me make decisions about patient care.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
11. EBP does not take into account patient preferences.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

For the following items, place a mark ☒ in the appropriate box that indicates your response for a typical month.

12. Read/review research/literature related to my clinical practice.
    ☐ ≤1 article ☐ 2–5 articles ☐ 6–10 articles ☐ 11–15 articles ☐ 16+ articles
13. Use professional literature and research findings in the process of clinical decision making.
    ☐ ≤1 time ☐ 2–5 times ☐ 6–10 times ☐ 11–15 times ☐ 16+ times
14. Use MEDLINE or other databases to search for practice-relevant literature/research.
    ☐ ≤1 time ☐ 2–5 times ☐ 6–10 times ☐ 11–15 times ☐ 16+ times

The following section inquires about personal use and understanding of clinical practice guidelines. Practice guidelines provide a description of standard specifications for care of patients with specific diseases and are developed through a formal, consensus-building process that incorporates the best scientific evidence of effectiveness and expert opinion available.[b]

For the following items, place a mark ☒ in the appropriate box that indicates your response.

15. Practice guidelines are available for topics related to my practice.
    ☐ Yes ☐ No ☐ Do Not Know
16. I actively seek practice guidelines pertaining to areas of my practice.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
17. I use practice guidelines in my practice.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree
18. I am aware that practice guidelines are available online.
    ☐ Yes ☐ No
19. I am able to access practice guidelines online.
    ☐ Yes ☐ No
20. I am able to incorporate patient preferences with practice guidelines.
    ☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

The following section inquires about availability of resources to access information and personal skills in using those resources.

For the following items, place a mark ☒ in the appropriate box that indicates your response. In items referring to your "facility," consider the practice setting in which you do the majority of your clinical care.

21. I have access to current research through professional journals in their paper form.
    ☐ Yes ☐ No
22. I have the ability to access relevant databases and the Internet at my facility.
    ☐ Yes ☐ No ☐ Do Not Know

Continued

Appendix.
Continued

23. I have the ability to access relevant databases and the Internet at home or locations other than my facility.
☐ Yes ☐ No ☐ Do Not Know

24. My facility supports the use of current research in practice.
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

25. I learned the foundations for EBP as part of my academic preparation.
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

26. I have received formal training in search strategies for finding research relevant to my practice.
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

27. I am familiar with the medical search engines (eg, MEDLINE, CINAHL).
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

28. I received formal training in critical appraisal of research literature as part of my academic preparation.
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

29. I am confident in my ability to critically review professional literature.
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

30. I am confident in my ability to find relevant research to answer my clinical questions.
☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

For the following item, place a mark ☒ in one box in the row for each term.

31. My understanding of the following terms is:

Term	Understand Completely	Understand Somewhat	Do Not Understand
a) Relative risk	☐	☐	☐
b) Absolute risk	☐	☐	☐
c) Systematic review	☐	☐	☐
d) Odds ratio	☐	☐	☐
e) Meta-analysis	☐	☐	☐
f) Confidence interval	☐	☐	☐
g) Heterogeneity	☐	☐	☐
h) Publication bias	☐	☐	☐

For the following items, rank your top 3 choices by placing numbers in the appropriate boxes (1=most important).

32. Rank your 3 greatest barriers to the use of EBP in your clinical practice.
☐ Insufficient time
☐ Lack of information resources
☐ Lack of research skills
☐ Poor ability to critically appraise the literature
☐ Lack of generalizability of the literature findings to my patient population
☐ Inability to apply research findings to individual patients with unique characteristics
☐ Lack of understanding of statistical analysis
☐ Lack of collective support among my colleagues in my facility
☐ Lack of interest

The following section inquires about personal demographic information.

For the following items, place a mark ☒ in the appropriate box next that indicates your response.

33. What is your sex?
☐ Male ☐ Female

34. What is your age group?
☐ 20–29 y ☐ 30–39 y ☐ 40–49 y ☐ 50+ y

35. Do you currently hold a valid physical therapy license?
☐ Yes ☐ No

36. For how many years have you been licensed?
☐ <5 y ☐ 5–10 y ☐ 11–15 y ☐ >15 y

37. What is your entry-level degree for physical therapy?
☐ Certificate
☐ Baccalaureate
☐ Entry-level master's
☐ Entry-level doctorate
☐ Other

(Continued)

Appendix.
Continued

38. What is your highest degree attained?
- ☐ Baccalaureate
- ☐ Entry-level master's
- ☐ Advanced master's
- ☐ Entry-level doctorate
- ☐ Advanced doctorate
- ☐ Other

39. If you do not currently hold an advanced degree, do you intend to pursue one in the future?
☐ Yes ☐ No ☐ Do Not Know

40. Are you a clinical certified specialist? If so, in which speciality?
☐ Yes ☐ No Speciality: _____

41. Do you regularly (≥once per year) participate in continuing education courses?
☐ Yes ☐ No

42. Do you belong to one or more professional practice-oriented organizations (eg, APTA)?
☐ Yes ☐ No

43. Are you a clinical instructor for physical therapist students/interns/residents?
☐ Yes ☐ No

44. On average, how many hours per week do you work?
☐ <20 ☐ 20–30 ☐ 31–40 ☐ >40

45. On average, how many patients do you see daily?
☐ <5 ☐ 5–10 ☐ 11–15 ☐ >15

46. How many full-time physical therapists are in the facility in which you do the majority of your patient care?
☐ <5 ☐ 5–10 ☐ 11–15 ☐ >15

47. Please indicate the percentage of your total work time that you spend in each type of activity during an average month.
- a) Patient care ☐ %
- b) Research ☐ %
- c) Teaching ☐ %

48. Which of the following *best* describes the location of the facility in which you perform the majority of your patient care?
- ☐ Rural
- ☐ Urban
- ☐ Suburban

49. List the state(s) in which you practice.

50. Which of the following *best* describes the facility at which you do most of your patient care?
- ☐ Acute care hospital
- ☐ Acute rehabilitation
- ☐ Subacute rehabilitation
- ☐ Skilled nursing facility
- ☐ Privately owned outpatient clinic
- ☐ Facility-based outpatient clinic
- ☐ Home care
- ☐ School system
- ☐ University
- ☐ Other

51. Which of the following *best* describes the majority of patients and types of problems you see? Mark one box in each section.
- ☐ Orthopedic
- ☐ Neurological
- ☐ Cardiovascular/pulmonary
- ☐ Other
- ☐ Do not treat patients

- ☐ Pediatric (<18 y)
- ☐ Adult (19–64 y)
- ☐ Geriatric (65+ y)
- ☐ Other
- ☐ Do not treat patients

Chiropractor and GP questionnaire amendments

Demographic information

- The personal demographic were moved from the end of the questionnaire to the beginning and the order of the questions was altered to best suit this study.

- The following questions were removed from this section:
  - Do you currently hold a valid physical therapy licence?
  - What is your entry-level degree for physical therapy?
  - If you do not hold an advanced degree, do you intend to peruse one in the future?
  - Are you a clinically certified specialist?
  - Do you regularly participate in continuing education courses?
  - Do you belong to one or more professional practice orientated-organizations?
  - Are you a clinical instructor for physical therapists students/interns/residents?
  - On average, how many patients do you see daily?
  - How many full-time physical therapists are in the facility in which you do the majority of your patient care?
  - Please indicate the percentage of your total work time that you spend in each type of activity during an average month.
  - Which of the following best describes the location of the facility in which you perform the majority of your patient care?
  - List the state(s) in which you practice.
  - Which of the following best describes the facility at which you do most of our patient care?
  - Which of the following best describes the majority of patients and types of problems you see?

- The above questions were replaced with:
  - 'Which of the following best describes your role in your profession?' and the answer options 'academic', 'part-time practice', 'full-time practice', 'research' and 'other'.
  - 'Have you received any formal education or training in any of the following?' and the answer options 'no', 'research methods', 'epidemiology' and 'statistics'.
  - 'Have you personally been involved in conducting any kind of research?' and the answer options 'yes' or 'no'.

- ‘What is your age group?’ was changed to ‘What is your age?’ and so practitioners were no longer to select an age range but to write their actual age.

- ‘How many years have you been licenced?' was reworded to ‘How many years have you been practising?' and the year categories were removed and so practitioners were no longer to select from a year range but to write the actual number of years.

- ‘What is your highest degree attained?’ was changed to ‘At which level is your highest academic degree?’ and the answer options were changed to ‘MBChB/ MBBS’, ‘Master’s’, ‘PhD’ and ‘Other’ so as to be appropriate for the chiropractor and GP practitioners.

- ‘On average, how many hours per week do you work?’ was reworded to ‘How many hours per week do you practice’ and the hour categories were removed and so practitioners were no longer to select from a range but to write the actual number of hours.

Attitude towards, use of and perceived benefits and limitations of EBP

- Where appropriate, the word ‘physical therapy’ was replaced with ‘chiropractic’ or ‘chiropractors’ in the questionnaire for chiropractors or with ‘medicine’ or ‘general practitioners’ in the GP questionnaire.

- The following questions were removed from this section:
  - EBP does not take into account the limitations of my clinical practice setting.
  - My reimbursement rate will increase if I incorporate EBP into my practice.

- The following three statements had the first answer option changed from ‘≤ 1’ to ‘none or 1’:
  - Read/review research/literature related to my clinical practice.
  - Use professional literature and research findings in the process of clinical decision making.
  - Use MEDLINE or other databases to search for practice-related literature/research.

Use and understanding of practice guidelines

- The following statements were removed from this section:
  - I actively seek practice guidelines pertaining to areas of my practice.
  - I am aware that practice guidelines are available online.
  - I am able to access practice guidelines online.
  - I am able to incorporate patient preferences into practice guidelines.

- ‘I use practice guidelines in my practice' was rephrased to read: ‘Do you use clinical guidelines in your practice?' and the answers were changed to ‘yes' or ‘no'.

Availability of resources to access information and personal skills in using those resources

- ‘I have the ability to access relevant databases and the internet at my facility’, was split into two separate statements: ‘I have the ability to access the internet at my facility’ and ‘I have the ability to access relevant databases at my facility’ and the answer option ‘do not know’ was removed from both statements.

- The following statement was removed from this section: ‘My facility supports the use of current research in practice’.

Appendix F: Chiropractor and GP expert group paperwork

Chiropractor expert group questionnaire

Evidence Based Practice Questionnaire

Thank you for assisting in this study. Please do not write your name or contact details or any other identification data on this questionnaire

Demographic information

Please place a mark "X" in the appropriate box to indicate your response

1. What is your sex?					Male	Female
2. What is your age? _____ years old						
3. At which level is your highest academic degree?	Degree	Honours	Bachelors/ Doctor of Chiropractic	Masters	PhD	Other
4. How many years have you been practicing? _____ years						
5. How many hours per week do you practice? _____ hours per week						
6. Which of the following best describes your role in your profession?	Academic	Part Time Practice	Full Time Practice	Research	Other	
7. Have you received any formal education or training (eg. Degree course, seminar, workshop) in any of the following?		No	Research Methods	Epidemiology	Statistics	
8. Have you personally been involved in conducting any kind of research?					Yes	No

9. When faced with a challenging case in your practice, explain the process that you would follow and what resources you would use to clinically solve your problem

10. In your own words, explain what you understand by the term evidence based practice

11. What barriers have you experienced using evidence based practice?

This section of the questionnaire inquires about personal attitudes toward, use of, and perceived benefits and limitations of EBP. Place a mark "X" in the appropriate box to indicate your response		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
12.1	Application of EBP is necessary in the practice of chiropractic/ medicine	att				
12.2	Literature and research findings are useful in my day-to-day practice	use				
12.3	I need to increase the use of evidence in my daily practice	use				
12.4	The adoption of EBP places an unreasonable demand on chiropractors/ general practitioners	att				
12.5	I am interested in learning or improving the skills necessary to incorporate EBP into my practice.	att				
12.6	EBP improves the quality of patient care	att				
12.7	Strong evidence is lacking to support most of the interventions I use with my patients	perc				
12.8	EBP helps me make decisions about patient care.	use				
12.9	EBP does not take into account patient preferences.	perc				
For the following questions indicate the number of times/articles consulted per week		**None or 1**	**2 – 5**	**6 – 10**	**11 –15**	**16 +**
13.1	Read/review research/literature related to my clinical practice	use				
13.2	Use professional literature and research findings in the process of clinical decision making	use				
13.3	Use MEDLINE or other databases to search for practice-relevant literature/research	Use/skills				
The following section inquires about personal use and understanding of clinical practice guidelines. Practice guidelines provide a description of standard specifications for care of patients with specific diseases and are developed through a formal, consensus building process that incorporates the best scientific evidence of effectiveness and expert opinion available. Place a mark "X" in the appropriate box that indicates your response.)				**Yes**	**No**	**Do not know**
14.1	Practice guidelines are available for topics related to my practice					
14.2	Do you use clinical guidelines in your practice?					
The following section inquires about availability of resources to access information and personal skills in using those resources. Place a mark "X" in the appropriate box that indicates your response. In items referring to your "facility," consider the practice setting in which you do the majority of your clinical care				**YES**	**NO**	**Do not know**
15.1	I have access to current research through professional journals in their paper form.					
15.2	I have the ability to access the Internet at my facility.					
15.3	I have the ability to access relevant databases at my facility.					
15.4	I have the ability to access relevant databases and the Internet at home or locations other than my facility.					

Please answer the following questions:		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
16.1	I learned the foundations for EBP as part of my academic preparation.					
16.2	I am familiar with the medical search engines (eg, MEDLINE, CINAHL).					
16.3	I have received formal training in search strategies for finding research relevant to my practice.					
16.4	I have received formal training in critical appraisal of search literature as part of my academic preparation.					
16.5	I am confident in my ability to critically review professional literature.					
16.6	I am confident in my ability to find relevant research to answer my clinical questions					

My understanding of the following terms is: Place a mark "X" in one box in the row for each term		Understand completely	Understand somewhat	Do not understand
17.1	Relative risk			
17.2	Absolute risk			
17.3	Systematic review			
17.4	Odds ratio			
17.5	Meta-analysis			
17.6	Confidence interval			
17.7	Heterogeneity			
17.8	Publication bias			

18. Rank your 3 greatest barriers to the use of EBP in your clinical practice. For the following items, rank your top 3 choices by placing numbers in the appropriate boxes (1 = most important).	Ranking
Insufficient time	
Lack of information resources	
Lack of research skills	
Poor ability to critically appraise the literature	
Inability to apply research findings to individual patients with unique characteristics	
Lack of generalizability of the literature findings to my patient population	
Lack of understanding of statistical analysis	
Lack of collective support among my colleagues in my facility	
Lack of interest	

19. In your opinion, how does the knowledge of evidence based practice principles and the skills to source research, influence your ability to utilise evidence based practice?

Thank you for your participation.

General practitioner expert group questionnaire

Evidence Based Practice Questionnaire

Thank you for assisting in this study. Please do not write your name or contact details or any other identification data on this questionnaire

Demographic information

Please place a mark "X" in the appropriate box to indicate your response

1. What is your sex?				Male	Female
2. What is your age? _____ years old					
3. At which level is your highest academic degree?	MBCHB/ MBBS	Masters	PhD	Other	
4. How many years have you been practicing? _____ years					
5. How many hours per week do you practice? _____ hours per week					
6. Which of the following best describes your role in your profession?	Academic	Part Time Practice	Full Time Practice	Research	Other
7. Have you received any formal education or training (eg. Degree course, seminar, workshop) in any of the following?		No	Research Methods	Epidemiology	Statistics
8. Have you personally been involved in conducting any kind of research?				Yes	No

This section of the questionnaire inquires about personal attitudes toward, use of, and perceived benefits and limitations of EBP. Place a mark "X" in the appropriate box to indicate your response		**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
9.1	Application of EBP is necessary in the practice of chiropractic/ medicine					
9.2	Literature and research findings are useful in my day-to-day practice					
9.3	I need to increase the use of evidence in my daily practice					
9.4	The adoption of EBP places an unreasonable demand on chiropractors/ general practitioners					
9.5	I am interested in learning or improving the skills necessary to incorporate EBP into my practice.					
9.6	EBP improves the quality of patient care					
9.7	Strong evidence is lacking to support most of the interventions I use with my patients					
9.8	EBP helps me make decisions about patient care.					
9.9	EBP does not take into account patient preferences.					
For the following questions indicate the number of times/articles consulted per week		**None or 1**	**2 – 5**	**6 – 10**	**11 –15**	**16 +**
10.1	Read/review research/literature related to my clinical practice					
10.2	Use professional literature and research findings in the process of clinical decision making					
10.3	Use MEDLINE or other databases to search for practice-relevant literature/research					

The following section inquires about personal use and understanding of clinical practice guidelines. Practice guidelines provide a description of standard specifications for care of patients with specific diseases and are developed through a formal, consensus building process that incorporates the best scientific evidence of effectiveness and expert opinion available. Place a mark "X" in the appropriate box that indicates your response.				**Yes**	**No**	**Do Not Know**
11.1	Practice guidelines are available for topics related to my practice					
11.2	Do you use clinical guidelines in your practice?					
The following section inquires about availability of resources to access information and personal skills in using those resources. Place a mark "X" in the appropriate box that indicates your response. In items referring to your "facility," consider the practice setting in which you do the majority of your clinical care.				**Yes**	**No**	
12.1	I have access to current research through professional journals in their paper form.					
12.2	I have the ability to access the Internet at my facility.					
12.3	I have the ability to access relevant databases at my facility.					
12.4	I have the ability to access relevant databases and the Internet at home or locations other than my facility.					
Please answer the following questions:		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
13.1	I learned the foundations for EBP as part of my academic preparation.					
13.2	I am familiar with the medical search engines (eg, MEDLINE, CINAHL).					
13.3	I have received formal training in search strategies for finding research relevant to my practice.					
13.4	I have received formal training in critical appraisal of search literature as part of my academic preparation.					
13.5	I am confident in my ability to critically review professional literature.					
13.6	I am confident in my ability to find relevant research to answer my clinical questions					

My understanding of the following terms is: Place a mark "X" in one box in the row for each term		Understand completely	Understand somewhat	Do not understand
14.1	Relative risk			
14.2	Absolute risk			
14.3	Systematic review			
14.4	Odds ratio			
14.5	Meta-analysis			
14.6	Confidence interval			
14.7	Heterogeneity			
14.8	Publication bias			

15. Rank your 3 greatest barriers to the use of EBP in your clinical practice. For the following items, rank your top 3 choices by placing numbers in the appropriate boxes (1 = most important).	Ranking
Insufficient time	
Lack of information resources	
Lack of research skills	
Poor ability to critically appraise the literature	
Inability to apply research findings to individual patients with unique characteristics	
Lack of generalizability of the literature findings to my patient population	
Lack of understanding of statistical analysis	
Lack of collective support among my colleagues in my facility	
Lack of interest	

Thank you for your participation.

Expert group attendance register

EXPERT GROUP ATTENDANCE REGISTER

Name	Contact number	Sign

Expert group confidentiality statement and code of conduct

CONFIDENTIALITY STATEMENT AND CODE OF CONDUCT:
EXPERT GROUP

- All information contained in the research documents and any information discussed during the focus group meeting must be kept private and confidential. This is especially binding to any information that may identify any of the participants in the focus group.

- 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.

- The information from this focus group will be made public in terms of a dissertation/thesis and/or journal publication, which will in no way identify any of the participants involved in this focus group.

- The returned questionnaires will be coded and kept anonymous in the research process.

- The focus group may be either voice or video recorded, as a transcript of the proceedings will need to be made. The data will stored securely under password protection.

- All data generated from this focus group (including the recording) will be kept for 15 years in a secure location at Durban University of Technology and thereafter will be destroyed.

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: _____Signature:_____

Supervisor's Name:_____Signature:_____

Co-supervisor's Name: _____Signature:_____

Appendix G: Chiropractor and GP expert group amendments

Chiropractor expert group amendments

STUDENT NAME: Divashni Naidoo

IREC REFERENCE NUMBER: REC 94/15

EXPERT GROUP RECOMMENDED CHANGES	STUDENT/ SUPERVISOR RESPONSE	PAGE NO. WHERE CHANGE WAS MADE
Remove 'Demographic Information'	Removed	Page 1
Question 3: Addition of 'Specialisation' as an additional possible answer	'Specialisation' added	Page 1
Question 4: Re-phrase from 'How many years have you been practicing?'	Rephrased to 'How many years have you been in practice?'	Page 1
Question 6: add 'You may select more than one answer' after the question	'You may select more than one answer' was added after the question	Page 1
Question 7: Remove 'formal education or training' and replace with 'formal post graduate training	Removed 'formal education or training' and replaced with 'formal post graduate training	Page 1
Question 7: Remove 'No' and replace with 'Not Applicable'	Removed 'No' and replaced with 'Not Applicable'	Page 1
Question 8: Renumber 8 to 8.1	Renumbered to 8.1	Page 1
Question 8: Add question 8.2 'If you answered 'Yes' to 8.1: What was your involvement in the research conducted?'	Addition of question 8.2 'If you answered 'Yes' to 8.1: What was your involvement in the research conducted?'	Page 1
Add an additional question after question 11 regarding continuing education credits.	Question 12 added: 'How many hours of continuing education credits have you earned during the past year?' – Exceeded the Requirements/Met the Requirements/Less than Required/None	Page 1
Renumber question 11 onwards	All following questions were renumbered accordingly	Pages 2 and 3
Question 12 renumbered to 13: Shorten the question for easier reading and understanding	Shortened to: 'For the following statements, state your level of agreement.'	Page 2
Question 12.1 renumbered to 13.1: Remove '/medicine'	Removed '/medicine"	Page 2
Question 12.4 renumbered to 13.4: Remove '/general practitioners'	Removed '/general practitioners'	Page 1

Question 13 renumbered to 14: Choose either times or articles.	Rephrased to: 'For these statements, indicate the number of times per week you would:	Page 2
Question 13.1 renumbered to 14.1: Choose either read or review and literature or research	Rephrased to: 'Read scientific literature related to clinical practice.	Page 2
Question 13.2 renumbered to 14.2: Remove 'professional literature and research' and replace with 'scientific research	Removed 'professional literature and research' and replaced with 'scientific research	Page 2
Question 14 renumbered to 15: Shorten the question for easier reading and understanding	Shortened to: ' Please answer the following regarding clinical practice guidelines and accessibility to resources	Page 2
Combine question 15 into question 14	Original questions from 15 were added to question 14 to form the new questions 15.3, 15.4 and 15.5.	Page 2
Question 15.2 and 15.3: Combine these into 1 question and allow 'Do Not Know' to be an answer	Question 15.4 was created: 'I have the ability to access relevant databases and the Internet at my facility. 'Do Not Know' was unblocked	Page 2
Addition of another question in question 15: 'I have the skills to access relevant databases and the Internet'	Question 15.6 was added: 'I have the skills to access relevant databases and the Internet'	Page 2
Question 16: Rephrase the question	Rephrased to: 'Please state your level of agreement with the following questions'	Page 2
Question 16.2: change 'e.g.' to 'such as'	Removed 'e.g.' and replaced with 'such as'	Page 2
Question 17: Shorten the question for easier reading and understanding	Rephrased to: 'Rate your understanding of the following terms:	Page 3
Question 17: Put the terms in alphabetical order to avoid favoritism	Terms were reshuffled to be in alphabetical order	Page 3
Question 18: Rephrase the question to allow better understanding of the requirements of the question	Rephrased to: 'From the below, in terms of your clinical practice, rank your top three barriers to EBP (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier)	Page 3
Question 18: Arrange statements into alphabetical order to avoid favoritism	Statements were reshuffled to be in alphabetical order	Page 3
Question 18: Add an option 'other' and ask respondent to specify the other	'Other (Please specify)' was added to the list of statements	Page 3

General practitioner expert group amendments

STUDENT NAME:Caitlyn Koekemoer

IREC REFERENCE NUMBER: REC140/15

EXPERT GROUP RECOMMENDED CHANGES	STUDENT/ SUPERVISOR RESPONSE	PAGE NO. WHERE CHANGE WAS MADE
Remove 'Demographic Information'	Removed	Page 1
Question 3: Addition of 'Specialisation' as an additional possible answer	'Specialisation' added	Page 1
Question 4: Re-phrase from 'How many years have you been practicing?'	Rephrased to 'How many years have you been in practice?'	Page 1
Question 6: add 'You may select more than one answer' after the question	'You may select more than one answer' was added after the question	Page 1
Question 7: Remove 'formal education or training' and replace with 'formal post graduate training	Removed 'formal education or training' and replaced with 'formal post graduate training	Page 1
Question 7: Remove 'No' and replace with 'Not Applicable'	Removed 'No' and replaced with 'Not Applicable'	Page 1
Question 8: Renumber 8 to 8.1	Renumbered to 8.1	Page 1
Question 8: Add question 8.2 'If you answered 'Yes' to 8.1: What was your involvement in the research conducted?'	Addition of question 8.2 'If you answered 'Yes' to 8.1: What was your involvement in the research conducted?'	Page 1
Add an additional question after question 8.2 regarding continuing education credits.	Question 9 added: 'How many hours of continuing education credits have you earned during the past year?' – Exceeded the Requirements/Met the Requirements/Less than Required/None	Page 1
Renumber question 9 onwards	All following questions were renumbered accordingly	Pages 1, 2 and 3
Question 9 renumbered to 10: Shorten the question for easier reading and understanding	Shortened to: 'For the following statements, state your level of agreement.'	Page 1
Question 9.1 renumbered to 10.1: Expand EBP as it is the first time the term is being used in the questionnaire.	EBP expanded to: evidence based practice (EBP)	Page 1
Question 9.1 renumbered to 10.1: Remove 'chiropractic/'	Removed 'chiropractic/''	Page 1

Question 9.4 renumbered to 10.4: Remove 'chiropractors/'	Removed 'chiropractors/'	Page 1
Question 10 renumbered to 11: Choose either times or articles.	Rephrased to: 'For these statements, indicate the number of times per week you would:	Page 2
Question 10.1 renumbered to 11.1: Choose either read or review and literature or research	Rephrased to: 'Read scientific literature related to clinical practice.	Page 2
Question 10.2 renumbered to 11.2: Remove 'professional literature and research' and replace with 'scientific research	Removed 'professional literature and research' and replaced with 'scientific research	Page 2
Question 11 renumbered to 12: Shorten the question for easier reading and understanding	Shortened to: ' Please answer the following regarding clinical practice guidelines and accessibility to resources	Page 2
Combine question 12 into question 11	Original questions from 12 were added to question 11 to form the new questions 12.3, 12.4 and 12.5.	Page 2
Question 12.2 and 12.3: Combine these into 1 question and allow 'Do Not Know' to be an answer	Question 12.4 was created: 'I have the ability to access relevant databases and the Internet at my facility. 'Do Not Know' was unblocked	Page 2
Addition of another question in question 12: 'I have the skills to access relevant databases and the Internet'	Question 12.6 was added: 'I have the skills to access relevant databases and the Internet'	Page 2
Question 13: Rephrase the question	Rephrased to: 'Please state your level of agreement with the following questions'	Page 2
Question 13.2: change 'e.g.' to 'such as'	Removed 'e.g.' and replaced with 'such as'	Page 2
Question 14: Shorten the question for easier reading and understanding	Rephrased to: 'Rate your understanding of the following terms:	Page 2
Question 14: Put the terms in alphabetical order to avoid favoritism	Terms were reshuffled to be in alphabetical order	Page 2
Question 15: Rephrase the question to allow better understanding of the requirements of the question	Rephrased to: 'From the below, in terms of your clinical practice, rank your top three barriers to EBP (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier)	Page 3
Question 15: Arrange statements into alphabetical order to avoid favoritism	Statements were reshuffled to be in alphabetical order	Page 3
Question 15: Add an option 'other' and ask respondent to specify the other	'Other (Please specify)' was added to the list of statements	

Appendix H: Chiropractor and GP pilot study paper work

Chiropractor pilot study questionnaire

Evidence Based Practice Questionnaire

Thank you for participating in this study. Please do not write your name or contact details or any other identification data on this questionnaire

Please place a mark "X" in the appropriate box to indicate your response

1. What is your sex?				Female	Male
2. What is your age? _____ years old					
3. At which level is your highest academic qualification?	MBCHB/ MBBS	Masters	PhD	Specialisation	Other
4. How many years have you been in practice? _____ years					
5. How many hours per week do you practice? _____ hours per week					
6. Which of the following best describes your role in your profession? (You may select more than one answer.)	Academic	Part Time Practice	Full Time Practice	Research	Other
7. Have you received any formal post graduate training (Such as: degree course, seminar, workshop) in any of the following?		Epidemiology	Research Methods	Statistics	Not Applicable
8.1 Have you personally been involved in conducting any kind of research?				Yes	No
8.2 If you answered 'Yes' to 8.1: What was your involvement in the research conducted?	Undergraduate		Postgraduate (Masters/ PHD)	Supervisor	Other

9. When faced with a challenging case in your practice, explain the process that you would follow and what resources you would use to clinically solve your problem.

_____
_____
_____
_____
_____
_____

10. In your own words, explain your understanding of the following term 'evidence based practice' (EBP).

_____
_____
_____
_____
_____
_____

11. Have you experienced any difficulties using EBP?

_____
_____
_____
_____
_____
_____

12. How many hours of continuing education credits have you earned during the past year?	Exceed the Requirements	Met the Requirements	Less than Required	None

13. For the following statements, state your level of agreement.		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13.1	Application of EBP is necessary in the practice of chiropractic.					
13.2	Literature and research findings are useful in my day-to-day practice.					
13.3	I need to increase the use of evidence in my daily practice.					
13.4	The adoption of EBP places an unreasonable demand on chiropractors.					
13.5	I am interested in learning or improving the skills necessary to incorporate EBP into my practice.					
13.6	EBP improves the quality of patient care.					
13.7	Strong evidence is lacking to support most of the interventions I use with my patients.					
13.8	EBP helps me make decisions about patient care.					
13.9	EBP does not take into account patient preferences.					
14. For the following statements, indicate the number of times per week you would:		None or 1	2 – 5	6 – 10	11 –15	16 +
14.1	Read scientific literature related to clinical practice.					
14.2	Use scientific research findings in the process of clinical decision making.					
14.3	Use MEDLINE or other databases to search for practice-relevant literature/research.					

15. Please answer the following regarding clinical practice guidelines and accessibility to resources:		Yes	No	Do Not Know
15.1	Practice guidelines are available for topics related to my practice			
15.2	Do you use clinical guidelines in your practice?			[redacted]
15.3	I have access to current research through professional journals in their paper form.			
15.4	I have the ability to access relevant databases and the Internet at my facility.			
15.5	I have the ability to access relevant databases and the Internet at home or locations other than my facility.			
15.6	I have the skills to access relevant databases and the Internet.			

16. Please state your level of agreement with the following questions:		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
16.1	I learned the foundations for EBP as part of my academic preparation.					
16.2	I am familiar with the medical search engines (such as: MEDLINE and CINAHL).					
16.3	I have received formal training in search strategies for finding research relevant to my practice.					

16.4	I have received formal training in critical appraisal of scientific literature as part of my academic preparation.					
16.5	I am confident in my ability to critically review scientific literature.					
16.6	I am confident in my ability to find relevant research to answer my clinical questions					

17. Rate your understanding of the following terms:		Understand completely	Understand somewhat	Do not understand
17.1	Absolute risk			
17.2	Confidence interval			
17.3	Heterogeneity			
17.4	Meta-analysis			
17.5	Odds ratio			
17.6	Publication bias			
17.7	Relative risk			
17.8	Systematic review			

18. From the list below, in terms of your clinical practice, rank your top three barriers to EBP (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier).	Ranking
Inability to apply research findings to individual patients with unique characteristics	
Insufficient time	
Lack of collective support among my colleagues in my facility	
Lack of generalizability of the literature findings to my patient population	
Lack of information resources	
Lack of interest	
Lack of research skills	
Lack of understanding of statistical analysis	
Poor ability to critically appraise the literature	
Other (Please specify)	

19. In your opinion, how does the knowledge of EBP principals and skills to source research, influence your ability to utilise EBP.

Thank you for your participation.

General practitioner pilot study questionnaire

Evidence Based Practice Questionnaire

Thank you for participating in this study. Please do not write your name or contact details or any other identification data on this questionnaire

Please place a mark "X" in the appropriate box to indicate your response

1. What is your sex?					Female	Male
2. What is your age? _____ years old						
3. At which level is your highest academic qualification?	MBCHB/ MBBS	Masters	PhD		Specialisation	Other
4. How many years have you been in practice? _____ years						
5. How many hours per week do you practice? _____ hours per week						
6. Which of the following best describes your role in your profession? (You may select more than one answer.)	Academic	Part Time Practice	Full Time Practice		Research	Other
7. Have you received any formal post graduate training (Such as: degree course, seminar, workshop) in any of the following?		Epidemiology	Research Methods		Statistics	Not Applicable
8.1 Have you personally been involved in conducting any kind of research?					Yes	No
8.2 If you answered 'Yes' to 8.1: What was your involvement in the research conducted?	Undergraduate		Postgraduate (Masters/ PHD)		Supervisor	Other
9.How many hours of continuing education credits have you earned during the past year?		Exceed the Requirements	Met the Requirements		Less than Required	None

10. For the following statements, state your level of agreement.		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10.1	Application of evidence based practice (EBP) is necessary in the practice of medicine.					
10.2	Literature and research findings are useful in my day-to-day practice.					
10.3	I need to increase the use of evidence in my daily practice.					
10.4	The adoption of EBP places an unreasonable demand on general practitioners.					
10.5	I am interested in learning or improving the skills necessary to incorporate EBP into my practice.					
10.6	EBP improves the quality of patient care.					
10.7	Strong evidence is lacking to support most of the interventions I use with my patients.					
10.8	EBP helps me make decisions about patient care.					
10.9	EBP does not take into account patient preferences.					

11. For these statements, indicate the number of times per week you would:		None or 1	2 – 5	6 – 10	11 –15	16 +
11.1	Read scientific literature related to clinical practice.					
11.2	Use scientific research findings in the process of clinical decision making.					
11.3	Use MEDLINE or other databases to search for practice-relevant literature/research.					

12. Please answer the following regarding clinical practice guidelines and accessibility to resources:		Yes	No	Do Not Know
12.1	Practice guidelines are available for topics related to my practice			
12.2	Do you use clinical guidelines in your practice?			
12.3	I have access to current research through professional journals in their paper form.			
12.4	I have the ability to access relevant databases and the Internet at my facility.			
12.5	I have the ability to access relevant databases and the Internet at home or locations other than my facility.			
12.6	I have the skills to access relevant databases and the Internet.			

13. Please state your level of agreement with the following questions:		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13.1	I learned the foundations for EBP as part of my academic preparation.					
13.2	I am familiar with the medical search engines (such as: MEDLINE and CINAHL).					
13.3	I have received formal training in search strategies for finding research relevant to my practice.					
13.4	I have received formal training in critical appraisal of scientific literature as part of my academic preparation.					
13.5	I am confident in my ability to critically review scientific literature.					
13.6	I am confident in my ability to find relevant research to answer my clinical questions					

14. Rate your understanding of the following terms:		Understand completely	Understand somewhat	Do not understand
14.1	Absolute risk			
14.2	Confidence interval			
14.3	Heterogeneity			
14.4	Meta-analysis			
14.5	Odds ratio			
14.6	Publication bias			
14.7	Relative risk			
14.8	Systematic review			

15. From the list below, in terms of your clinical practice, rank your top three barriers to EBP practice (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier).	Ranking
Inability to apply research findings to individual patients with unique characteristics	
Insufficient time	
Lack of collective support among my colleagues in my facility	
Lack of generalizability of the literature findings to my patient population	
Lack of information resources	
Lack of interest	
Lack of research skills	
Lack of understanding of statistical analysis	
Poor ability to critically appraise the literature	
Other (Please specify)	

Thank you for your participation.

Pilot study confidentiality statement and code of conduct

CONFIDENTIALITY STATEMENT AND CODE OF CONDUCT:
PILOT STUDY

- All information contained in the research documents and any information discussed during the pilot study must be kept private and confidential. This is especially binding to any information that may identify any of the participants in the pilot study.

- None of the information shall be communicated to any other individual or organisation outside of this specific pilot study as to the decisions of this pilot study.

- The information from this pilot study will be made public in terms of a dissertation/thesis and/or journal publication, which will in no way identify any of the participants involved in this pilot study.

- The returned questionnaires will be coded and kept anonymous in the research process.

- The pilot study data will stored securely under password protection.

- All data generated from this pilot study will be kept for 15 years in a secure location at Durban University of Technology and thereafter will be destroyed.

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:
Pilot study Member: _____Signature:_____

Witness Name: _____Signature:_____

Researcher's Name: _____Signature:_____

Supervisor's Name:_____Signature:_____

Co-supervisor's Name: _____Signature:_____

Appendix I: Chiropractor study GP pilot study amendments

Chiropractor pilot study amendments

STUDENT NAME: Divashni Naidoo

IREC REFERENCE NUMBER: REC 94/15

PILOT STUDY RECOMMENDED CHANGES	STUDENT/ SUPERVISOR RESPONSE	PAGE NO. WHERE CHANGE WAS MADE
Question 15: Was found to be confusing to answer with many pilot study participants either answering incorrectly or requiring to ask the researcher how to answer the question.	Rephrased to be the very similar as phrased in Dr Jette's study (Jette *et al.* 2003) as no difficulties with this question were noted in that study : 'From the list below, rank your 3 greatest barriers to the use of EBP in your clinical practice. Rank your top 3 choices by placing numbers in the appropriate boxes (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier).	Page 3

Chiropractor pilot study amendments

DUT DURBAN UNIVERSITY OF TECHNOLOGY

INSTITUTIONAL RESEARCH ETHICS COMMITTEE

STUDENT NAME: Caitlyn Koekemoer

IREC REFERENCE NUMBER: REC140/15

PILOT STUDY RECOMMENDED CHANGES	STUDENT/ SUPERVISOR RESPONSE	PAGE NO. WHERE CHANGE WAS MADE
Question 10.5: A general practitioner questioned the need for this question as practitioners who have said to be practicing EBP by default would then also be interested and should be improving their skills in practicing EBP.	It was decided to leave this question unchanged as it allows for cross correlation between questions to determine if the respondent is consistent in their answering. It also cannot be assumed that a practitioner who practices EBP is interested in improving his/her skills necessary for the incorporation of EBP.	Page 1
Question 15: Was found to be confusing to answer with many pilot study participants either answering incorrectly or requiring to ask the researcher how to answer the question.	Rephrased to be the very similar as phrased in DrJette's study (Jette*et al.* 2003) as no difficulties with this question were noted in that study : 'From the list below, rank your 3 greatest barriers to the use of EBP in your clinical practice. Rank your top 3 choices by placing numbers in the appropriate boxes (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier).	Page 3

Appendix J: Final chiropractor and GP questionnaires

Final chiropractor questionnaire

Evidence Based Practice Questionnaire

Thank you for participating in this study. Please do not write your name or contact details or any other identification data on this questionnaire

Please place a mark "X" in the appropriate box to indicate your response

1. What is your sex?				Female	Male
2. What is your age? _____ years old					
3. At which level is your highest academic qualification?		Masters	PhD	Specialisation	Other
4. How many years have you been in practice? _____ years					
5. How many hours per week do you practice? _____ hours per week					
6. Which of the following best describes your role in your profession? (You may select more than one answer.)	Academic	Part Time Practice	Full Time Practice	Research	Other
7. Have you received any formal post graduate training (Such as: degree course, seminar, workshop) in any of the following?		Epidemiology	Research Methods	Statistics	Not Applicable
8.1 Have you personally been involved in conducting any kind of research?				Yes	No
8.2 If you answered 'Yes' to 8.1: What was your involvement in the research conducted?	Undergraduate		Postgraduate (Masters/ PHD)	Supervisor	Other

9. When faced with a challenging case in your practice, explain the process that you would follow and what resources you would use to clinically solve your problem.

10. In your own words, explain your understanding of the following term 'evidence based practice' (EBP).

11. Have you experienced any difficulties using EBP?

12. How many hours of continuing education credits have you earned during the past year?		Exceed the Requirements	Met the Requirements	Less than Required	None
13. For the following statements, state your level of agreement.		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13.1	Application of EBP is necessary in the practice of chiropractic.					
13.2	Literature and research findings are useful in my day-to-day practice.					
13.3	I need to increase the use of evidence in my daily practice.					
13.4	The adoption of EBP places an unreasonable demand on chiropractors.					
13.5	I am interested in learning or improving the skills necessary to incorporate EBP into my practice.					
13.6	EBP improves the quality of patient care.					
13.7	Strong evidence is lacking to support most of the interventions I use with my patients.					
13.8	EBP helps me make decisions about patient care.					
13.9	EBP does not take into account patient preferences.					
14. For the following statements, indicate the number of times per week you would:		None or 1	2 – 5	6 – 10	11 –15	16 +
14.1	Read scientific literature related to clinical practice.					
14.2	Use scientific research findings in the process of clinical decision making.					
14.3	Use MEDLINE or other databases to search for practice-relevant literature/research.					

15. Please answer the following regarding clinical practice guidelines and accessibility to resources:		Yes	No	Do Not Know
15.1	Practice guidelines are available for topics related to my practice			
15.2	Do you use clinical guidelines in your practice?			
15.3	I have access to current research through professional journals in their paper form.			
15.4	I have the ability to access relevant databases and the Internet at my facility.			
15.5	I have the ability to access relevant databases and the Internet at home or locations other than my facility.			
15.6	I have the skills to access relevant databases and the Internet.			

16. Please state your level of agreement with the following questions:		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
16.1	I learned the foundations for EBP as part of my academic preparation.					
16.2	I am familiar with the medical search engines (such as: MEDLINE and CINAHL).					

16.3	I have received formal training in search strategies for finding research relevant to my practice.					
16.4	I have received formal training in critical appraisal of scientific literature as part of my academic preparation.					
16.5	I am confident in my ability to critically review scientific literature.					
16.6	I am confident in my ability to find relevant research to answer my clinical questions					

17. Rate your understanding of the following terms:		Understand completely	Understand somewhat	Do not understand
17.1	Absolute risk			
17.2	Confidence interval			
17.3	Heterogeneity			
17.4	Meta-analysis			
17.5	Odds ratio			
17.6	Publication bias			
17.7	Relative risk			
17.8	Systematic review			

18. From the list below, rank your 3 greatest barriers to the use of EBP in your clinical practice. Rank your top 3 choices by placing numbers in the appropriate boxes (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier).	Ranking
Inability to apply research findings to individual patients with unique characteristics	
Insufficient time	
Lack of collective support among my colleagues in my facility	
Lack of generalizability of the literature findings to my patient population	
Lack of information resources	
Lack of interest	
Lack of research skills	
Lack of understanding of statistical analysis	
Poor ability to critically appraise the literature	
Other (Please specify)	

19. In your opinion, how does the knowledge of EBP principles and skills to source research, influence your ability to utilise EBP.

_____
_____
_____
_____
_____
_____
_____

Thank you for your participation.

Final GP questionnaire

Evidence Based Practice Questionnaire

Thank you for participating in this study. Please do not write your name or contact details or any other identification data on this questionnaire

Please place a mark "X" in the appropriate box to indicate your response

1. What is your sex?					Female	Male
2. What is your age? _____ years old						
3. At which level is your highest academic qualification?	MBCHB/ MBBS	Masters	PhD		Specialisation	Other
4. How many years have you been in practice? _____ years						
5. How many hours per week do you practice? _____ hours per week						
6. Which of the following best describes your role in your profession? (You may select more than one answer.)	Academic	Part Time Practice	Full Time Practice		Research	Other
7. Have you received any formal post graduate training (Such as: degree course, seminar, workshop) in any of the following?		Epidemiology	Research Methods		Statistics	Not Applicable
8.1 Have you personally been involved in conducting any kind of research?					Yes	No
8.2 If you answered 'Yes' to 8.1: What was your involvement in the research conducted?	Undergraduate		Postgraduate (Masters/ PHD)		Supervisor	Other
9.How many hours of continuing education credits have you earned during the past year?		Exceed the Requirements	Met the Requirements		Less than Required	None

10. For the following statements, state your level of agreement.		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
10.1	Application of evidence based practice (EBP) is necessary in the practice of medicine.					
10.2	Literature and research findings are useful in my day-to-day practice.					
10.3	I need to increase the use of evidence in my daily practice.					
10.4	The adoption of EBP places an unreasonable demand on general practitioners.					
10.5	I am interested in learning or improving the skills necessary to incorporate EBP into my practice.					
10.6	EBP improves the quality of patient care.					
10.7	Strong evidence is lacking to support most of the interventions I use with my patients.					
10.8	EBP helps me make decisions about patient care.					
10.9	EBP does not take into account patient preferences.					

11. For these statements, indicate the number of times per week you would:		None or 1	2 – 5	6 – 10	11 –15	16 +
11.1	Read scientific literature related to clinical practice.					
11.2	Use scientific research findings in the process of clinical decision making.					
11.3	Use MEDLINE or other databases to search for practice-relevant literature/research.					

12. Please answer the following regarding clinical practice guidelines and accessibility to resources:		Yes	No	Do Not Know
12.1	Practice guidelines are available for topics related to my practice.			
12.2	Do you use clinical guidelines in your practice?			
12.3	I have access to current research through professional journals in their paper form.			
12.4	I have the ability to access relevant databases and the Internet at my facility.			
12.5	I have the ability to access relevant databases and the Internet at home or locations other than my facility.			
12.6	I have the skills to access relevant databases and the Internet.			

13. Please state your level of agreement with the following questions:		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13.1	I learned the foundations for EBP as part of my academic preparation.					
13.2	I am familiar with the medical search engines (such as: MEDLINE and CINAHL).					
13.3	I have received formal training in search strategies for finding research relevant to my practice.					
13.4	I have received formal training in critical appraisal of scientific literature as part of my academic preparation.					
13.5	I am confident in my ability to critically review scientific literature.					
13.6	I am confident in my ability to find relevant research to answer my clinical questions.					

14. Rate your understanding of the following terms:		Understand completely	Understand somewhat	Do not understand
14.1	Absolute risk			
14.2	Confidence interval			
14.3	Heterogeneity			
14.4	Meta-analysis			
14.5	Odds ratio			
14.6	Publication bias			
14.7	Relative risk			
14.8	Systematic review			

15. From the list below, rank your 3 greatest barriers to the use of EBP in your clinical practice. Rank your top 3 choices by placing numbers in the appropriate boxes (1 = top barrier, 2 = 2nd barrier, 3 = 3rd barrier).	Ranking
Inability to apply research findings to individual patients with unique characteristics	
Insufficient time	
Lack of collective support among my colleagues in my facility	
Lack of generalizability of the literature findings to my patient population	
Lack of information resources	
Lack of interest	
Lack of research skills	
Lack of understanding of statistical analysis	
Poor ability to critically appraise the literature	
Other (Please specify)	

Thank you for your participation.

Appendix K: Clinic student administrator agreement

DUT DURBAN UNIVERSITY OF TECHNOLOGY

25 March 2015

To: Whom it may concern

Miss Caitlyn Koekemoer and Miss Divashni Naidoo, M.Tech Chiropractic students at the Durban University of Technology (DUT), will be conducting their research in 2015.

Caitlyn Koekemoer's study is titled:
A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the greater Durban area.

Divashni Naidoo's study is titled:
The knowledge, attitudes, perceptions and perceived barriers of chiropractors within the eThekwini municipality towards evidence-based practice.

Part of the protocol will require electronic mail (e-mail) replies from participants. In this instance, an administrative person from the DUT Chiropractic Day Clinic will be required to receive these e-mail replies on behalf of the researcher in order to ensure participant confidentiality.

As the research assistant, Ms Linda Twiggs will be involved in the data collection of both these studies by means of e-mailing potential respondents, the receiving of returned e-mailed responses and tracking of respondents. The research assistant will be in possession of four separate ballot boxes in order to ensure that the letter of information and consent for each study is placed in separate boxes and the questionnaires from each study be placed separately in the other boxes. The research assistant will tick the respondents' names off a list of potential participants once the completed documentation has been returned in order to track respondents. The research assistant will be required to present this list to the researchers at the end of each week I order to consolidate an updated list. At the end of the data collection, each researcher will receive two ballot boxes with the responses for their respective study.

This letter serves to confirm that I, Linda Twiggs, am willing to assume this responsibility – my position as Clinic Student Administrator in the DUT Chiropractic Day Clinic. I can be contacted on 031 373 2205 or via e-mail at lindat@dut.ac.za.

Yours Sincerely

[redacted]

Appendix L: Student research assistant agreement

25 March 2015

To: Whom it may concern

Miss Caitlyn Koekemoer and Miss Divashni Naidoo, M.Tech Chiropractic students at the Durban University of Technology (DUT), will be conducting their research in 2015.

Caitlyn Koekemoer's study is titled:
A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the greater Durban area.

Divashni Naidoo's study is titled:
The knowledge, attitudes, perceptions and perceived barriers of chiropractors within the eThekwini municipality towards evidence-based practice.

The data generated from the study by Miss Divashni Naidoo will be utilised in the study by Miss Caitlyn Koekemoer in order to do the comparison. As the research assistant, Miss Divashni Naidoo will be involved in the data collection of Miss Caitlyn Koekemoer's study by means of delivery of questionnaires, collection of those questionnaires and tracking of respondents. The eThekwini municipal area will be divided geographically and allocated by convenience to either the researcher or research assistant. The research assistant will be in possession of two separate ballot boxes in order to ensure that the letter of information and consent be placed in one box and the questionnaire in another. The research assistant will tick the respondents' names off a list of potential participants once the completed documentation has been collected in order to track respondents. The research assistant will be required to present this list to the researcher and clinic student administrator at the end of each week in order to consolidate an updated list. At the end of the data collection process, Miss Caitlyn Koekemoer will have access to the data collected with regards to the chiropractic participants and will receive both of the ballot boxes in order to process the data collected with regards to the general practitioner respondents.

This letter serves to confirm that I, Miss Divashni Naidoo, am willing to assume these responsibilities. I can be contacted on 083 415 8391 or by e-mail at divashninaidoo18@gmail.com.

Yours sincerely

[redacted] ....

Miss Divashni Naidoo

Appendix M

On 01 Jun 2016, at 11:59 AM, Kamlesh Maharaj <kamlesh@kznmcc.co.za> wrote:

Hi Caitlyn

Please feel free to attend on the Saturday.

Regards

Mrs Kamlesh Maharaj

Kwa Zulu Natal Doctors Healthcare Coalition

Office Manageress

Events Coordinator/ Representative

Tel : 031-207 3728

Fax : 031-209 2398

Cell : 083-777 4713

From: Caitlyn Koekemoer [mailto:c8lynkoekemoer@yahoo.com]
Sent: Wednesday, 01 June 2016 10:54 AM
To: Kamlesh Maharaj <kamlesh@kznmcc.co.za>
Subject: Fw: Request to conduct data collection at 2016 KZN MCC Conference

Good Morning Kamlesh,

I am sorry to worry you with this, do you by any chance have any feedback with regards to my request to conduct data collection at the KZN MCC conference this weekend?

Many Thanks

Caitlyn

On Friday, May 27, 2016 11:57 AM, "c8lynkoekemoer@yahoo.com" <c8lynkoekemoer@yahoo.com> wrote:

Good Afternoon Mrs Maharaj,

Thank you very much.

Caitlyn

On 27 May 2016, at 11:53 AM, Kamlesh Maharaj <kamlesh@kznmcc.co.za> wrote:

Hi Caitlyn

I will get back to you.

Regards

Mrs Kamlesh Maharaj
Kwa Zulu Natal Doctors Healthcare Coalition
Office Manageress
Events Coordinator/ Representative

Tel : 031-207 3728
Fax : 031-209 2398
Cell : 083-777 4713

From: Caitlyn Koekemoer [mailto:c8lynkoekemoer@yahoo.com]
Sent: Friday, 27 May 2016 10:42 AM
To: kamlesh@kznmcc.co.za
Subject: Request to conduct data collection at 2016 KZN MCC Conference

Good Morning Kamlesh

I hope that this finds you well.

I received your details on referral from Dr K. Ramkissoon in Chatsworth.

I am currently a M.Tech Chiropractic student at the Durban University of Technology and I am conducting a questionnaire based study on Evidence Based Practice involving general practitioners in private practice in the eThekwini Municipality.

Study Title: A comparison of the perceptions, use and barriers to evidence based practice by chiropractors and general practitioners in the eThekwini municipality.

I would hereby like to request permission to attend the 2016 KZN MCC Conference (or any part thereof) in order to request permission from suitable general practitioner attendants to participate in the study. I have attached the letters of information and consent as well as the questionnaire and ethical clearance for the study. If you require any further information, please don't hesitate to contact me.

Your time and consideration in this regard is most appreciated.

Kind Regards
Caitlyn Koekemoer
073 263 1812

Appendix N: Table 4.12 Response of chiropractic and GP respondents to perceived barriers to EBP

Table 4.12: Responses of chiropractic and GP respondents to perceived barriers to EBP

Barrier	Ranking	Chiropractors		GPs		*p*-value *
		n	%	n	%	
Inability to apply research findings to individual patients with unique characteristics.	1	12	26.7	9	6.3	0.001
	2	6	13.3	34	23.8	
	3	5	11.1	28	19.6	
	Total	**23**	**51.1**	**71**	**49.7**	
Insufficient time.	1	17	37.8	87	60.8	0.037
	2	10	22.2	20	14.0	
	3	7	15.6	12	8.4	
	Total	**34**	**75.6**	**119**	**83.2**	
Lack of collective support among my colleagues in my facility.	1	6	13.3	3	2.1	0.010
	2	3	6.7	15	10.5	
	3	2	4.4	14	9.8	
	Total	**11**	**24.4**	**32**	**22.4**	
Lack of generalizability of the literature findings to my patient population.	1	2	4.4	10	7.0	0.520
	2	15	33.3	31	21.7	
	3	8	17.8	27	18.9	
	Total	**25**	**55.5**	**68**	**47.6**	
Lack of information resources.	1	3	6.7	0	0.0	0.094
	2	4	8.9	7	4.9	
	3	5	11.1	12	8.4	
	Total	**12**	**26.7**	**19**	**13.3**	
Lack of interest.	1	0	0.0	2	1.4	0.246
	2	4	8.9	1	0.7	
	3	4	8.9	2	1.4	
	Total	**8**	**17.8**	**5**	**3.5**	
Lack of research skills.	1	1	2.2	6	4.2	0.882
	2	3	6.7	7	4.9	
	3	5	11.1	15	10.5	
	Total	**9**	**20.0**	**28**	**19.6**	
Lack of understanding of statistical analysis.	1	3	6.7	18	12.6	0.246
	2	7	15.6	17	11.9	
	3	2	4.4	19	13.3	
	Total	**12**	**26.7**	**54**	**37.8**	
Poor ability to critically appraise the literature.	1	1	2.2	4	2.8	0.844
	2	4	8.9	9	6.3	
	3	2	4.4	11	7.7	
	Total	**7**	**15.5**	**24**	**16.8**	
Other (Please specify).	1	0	0.0	4	2.8	0.208
	2	0	0.0	1	0.7	
	3	4	8.9	3	2.1	
	Total	**4**	**8.9**	**8**	**5.6**	

* Fischer's exact test unless otherwise stated

Appendix O: Tables 4.17 to 4.24 Cross-tabulations of chiropractic and GP responses to age, sex, years in practice and previous personal research involvement and the statements 'application of EBP is necessary in the practice of medicine' and 'literature and research findings are useful in my day-to-day practice'

Table 4.17: Cross-tabulation of chiropractic and GP responses to age and the statement 'application of EBP is necessary for the practice of medicine'

Ages categorised		Application of EBP is necessary for the practice of chiropractic/medicine.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
20-29	Chiropractors	0	0.0	0	0.0	0	0.0	5	71.4	2	28.6
	GPs	0	0.0	0	0.0	0	0.0	3	50.0	3	50.0
30-39	Chiropractors	0	0.0	0	0.0	0	0.0	11	42.3	15	57.7
	GPs	0	0.0	0	0.0	0	0.0	5	22.7	17	77.3
40-49	Chiropractors	0	0.0	0	0.0	1	6.7	8	53.3	6	40.0
	GPs	1	1.8	0	0.0	2	3.6	12	21.8	40	72.8
50-59	Chiropractors	0	0.0	0	0.0	0	0.0	1	50.0	1	50.0
	GPs	0	0.0	1	2.9	0	0.0	11	31.4	23	65.7
60-69	Chiropractors	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0
	GPs	0	0.0	0	0.0	1	5.0	8	40.0	11	55.0
70+	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	2	22.2	0	0.0	1	11.2	3	33.3	3	33.3

Table 4.18: Cross-tabulation of chiropractic and GP responses to age and the statement 'literature and research findings are useful in my day-to-day practice'

Ages categorised		Literature and research findings are useful in my day-to-day practice.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
20-29	Chiropractors	0	0.0	0	0.0	0	0.0	5	71.4	2	28.6
	GPs	0	0.0	0	0.0	0	0.0	5	83.3	1	16.7
30-39	Chiropractors	0	0.0	0	0.0	3	11.6	16	61.5	7	26.9
	GPs	0	0.0	0	0.0	2	9.1	9	40.9	11	50.0
40-49	Chiropractors	0	0.0	1	6.7	1	6.7	10	66.6	3	20.0
	GPs	1	1.8	0	0.0	1	1.8	24	43.6	29	52.7
50-59	Chiropractors	0	0.0	0	0.0	1	50.0	1	50.0	0	0.0
	GPs	0	0.0	1	2.9	4	11.4	11	31.4	19	54.3
60-69	Chiropractors	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0
	GPs	0	0.0	0	0.0	1	5.0	13	65.0	6	30.0
70+	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	2	22.2	0	0.0	0	0.0	6	66.6	1	11.2

Table 4.19: Cross-tabulation of chiropractic and GP responses to sex and positive perception towards EBP (Application of EBP is necessary for the practice of chiropractic/ medicine)

Sex		Application of EBP is necessary for the practice of chiropractic/medicine.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
Female	Chiropractors	0	0.0	0	0.0	1	4.0	14	56.0	10	40.0
	GPs	1	2.5	1	2.5	1	2.5	14	35.0	23	57.5
Male	Chiropractors	0	0.0	0	0.0	0	0.0	12	46.2	14	53.8
	GPs	2	1.8	0	0.0	3	2.8	28	26.2	74	69.2

Table 4.20: Cross-tabulation of chiropractic and GP responses to sex and positive perception towards EBP (Literature and research findings are useful in my day-to-day practice)

Sex		Literature and research findings are useful in my day-to-day practice.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
Female	Chiropractors	0	0.0	0	0.0	2	8.0	17	68.0	6	24.0
	GPs	1	2.5	1	2.5	2	5.0	20	50.0	16	40.0
Male	Chiropractors	0	0.0	1	3.8	3	11.5	16	61.5	6	23.2
	GPs	2	1.9	0	0.0	6	5.6	48	44.8	51	47.7

Table 4.21: Cross-tabulation of chiropractic and GP responses to years in practice and positive perception towards EBP (Application of EBP is necessary for the practice of chiropractic/medicine)

Years in practice categorised		Application of EBP is necessary for the practice of chiropractic/medicine.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
<10	Chiropractors	0	0.0	0	0.0	0	0.0	10	47.6	11	52.4
	GPs	1	4.2	1	4.2	0	0.0	5	20.8	17	70.8
10-19	Chiropractors	0	0.0	0	0.0	1	4.2	11	45.8	12	50.0
	GPs	0	0.0	0	0.0	1	2.4	12	28.6	29	69.0
20-29	Chiropractors	0	0.0	0	0.0	0	0.0	3	75.0	1	25.0
	GPs	0	0.0	0	0.0	1	2.4	9	20.9	33	76.7
30-39	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	0	0.0	0	0.0	1	4.4	9	39.1	13	56.5
40-49	Chiropractors	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0
	GPs	1	7.1	0	0.0	1	7.1	7	50.0	5	35.8
50-59	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0

Table 4.22: Cross-tabulation of chiropractic and GP responses to years in practice and positive perception towards EBP (Literature and research findings are useful in my day-to-day practice)

Years in practice categorised		Literature and research findings are useful in my day-to-day practice.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
<10	Chiropractors	0	0.0	1	4.8	2	9.5	13	61.9	5	23.8
	GPs	1	4.2	1	4.2	0	0.0	11	45.8	11	45.8
10-19	Chiropractors	0	0.0	0	0.0	2	8.3	15	62.5	7	29.2
	GPs	0	0.0	0	0.0	4	9.5	16	38.1	22	52.4
20-29	Chiropractors	0	0.0	0	0.0	1	25.0	3	75.0	0	0.0
	GPs	0	0.0	0	0.0	4	9.3	18	41.9	21	48.8
30-39	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	0	0.0	0	0.0	0	0.0	13	56.5	10	43.5
40-49	Chiropractors	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0
	GPs	1	7.2	0	0.0	0	0.0	10	71.4	3	21.4
50-59	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0

Table 4.23: Cross-tabulation of chiropractic and GP responses to previous personal research involvement and positive perception towards EBP (Application of EBP is necessary for the practice of chiropractic/medicine)

Previous personal research involvement		Application of EBP is necessary for the practice of chiropractic/medicine.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
Yes	Chiropractors	0	0.0	0	0.0	1	1.9	26	51.0	24	47.1
	GPs	1	1.8	0	0.0	2	3.5	10	17.5	44	77.2
No	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	2	2.2	1	1.1	2	2.2	32	35.6	53	58.9

Table 4.24: Cross-tabulation of chiropractic and GP responses to previous personal research involvement and positive perception towards EBP (Literature and research findings are useful in my day-to-day practice)

Previous personal research involvement		Literature and research findings are useful in my day-to-day practice.									
		Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		n	%	n	%	n	%	n	%	n	%
Yes	Chiropractors	0	0.0	1	2.0	5	9.8	33	64.7	12	23.5
	GPs	1	1.8	0	0.0	1	1.8	25	43.8	30	52.6
No	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	2	2.2	1	1.1	7	7.8	43	47.8	37	41.1

Appendix P: Tables 4.26 to 4.33 Cross-tabulations of chiropractic and GP responses to age, sex, years in practice and previous personal research involvement and use of EBP (Read scientific literature related to clinical practice; use scientific research findings in the process of clinical decision-making)

Table 4.26: Cross-tabulation of chiropractic and GP responses to age and use of EBP (Read scientific literature related to clinical practice)

Ages categorised		Read scientific literature related to clinical practice.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
20-29	Chiropractors	4	57.1	1	14.3	1	14.3	0	0.0	1	14.3
	GPs	1	16.7	4	66.6	1	16.7	0	0.0	0	0.0
30-39	Chiropractors	11	42.3	11	42.3	3	11.6	1	3.8	0	0.0
	GPs	8	36.4	12	54.5	0	0.0	0	0.0	2	9.1
40-49	Chiropractors	7	46.7	7	46.7	1	6.6	0	0.0	0	0.0
	GPs	14	25.5	35	63.6	4	7.3	2	3.6	0	0.0
50-59	Chiropractors	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0
	GPs	4	11.4	26	74.3	5	14.3	0	0.0	0	0.0
60-69	Chiropractors	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
	GPs	5	25.0	11	55.0	4	20.0	0	0.0	0	0.0
70+	Chiropractors	0	0.0	0	0.0	0	0.0	0.0	0.0	0	0.0
	GPs	0	0.0	4	44.4	4	44.4	0	0.0	1	11.2

Table 4.27: Cross-tabulation of chiropractic and GP responses to age and use of EBP (Use scientific research findings in the process of clinical decision-making)

Ages categorised		Use scientific research findings in the process of clinical decision-making.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
20-29	Chiropractors	1	14.3	4	57.1	0	0.0	1	14.3	1	14.3
	GPs	3	50.0	1	16.7	2	33.3	0	0.0	0	0.0
30-39	Chiropractors	7	26.9	10	38.5	4	15.4	3	11.5	2	7.7
	GPs	6	27.3	7	31.8	3	13.6	1	4.5	5	22.8
40-49	Chiropractors	6	40.0	3	20.0	4	26.6	1	6.7	1	6.7
	GPs	15	27.3	27	49.1	4	7.3	3	5.5	6	10.8
50-59	Chiropractors	1	50.0	0	0.0	1	50.0	0	0.0	0	0.0
	GPs	8	22.9	16	45.7	5	14.3	0	0.0	6	17.1
60-69	Chiropractors	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
	GPs	7	35.0	4	20.0	6	30.0	0	0.0	3	15.0
70+	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	1	11.2	4	44.4	4	44.4	0	0.0	0	0.0

Table 4.28: Cross-tabulation of chiropractic and GP responses to sex and use of EBP (Read scientific literature related to clinical practice)

Sex		Read scientific literature related to clinical practice.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
Female	Chiropractors	12	48.0	9	36.0	3	12.0	1	4.0	0	0.0
	GPs	10	25.0	26	65.0	4	10.0	0	0.0	0	0.0
Male	Chiropractors	11	42.3	12	46.2	2	7.7	0	0.0	1	3.8
	GPs	22	20.6	66	61.7	14	13.1	2	1.9	3	2.7

Table 4.29: Cross-tabulation of chiropractic and GP responses to sex and use of EBP (Use scientific research findings in the process of clinical decision-making)

Sex		Use scientific research findings in the process of clinical decision-making.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
Female	Chiropractors	6	24.0	11	44.0	5	20.0	1	4.0	2	8.0
	GPs	11	27.5	21	52.5	4	10.0	1	2.5	3	7.5
Male	Chiropractors	9	34.6	6	23.1	5	19.2	4	15.4	2	7.7
	GPs	29	27.1	38	35.5	20	18.7	3	2.8	17	15.9

Table 4.30: Cross-tabulation of chiropractic and GP responses to years in practice and use of EBP (Read scientific literature related to clinical practice)

Years in practice categorised		Read scientific literature related to clinical practice.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
<10	Chiropractors	10	47.6	8	38.1	2	9.5	0	0.0	1	4.8
	GPs	4	16.6	16	66.7	3	12.5	0	0.0	1	4.2
10-19	Chiropractors	11	45.8	9	37.5	3	12.5	1	4.2	0	0.0
	GPs	14	33.3	22	52.4	3	7.1	2	4.8	1	2.4
20-29	Chiropractors	1	25.0	3	75.0	0	0.0	0	0.0	0	0.0
	GPs	9	20.9	31	72.1	3	7.0	0	0.0	0	0.0
30-39	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	4	17.4	15	65.2	4	17.4	0	0.0	0	0.0
40-49	Chiropractors	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0
	GPs	1	7.1	7	50.0	5	35.7	0	0.0	1	7.2
50-59	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0

Table 4.31: Cross-tabulation of chiropractic and GP responses to years in practice and use of EBP (Use scientific research findings in the process of clinical decision-making)

Years in practice categorised		Use scientific research findings in the process of clinical decision-making.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
<10	Chiropractors	6	28.6	10	47.6	2	9.5	1	4.8	2	9.5
	GPs	9	37.5	10	41.7	2	8.3	0	0.0	3	12.5
10-19	Chiropractors	7	29.2	7	29.2	5	20.8	3	12.5	2	8.3
	GPs	11	26.2	17	40.5	7	16.7	3	7.1	4	9.5
20-29	Chiropractors	2	50.0	0	0.0	2	50.0	0	0.0	0	0.0
	GPs	12	27.9	19	44.2	4	9.3	1	2.3	7	16.3
30-39	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	4	17.5	7	30.4	7	30.4	0	0.0	5	21.7
40-49	Chiropractors	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0
	GPs	3	21.4	6	42.9	4	28.6	0	0.0	1	7.1
50-59	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0

Table 4.32: Cross-tabulation of chiropractic and GP responses to previous personal research involvement and use of EBP (Read scientific literature related to clinical practice)

Previous personal research involvement		Read scientific literature related to clinical practice.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
Yes	Chiropractors	23	45.1	21	41.2	5	9.7	1	2.0	1	2.0
	GPs	9	15.8	35	61.4	8	14.0	2	3.5	3	5.3
No	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	23	25.6	57	63.3	10	11.1	0	0.0	0	0.0

Table 4.33: Cross-tabulation of chiropractic and GP responses to previous personal research involvement and use of EBP (Use scientific research findings in the process of clinical decision-making)

Previous personal research involvement		Use scientific research findings in the process of clinical decision-making.									
		None or 1		2-5		6-10		11-15		16+	
		n	%	n	%	n	%	n	%	n	%
Yes	Chiropractors	15	29.4	17	33.3	10	19.7	5	9.8	4	7.8
	GPs	7	12.3	30	52.6	9	15.8	2	3.5	9	15.8
No	Chiropractors	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	GPs	33	36.7	29	32.2	15	16.7	2	2.2	11	12.2

Appendix Q: Tables 4.35 to 4.38 Cross-tabulations of chiropractic and GP responses to age, sex, years in practice and previous personal research involvement and barriers to the use of EBP (Inability to apply research findings to individual patients with unique characteristics; insufficient time; lack of generalisability of the literature findings to my patient population)

Table 4.35: Cross-tabulation of chiropractic and GP responses to age and barriers to the use of EBP

Ages categorised		Barriers to the use of EBP					
		Inability to apply research findings to individual patients with unique characteristics.		Insufficient time.		Lack of generalisability of the literature findings to my patient population.	
		n	%	n	%	n	%
20-29	Chiropractors	4	7.8	5	9.8	4	7.8
	GPs	4	2.7	4	2.7	2	1.4
30-39	Chiropractors	12	23.5	16	31.4	12	23.5
	GPs	13	8.8	20	13.6	11	7.5
40-49	Chiropractors	6	11.8	10	19.6	7	13.7
	GPs	26	17.7	45	30.6	26	17.7
50-59	Chiropractors	1	2.0	2	3.9	1	2.0
	GPs	19	12.9	29	19.7	20	13.6
60-69	Chiropractors	0	0.0	1	2.0	1	2.0
	GPs	8	5.4	16	10.9	8	5.4
70+	Chiropractors	0	0.0	0	0.0	0	0.0
	GPs	2	1.4	5	3.4	1	0.7

Table 4.36: Cross-tabulation of chiropractic and GP responses to sex and barriers to the use of EBP

Sex		Barriers to the use of EBP					
		Inability to apply research findings to individual patients with unique characteristics.		Insufficient time.		Lack of generalisability of the literature findings to my patient population.	
		n	%	n	%	n	%
Female	Chiropractors	12	23.5	18	35.3	13	25.5
	GPs	18	12.2	31	21.1	22	15.0
Male	Chiropractors	11	21.6	16	31.4	12	23.5
	GPs	53	36.1	88	59.9	46	31.3

Table 4.37: Cross-tabulation of chiropractic and GP responses to years in practice and barriers to the use of EBP

Years in practice categorised		Barriers to use of EBP					
		Inability to apply research findings to individual patients with unique characteristics.		Insufficient time.		Lack of generalisability of the literature findings to my patient population.	
		n	%	n	%	n	%
<10	Chiropractors	11	21.6	14	27.5	10	19.6
	GPs	16	10.9	18	12.2	10	6.8
10-19	Chiropractors	10	19.6	14	27.5	12	23.5
	GPs	20	13.6	35	23.8	18	12.2
20-29	Chiropractors	2	3.9	4	7.8	2	3.9
	GPs	19	12.9	38	26.5	26	17.7
30-39	Chiropractors	0	0.0	0	0.0	0	0.0
	GPs	13	8.8	19	12.9	12	8.2
40-49	Chiropractors	0	0.0	1	2.0	1	2.0
	GPs	3	2.0	8	5.4	2	1.4
50-59	Chiropractors	0	0.0	0	0.0	0	0.0
	GPs	0	0.0	1	0.7	0	0.0

Table 4.38: Cross-tabulation of chiropractic and GP responses to previous personal research involvement and barriers to the use of EBP

Previous personal research involvement		Barriers to use of EBP					
		Inability to apply research findings to individual patients with unique characteristics.		Insufficient time.		Lack of generalisability of the literature findings to my patient population.	
		n	%	n	%	n	%
Yes	Chiropractors	23	45.1	34	66.7	25	49.0
	GPs	27	18.4	44	29.9	34	23.1
No	Chiropractors	0	0.0	0	0.0	0	0.0
	GPs	44	29.9	75	51.0	34	23.1