AN ASSESSMENT OF PATIENT-CENTRED CARE IN PATIENTS WITH CHRONIC MUSCULOSKELETAL CONDITIONS ATTENDING CHIROPRACTIC PRACTICE

KENT JASON STUBER

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> *"Tell me, what is my life without your love?*
> *Tell me, who am I without you, by my side?"*
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> - What is Life? George Harrison

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"And love dares you to care for the people on the edge of the night
And love dares you to change our way of caring about ourselves
This is our last dance, this is our last dance, this is ourselves: under pressure."

- Under Pressure. David Bowie,
  Freddie Mercury, Roger Taylor,
  Brian May, John Deacon

ABSTRACT

Background: Patient-centred care is seen as an increasingly important component of health care quality, particularly for patients with chronic conditions. Chiropractors frequently see patients with chronic musculoskeletal conditions and the chiropractic profession is often described as patient-centred.

Objectives: To assess how patient-centred chiropractic care is for patients with chronic musculoskeletal conditions and gain an understanding of patient and chiropractor experiences and perspectives of how chiropractic care is patient-centred.

Design: Mixed methods

Methods: An explanatory sequential mixed methods design with quantitative priority was used. Quantitative data was collected from 885 chiropractic patients with chronic musculoskeletal conditions who attended 1 of 20 Canadian chiropractic clinics. The patients each completed a questionnaire that included a modified version of the Patient Assessment of Chronic Illness Conditions (PACIC) to assess the patient-centredness of chiropractic care. Chiropractors from the study clinics completed a questionnaire that included the Patient-Practitioner Orientations Scale (PPOS) to assess chiropractor attitudes and orientation towards patient-centred care. Facilitated focus group interviews were conducted with patients, while individual semi-structured interviews were conducted with chiropractors. Interviews were transcribed and analyzed using thematic analysis.

Results: Patient perceptions of more patient-centred care provided by chiropractors were significantly associated with patient satisfaction, younger patient age, having a mental health condition, attending the chiropractor’s clinic for fewer years, and the number of chiropractic visits and other healthcare providers seen in the past year. More positive chiropractor attitudes toward patient-centred care were significantly associated with seeing more patients per week and more years in practice. Interview findings largely confirmed the survey findings. Patients described chiropractors as good listeners who provide holistic care. Chiropractors and patients both emphasized the importance of a close, trusting relationship. While chiropractors generally encourage patient engagement, patient involvement in treatment decisions and goal setting typically occurs earlier in their relationship. Follow-up by chiropractors mostly takes place in regular maintenance care visits.

Conclusion: The study suggests that patients with chronic musculoskeletal conditions are highly satisfied with the care that they receive from their chiropractors and it incorporates numerous elements of patient-centred care including a close therapeutic relationship, shared decision making and individualized treatment plans tailored to their specific context.

Key words: patient-centred, patient-centredness, chiropractic, mixed methods

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GLOSSARY

- Chronic condition – a condition persisting or recurring for three months or more
- Chronic musculoskeletal pain – pain that persists or recurs for three months or more and arises from the joints, muscles, soft tissues, bones, or any combination thereof.
- Contextual factors – the physical/environmental, social, and psychological aspects of a healthcare visit or consultation.
- Patient-centred care – healthcare that considers the input, priorities, and preferences of patients in the process of clinical decision making.
- Shared decision making – a process where a patient and health professional come together to jointly make decisions about the patient's care.
- Therapeutic alliance – the relationship and bond formed between a patient and health professional.

CHAPTER 1

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.0 BACKGROUND

The chiropractic profession is often characterized as having a holistic and patient-centred approach to care (Jamison, 2001; Leboeuf-Yde et al., 2019; Rosner, 2016; Schneider, Murphy and Hartvigsen, 2016). However, to date there is a relative lack of research into the degree to which chiropractic care is patient-centred, and further investigation has been encouraged (Schneider, Murphy and Hartvigsen, 2016). Healthcare providers and patients must establish a relationship and pattern of communication in the provision and receipt of care (Taylor, 2009). However, the nature of this relationship has changed over time and throughout the history of healthcare.

Dating back to the ancient Egyptians, the predominant approach to the design and delivery of healthcare has been paternalistic: centred around the practitioner, most often a medical doctor, and their knowledge of illness or disease and ability to decide what was best for their patients (Hughes, Bamford and May, 2008; Kaba and Sooriakumaran, 2007; Lawrence and Kinn, 2011; Mckinistry, 1992; Taylor, 2009). Even the Hippocratic Oath has led to a paternalistic approach to doctor-patient relationships as the doctor implicitly must look out for the well-being of their patients, much like a parent would for an infant (Kaba and Sooriakumaran, 2007). A power imbalance between providers and patients may be undesirable from an ethical standpoint as it may impact patient dignity and lessen the respect for patient input, autonomy, and self-determination (Gzil et al., 2009; Hughes, Bamford and May, 2008; McClimans, Dunn and Slowther, 2011; Munthe, Sandman and Cutas, 2011).

Since the 1950s, increasing importance has been attached to patients' subjective experiences and input, particularly in the fields of psychology and psychoanalysis (Kaba and Sooriakumaran, 2007; Leplege et al., 2009; Szasz and Hollender, 1956). The term 'patient-centred medicine' was first coined by Enid Balint from the Tavistock Institute of Human Relations in 1969 (Balint, 1969). Balint described patient-centred medicine as the addition of an overall assessment or diagnosis of the person and their problems based on the doctor's understanding of the patient as an individual, along with their traditional medical diagnosis or illness. Applying their psychoanalytical approach, Balint's group trained general practitioners (GPs) to assess emotional problems in their patients similar to a psychoanalyst, but within the more time-constrained setting of the general practitioner. Balint described a tension experienced by GPs between practising in the traditional illness- or doctor-oriented manner and the patient-centered manner espoused by the psychoanalyst, albeit with neither the necessary training nor time to conduct a full psychoanalytic assessment and treatment.

Subsequent to Balint's work (Balint, 1969), others evolved the concept of patient involvement in their care, describing more generic models of patient-centred care (PCC) as the concept and its ethical basis developed (Hughes, Bamford and May, 2008; Mezzich et al., 2016; Munthe, Sandman and Cutas, 2011). In both policy and practice, greater emphasis is being placed on creating greater balance in the patient-provider relationship in the form of patient-centred care (Medicine and Medicine, 2001; Paparella, 2016; Organization et al., 2015). An important moment in the history of patient-centred care occurred in 2001 when the Institute of Medicine (now the National Academy of Medicine) identified care that is patient-centred as 1 of the 6 aims toward improving the quality of health care in the United States at the turn of the 21st century, along with care being safe, effective, timely, efficient, and equitable (Medicine and Medicine, 2001). As a consequence, increasing attention is given to the evolving nature of the doctor-patient relationship and communication between doctors, patients, and their families (Ha and Longnecker, 2010; Ishikawa, Hashimoto and Kiuchi, 2013; Kaba and Sooriakumaran, 2007). Still, some argue the shift from a more traditional biomedical model to patient-centred care has been insufficient (Britten et al., 2016; Gzil et al., 2009). In many settings and societies throughout the world, more traditional doctor-patient relationships predominate with a focus on more paternalistic, doctor-centred, and disease- or illness-based care that is largely delivered by men (Britten et al., 2016; Gzil et al., 2009; Kaba and Sooriakumaran, 2007).

Accordingly, researchers have investigated the extent to which care is patient-centred and the role of a patient-centred approach. Training programs to increase patient-centred behaviour in clinicians have shown mixed results pertaining to their impact on patient health status and satisfaction (Dwamena et al., 2012). Still, the provision of patient-centred care has been shown to positively impact patient outcomes such as quality of life, pain, function, satisfaction with care, job performance and satisfaction, patient knowledge, and self-management skills (Park et al., 2018; Ramlakhan et al., 2019; Stewart et al., 2000; Yun and Choi, 2019). Patients indicate a preference for patient-centred approaches (Little, 2001) and the impact of patient-centred care on patient status may arise from the improved communication between patients and clinicians, which can aid compliance and improve patient-clinician relationships (Hughes, Bamford and May, 2008).

1.1 DEFINITIONS AND MODELS OF PATIENT-CENTRED CARE

Patient-centred care has been described as care ‘of the person, for the person, by the person, and with the person’ (Mezzich et al., 2016), where health professionals should bear in mind the notion of ‘nothing about me without me’ (Delbanco et al., 2001). As de Silva points out, there is a difference between patient-centredness and consumerism, as patient-centredness involves working together with patients, and not only giving patients what they want (Silva, 2014). When evaluating patient-centred care, one of the initial concepts that needs to be established is whether it is care that is actually ‘patient-centred’, ‘person-centred’, ‘client-centred’, or ‘family-centred’ that is being studied. ‘Person-centred care’ appears to be used increasingly in the literature, partially due to greater use of ‘people-first’ language (Zhao et al., 2016), and it might be assumed on face value that these terms are interchangeable with some geographical preferences for one term over another (Louw, Marcus and Hugo, 2017; Starfield, 2011). In both policy and practice, ‘person-centred care’ is the preferred term in the National Health Service in the United Kingdom and throughout Europe, while in North America ‘patient-centred care’ is used more frequently. In their review, Hughes, Bamford, and May were unable to find thematic differences between patient-centredness, person-centredness, and client-centredness (Hughes, Bamford and May, 2008). However, numerous authors have argued that while there are many thematic similarities between these terms, there are obvious contextual differences (Eklund et al., 2019b; Hughes, Bamford and May, 2008; Louw, Marcus and Hugo, 2017; Starfield, 2011; Zhao et al., 2016). For example, family-centred care is typically used more in pediatric or elderly care settings, while client-centred is more frequently used in a counselling setting, and patient-centred care is typically used in primary care settings.

For the purpose of this thesis, the two terms to be considered are ‘patient-centred’ and ‘person-centred’ care. Some authors argue against using ‘patient-centred care’ as they feel that it minimizes the role of the injured or ill or even the well person, and that ‘person-centred care’ is preferable as there is more to the person than their condition or symptoms or role as a patient, and that the person should be considered as a whole over time (Britten et al., 2016;

Starfield, 2011; Zhao et al., 2016). However, models of patient-centredness include consideration of the patient as a complete or whole person (Mead and Bower, 2000; Stewart, 2001). Eklund *et al*. (Eklund et al., 2019b) conducted a review of reviews and found many thematic similarities between person-centredness and patient-centredness, but the main thematic difference identified related to their respective goals. In person-centred care the goals are oriented to the person leading a meaningful life, while in patient-centred care the goals are for the patient to lead a functional life (Eklund et al., 2019b). The theme of the clinician defending or advocating for the patient was observed more often in articles that used the term patient-centred, as was the theme of the clinician being self-reflective, although these themes occurred much less frequently than others (Eklund et al., 2019b). 'Patient-centred care' is often used in the context of the visit or consultation and when considering the relationship between the patient and provider given that the specific reason why they interact is the patient's health or condition (Louw, Marcus and Hugo, 2017; Starfield, 2011; Zhao et al., 2016). Thus, the theoretical framework employed throughout this thesis is patient-centred care as most chiropractic patients consult their chiropractor with a particular injury or condition to address, chiropractors tend to emphasize improving function, and the point of contact visit-based interactions and relationship between chiropractors and their patients.

To date no consensus definition or model of patient-centred care has emerged (Ishikawa, Hashimoto and Kiuchi, 2013; Pelzang, 2010). As Stewart aptly wrote, patient-centred care "may be most commonly understood for what it is not—technology centred, doctor centred, hospital centred, disease centred" (Stewart, 2001). Regardless, one of the most frequently cited definitions comes from the Institute of Medicine, wherein patient-centred care is defined as "care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions" (Medicine and

Medicine, 2001). Of relevance to the current study, which was conducted in Canada, Doktorchik and colleagues found that nearly half (45%) of the Canadian organizations surveyed use the Institute of Medicine definition of patient-centred care (Doktorchik et al., 2018).

The three most frequently cited models of patient-centred care arose in the 1990s and early 2000s (Kitson et al., 2012), being described by Mead and Bower (Mead and Bower, 2000), Stewart *et al.* (Stewart et al., 1995), and Gerteis *et al.* (Gerteis, Edgman-Levitan and Daley, 1993). The multidimensional model of patient-centred care described by Margaret Gerteis *et al*. (Gerteis, Edgman-Levitan and Daley, 1993) from the Picker/Commonwealth Fund was constructed following 62 hospital-based focus group interviews assessing the experiences of post-discharge patients and their families (over 8000 people), as well as other stakeholders. This model has been used by both the Institute of Medicine (Medicine and Medicine, 2001) and the Picker Institute (Paparella, 2016). Gerteis described 7 dimensions involved in patient-centred care (Gerteis, Edgman-Levitan and Daley, 1993):

1. Respect for patients' values, preferences, and expressed needs – PCC involves responding to patient needs, wants, and preferences while involving them in decision making. Care should be customized, consider patient comfort with and tolerance for risk, and be culturally competent. Patient preferences may change over time, so decision making should be considered a dynamic process;
2. Coordination and integration of care – clinicians should work together to provide care in a coordinated manner and share clinical information in an accurate and timely manner when necessary;

3. Information, communication, and education – PCC involves providing the patient with information on their condition, available treatments, and prognosis that is tailored, comprehensible, and trustworthy while encouraging patient involvement and communication in their preferred manner;
4. Physical comfort – patients should receive care that is tailored and timely with expert treatment of symptoms or discomfort;
5. Emotional support and alleviation of fear and anxiety – clinicians should recognize that the experience of having a condition is not only a physical one, a patient's emotions and spiritual life can be affected by any condition and feeling such as fear and anxiety should be addressed;
6. Involvement of family and friends – PCC accommodates, recognizes, and welcomes the participation of the patient's loved ones in the decision-making process when required and supports them in their potential role as caregivers;
7. Transition and continuity of care – clinicians should ensure continuing care and support to patients and enable their transition into the community or self-care upon discharge.

The Institute of Medicine used 6 of these dimensions in its description of patient-centred care, choosing to incorporate 'Transition and continuity of care' under 'Coordination and integration of care' (Medicine and Medicine, 2001). The Picker Institute added the 8th dimension of 'fast access to reliable advice' to the Gerteis model in its principles of patient-centred care (Paparella, 2016).

A group led by Moira Stewart from the University of Western Ontario (now Western University) described 6 interactive components to the patient-centred clinical method in the mid-1990s based on their clinical observations and experience in primary care (Brown, Stewart and McWilliam, 1999; Stewart et al., 1995; Stewart, 2005). Stewart's 6 components of patient-centred care are elements that they felt should take place in each patient-clinician encounter in order to improve the doctor-patient relationship and communication and consist of:

1. Exploring both the disease and the illness experience – clinicians should attempt to understand both the patient's condition and each patient's unique experience of their condition in terms of their feelings towards and understanding of their condition, the impact of their condition, and their expectations of the clinician;
2. Understanding the whole person – taking into consideration that people are unique and that there is considerably more to them and their lives than their diagnoses including their mental health and life circumstances;
3. Finding common ground – clinicians and patients need to have a mutual understanding and agreement on the clinical issues, the goals of care, and their respective roles. Stewart has described this component as central to patient-centred care (Stewart, 2005);
4. Incorporating prevention and health promotion – opportunities to discuss health habits and mental health should be present in each visit;
5. Enhancing the patient-doctor relationship – the relationship between clinicians and patients should grow with each visit;
6. Being realistic – limitations exist in what health care can accomplish in terms of time and resources and these should be discussed and understood (Brown, Stewart and McWilliam, 1999; Stewart, 2005)

Mead and Bower (Mead and Bower, 2000) critically reviewed the conceptual and empirical literature and developed a model of patient-centredness in medicine with the doctor-patient relationship as its central element and consisting of 5 dimensions that differentiate it from the biomedical model:

1. Biopsychosocial perspective – clinicians should consider how biological, psychological, and social status interact and combine to produce illness or injury;
2. Patient as person – patients do not have the same life history leading up to their presentation and thus a condition can have substantially different impact on individual patients. Clinicians should strive to have an understanding of each patient and their personal context;
3. Sharing power and responsibility – establishment of an equal power relationship between patients and clinicians with mutual participation and patient empowerment whilst assuming a more active role in their care.
4. Therapeutic alliance – the relationship between patients and clinicians is of great importance and potential benefit. An alliance between patient and clinician is essential along with mutual understanding of the treatments and goals;
5. Doctor as person – the clinician is an essential component of the clinician-patient relationship and their subjective behaviour influences the relationship and therapeutic process and they should be aware of this influence.

Mead and Bower's model was based solely on a comprehensive review of the conceptual and empirical medical literature on patient-centredness. This allowed Mead and Bower to assess patient-centred healthcare service research on a global scale.

The models of Stewart (Stewart, 2005) and Mead and Bower (Mead and Bower, 2000) have been specifically compared by other authors (Hudon et al., 2011; Kitson et al., 2012; Louw, Marcus and Hugo, 2017). Hudon *et al*. (Hudon et al., 2011) identified four common dimensions, drawing parallels between Mead and Bower's 'biopsychosocial perspective' and Stewart's 'understanding the whole person', the 'patient as person' with 'exploring both the disease and illness experience', 'sharing power and responsibility' with 'finding common ground, and 'therapeutic alliance' with 'enhancing the patient-doctor relationship'. Mead and Bower's dimension of 'doctor as person' is not addressed in Stewart's model. Conversely Stewart's dimensions of 'being realistic' and 'incorporating prevention and health promotion' are not specifically addressed by Mead and Bower. As Louw, Marcus, and Hugo note (Louw, Marcus and Hugo, 2017), Stewart's group removed those 2 dimensions in later versions of their work, making the Mead and Bower and Stewart models even more similar. The Mead and Bower model's dimensions of 'biopsychosocial perspective' and seeing the 'patient as person' could be seen as related, as could the 'therapeutic alliance' and the 'doctor as person', but they saw their dimensions as distinct. Louw, Marcus, and Hugo (Louw, Marcus and Hugo, 2017) comment that from an ethical standpoint Stewart's model leans more towards clinician beneficence over patient autonomy, while Mead and Bower with their notion of sharing power with patients is likely more balanced between the two. Kitson *et al*. (Kitson et al., 2012) opined that Mead and Bower noted the importance of patient experience and knowledge during the consultation.

1.1.1 THEORETICAL FRAMEWORK

In consideration of the importance given to patient experience and the objectives of my study, I selected Mead and Bower's model of patient-centredness as the theoretical framework for this thesis. By adding the elements of the 'doctor as person' along with the 'patient as person', Mead and Bower include the two key players in the patient-clinician relationship individually and then together through patient-centred communication that builds a therapeutic alliance with the sharing of power and responsibility. This consideration of both the patient and clinician is harmonious with the mixed methods approach of my study where both quantitative and qualitative data from patients and clinicians was obtained.

Mead and Bower were uncertain that their model and the dimensions therein could be applied to healthcare professions outside of medicine owing to contextual differences of where and how different professionals practise and their roles in healthcare and felt that further research as to the model's applicability in other professions was in order (Mead and Bower, 2000). Regardless I deemed it most suitable and appropriate to explore patient-centredness in the chiropractic profession using one of the most balanced and cited models in the field of patient-centred care research. The Mead and Bower model was largely developed from literature in the primary care medical field and there has been ongoing debate as to whether chiropractic should be seen as a primary care profession (Coulter, 1992; Jones-Harris, 2010; Schneider, Murphy and Hartvigsen, 2016). Regardless, chiropractors often have primary contact with their patients and have the duty to diagnose and provide care for patients and develop a (chiropractic) doctor-patient relationship that enables my use of the Mead and Bower model.

1.2 MEASUREMENT OF PATIENT-CENTRED CARE

Patient-centredness occurs and can be measured at both individual and healthcare system-wide levels (Hudon et al., 2011). Measuring the degree to which care is patient-centred can be important to quality improvement initiatives as it could potentially allow for changes to be implemented on both a healthcare system-wide basis or by individual practitioners and that can potentially lead to improved quality of care, outcomes, and patient satisfaction (Doktorchik et al., 2018; Tzelepis et al., 2015). The measurement of patient-centred care across organizations internationally has been found to be inconsistent (Doktorchik et al., 2018).

Discussion of the measurement of patient-centredness requires delineation between the measurement of patient-centredness and the use of measures that are considered to be patient-centred. Numerous instruments that measure patient-centredness can be categorized as Patient-Reported Experience Measures (PREMs). PREMs are a form of health care quality indicator, typically in the form of retrospective questionnaires designed to ascertain the patient experience of receiving care by examining the humanity of care and different processes involved in care (Black, 2013; Kingsley and Patel, 2017; Øvretveit et al., 2017; England, 2016). Due to their focus on the experience of care, PREMs generally do not assess outcomes of care, differentiating them from Patient Reported Outcome Measures (PROMs) and Patient-Centred Outcome Measures (PCOMs).

PROMs are standardized questionnaires that have been designed and validated to assess patient views of their symptoms, functional status or disability, health status, and quality of life or wellbeing (Black, 2013; Kingsley and Patel, 2017; Øvretveit et al., 2017; England, 2016). PROMs are frequently used both clinically and in research before and after care to help assess the impact of care on pre-determined dimensions. The items on a PROM are largely pre-defined by clinicians and researchers and often symptom-focused, there is disagreement as to whether PROMs should be considered patient-centred other than because they are completed by patients (England, 2016). Conversely, PCOMs are a more recent development, and they seek and consider individual patient perspectives of what is important to them and their lives as relates to their health, quality of life, and the effects of treatment toward achieving their health goals and personal outcomes that they value (Øvretveit et al., 2017; England, 2016).

As discussed previously, the most referenced models of patient-centred care point to its multidimensional nature and thus the measurement of patient-centred care is complex. Numerous authors point to a lack of agreement in the literature on the ideal measures to use to measure patient-centred care (Doktorchik et al., 2018; Louw, Marcus and Hugo, 2020; Silva, 2014). The 3 most common ways to measure patient-centred care are by patient survey and interviews, clinician surveys, and observations of consultations (Silva, 2014). Numerous authors point to the importance of patient completed questionnaires in measuring patient-centredness of care (Hudon et al., 2011; Louw, Marcus and Hugo, 2020; Tzelepis et al., 2015). There are well over 100 different instruments or means of measuring patient-centredness or some aspect thereof (Louw, Marcus and Hugo, 2020; Silva, 2014). Measures of patient-centredness can attempt to assess the entire or holistic concept of patient-centredness or specific components of patient-centred care (Louw, Marcus and Hugo, 2020; Silva, 2014). De Silva (Silva, 2014) described the most 6 commonly assessed components of patient-centred care as:

i) experience of care;
ii) shared decision making (SDM);
iii) supporting self-management;
iv) communication;
v) patient activation, empowerment and engagement; and
vi) empathy, compassion and dignity.

To date, no single instrument has been identified as suitable to comprehensively measure all of the above components of patient-centred care, as might be expected given the complexity of the topic (Louw, Marcus and Hugo, 2020; Ramlakhan et al., 2019; Silva, 2014). To assess as many of these components as possible, authors have recommended using more than one instrument and/or method (i.e., potentially using both questionnaires and interviews) to assess the patient-centredness of care (Silva, 2014; Tzelepis et al., 2015).

1.3 THE CHIROPRACTIC PROFESSION

The chiropractic profession has been cited by some researchers as being patient-centred (Jamison, 2001; Rosner, 2016). The profession originated in Iowa in 1895, with Canadian Daniel David (D.D.) Palmer credited as the founder of the profession (Kaptchuk and Eisenberg, 1998; Rosner, 2016). Well over a century later there are over 100,000 chiropractors worldwide, practicing in over 90 countries (Hartvigsen and French, 2020; Stochkendahl et al., 2019). While half of those 90 countries have fewer than 10 chiropractors, the majority of chiropractors are in the United States (n=77,000), followed by Canada, the United Kingdom, and Australia, with the United States and Canada having the highest number of chiropractors per capita (Stochkendahl et al., 2019). Chiropractic is one of the largest complementary and alternative medicine (CAM) professions, although some contend that the profession could be viewed as part of mainstream healthcare (Coulter and Shekelle, 2005; Rosner, 2016). Chiropractic utilization varies between countries, with some countries such as Canada and the United States seeing increased utilization over time while Australia experienced a decrease (Beliveau et al., 2017). A recent scoping review reported median 1-year chiropractic utilization rates of 9.1% and lifetime utilization of 22.2% across the 52 studies that they included (Beliveau et al., 2017).

This study took place in Canada, where there are over 9000 practising chiropractors. The chiropractic profession is regulated in all of Canada's ten provinces and three territories. For a chiropractor to be licensed in Canada they must graduate from an accredited chiropractic educational program, pass national board examinations, and meet specific licensure requirements in their respective province or territory. There are two accredited chiropractic educational programs in Canada, one taught in English at the Canadian Memorial Chiropractic College (CMCC) in Toronto, Ontario, and one taught in French at the Université du Québec à Trois-Rivières (UQTR) in Trois-Rivières, Québec. Most Canadian chiropractors are trained in Canada, although approximately one-third are trained internationally, with the majority of those graduating from chiropractic programs in the United States (Association, 2016). While historically a male-dominated profession, the proportion of female chiropractors in Canada doubled from 18% in 1997 to 37% in 2016 (Association, 2016). Chiropractors mainly work in private clinical practice, although this can take numerous forms such as solo practice, group practice with other chiropractors, or multidisciplinary clinics (Association, 2016; Mior et al., 2019). In all provinces, chiropractors are primary contact practitioners, meaning that patients can see a chiropractor directly without referral from a medical doctor or other healthcare professional. Chiropractic services are primarily paid for out-of-pocket by patients, and may be reimbursed through private insurance, such as employment benefits (Mior et al., 2019). In Manitoba, the provincial health plan covers a portion of all patient visits, additionally some provinces provide a partial payment for senior citizens or low-income earners through provincial health insurance plans. Finally, in most provinces chiropractors provide services covered by insurers for those injured in motor-vehicle collisions or in the workplace. Beliveau *et al.* (Beliveau et al., 2017) found that chiropractic utilization rates in Canada held steady at 11-12% over the period from 1995 to 2015.

1.4 CHIROPRACTIC AND PATIENT-CENTRED CARE

The chiropractic profession has identified patient-centredness as an important part of its identity (Jamison, 2001; Leboeuf-Yde et al., 2019; Rosner, 2016). The World Federation of Chiropractic has indicated that patient-centred care is essential to chiropractor-patient interactions as part of their chiropractic rehabilitation competency framework (Côté et al., 2019b). Chiropractic-specific clinical practice guidelines and best practice documents have emphasized a patient-centred approach (Globe et al., 2016; Hawk et al., 2017; Whalen et al., 2019). As described by Jamison (Jamison, 2001), numerous aspects of the chiropractic consultation and treatment can be considered patient-centred, although the patient’s role is frequently more cooperative with the chiropractor in determination of a plan of management and therapeutic goals. Despite this, recent research indicates that chiropractors do not espouse an orientation that leans more heavily towards either the biopsychosocial or biomedical models of pain, the latter of which may be considered less patient-centred (Innes et al., 2015; Lady et al., 2018). However, previous research showed that chiropractor attitudes have a more biomedical tendency in their approach to back pain than other musculoskeletal practitioners (Pincus et al., 2007). Authors and researchers have recommended that chiropractors provide care which is patient-centred in its communication and sensitive in considering patients from different demographics and cultural backgrounds, and that chiropractic educational programs should include training that allows students to develop cultural competence (Dougherty et al., 2012; Hammerich, 2014; Hennius, 2013; Maiers, Foshee and Dunlap, 2017).

In the late 1990s chiropractic educators recommended adoption of a patient-centred paradigm for chiropractic practice, education, and research (Adams and Gatterman, 1997; Gatterman, 1995; Hooper et al., 2000). Gatterman (Gatterman, 1995) described such a patient-centred paradigm, which arose from an 8-member consensus panel including several prominent chiropractic researchers, educators, and scholars. This patient-centred paradigm was characterized by 6 traits: focusing on the whole or total person; respecting patient values, beliefs, needs and expectations; self-healing; promoting health through conservative, drugless care; encouraging patients to take responsibility for their health; and shared decision making (Gatterman, 1995). More recent research has emphasized patient-centred approaches to the education of chiropractic students, including when integrating with students from other health professions (Schneider, Murphy and Hartvigsen, 2016; Taylor et al., 2011). Current chiropractic educational program accreditation standards mandate that graduates have competency in providing a patient-centred approach to care (Innes and Kimpton, 2020). Two recent studies involving chiropractic trainees have assessed their patient-centred care and attitudes. Stomski *et al*. (Stomski et al., 2019) assessed the extent to which chiropractic interns at one university's teaching clinics provided patient-centred care for adults with spinal pain as well as changes in the patient's pain intensity. The extent of patient-centred care was assessed using 2 instruments, the Consultational and Relational Empathy Questionnaire (CARE) as well as the Picker Institute Musculoskeletal Disorder Questionnaire (PMSDQ), while pain intensity was measured by a Numerical Rating Scale (NRS). Unfortunately, the relationships between the instruments was not explored due to skewness of the data, possibly related to social desirability bias or ceiling effects of the CARE instrument. Hammerich (Hammerich et al., 2019) led a study that assessed chiropractic student attitudes and orientation towards patient-centred care at 7 institutions in 6 countries. This study used the Patient-Practitioner Orientation scale (PPOS) to determine attitudes and orientation towards patient-centred care; the PPOS provides an overall score as well as scores on sharing and caring subscales (Hammerich et al., 2019; Krupat et al., 2000).

Some researchers have argued for more patient-centred research in the chiropractic profession (Schneider, Murphy and Hartvigsen, 2016), and for the development of patient-centred guidelines for back pain (Chou et al., 2018). Despite this, the current Canadian chiropractic research agenda and priorities do not emphasize patient-centred care (French et al., 2017a, 2017b). Not surprisingly there has been relatively little patient-centred chiropractic clinical research conducted to date. The Collaborative Care for Older Adults (COCOA) study provided one of the first assessments of a patient-centred chiropractic intervention for older adults with low back pain (Goertz et al., 2010, 2013, 2017b; Salsbury et al., 2018c). COCOA was a 3-arm randomized trial in which 1 of the treatment arms involved a patient-centred collaborative group receiving chiropractic and medical co-management (shared care). The other arms consisted of a conventional guideline-based medical group and a group that received both chiropractic and guideline-based medical care but without collaboration (dual care).

Shared decision making is an important process in providing patient-centred care, and thus far has not been thoroughly explored in chiropractic research. Jamison opined that shared decision making can help chiropractic patients increase their locus of control and self-efficacy (Jamison, 1998). Dagenais, Brady, and Haldeman (Dagenais, Brady and Haldeman, 2012) evaluated informed consent documents used in the teaching clinics from 20 chiropractic educational institutions and found them to be generally inadequate in terms of aiding low back pain patients who are considering chiropractic care make a fully informed shared decision regarding chiropractic treatment. Vining *et al.* (Vining et al., 2019) recently developed a clinical decision aid for veterans with low back pain; such decision aids can be useful tools for patients and practitioners as they work through a shared decision making process.

Both integrative and collaborative patient care models can be described as having patient-centred care as a main attribute or goal (Boon et al., 2009; Mior et al., 2010). Collaborative team-based care allows for greater retention of professional autonomy while working with other professionals, whereas integrative care requires more support on a system-wide level while practitioner roles overlap in a cohesive approach to care (Boon et al., 2009). Boon *et al.* (Boon et al., 2009) found that both chiropractors and other health care professionals that they interviewed were more interested in collaborative care models. This appears to be reflected in the process-based model for interprofessional collaborative care involving the addition chiropractors to Family Health Teams or Primary Care Networks in Ontario, Canada designed by Mior *et al.* (Mior et al., 2010, 2013). Other models have demonstrated the addition of chiropractors to academic, private, or publicly-funded health care settings such as long-term care, Veteran's Affairs (VA), military medical facilities, and patient-centred medical homes, emphasizing that the chiropractor is part of a patient-centred approach in these settings (Evans et al., 2015; Goertz et al., 2018; Lisi et al., 2018a, 2018b; Maiers et al., 2010; Shannon et al., 2018). Other prominent models have emerged where chiropractors serve a role in providing a patient-centred approach for patients with spinal disorders, such as a primary spine care practitioner or as part of a collaborative care team, as in a spine care pathway (Chihambakwe et al., 2019; Goertz et al., 2017a; Kosloff et al., 2013; Mior et al., 2018; Murphy et al., 2011; Murphy, 2014; Paskowski et al., 2011; Schneider, Murphy and Hartvigsen, 2016; Snow and Torda, 2009; Walker, 2016).

Several qualitative research studies have attempted to characterize chiropractic care and communication and identified elements of patient-centredness or named patient-centred care as a theme (Evans, Maiers and Bronfort, 2003; Lyons et al., 2013; Maiers et al., 2014, 2016; Myburgh et al., 2013, 2016; Penney et al., 2016; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018a; Stilwell and Harman, 2017b; Stilwell et al., 2018). Salsbury *et al.* (Salsbury et al., 2018a; Shannon et al., 2018) identified patient-centredness as the central domain of a model of a preferred chiropractor for multidisciplinary rehabilitation settings after interviewing numerous stakeholders while exploring the integration of a chiropractor into a rehabilitation speciality hospital. Studies have also noted the importance of a patient-centred approach by chiropractors when managing injured workers and trying to prevent work disability (Côté et al., 2001; Stochkendahl et al., 2018).

Taken together there is a noticeable gap between chiropractic professional discourse towards patient-centred care and the current body of literature exploring the extent to which chiropractic care is patient-centred, the aspects of chiropractic care that are patient-centred, and the impact of patient-centred care programs involving chiropractic on patient outcomes. Further research in this area is clearly needed.

The primary research question in my thesis was to what extent do chiropractic patients with chronic musculoskeletal conditions perceive the care that they receive to be patient-centred? The secondary question was to what extent do chiropractors perceive the care that they provide to be patient-centred, particularly for patients with chronic musculoskeletal conditions? My study is the first to address these questions from the perspectives of both chiropractors and their patients with chronic musculoskeletal conditions. Determining if chiropractors deliver patient-centred care to patients with chronic musculoskeletal conditions is important to improve the quality and outcomes of care in practice and inform training and education curricula.

The primary objective of this study was to assess how patient-centred chiropractic care is for patients with chronic musculoskeletal conditions through a mixed methods study that employed a sequential explanatory design that used the Patient Assessment of Chronic Illness Care (PACIC) to measure patient-centredness. The PACIC is a PREM and among the most frequently used instruments for assessing experience of care and concordance of health care services with the Chronic Care Model for patients with chronic conditions (Glasgow et al., 2005a; Silva, 2014). The PACIC is one of the only tools available specifically designed to measure patient-centredness in populations with chronic conditions (Silva, 2014). Prior to this study, the PACIC had not been used in a chiropractic setting, but had been previously employed with a chronic musculoskeletal condition population where the patients had osteoarthritis (Rosemann et al., 2007). The secondary objective of this study was to gain an understanding of patient and chiropractor experiences and perspectives of how patient-centred chiropractic care is through the qualitative components of the mixed methods study comprising facilitated focus group interviews with patients and individual semi-structured interviews with chiropractors.

1.5 CHRONIC MUSCULOSKELETAL PAIN

The International Association for the Study of Pain (IASP) defines chronic musculoskeletal pain as “persistent or recurrent pain that arises as part of a disease process directly affecting bone(s), joint(s),muscle(s), or related soft tissue(s)” (Treede et al., 2015). The IASP considers a chronic pain condition to be chronic “when it lasts or recurs for more than 3 months” (Perrot et al., 2019; Treede et al., 2015). Chronic musculoskeletal conditions, including various forms of spinal pain, arthritis, headaches, and widespread pain, are highly prevalent and sources of burden and disability. The prevalence of chronic pain has been estimated to affect 16-20% of adults worldwide (Breivik et al., 2006; Harrison et al., 2013; Sá et al., 2019; Treede et al., 2015). The Global Burden of Disease Study 2015 demonstrated that the worldwide prevalence of low back pain (LBP), migraine, tension type headaches, neck pain, osteoarthritis, and other musculoskeletal disorders is increasing (Vos et al., 2016).

Chronic pain negatively impacts the quality of life of those affected (Breivik et al., 2013). Chronic musculoskeletal pain accounts for several of the most disabling conditions worldwide and is important across adult age groups (Vos et al., 2016). Back pain is the leading cause of worldwide disability measured as Years Lived with Disability (YLD), along with neck pain (5th leading cause), migraine (7th), other musculoskeletal disorders (8th), and osteoarthritis (13th) (Vos et al., 2016).

Having chronic pain can impact a patient's employment status with over one quarter of chronic pain patients reporting that their pain has affected their employment (Breivik et al., 2006). It is disconcerting to note that 30% of chronic pain patients do not feel that others believe how much pain they are experiencing, and 20-25% do not feel support from family, colleagues, employers, or doctors (Breivik et al., 2006). Nearly 40% of chronic pain patients are not satisfied or only somewhat satisfied with their doctor's treatment of their pain (Breivik et al., 2006). Another ongoing issue related to chronic pain sufferers is the opioid crisis being faced in North America and Europe in particular. Concerns stem from the side effects, addiction and related mortality from chronic opioid use (Weesie et al., 2020). Despite these concerns, the prescription of opioids for musculoskeletal pain management continues to rise, particularly among older patients, and the rate of prescription of opioids increases with age (Weesie et al., 2020). Breivik *et al*. reported that 28% of their respondents were taking a prescription opioid with an additional 13% who were taking a non-prescription opioid (Breivik et al., 2006).

1.6 CHIROPRACTIC MANAGEMENT OF CHRONIC MUSCULOSKELETAL CONDITIONS

Chiropractors frequently see patients with chronic musculoskeletal conditions. The vast majority (>90%) of patients seen by chiropractors have musculoskeletal conditions (Beliveau et al., 2017; French et al., 2013; Mior et al., 2019). The most common musculoskeletal complaints seen by chiropractors are spinal conditions such as back pain, neck pain, back-related leg or radicular pain (including sciatica), and cervicogenic headaches (Beliveau et al., 2017; French et al., 2013; Mior et al., 2019). Such spinal conditions account for over 70% of the reasons for patients to attend a chiropractor (Beliveau et al., 2017; Coulter and Shekelle, 2005). Patients with recurrent or chronic conditions make up over half of the populations seen by chiropractors and that has been reported as high as 77%, although reporting varies between countries and may differ based on the definitions of chronicity employed (Ailliet, Rubinstein and Vet, 2010; Coulter and Shekelle, 2005; Coulter et al., 2002; Humphreys et al., 2010; Lishchyna and Mior, 2012; Rubinstein et al., 2000; Waalen and Mior, 2005). Approximately 16% of chronic pain patients report seeing a chiropractor in the past year and nearly 25% have seen a chiropractor at some point in their lives (Beliveau et al., 2017).

The initial consultation between a chiropractor and patient typically lasts between 30 and 45 minutes (Ailliet, Rubinstein and Vet, 2010; Humphreys et al., 2010; Myburgh et al., 2016; Nielsen, Kongsted and Christensen, 2015), while subsequent visits are typically 10 to 15 minutes in duration (Ailliet, Rubinstein and Vet, 2010; French et al., 2013; Humphreys et al., 2010; Myburgh et al., 2016; Nielsen, Kongsted and Christensen, 2015). The treatment methods utilized by chiropractors during visits vary widely although the most frequently employed treatments are forms of manual therapy (French et al., 2013; Mior et al., 2019). In particular, the most commonly used treatment by chiropractors is spinal manipulative therapy

(SMT), with approximately 80% of chiropractic patients receiving SMT (Beliveau et al., 2017; French et al., 2013; Mior et al., 2019; Nielsen, Kongsted and Christensen, 2015). There are numerous forms of SMT including both manual and instrumented techniques; the most frequently used is the Diversified technique, although there are over 100 known chiropractic named techniques (Ailliet, Rubinstein and Vet, 2010; Beliveau et al., 2017; Humphreys et al., 2010; Kaptchuk and Eisenberg, 1998). Chiropractors employ other interventions such as additional forms of manual therapy including mobilizations, manual traction, and soft tissue therapy, exercise prescription, electrical modalities, heat or cryotherapy, and different forms of patient education and advice (Beliveau et al., 2017; French et al., 2013; Mior et al., 2019; Nielsen, Kongsted and Christensen, 2015). This approach has proven efficacious in chronic pain populations as clinical practice guidelines recommend manual therapy including spinal manipulation either alone or in combination with other non-pharmacologic treatments for chronic back pain (Bussières et al., 2018; Foster et al., 2018; Wong et al., 2016), chronic back-related leg pain (Bussières et al., 2018), chronic neck pain (Côté et al., 2016; Coulter et al., 2019b), cervicogenic headaches (Côté et al., 2019a), and osteoarthritis ((NICE), 2014).

1.7 THESIS OVERVIEW

Chapter 2 of the thesis will present a systematic review of the literature on patient-centred care interventions for patients with chronic musculoskeletal conditions. Chapter 3 will present a narrative review of the chiropractic literature on patient-centred care. Both the systematic and narrative reviews were accepted for poster presentation at the World Federation of Chiropractic's Biennial Congress in September 2021.

Chapter 4 describes the foundational work for my thesis. It includes the original study protocol (Stuber et al., 2016) and the pilot study (Stuber et al., 2018) assessing the feasibility of the methods used in my main study. Chapter 4 goes on to describe the research methods of the main study, particularly the quantitative and qualitative methods employed. Based on lessons learned from the original study protocol and pilot study, changes made to the study methods are highlighted.

Chapter 5 presents the findings of the main study, describing the patients and chiropractors involved, as well as the analysis of their responses to both the quantitative and qualitative components of the study. As this was a mixed methods study, qualitative and quantitative results are mixed, rather than presented separately.

Chapter 6 discusses the findings of the study, comparing them to the literature on chiropractic, chronic pain patients, and patient-centred care. The strengths and weaknesses of the study will be discussed as well.

Chapter 7 provides the conclusion to the thesis, detailing the contributions made to the literature and the chiropractic profession, and provides recommendations for future research directions.

CHAPTER 2

ARE PATIENT-CENTRED CARE INTERVENTIONS EFFECTIVE FOR THE MANAGEMENT OF CHRONIC MUSCULOSKELETAL CONDITIONS IN ADULTS? A SYSTEMATIC REVIEW

CHAPTER 2: ARE PATIENT-CENTRED CARE INTERVENTIONS EFFECTIVE FOR THE MANAGEMENT OF CHRONIC MUSCULOSKELETAL CONDITIONS IN ADULTS? A SYSTEMATIC REVIEW

2.0 INTRODUCTION

Chronic musculoskeletal (MSK) conditions are common sources of pain and disability in adults worldwide (Cimas et al., 2017; Fejer, Kyvik and Hartvigsen, 2005; Fejer and Ruhe, 2015; Harrison et al., 2013; Hurwitz et al., 2018b; Ma, Chan and Carruthers, 2014; Reid et al., 2010; Tsang et al., 2008; Vos et al., 2016). The prevalence of chronic pain varies between 15-50%, with moderate-to-severe chronic pain estimated to be 10-20% (Breivik et al., 2006; Fayaz et al., 2016; Mills, Nicolson and Smith, 2019). The prevalence of chronic pain in adults in the United Kingdom has been observed to lie between 13-50% (Fayaz et al., 2016; Mills, Nicolson and Smith, 2019), with a pooled estimate of 43.5% (95 CI=38.4% to 48.5%) from 7 studies according to a recent meta-analysis (Fayaz et al., 2016). The variance in chronic pain prevalence may be attributed to different definitions of minimum pain duration and severity employed in epidemiological studies (Breivik et al., 2013).

Chronic MSK pain is more common in women and remains highly prevalent among the elderly (Breivik et al., 2006; Cimas et al., 2017; Hecke, Torrance and Smith, 2013; Fayaz et al., 2016; Mills, Nicolson and Smith, 2019; Murphy et al., 2017; Vos et al., 2016). The prevalence of chronic pain in older adults is between 25-30% and as high as 62% in those 75 years and older (Fayaz et al., 2016; Reyes, Perea and Marcos, 2019), with even higher rates in frail adults (Reyes, Perea and Marcos, 2019). The prevalence of MSK disorders does not increase substantially with advancing age, and some conditions may slightly decrease in frequency among the oldest age groups (80 years and older) (Fejer and Ruhe, 2015).

The most common chronic musculoskeletal pain is chronic back pain, even among the elderly (Breivik et al., 2006; Fejer and Ruhe, 2015; Schopflocher, Taenzer and Jovey, 2011). Chronic low back pain (LBP) has an estimated prevalence of between 4-25%, with numerous authors putting the prevalence between 13-15% (Côté, Cassidy and Carroll, 2001; Lacasse et al., 2017; Shmagel, Foley and Ibrahim, 2016). Chronic LBP is 2.5 times more prevalent among working populations when compared with non-working populations (Hartvigsen et al., 2018). Back and neck pain are common throughout adulthood, increasing through the 5th and 6th decades but not necessarily increasing in prevalence in older age (Fejer and Leboeuf-Yde, 2012; Shmagel, Foley and Ibrahim, 2016). Arthritis is the second most common musculoskeletal pain among the elderly (Fejer and Ruhe, 2015), with a reported prevalence between 12% and 22% (Harrison et al., 2013; Ma, Chan and Carruthers, 2014). Chronic neck pain has a prevalence of 10% (Côté, Cassidy and Carroll, 2001).

Chronic musculoskeletal (MSK) conditions are among the leading causes of disease burden in society, with low back and neck pain disability ranked first worldwide, and ‘other MSK disorders’ and osteoarthritis ranked eighth and thirteenth, respectively (Hartvigsen et al., 2018; Hurwitz et al., 2018a; Vos et al., 2016). Back and neck pain are the leading cause of disability globally and in most countries, as well as most age groups (Vos et al., 2016). Disability caused by back pain continues to worsen, with a 54% increase in YLD due to back pain between 1990 and 2015 worldwide (Hartvigsen et al., 2018; Vos et al., 2016).

There are numerous demographic, socioeconomic, occupational, and psychological factors associated with chronic pain (Green et al., 2018; Hartvigsen et al., 2018; Mills, Nicolson and Smith, 2019). People with fewer socioeconomic resources, lower income, and less education are more likely to have chronic pain, as are smokers, those who have challenges with employment, and people who use passive coping strategies or demonstrate fear avoidance behaviours (Mills, Nicolson and Smith, 2019). Chronic pain can be further complicated by underlying multimorbidity and polypharmacy (Cimas et al., 2017; Giummarra et al., 2015; Green et al., 2018; Mills, Nicolson and Smith, 2019; Øverås et al., 2021; Poitras et al., 2018). Comorbidities with chronic pain are commonly encountered, depression for example affects 20- 50% of chronic pain sufferers (Breivik et al., 2006, 2013; Hajat and Stein, 2018; Mills, Nicolson and Smith, 2019). More than one-third of adults have multiple chronic conditions with rates reported between 16-57%, although rates can vary based on the differing study definitions and chronic conditions included (Hajat and Stein, 2018; Muggah et al., 2012). Multiple chronic conditions are more likely in women and increase with age (Hajat and Stein, 2018). Sleep disorders, obesity, and anxiety are all associated with chronic pain and can lead to a less favourable prognosis (Mills, Nicolson and Smith, 2019). In younger adults there is a negative relationship between socioeconomic status and having multiple chronic conditions, although this relationship is not seen in older adults (Hajat and Stein, 2018).

Chronic MSK disorders have important direct and indirect economic impacts, with total worldwide costs in the hundreds of billions of dollars (USD) annually (Breivik et al., 2013; Gaskin and Richard, 2012; Ma, Chan and Carruthers, 2014; Reid et al., 2010). The costs of chronic pain equate to 3-10% of a nation's Gross Domestic Product (GDP) (Breivik et al., 2013). In the United States, conservative estimates for the annual total cost of pain are between $550 and 635 billion USD (in 2010 dollars) (Gaskin and Richard, 2012). Both

American and European studies indicate that lost productivity and direct costs each account for roughly half of the costs of pain, $261-$300 billion versus $299-$335 billion respectively in the United States (Breivik et al., 2013; Gaskin and Richard, 2012). Back pain and arthritis in the United States alone have an annual total cost of over $200 billion USD (Ma, Chan and Carruthers, 2014). A European survey of nearly 5000 chronic pain patients from 16 countries showed that nearly 1 in 5 chronic pain patients had lost their job because of their pain and nearly 30% changed their job or job responsibilities because of their condition (Breivik et al., 2006). Health care usage is increased among chronic pain patients as they see more health care professionals and on a more frequent basis (Breivik et al., 2006). Having multiple chronic conditions escalates the cost of healthcare and resource utilization including medication use and physician access appreciably with each additional condition (Hajat and Stein, 2018).

Patients living with chronic pain typically demonstrate realistic treatment expectations (Geurts et al., 2017). Recent research indicates that the goals of care described by patients with chronic spinal pain, for example, are not necessarily curative, but rather focus more on pain management (Herman et al., 2019). Chronic MSK conditions are difficult to manage despite numerous treatment options and clinical practice guidelines (CPGs) (Bussières et al., 2018; Côté et al., 2016, 2019a; (NICE), 2014; Wong et al., 2016). Accordingly, patients with chronic MSK conditions at times describe frustration with the care that they receive (Harding et al., 2005). Patients identify barriers in the management of chronic pain including perceived lack of interest, understanding, or empathy from healthcare professionals, a lack of communication between healthcare professionals, or absence of an integrated holistic approach (Hadi et al., 2017). Arguably, patient-centred interventions could help overcome these barriers by opening dialogue and aligning patient and clinician beliefs and expectations of care, and tailoring treatment plans more to patient preferences. Patient outcomes and corresponding satisfaction can also be enhanced using an evidence-based approach to practice. The application of CPGs and credible research are foundational elements of evidence-based clinical decision making, along with clinical expertise and patient preference (Barratt, 2008; Haynes, Devereaux and Guyatt, 2002; Sackett et al., 1996). Patient preference is an important component of patient-centred care (PCC) (Al-Omari, McMeekin and Bate, 2021; Muhlbacher and Juhnke, 2013), with recent research suggesting that most patients prefer to be well-informed, have input, and participate in their healthcare decisions (Bastemeijer et al., 2021). PCC can help fulfill these preferences for patients with chronic MSK conditions, which can improve compliance and patient satisfaction (Al-Omari, McMeekin and Bate, 2021; Geurts et al., 2017; Parsons et al., 2012).

The Institute of Medicine included PCC in its six aims for improving healthcare, and defined it as "care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions" (Medicine and Medicine, 2001). Policymakers increasingly emphasize and recognize the importance of PCC (Medicine and Medicine, 2001; Paparella, 2016). Some authors contend that patient-centred approaches should be emphasized on several moral grounds including patient autonomy, regardless of the support provided by evidence in the literature (Barratt, 2008; Duggan et al., 2006; Epstein and Street, 2011). However, evidence from systematic reviews suggest that patient-centred approaches and building a therapeutic alliance may produce positive patient health outcomes and improve patient satisfaction for patients with a wide variety of health conditions (Dwamena et al., 2012; Doyle, Lennox and Bell, 2013; Mead and Bower, 2000; Paparella, 2016; Stewart et al., 2000; Stewart, 2005). It has been suggested that PCC facilitates patient empowerment and activation in self-management of chronic conditions, and this is valued by patients (Bastemeijer et al., 2021; Coulter et al., 2015).

PCC can be provided by practitioners in most consultations by establishing a therapeutic relationship, engaging and involving patients in their treatment plans, and treating them as unique individuals with an empathetic and integrative approach (Constand et al., 2014; Miciak et al., 2018; Santana et al., 2018). PCC techniques such as goal setting (Santana et al., 2018; Vermunt et al., 2017), eliciting patient preferences (Al-Omari, McMeekin and Bate, 2021), problem solving (Devan et al., 2018), and shared decision making (SDM) between patient and practitioner can be used to enhance patient engagement in their care and encourage PCC (Barratt, 2008; Barry and Edgman-Levitan, 2012; Bowen et al., 2019; Santana et al., 2018). Methods that facilitate PCC are both desirable and feasible for clinicians who see patients with chronic MSK conditions.

To date there is a notable gap in the literature between the description and application of PCC, and patient outcomes for patients with chronic MSK conditions. The purpose of this systematic review was to review the evidence on the efficacy and/or effectiveness of non-surgical and non-counselling PCC interventions compared with other interventions, placebo or sham interventions, wait list, or no intervention in improving clinical outcomes, self-rated recovery, health-related quality of life, self-efficacy, and satisfaction.

2.1 METHODS

The protocol for this systematic review was registered with the Open Science Framework Registries on June 8, 2020 (osf.io/nc4dq). This review was reported according to the

Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement (http://www.prisma-statement.org/) (Moher et al., 2009).

2.1.1 SEARCH STRATEGY

A search strategy in MEDLINE was developed in consultation with a health sciences librarian and then adapted to other bibliographic databases (see Appendix 1 for the MEDLINE search). A second health sciences librarian assessed the search strategy for completeness and accuracy using the Peer Review of Electronic Search Strategies (PRESS) Checklist (see Appendix 2) (McGowan, Simpson and Lefebvre, 2010). The search was conducted in five databases from inception to September 15, 2020: MEDLINE, EMBASE, CINAHL, the Cochrane Central Register of Controlled Trials, and the Index of Chiropractic Literature. The search terms included free text words relevant to PCC and chronic MSK disorders, as well as subject headings specific to each database (e.g. MeSH in MEDLINE). Reference lists of the full text studies were also consulted for additional references. The search was restricted to papers published in English.

2.1.2 ELIGIBILITY CRITERIA

Population

Studies of adult patients (≥ 18 years old) with chronic MSK disorders were included. A chronic MSK disorder was defined as any mechanical and/or degenerative condition affecting the muscles, joints, bones, ligaments, tendons, fascia or other connective tissues for a minimum duration of three months. Conditions including mechanical or non-specific spinal pain (back and/or neck pain), mechanical or degenerative discogenic pain, tendinopathies, ligament injuries, myofascial conditions, and osteoarthritis / degenerative joint disease, or other degenerative conditions such as spinal stenosis were included in our review. Studies were excluded if the origin of pain was of an inflammatory (e.g., rheumatoid arthritis and other inflammatory arthropathies), neurological (e.g., multiple sclerosis and other painful neurological conditions), major structural (e.g., osteoporosis, fracture, tumor, infection) or undetermined nature (e.g., fibromyalgia, migraine, tension-type or other headaches that are not conclusively known to be of a MSK origin). Studies of post-surgical populations such as groups with osteoarthritis / degenerative joint disease who were post-arthroplasty or post-surgical back pain populations were excluded.

Interventions

Included studies required at least one treatment group to have evaluated the effectiveness of a PCC intervention. A PCC intervention was defined as involving patient participation in the decision-making process (i.e., SDM and /or patient choice) and /or individualized/tailored treatment (i.e., treatment that is customized to the individual patient, based on their presentation and clinical findings) with patient feedback or input. PCC interventions were delivered under the guidance of or in consultation with a healthcare professional, and could have taken place in-person, online or telephone, or at home as part of a self-management strategy. The PCC interventions could include other co-interventions including exercise, medication, education, physical treatments such as manual therapy, or any combination thereof. Studies were excluded if the only patient-centred intervention arm consisted of training interventions for healthcare professionals, surgical choices (i.e., choice of surgical technique or surgery versus no surgery), or predominantly counselling-based interventions such as Cognitive Behavioral Therapy (CBT), Motivational Interviewing (MI), Acceptance and Commitment Therapy (ACT), or other patient-centred counselling techniques.

Comparators

Comparison groups included other interventions, wait list (e.g., wait and see), placebo or sham, or no intervention.

Outcomes

Outcomes of interest included at least one of the following clinical outcomes: pain intensity/severity, disability, health-related quality of life (QOL), self-rated recovery, self-efficacy, or measures of patient satisfaction. Adverse events were included where reported.

Study characteristics

Criteria for eligibility included: (1) published in a peer-reviewed journal; (2) written in the English language; (3) study designs consisting of randomized controlled trials (RCTs), case control, or cohort studies; (4) an outcome measure of interest; and (5) at least one treatment arm that fulfilled the intervention criteria described above.

Studies were excluded if they: (1) did not include or separately analyze patients with chronic MSK conditions; (2) assessed only surgical or predominantly counselling-based interventions (e.g. CBT, MI, ACT, or other patient-centred counselling techniques) or training interventions for healthcare professionals; (3) assessed only administrative or functional outcomes; or (4) were pilot studies, cross-sectional studies, qualitative designs, case series and reports, study protocols, narrative, scoping, or systematic reviews, meta-analyses, consensus statements or clinical practice guidelines, biomechanical or laboratory studies, cadaveric or animal studies, conference proceedings, meeting abstracts, dissertations, government reports, lectures and addresses, books and book chapters, commentaries, letters, editorials, or unpublished manuscripts.

2.1.3 STUDY SELECTION

A two-phase screening process was used to select eligible studies. Screening was completed using a standardized spreadsheet created in Microsoft Excel for Mac® (version 16.45). A calibration exercise was performed prior to phase one to ensure adequate agreement among members of the screening team, which included the researcher (KS). A random selection of 50 titles and abstracts from the electronic search were reviewed independently by each member of the screening team to determine level of agreement for relevance based on the inclusion criteria. A 90% level of agreement among team members was considered the minimum requirement before moving to phase one.

In phase one, pairs of reviewers (GC and KS, SS and KS, DT and KS) independently screened the titles and abstracts classifying them as possibly relevant or irrelevant. In phase two screening, all possibly relevant studies were retrieved for full text review. The same pairs of reviewers independently reviewed the full text of these articles, and assessed inclusion and risk of bias. Disagreements in phases one and two were resolved by consensus, and if not reached, a third reviewer (SM) was consulted.

2.1.4 ASSESSMENT OF RISK OF BIAS

Pairs of reviewers (DT and KS, GC and KS) critically appraised eligible studies independently. The Scottish Intercollegiate Guidelines Network (SIGN) criteria for RCTs, cohort studies, and case-control studies was used to evaluate the internal validity of eligible studies (see Table 2.1). Studies were included if deemed to have a low risk of bias (i.e., 'high quality' or 'acceptable' in the overall assessment on the SIGN criteria), while studies with a high risk of bias (i.e., 'low quality' or 'unacceptable – reject' in the overall assessment on the SIGN criteria) were excluded from the synthesis. In the event of disagreement, consensus on the internal validity was reached through discussions between the two reviewers with a third independent reviewer (SM) resolving disagreements. A minimum score from the SIGN criteria was not used to determine high or low risk of bias.

2.1.5 DATA EXTRACTION AND SYNTHESIS OF RESULTS

The researcher (KS) extracted data and created evidence tables from studies with a low risk of bias (see Tables 2.2-2.5). Two additional reviewers (DT, GC) independently reviewed and verified the extracted data. Slavin's principles of best-evidence synthesis (Slavin, 1986, 1995) were followed to qualitatively synthesize findings from included studies. The results of the synthesis were then stratified by chronic MSK disorder type (i.e., chronic spinal pain, osteoarthritis, etc.). A meta-analysis was conducted if deemed appropriate.

2.1.6 STATISTICAL ANALYSIS

Inter-rater reliability was determined for the citation screening stage and in determining articles with high or low risk of bias after critical appraisal and reported as the kappa (k) statistic with 95% confidence intervals (Viera and Garrett, 2005). When not provided, difference in between-group mean change from baseline with 95% confidence intervals was calculated assuming high correlation ($r=0.80$) between baseline and post-intervention outcomes (Abrams, Gillies and Lambert, 2005; Follmann et al., 1992). Published values were used to determine minimal clinically important difference (MCID) between-group difference for specific outcome measures (e.g. Visual Analog Scale = 10mm/100mm, Numerical Rating Scale = 2/10, Neck Disability Index > 5/50, Oswestry Disability Index >10/100, Roland Morris Disability Questionnaire>5/24, Swiss Spinal Score >3.02) (Cleland et al., 2012; Ostelo et al., 2008; Shearer et al., 2016). Adverse events were reported when described by the authors.

2.2 RESULTS

2.2.1 STUDY SELECTION

The search yielded 6634 entries, including two identified by reference searching (Figure 2.1). 1145 duplicates were removed and 5489 articles were screened. There was 93.5% agreement in the calibration exercise. The inter-rater reliability when screening titles and abstracts was $\kappa = 0.83$ (95% CI = 0.79 to 0.88), which represents 'almost perfect' agreement (Viera and Garrett, 2005). After screening of titles and abstracts, 118 articles were identified for full text review, of which 18 RCTs and 2 cohort studies were eligible for critical appraisal for risk of bias. Two of the identified RCTs each published two articles, resulting in 22 eligible articles for critical appraisal (Dobscha et al., 2008, 2009; Hughes et al., 2004, 2006). The inter-rater reliability for the critical appraisal was κ = 0.79 (95% CI = 0.52 to 1.00), indicating ‘substantial’ agreement (Viera and Garrett, 2005). Five RCTs (from six articles) were deemed to have low risk of bias and included in the synthesis. Meta-analysis was precluded due to the heterogeneity of the included studies in terms of clinical features, treatments, outcome measures, and measurement timepoints.

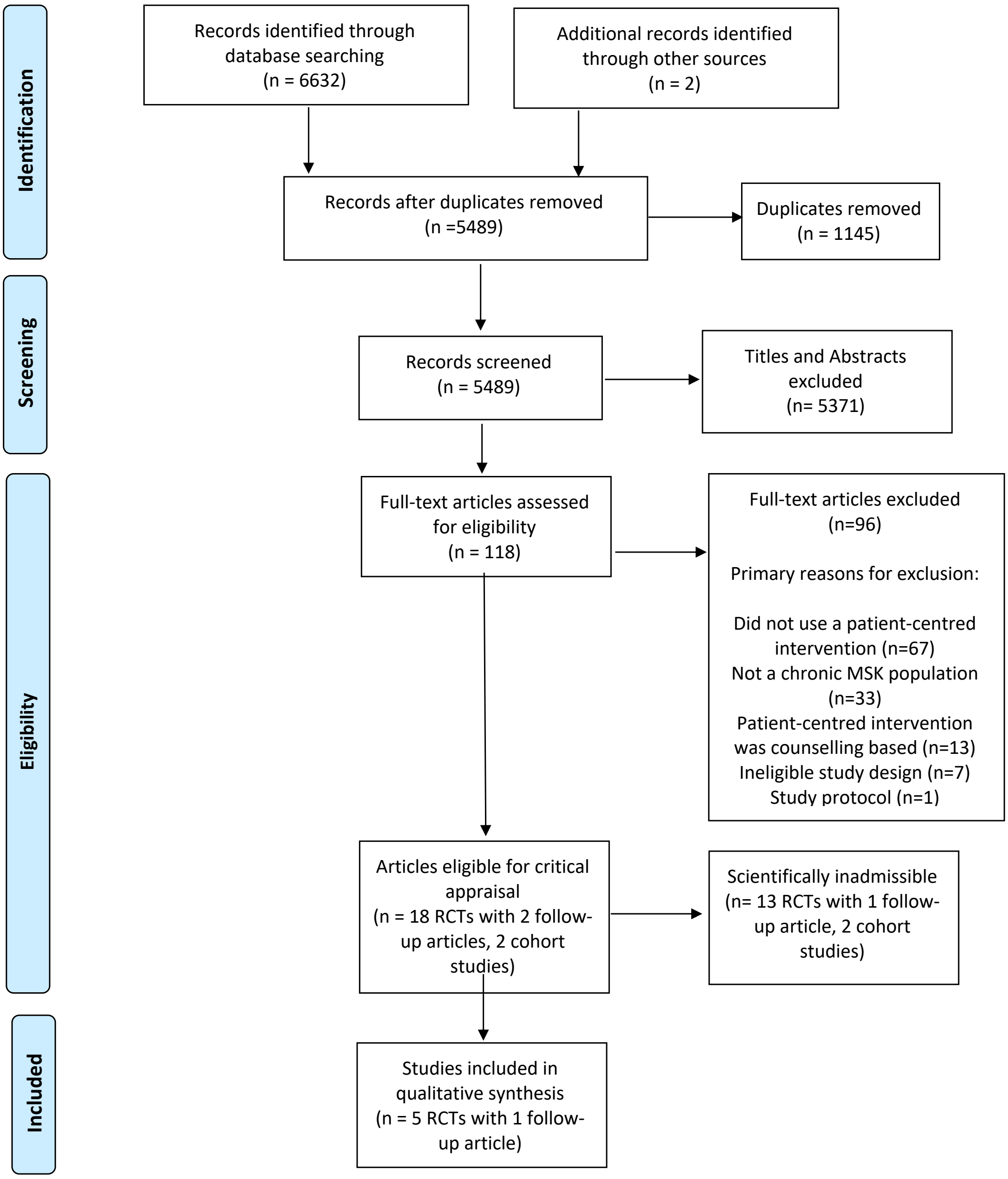


Figure 2.1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram.

2.2.2 RISK OF BIAS WITHIN STUDIES

All included RCTs (Table 2.1) with low risk of bias used suitable randomization methods, employed valid and reliable outcome measures, and performed an intention-to-treat analysis

(Crotty et al., 2009; Dobscha et al., 2009; Hurley et al., 2015; Kravitz et al., 2018; Schneider et al., 2019). Three RCTs reported follow-up rates over 75% in each study arm (Crotty et al., 2009; Dobscha et al., 2009; Kravitz et al., 2018). Two of those studies had follow-up rates of 90% or greater (Crotty et al., 2009; Dobscha et al., 2009). The other two RCTs had at least 75% follow-up in at least one, but not all, study arms (Hurley et al., 2015; Schneider et al., 2019). Among the low risk of bias RCTs, there were some methodological concerns including: allocation concealment (1/5) (Dobscha et al., 2008, 2009), blinding (3/5) (Crotty et al., 2009; Dobscha et al., 2009; Schneider et al., 2019), differences in between-group baseline characteristics (1/5) (Schneider et al., 2019), and possible between group differences besides the treatment under investigation (1/5) (Schneider et al., 2019).

Table 2.1. Risk of bias for accepted randomized controlled trials based on the Scottish Intercollegiate Guidelines Network (SIGN) criteria.

Author, year	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	1.11
Crotty, 2009	Y	Y	Y	N	Y	CS	Y	6 months No dropouts in either group	Y	CS	+
Dobscha. 2008/ 2009	Y	Y	N	N	Y	CS	Y	12 months Intervention = 10% TAU = 10%	Y	CS	+
Hurley, 2015	Y	Y	Y	Y	Y	Y	Y	12 months Walking Program = 39% Exercise Class = 23% Usual Care = 23%	Y	CS	+
Kravitz, 2018	Y	Y	Y	CS	Y	CS	Y	12 months Intervention: 22% Control = 20%	Y	CS	+
Schneider, 2019	Y	Y	Y	N	N	N	Y	6 months Medical care - 23.9% MTIE = 25.3% Group Exercise = 30%	Y	Does not apply	+

Legend: Y = Yes, N = no, CS = Cannot say, N/A = Not applicable, TAU = Treatment As Usual, MTIE = Manual Therapy with Individualized Exercise, + = acceptable

1.1 Research question
1.2 Method of randomization
1.3 Concealment
1.4 Blinding
1.5 Similarity at baseline
1.6 Similarity between arms
1.7 Outcome measurement
1.8 Percentage dropout
1.9 Intention-to-Treat
1.10 Results comparable between sites
1.11 Overall assessment

Fifteen studies in 16 articles, comprising 13 RCTs and two cohort studies, had high risk of bias and were excluded from the synthesis. Among these studies, numerous methodological limitations were identified such as: inadequate description of concealment (10/13) (Alamo, Moral and Torres, 2002; Chassany et al., 2006; Gardner et al., 2019; Hughes et al., 2004; Kearing, Berg and Lurie, 2016; Korff et al., 2005; Martire et al., 2007; Mazzuca et al., 2005; Wilson et al., 2015; Wilkens et al., 2019) or randomization (6/13) (Alamo, Moral and Torres, 2002; Chassany et al., 2006; Korff et al., 2005; Martire et al., 2007; Mazzuca et al., 2005; Wilson et al., 2015), unsuitable blinding (11/13) (Alamo, Moral and Torres, 2002; Bozic et al., 2013; Chassany et al., 2006; Gardner et al., 2019; Hughes et al., 2004; Kearing, Berg and Lurie, 2016; Korff et al., 2005; Martire et al., 2007; Mazzuca et al., 2005; Wilson et al., 2015; Wilkens et al., 2019), between group differences at baseline (2/13) (Alamo, Moral and Torres, 2002; Gardner et al., 2019), lack of information on co-interventions (8/13) (Alamo, Moral and Torres, 2002; Bozic et al., 2013; Gardner et al., 2019; Kearing, Berg and Lurie, 2016; Korff et al., 2005; Riva et al., 2014; Wilkens et al., 2019; Wilson et al., 2015), not using valid and reliable outcome measures (2/13) (Bozic et al., 2013; Kearing, Berg and Lurie, 2016), or not employing intention-to-treat analysis (8/13) (Alamo, Moral and Torres, 2002; Bozic et al., 2013; Coppack, Kristensen and Karageorghis, 2012; Hughes et al., 2004, 2006; Kearing, Berg and Lurie, 2016; Mazzuca et al., 2005; Wilkens et al., 2019; Wilson et al., 2015). The two cohort studies were found to have high risk of bias, since both had inadequate blinding to exposure and did not account for all potential confounding factors (Sepucha et al., 2017, 2018). Furthermore, one of the cohort studies provided an inadequate description of the source population and did not determine confidence intervals for all outcome measures (Sepucha et al., 2018).

2.2.3 STUDY CHARACTERISTICS

Five RCTs were identified (in six articles) with low risk of bias, all were published in 2008 or later. Three RCTs were conducted in the United States (Dobscha et al., 2009; Kravitz et al., 2018; Schneider et al., 2019), one in Ireland (Hurley et al., 2015) and another in Australia (Crotty et al., 2009). The RCTs investigated chronic low back pain (Hurley et al., 2015), hip or knee osteoarthritis (Crotty et al., 2009), spinal stenosis (Schneider et al., 2019), and chronic MSK pain (Dobscha et al., 2009; Kravitz et al., 2018). The PCC interventions studied included SDM (Kravitz et al., 2018; Schneider et al., 2019), problem solving and goal setting (Hurley et al., 2015), patient choice (Crotty et al., 2009), and goal setting and action planning (Crotty et al., 2009; Dobscha et al., 2009). None of the included studies assessed the use of decision aids, although they were used in several studies with high risk of bias (Sepucha et al., 2017, 2018; Wilkens et al., 2019).

2.2.4 SUMMARY OF EVIDENCE

Chronic low back pain

Hurley *et al*. (Hurley et al., 2015) randomized chronic LBP patients to one of three groups, either an eight-week graded individualized walking program (WP), eight weeks of once weekly group exercise classes (EC), or usual physiotherapy (UP) (Table 2.2). The WP and EC groups both received PCC interventions as patients engaged in problem solving and goal setting with a physiotherapist. The UP group received individualized care having a choice of treatments and number of visits at the discretion of the physiotherapist. There were no significant between group differences in change score in disability related to low back pain, pain intensity, health related QOL, or self-efficacy at three, six, and 12 months. There were no significant between group differences in patient satisfaction with care received or outcome at three months. Seven participants in the WP group experienced temporary increases in pain during the intervention, while another seven were withdrawn from the WP group due to increases in pain. Neither the UP or EC groups had any adverse events.

Table 2.2 Evidence from included randomized controlled trial on PCC interventions for chronic low back pain.

First author, year, design, setting, country, number enrolled	**Patient condition, demographics (% female, age)**	**Follow-up and Outcomes**	**Interventions (n) and Comparison groups (n)**	**Main findings**
Hurley, 2015, RCT – 3 arms, 5 hospital physical therapy departments, Ireland, 246 randomized	Chronic (>3 months) or recurrent (>3 episodes in previous 12 months) mechanical LBP, 18-65 years old, 67.9% female, mean 45.4 years (SD = 11.4)	Follow-up at 3, 6, 12 months Disability related to low back pain - ODI (0-100) Pain - 11-point NPRS (0-10) QOL - Euro-Qol-5D-3L (-0.59-1) Self-efficacy – Exercise Self-Efficacy	Walking program (WP) - graded, individualized, pedometer assisted, 8 weeks duration, *included problem solving to address barriers and short- and long-term goal setting between patients and a physiotherapist* (n= 82). Exercise class (EC) - group-based, circuit training, based on Back to Fitness program, 1x/week for 8 weeks, *included problem solving to address barriers and short and long -term*	Between group difference in mean change from baseline with 95% CI (LL to UL) **ODI:** 3 months UP-WP: 1.54 (-4.21 to 7.27) UP-EC: 1.03 (-4.78 to 6.84) WP-EC: -0.51 (-6.27 to 5.26) 6 months UP-WP: -1.81 (-7.36 to 3.74) UP-EC: - 0.83 (-6.40 to 4.74) WP-EC: 0.98 (-4.64 to 6.60) 12 months UP-WP: -1.60 (-7.86 to 4.66) UP-EC: -3.09 (-9.36 to 3.17) WP-EC: -1.49 (-7.74 to 4.74)

		Questionnaire (0-5) Patient Satisfaction Questionnaire	*goal setting between patients and a physiotherapist* (n= 83). Usual Physiotherapy (UP) - individualized education/advice, exercise and manipulative therapy at discretion of physical therapist, as many visits as deemed necessary (n= 81). All participants received a book on self-management of chronic LBP	**NPRS:** 3 months UP-WP: 0.19 (-0.68 to 1.07) UP-EC: 0.73 (-0.14 to 1.59) WP-EC: 0.53 (-0.35 to 1.41) 6 months UP-WP: -0.19 (-1.17 to 0.79) UP-EC: 0.42 (-0.54 to 1.38) WP-EC: 0.61 (-0.38 to 1.59) 12months UP-WP: -0.08 (-1.11 to 0.96) UP-EC: 0.48 (-0.55 to 1.50) WP-EC: 0.56 (-0.46 to 1.56) **Euro-Qol-5D-3L:** 3 months UP-WP: -0.04 (-0.14 to 0.06) UP-EC: -0.06 (-0.16 to 0.04) WP-EC: -0.02 (-0.12 to 0.08) 6 months UP-WP: 0.01 (-0.10 to 0.12) UP-EC: -0.01 (-0.12 to 0.10) WP-EC: -0.02 (-0.14 to 0.09) 12 months UP-WP: 0.02 (-0.10 to 0.13) UP-EC: 0.03 (-0.08 to 0.15) WP-EC: 0.02 (-0.10 to 0.13) **Exercise self-efficacy:** 3 months UP-WP: 0.01 (-0.31 to 0.33) UP-EC: -0.14 (-0.46 to 0.17) WP-EC: -0.16 (-0.47 to 0.16) 6 months UP-WP: -0.01 (-0.31 to 0.28) UP-EC: -0.03 (-0.32 to 0.27) WP-EC: -0.01 (-0.32 to 0.29) 12 months UP-WP: 0.01 (-0.35 to 0.37) UP-EC: -0.10 (-0.46 to 0.26) WP-EC: -0.11 (-0.47 to 0.24) **Satisfaction:** 3 months At least somewhat satisfied with care received EC: 84.8% WP: 85.0% UP: 86.0% At least some benefit for LBP EC: 77.3% WP: 84.5%

				UP: 84.4% No significant between group differences with care received or outcome **Adverse events:** 12 months Increased pain WP: n= 14 (7 with short term pain increase but remained in the study, 7 others withdrew from WP) EC: n= 0 UP: n= 0

Legend: RCT = randomized controlled trial, LBP = low back pain, SD = standard deviation, ODI = Oswestry Disability Index, NPRS = Numerical Pain Rating Scale, QOL = Quality of Life, CI = Confidence Interval, LL = Lower Limit, UL = Upper Limit

Osteoarthritis

Crotty *et al*. (Crotty et al., 2009) conducted an RCT with patients with hip or knee osteoarthritis who were on a waiting list for elective joint replacement and randomized to either a PCC Self-Management and Peer Support (SMPS) group or a usual care (UC) group (Table 2.3). The SMPS group involved PCC through patient choice from a combination of: (1) a self-management model that included patient-centred goal-setting and action planning; (2) an educational program that included generic (15 hours over six weeks) and joint replacement specific components (2.5 hours over two weeks); and (3) monthly peer support telephone calls. The UC group received the standard of care for patients on the joint replacement waitlist and access to the generic educational program. At 6 months there were no significant between-group differences in mean change score from baseline on the Assessment of Quality of Life (AQoL) or on the Western Ontario and McMaster Universities (WOMAC) Arthritis Index for pain, stiffness, or physical functioning. Eleven patients from each group had joint replacement surgery within the six-month follow-up period. Adverse events were not reported by the authors.

Table 2.3. Evidence from included randomized controlled trial on PCC interventions for hip or knee osteoarthritis.

First author, year, design, setting, country, number enrolled	**Patient condition, demographics (% female, age)**	**Follow-up and Outcomes**	**Interventions (n) and Comparison groups (n)**	**Main findings**
Crotty, 2009, RCT – 2 arms, public hospitals (number not indicated), Australia, 152 randomized	Knee or hip osteoarthritis, on waiting list for elective arthroplasty, 60.5% female, mean 67.5 years (SD = 10.8)	Follow-up at 6 months Quality of life – Assessment of Quality of Life (AQoL) (-0.04 – 1.00) Pain, stiffness, and physical functioning associated with osteoarthritis – Western Ontario and McMaster Universities (WOMAC) Arthritis Index – pain (0-20), stiffness (0-8), physical function limitations (0-68)	Self-Management and Peer Support (SMPS) - *Patient choice of :* (a) Partners in Health - Flinders University Chronic Disease Self-Management model – including interview with a nurse and self-management assessment, *goal-setting and development of an action plan* (b) Education program - access to a generic self-management course for chronic disease (2.5 hours per week for 6 weeks), access to a joint replacement specific course, 2.5 hour course over 2 weeks *(c) Peer-support telephone calls on a monthly basis* (n=75, 50 knees, 25 hips) Usual Care (UC) - Typical standard of care for orthopaedic wait list patients, management by primary care physician with appointments initiated by the patient. Follow-up from orthopaedic team every 6 months. Access to generic self-management course for chronic disease (2.5 hours per week for 6 weeks) (n=77, 52 knees, 25 hips)	Between group (SMPS – UC) difference in mean change from baseline with 95% CI (LL to UL) **AQoL:** 6-months: -0.05 (-0.1 to 0.001) **WOMAC pain:** 6-months: -1.0 (-1.807 to 0.193) **WOMAC stiffness:** 6-months: 0.1 (-0.297 to 0.497) **WOMAC physical function limitations:** 6-months: -1.7 (-4.6315 to 1.2315) **Adverse events:** Not reported

Legend: RCT = randomized controlled trial, SD = standard deviation, AQoL = Assessment of Quality of Life, WOMAC = Western Ontario and McMaster Universities, CI = Confidence Interval, LL = Lower Limit, UL = Upper Limit

Lumbar spinal stenosis

Schneider *et al*. (Schneider et al., 2019) randomized older adults with lumbar spinal stenosis (LSS) to either a combination of manual therapy / individualized exercise (MTIE) group, individualized medical care (MC), or group exercise classes (GE) (Table 2.4). In the MTIE group, manual therapy and individualized exercise prescription were provided by either a chiropractor or physical therapist. In the MC group, the group with the PCC intervention, the treating physician engaged in shared decision making to determine which medications to use and if referrals for epidural steroid injections were warranted. Medication prescription could consist of one or more of non-narcotic analgesics, anti-convulsants, or anti-depressants. At two months statistically but not clinically important differences favouring the MTIE group over both the MC and GE groups were seen in mean change from baseline on the Swiss Spinal Stenosis (SSS) questionnaire. No significant differences in SSS questionnaire score were observed between the MC and GE groups. The statistically significant between-group differences were not sustained at six months. However, all three groups demonstrated clinically important within-group improvements in walking distance at two and six months, although there were no between-group differences in walking distance on the self-paced walking test. None of the groups reported any serious adverse events at two months. However, 84 temporary minor adverse events were reported in the MTIE group, compared with 24 in the MC group, and in the 32 GE group.

Table 2.4. Evidence from included randomized controlled trial on PCC interventions for lumbar spinal stenosis.

First author, year, design, setting, country, number enrolled	**Patient condition, demographics (% female, age)**	**Follow-up and Outcomes**	**Interventions (n) and Comparison groups (n)**	**Main findings**
Schneider, 2019, RCT - 3 arms, 1 outpatient research clinic, USA, 259 randomized	Older adults (60 years+) with lumbar spinal stenosis with supporting advanced diagnostic imaging findings, 52.9% female, mean 72.4 years (SD = 7.8 years)	Follow-up at 2 months, 6 months Symptom severity and physical function - 12-item Swiss Spinal Stenosis questionnaire (12-55)	Medical Care (MC) – 3 visits over 6 weeks with a physical medicine specialist, prescription of 1 or more of non-narcotic analgesic, anti-convulsant, or anti-depressant medications. Physician could refer for epidural steroid injections (ESI), and provided generalized activity advice. *SDM employed to decide on medication and referrals for ESI based on response to medications to date at each visit.* (n=88) Group Exercise (GE) – 2 x 45-minute group exercise classes per week for 6 weeks (12 total classes) at self-selected intensity level. Took place at 1 of 2 community centers. (n=84) Manual Therapy with Individualized Exercise (MTIE) - 2 x 45 minute-individual treatment sessions per week for 6 weeks (12 total treatment sessions) consisting of stationary cycling warm-up, manual therapy consisting of mobilizations for lumbar spine, hip, SI joint, and neural structures, and individualized	Between group difference in mean change from baseline with 95% CI (LL to UL) **Swiss Spinal Stenosis Questionnaire:** 2 months: MC-GE: 0.4 (-0.79 to 1.59) MC-MTIE: -2.2 (-3.39 to -1.01) GE-MTIE: -2.6 (-3.74 to -1.46) 6 months: MC-GE: -0.2 (-1.43 to 1.03) MC-MTIE: -1.2 (-2.42 to 0.02) GE-MTIE: -1.0 (-2.23 to 0.23) **Adverse Events:** 2 months: MC: Minor = 24 (5 muscle soreness, 1 joint soreness, 5 GI, 5 drowsiness, 4 dry mouth, 4 headache), Serious = 0 GE: Minor = 32 (21 muscle soreness, 11 joint soreness), Serious = 0 MTIE: Minor = 84 (43 muscle soreness, 39 joint soreness, 1 headache, 1 gastrointestinal), Serious = 0 6 months: MC: 2 spinal surgery GE: 1 spinal surgery MTIE: 1 spinal surgery

			stabilization and stretching exercises Treatment provided by either a chiropractor or a physical therapist. (n=87)	

Legend: RCT = randomized controlled trial, SD = standard deviation, MC = medical care, GE = group exercise, MTIE = Manual Therapy with Individualized Exercise, SDM = shared decision making, CI = Confidence Interval, LL = Lower Limit, UL = Upper Limit

Chronic MSK pain

Two RCTs (in three articles) provide conflicting evidence for PCC interventions for chronic MSK pain (Table 2.5) (Dobscha et al., 2008, 2009; Kravitz et al., 2018). In the first RCT by Dobscha *et al.* (Dobscha et al., 2008, 2009), adults with moderate or severe chronic MSK pain (back, neck, joint or arthritic) for at least 12 weeks were randomized to either an Assistance with Pain Treatment (APT) group or Treatment As Usual (TAU). Statistically significant but not clinically important between group differences in mean change from baseline favoured the APT group over TAU at six and 12 months in pain-related disability on the Roland Morris Disability Questionnaire (RMDQ). Statistically significant between group differences in mean change from baseline favouring the APT group were seen at three, six, and 12 months on both the Chronic Pain Grade Severity and Interference subscales. Significant differences in mean change from baseline favouring the APT group were also found in health-related quality of life on the EQ-5D at 12 months, and treatment satisfaction and perceived effectiveness of pain treatment at six months, but not at the other timepoints. The APT group also had significantly greater improvements than the TAU group in global impression of change over the past six months at both six and 12 months. Adverse events were not reported by the authors.

In the second RCT by Kravitz *et al*. (Kravitz et al., 2018), adults with at least moderate chronic MSK pain (axial/spinal, extremity, or other) for at least six weeks were randomized to either an n-of-1 trial supported by a mobile health app or usual care (UC). The n-of-1 trial was the PCC intervention as patients and clinicians engaged in SDM to determine which pain management regimens to use as part of the trial. The patient and clinician chose the treatments, duration of treatment periods, and number of comparisons. No significant between group differences in change score were found at any follow-up period on any outcome measure. The authors reported that there were no adverse events in either group.

Table 2.5. Evidence from included randomized controlled trials on PCC interventions for chronic MSK pain.

First author, year, design, setting, country, number enrolled	**Patient condition, demographics (% female, age)**	**Follow-up and Outcomes**	**Intervention (n) and comparison groups (n)**	**Main findings**
Dobscha, 2008/2009, RCT- 2 arms, Veterans Affairs Medical Centre including 5 primary care clinics, Oregon, USA, 401 patients assigned to groups	Moderate or greater chronic MSK pain, >12 weeks, 8% female, mean 61.7 years (SD = 11.8)	Follow-up at 3,6, 12 months Pain-related function – Roland Morris Disability Questionnaire (RMDQ) (0-24) Pain intensity - Chronic Pain Grade Severity subscale (0-100) Disability - Chronic Pain Grade Interference subscale (0-100) Health-related quality of life – EQ-5D (-1.0 – 1.0)	Assistance with Pain Treatment (APT) – collaborative care model based on the Chronic Care Model, included assessment with a care manager, including *treatment barrier identification, development of individualized functional goals,* case review and treatment planning by care manager and a pain specialist which was communicated to patient and primary care clinician, potentially including referrals to physical, occupational, or recreational therapy, specialty pain clinic, mental health services or pain specialist consultation. Patients to	**Global impression of change:** APT: 6 months: 3.6 12 months: 3.7 TAU: 6 months: 4.5 12 months: 4.4 Between group (APT - TAU) difference in mean change from baseline with 95% CI (LL to UL) **Roland Morris Disability Questionnaire:** 3 months: 0.5 (-0.13 to 1.13) 6 months: 0.7 (0.19 to 1.21)

		Treatment satisfaction - Global Treatment Satisfaction Effectiveness of pain treatment Global impression of change in past 6 months	attend a 4-session workshop that reflected a *brief activating approach, follow-up by care manager every 2 months to assess and modify goals and activities and to provide support.* Involved clinicians received 3 hours of training on the intervention, SDM, communication, and chronic pain (n=187) Treatment As Usual (TAU) – Clinicians had typical access to speciality pain clinic, mental health services, other services such as physical, occupational, or recreational therapy. Did not employ a cohesive case management approach nor did it involve the barrier identification, goal setting, workshops, or case management follow-up. (n=214)	12 months: 1.1 (0.59 to 1.61) **Chronic Pain Grade Severity subscale:** 3 months: 3.8 (2.04 to 5.56) 6 months: 4.4 (2.50 to 6.30) 12 months: 3.8 (1.75 to 5.85) **Chronic Pain Grade Interference subscale:** 3 months: 4.7 (1.78 to 7.62) 6 months: 5.8 (2.70 to 8.90) 12 months: 7.1 (3.92 to 10.28) **EQ-5D:** 3 months: 0.02 (-0.01 to 0.05) 6 months: -0.01 (-0.03 to 0.01) 12 months: -0.03 (-0.06 to -0.004) **Global Treatment Satisfaction:** 6 months: -0.2 (-0.33 to -0.07) 12 months: -0.1 (-0.23 to 0.03) **Effectiveness of pain treatment:** 6 months: -0.3 (-0.55 to -0.05) 12 months: -0.2 (-0.45 to 0.05) **Adverse Events:** Not reported
Kravitz, 2018, RCT – 2 arms, 5 university and VA and military - based clinics in Northern California, USA, 215 randomized	Chronic MSK pain, >6 weeks, 18-75 years old, 47% female, mean 55.5 years (SD = 11.1)	Follow-up at 3, 6, 12 months Pain related interference - PROMIS pain related interference 8 item short form scale (41-78) Global health - PROMIS Global Health Scale – Physical (16.2 – 67.7) and	n-of-1 (n1) trial - mobile health app supported intervention with *decision based on the clinician's judgment and the patient's preferences, selected 2 pain-management regimens* from: (1) acetaminophen (2) NSAIDs (3) acetaminophen/codeine (4) acetaminophen/hydrocodone (5) acetaminophen/oxycodone (6) tramadol	**Treatment utilization (n-of-1 group):** Acetaminophen - 31% NSAID - 57% Tramadol - 24% Opioid - 26% 1 or more nonpharmacologic treatments, complementary, or alternative treatments - 48% Between group (n-of-1 – UC) difference in mean

		Mental (21.2 – 67.6) subscales Pain intensity - PROMIS 3a short form (36.3-81.8) Satisfaction with pain care (0-100) (pain information, medical care, and pain medications)	(7) complementary/ alternative treatments such as massage, meditation, or physical exercise (8) current therapy or no therapy. All patients received a chronic pain self-management booklet. Treatment regimens could be single agents or combinations. Trials could be structured to compare treatments between or within categories The mHealth app provided reminders to take treatments and to complete questions on pain and treatment-associated adverse effects (n=108). Usual care (UC) – Typical care and a chronic pain self-management booklet (n=103).	change from baseline with 95% CI (LL to UL) **PROMIS Pain-related Interference 8 item short form scale:** 3 months: −0.79 (−2.37 to 0.80) 6 months: -1.36 (-2.91 to 0.19) 12 months: 0.16 (−1.47 to 1.79) 34% in intervention group had improvements of 5 points or more vs 22% in control group (p= 0.05). **PROMIS 3a short form:** 3 months: 0.31 (−1.18 to 1.81) 6 months: -1.41 (-2.87 to 0.06) 12 months: −1.24 (−2.77 to 0.30) **PROMIS Global Health Scale Physical:** 3 months: 0.30 (−1.01 to 1.61) 6 months: -0.17 (-1.45 to 1.12) 12 months: −0.26 (−1.61 to 1.09) **PROMIS Global Health Scale Mental:** 3 months: −0.66 (−2.55 to 1.24) 6 months: 0.93 (-0.92 to 2.79) 12 months: 0.76 (−1.19 to 2.70) **Satisfaction with information about pain and its treatment:** 3 months: 7.77 (−2.87 to 18.42) 6 months: 7.29 (-3.16 to 17.75) 12 months: 4.13 (−6.81 to 15.07) **Satisfaction with medical care:** 3 months: 2.15 (−2.84 to 7.13) 6 months: 3.31 (-1.57 to 8.19)

				12 months: 1.00 (−4.11 to 6.11) **Satisfaction with current pain medications:** 3 months: 1.81 (−4.41 to 8.02) 6 months: -1.57 (-7.68 to 4.54) 12 months: 1.11 (−5.27 to 7.48) **Adverse events:** 3, 6, 12 months: n-of-1: 0 UC: 0

Legend: RCT = randomized controlled trial, SD = standard deviation, ODI = Oswestry Disability Index, NPRS = Numerical Pain Rating Scale, QOL = Quality of Life, SDM = shared decision making, CI = Confidence Interval, LL = Lower Limit, UL = Upper Limit

2.3 DISCUSSION

2.3.1 SUMMARY OF EVIDENCE

Few high-quality studies assessing the effectiveness of PCC interventions in managing chronic MSK conditions were identified. Five RCTs (in six articles) with low risk of bias were included in the review, while 15 studies (in 16 articles) with a high risk of bias were excluded. The included studies with a low risk of bias used several different PCC interventions, including shared decision-making (Kravitz et al., 2018; Schneider et al., 2019), problem-solving and goal setting (Hurley et al., 2015), patient choice (Crotty et al., 2009), and goal setting and action planning (Crotty et al., 2009; Dobscha et al., 2008, 2009) combined with other co-interventions compared with treatment as usual, usual care, or other interventions. None of the included studies reported minimally clinically important between-group differences in mean change scores from baseline on any outcome measures. This review identified one RCT where a PCC intervention that employed treatment barrier identification and individualized functional goal setting as part of a comprehensive chronic pain care plan that could include referrals to numerous health services as well as a 4-session workshop attendance that followed a brief activating approach, was more effective than treatment as usual for patients with chronic MSK pain in terms of: pain intensity, pain-related function, quality of life, treatment satisfaction, and effectiveness at 12 months (Dobscha et al., 2008, 2009). There was conflicting evidence from one study where a combination of manual therapy and individualized exercise that was not patient-centred was more effective than medical care that involved SDM on medication selection and subsequent use for patients with lumbar spinal stenosis at two months in terms of symptom severity and function, although the between-group differences were not sustained at six months (Schneider et al., 2019). This review also identified RCTs evaluating PCC interventions for other chronic MSK conditions, such as chronic low back pain (Hurley et al., 2015) and osteoarthritis of the hip and knee (Crotty et al., 2009), reporting no significant or clinically important differences between the groups receiving PCC interventions or the comparison groups on the outcome measures of interest.

I am unaware of published systematic reviews that specifically assess the effectiveness of PCC interventions for patients with chronic MSK disorders. Bowen *et al*. (Bowen et al., 2019) recently reviewed the use of decision aids to encourage SDM in patients with chronic MSK disorders. None of the 17 studies that they included met this review's inclusion criteria, as most of those studies used outcome measures that were excluded, such as surgical decisions, decision quality, or patient knowledge. Bowen *et al*. (Bowen et al., 2019) found that patient knowledge was positively impacted by using a decision aid for those making decisions on surgery, but other decision-related outcomes were typically mixed. It is unclear if the improvement in patient knowledge impacted clinical outcomes. Earlier systematic reviews have found that PCC can produce positive health outcomes for patients (Doyle, Lennox and Bell, 2013; Dwamena et al., 2012), but did not specifically evaluate chronic MSK conditions nor the related outcome measures.

Several systematic reviews have assessed the effects of SDM on chronic conditions; however, none of the studies included in those reviews specifically targeted chronic MSK conditions nor the effects of SDM on pain and disability (Coulter et al., 2015; Joosten et al., 2008; Shay and Lafata, 2015). The reported effects of SDM on patient satisfaction and health-related quality of life for those with chronic conditions have been mixed (Coulter et al., 2015; Joosten et al., 2008; Kew et al., 2017; Shay and Lafata, 2015). SDM appears to be primarily associated with positive effects on affective and cognitive outcome measures (Bowen et al., 2019; Coulter et al., 2015; Joosten et al., 2008; Shay and Lafata, 2015). A Cochrane review by Coulter *et al*. (Coulter et al., 2015) of personalised care planning that involved SDM processes, including collaborative goal-setting and action planning, found positive effects on at least one outcome measure in the majority (15/19) of studies included. These authors suggested that personalised care can help enhance self-management of chronic conditions, as well as some psychological and physical outcomes, but not health status or health-related quality of life (Coulter et al., 2015). In contrast, this review's findings suggest that there were no appreciable differences between interventions involving SDM and usual care (Kravitz et al., 2018) or other studied interventions (Schneider et al., 2019) at six months or greater for patients with chronic MSK conditions.

Policymakers, ethicists, patient advocacy groups, and other stakeholders increasingly recommend patient-centred approaches to care (Duggan et al., 2006; Epstein and Street, 2011; McClimans, Dunn and Slowther, 2011; Paparella, 2016; Protheroe et al., 2013; Tomaselli et al., 2020; Organization et al., 2015). These recommendations consider the moral and clinical ethical implications of PCC, such as patient autonomy and the provision of care that imparts respect, dignity, and responsiveness (Barratt, 2008; Duggan et al., 2006; Lee and Lin, 2020; McClimans, Dunn and Slowther, 2011). Clinicians and patients are in favour of PCC interventions such as SDM, despite reporting difficulties with their implementation (Manhas et al., 2020; Pollard, Bansback and Bryan, 2015; Zeuner et al., 2015). In using PCC interventions, clinicians can satisfy the moral imperative to serve the best interests of their patients and attempt to provide the best possible care, whilst appreciating they are as effective as usual care in managing chronic MSK conditions.

2.3.2 STRENGTHS AND LIMITATIONS

This review has numerous strengths. It followed the PRISMA statement to increase internal validity and improve reporting (Moher et al., 2009). The search strategy was rigorous as five electronic databases were searched using a search strategy developed with a reference librarian and peer-reviewed by another reference librarian using the PRESS to minimize omissions (McGowan, Simpson and Lefebvre, 2010). Independent pairs of experienced reviewers screened and critically appraised papers and had a high degree of inter-rater agreement and reliability. The SIGN criteria were used to critically appraise eligible studies to decrease the risk of bias and eliminate low-quality studies. Finally, a best-evidence synthesis was conducted to reduce the risk of bias associated with low quality studies.

The limitations of this study include that the search was only conducted in English and included studies published in English, which may have led to publication bias. However, most studies in healthcare research are published in English, so the risk of publication bias due to language restriction is likely to be low, and language restrictions in systematic reviews do not typically bias their results or affect their conclusions (Moher et al., 2003; Nussbaumer-Streit et al., 2020). Common cognitive outcomes found in several studies, such as knowledge or decision-making quality, were not included. Several outcome measures did not have established MCIDs, making it difficult to determine if the observed statistically significant difference was clinically important. Studies were excluded that included counselling-based interventions, particularly when interventions attempted to produce behaviour change in patients. Studies that used ‘tailored’ or ‘individualized’ treatment plans (often exercise prescriptions) were also excluded as I did not consider these interventions as patient-centred unless they allowed for specific inclusion of patient preferences on a tailored or individualized treatment. It is also inherently difficult to determine the therapeutic effects of the component involving PCC (such as SDM, goal-setting, etc.) in the included studies, and what might be due to co-interventions. It is also possible that there might have been some PCC in some of the comparison groups in the included studies, although studies were thoroughly reviewed to determine if this was disclosed.

2.3.3 FUTURE RESEARCH

The findings of this review suggest a need for high-quality research on the effectiveness of PCC interventions in the management of chronic MSK conditions. No studies with a low risk of bias were identified for many important chronic MSK conditions, despite numerous CPGs that recommend patient-centred approaches for patients with chronic MSK conditions (Bussières et al., 2016b, 2018; Côté et al., 2016, 2019a; (NICE), 2014).

Studies of PCC interventions are recommended for chronic MSK conditions as a whole (i.e., all patients with chronic MSK conditions as per Dobscha *et al.*(Dobscha et al., 2008, 2009) , and Kravitz *et al.* (Kravitz et al., 2018)) and for specific chronic MSK conditions such as chronic spinal pain, osteoarthritis, etc., as some chronic MSK conditions could be more responsive to PCC interventions than others.

Identifying barriers to and facilitators of PCC and clinician perceptions of PCC interventions may help enable PCC approaches to be more successful in both research and practice (Devan et al., 2018; Joseph-Williams, Elwyn and Edwards, 2014; Pel-Littel et al., 2021). A consistent set of validated and reliable outcome measures with established MCID and assessment time points should be employed in studies assessing PCC interventions to facilitate comparison and possible data pooling. The outcome measures should include clinical outcome measures as well as other outcome measures that can contribute to recovery from chronic MSK pain such as self-efficacy, empowerment, and motivation. It is also necessary for both researchers and clinicians to consider the role of contextual factors in the management of chronic MSK conditions (Miller and Kaptchuk, 2008; Rossettini, Carlino and Testa, 2018). As an example, a 2016 meta-analysis found that contextual effects contribute the majority (75%) of the overall treatment effect for osteoarthritis pain treatments (Zou et al., 2016). Future studies could also consider technology implementation to help facilitate patient compliance and outcome measurement.

2.4 CONCLUSION

This best evidence synthesis of low risk of bias studies suggests that included PCC interventions provide similar outcomes as usual care or other interventions for patients with chronic low back pain, hip or knee osteoarthritis, or lumbar spinal stenosis. Given its ethical, moral and social desirability PCC should be considered for clinical practice for patients with chronic MSK conditions, consistent with recommendations from healthcare policies and numerous CPGs, although further high-quality, methodologically robust studies exploring PCC interventions for patients with chronic MSK conditions are needed.

CHAPTER 3

CHIROPRACTIC RESEARCH INTO PATIENT-CENTRED CARE: A NARRATIVE REVIEW OF THE LITERATURE

CHAPTER 3: CHIROPRACTIC RESEARCH INTO PATIENT-CENTRED CARE: A NARRATIVE REVIEW OF THE LITERATURE

3.0 INTRODUCTION

The previous chapter presented a systematic review of the literature on patient-centred interventions for chronic musculoskeletal conditions. None of the studies included in the systematic review employed a patient-centred chiropractic intervention, although one of the studies (Schneider et al., 2019) did include a study arm (the MTIE group) that included care by either a chiropractor or physical therapist. To further the assessment of this topic, this chapter provides a review of the literature addressing patient-centred care (PCC) in the chiropractic profession. PCC is an increasingly important topic in healthcare, with its use being encouraged by clinicians, researchers, and policymakers (Davis, Schoenbaum and Audet, 2005; Medicine and Medicine, 2001; Paparella, 2016; Pelzang, 2010). The ability of healthcare professionals to forge a therapeutic alliance and consider the perspectives, desires, and values of their patients can positively affect quality of care and impact patient outcomes, including patient satisfaction. PCC has been defined by the Institute of Medicine (now the National Academy of Medicine) as "providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions"(Medicine and Medicine, 2001).

The chiropractic approach to care has been described as patient-centred, similar to most other complementary medicine professions (Gatterman, 1995; Jamison, 1998, 2001). Several chiropractic educational institutions have increased instruction and emphasis on a patient-centred approach to their students, possibly reflecting accreditation standards that require instruction in PCC (Innes and Kimpton, 2020). Despite this somewhat lengthy history of describing the chiropractic profession as patient-centred, it is possible this could be an *argumentum ad populum,* where just because the idea is popular it is considered true. On the other hand, it could also be an *argumentum ad ignorantiam*, as there has been little assessment of the literature on this topic. Therefore, the purpose of this narrative review is to examine the available evidence pertaining to PCC in the chiropractic profession.

3.1 METHODS

A narrative review, in the form of a narrative overview (Green, Johnson and Adams, 2006), is used in this chapter to provide a broad evaluation of the literature on patient-centred care in the chiropractic profession (Ferrari, 2015). The risk of bias for this review was decreased by *a priori* establishing a search strategy, inclusion criteria, and appraisal methods (Ferrari, 2015).

3.1.1 SEARCH STRATEGY

The search strategy was designed in consultation with my supervisors using combinations of the keywords *chiropract** (a truncated search term) with *patient* (*-centred* or *-centered*), *person* (*-centred* or *-centered*), and *shared decision making*. Embase, PubMed, the Cochrane Library, and the Index to Chiropractic Literature (ICL) were searched from inception through August 5, 2020. The search terms were used and modified to suit the respective databases as necessary. Reference searching of retrieved articles was also conducted, as was a search of the researcher's personal collection of relevant literature.

3.1.2 ARTICLE SELECTION

Following the execution of the search strategy, I assessed the titles and abstracts and the full text of articles that appeared to meet the inclusion criteria were retrieved for further analysis.

Inclusion Criteria

Articles were eligible for inclusion if they were any form of prospective qualitative, quantitative, or mixed methods designs; published in English in a peer-reviewed journal; and relevant to the topic of PCC provided by chiropractors or chiropractic students. Qualitative studies were deemed eligible for inclusion if the subjects interviewed or observed were either chiropractors and/or chiropractic patients specifically, and/or other stakeholders who worked collaboratively with chiropractors and discussed chiropractors and PCC.

Exclusion Criteria

Articles were excluded if they were not specific to the topic of PCC provided by chiropractors; were review articles, retrospective studies, case reports, study protocols, commentaries, editorials, letters to the editor, erratum, conference proceedings, abstracts only; or published in trade magazines or any other non-peer-reviewed source.

3.1.3 APPRAISAL METHODS

Data were extracted into a table consisting of the following information: title, lead author, year of publication, country and setting, study design, sample size and characteristics, and key findings with particular attention paid to the measurement or description of PCC by chiropractors. Included articles were categorized as: (1) clinical studies involving patients; (2) cross-sectional studies involving chiropractors, chiropractic students, or other stakeholders; or (3) qualitative studies. For each category included articles and their findings were further presented and synthesized narratively and critically appraised for their contribution to the body of literature surrounding PCC in the chiropractic profession.

3.2 RESULTS

3.2.1 SEARCH RESULTS

The search identified 36 articles for full paper review. Of these articles, 25 were identified through the electronic database search, 2 through the Cochrane Library, 18 from Embase, 19 from PubMed, and 11 from the Index to Chiropractic Literature, and there were 16 duplicates. A further 6 articles were identified through reference searching (Busse et al., 2009, 2011; Evans, Maiers and Bronfort, 2003; Maiers et al., 2016; Penney et al., 2016; Weis et al., 2016), and 5 came from the researcher's personal collection (Maiers et al., 2014; Myburgh et al., 2016; Shannon et al., 2018; Stilwell et al., 2018; Stochkendahl et al., 2018). Most of the studies not captured in the electronic search were either qualitative or mixed methods studies.

3.2.2 INCLUDED ARTICLES

Of the 36 full text articles identified, 19 met the inclusion criteria. These comprised 6 quantitative studies, consisting of 1 pilot randomized controlled trial (RCT) (Goertz et al., 2017b), 1 observational study (Stomski et al., 2019), 4 cross-sectional studies (Busse et al., 2009; Foley, Steel and Adams, 2020; Hammerich et al., 2019; Weis et al., 2016), along with 1 mixed methods pilot study (Stuber et al., 2018), and 12 qualitative studies (Côté et al., 2001; Lyons et al., 2013; Maiers et al., 2014; Mior et al., 2018; Myburgh et al., 2013; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018a, 2018c; Stilwell and Harman, 2017b; Stilwell et al., 2018; Stochkendahl et al., 2018; Telford, Miller and Miller, 2015).

The 16 full text articles excluded from the review included 5 that did not specifically report data on chiropractors or chiropractic patients (Cohen, Cambron and Shiel, 2009; Carroll et al., 2016; Lund et al., 2020; Parsons et al., 2012; Penney et al., 2016), 7 that did not discuss patient-centredness (Busse et al., 2011; Cohen, Cambron and Shiel, 2009; Evans, Maiers and Bronfort, 2003; Maiers et al., 2016; Myburgh et al., 2016; Schneider et al., 2019; Shannon et al., 2018), 2 were study protocols (Coulter et al., 2019a; Stuber et al., 2016), 2 were document analyses (Dagenais, Brady and Haldeman, 2012; Innes and Kimpton, 2020), and 1 that was an abstract from a conference proceeding (Bertram).

3.2.3 MAIN OUTCOMES

3.2.3.1 CLINICAL STUDIES INVOLVING PATIENTS

Summaries of the clinical studies involving patients selected for inclusion can be found in Table 3.1. Foley, Steel, and Adams (Foley, Steel and Adams, 2020) employed the 10-item Patient-Centred Care Scale (PCCS, maximum score of 5.0), 7-item Perceived Provider Support Scale (PPSS, maximum score of 5.0), the 5-item Empowerment scale (maximum score of 3.0), and the Patient Assessment of Chronic Illness Care (PACIC, maximum score of 5.0) to evaluate patient perceptions of PCC among patients with chronic conditions who see complementary medicine (CM) practitioners from 5 professions – chiropractic, osteopathy, massage therapy, acupuncture, and naturopathy. Among this sample were 28 patients who saw chiropractors. Patients completed the instruments following a visit with a CM practitioner as well as based on their most recent visit with their medical doctor. Higher scores on each of the instruments are indicative of greater patient perception of PCC or empowerment. The overall trend across all 4 instruments, was for the patients of CM practitioners in each of the CM professions to have higher perceptions of PCC, support, and empowerment during consultations than during consultations with their medical doctor.

Among the CM practitioner groups, patients seeing a chiropractor typically had the lowest scores on each of the instrument items, although they still had higher perceptions of PCC, support, and empowerment in consultations with their chiropractor than in consultations with their medical doctor on nearly all the instrument items. Data was only analyzed descriptively due to the small sample size with no further analysis of between group differences. Patients completed the questionnaires related to their most recent CM visit and their most recent medical doctor visit following their visit to a CM practitioner and that may have led to recall bias in their responses.

Stomski *et al.* (Stomski et al., 2019) assessed patients after their fourth visit at 3 chiropractic teaching clinics. Adult patients with nonspecific spinal pain completed the Consultation and Relational Empathy (CARE) questionnaire, the Picker Musculoskeletal Disorder Questionnaire (PMSDQ), and a Numerical Rating Scale (NRS). The CARE questionnaire (10 items producing a score out of 50 where higher scores indicate greater empathy, normative value of 45.8) and PMSDQ (52 items in 6 sections, scored as whether or not they are a problem in the process of receiving care) have both been used to assess PCC. CARE scores among respondents were almost universally high, averaging 46.3 out of 50, and nearly half (45.4%) of the respondents gave the maximum score of 50 out of 50. The CARE results were in line with those previously seen in allied health professions (Howick et al., 2017). Most items in the consultation, treatment, continuing care, and overall impression sections of the PMSDQ were rated as “No Problem” by the majority of respondents. However, some items in the continuing care section relating to receiving tailored information or information on self-care or whom patients could contact if they had concerns about their condition or treatment were not rated as “No Problem” with near the frequency of the other items. However, due to ceiling effect of the CARE outcomes and skewness of all the patient-centredness and empathy outcomes, the authors could not assess the relationship between patient-centredness and pain intensity. Furthermore, visits with students in teaching clinics are typically longer than seen in clinical practice, and thus the results may not necessarily translate or be applicable to a private practice environment. The study only included 108 patients, who were mostly male and averaged 36 years of age, which differs from typical chiropractic patient populations that are older on average and have a predominance of females (Beliveau et al., 2017).

Stuber *et al*. (Stuber et al., 2018) conducted a pilot sequential explanatory mixed-methods study with a quantitative priority where they administered a modified version of the PACIC. They adapted the PACIC for chiropractic patients. The average overall PACIC score was 3.29 with a weak but significant correlation between overall PACIC score and number of health care providers seen in the past year (r=0.26, p=.02) and that was the only variable identified with a significant correlation. The PACIC subscale with the highest average scores were the problem solving/contextual (4.01), patient activation (3.92), and delivery system design/decision support (3.78) subscales, while scores were considerably lower on the goal setting/tailoring (2.78) and follow-up/coordination (2.58) scales. The qualitative component of this study included individual interviews with patients and chiropractors, as well as a mini-focus group interview with patients and a chiropractor. In the interviews, chiropractic care was described as holistic and emphasizing problem-solving and active care, albeit with minimal patient involvement in decision-making and care plan design. Patients described having a trusting relationship with their chiropractor built upon the chiropractor listening to them and spending more time with them during visits, although goal setting and follow-up were described as lacking. This study will be explored in more detail in the following chapter.

The pilot RCT conducted by Goertz *et al.* (Goertz et al., 2017b) compared guideline-based medical care (Medical Care, MC), guideline-based medical care in parallel with chiropractic care (Dual Care, DC), and collaborative care between chiropractors and physicians providing guideline-based medical care (Shared Care, SC) for seniors with low back pain. In the SC group, clinicians developed a shared treatment plan based on their mutual understanding of patient goals after discussion with the patient and their treatment colleague. Patients in the SC group could provide feedback resulting in changes to the treatment plan (Goertz et al., 2013). At 12 weeks the group with the greatest mean decrease in mean and worst pain intensity was the Dual Care group, followed by the Medical Care group and the Shared Care group, there were no statistically significant differences between groups. Only the Dual Care group's average decrease in worst and average pain intensity met or exceeded the Minimal Clinically Important Change (MCIC) of 2.5 on the NRS. The Shared Care group had the greatest average decreases in average RMDQ scores, followed by the Dual Care and Medical Care Groups, but again those differences were not statistically significant. Both the SC and DC groups average scores either met or exceeded the MCIC of 2.0 for the RMDQ. Among the secondary outcome measures, there was a statistically significant difference in perceived improvement in quality of life that favoured the SC and DC groups when compared with the MC group.

Only 4 clinical studies involving patients that evaluated patient-centred care in chiropractic settings were identified in this review (Foley, Steel and Adams, 2020; Goertz et al., 2017b; Stomski et al., 2019; Stuber et al., 2018). While one study did not evaluate patient-centredness of care (Goertz et al., 2017b), among the remaining three studies (Foley, Steel and Adams, 2020; Stomski et al., 2019; Stuber et al., 2018) several different instruments were used to evaluate different elements of empowerment and patient-centredness of care, such as the PACIC, CARE, PMSDQ, PCCS, PPSS, and Empowerment scale. The use of several different instruments makes it difficult to make direct comparisons among these studies, although 2 studies (Foley, Steel and Adams, 2020; Stuber et al., 2018) used the PACIC, and results were not significantly different between them even though the mean overall PACIC and most subscale scores were higher in the study by Stuber *et al*. (Stuber et al., 2018) than the study by Foley, Steel, and Adams (Foley, Steel and Adams, 2020). Each of the included clinical studies suffered from numerous methodological limitations, such as small sample sizes (Foley, Steel and Adams, 2020; Goertz et al., 2017b; Stomski et al., 2019; Stuber et al., 2018) and either brief (Goertz et al., 2017b; Stomski et al., 2019) or no (Foley, Steel and Adams, 2020; Stuber et al., 2018) follow-up periods. Only two of the studies had comparison groups (Foley, Steel and Adams, 2020; Goertz et al., 2017b), of which only one randomly allocated patients to groups (Goertz et al., 2017b). Finally, two of the studies were conducted in settings that may not be representative of chiropractic private practice (Goertz et al., 2017b; Stomski et al., 2019), limiting their potential generalizability. In addition, studies were conducted in 3 different countries: Australia (Foley, Steel and Adams, 2020; Stomski et al., 2019), Canada (Stuber et al., 2018), and the United States (Goertz et al., 2017b). Differences between patients, practitioners and their training, and local healthcare settings may again limit the generalizability of the study findings.

Table 3.1. Summary of clinical studies involving patients reviewed.

First author, year of publication, study title	Country, setting	Study design	Sample size and characteristics	Key findings
Foley, 2020 Perceptions of person-centred care amongst individuals with chronic conditions who consult complementary medicine practitioners	Australia, complementary medicine clinics (chiropractic, naturopathic, osteopathic, massage therapy, acupuncture),	Cross-sectional study – paper-based. Patients were to complete the instrument with respect to their most recent complementary medicine visit as well as their most recent medical visit.	7 chiropractors participated and aided with patient recruitment 153 patients with chronic conditions completed the survey, including 28 chiropractic patients. 71% of the entire sample were between 18-64 years old, 29% were 65+ 82.1% of chiropractic patients were 18-64, 17.9% were 65+ 82.4% of the entire sample were female 67.9% of the chiropractic patients were female.	**Overall PACIC score** Chiropractors = 3.06 (SD 0.72) All CM practitioners = 3.33 (SD 0.82) MDs = 2.95 (SD 0.96) **Patient activation** Chiropractors =3.65 (SD 1.01) CM practitioners = 3.83 (SD 0.97) MDs = 3.38 (SD 1.05) **Delivery system design / decision support** Chiropractors 3.6 (SD 0.78) CM practitioners = 3.87 (SD 0.76) MDs = 3.25 = (SD 0.91) **Problem solving / contextual** Chiropractors = 3.57 (SD 0.91) CM practitioners = 3.8 (SD 0.96) MDs = 3.19 (SD 1.06) **Goal-setting / tailoring** Chiropractors = 2.79 (SD 0.79) CM practitioners = 3.21 (SD 1.03) MDs = 2.78 (SD 1.04) **Follow-up/ coordination** Chiropractors = 2.34 (SD 0.95) CM practitioners = 2.66 (SD 1.02) MDs = 2.52 (SD 1.09)
Goertz, 2017. Patient-centered professional practice models for managing low back pain in older adults: a pilot randomized controlled trial	USA, family medicine residency and chiropractic research centre clinic.	3-arm pilot RCT, chronic LBP patients, older adults (65 years and older), 12 weeks of care 1. Guideline-based medical care	122 participants Shared care group n=42 Dual care group n=44 Medical care group n=36 Average age 72 years 39% female	Primary outcomes at 12 weeks: **NRS-average decrease:** SC= 1.8 (95% CI 1.0-2.6) DC= 3.0 (95% CI 2.3-3.8) MC= 2.3 (95% CI 1.5-3.2) **NRS-worst decrease:** SC= 2.1 (95% CI 1.3-2.9)

		(MC) – including recommendations for self-care and exercise, medication, referrals to other health professions 2. Dual care (DC) – guideline based medical care along with 12 weeks of concurrent chiropractic care 3. Shared care (SC) –co-management by guideline based medical care with chiropractic care	84% had current LBP complaint for at least 1 year. NRS average 5.8/10 RMDQ average 7.5	DC= 2.9 (95% CI 2.1-3.6) MC= 2.3 (95% CI 1.5-3.1) **RMDQ average decrease:** SC = 2.8 (95% CI 1.6-4.0) DC = 2.5 (95% CI 1.3-3.7) MC: = 1.5 (95% CI 0.2-2.8)
Stomski, 2019. The adoption of person-centred care in chiropractic practice and its effect on non-specific spinal pain: an observational study	Australia, 3 university chiropractic student training clinics, 1 on-campus, 2 outreach clinics	Observational study - non-specific spinal pain patients invited to participate after 4th visit at chiropractic training clinic	108 chiropractic patients with non-specific spinal pain. Average age 36.3 years (SD 13.8) 40.6% female 55% with low back pain 25.7% with neck pain 11% with midback pain	**CARE** Mean = 46.3 (SD 5.0) **PMSDQ** Percentage of respondents who indicated a problem with: Getting information about different treatments = 31.4% Receiving information about self-management = 43.9% Getting advice adapted to their family and living situation = 62.7% Getting advice adapted to their work situation = 29.5% Receiving information of who to contact if they had concerns = 42.5% **NRS** Baseline mean = 4.1 (SD 2.0) 4-week mean = 2.1 (SD 1.5)

Stuber, 2018. A pilot study assessing patient-centred care in patients with chronic health conditions attending chiropractic practice.	Canada, 2 multi-disciplinary private practices	Sequential explanatory mixed methods pilot study with quantitative priority.	Quantitative component - 78 chiropractic patients with chronic health conditions. Average age 47.1 years 60.3% female Average 1.8 chronic condition per patient, 52.6% >1 chronic condition, 44.7% indicated overall health as average. Qualitative component – 4 chiropractors and 6 chiropractic patients completed individual interviews, 3 patients and 1 chiropractor participated in mini-focus group.	**Overall PACIC score =** 3.29 (95% CI (3.21, 3.46)) **Patient activation =** 3.92 (95% CI 3.71-4.12) **Delivery system design/ decision support =** 3.78 (95% CI 3.60-3.96) **Problem solving/contextual** = 4.01 (95% CI 3.83-4.20) **Goal-setting/tailoring =** 2.78 (95% CI 2.57-2.99) **Follow-up/ coordination =** 2.58 (95% CI 2.35-2.82)

RCT = randomized controlled trial, PACIC = Patient Assessment of Chronic Illness Care, NRS = Numerical Rating Scale, RMDQ = Roland Morris Disability Questionnaire, PMSDQ = Picker Musculoskeletal Disorder Questionnaire, CARE = Consultation and Relational Empathy, MD = Medical Doctor, CM = Complementary Medicine

3.2.3.2 CROSS-SECTIONAL STUDIES

Table 3.2 summarizes 3 cross-sectional studies of chiropractic students and other healthcare professionals. Hammerich *et al.* (Hammerich et al., 2019) conducted an online survey using the Patient-Practitioner Orientation Scale (PPOS) to assess attitudes of chiropractic students toward PCC. The PPOS has been validated (Shaw, Woiszwillo and Krupat, 2012) and is frequently used in studies of health professional student attitudes towards PCC. The survey was undertaken at 7 chiropractic educational institutions in 6 countries on 3 continents and included students from all years of study. The PPOS consists of 18 items and provides an overall score as well as scores on ‘sharing’ and ‘caring’ subscales, each consisting of 9 items. For each of the overall and the 2 subscales a score from 1 to 6 is determined, where lower scores indicate more doctor-centred attitudes while higher scores indicate more patient-centred attitudes. The overall PPOS score determined for the 1858 students who completed the survey was 4.18, while the average score on the Caring subscale was 4.48 and 3.89 on the Sharing subscale. Age, gender, and educational institution attended all made small but significant contributions to each of the subscale scores and the overall PPOS score. Increasing age and female gender contributed to higher PPOS scores on all 3 scales, and educational institution showed moderate to large effect sizes in their impact on PPOS scores. The mean PPOS scores overall and on the 2 subscales from these chiropractic students were lower than most seen in similar studies of medical students. PPOS scores were not affected by chiropractic student semester or year of study. The study was only conducted in those 7 institutions, so it is uncertain if they are representative of all chiropractic educational programs internationally. In addition, the PPOS was administered in English and French only, so it is uncertain if there were comprehension issues for students from countries where those are not official languages. Furthermore, the extent to which chiropractic student attitudes to patient-centred care translate to their future attitudes in practice is unknown, as is if they are comparable to the attitudes of already practicing chiropractors.

Busse *et al.* (Busse et al., 2009) and Weis *et al.* (Weis et al., 2016) surveyed Canadian and American orthopaedic surgeons and Canadian obstetricians for their respective opinions on chiropractic. Both surveys employed the 20-item Chiropractic Attitude Questionnaire (CAQ) designed and validated by Busse *et al.* (Busse et al., 2009). The CAQ contains 1 item that specifically asks respondents to what extent they agree with the statement that “Chiropractors provide a patient centred approach.” Nearly half (45.6%) of the orthopaedic surgeons surveyed agreed with that statement, while just over half of the obstetricians (57.7%) agreed. Responses to this item in both studies were only reported descriptively without additional analysis for variables that may affect item responses. It is uncertain whether the use of this single item on the CAQ to inquire about a complex topic such as the provision of patient-centred care by chiropractors is sufficient to determine the actual attitudes or opinions of other professionals, and it is also uncertain the extent to which their perceptions may be influenced by both personal and professional biases or other variables. The CAQ has not been employed aside from the 2 studies included in this review.

The 3 cross-sectional studies were each conducted among unique populations including chiropractic students from 7 chiropractic educational institutions in 6 countries (Hammerich et al., 2019), Canadian obstetricians (Weis et al., 2016), and Canadian and American orthopedic surgeons (Busse et al., 2009). The different intents of the instruments used, and populations surveyed in these studies limits further comparison. The response rates of each of the cross-sectional studies were below 50%, including Weis *et al.* (Weis et al., 2016) which was markedly lower at 15%, leading to possible concern of non-response bias despite each of these studies employing methods to improve their response rates such as repeated distribution and personal contacts.

Table 3.2. Summary of cross-sectional studies of chiropractic students and other healthcare professionals.

First author, year of publication, study title	**Country, setting**	**Study design**	**Sample size and characteristics**	**Key findings**
Busse, 2009, Attitudes toward chiropractic. A survey of North American orthopedic surgeons	Canada and USA	Cross-sectional study, paper-based survey distributed by fax	Canadian and American orthopaedic surgeons, 487 completed surveys / 1000 invited, 243 Canadians, 244 Americans. 45.8% in practice > 20 years 94% male	49% completed response rate. **CAQ mean =** 34.7 (SD 11.9, range 4-68). 29.4% had positive opinion of chiropractic, 44.5% had negative opinions. 45.6% agreed that chiropractors provide a patient-centred approach, 15.6% disagreed, 38.8% undecided.
Hammerich, 2019, Assessing attitudes of patient-centred care among students in international chiropractic educational programs: a cross-sectional survey	Canada, USA, Wales, Denmark, France, Australia, 7 chiropractic educational institutions	Online cross-sectional study.	1858 chiropractic students completed the survey, Average age 24.7 57% female	48.9% response rate **PPOS – Sharing =** 3.89 (SD 0.64) **PPOS – Caring =** 4.48 (SD 0.52) **PPOS Total =** 4.18 (SD 0.48)
Weis, 2016, Attitudes toward chiropractic: a survey of Canadian obstetricians	Canada	Online cross-sectional study	Canadian obstetricians, 91 completed surveys / 659 invited. 30.8% in practice > 20 years 63.7% female	15% completed response rate. **CAQ mean =** 41.2 (SD 11.7, range 0-69). 30.0% had positive opinion of chiropractic, 33.3% had negative opinions. 57.7% agreed that chiropractors provide a patient-centred approach, 5.5% disagreed, 36.7% undecided

PPOS = Patient-Practitioner Orientation Scale, CAQ = Chiropractic Attitude Questionnaire

3.2.3.3 QUALITATIVE STUDIES

Table 3.3 summarizes the included qualitative studies. Among the 12 qualitative studies included in this review, 6 included interviews with patients or family members (Lyons et al., 2013; Maiers et al., 2014; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018a; Stilwell and Harman, 2017b; Telford, Miller and Miller, 2015), 8 included interviews with chiropractors (Côté et al., 2001; Mior et al., 2018; Myburgh et al., 2013; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018a; Stilwell et al., 2018; Stilwell and Harman, 2017b; Stochkendahl et al., 2018), 3 included interviews with other healthcare professionals (Mior et al., 2018; Salsbury et al., 2018a, 2018c), while 2 more included interviews of other stakeholders (Mior et al., 2018; Salsbury et al., 2018a). Three of the qualitative papers comprised the qualitative components of 2 different RCTs (Lyons et al., 2013; Maiers et al., 2014; Salsbury et al., 2018c).

Five qualitative studies explored the approach that chiropractors take in different clinical scenarios such as the screening and management of psychosocial factors (Stilwell et al., 2018), exercise prescription (Stilwell and Harman, 2017b), preventive or maintenance care (Myburgh et al., 2013), and management of return-to-work (Côté et al., 2001) or sickness absence management (Stochkendahl et al., 2018) and specifically mentioned a patient-centred approach. Similarly a patient-centred approach was described in the chiropractic management of several clinical populations, including pregnancy (Sadr, Pourkiani-Allah-Abad and Stuber, 2012), infants (Telford, Miller and Miller, 2015), injured workers (Côté et al., 2001; Stochkendahl et al., 2018), and adults of varying age groups with different forms of spinal pain (Lyons et al., 2013; Maiers et al., 2014; Salsbury et al., 2018c; Stilwell and Harman, 2017b; Stilwell et al., 2018). Four of the qualitative studies evaluated the opinions of different stakeholders on the addition of chiropractic services to existing healthcare services or in the provision of collaborative care for different populations (Lyons et al., 2013; Mior et al., 2018; Salsbury et al., 2018a, 2018b). In each of those 4 studies a patient-centred approach to care by chiropractors was deemed desirable and important to those stakeholders for the successful inclusion of chiropractic services (Lyons et al., 2013; Mior et al., 2018; Salsbury et al., 2018a, 2018b).

In several of the qualitative studies, the manner in which chiropractic is patient-centred was described and it typically involved patient-centred communication and the establishment of trust and rapport in a therapeutic alliance with patients and providing care plans that are tailored to each patient (Côté et al., 2001; Maiers et al., 2014; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Stochkendahl et al., 2018; Telford, Miller and Miller, 2015). In 2 Canadian studies led by Stilwell, barriers and facilitators were identified under a theme of PCC and therapeutic alliance to different clinical activities (screening and management of psychosocial factors in LBP patients and exercise prescription adherence in LBP patients) (Stilwell and Harman, 2017b; Stilwell et al., 2018). Identified facilitators included goal setting, the development of rapport and a trusting relationship, and meeting patient expectations. Meanwhile some of the barriers included a poor relationship or lack of understanding, expectations of a mechanical or tissue-based treatment, and not meeting patient expectations. Specific recommendations for PCC were made by Lyons (Lyons et al., 2013) and Salsbury (Salsbury et al., 2018a, 2018c) and included providing individualized care, with honest open communication and listening to patients and their preferences, setting goals, providing referrals when necessary, and spending sufficient time with patients.

PCC or patient-centred communication was identified as either a major theme or central domain in 6 studies (Lyons et al., 2013; Salsbury et al., 2018a, 2018c; Stilwell and Harman, 2017b; Stilwell et al., 2018) or as a sub-theme (Côté et al., 2001) and described in detail. In the remaining 6 qualitative studies, the provision of PCC or patient-centred communication were mentioned but not described in detail (Maiers et al., 2014; Mior et al., 2018; Myburgh et al., 2013; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Stochkendahl et al., 2018; Telford, Miller and Miller, 2015). In many of the qualitative studies, the generalizability of the findings may be limited by the special or localized populations that were interviewed (Côté et al., 2001; Lyons et al., 2013; Mior et al., 2018; Myburgh et al., 2013; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018c, 2018a; Stilwell and Harman, 2017b; Stilwell et al., 2018; Stochkendahl et al., 2018; Telford, Miller and Miller, 2015). Similarly, several studies did not employ methods to enhance the validity of their findings such as triangulation by interviewing different stakeholders (Côté et al., 2001; Maiers et al., 2014; Myburgh et al., 2013; Stilwell et al., 2018; Stochkendahl et al., 2018; Telford, Miller and Miller, 2015), and many did not use member checking (Côté et al., 2001; Lyons et al., 2013; Maiers et al., 2014; Myburgh et al., 2013; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018c, 2018a; Stilwell and Harman, 2017b; Telford, Miller and Miller, 2015). Finally, only a few of the included qualitative studies mentioned reflexive consideration of the influence and attitudes of the researchers (Myburgh et al., 2013; Sadr, Pourkiani-Allah-Abad and Stuber, 2012; Salsbury et al., 2018a; Stilwell and Harman, 2017b; Stilwell et al., 2018).

Table 3.3. Summary of qualitative studies reviewed.

First author, year of publication, study title	Country, setting	Study design	Sample size and characteristics	Key findings
Cote, 2001. Chiropractors and return-to-work: the experiences of three Canadian focus groups.	Canada, 3 large cities in 3 provinces	3 focus group interviews using a structured interview schedule, 11 individual semi-structured interviews in one city after difficulty with audio recordings. Purposeful sampling.	29 chiropractors, 2 female, age range 27-49 years old, 0-40% of their patient population were workers' compensation cases	PCC was identified as a sub-theme as a part of the major theme of 'approach used by chiropractors to manage occupational injuries'. Chiropractors described the importance of interaction and communication with patients and building a therapeutic relationship early on where both understood the condition being treatment and had realistic expectations, while advocating for the patient and empowering the patient towards self-management.
Lyons, 2013. Perspectives of older adults on co-management of low back pain by Doctor of Chiropractic and family medicine physicians: a focus group study	USA, community dwelling older adults (65 years+) recruited from a family medical clinic, chiropractic academic health centre, senior centers, senior housing sites	Structured focus group interviews, participants by letter from patient lists at a family medicine clinic and chiropractic academic health center and through flyers at two senior centers (SC) and three senior housing (SH) sites. 1 hour long. Content analysis conducted.	10 focus groups with 48 older adults with low back pain in the past year. Average age 75.2 years (SD = 8), 38 female	Patient-centred communication was identified as a theme. That along with a patient-centred approach in general were necessary for the collaborative care of LBP in older adults. Patient-centred communication was further deemed to be needed in all interactions between patients and health professionals. The patients made recommendations for patient-centred communication in co-management of LBP by MDs and DCs that included being respectful, open, and honest, listening to patients, providing explanations of their condition, treatment, and prognosis, spending sufficient time with patients, working together and in agreement with other providers and presenting themselves as a team, providing individualized care, and allowing patients to use their own judgment.
Maiers, 2014. Perceived value of spinal manipulative therapy and exercise among seniors with chronic neck pain: a mixed methods study.	USA, clinical research centre in a health sciences university	Mixed methods – qualitative component within an RCT, semi-structured individual interviews occurred at 12-week point of intervention. Content analysis conducted	222 seniors (65 years and older) with chronic neck pain interviewed. Average 72.2 years old, 47% female. Mean pain intensity 5/10 (SD 1.4), median neck pain duration 6 years (SD 14.4)	Patient perception of value for an intervention is influenced by how care is delivered. The interpersonal dynamic between the patient and professional can increase the value patients place on an intervention through their relationship with their health care providers and how their care is individualized. This can be leveraged to increase active care and patient education to help

				empower patients, increase patient satisfaction and value of care.
Mior, 2018. Exploring chiropractic services in the Canadian Forces Health Services – perceptions of facilitators and barriers among key informants	Canada, telephone interviews with health professionals, military personnel, and researchers with experience in military health care settings	Qualitative study, 45-60 minute semi-structured individual interviews by telephone. Purposeful and snowball recruiting techniques employed. Content analysis conducted.	25 interviews conducted. 7 MDs, 13 PTs, 5 DCs. 76% male, 52% military personnel, 24% civilians, 24% contactors and civil servants employed by the Canadian Department of Defense.	Key informants felt that the integration of chiropractic services into the on-base services of the CFHS should be in a patient-centred spine care model that is collaborative, integrative, and evidence-based. This may need to occur on a personal referral basis as the diversity within the chiropractic profession can create barriers to collaboration.
Myburgh, 2013. The Nordic maintenance care program: what is maintenance care? Interview based survey of Danish chiropractors	Denmark, interviews	Phenomenological case study, semi-structured interviews, 20-50 minutes long. Purposeful sampling. Thematic analysis conducted	10 chiropractors, 50% female, 3 US educated, 4 UK educated, 3 Denmark educated, 3 high use of maintenance care, 3 medium use, 3 low use, 1 medium/low use	Maintenance care is a form of secondary and tertiary prevention often for patients who have recurrent injuries. The provision of maintenance care comes from a patient-oriented approach to care and is a shared decision between the chiropractor and patient which is often enabled by a positive chiropractor-patient relationship.
Sadr, 2012. The treatment experience of patients with low back pain during pregnancy and their chiropractors: a qualitative study.	Canada, in-person and telephone interviews	Individual semi-structured interviews 15-20 minutes long with patients and 10-15 minutes with chiropractors, conducted in-person or over the telephone. Grounded theory approach employed	11 pregnant patients with low back pain, 24-36 years old and 17-38 weeks pregnant interviewed 12 chiropractors (3-38 years in practice) interviewed	The approach to pregnancy care was described as patient-centred by the chiropractors in that it was tailored to each patient and their presentation and relevant biopsychosocial issues.
Salsbury, 2018, Interdisciplinary practice models for older adults with back pain: a qualitative evaluation	USA, family medicine residency and chiropractic research centre	Qualitative study within an RCT. In-person individual structured interviews, field note review and chart abstraction. Content analysis employed.	13 family medicine residents, 6 chiropractors interviewed.	PCC and communication were identified as common priorities between family medicine and chiropractic and central to the conceptual model of collaborative care for LBP in older adults. Recommendations for PCC from clinicians included open communication (discussing pain management over cures, listening, problem solving), goal-setting, determining patient motivation and treatment preferences, encouraging lifestyle changes, referrals for issues outside of scope of practice, asking about care from other practitioners, and sufficient appointment times for thorough assessments.

Salsbury, 2018. Be good, communicate, and collaborate: a qualitative analysis of stakeholder perspectives on adding a chiropractor to the multidisciplinary rehabilitation team	USA, rehabilitation specialty hospital	Qualitative organizational case study using ethnographic methods, including participant observation, individual in-person semi-structured interviews and role-specific focus group interviews following purposive sampling. Content analysis employed.	Interviews with patients (n=6), family members (n=4), staff (n=48), and members of the community (n=2)	60 interviews conducted. Patient-centredness identified as the central domain and desirable quality in a chiropractor in a multidisciplinary rehabilitation setting, mentioned in all interviews by members of all stakeholder groups. Patient-centredness defined as "quality of a chiropractor (and, importantly, all staff members) that demonstrates a provision of care that is respectful and responsive to the patient, and which is inclusive of the person's values, preferences, and needs."
Stilwell, 2018. A qualitative study of Doctor of Chiropractic in a Nova Scotian practice-based research network: barriers and facilitators to the screening and management of psychosocial factors for patients with low back pain.	Canada, chiropractic Practice-Based Research Network	Individual semi-structured interviews informed by Theoretical Domains Framework. Content analysis used.	10 chiropractors, 6 women, 9 in practice <5 years, 1 >20 years, all graduates from the same chiropractic college	PCC and therapeutic alliance was 1 of 6 themes of barriers and facilitators to screening and managing psychosocial factors in patients with low back pain. Barriers to screening and managing psychosocial factors in patients with low back pain under the therapeutic alliance and PCC theme: 1. Patients expect mechanical or tissue-based treatment 2. Concern about meeting patient expectations so that they do not leave care due to lack of results 3. Use of psychosocial questionnaires can negatively impact chiropractor-patient relations 4. Concern about patient response to and stigma associated with referral to a mental health provide Facilitators of screening and managing psychosocial factors in patients with low back pain under the therapeutic alliance and PCC theme: 1. Meeting patient expectations while addressing psychosocial issues 2. Building trust and rapport over time allows for psychosocial issues to be identified and addressed.

				3. Having an emotional connection or response with the patient builds rapport and helps psychosocial issue management 4. Helping patients understand that exercise and education are valuable treatments for back pain.
Stilwell, 2017. 'I didn't pay her to teach me how to fix my back': a focused ethnographic study exploring chiropractors' and chiropractic patients' experiences and beliefs regarding exercise adherence	Canada, interviews conducted in a university setting, participants recruited from the community and local chiropractic clinics	Focused ethnographic design, 50-90 minute in-person individual semi-structured interviews	6 chiropractors interviewed -1 female, 5 male, average of 8.3 years in practice (SD = 7.3). 6 chiropractic patients interviewed – 3 male and 3 female, average age of 34.5 years (SD=14.4), average of 10 years of back pain (SD = 8.3), minimal to moderate disability due to back pain.	PCC and therapeutic alliance was 1 of 4 themes of barriers and facilitators to exercise prescription adherence in patients with chronic low back pain Barriers to exercise prescription adherence under the therapeutic alliance and PCC theme: 1. Poor relationship between chiropractor and patient 2. Patient perception that they are not understood by clinicians Facilitators of exercise prescription adherence under the therapeutic alliance and PCC theme: 1. Developing trust and rapport DC helping the patient set goals for exercise
Stochkendahl, 2018. Can chiropractors contribute to work disability prevention through sickness absence management for musculoskeletal disorders? - a comparative qualitative case study in the Scandinavian context	Sweden, Norway, Denmark, interviews conducted in convenient locations for participants	Qualitative study within a sequential exploratory mixed-methods study. In-person semi-structured individual interviews, 12-65 minutes long. Purposeful (n=9) and snowballing (n=3) sampling methods. Content analysis conducted.	12 chiropractors interviewed, 4 from Sweden, 4 from Norway, 4 from Denmark. 4 female, average 42.7 years.	Chiropractors from Denmark and Norway described an approach to sickness absence management that was multimodal, holistic, patient-centred, and considered the patient's work situation.
Telford, 2015. Patient-centered health care for infants: a qualitative analysis of mothers' experiences and preferences	England, chiropractic teaching clinic	Qualitative study including individual semi-structured interviews and 1 focus group interview. All interviews 30 minutes in duration. Content	34 mothers with infants attending the clinic, 31 individual interviews and 3 in the focus group interview. 26 primiparous mothers, average 7.2 health professionals seen	Mothers discussed the importance of reassurance and open communication including listening.

		analysis conducted.	for problem (range 2-17), 9 reported multiple birth interventions, 19 female babies, 19 babies with feeding problems, 8 presented for check-up, 6 babies had a head turning direction of preference, 5 babies had sleep issues	

MD = Medical Doctor, DC = Doctor of Chiropractic, PT = Physical Therapist, RCT = randomized controlled trials, SD = standard deviation, SMT = spinal manipulative therapy, CFHS = Canadian Forces Health Services, LBP = low back pain.

3.3 DISCUSSION

To the best of my knowledge, this review represents the first evaluation of evidence assessing the nature or depth of PCC delivered by chiropractors. The majority of the evidence evaluating patients' perceptions of the patient-centredness of chiropractic care suggests it is similar to that in other health professions (Foley, Steel and Adams, 2020; Stomski et al., 2019; Stuber et al., 2018). Chiropractic patient ratings of the patient-centredness of chiropractic care were slightly higher than reported in previous research on medical care (Foley, Steel and Adams, 2020; Krucien, Vaillant and Pelletier-Fleury, 2014; Stuber et al., 2018), but slightly lower than other complementary medicine professions (Foley, Steel and Adams, 2020). However, the differences were not statistically significant.

To date only 1 study has looked at the potential effects of a patient-centred intervention used by chiropractors in the form of shared decision-making in the Shared Care group of the pilot RCT conducted by Goertz *et al.* (Goertz et al., 2017b). However, the results could be considered mixed at best as the Shared Care Group showed the least average decrease in pain among the 3 groups when compared at 12 weeks, with the average decreases not exceeding the MCIC for the NRS, despite showing the greatest average decrease in disability and exceeding the MCIC for the RMDQ. Even then, the differences between groups were not statistically significant. As this was a pilot study, the sample size was small with approximately 40 patients per group. It may not be suitable to generalize its findings to the professional relationships or procedures found in private practice as the study settings were markedly different than private practice settings, as they consisted of a chiropractic research centre and family medicine residency clinics. The collaboration of the Shared Care group in particular may be difficult to reproduce in private practice and may only be suited to more specialized settings such as hospitals or multidisciplinary group practices. The follow-up period of 12 weeks was also relatively brief, particularly for a patient population where the majority of patients (84%) experienced low back pain for greater than 1 year. In addition, this study did not employ any instruments that ascertained the extent to which patients felt that the care that they received was patient-centred.

When chiropractic students were asked to rate their orientation between more patient-oriented and doctor-oriented care (Hammerich et al., 2019), the average scores overall and on caring and sharing subscales trended toward more doctor-centred. When compared with the scores obtained by medical students those obtained from the chiropractic students were lower (i.e., more doctor-centred) on average. To date the orientation of practicing chiropractors towards patient-centredness has not been evaluated and it is unclear if student orientations are representative of those of practicing chiropractors or predictive of their future attitudes in practice.

The majority of North American orthopaedic surgeons (Busse et al., 2009) and Canadian obstetricians (Weis et al., 2016) who expressed an opinion agreed that chiropractors provide

PCC. However, not all of the orthopaedic surgeons or obstetricians had direct experience with chiropractors either throughout professional relationships or as a patient themselves. Other sources of information about chiropractic for respondents included patients, research literature, family and friends, their education, and the media. One of the possible explanations for the perception of chiropractic being patient-centred among chiropractors and other stakeholders is the high levels of satisfaction reported by chiropractic patients (Rosner, 2016; Weigel, Hockenberry and Wolinsky, 2014). While patient-centredness has been identified as a possible predictor of patient satisfaction (Plewnia, Bengel and Körner, 2016; Rathert et al., 2015), the extent to which that relationship is bi-directional remains unclear as other elements of the patient experience could influence satisfaction.

There is a paucity of research on patient-centred care in the chiropractic profession, with only 7 quantitative (including 1 mixed methods), and 12 qualitative studies meeting the inclusion criteria. Among the quantitative studies there was considerable diversity in the study methods used (pilot RCT, observational, cross-sectional studies), and only 4 where patients were involved. There have been more qualitative studies exploring PCC by chiropractors than quantitative studies; however, with only 12 qualitative studies meeting the inclusion criteria for this review, studies are lacking. There was also disparity in the studies in terms of those who were interviewed (chiropractors, other healthcare professionals, patients, other stakeholders), the health conditions or clinical tasks addressed, and the reasons for the interviews (such as prospectively interviewing stakeholders before adding chiropractic services or interviewing those who had already undergone chiropractic care). The provision of PCC by chiropractors is seen as desirable by other healthcare professionals and stakeholders, and both chiropractors and their patients describe the care that is provided by chiropractors as patient-centred. This can take the form of care that is individualized or tailored to the patient, establishing a therapeutic alliance with patients by listening and attempting to gain an understanding of the patient. However, there was less description of other elements of PCC such as shared decision-making, goal-setting, and suitable follow-up. Many of the qualitative studies did not adequately describe PCC or its application in chiropractic settings, and several of the qualitative studies could have been strengthened by more frequent use of triangulation by interviewing different stakeholders, member checking, reflexivity, and by assessing more generalizable chiropractic practice settings and populations.

3.3.1 STRENGTHS AND LIMITATIONS

This review has numerous strengths. Narrative review methods (Ferrari, 2015) were used to comprehensively assess the literature on PCC in chiropractic. The narrative review was further strengthened by establishing the review inclusion and exclusion criteria *a priori* and by designing a search of the literature in consultation with my supervisors and executing it in several electronic databases along with reference searching and a search of my personal collection. That led to the identification and retrieval of relevant clinical, cross-sectional, and qualitative studies. This also allowed for identification of gaps in the literature.

There were also some limitations to this review. Only 1 author designed and conducted the literature search and retrieval. Furthermore, since this was a narrative review, the review may have included studies with a high risk of bias. However, in the critical analysis possible sources of bias in the included studies were identified and considered in the synthesis of results. Several articles were identified through reference searching and from my personal collection, possibly indicating that a more detailed search strategy, developed and executed in consultation with a reference librarian, would yield more articles. Finally, only studies written in English in peer-reviewed journals were included; accordingly, articles published in other languages or from other source material such as the grey literature were not considered.

3.3.2 FUTURE RESEARCH

Further research is needed to evaluate the manners in and extent to which chiropractic care is patient-centred. Such studies could take the form of qualitative and/or quantitative and/or mixed methods research and should evaluate both general and specialty populations seen by chiropractors, as well as the attitudes of chiropractors themselves. There is only a single clinical trial (Goertz et al., 2017b) where a patient-centred intervention involving chiropractors has been compared to more traditional, clinician-centred approach. Additional studies along these lines are needed to determine which patient-centred interventions are most effective for improving quality of care and patient outcomes. Future research could inform curriculum design at chiropractic educational institutions and professional development offerings, with the with the intent of furthering a patient-centred approach.

3.4 CONCLUSION

This chapter presents the first review to comprehensively evaluate the literature on PCC delivered by chiropractors. Chiropractors appear to provide care that is perceived by patients to be similar to other professions in terms of patient-centredness, but further research must elucidate this point. This review has identified that little qualitative and quantitative research has been published on PCC in the chiropractic profession to date. The study described in the remaining chapters of this thesis contributes to this limited literature base.

CHAPTER 4

RESEARCH METHODS

CHAPTER 4: RESEARCH METHODS

4.0 INTRODUCTION

This chapter will describe the methods employed in the study, the primary aim of which was to determine to what extent chiropractic patients with chronic musculoskeletal conditions perceive the care that they receive to be patient-centred. As the literature review in Chapter 3 demonstrated, there is relatively little evidence on the topic of patient-centred care in the chiropractic profession. This study adds to this body of knowledge in that quantitative data collection from both chiropractors and patients will be augmented by qualitative interviews from both groups to help gain a clearer understanding of the manners in which chiropractors either do or do not provide patient-centred care. I used an explanatory sequential mixed methods design with a quantitative priority to address the study objectives (Ivankova, Creswell and Stick, 2006; Vedel et al., 2019).

Mixed methods studies typically use both qualitative and quantitative data collection and analysis methods, with an integrated interpretation of the results (Creswell, 2014; Vedel et al., 2019). Explanatory sequential mixed method studies involve the initial collection and analysis of quantitative data (Phase 1) followed by qualitative data collection and analysis (Phase 2) (see Figure 4.1 for a flowchart of the study) (Creswell, 2014; Fetters, Curry and Creswell, 2013; Ivankova, Creswell and Stick, 2006; Vedel et al., 2019). The main strength of this design is the further explanation of quantitative data through the qualitative data, which has helped this design rise in popularity, particularly in the health sciences (Creswell et al., 2011; Ivankova, Creswell and Stick, 2006). In this thesis the quantitative data was given the priority, and the qualitative data helped explain the quantitative results (Ivankova, Creswell and Stick, 2006; Vedel et al., 2019). However, explanatory sequential designs can suffer from feasibility issues related to data collection and analysis, particularly when there are time constraints, making organization vital from the point of study conception (Ivankova, Creswell and Stick, 2006). The methods described within this chapter address those feasibility issues and describe how the study was planned and organized.

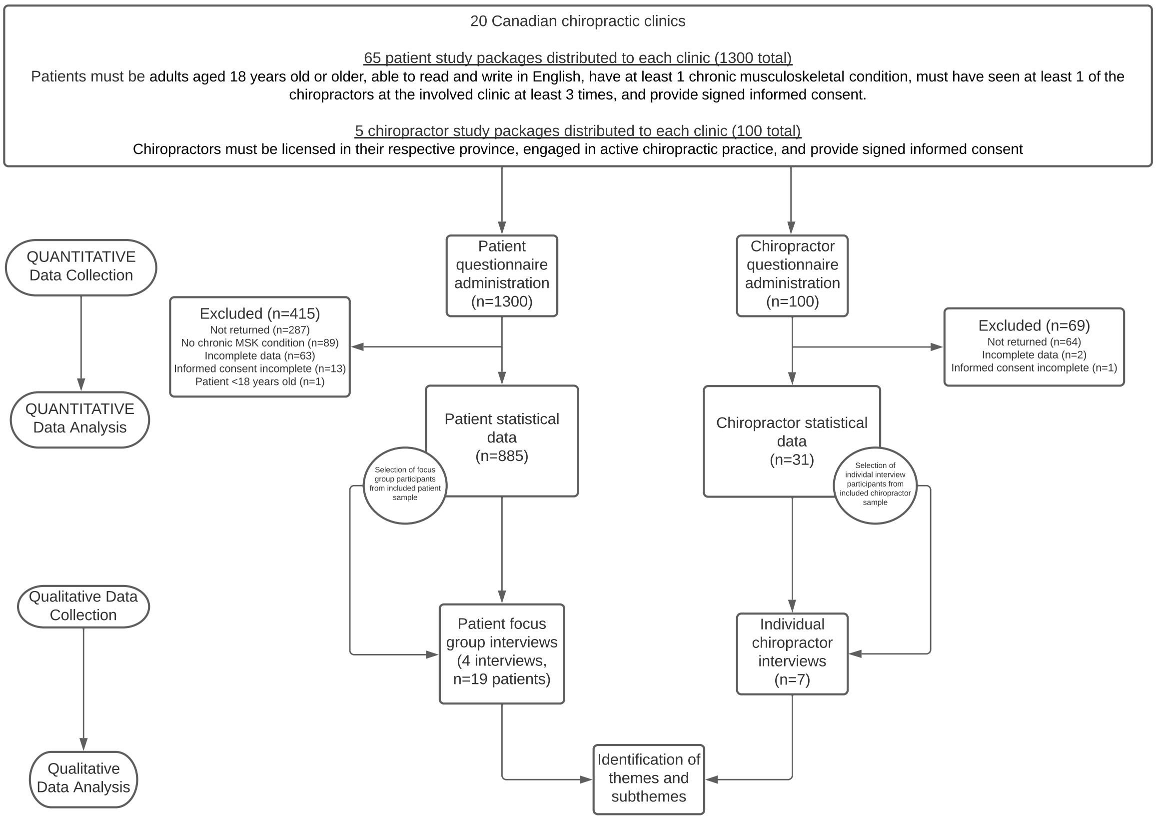


Figure 4.1. Flowchart of the explanatory sequential mixed methods study.

The analysis of results were approached from a pragmatist stance or orientation (Creswell, 2014; Johnson and Onwuegbuzie, 2004; Kaushik and Walsh, 2019). A pragmatist orientation emphasizes solving problems and addressing research questions, leading to the selection of multiple approaches that help answer the research question using both quantitative methods and deductive reasoning along with qualitative methods and inductive reasoning (Creswell, 2014; Johnson and Onwuegbuzie, 2004; Kaushik and Walsh, 2019). A pragmatist points to the “what and how to research” and justifies the collection and analysis of both quantitative and qualitative data (Creswell, 2014). In this study in order to address the research questions the qualitative data was used to elaborate upon and explain the quantitative data and this was strengthened by their linkage at many points throughout the study.

4.1 ETHICS

Ethics approvals for the pilot study were received from both the University of South Wales Faculty of Life Science and Education Schools of Health, Sport and Professional Practice and Care Sciences Research Ethics Subgroup (Approval LSE15KS36E0, July 2015) and the Canadian Memorial Chiropractic College Research Ethics Board (Approval 1510X01, October 2015, renewed October 2016). Ethics approvals for the main study were obtained from the University of South Wales Schools of Health, Sport and Professional Practice and Care Sciences Research Ethics SubGroup (2017KS1101, November 2017, amendments approved March 2019) and the Canadian Memorial Chiropractic College's Research Ethics Board (Project 172027, #1712X01, December 2017, renewed December 2018) (Appendix 3).

Participant right to autonomy was preserved through an informed consent process (Fouka and Mantzorou, 2011; Varkey, 2021). Prior to enrollment in the study, all participants read a study information package that outlined the study protocols and completed an informed consent form if they freely agreed to participate in the study. Participants were able to have any questions answered by the researcher and to withdraw from the study at any point if desired. All responses from participants in both the quantitative and qualitative study components were kept confidential (Fouka and Mantzorou, 2011; Varkey, 2021). Unique identifiers created for the patients and clinicians were provided on the questionnaires. Participants were not asked to enter their names and so questionnaires were completed anonymously. To further preserve anonymity, no personal information that could identify participants, such as subject names, was associated with participant responses in this thesis or any reports or publications that result from this study, and any quotes attributed to participants used pseudonyms. Subjects voluntarily provided their names and contact information (either an e-mail address or contact telephone number) on a separate form if interested in being contacted to take part in one of the individual or focus group interviews. Several steps were taken in this study to protect participant data (Sanjari et al., 2014). All records from the study were kept private and appropriately encrypted. Patient and clinician questionnaires and all study forms are stored in a locked filing cabinet in a locked office and will be destroyed by secured shredding five years after completion of the study. Any electronic files containing patient data were password protected and will be permanently deleted. The only person with access to any study data outside of the researcher and supervisors was the professional transcriptionist, although at no point did the transcriptionist have access to any identifiable information as pseudonyms were used by participants in the interviews. During analysis of interview transcripts, multiple members among the researcher and supervisors had access to de-identified transcripts, with only pseudonyms in place for identification. To offset the cost of transportation and parking, each participant in the individual and focus group interviews was provided with a $50.00 gift card in Canadian dollars. Gift cards were distributed at in-person meetings and focus group sessions, while participants in videoconference or telephone interviews received their gift card in the post/ mail after their interview.

This study did not involve a treatment protocol and there were no physical risks anticipated, so the ethical principles of beneficence and non-maleficence were not threatened as greatly as in a clinical trial, for example. Beneficence may have been demonstrated through participants gaining insight into their role in patient-centred care through completion of the questionnaires and/or interview participation (Fouka and Mantzorou, 2011; Varkey, 2021). The main concern in terms of non-maleficence was the amount of a participant’s time taken to complete the questionnaires and/or interviews (Fouka and Mantzorou, 2011; Varkey, 2021). There was also potential for difficult or uncomfortable topics or memories to be discussed during interviews (Fouka and Mantzorou, 2011; Varkey, 2021), although the content of the questionnaires and interview guides was not sensitive in nature, so this risk was minimal. There was also the potential for alteration of the patient-chiropractor relationship due to participation in the study, so the researcher attempted to be non-judgmental when participants disclosed behaviours by chiropractors that were not patient-centred, and the study was not to interfere with patients receiving their usual care from their chiropractor. Being non-judgmental is important for interviewers conducting qualitative interviews to help establish rapport and trust with participants and maintain impartiality (DeJonckheere and Vaughn, 2019).

It is acknowledged that I likely had some influence on the study as I was involved in all aspects of the study and conducted all of the interviews and analysis (see section 4.5.9 Reflexivity) (Sanjari et al., 2014). My background and experience as a practising chiropractor, researcher, policymaker, editor, and educator may have provided specific knowledge that may have affected the study, particularly the qualitative components of the study. The researcher had professional knowledge of at least one chiropractor at several of the involved clinics and this may have influenced clinic recruitment and chiropractor participation. However, care was taken to ensure that these professional relationships did not influence chiropractor autonomy and their willingness to freely participate in the study. Furthermore, the researcher did not have a role in treatment of any of the involved participants and care was taken during the interviews not to provide any information that may be construed as providing healthcare advice and to avoid formation of personal relationships with participants (Fouka and Mantzorou, 2011; Sanjari et al., 2014).

4.2 PILOT STUDY

A pilot study was conducted prior to undertaking the main study. The pilot study was performed to test the feasibility of the proposed methods and determine what modifications and sample size would be required for the main study (Stuber et al., 2016). While the pilot study ethics applications were being prepared and reviewed, a study protocol paper was also prepared and published in a peer-reviewed journal in May 2016 (see Appendix 4) (Stuber et al., 2016).

The pilot study began following final ethics approval in October 2015. The clinics involved in the pilot study were located in Calgary, Alberta, Canada. The clinics were selected out of convenience as both of the clinic owners were known to the researcher, although the researcher held no affiliation with either clinic. One of the clinics had two female chiropractors, consisting of the clinic owner and an associate chiropractor. Both of these chiropractors maintained general chiropractic practice without any specializations. This clinic also offered massage therapy. The second clinic had 4 chiropractors on staff, consisting of the clinic owner and 3 associate chiropractors. There were 3 male chiropractors including the clinic owner and 1 female chiropractor. The clinic owner is a chiropractic sports specialist, a Fellow of the Royal College of Chiropractic Sports Sciences. One of the other male chiropractors is a resident in chiropractic sports sciences, another is a Fellow of the Canadian Chiropractic Specialty College of Physical and Occupational Rehabilitation, while the female chiropractor is in general practice. Although this clinic had an emphasis on sports injuries, all of the involved chiropractors regularly saw patients with chronic conditions, regardless of whether the patients came from an athletic background. There were numerous other professionals practicing within this clinic including massage therapists, a naturopathic doctor, a physiotherapist, and a sports medicine specialist. All of the chiropractors included in the pilot study were licensed in Alberta, engaged in active chiropractic practice, and provided signed informed consent for their participation.

The pilot study used a sequential explanatory mixed methods design with a quantitative priority, wherein quantitative data were collected and informed later qualitative data collection (see Figure 4.2 for a flowchart of the pilot study) (Creswell et al., 2011; Creswell, 2014). However, after ethics approval for the pilot study was received in October 2015 it was judged that November and December would potentially be difficult months to collect patient data and the quantitative data collection period was scheduled for February 2016. To test the initial data collection methods and obtain some initial data, it was decided to commence the pilot study by interviewing some of the involved chiropractors. The interview schedule for the interviews with chiropractors was based on the Mead and Bower framework of patient-centred care (Mead and Bower, 2000). Individual interviews were conducted with 4 chiropractors, 2 from each clinic, from November to December 2015. All participants in the qualitative components of the pilot study provided a separate informed consent to participate in the qualitative interviews. Two of the chiropractor interviews were conducted in-person (face to face) and the other 2 by telephone.

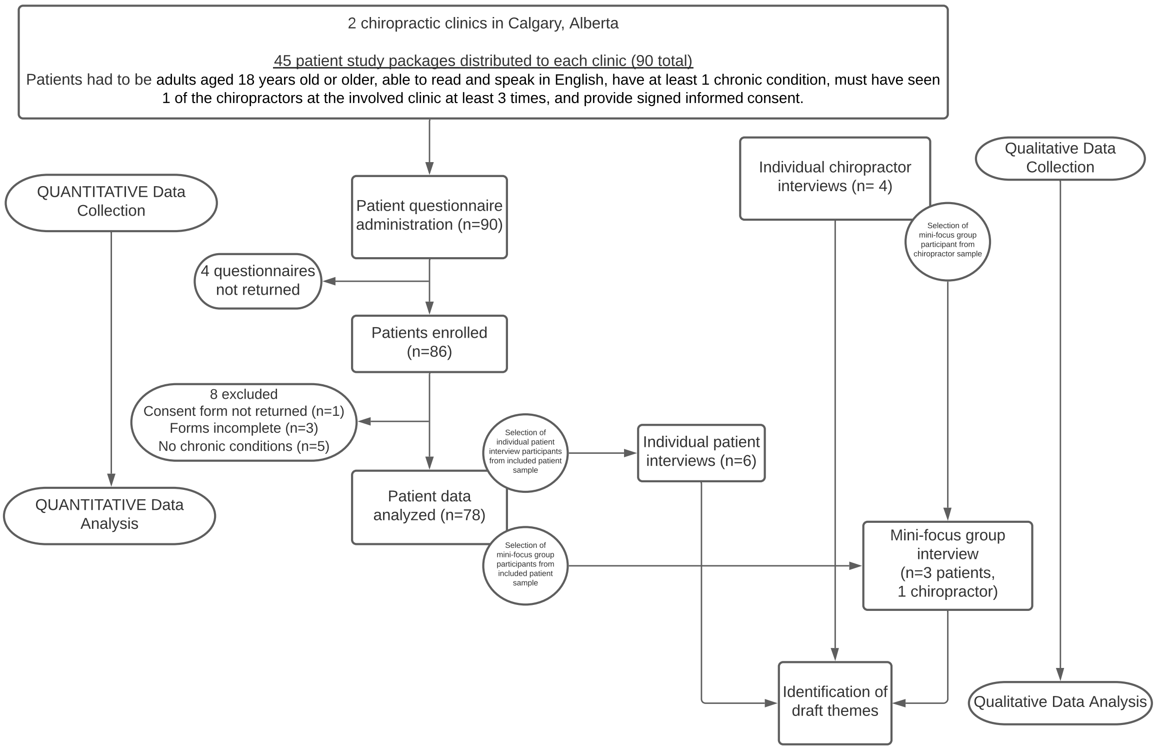


Figure 4.2. Flowchart of the pilot study

Training meetings between the researcher and staff at the involved clinics took place in January 2016, along with the provision of a training manual created by the researcher to each clinic. Upon completion of study familiarization and training the clinics commenced patient recruitment and the quantitative component of the pilot study was conducted in February 2016. Each clinic received 45 study packages consisting of a participant information sheet, informed consent form, and the patient questionnaire, along with marked envelopes for each study package. The researcher personally retrieved completed packages following a three-week recruitment period.

Quantitative data was manually entered into a Microsoft Excel spreadsheet and transferred into SPSS Version 24 for analysis. The quantitative results from the pilot study were first analyzed descriptively, determining means, medians, percentages, and frequencies of different responses to demographic and health information questions. The overall Patient Assessment of Chronic Illness Care (PACIC) score was determined for each participant, as were scores for each of the five PACIC subscales. Further analysis included the determination of possible correlations of several variables with overall PACIC scores. Quantitative data analysis was completed in July 2016.

Following initial quantitative data analysis, individual interviews with patients began in late February 2016. A total of 6 individual patient interviews were completed, the final one in September 2016. All of the interviews with individual patients took place in person in public spaces. Three patients and 1 chiropractor were interviewed in a mini-focus group. The mini-focus group interview took place in a conference room at one of the involved clinics in December 2016. The interview schedules for the patient interviews and mini-focus group interview were informed by the pilot study quantitative data, as well as the Mead and Bower model of patient-centredness (Mead and Bower, 2000), the qualitative interviews with chiropractors, and items on the PACIC (Glasgow et al., 2005a). All individual interviews with patients and chiropractors as well as the mini-focus group interview, were semi-structured, audio-recorded, and conducted by the researcher. All interview recordings were transcribed verbatim by the researcher with 25% of the recordings randomly double-checked for accuracy. Transcriptions were entered into Dedoose (Dedoose Version ***8.0.35***, web application for managing, analyzing, and presenting qualitative and mixed method research data ***(2018)***. Los Angeles, CA: SocioCultural Research Consultants, LLC www.dedoose.com) for analysis. The qualitative data was analyzed by the researcher and subsequently supervisors using a thematic analysis following the method described by Braun and Clarke (Braun and Clarke, 2006). The qualitative data was reviewed, initial codes were generated, and preliminary themes were identified. Mixing of the data took place by using quantitative data to inform the interview schedules for the patient interviews and mini-focus group interview, in addition the codes generated in the qualitative analysis were used to further interpret trends noted in the quantitative data. The pilot study paper and further information has been published elsewhere (Stuber et al., 2018) (see Appendix 5).

4.2.1 PILOT STUDY - FEASIBILITY OUTCOMES

The feasibility outcomes were the questionnaire participation, consent, and completion rates. The main criterion for success of the feasibility was the completion of 40 questionnaires per clinic site, for a total of 80 completed questionnaires within 1 month (Stuber et al., 2018). To achieve this each participating clinic received 45 questionnaires for distribution to eligible patients. A total of 86 out of the 90 questionnaires were returned for analysis (questionnaire participation rate): of these, 8 were excluded; 5 because the patient did not list any chronic conditions, 3 due to incomplete data (specifically the PACIC was not completed), and 1 as the informed consent form was not returned (1 patient was excluded because they did not have a chronic condition and the PACIC was incomplete). Therefore, of the 86 patient participants, 85 provided written consent (consent rate), and 78 patients completed the questionnaire (completion rate), 39 from each clinic. The quantitative data collection period was completed in 3 weeks. Thus, while the number of questionnaires completed in total and per clinic fell just short of the respective targets, the timeline to completion was ahead of schedule. Interestingly, over half of the participants who returned questionnaires (n=41) indicated interest in participating in an interview.

One goal of the pilot study was to obtain feedback on study design from patients, clinicians, and clinic staff. This was elicited from patients through an open-ended item at the end of the questionnaire, from clinic staff during informal conversations, and through direct questioning of patients and chiropractors during the interviews. Prior to the pilot study, modifications were made to the PACIC instructions and 5 of the 20 items on the PACIC to reflect its use in chiropractic patient populations (see Table 4.1 below) (Stuber et al., 2016). These changes were necessary as the original items were not completely applicable and may have led to confusion in a chiropractic setting. The changes were not anticipated to alter the meaning of the respective questions. This was confirmed in the pilot study as patients were asked to provide feedback for any changes that they felt might improve the questionnaire or if any items were unclear. There was no feedback indicating that those changes were detrimental to the understanding or meaning of those particular items or the entire instrument (Stuber et al., 2018).

Table 4.1. Modifications to the PACIC.

Question #	Original item (phrasing that was changed in bold)	Revised item (changes in bold)
3	Asked to talk about any problems with my **medicines** or their effects.	Asked to talk about any problems with my **treatments** or their effects.
12	Sure that my **doctor or nurse** thought about my values, beliefs, and traditions when they recommended treatments to me.	Sure that my **chiropractor** thought about my values, beliefs, and traditions when they recommend treatments to me.
18	Referred to a **dietitian, health educator, or counselor**.	Referred to **another health professional**.
19	Told how my visits with other **types of doctors, like an eye doctor or other specialist**, helped my treatment.	Told how my visits with other **health professionals** helped my treatment.
20	Asked how my visits with other **doctors** were going.	Asked how my visits with other **health professionals** were going.

Only 1 patient provided feedback that the questionnaire instructions should be clearer. Furthermore, a staff member at one of the participating clinics suggested reducing the length of the patient information sheet. There were no comments from patients in the pilot study regarding the 5 changed items. Neither clinic staff nor chiropractors reported any difficulty administering the questionnaire during their workday, with some of the chiropractors remarking that they were not even aware of which patients completed the questionnaire as the staff was able to handle questionnaire distribution without their involvement. There were no reported deviations from the study protocol.

The researcher's study log and reflection documents noted that the mini-focus group interview conducted with 3 patients and 1 chiropractor did not perform as expected. It was proposed that a mini-focus group involving patients and chiropractors could produce rich data through discussion between these stakeholders. However, this did not occur as it was difficult to get the chiropractor involved or to contribute to the discussion. There was a good flow of conversation among the patients and it was noted that the interaction between the patient participants in the mini-focus group produced robust data, more so than that observed in the individual interviews with the patients. This could be due to a shift in the dynamic between individual interviews, where it was just the patient and interviewer (the researcher) one-on-one, while in the mini-focus group there were three patients, one of the chiropractors, and the researcher which might have led to enhanced patient comfort and engagement in discussion.

In the pilot study, the average patient was middle-aged (mean 47.1 years) and female (60.3%). These characteristics were similar to those seen in studies of chiropractic patient populations (Beliveau et al., 2017). The patients in the pilot study were also predominantly

Caucasian (94.9%) and well-educated (76.9% at least completed post-secondary education, only 5.1% had not completed high school). The most common complaint among those included in the pilot study was chronic spinal pain (reported by 60.3% of patients), again similar to what is typically seen in chiropractic patient populations (Beliveau et al., 2017). The pilot study patients reported an average of 1.8 chronic conditions, 12.9 visits to the chiropractor in the past year, and had been attending their chiropractor's clinic for 4.9 years on average. The patients reported seeing an average of 2.9 different health professionals for their chronic conditions in the past year, the most commonly consulted were massage therapists followed by general practitioners/family doctors. The average overall PACIC score of 3.29 was higher than typically seen on the PACIC (Krucien, Vaillant and Pelletier-Fleury, 2014), but not far above the mid-point score of 3.0 on the PACIC, and below the cutoff of 3.5 or more for care that is concordant with the Chronic Care Model set by Jackson *et al.* (Jackson et al., 2008). In all, it was determined that the quantitative data obtained in the pilot study was suitably representative of chiropractic patient populations and that the feasibility of conducting a larger scale study was proven through the pilot study.

4.3 PROPOSED AMENDMENTS TO THE STUDY PROTOCOL

After consideration of the pilot study results and reflections, a series of amendments were proposed for the main study. One source of concern in terms of the feasibility of the study on a larger scale was that the pilot study had been conducted in a single city where the researcher was familiar with the owners of the involved clinics and was able to retrieve study materials in-person: i.e., the relative performance of clinics in other municipalities had not been ascertained. Another concern was the questionnaire completion rate in the pilot study. It was anticipated that the completion rate (86.7%) was likely higher than would be obtained in a full study taking place in multiple municipalities, thus a more conservative estimated completion rate of 66.7% was established by establishing consensus between the researcher and supervisors. With this new estimate of completion rate, and a minimum sample size of 860 participants calculated for the main study (see section 4.4.5 below), at least 1290 patient questionnaires would need to be distributed. This sample size is within the range of published studies that have employed the PACIC. Krucien, Vailant, and Pelletier-Fleury (Krucien, Vaillant and Pelletier-Fleury, 2014) reported minimum and maximum sample sizes of 89 and 4108, respectively, among studies that used the PACIC.

During the pilot study, clinic staff and chiropractors were trained in the study protocols by the researcher in a single training meeting/presentation per site. This training was undertaken to ensure compliance and consistency with the study protocol and to answer questions from the involved clinic personnel. In addition, each clinic was supplied with a study training manual. Despite no reported deviations from the pilot study protocol this method of training clinical staff did leave the potential for inconsistency in application, as not all front office or chiropractic staff members were able to attend training meetings. As data collection in multiple municipalities and provinces across Canada was planned it was deemed impractical and time- and cost-prohibitive to train all clinical staff and chiropractors in-person. Therefore, it was decided that a standardized training protocol for all clinic staff and chiropractors would be beneficial to create a more consistent training experience and understanding of the study prior to commencement. It was decided that the researcher would create a video presentation (Stuber, 2018) to be viewed by all clinic staff and chiropractors prior to commencement of the main study, along with a training manual (see Appendix 6) to be reviewed by all involved chiropractors and clinic staff.

Ideally in an explanatory sequential mixed method design, the quantitative data collection and analysis precedes and informs the qualitative data collection (Creswell et al., 2011; Creswell, 2014; Fetters, Curry and Creswell, 2013; Ivankova, Creswell and Stick, 2006). However, as noted previously, the pilot study did not precisely follow the explanatory sequential mixed methods design. To allow for initial data collection, and simply for convenience, the volunteering chiropractors were interviewed prior to quantitative data collection, which was followed by the interviews with the patients and the mini-focus group interview with 3 patients and 1 chiropractor. In the main study an emphasis was placed on following the explanatory sequential mixed methods design with the quantitative components taking place first, followed by the qualitative components.

The pilot study mini-focus group produced more robust data than the individual patient interviews, largely owing to the discourse and interaction between patients. However, there were difficulties noted in engaging the chiropractor in the pilot study mini-focus group interview. It was felt that the presence of the chiropractor was not beneficial to facilitating the conversation between the patients, nor was the potentially complicating presence of a patient's chiropractor in the focus group interview, which might make them uncomfortable and less likely to speak freely. As such, it was decided that only patients would be included in the focus group interviews and the focus group interviews would be the only qualitative data collection approach with patients. Interviews with chiropractors would continue to be semi-structured individual interviews conducted either by telephone, videoconferencing, or in-person.

Qualitative data from both patients and chiropractors concerning patient-centred care by chiropractors was gathered in the pilot study both by individual interviews and mini-focus groups. In contrast, quantitative patient-centred care data was only collected from patients in the pilot study. It was decided that collection of quantitative data from chiropractors relating to their attitudes toward the care that they provided would further aid in the exploring the manners in, and extent to, which chiropractors provided patient-centred care. The Patient-Practitioner Orientation Scale (PPOS), developed by Krupat (Krupat et al., 2000), was identified as a promising validated instrument for this purpose (Shaw, Woiszwillo and Krupat, 2012), and included in the main study.

There was only one measure of patient global health employed in the pilot study, namely a five-point scale that asked patients to rate their overall health from ‘Excellent’ to ‘Poor’. None of the 78 respondents indicated having ‘poor’ health, only 7 indicated having ‘below average’ health, and the rest indicated having either ‘average’ (n= 34), ‘very good’ (n=26), or ‘excellent’ (n=9) health; showing some similarity to previous research conducted on Canadian chiropractic patients (Hurwitz and Chiang, 2006). However, given the simple nature of this assessment of overall health, it was decided that it would be beneficial to use a more comprehensive approach to the assessment of overall patient health status. This would allow for a more appropriate determination if overall health status was associated with overall PACIC scores. Accordingly, the 10-item Patient-Reported Outcome Measurement Information System-Global Health Scale (PROMIS-GHS) was selected for use in the main study (Hays et al., 2009). The PROMIS-GHS has established validity and reliability, internal consistency reliability, and responsiveness (Bryan et al., 2014; Cella et al., 2010; Hays et al., 2009) and it is being used more frequently in health care research. The internal consistency reliability of the PROMIS-GHS has been reported for both the global mental health (0.86) and global physical health (0.81) dimensions (Hays et al., 2009).

Finally, a decision was made to modify the inclusion criteria for patients entering the study. Specifically, in the pilot study, patients were required to have at least 1 chronic health condition, which was defined as a condition affecting any organ for at least 1 year. For the main study, this criterion changed to patients having at least 1 chronic musculoskeletal condition, lasting for at least 1 year. This change reflects the chronic patient population typically seen by chiropractors, as worldwide only 3.1% of chiropractic patients see chiropractors for non-musculoskeletal complaints (Beliveau et al., 2017). In the pilot study 19 of the included subjects reported a chronic non-musculoskeletal condition. However, even among those 19 patients the majority reported at least 1 chronic musculoskeletal condition (15/19 or 78.9%). As such 74 of the 78 patients (94.9%) included in the pilot study reported having a chronic musculoskeletal condition and it was felt that recruitment would not be hindered by this modification to the population of interest.

The most important conclusion drawn from the pilot study was that the methods for conducting the planned main study were feasible on a large-scale multi-site level. Even still, several minor and easily implemented modifications to the study protocol were proposed to aid the feasibility and utility of the proposed study results.

4.4 MAIN STUDY - QUANTITATIVE PHASE

The data from the quantitative phase of the main study were elicited from questionnaires completed by chiropractic patients and chiropractors at the involved clinics.

4.4.1 CLINIC SAMPLING AND RECRUITMENT

The main study was conducted in a total of 20 private clinics across Canada. The clinics were sampled purposively (Palinkas et al., 2015; Taherdoost, 2016) as attempts were made to recruit clinics from rural, suburban, and urban settings of different sizes, to ensure that both male and female chiropractors were recruited, and to involve clinicians with varying amounts of experience. Among the strengths of this non-probability sampling method are the relative speed and convenience of sampling, and it is well-suited for exploratory research (Taherdoost, 2016). At least one of the chiropractors at several of the clinics were known to the researcher, which facilitated clinic recruitment. However, this may lead to concerns about the representativeness of the sample, as well as selection bias (Palinkas et al., 2015; Taherdoost, 2016).

4.4.2 SETTINGS

The involved clinics were located in 1 of 7 Canadian provinces (3 in British Columbia, 3 in Alberta, 3 in Saskatchewan, 1 in Manitoba, 6 in Ontario, 2 in Nova Scotia, and 2 in Newfoundland). Clinics from the provinces of Quebec, New Brunswick, and Prince Edward Island and the 3 Canadian territories of the Yukon, Northwest Territories, and Nunavut were not included because of the relative paucity of chiropractors in Prince Edward Island, and the territories. There were concerns of potential issues with language comprehension of the questionnaires, which were provided in English only, in Quebec and New Brunswick as New Brunswick is Canada’s only officially bilingual province while Quebec is the only province in Canada that is predominantly francophone and French is the official language. These concerns were greater for Quebec than New Brunswick, regardless the decision was made to exclude both to avoid such potential complications.

4.4.3 PARTICIPANTS

The population of interest was adult chiropractic patients with chronic musculoskeletal conditions receiving chiropractic care. A chronic condition was defined as one that patients had for at least one year. A musculoskeletal condition was defined as a painful condition affecting any combination of muscles, joints, bones, or related soft tissues. Patients were eligible for inclusion if they met all of the following criteria:

1. adults aged 18 years old or older;
2. able to read and write in English;
3. have at least 1 chronic musculoskeletal condition;
4. must have seen at least 1 of the chiropractors at the involved clinic at least 3 times to help ensure that the patient had enough familiarity with the chiropractor to formulate an opinion on the care they provide; and
5. provided signed informed consent.

Chiropractors practising in the selected clinics met the following inclusion criteria:

1. licensed in their respective province;
2. engaged in active chiropractic practice; and
3. provided signed informed consent

Eligible patients were recruited out of convenience and sequentially from the involved chiropractic clinics, while the chiropractors were recruited out of convenience due to practising in the respective clinics. These non-probability sampling methods were used due to the efficiency with which they could be employed, while acknowledging that there might be concerns with the representativeness of the respective samples (Taherdoost, 2016).

4.4.4 PATIENT QUESTIONNAIRE

Patients enrolled in the study received a study package from the clinic's front desk staff. The package consisted of the questionnaire (see Appendix 7), and a 5-page information package (see Appendix 8) that described the study's risks and benefits, and the patient's potential involvement, rights, and protections. The patient questionnaire included demographic information (5 items including age, gender, race and ethnicity, highest education level, and location based on the first three letters of their postal code), health information (6 items including listing all chronic conditions, health providers seen in the past year, subjective overall health, number of times they saw their chiropractor in the past year, length of time that they have been seeing their chiropractor, and satisfaction with the chiropractic care that they received in the past year), the Patient-Reported Outcomes Measurement Information System® (PROMIS) Global Health Scale (GHS), and a modified version of the Patient Assessment of Chronic Illness Care (PACIC) (see Appendix 6). All items on the questionnaire were tested in the pilot study and informed by previous studies using the PACIC as the dependent variable, with the exception of the PROMIS GHS and the items asking for the patient's postal code and satisfaction with their chiropractic care.

The Patient-Reported Outcomes Measurement Information System® (PROMIS) Global Health Scale (GHS) (also known as the PROMIS-10 or PROMIS Global-10) was used to assess health-related quality of life. Previous studies using the PACIC have used validated measures of health-related quality of life as independent variables (Aung et al., 2016; Schmittdiel et al., 2007) and one study found health-related quality of life to be significantly associated with overall PACIC score (Schmittdiel et al., 2007). The PROMIS GHS, initially tested by Hays and colleagues in 2009, is one of several short-form outcome measures developed from the larger PROMIS® item bank inventory (Hays et al., 2009). PROMIS® was developed by the United States National Institute of Health (NIH) beginning in 2004 to provide a common metric for measuring patient-reported outcomes (PROs) in numerous domains. The PROMIS item banks were developed using qualitative item development and item response theory, calibrated and referenced to the general population in the United States and have been shown to correlate with previously established (also known as legacy) patient reported outcome measures (PROMs) (Alonso et al., 2013; Brodke, Saltzman and Brodke, 2016; Cella et al., 2010; Saad et al., 2018).

The PROMIS GHS consists of 10 multiple-choice items across 5 domains: physical function, fatigue, pain, emotional problems, and social health (2 items), as well as items on physical health, mental health, overall quality of life, and self-rated health (Hays et al., 2009). The PROMIS GHS is freely accessible to researchers and takes only 2 minutes to complete (Hays et al., 2009). Only 1 of the 10 items (pain) on the PROMIS GHS is rated on an 11-point scale (0 = no pain to 10 = worst imaginable pain), while the remaining 9 items are on 1 of 4 different 5-point scales. One of the 5-point scales asks respondents to provide a ranking from Excellent to Poor (for 6 items – general health, quality of life, physical health, mental health, social activity satisfaction, and social function), another from 'Completely' to 'Not At All' (1 item – physical function), 1 from 'Never to Always' (1 item – emotional problems), and 1 from 'None' to 'Very Severe' (1 item – fatigue). The pain item is re-coded so that a response of 0 (no pain) is assigned a score of 5, responses from 1 to 3 are scored as a 4, responses of 4 to 6 are scored as 3, scores of 7 to 9 are scored as 2, and scores of 10 (worst imaginable pain) are scored as a 1 (Hays et al., 2009). The PROMIS GHS has two scales each consisting of 4 items, a Global Physical Health (GPH) scale and a Global Mental Health (GMH) scale (Hays et al., 2009). The GPH includes the physical health, physical functioning, pain, and fatigue items, while the GMH includes the overall quality of life, mental health, satisfaction with social activities, and emotional problems items. The raw scores from the 4 items on each of the GPH and GMH are summed and then converted to a t-score distribution which is standardized with a mean of 50 and a standard deviation of 10 for the United States general population (Brodke, Saltzman and Brodke, 2016; Cella et al., 2010; Saad et al., 2018).

The PROMIS GHS has shown good psychometric properties including internal consistency reliability, construct validity, precision, and responsiveness (Bryan et al., 2014; Cella et al., 2010; Hays et al., 2009). The GPH and GMH scales demonstrate moderate-to-strong correlations with one another (r=0.62) and with the EQ-5D (r= 0.76 for the GPH and r=0.59 for the GMH) (Hays et al., 2009). The PROMIS GHS can be used to predict EQ-5D scores for patients and this predicted score shows excellent correlation with actual EQ-5D scores (r=0.72) (Saad et al., 2018). These psychometric properties, along with its ease of use and administration make it one of the patient-reported outcome measures (PROMs) advocated by investigators for assessing health status (Bryan et al., 2014; Cella et al., 2010). To date the PROMIS GHS has not been used in chiropractic patient populations. The PROMIS GHS is being used increasingly, although as it was developed recently it has not been as widely used as other health-related quality of life measures such as, for example, the SF-36 or EQ-5D (Bryan et al., 2014). However, the PROMIS GHS has been recommended for use in primary and community care (Bryan et al., 2014), and was deemed suitable for this study.

The Patient Assessment of Chronic Illness Care (PACIC) assesses the extent to which patients with chronic conditions perceive the care that they receive from practitioners to be patient-centred. The PACIC was developed by Glasgow *et al.* in 2005 (Glasgow et al., 2005a) to determine the extent to which patients with chronic health conditions receive care that is congruent with the Chronic Care Model (CCM). The CCM was originally described by Wagner and colleagues in the late 1990s (Wagner et al., 2001a, 2001b). The CCM is an internationally recognized and utilized evidence-based framework for improving the quality of care for patients with chronic conditions (Barr et al., 2003). It acknowledges that having one or more chronic conditions can come with an abundance of challenges to patients and families, affecting all aspects of their lives (Wagner et al., 2005). The CCM holds that the management of chronic conditions should be more evidence-based, proactive, and planned, while activating and involving patients in the self-management of their chronic condition(s) (Wagner et al., 2005). The CCM consists of 6 interrelated elements (Wagner et al., 2001a):

1. Health Care Organization – support of chronic disease improvement programs at an organizational level and with promotion by leadership;
2. Community Resources – encouraging the development and use of services and resources accessible to patients in the community and for health care and community organizations to have relationships or linkages to improve awareness and facilitate patient access;
3. Self-Management Support – group and individual self-management strategies are emphasized over traditional patient education and counselling to empower patients to take a central role in their care and living with their condition, and can include goal-setting, action planning, and problem solving to identify barriers and the solutions to overcome them;
4. Delivery System Design – the development of an approach that is planned and coordinated between the patient and a multidisciplinary team and encourages self-management and follow-up;
5. Decision Support –the incorporation of clinical practice guidelines and other best evidence into easily accessible resources for clinicians and patients such as decision

aids, assessment tools, and flow sheets. Training clinicians using best practices and encouraging relationship building and communication with specialists is also beneficial; and

6. Clinical Information Systems – the implementation of registries and databases to monitor management strategies and improve data sharing

Wagner and colleagues contend that the CCM is aligned with both evidence-based and patient-centred chronic illness care, at a health care systems level (Wagner et al., 2005). Ethicists have argued that the CCM demonstrates greater ethical value than traditional care by promoting beneficence and human agency at organizational and individual levels through the development of mutual trust, collaboration, and patient autonomy (Oprea et al., 2010). Comprehensive care programs that incorporate elements of the CCM have been shown to positively impact care quality and outcomes for those with chronic conditions including patient behaviours, satisfaction, and resource utilization and healthcare costs (Bruin et al., 2012; Coleman et al., 2009; Desmedt et al., 2016). However, the CCM does not offer prescriptive guidelines to aid managers, clinicians, and patients with implementation (Kadu and Stolee, 2015). Not surprisingly, barriers to and facilitators of implementation of the CCM in a practical manner have been identified including organizational context, structure and culture, resource availability, internal and external communication, supportive leadership, change capacity and readiness, and attitudes and beliefs among providers (Kadu and Stolee, 2015). It is uncertain whether the CCM is suitable for solo practitioners in private or community practice, or better suited to larger health care institutions (Yeoh et al., 2018).

Glasgow *et al*. described the PACIC as "intended to assess the receipt of patient-centered care." (Glasgow et al., 2005a). The PACIC is commonly used and can be completed by patients in under 8 minutes (Glasgow et al., 2005a). The PACIC has been translated from the original English for use in several languages including Danish (Maindal, Sokolowski and Vedsted, 2012), Dutch (Cramm and Nieboer, 2012; Vrijhoef et al., 2009; Wensing et al., 2008), Finnish (Simonsen, Koponen and Suominen, 2018), French (Krucien, Vaillant and Pelletier-Fleury, 2014), German (Rosemann et al., 2007), Greek (Malliarou et al., 2020), Malay (Abdul-Razak et al., 2018), Spanish (Aragones et al., 2008), and Thai (Zeugfang et al., 2018).

The PACIC has been recommended as an appropriate instrument for measuring the patient-centredness of care for patients with chronic health conditions (Silva, 2014; Spicer, Budge and Carryer, 2012; Vrijhoef et al., 2009). This is relevant to my study as the population of interest is patients with chronic musculoskeletal conditions. De Silva categorized the PACIC as a means of assessing patient experience of care for patients with chronic conditions, describing patient experience as an important component of patient-centredness, with the terms often being used interchangeably (Silva, 2014). The PACIC has been validated, demonstrating face, construct, concurrent, content, convergent and discriminant validity and shown to be internally consistent with adequate test-retest reliability (Drewes et al., 2012; Glasgow et al., 2005a; Noel, Jones and Parchman, 2016; Rick et al., 2012; Taggart et al., 2010). The test-retest reliability of the PACIC has been established at 0.58 (Glasgow et al., 2005a). The internal consistency of the PACIC has been reported with Cronbach's alpha of 0.91 to 0.95 (Drewes et al., 2012; Glasgow et al., 2005a; Rick et al., 2012; Taggart et al., 2010; Vrijhoef et al., 2009). The overall PACIC score has demonstrated convergent validity as it is moderately correlated with the Patient Self-Activation scale (r= 0.42) and 4 of the subscales from the Ambulatory Care Experience Survey (PCP-ACES) (r=0.32-0.60)(Glasgow et al., 2005a), as well as the PSQ-18 (r=0.39) (Vrijhoef et al., 2009).

Construct validity has been demonstrated by significant moderate correlations with patient satisfaction (r=0.24), shared decision making (r=0.47) and quality of care (r=0.54) (Rick et al., 2012).

The commonly used original version of the PACIC consists of 20 items (Glasgow et al., 2005a). For each item the respondent (patient) indicates the frequency with which the care for their chronic conditions met the criterion over the past 6 months. Each of the items lies on a five-point scale ranging from "None of the time", which is scored as 1, to "Always", which is scored as 5 (Glasgow et al., 2005a). The overall PACIC score is determined by averaging the scores of all 20 items, with a score that can range from 1 to 5. Higher scores are indicative of receiving care that is more patient-centred and concordant with the Chronic Care Model.

Along with generating an overall PACIC score, the PACIC developers identified five subscales *a priori* (Glasgow et al., 2005a). Items in the first PACIC subscale, "Patient Activation" (items 1 to 3) refer to ways to get patients involved and providing input into the decision making about their care. The "Delivery System Design / Decision Support" subscale items (items 4 to 6) involve methods to educate patients on care and organize care. "Goal Setting / Tailoring" subscale items (items 7 to 11) inquire about obtaining information from patients and setting specific collaborative goals with them. The "Problem Solving / Contextual" subscale items (items 12 to 15) deal with the consideration of a patient's individual social and environmental situation and possible barriers when creating treatment plans. The final five questions of the PACIC make up the "Follow-up/Coordination" subscale (items 16 to 20) which considers how practitioners provide care that goes beyond the clinical setting, monitor patient progress, and maintain contact and coordinate care with patients. Scores for each of the PACIC subscales are determined by averaging the respective items, with the scores again lying between 1 and 5, with higher scores indicating the most patient-centred and CCM concordant scores.

There are 3 additional versions of the PACIC available, the PACIC 5A version (Glasgow et al., 2005b), PACIC+ version (Drewes et al., 2012), and a short form of the PACIC (also known as the PACIC-S) (Gugiu et al., 2009). The PACIC 5A version asks 6 additional questions that are then incorporated into the scoring to help assess adherence to the 5A model of behaviour change (Glasgow et al., 2005b; Gugiu, Coryn and Applegate, 2010). The PACIC+ version asks 6 different additional questions that assess multidisciplinary team function and work (Drewes et al., 2012). Gugiu *et al.* (Gugiu et al., 2009) developed and validated the 11-item short version of the PACIC, which is unidimensional and uses an 11-point scale rather than the 5-point scale employed in the original version. The original version of the PACIC was selected for this study as it is the most often used and psychometrically assessed and validated version. As described in Section 4.2.1 and Table 4.1, I modified the wording in 5 items from this version of the PACIC to be more suitable for chiropractic settings, and these changes performed well in the pilot study.

4.4.5. SAMPLE SIZE ESTIMATE

The PACIC results from the pilot study were used to estimate the minimum sample size using the formula for continuous data described by Cochran and further elucidated by Bartlett (III, Kotrlik and Higgins, 2001). The formula is

$$n = \frac{t^2 \times s^2}{d^2}$$

where:

n = sample size estimation

t = t-value for the alpha level (an alpha level of 0.05 produces a t-value of 1.96).

s = standard deviation (in this case estimated from the pilot study results as 0.75)

d = alpha level (acceptable margin of error, 0.05)

Thus, from the pilot study data, the sample size was estimated as :

$$n = \frac{t^2 \times s^2}{d^2} = \frac{(1.96)^2 \times (0.75)^2}{(0.05)^2} = \frac{3.84 \times 0.56}{0.0025} = \frac{2.15}{0.0025} = 860$$

Accordingly, a minimum sample size of 860 participants completing the questionnaire was considered appropriate for the main study.

4.4.6 CHIROPRACTOR QUESTIONNAIRE

Following the pilot study, augmenting the quantitative data with data specifically from the involved chiropractors was identified as a desirable addition to the main study to further enhance the validity of the data collected. Accordingly, a questionnaire was designed for chiropractors to complete in the main study. This questionnaire (see Appendix 9) provided data on the chiropractors and their practices, as well as their attitudes and orientation toward patient-centred care. There was no minimum sample size of chiropractors to complete the chiropractor questionnaire, this was a convenience sample of the chiropractors working at the involved clinics. The main strength of convenience sampling is the relative ease of recruitment, but this does come with the risk possible selection bias and lack of representativeness (Taherdoost, 2016). The chiropractor questionnaire included demographic information (4 items including gender, number of years in practice, the chiropractic educational institution where they trained, and their practice location based on the first 3 letters of their postal code), practice habits (3 items including the number of patients seen per week, hours per week spent seeing patients, and the design of their practice, i.e. whether multidisciplinary, solo practice, etc.), and the Patient-Practitioner Orientation Scale (PPOS) (see Appendix 9).

The PPOS was used to assess patient-centred communication and attitudes of the involved chiropractors toward the relationship and sharing of power and control between chiropractors and their patients (Shaw, Woiszwillo and Krupat, 2012; Silva, 2014). The PPOS was developed by Krupat *et al.* (Krupat, Putnam and Yaegar, 1996) in 1996 and can be completed by either patients or practitioners. For this study, the addition of the PPOS was also beneficial as determination of chiropractor attitudes towards patient-centred care could inform the interview guides in the subsequent individual semi-structured interviews. The PPOS consists of 18 multiple-choice items, each on a 6-point scale with detractors ranging from “Strongly Disagree” which is scored as 1 on most items to “Strongly Agree” which is scored as 6 on most items. The scores of 3 items (9, 13, and 17) are reverse coded. The PPOS provides 3 scores. The first is the overall PPOS score, consisting of the average scores from all 18 items. The PPOS can also be divided into two subscales, the Sharing and Caring subscales, with each consisting of the average of 9 different PPOS items. The 9 Sharing subscale items assess attitudes towards sharing information, power, control, and decision-making between practitioners and patients, while the 9 Caring subscale items assess attitudes towards warm supportive doctor-patient relationships, and the consideration of psychosocial factors and a holistic approach to care. Overall PPOS scores as well as those on each of the Sharing and Caring subscales range between 1 and 6, where higher scores indicate more patient-centred attitudes, while lower scores are indicative of attitudes that are more disease-centred or doctor-centred.

The PPOS is a valid and reliable tool that has been frequently used in published reports. The internal consistency of the PPOS is moderate (0.73 for the PPOS Total score, 0.67 for Sharing subscale and 0.52 for Caring subscale among physicians) (Krupat et al., 2000). Construct validity of the PPOS has also been demonstrated, showing significant differences between providers who were more patient-centred on the PPOS in their discourse with patients and specifically were less likely to ask biomedical questions during consultations and more likely to try to establish rapport and discuss lifestyle with patients (Shaw, Woiszwillo and Krupat, 2012).

The PPOS has been used in many countries and translated for use in several languages including Chinese (Wang et al., 2017), French (Paul-Savoie et al., 2015), Greek (Tsimtsiou et al., 2007), Japanese (Ishikawa et al., 2018), Korean (Choi, Hwang and Kim, 2015), Persian (Rohani, Ebrahimi and Ahmadipour, 2019), Polish (Pers et al., 2019), Portuguese (Ribeiro, Krupat and Amaral, 2007), Russian (Zhumadilova, Craig and Bobak, 2018), and Swedish (Wahlqvist et al., 2010). It is widely used and employed in studies of several health professions including medicine (Ahmad et al., 2015; Al-Bawardy et al., 2009; Haidet et al., 2002; Moore, 2009; Ribeiro, Krupat and Amaral, 2007; Shaw, Woiszwillo and Krupat, 2012;

Tsimtsiou et al., 2007; Wahlqvist et al., 2010), orthodontics (Madhan, Rajpurohit and Gayathri, 2011), physical therapy (Ross and Haidet, 2011; Rosewilliam et al., 2019), nursing (Rosewilliam et al., 2019; Paul-Savoie et al., 2018), speech and language therapy (Rosewilliam et al., 2019), and chiropractic (Hammerich et al., 2019). Many studies that have employed the PPOS have been in health professional education (Ahmad et al., 2015; Al-Bawardy et al., 2009; Fothan, Eshaq and Bakather, 2019; Haidet et al., 2002; Hammerich et al., 2019; Hur, Cho and Choi, 2017; Liu et al., 2019; Moore, 2009; Pereira et al., 2013; Pers et al., 2019; Ribeiro, Krupat and Amaral, 2007; Rohani, Ebrahimi and Ahmadipour, 2019; Rosewilliam et al., 2019; Ross and Haidet, 2011; Tsimtsiou et al., 2007; Wahlqvist et al., 2010) or postgraduate (Ishikawa et al., 2018; Madhan, Rajpurohit and Gayathri, 2011; Mohamed et al., 2019; Moore, 2009; Pereira et al., 2013) training settings, while others have involved patients (Choi, Hwang and Kim, 2015; Krupat et al., 2000; Pereira et al., 2013; Pers et al., 2019; Shaw, Woiszwillo and Krupat, 2012; Wang et al., 2017; Zhumadilova, Craig and Bobak, 2018) or practicing health professionals (Krupat et al., 2000; Moore, 2009; Paul-Savoie et al., 2015; Shaw, Woiszwillo and Krupat, 2012; Wang, Liu and Zhang, 2020; Wang et al., 2017; Zhumadilova, Craig and Bobak, 2018). It was decided that the PPOS was a suitable instrument to assess chiropractor attitudes and orientation to patient-centred care in this study given its psychometric properties and international use in a variety of health professions including among practising health professionals.

4.4.7 QUANTITATIVE DATA COLLECTION

The questionnaires were distributed by courier to each of the involved clinics with instructions that eligible and interested patients should complete the questionnaire in the clinic itself, most typically in the waiting area, either before an appointment while waiting to see the chiropractor, or after their appointment. However, if clinic staff felt that it was more appropriate or convenient for the patient to complete the questionnaire in the treatment/consultation room, that was also acceptable. Paper-based questionnaires were selected over online formats as response rates are often higher for paper-based questionnaires (Nulty, 2008), as exemplified by the response rate from the pilot study (Stuber et al., 2018)

A large package containing a training manual, study promotion poster, 65 patient study packages, 5 chiropractor study packages, and several pens were distributed by courier in April 2018 to each of the 20 participating clinics (see Appendices 6-10 for materials). As such, there was a total of 1300 patient and 100 chiropractor study packages. Each patient study package consisted of a participant information sheet, informed consent form, and the patient questionnaire along with 2 envelopes, 1 each for the completed questionnaire and informed consent form. The patient questionnaires and informed consent forms in each patient study package were numbered sequentially (1-1300) to allow for identification during data entry. To obtain the minimum calculated sample size of 860 completed questionnaires, a minimum 66.2% response rate from the 1300 patient questionnaires would be required, below the 78% response rate from the pilot study, and close to the estimated completion rate of 66.7% that the researcher and supervisors decided on following the pilot study (Stuber et al., 2018)

Each chiropractor study package consisted of a participant information sheet, informed consent form, and the chiropractor questionnaire, along with 2 envelopes, 1 each for the completed questionnaire and informed consent form. The chiropractor questionnaires and informed consent forms in each chiropractor study package were numbered sequentially (e.g. DC1, DC2, DC3, up to DC100) to allow for identification during data entry.

Prior to commencement of data collection, all participating chiropractors and clinic staff underwent a standardized clinic training program. The training program consisted of an online video presentation created by the Primary Investigator that was posted on YouTube (https://www.youtube.com/watch?v=Ex_oCt9ltrw&t=1s) (Stuber, 2018), and a training manual that was distributed to each of the involved clinics for review. At each clinic, 1 of the chiropractors (typically the clinic owner or director) was designated as the main contact regarding all issues related to the study and provided written informed consent for access to their clinic to participate in the study. The researcher contacted the designated chiropractor at each of the clinics by e-mail following a 1-week training period to ensure that the staff was suitably trained and comfortable with the study protocol and that all questions and concerns were addressed.

Clinics commenced patient recruitment at the beginning of May 2018 with a planned 2-month data collection period to the end of June 2018. To aid with recruitment study promotion posters (see Appendix 10) were displayed in an obvious and suitable location in the clinic, such as the reception area. Patients were either asked by front desk staff (before or after their visit) or by their chiropractor (during their visit) if they were interested in participating in the study. It was recommended that chiropractors review their daily patient schedules for patients who could be suitable for the study and consider either discussing the study with those patients personally or via their front desk staff. Chiropractors and front desk staff were reminded to inform patients that their participation was completely voluntary and would not impact the care that they received. This was to reduce any perceived pressure on patients to participate in the study. Patients agreeing to participate reviewed the study information materials, read and completed the informed consent form, and then completed the patient questionnaire. Patients had the opportunity to ask questions or address concerns about study participation either with their chiropractor or front desk staff and could also contact the researcher with any concerns. Patients could complete the questionnaire either before or after their appointment with their chiropractor, but not during the appointment so as not to impact the care that they received from their chiropractor. The completed informed consent and questionnaire were placed in separate envelopes and sealed by the patient.

All chiropractors practising at the respective clinics were asked to review the participant information sheet, complete the informed consent form, which was to be witnessed by another clinic staff member, and then complete the chiropractor questionnaire. Chiropractors had the opportunity to ask questions or address concerns about study participation with the researcher. The completed informed consent and chiropractor questionnaire were each to be placed in a separate envelope and sealed by the chiropractor.

During the data collection period the researcher contacted the designated contact individual at each clinic by a weekly e-mail to inquire on recruitment progress and any issues that arose. Clinics stored completed study packages in a secure location in an accordion-style folder provided by the researcher, preferably a locked filing cabinet. All completed study packages were returned to the researcher either upon completion of the data collection period or completion of all study packages, whichever came first.

Upon completion of recruitment the completed patient and chiropractic study packages were placed in a box, sealed, and returned to the researcher via courier. The quantitative data was entered into a password protected Microsoft Excel spreadsheet and subsequently into SPSS Version 25 into a password protected file for analysis. A random 10% of the study packages, selected using a computerized random number generator, were double-checked for data entry accuracy.

4.4.8 QUANTITATIVE DATA ANALYSIS – PATIENT RESULTS

The quantitative data analysis began with a descriptive analysis, followed by bivariate analysis, and regression analysis. The descriptive analysis of the results from the patient questionnaire was initially performed for the independent variables, namely the demographic and health information questions, and the PROMIS Global Health Scale, as well as the overall PACIC score. The overall PACIC score was the dependent variable to determine chronic musculoskeletal condition patient perception of patient-centredness of care from their chiropractor and concordance with the Chronic Care Model. PACIC subscale scores were also determined. The raw scores for the PROMIS Global Physical Health (GPH) scale and Global Mental Health (GMH) scales were determined for each patient and were converted to the relevant t-score.

Among the independent variables, counts and percentages were determined for categorial variables, while means with standard deviations, medians, and ranges were calculated for continuous variables. Several independent variables were extracted from the questionnaire results and categorized by their presence or absence including having chronic spinal pain, a mental health condition, a non-MSK condition, and multiple chronic conditions. Satisfaction with chiropractic care (highly satisfied or not), and duration of care (less than 10 years or 10 years and greater) were also dichotomized. Cross-referencing between patient and practitioner data allowed for determination of whether the patient attended a clinic where at least 1 of the chiropractors saw more than 100 patients per week on average. The mean with standard deviation, median, range and 95% Confidence Intervals (95% CI) for the overall PACIC score and PACIC subscale scores were also determined.

Following the descriptive analysis, bivariate analysis was performed to identify independent variables from the demographic and health information questions and PROMIS Global Health Scale that were significantly associated with the dependent variable (overall PACIC score). The overall PACIC scores were first assessed for normal distribution with the Shapiro-Wilk and Kolmogorov-Smirnov tests. The overall PACIC scores were found to be normally distributed on the Kolmogorov-Smirnov test, but not normally distributed on the Shapiro-Wilk test, and based on supporting literature (Field, 2009; Ghasemi and Zahediasl, 2012) and statistical advice, the decision was made to use non-parametric testing. Accordingly overall PACIC score means of categorical independent variables with 2 categories were compared using the Mann-Whitney U test, while overall PACIC scores means of categorical independent variables with 3 or more categories were compared using the Kruskal-Wallis test. Correlations between continuous variables, including the overall PACIC scores were determined using Spearman's test. This identified the independent variables that were significantly associated with the dependent variable, the overall PACIC score.

Multivariate linear regression analyses were conducted to identify predictors of the overall PACIC score. Based on statistical advice and supporting evidence, linear regression analyses were performed using the Enter (forced entry) method (Field, 2009). Enter method regressions were performed with independent variables found to have statistically significant between-group differences in PACIC scores or significant correlations with PACIC scores. Stepwise method regressions were also performed with all of the independent variables on an exploratory basis, but were not reported due to concerns with the effectiveness of stepwise regressions as a confirmatory analysis (Campbell, 2001; Field, 2009; Grant, Hickey and Head, 2018; Smith, 2018).

As mentioned, the overall PACIC score was the main dependent variable for this study. Previous psychometric research has recommended using the overall PACIC score as the PACIC fits a single dimensional model, and some researchers have indicated that providing the subscale scores does not confer additional beneficial information (Gugiu et al., 2009; Iglesias, Burnand and Peytremann-Bridevaux, 2014; Rick et al., 2012). However, it should be noted that there is conflicting evidence favouring each of the single-dimensional models of the PACIC (Cramm and Nieboer, 2012; Gibbons et al., 2017; Glasgow et al., 2005a; Gugiu, Coryn and Applegate, 2010; Iglesias, Burnand and Peytremann-Bridevaux, 2014; Rick et al., 2012), a 5-dimensional model (Aragones et al., 2008; Noel, Jones and Parchman, 2016; Rosemann et al., 2007; Vrijhoef et al., 2009; Wensing et al., 2008), and a 2-dimensional model (Taggart et al., 2010). It is noteworthy that even the developers of the PACIC, Glasgow *et al.* (Glasgow et al., 2005a), recommended focusing on the overall PACIC score as opposed to focusing on the subscales indicating that "we are most confident recommending use of the entire PACIC and the total score to represent CCM congruency" and that "Although the overall summary scores appear useful, the subscales are so highly intercorrelated that it may not make sense to interpret them separately" (Glasgow et al., 2005b). Given the recommendations from the PACIC's developers (Glasgow et al., 2005b) and considering the abundant supporting evidence for the single-dimensional model, the decision was made to conduct the analysis using the PACIC single-dimensional model as the dependent variable.

4.4.9 QUANTITATIVE DATA ANALYSIS – CHIROPRACTOR RESULTS

Similar to the patient data, analysis of the chiropractor questionnaire began with a descriptive analysis, followed by bivariate analysis, and regression analysis. In the descriptive analysis counts and percentages were determined for categorical independent variables, while means, medians, ranges and standard deviations (SD) were calculated for continuous independent variables. An additional variable, patients seen per hour, was determined from the questionnaire data, calculated by dividing the 'number of patients seen per week' by the 'number of hours spent seeing patients per week'. One of the independent variables 'number of patients seen per week' was reported as a continuous variable, and also dichotomized into 100 or more patients seen per week and 99 or fewer patients seen per week.

The PPOS overall score and the Sharing and Caring subscales scores are continuous variables for which means, medians, ranges, SD, and 95% Confidence Intervals were calculated. These were the dependent variables for determining chiropractor patient-centred communication and attitudes toward the nature of health professional-patient relationships (Caring subscale) and sharing of power and control (Sharing subscale), respectively.

Bivariate analysis followed the descriptive analysis. The bivariate analysis was performed to identify independent variables from the chiropractor demographic and practice information questions that were significantly associated with the dependent variables (PPOS Total and Caring and Sharing scores).

PPOS Overall, Sharing and Caring subscale scores were assessed for normal distribution using the Shapiro-Wilk and Kolmogorov-Smirnov tests and found to be normally distributed (Field, 2009; Ghasemi and Zahediasl, 2012). Accordingly, based on supporting literature

(Field, 2009; Ghasemi and Zahediasl, 2012) and statistical advice, the decision was made to use parametric testing. PPOS score means (Overall, Sharing and Caring subscales) of categorical independent variables with 2 categories were compared using the independent samples t-test, while PPOS score means of categorical independent variables with 3 or more categories were compared using one-way ANOVA. Correlations between continuous variables, including the PPOS scores (Overall, Sharing and Caring subscales) were determined using Pearson's test.

Multivariate linear regression analyses were conducted to identify predictors of the Overall, Sharing, and Caring PPOS scores. Again, based on statistical advice and supporting evidence, linear regression analyses were performed for each of the PPOS scores using the Enter (forced entry) method (Field, 2009). Enter method regressions were performed with independent variables found to have statistically significant between-group differences in PPOS scores or significant correlations with PPOS scores. Stepwise method regressions were similarly performed with all of the independent variables on an exploratory basis, but were not reported due to concerns with the effectiveness of stepwise regressions as a confirmatory analysis (Campbell, 2001; Field, 2009; Grant, Hickey and Head, 2018; Smith, 2018).

4.5 QUALITATIVE PHASE

The data from the qualitative phase of the study consisted of interview data collected from focus group interviews with chiropractic patients, and individual semi-structured interviews with chiropractors from the involved clinics. Focus group methodology was used to explore patient experiences of patient-centered care. Focus groups were used because they allow for a group of people with potentially common or disparate experiences and opinions to share their thoughts and perceptions of a topic (Barbour, 2005; Guest et al., 2017; Lambert and Loiselle, 2008; Leung and Savithiri, 2009; Ritchie and Lewis, 2003). In this study the patients shared the experience of seeing a chiropractor, although they had not all seen the same chiropractor, so there was the potential for different experiences with chiropractic care among them. The similarities and differences in their experiences and care received were explored through the group discussion.

One of the main strengths of focus groups is that, unlike individual interviews, focus groups allow for richer data to be obtained from the group owing to their social and interactive structure, enabling an exploration of diverse ideas, experiences, and backgrounds (Barbour, 2005; Guest et al., 2017; Lambert and Loiselle, 2008; Leung and Savithiri, 2009; Ritchie and Lewis, 2003). The comments of one participant can agree with, build upon, or contrast with others (Bloor et al., 2001; Leung and Savithiri, 2009). Another strength of focus groups is that they can present a more relaxed environment for participants as the social setting may allow them to feel comfortable and able to freely share their thoughts when compared with an individual interview (Onwuegbuzie et al., 2009; Ritchie and Lewis, 2003). Focus groups are flexible and provide additional value as they can produce important and often spontaneous interaction data between participants (Lambert and Loiselle, 2008; Leung and Savithiri, 2009; Onwuegbuzie et al., 2009; Ritchie and Lewis, 2003). Individual interviews were not conducted with patients as the pilot study demonstrated that similar information was obtained from the patients in the mini-focus group when compared with the individual patient interviews, and the mini-focus group benefitted from the interaction and discussion between the patients. The selection of focus group methods with patients was informed by the performance of the mini-focus group in the pilot study as described previously, as well as the above-noted strengths of this form of data collection. However, there are some potential weaknesses of conducting focus group. Participants may not completely share their thoughts or feelings (Ritchie and Lewis, 2003). This could be due to sensitivity of a topic, feelings of shyness in a group setting, or because other participants have been allowed to dominate the interview and some participants have not been able to participate as much (Ritchie and Lewis, 2003). A well conducted focus group is dependent on the preparation, experience, and ability of the interviewer, particularly when it comes to facilitating participation and interaction among participants (Leung and Savithiri, 2009; Ritchie and Lewis, 2003). Focus groups also carry some inherent costs, between the cost of room rentals and transcription. Finally, they produce a large amount of data for transcription and subsequent analysis (Leung and Savithiri, 2009; Bloor et al., 2001).

Chiropractors were individually interviewed to elicit their perspective of patient-centered care and describe how they perceive the care they offered to be patient-centered for patients with chronic musculoskeletal conditions. Individual interviews are the most used form of qualitative data collection (Lambert and Loiselle, 2008; Ritchie and Lewis, 2003). The main strength of individual interviews is that they can provide a comprehensive account of a subject’s beliefs, attitudes, or experiences relating to a topic or phenomenon of interest (Guest et al., 2017; Lambert and Loiselle, 2008). In this study the use of individual interviews with chiropractors was informed by the pilot study and felt to be the most appropriate means to gain their in-depth perceptions of the provision of patient-centred care. However, individual interviews can be limited by the ability of the interviewer to engage and establish rapport with the participant and get them to provide meaningful responses to questions (Anderson, 2010; Ritchie and Lewis, 2003). Individual interviews can also be time-consuming, particularly when trying to conduct, transcribe, and analyze several interviews within a study. Chiropractors did not participate in focus groups as the chiropractor involvement in the pilot study mini-focus group interview was difficult to engage and not beneficial to the conversation. This may have been due to the chiropractor being concerned about a possible power differential between them and the patients. Focus groups with chiropractors only were not conducted from a practical standpoint as it would be difficult to assemble a suitably sized focus group of chiropractors in any of the involved municipalities unless all of the chiropractors from 1 or 2 large clinics participated, which might be counterproductive as they might all share similar perspectives and may reduce the representativeness of the sample. Furthermore, a focus group with multiple chiropractors was not performed in the pilot study, thus this method and a suitable interview guide were not tested. As described above, it was felt that the individual interviews would capture the most pertinent information from chiropractors in this study.

Some researchers have advocated for the use of multiple qualitative research methods, potentially including both individual and focus group interviews within a single study to produce rich complementary data (Hahn, Steinhäuser and Goetz, 2020; Lambert and Loiselle, 2008; O'Reilly, Kiyimba and Drewett, 2021). The current study employed both methods of qualitative data collection, albeit in the form of focus groups with patients and individual interviews with chiropractors, as explained above. By interviewing both chiropractors and patients it allowed for a more complete understanding of the patient-centredness of chiropractic care by exploring the potentially differing roles and perspectives to be described, compared, and contrasted (Lambert and Loiselle, 2008).

4.5.1 QUALITATIVE DATA COLLECTION – SETTINGS

The focus group interviews were conducted in 4 municipalities in 3 different Canadian provinces: Calgary, Alberta; Swift Current, Saskatchewan; Cambridge, Ontario; and Toronto, Ontario. Patients recruited by clinics from these municipalities were asked to complete a separate form indicating if they were interested in taking part in a focus group interview. Each focus group interview took place in a small meeting room, which was felt to be conducive to engaging participants in discussion: 2 in hotels (Swift Current and Cambridge), 1 in a public library (Calgary), and 1 in a post-graduate educational institution (Toronto). A fifth focus group interview was planned for Halifax, Nova Scotia but did not take place as saturation was considered to have been achieved, and under the assumption that location would not impact patient responses.

The semi-structured individual interviews with chiropractors took place either in-person when possible or by telephone or online using free online applications such as Skype (Skype Communications SARL) or FaceTime (Apple Inc), whichever was most convenient for the participating chiropractor. With online data collection methods, while a potentially convenient and viable means for both the interviewer and participant who are remotely located from each other (Bloor et al., 2001; Moylan, Derr and Lindhorst, 2015; Roberts, Pavlakis and Richards, 2021), consideration must be put into resulting differences in methods. One notable consideration is that qualitative researchers may need to extend more effort into establishing rapport in interviews conducted virtually when compared to in-person interviews (Bloor et al., 2001; Roberts, Pavlakis and Richards, 2021). The researcher must also devote suitable time to learning the involved technologies (Bloor et al., 2001; Roberts, Pavlakis and Richards, 2021). In this study, the researcher was experienced with and a regular user of both Skype and FaceTime.

4.5.2 QUALITATIVE DATA COLLECTION - PARTICIPANTS

The patients who participated in the focus group interviews were selected purposefully from a subset of those who completed the quantitative component of the study, were located in the selected municipality, and indicated willingness to participate in the focus group. Attempts were made to purposefully recruit a representative sample to participate in the focus group interviews from among those providing their contact information, similar to the sample of the quantitative component of the study in terms of average age and gender distribution. Recruitment of patients from both larger (Toronto, Calgary) and smaller (Cambridge, Swift Current) municipalities was deemed important, as was recruiting from practices where clinicians tend to see more patients as well as those where clinicians do not see as many.

The chiropractors who were interviewed practised at 1 of the 20 involved clinics and were purposefully selected to ensure a balance of male and female chiropractors, as well as those practicing in municipalities of different sizes. Attempts were made to select chiropractors from different provinces and were not necessarily required to practise in the cities where the focus group interviews were going to take place. Participation in the interviews was voluntary.

4.5.3 QUALITATIVE DATA COLLECTION - SAMPLE SIZE

It was proposed *a priori* that 3 to 6 focus group interviews would be conducted and that each focus group would include 6 to 10 participants based on previous literature that indicates that 3 to 6 focus groups may be sufficient to reach data and/or theoretical saturation (Onwuegbuzie et al., 2009). However, qualitative studies frequently involve greater numbers of focus groups (Carlsen and Glenton, 2011; Guest, Namey and McKenna, 2016). Focus group sizes between 4 and 12 participants are commonly seen in the literature (Fusch and Ness, 2015; Onwuegbuzie et al., 2009).

For the individual interviews a sample size of up to 12 chiropractors was proposed. Guest, Bunce, and Johnson (Guest, Bunce and Johnson, 2006) found that the first 6 interviews produce the majority of new data and themes. For this study it was again deemed acceptable to cease recruitment once data saturation was reached, which could occur in as few as 6 to 12 interviews (Guest, Bunce and Johnson, 2006; Hennink, Kaiser and Marconi, 2017). Greater sample sizes are often seen in qualitative research studies that only employ individual interviews and may vary based on the nature of their research and qualitative approach (Guest, Bunce and Johnson, 2006; Vasileiou et al., 2018) but given the mixed methods design of this study, a smaller number was deemed acceptable.

4.5.4 SEMI-STRUCTURED INTERVIEW GUIDES

Two separate semi-structured interview guides were developed with consideration of numerous sources for the patient focus group and individual chiropractor interviews respectively (see Appendices 11 and 12). The interview guide questions were derived both theoretically and practically. The initial structure of the interview guides reflected Mead and Bower's model of patient-centred care (Mead and Bower, 2000) and the Chronic Care Model (Wagner et al., 2001a). To build upon that structure, the data from the pilot study and the quantitative component of the main study were analyzed and used to develop additional questions for the interview guides. In particular, the modified PACIC results from the patients were considered for both the focus group and individual chiropractor interview guides, while the PPOS results from the chiropractors were also considered for the individual chiropractor interview guide. Finally, the performance of the interview guides from the pilot study interviews were considered, consisting of the individual interviews with patients and chiropractors as well as the mini-focus group interview.

The questions in the focus group interview guide consisted primarily of open-ended questions (DeJonckheere and Vaughn, 2019; Leung and Savithiri, 2009; McGrath, Palmgren and Liljedahl, 2018) regarding patient perceptions of how patient-centred the care that they received from their chiropractor, and the manner in which the care they received was patient-centred. These questions were followed with probing questions to help develop a deeper understanding of patient experiences and perspectives of the care they received from their chiropractor, particularly if discussion from the open-ended questions was brief (McGrath, Palmgren and Liljedahl, 2018). 'Ice-breaker' or 'easy' questions (McGrath, Palmgren and Liljedahl, 2018) regarding patient experiences of living with chronic conditions began the focus group interviews to put participants at ease, initiate discussion, and allow participants to begin opening up and interacting with one another. The focus group interview guide was not piloted aside from questions used in the pilot study.

Similarly, the items in the individual chiropractor interview guide were mainly open-ended questions followed by probing questions. This allowed for exploration of chiropractor perspectives and experiences in providing care for patients with chronic musculoskeletal conditions and the manner they provide patient-centred care in this population. Probing questions were employed when needed to help elicit further responses, particularly when initial responses were brief (DeJonckheere and Vaughn, 2019; McGrath, Palmgren and Liljedahl, 2018) The chiropractor interview guide was not piloted aside from questions used in the pilot study chiropractor interview guide.

Semi-structured interviews have several notable strengths such as the amount of data that can potentially be generated and both the structure and flexibility that is offered to the interviewer. Semi-structured interviews benefit from having a set of pre-determined questions prepared ahead of time for the interviewer to ask participants (DeJonckheere and Vaughn, 2019). The interviewer can also use their experience and intuition to determine when to follow-up on, move, alter, add, or remove questions based on how participants are responding (DeJonckheere and Vaughn, 2019). However, the effectiveness of semi-structured interviews can be limited by the ability of the interviewer to conduct the interview effectively and gather the information needed to address the research questions, such as through appropriate sequencing of questions, probing, and actively listening to the participant (DeJonckheere and Vaughn, 2019). Semi-structured interviews can be further hampered if the person being interviewed is having difficulty with the interview topic either because the topic is sensitive or due to inadequate knowledge of the topic, or if they are unable to elaborate on their thoughts throughout the interview (DeJonckheere and Vaughn, 2019).

4.5.5 QUALITATIVE DATA COLLECTION – PATIENT FOCUS GROUPS INTERVIEWS

Participant recruitment for the focus interviews began after the quantitative data collection was complete, with recruitment primarily taking place by e-mail using e-mail addresses provided by participants. The focus groups were moderated by the researcher, with an assistant moderator present when possible. However, as the focus groups were conducted in different municipalities in different provinces, this was not always possible. Prior to the focus group meetings, the tables were organized into an alignment that was conducive to discussion, and refreshments were provided and set out for participant convenience. In front of each seat a name card was placed, labelling each participant with a pseudonym such as

‘Patient 1’, ‘Patient 2’, ‘Patient 3’, etc. A study information package and informed consent form were also provided for each participant.

The focus groups took place from April to June 2019. The focus groups were anticipated to be 90 to 120 minutes in duration (Onwuegbuzie et al., 2009). Upon arrival, focus group subjects were asked to read the participant information package and informed consent form. The moderator (researcher) further explained the study and the role of the subjects and answered any questions (Ritchie and Lewis, 2003). If participants were satisfied and still prepared to participate in the focus group, they were asked to complete and sign the informed consent form, which was signed by a witness. Upon completion of the consent forms the moderator began the focus group interviews. The moderator asked the questions from the interview guide, beginning with the ‘ice-breaker’ questions (DeJonckheere and Vaughn, 2019), and further facilitated the focus group by encouraging all subjects to participate in the discussion, and by probing participants for further discussion (Ritchie and Lewis, 2003). Both the moderator and assistant moderator took notes during the focus group interview, and the assistant moderator also provided a summary of the session to the researcher. All of the focus group interviews were audio recorded with back up using 2 digital recorders (Bloor et al., 2001; Ritchie and Lewis, 2003).

Subjects were asked not to provide their name or other identifying characteristics (such as the name or location of their chiropractor) during the recording.   To aid with the interview transcription and analysis process, participants were asked to begin their responses to questions or in discussion by first stating the patient number / pseudonym on the card in front of them (Patient 1, Patient 2, Patient 3, etc.). Following the interview, the moderator and assistant moderator met to debrief and discuss the content of the interview, review the interview guide, and decide whether changes were necessary (Bloor et al., 2001).

4.5.6 QUALITATIVE DATA COLLECTION – CHIROPRACTOR INDIVIDUAL INTERVIEWS

Recruitment for the individual chiropractor interviews began after the quantitative data collection was complete, with recruitment primarily taking place by e-mail using e-mail addresses provided by participants. The individual semi-structured interviews with the chiropractors were conducted by the researcher. These interviews took place at a convenient time for the participant and in a convenient location when conducted in-person. Participants who could not partake in an in-person interview were offered interviews either by telephone or videoconference, whichever was most comfortable and convenient for the participant. Interviews conducted in-person allowed for the opportunity for the chiropractor to initially review the study information package and informed consent form in person, followed by discussion of the project with the moderator before signing and witnessing the informed consent form if they agreed to participate, prior to commencing the interview itself. For interviews that were conducted over the telephone or videoconferencing software, the study information package and informed consent forms were first e-mailed to the participant for review, they were then asked to print, sign with witness, and return a copy of the informed consent form to the researcher before the interview took place. At the interview there was a final opportunity to discuss the role of the participant and address any questions or concerns regarding the study before beginning the interview.

The interviews took place in April and May 2019. The interviews were anticipated to be 45 to 60 minutes in length. The researcher asked the questions from the interview guide along with probing questions to help elicit further comment from the participant when necessary (Ritchie and Lewis, 2003). Each interview was audio recorded with back-up using 2 digital recorders. Subjects were asked not to provide their name or other identifying characteristics (such as their professional practice name or location) during the recording and each clinician was given a pseudonym (DC1, DC2, DC3, etc.) which the researcher used if needed during the interview.

4.5.7 QUALITATIVE DATA ANALYSIS

Upon completion of the focus group and individual chiropractor interviews, the audio recordings were transcribed verbatim with voice inflections and sounds described in parentheses by a professional transcriptionist to a password-protected word processing file. Appropriate transcription is important to allow researchers analyzing the transcripts opportunity to correctly interpret the meanings of what a participant says (Bloor et al., 2001; McGrath, Palmgren and Liljedahl, 2018; Onwuegbuzie et al., 2009). However, transcription is time and resource intensive (Bloor et al., 2001). To secure the data (McGrath, Palmgren and Liljedahl, 2018), the transcribed files were loaded onto a password-protected computer that was accessed only by the researcher in a locked private office. To ensure accuracy of the transcriptions a random 25% sample of the audio recordings, determined using a computerized random number generator, were double-checked against the transcriptions for accuracy by the researcher. Data analysis took place following transcription of each interview using thematic analysis until saturation was felt to be achieved (Braun and Clarke, 2006). Analysis of the qualitative data was conducted inductively using thematic analysis and based on the methods described by Braun and Clarke (Braun and Clarke, 2006). Braun and Clarke's method involves 6 phases of analysis:

1) *Familiarization and transcription of data* - Each of the interview transcripts were reviewed in their entirety on at least 2 separate occasions by the researcher to ensure completeness and for familiarization with the data before progressing to the next phase of analysis.

2) *Generating initial codes* – The transcribed documents were entered by the researcher into Dedoose (SocioCultural Research Consultants) using password protection of the units for analysis. The process of coding each interview (focus group and individual) was conducted by the researcher and another researcher with experience in qualitative data analysis and coding. These researchers separately coded the interviews inductively using pen and paper, with the student maintaining a master codebook in word processing document. After coding each focus group interview and after every 3 individual interviews, the researchers met to discuss the coding and ensure coding consistency. A third qualitative researcher was available to resolve differences if needed. The finalized coding was entered into the qualitive data analysis software by the researcher. In the focus group interviews, both individual and group interaction data were considered. The codes were generated *de novo; a priori* codes such as those from the pilot study were not employed. Data saturation was felt to be achieved when no further concepts requiring unique codes were generated (Fusch and Ness, 2015; Guest, Bunce and Johnson, 2006; Guest, Namey and McKenna, 2016; Hennink, Kaiser and Marconi, 2017; Hennink, Kaiser and Weber, 2019).

3) *Searching for themes* –Themes and subthemes were identified *de novo* after the coding process. The initial identification of themes and sub-themes was discussed between researchers during meetings that evaluated coding consistency. After coding

the interviews, the researcher and another qualitative researcher met to discuss and generate themes and subthemes emerging from the generated codes, with a third researcher available to resolve disagreements. This phase produced possible themes and sub-themes to further consider, along with accompanying extracts.

4) *Reviewing themes* – The initial themes and sub-themes with the coded extracts were reviewed individually by the researcher and another qualitative researcher to determine if a pattern was emerging. The themes and subthemes were discussed and refined between the researcher and qualitative researcher with disagreements resolved by third qualitative researcher if necessary. The researchers then met to discuss and refine themes and subthemes and ascertain whether they produced a suitable representation of the data set, which included further individual review of the entire data set, with some re-categorizing of codes as necessary. This went on until the researchers agreed upon a final set of themes and sub-themes.

5) *Defining and naming themes* – The final themes and sub-themes were formally named and definitions were drafted by the researcher before distribution to my supervisors for review. Several iterations of the definitions were drafted before final agreement was obtained. Data extracts consistent with the definitions were identified.

6) *Producing the report* – The final themes and their definitions, along with interpretive analysis and data in the forms of representative quotations were provided within this thesis. As this was a mixed methods study, a decision was made to present the data

and results of both the quantitative and qualitative together, using qualitative findings to explain or refute findings of the quantitative components. When attributing quotes within this thesis, only the participant's pseudonym will be provided.

Thematic analysis is frequently used in qualitative research as it is seen as flexible due to not necessarily being attached to any particular theoretical or epistemological framework, and due to its comprehensive process, which can offer a rich and detailed assessment of a data set (Alhojailan, 2012; Braun and Clarke, 2006). However, because the process of thematic analysis is comprehensive, it can be quite time-consuming (Braun and Clarke, 2006).

4.5.8 INTEGRATING QUANTITATIVE AND QUALITATIVE RESULTS

Integration of the quantitative and qualitative data in this mixed methods study took place at each of the study design, methods, interpretation, and reporting levels (Fetters, Curry and Creswell, 2013; Ivankova, Creswell and Stick, 2006). Both quantitative and qualitative data were collected from patients with chronic musculoskeletal conditions who receive chiropractic care, as well as their chiropractors. The quantitative and qualitative data were integrated by connecting their samples as the patients and chiropractors in the qualitative component had all taken part in the quantitative component (Fetters, Curry and Creswell, 2013). Developing the interview schedules with consideration of the quantitative results provided another method to integrate the quantitative and qualitative aspects of the study (Creswell et al., 2011; Ivankova, Creswell and Stick, 2006; Pluye et al., 2018).

The results of the quantitative and qualitative sections were compared for similarities and differences (Pluye et al., 2018). The qualitative analysis of both the patient focus groups and chiropractor interviews helped frame and explain the results of the overall PACIC score as the main dependent variable in the study as well as the PACIC subscales. Similarly, the results of the overall PPOS scores as well as those on the Sharing and Caring subscales were potentially augmented and explained through the individual interview data. Additional mixing of the data took place through the narrative in reporting the results with a weaving approach between the quantitative and qualitative results, as opposed to presenting 1 form of results (e.g., quantitative) followed by the other (e.g., qualitative) (Fetters, Curry and Creswell, 2013; Ivankova, Creswell and Stick, 2006). The study methods and findings were reported in accordance with the Good Reporting of a Mixed Methods Study (GRAMMS) (O'Cathain, Murphy and Nicholl, 2008). GRAMMS consists of the 6 items seen in Figure 4.3.

Guideline	**Section**
Describe the justification for using a mixed methods approach to the research question	Chapter 4, section 4.0: Introduction
Describe the design in terms of the purpose, priority and sequence of methods	Chapter 4, section 4.0: Introduction
Describe each method in terms of sampling, data collection and analysis	Chapter 4, sections 4.4.1 to 4.4.8 (quantitative) and 4.5.1 to 4.5.7 (qualitative)
Describe where integration has occurred, how it has occurred and who has participated in it	Chapter 4, section 4.5.8
Describe any limitation of one method associated with the presence of the other method	Chapter 6, section 6.3
Describe any insights gained from mixing or integrating methods	Chapter 5, sections 5.2-5.4, 5.7-5.8 Chapter 6, sections 6.1-6.2

Figure 4.3. Good Reporting of a Mixed Methods Study (GRAMMS) guide (O’Cathain, Murphy and Nicholl, 2008).

4.5.9 REFLEXIVITY

In studies using qualitative or mixed methods it is important for the investigators to acknowledge and critically self-reflect upon the impact that their personal actions, background, history, position, assumptions, and biases can have on the study (Berger, 2020; Creswell, 2014; Cypress, 2017; Fusch and Ness, 2015; Korstjens and Moser, 2017; McGrath, Palmgren and Liljedahl, 2018; Ritchie and Lewis, 2003). I brought unique knowledge and potential biases to my study as a male chiropractor with over a decade and a half of clinical experience, as well as ongoing engagement as a researcher, editor, educator, and policymaker in the chiropractic profession. My specific experience framed my personal lens on the chiropractic profession and patient care. It was important for me as a researcher to recognise that researchers are part of the study just as the study participants are, and through these reflections minimize the influence that these factors may exert throughout the study (Creswell, 2014; Fusch and Ness, 2015; Korstjens and Moser, 2017; McGrath, Palmgren and Liljedahl, 2018; Ritchie and Lewis, 2003).

As part of researcher reflexivity and to establish an audit trail (Berger, 2020; Cypress, 2017), I maintained a journal for self-reflection and recording insights and experiences throughout the planning, execution, and interpretation of the qualitative components of the study (Walker, Read and Priest, 2013). Journal entries began in the planning phases of the study and related to interview guide development and participant recruitment as well as determining suitable interview locations and arrangements. For example, at numerous points I identified difficulty with recruiting patients to participate in the focus groups, with very few people answering or returning phone calls, but having more success when recruiting by e-mail.

During qualitative data collection, journal entries were made as soon as possible after each focus group and individual interview and considered along with the notes taken by the researcher and assistant moderators during interviews. Journal entries and notes from the interviews were reviewed frequently, including prior to subsequent interviews and during data analysis. Decisions made during data analysis were also logged into the journal as were comments from meetings between the researcher and the other qualitative researcher involved in the thematic analysis.

The impact of me being a chiropractor was considered on numerous occasions prior to and following interviews and throughout analysis and interpretation. In instances where I had an existing relationship with the chiropractor being interviewed, that relationship and shared experience of being a chiropractor might have been beneficial in establishing interview rapport, although it could also lead to some potential role conflict, assumptions, and pre-existing knowledge of the chiropractors and their practices (Berger, 2020; McConnell-Henry et al., 2014). During analysis, I attempted to bracket myself by looking at the content of the transcripts and what the participants said specifically and remove any influence of my previous knowledge of the chiropractors.

There was a potential power difference between the researcher and particularly focus group participants, as I am a chiropractor investigating chiropractic care (Day, 2012). I attempted to mitigate the influence of being a chiropractor and any potential power differences in the focus group interviews by setting up the interview rooms so that I was not sitting at the head of the table and asked patients to address me by my first name and not use a more formal title. I also encouraged interaction between focus group participants to reduce my influence on the interview as demonstrated from an entry in the journal, "*It took a while to get them to talk to each other and not just to me, but they did eventually, expanding on what some said in some cases, or contradicting each other a bit sometimes too*" (May 10, 2019). A journal entry demonstrated such power differences being considered from the third focus group interview, "*Patients had no issues talking about the positives of seeing their chiro(practor) - had to do probe a bit to get them to talk about problems, usually with previous chiropractors…..*

Possible issue - were (initial) positive comments because they know I am a chiro(practor)?" (May 24, 2019). During data analysis and interpretation, I considered whether participants were saying what they thought I wanted to hear and sought out instances of high levels of agreement among participants, along with instances of participants providing contrasting views with each other, regardless of my personal views on the topics discussed.

In addition, I recognized an assumption that chiropractors who use systematized techniques or prescribe similar extended treatment plans to their patients are not being patient-centred based on experiences with colleagues. As noted in a comment from the journal while analyzing data, "L*ots of concern about high-volume chiros (chiropractors) and techniques not being PC (patient-centred) from the chiro interviews, a few focus groups mentioned it too"* (October 29, 2019). I further recognized the biased opinion that such less patient-centred behaviours and attitudes would be more common among older chiropractors and graduates from non-Canadian chiropractic educational institutions. I recognized these biases, assumptions, and power differentials and that allowed me to be more aware during analysis of the qualitative data and guard against allowing these biases to influence the interpretation of the results (Creswell, 2014; Fusch and Ness, 2015; McGrath, Palmgren and Liljedahl, 2018; Ritchie and Lewis, 2003). The presence of a qualitative researcher who was not a chiropractor working with me on the thematic analysis was important to consider whether my interpretations of the data were different from theirs and if that was influenced by my personal views and professional experience and ensure that emerging themes arose from the data alone.

4.5.10 VERIFICATION

Verification of the qualitative components of the study was performed in several ways and at multiple points throughout the study. The researcher and assistant moderators from the focus groups met to debrief and compare notes from the focus group interviews. In addition, the interview recordings were transcribed by a professional transcriptionist with the researcher verifying 25% of the recordings. Intercoder agreement was monitored between the researcher and qualitative researcher during the analysis (Creswell et al., 2011). Finally, methods triangulation (Creswell et al., 2011; Creswell, 2014; Korstjens and Moser, 2017; Lambert and Loiselle, 2008; Morse, 1991; Ritchie and Lewis, 2003) was used to further demonstrate validity of the results by considering the quantitative data from the patient and chiropractor questionnaires, as well as the qualitative data from the two forms of interviews, specifically patient focus groups and individual chiropractor interviews.

Participant validation was not performed in this study. Participant validation can be particularly difficult with focus groups (Barbour, 2005), and it was anticipated that this would be further compounded by conducting multiple focus groups in different municipalities, along with the individual chiropractor interviews. In focus group interviews in particular, the presence of numerous participants and interactive nature of focus groups can make them difficult to ensure effective respondent validation as participants only contribute so much to the discussion and their recall of the topics discussed over the course of a 90- to 120-minute meeting may be insufficient (Barbour, 2005; McGrath, Palmgren and Liljedahl, 2018). Further pragmatic reasons for not conducting respondent validation in the individual and focus group interviews included anticipated difficulty with contacting participants to gain their agreement and consent to review transcripts and/or manuscripts for these purposes and an ethical concern about infringing upon their time.

4.6 CONCLUSION

This chapter described the methods for the study. The study began with a pilot study to establish proof of the feasibility of the methods, generate initial data for consideration, and enable determination of the main study's sample size. The pilot study informed changes that were deemed necessary for the main study. The study had an explanatory sequential mixed methods design with a quantitative priority, which was felt to be the most suitable way to address the research questions. To fulfill this design the study had both chiropractors and patients complete questionnaires, followed by focus group interviews with patients, and individual interviews with chiropractors. The next chapter of the thesis will present the results of the main study in particular.

CHAPTER 5

RESULTS

CHAPTER 5: RESULTS

5.0 INTRODUCTION

This chapter describes the main study results. Throughout this chapter, the qualitative data will be integrated with the quantitative analysis to help explain the results. The patient questionnaire results will be presented first as the Patient Sample Characteristics (Section 5.1) and Patient Health Status and Health Care Utilization (Section 5.2). This will be followed by Descriptive Analysis of the PACIC results (Section 5.3), which will present assessments of the PACIC overall and subscale scores, using the qualitative data to help explain why some of the subscale scores were higher than others. The results of the Overall PACIC Score Bivariate Analysis (Section 5.4) will follow, along with the results of the Overall PACIC Score Regression Analysis (Section 5.4.1).

The results of the questionnaires completed by the chiropractors will be presented in a similar manner by evaluating the Chiropractor Sample Characteristics (Section 5.5), Chiropractor Practice Patterns (Section 5.6), and Descriptive Analysis of the PPOS (Section 5.7). The Descriptive Analysis will be depicted descriptively and accompanied by relevant quotes from the qualitative data that illustrate possible explanations for the higher PPOS Caring scores over PPOS Sharing scores. The results of the PPOS Score Bivariate Analysis (Section 5.8) and PPOS Multiple Linear Regression Analysis (Section 5.8.1) will follow. The chapter will close with presentation of the Thematic Analysis Results (Section 5.9) describing and illustrating the themes developed from the qualitative analysis. Given the sequential explanatory design of the study, qualitative data is used throughout this chapter to explain the findings from both patient and chiropractor questionnaires.

5.1 PATIENT SAMPLE CHARACTERISTICS

The estimated minimum patient sample size for the study was 860 participants. Of the 1300 questionnaires distributed to the 20 participating clinics, 885 patients met the inclusion criteria and completed the questionnaire, for an inclusion rate of 68.1%. The remaining 415 questionnaires were excluded from the analysis for several reasons including, the questionnaire not being returned (n=287, 22.1%), the patient not having a chronic musculoskeletal condition (n=89, 6.8%), incomplete data (n=63, 4.8%), the informed consent form not being complete (n=13, 1%), and the patient not being old enough to participate in the study (n=1, <0.1%).

Participating patients varied across seven Canadian provinces with the majority (36.2%) being from Ontario (see Table 5.1). The mean age of the patients was 52.75 years old (SD =14.80), with a median of 54 years, and ranging from 18-93 years. Nearly 1 in 4 participants (22.4%) were 65 years old or older, the standard age of retirement in Canada. Nearly two-thirds of the patients were women (64.4%), and the majority of patients were Caucasian (88.0%). The participants were well-educated with 92.4% having at least completed high school, nearly half having completed post-secondary training (47.8%), and 13.3% having completed professional or graduate school.

Table 5.1. Patient demographic data

Variable	Count (%)
Province	
- Alberta	128 (14.5%)
- British Columbia	147 (16.6%)
- Manitoba	45 (5.1%)
- Newfoundland	51 (5.8%)
- Nova Scotia	59 (6.7%)
- Ontario	320 (36.2%)
- Saskatchewan	135 (15.3%)
Age	
- 18-64	687 (77.6%)
- 65+	198 (22.4%)
Gender	
- Female	570 (64.4%)
- Male	315 (35.6%)
Ethnicity	
- First Nations/Indigenous	25 (2.8%)
- Asian	41 (4.6%)
- Black	12 (1.4%)
- Caucasian	779 (88.0%)
- Latin/Hispanic	6 (0.7%)
- Other	9 (1.0%)
- Not indicated	13 (1.5%)
Education	
- High school incomplete	67 (7.6%)
- High school complete	149 (16.8%)
- Post-secondary education incomplete	128 (14.5%)
- Post-secondary training complete	423 (47.8%)
- Professional / graduate school	118 (13.3%)

Out of 205 study participants who indicated interest in participating in the focus group interviews and provided their contact information, a total of 19 patients (9.3%) were selected and participated in the 4 focus group interviews. Among them were 4 participants in Saskatchewan, 6 in Alberta, and 9 in 2 focus groups in Ontario. There were 15 females (78.9%) and 4 males (21.0%), with a mean of 57.84 years of age with a range from 19 to 75 years. Thus, there was a higher mean age and proportion of females in the focus groups when compared with patients included in the quantitative component.

5.2 PATIENT HEALTH STATUS AND HEALTH CARE UTILIZATION

Table 5.2 depicts the clinical characteristics of participating patients. Patients frequently reported multiple chronic conditions, with approximately two-thirds of the patients indicating having multiple chronic conditions, with a median of 2 conditions (mean = 2.05, sd =1.12) and ranging up to 9 chronic conditions. Nearly 80% of the patients reported a chronic spinal condition. Close to one-quarter of the patients reported at least 1 chronic non-musculoskeletal condition, 6.41% had at least 2 chronic non-musculoskeletal conditions, with a range from 0-6. Chronic mental health conditions were rarely reported (3.8%); however, this may have been under-reported given the importance assigned to mental health and perceived prevalence described by the participating chiropractors during interviews. As one chiropractor noted, *"On my intake form there is a specific check mark for depression or anxiety….I would say 30-40% have that checked off"* (DC3).

Over 40% of the patients subjectively rated their health as 'above average' or 'excellent', and less than 1% indicated being in 'poor' health. The mean PROMIS physical T-score was 45.27 (SD = 7.51) with a median of 44.9 and ranging from 16.2 to 67.7, while the mean PROMIS mental T-score was 49.09 (SD = 8.46) with a median of 48.3 and ranging from to 21.2 to 67.6. These scores were corroborated in the interviews as patients indicated that their chronic conditions affected them both physically and mentally. *"I don't know if you can separate the physical and the mental because it just affects your life so much, it's so frustrating, it changes who you are and you're not able to be the person you normally would, you're you know less cheerful, you know you isolate whatever and in those extreme times when it's really bad I think there is no difference between the physical and mental because after you've experienced it (*pain*) for such a prolonged period of time, it affects you mentally. You become frustrated, you become depressed, you become, you know, a lot of things and those are all* *mental and the source of the pain is physical"* (FG3 – Patient 2). One of the chiropractors further described how having a chronic musculoskeletal condition affects all aspects of a patient's life. *"Chronicity leads to more global effects on health and can lead people into a negative spiral….chronicity is like that, you know, it just becomes so many things...it doesn't stop at one thing, it is many things. There could be drug interactions that are affecting them, sleep problems, relationship problems, many many things come into it"* (DC1).

Table 5.2. Patient clinical features

Variable	Count (%)
Multiple chronic conditions	
- No	331 (37.4%)
- Yes	554 (62.6%)
Chronic spinal condition	
- No	178 (20.1%)
- Yes	707 (79.9%)
Chronic non-MSK condition	
- No	673 (76.0%)
- Yes	212 (24.0%)
Mental health condition	
- No	851 (96.2%)
- Yes	34 (3.8%)
Overall health	
- Poor	8 (0.9%)
- Below average	72 (8.1%)
- Average	439 (49.6%)
- Above average	288 (32.5%)
- Excellent	78 (8.8%)

The patients reported seeing a mean of 3.05 health care providers in the past year (SD = 1.19) with a median of 3 and ranging from 1 to 8 providers. The number of providers seen supported chiropractors' opinion favouring multidisciplinary care for patients with chronic MSK conditions. However, the extent of co-treatment or interprofessional collaboration in management of chronic MSK conditions varied among participating chiropractors. *"Treatment for me for chronic type pain I think is still multidisciplinary, so depending on the patient we could co-treat with physio(*therapy*), massage, and a physician. It is just a matter of* *the complexity of the case"* (DC4). Some chiropractors described wanting to learn more about the practitioners that patients attend and their involvement in treating their chronic conditions. *"A very big component of what I do is understanding the health care team they have assembled around them.... a lot of people see their family physician and they neglect to mention chronic MSK conditions, because they just maybe don't feel that that is sort of their thing. So, a lot of times you will have somebody who has had severe chronic knee pain for years and I will say' have you mentioned that to your physician?' They will say 'No, I haven't'."* (DC2).

The manners in which chiropractors and other healthcare professionals collaboratively work and interact with patients was explored. Collaboration was facilitated by co-location where chiropractors work in the same setting as other healthcare professionals, as noted: *"There are people within the office, a massage therapist, naturopath, who will often see the same patients and so we do have some discussions around care and issues that we recognize that may be relevant to the care from another practitioner"* (DC1). However, patients suggested that collaboration can be hindered by antipathetic attitudes between other health professionals and chiropractors. "'*Don't go, don't get manipulated' that's his (*the medical doctor's*) words to me because I would say 'I got to go see the chiropractor and get rid of this neck pain'.*" (FG4).

The patients reported seeing their chiropractors for a mean of 14.43 visits in the past year (SD = 12.31), with a median of 12 visits and ranging from 3 to 104 visits. Interview data indicated that chronic pain patient visit frequency varies depending on the patient's case, but regular monthly appointments appear commonplace in this population, which may explain the median visit frequency. This variation in visit frequency was explained by one chiropractor as being determined with patients and how they deemed regular care to be important. *"An average of once a month works well for a lot of people but some people maybe it is every couple of weeks, they feel they need to come in or maybe their condition starts to re-lapse within a couple of weeks or maybe it could be a couple of months or maybe it is once a year, so it is all dependent on the patient and the condition but some type of regular follow-up like proactive regular follow up I think is important for chronic patients. Again, just to help keep them motivated and as a practitioner we can use those visits as a way to coach, educate and reassure the patient"* (DC6).

Patients attended their present chiropractic clinic for a mean of 10.3 years (SD = 9.09), with a median of 8 years and ranging from 2 weeks to 49 years. Patients described how the length of the relationship with their chiropractor reflected the trust that they have in their chiropractor, for example, *"I trust my chiropractor, so I just tell him do what you need to do, so that being said I've seen him for 10 years, so I know he's going to do something that's going to help me, I know he won't do something to hurt me."* (FG2 – Patient 4). Chiropractors agreed that longer relationships and more frequent visits can help with building trust between them and their patients, as highlighted here: *"I do feel that the more that you see a patient the more they literally will trust you with anything, the more that the conversations are going to open up."* (DC7). *"I think when you have a little bit more of a long-term relationship you build a lot more trust"* (DC5).

Table 5.3 provides additional information with respect to chiropractic clinic attendance and patient satisfaction. Just over half of the patients were found to attend a clinic where the chiropractor sees 100 or more patients per week. The vast majority of the patients were satisfied with the chiropractic care received, with nearly 90% indicating that they were 'very satisfied'. This high satisfaction score was supported by patients in the focus groups, *"I'm very satisfied because if I wasn't, I would leave, there's other chiropractors in the city, and you know I'll drive if whatever distance I need to get good care"* (FG1). Similarly, chiropractors point to patient satisfaction as being extremely important and potentially more important than symptom relief or improvement in the patient's condition, as explained by one chiropractor, *"Patient satisfaction is the ultimate outcome, period. No matter whether or not you get them better or whether you make them feel like they are going to get better"* (DC3). While most patients were quite satisfied with the chiropractic care that they received, several reported previously seeing other chiropractors whose care left them unsatisfied and caused them to seek another chiropractor. One patient described a particularly negative experience with a previous chiropractor where they felt that the chiropractor only completed half of their treatment but still charged them for the full amount, leaving the patient to feel quite dissatisfied and that the patient did not matter to the chiropractor: *"..... but he (*the chiropractor*) didn't do the other side and 'here's your bill' and off I went, and it was like 'you only did half an adjustment', but you know he was so busy it was just like 'how many* (patients) *can I get through?' And that is not a, that's not a good feeling, that's not being cared for"* (FG1).

Table 5.3. Patient chiropractic service data.

Variable	Count (%)
Duration of care	
- Less than 10 years	471 (53.2%)
- 10 years or more	414 (46.8%)
Clinic where DC sees 100+ patients per week	
- No	415 (46.9%)
- Yes	470 (53.1%)
Satisfaction with chiropractic care	
- 0 -Very dissatisfied	1 (0.1%)
- 1	2 (0.2%)
- 2	0 (0%)
- 3	8 (0.9%)
- 4	90 (10.2%)
- 5 - Very Satisfied	784 (88.6%)

5.3 DESCRIPTIVE ANALYSIS OF THE PACIC

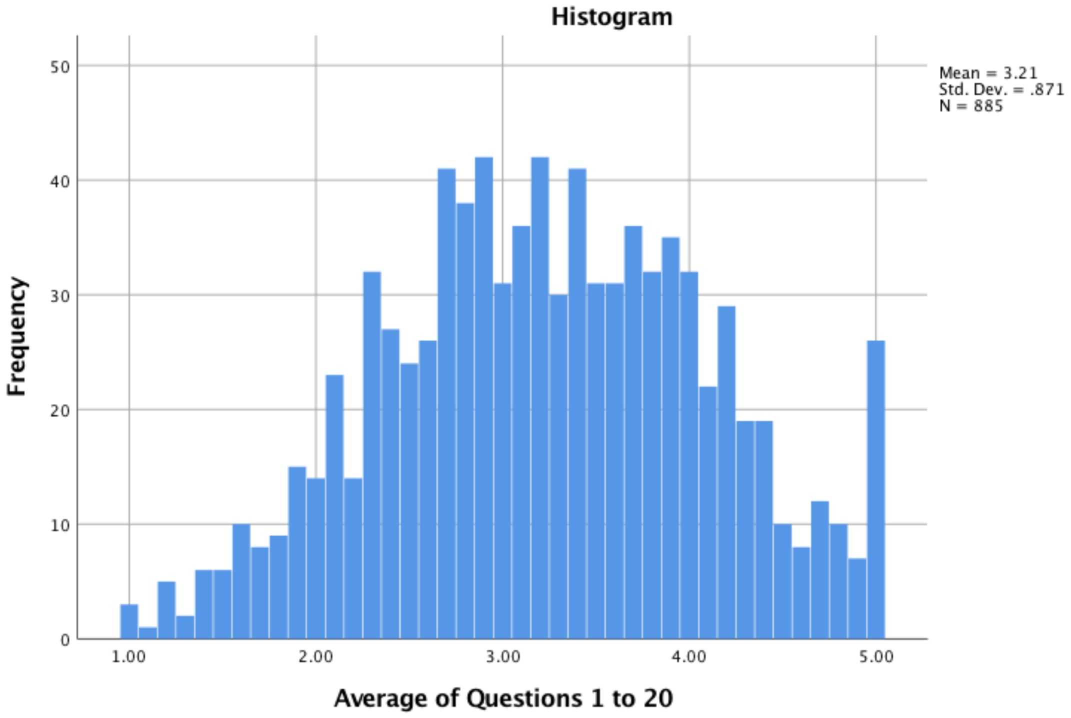
The mean Overall PACIC score was 3.21 (95% CI 3.15-3.27) and the median was 3.20, while mean PACIC subscale scores ranged from 2.50 to 3.94 (Table 5.4). The subscale with the highest mean score was Problem Solving / Contextual (3.94), followed by Patient Activation (3.74), Delivery System Design (3.66), Goal-Setting / Tailoring (2.75), and Follow-Up / Coordination (2.50).

Table 5.4. Patient PACIC scores (n=885)

Variable	Mean (SD)	95% CI	Median
Overall PACIC	3.21 (0.87)	3.15-3.27	3.20
PACIC 1-3 – Patient Activation	3.74 (1.07)	3.68-3.81	4
PACIC 4-6 - Delivery System Design / Decision Support	3.66 (0.88)	3.61-3.72	3.67
PACIC 7-11 – Goal-Setting / Tailoring	2.75 (1.09)	2.68-2.82	2.6
PACIC 12-15 – Problem Solving / Contextual	3.94 (1.02)	3.87-4.00	4
PACIC 16-20 – Follow-Up / Coordination	2.50 (1.13)	2.42-2.57	2.40

The Kolmogorov-Smirnov test indicated that the Overall PACIC scores followed a normal distribution, D(885) = 0.03, p = 0.058. However, the Shapiro-Wilk test was also performed and showed a significant departure from normality for overall PACIC scores (W(885) =

0.992, p<0.001), with the data negatively-skewed (see Figure 5.1 for histogram). Given the enhanced power of the Shapiro-Wilk test (Field, 2009; Ghasemi and Zahediasl, 2012), non-parametric analysis of overall PACIC scores was used due to non-normal distribution of the scores.



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Average of Questions 1 to 20 Stem-and-Leaf Plot
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Figure 5.1. Overall PACIC score distribution.

The Problem Solving / Contextual subscale had the highest mean scores (3.94) of all the PACIC subscales from the patients in our study. This study followed the definition of this subscale provided by Glasgow et al. (Glasgow et al., 2005a) as “considering potential barriers and the patient’s social and cultural environment in making treatment plans.” These high scores could be explained by chiropractors gathering information on the symptoms that patients experience due to their chronic condition and how it affects them by taking a detailed patient history and learning about patients and their lives during office visits. This was noted by a patient, *"With a chiro*(practic) *appointment, it's much longer and they take more time to listen and understand what's going on, how your injury is coming on."* (FG1 – Patient 4). The patient's perspective was supported by the chiropractors who reported they needed to spend more time with chronic pain patients in order to identify issues and try to problem solve with them, *"I spend a lot more time with people who are chronic because we are always looking to find things that maybe we haven't been able to identify that we can bring into the equation so we can help them manage it or look at from a treatment perspective."* (DC2). Patients described how chiropractors attempt to determine their interests and find different ways to motivate them to take part in self-care activities, such as *"My chiropractor does ask a lot of questions of you know what am I willing to do, am I doing the things that I know I'm supposed to? And they have the ability to kind of chide me into doing the exercises that I just don't like doing but it's a good relationship that they can get you to do the things that you don't want to do that you know that you need to do"* (FG1). One chiropractor provided an example of how they address a commonly encountered barrier for patients with lumbar spinal stenosis and ways to overcome that barrier as part of their individual treatment plan, *"So, stenosis is a good example of where the patient will come in to you and they are becoming sedentary because it hurts them to walk and they can't understand why they can't go for long walks like they used to, and so they get really discouraged. So, if you can get them to exercise in a way that is not going to aggravate their condition it will help them to stay more active and healthy, and so on. So, I talk about cardiovascular exercise like walking or swimming depending on the patient"* (DC6).

The Patient Activation subscale had the second highest mean scores (3.74). This study followed Glasgow's (Glasgow et al., 2005a) definition of this subscale as "Actions that solicit patient input and involvement in decision-making". The higher Patient Activation subscale scores were reflected as patients described interactions with their chiropractor where they were allowed to make choices about their care, for example, *"He (*the chiropractor*) is always asking 'What works? What doesn't work?' and he'll often give me an A or B option rather than saying 'Hey, we're going to be doing this', it's 'How do you feel about this or would you rather we do this?', so he's always asking for my input"* (FG2). The higher scores for this subscale were further explained by comments from patients who indicated that their chiropractors invited them to participate in their care by asking for their thoughts on elements of their treatment plans and by encouraging them to participate in self-care -*"He (*the chiropractor*) is asking my input and giving me suggestions and little pieces of homework to do rather than just saying 'Okay, well suffer for the next month until you see me.' It's 'These little bits will help you until you see me next.'"* (FG2).

The Delivery System Design / Decision Support subscale had the third highest mean scores (3.66) in our sample of chiropractic patients with chronic MSK conditions. This study followed the definition of this subscale provided by Glasgow et al. (Glasgow et al., 2005a) as consisting of "actions that organize care and provide information to patients to enhance their understanding of care". The higher scores on this subscale may reflect how chiropractors regularly provide patient education on their conditions and treatments during visits, as described by one of the patients: "*he* (the chiropractor) *explains everything to me very well and he shows me and he'll draw diagrams when he's showing me lots of things and explaining what's happening with it."* (FG3). Patients recognized that receiving information on their condition, treatments, and engaging in self-care enabled them in self-managing their condition, as exemplified in this quote, *"If you're given all the tools then you have the knowledge to be part of the solution as well….I think knowledge is power."* (FG3).

Some chiropractors recommend online resources to help patients engage in self-management and learn at home on their own time, *"They usually like them (*recommended videos on YouTube*) and they sometimes have questions on why I ask them to do this or why I ask them to do that but I find that if the videos are well made, which again, I don't just tell them to search because I do look for my own, look at the videos first and I make sure they are good videos and then they seem very appreciative of having somewhere that they can turn to other than just needing to book another appointment when they are in pain and they will often remember the exercises more than they remember half the things that we say"* (DC7). Chiropractors mentioned the importance of recommending high quality resources to patients, *"As a Canadian chiropractor we have a very well-organized program, the Canadian Chiropractic Guideline Initiative, there is a website, it is user-friendly for patients and there is some good information that I can direct them there"* (DC6).

Chiropractors frequently work in multidisciplinary clinics and that presents opportunities for organizing care between different professionals in a collaborative manner. These opportunities can be informal and happen just in the process of care being provided within the same environment, or more formal and driven by clinical systems and policies, as noted by one chiropractor: *"We have actually set up systems where we are actually working collaboratively. So we get together regularly for meetings, we set up systems where if one patient of one practitioner books in with another person those people have a bit of a conference. Obviously with patient permission, we have people sign consent and release forms and if they don't want it, we don't, but that is the whole point of what we do is that integrated health and being able to have that conversation"* (DC5). One patient noted how their chiropractor sometimes attempted to organize informal 'hallway' meetings between themselves and other practitioners within the clinic to ensure that there was mutual agreement on the direction of care being provided, *"… there's times where they're like 'hey, do you have five minutes' and all of us (*the patient, chiropractor and another practitioner*) would have a quick conversation and 'so this is what I'm doing with you, this is what you're doing with them, some of these are conflicting with each other, so just do this one instead'"* (FG2 – Patient 4).

The chiropractic patients in our study gave the Goal-Setting / Tailoring subscale the second lowest mean scores (2.75) out of the five subscales. This study followed Glasgow's (Glasgow et al., 2005a) definition of this subscale as "acquiring information for and setting of specific, collaborative goals". This lower score can be explained by goal setting taking place on an informal basis, if at all, for many chiropractic patients. *"I think our goal is to just you know relieve whatever ails you the day you're there and to help you maintain being pain-free. I don't think there's any kind of long-term goal beyond that, at least not one I can think of"* (FG3 – Patient 2). Chiropractors and patients may both make assumptions about the patient's health-related goals without actually discussing them, as highlighted by this patient: *"I think it's an unspoken given that our goal is to be as pain free and functional as possible, perhaps if someone were in a state where they weren't going to, weren't able to achieve such a thing then they would have sort of an interim goal but I think it's just to allow me to be as functional and pain free as possible, that would be my goal and I would just think that it would be his (the chiropractor's) goal as well"* (FG3 – Patient 3).

However, in some instances goal setting is reported to take place between chiropractors and their chronic MSK patients. Chiropractors discussed how this can involve setting realistic and relevant goals such as decreased pain or improved function, but also delve into other areas of the patient's life where they are experiencing limitations or where the patient's quality of life is being affected detrimentally, for example, *"I mean everybody's goal is to be pain free and functional exactly the way that they want, and to have no impediments to their lifestyle, but as you know that is not always attainable. So, you have to kind of drill down to 'what would make you feel really engaged in your life if we can't make you pain-free, but we could say reduce your pain level by 60%?'"* (DC2). Achieving pain-free status can be difficult with chronic pain patients, but other goals may be more achievable and become the focus of discussion, *"I want to get them more mobile and moving and I will let them know that we may or may not get you out of pain but let's see if we can decrease your medication intake, let's see if we can get you more comfortable throughout the day and do more"* (DC4).

The Follow-Up / Coordination subscale received the lowest mean scores (2.50) from the chiropractic patients in our study. This study followed the definition of this subscale provided by Glasgow et al. (Glasgow et al., 2005a) as "arranging care that extends and reinforces office-based treatment and making proactive contact with patients to assess progress and coordinate care". Both chiropractors and patients described typical follow-up care as simply taking place through additional in-person appointments, with few other follow-up mechanisms routinely followed. As one of the chiropractors indicated, *"most of the follow-up would be done in-office with visits"* (DC6). This was further exemplified by an exchange between patients in one of the focus groups when discussing whether their chiropractor follows-up with them and it appeared to be typically by having the patient attend for subsequent visits. *"I think he* (the chiropractor*) relies on me calling him"* (FG4 - Patient 4). *"Same with me too, yeah, they don't have any follow-up"* (FG4 - Patient 2). *"No, no follow-up.* (FG4 - Patient 3).

Another chiropractor indicated that they provide follow-up by sending at-home exercise and other recommendations to patients, *"I will e-mail them exercises occasionally if they want it, some don't (laugh), but I will e-mail them exercises as a follow-up as well some do's and don'ts."* (DC4). However, patients indicated how prescribing exercises may be insufficient and that further follow-up beyond that may be needed by some patients, for example: *"He's given me exercises to do but he's never said 'are you doing them'? I think he's assuming if I'm smart enough, I've asked for this or we've talked about it that I will do what he suggested"* (FG3 – Patient 1).

Patients shared a sense of disappointment with the absence of regular follow-up from their chiropractor. One of the patients described why they felt follow-up beyond in-office care was important in enabling patients, particularly when it came to ensuring that they were performing their self-management tasks, *"I would appreciate if my chiropractor followed up because I think it transmits that sense that this is important, you know, because when you follow-up on it implies you should be doing this and these are important where if you just give them something and then never follow-up it's kind of like if I was busy that week and I didn't do it, then it's off the table like it just falls away and I do think that is part of the empowering to communicate that sense of responsibility like you said but also that sense of this is important, you need to do these things to get better"* (FG3 – Patient 2).

5.4 OVERALL PACIC SCORE BIVARIATE ANALYSIS

Statistically significant higher mean Overall PACIC scores were provided by those aged 18 to 64 compared with those 65 and older (Table 5.5). This difference could be explained by the generational differences in terms of relationships with healthcare professionals and differing attitudes toward self-advocacy, as noted by this chiropractor, *"I would say that* *older patients tend to say, 'Hey you are the doctor, you do whatever you think is right'. Whereas maybe some younger patients are inclined to have done some of their own research and will at least have an idea of what they want"* (DC1). Patients who indicated having a mental health condition had significantly higher mean Overall PACIC scores when compared with those reporting no mental health condition. The higher PACIC scores given by those with mental health conditions is supported by interview data that suggested that chiropractors acknowledge mental health issues and discuss their effects with chronic MSK patients while providing encouragement and care for their MSK conditions, *"I address it (*mental health) *by asking them how it affects them, straight up, I don't ask, don't push corners, I say 'You have knocked this off on this check-list that you have depression or anxiety, which one is it and how does it affect you on a daily basis?' 'Do you think it affects your pain? Do you think it affects your sleep? Do you think it affects your work life? So I don't just go ask the question, I break down what portion (*of their life*) it affects"* (DC3). Chiropractors felt that some of the interventions that they provide can be indirectly helpful for patients with mental health conditions, for example, *"I think you know without us realizing it I think we are helping a lot of mild depressive issues just with talking, care, and exercise, especially exercise"* (DC4).

Patients who indicated being very satisfied (5 on the scale provided) with the care that they receive from their chiropractor had significantly higher mean Overall PACIC scores than those who gave any other score (Table 5.6). The high satisfaction scores were reflected by interview data which suggested that patients were highly satisfied and that their needs were being met according to their expectations, but if they were unsatisfied that they would consider changing chiropractors or leave care. *"I would say there's so many options that if you're not satisfied than I wouldn't stay, so if I'm going on a regular basis than I'm satisfied and I'm getting the care that I think I deserve and need"* (FG1 – Patient 1).

Patients who had been coming to their chiropractic clinic for fewer than 10 years had significantly higher mean Overall PACIC scores when compared with those who had seen their chiropractor for 10 years or more. Female respondents had higher mean Overall PACIC scores when compared to males, although the differences were not statistically significant. There were no significant differences in Overall PACIC scores between patients who reported having a spinal condition compared with those who did not, nor were there significant differences between patients who did or did not report having a non-musculoskeletal condition, or patients who reported multiple chronic conditions when compared with those who only reported a single chronic condition. Patients who attended a clinic where one of the chiropractors sees 100 or more patients per week had lower mean Overall PACIC scores than those who attended clinics where the chiropractor(s) saw 99 patients or fewer per week, although again the differences in mean scores were not significant.

Table 5.5. PACIC comparison of means – 2 category independent variables

Variable	Median Overall PACIC score	Mean Overall PACIC overall score (SD)	95% CI of mean	Comparisons of Overall PACIC score (Mann-Whitney U)
Gender				
- Female	3.25	3.23 (0.87)	3.16-3.30	-1.21 (p=0.23)
- Male	3.15	3.17 (0.87)	3.07-3.27	
Patient age				
- 18-64	3.30	3.25 (0.86)	3.19-3.31	-2.98 (p=0.003)*
- 65+	2.98	3.07 (0.89)	2.95-3.20	
Spinal condition				
- No	3.28	3.29 (0.84)	3.17-3.41	-1.32 (p=0.19)
- Yes	3.20	3.19 (0.88)	3.12-3.25	
Mental health condition				
- No	3.20	3.19 (0.87)	3.14-3.25	-2.565 (p=0.01)*
- Yes	3.68	3.61 (0.86)	3.31-3.91	
Non-MSK condition				
- No	3.20	3.18 (0.87)	3.12-3.25	-1.085 (p=0.278)
- Yes	3.30	3.28 (0.88)	3.16-3.40	
Multiple conditions				
- No	3.15	3.14 (0.89)	3.04-3.23	-1.732 (p=0.083)
- Yes	3.30	3.25 (0.86)	3.18-3.32	
Satisfaction				
- 0-4	2.65	2.75 (0.86)	2.59-2.92	-5.578 (p<0.001)*
- 5	3.30	3.27 (0.86)	3.21-3.33	
Number of years attending this chiropractic clinic				
- Less than 10 years	3.30	3.28 (0.82)	3.21-3.35	-2.603 (p=0.009)*
- 10 years or more	3.10	3.13 (0.92)	3.04-3.22	
Clinic where DC sees 100+ patients per week				
- No	3.25	3.22 (0.82)	3.15-3.30	-0.532 (p=0.60)
- Yes	3.15	3.20 (0.92)	3.11-3.28	

**= Significant at 0.05*

Only patient satisfaction was significantly different in mean Overall PACIC scores among the 6 categories (H(4) = 36.2, p<0.001). There were no significant differences between Overall PACIC scores and ethnicity, education level, and overall health (Table 5.6).

Table 5.6. PACIC comparison of means – 3 or more category independent variables

Variable	Median PACIC score	Mean PACIC overall score (SD)	95% CI of mean	Comparisons of PACIC score (Kruskal-Wallis)
Ethnicity				3.76 (p=0.71)
- First Nations	3.25	3.53 (0.96)	3.13-3.92	
- Asian	3.20	3.32 (0.82)	3.06-3.58	
- Black	3.50	3.31 (0.64)	2.90-3.71	
- Caucasian	3.20	3.19 (0.88)	3.13-3.25	
- Latin/Hispanic	3.49	3.40 (0.61)	2.76-4.04	
- Other	3.00	3.16 (0.72)	2.61-3.72	
- Not indicated	2.95	3.13 (0.95)	2.56-3.70	
Education				3.17 (p=0.53)
- Not high school	3.20	3.21 (1.04)	2.95-3.46	
- High school	3.05	3.10 (0.98)	2.94-3.26	
- Some post-secondary	3.23	3.26 (0.82)	3.12-3.41	
- Completed degree	3.25	3.23 (0.83)	3.15-3.31	
- Professional / grad school	3.23	3.23 (0.81)	3.08-3.38	
Overall health				2.08 (p=0.72)
- Poor	3.33	3.29 (1.09)	2.38-4.20	
- Below average	3.08	3.16 (0.97)	2.93-3.38	
- Average	3.20	3.20 (0.88)	3.12-3.29	
- Above average	3.20	3.20 (0.88)	3.10-3.30	
- Excellent	3.38	3.32 (0.67)	3.17-3.47	
Satisfaction				36.2 ($p<0.001$)*
- 0 -Very dissatisfied	4.5	4.5		
- 1	2.85	2.85 (1.98)		
- 2	N/A	N/A		
- 3	2.33	2.44 (0.95)	1.65-3.23	
- 4	2.68	2.76 (0.82)	2.59-2.93	
- 5 - Very Satisfied	3.30	3.27 (0.86)	3.21-3.33	

**= Significant at 0.05*

Table 5.7 shows Spearman's correlations between Overall PACIC score and continuous variables from the patient questionnaire, a complete correlation table can be found in Appendix 13. Overall PACIC score demonstrated very weak but significant correlations with patient age (r= -0.155, p<0.001), number of visits with their chiropractor in the past year (r= 0.116, p<0.001), number of providers seen in the past year (r= 0.082, p<0.05), and the number of years that they attended their chiropractor's clinic (r= -0.074, p<0.05). Interview data with chiropractors supported the weak positive correlation between patient-centredness and number of chiropractic visits per year as more frequent visits were described as a means to stay abreast of the patient's status and provide support for their chronic MSK condition(s). "*So, follow-up visits are a way to sort of keep track of the patient, work with them over more of a long-term basis to keep them engaged and keep them encouraged or reassured again about their condition. It is almost like I might say to them it is a tune-up you should come in to get your spine tuned up, but really I am also using that as a way to continue coaching them and educating them and reassuring them"* (DC6). Similarly, the weak positive correlation between the number of healthcare providers seen in the past year and patient-centredness was explained by referrals suggested by the chiropractor and utilized by the patient, *"I have the opportunity to bring in acupuncture, physio, massage, chiro and everything just to work on that condition and then if I want to go and seek other modalities or other people then he (*the chiropractor*) has a network of people that he can put me in touch with, but he definitely is individual-centred"* (FG2).

The weak negative correlation between Overall PACIC score and number of years attending their chiropractor's clinic reflected concerns from chiropractors about becoming complacent with patients that they have seen for longer periods, and that visits could become stuck in a routine. *"We get a little bit more complacent I think, and I think that is the tough part when you know, I am even seeing somebody off and on for 20 years and so what I do seems to work, but did we ever come up with any other conversations so to speak?"* (DC4).

The number of chronic conditions, number of non-musculoskeletal conditions, or either of the PROMIS Physical or Mental t-scores were weakly but not significantly correlated with Overall PACIC score (Table 5.7).

Table 5.7. Overall PACIC score correlations with continuous variables

Variable	Correlation with Overall PACIC score (Spearman's rho)
Age	-0.155 ($p < 0.001$)*
Number of chronic conditions	0.053 ($p = 0.11$)
Number of non-MSK conditions	0.033 ($p = 0.33$)
Number of providers seen in past year	0.082 ($p = 0.015$)*
Number of visits with chiropractor in past year	0.116 ($p = 0.001$)*
Number of years attending this chiropractic clinic	-0.074 ($p = 0.03$)*
PROMIS Physical t-score	-0.03 ($p = 0.376$)
PROMIS Mental t-score	-0.005 ($p = 0.878$)

**= Significant at 0.05*

5.4.1 OVERALL PACIC SCORE REGRESSION ANALYSIS

Two multiple linear regressions were calculated to predict Overall PACIC scores. The independent variables for the regressions were selected on a statistical basis as they had either statistically significant between group mean differences or correlations with Overall PACIC scores in the bivariate analysis. The first model (Model 1) was constructed using the Enter method (a forced entry regression method) (Field, 2009) with the following variables that had either significant between group mean differences or correlations with Overall PACIC scores: patient age, whether or not the patient indicated a mental health condition (coded as 0 for not reporting a mental health condition and 1 if a mental health condition), number of health care providers seen in the past year, number of visits to the chiropractor in the past year, number of years attending the chiropractor's clinic, and satisfaction with chiropractic care. Preliminary analysis was performed to ensure that the data was normally distributed and assumptions regarding collinearity, normality, and other requirements were met in Model 1. A significant regression equation was found for Model 1 as seen in Table 5.8.

In Model 2, the Enter method was used again, but substituted dichotomized data for age (dichotomized as 18-64 years = 0 and 65 years and over =1), number of years attending the chiropractor's clinic (dichotomized to less than 10 years = 0 and 10 years or more = 1), and satisfaction with chiropractic care (dichotomized as 0-4 =0 and 5=1). These dichotomized variables also had significant between group mean differences in Overall PACIC scores. Preliminary analysis was performed to ensure that the data was normally distributed and assumptions regarding collinearity, normality, and other requirements were met in Model 2. A significant regression equation was found for Model 2 (see Table 5.8).

Table 5.8. Descriptions and equations of multiple linear regression models to predict Overall PACIC score.

Model	Description	Equation	R^2
1	Independent variables with significant associations and correlations from bivariate analysis	F (6,878) = 10.51, $p<0.001$	0.067
2	Independent variables with significant associations and correlations from bivariate analysis but substituting in dichotomized versions of age, number of years attending this chiropractic clinic, and satisfaction with chiropractic care	F (6,878) = 11.80, $p<0.001$	0.075

In Model 1, only patient age, having a mental health condition, number of chiropractic visits in the past year, and satisfaction with chiropractic care were significant predictors of Overall PACIC score, $p<0.05$ (see Table 5.9). According to Model 1 the Overall PACIC score would decrease by 0.007 with each added year of patient age, while having a mental health condition increased Overall PACIC score by 0.364, and each increase in the number of health care providers that the patient saw in the past year would increase Overall PACIC score by 0.033. Factors associated with chiropractic care also influenced Overall PACIC score in the regression analysis, with each visit to the chiropractor in the past year increasing the Overall PACIC score by 0.009, each year attending their chiropractor's clinic decreased the Overall PACIC score by 0.002, and each increase in patient satisfaction with chiropractic care on the satisfaction scale would increase Overall PACIC score by 0.312. The resulting equation for Overall PACIC score from Model 1 is:

> Overall PACIC = 1.83 - (0.007 x age) + (0.364 x having a mental health condition) + (0.033 x # providers seen in past year) + (0.009 x # chiropractic visits in past year) - (0.002 x # years attending chiropractic clinic) + (0.312 x Satisfaction)

Table 5.9. Overall PACIC score Models 1 and 2. Linear regression using Enter method of Overall PACIC score as a function of independent variables with significant between-groups differences and significant correlations.

Model	Variable	β	Standard Error (SE)	Standardized β	t-value	p-value
1	Age	-0.007	0.002	-0.114	-3.29	0.001*
	Mental health condition	0.364	0.149	0.08	2.439	0.015*
	Number of providers seen in the past year	0.033	0.024	0.045	1.36	0.174
	Number of chiropractic visits in the past year	0.009	0.002	0.125	3.76	<0.001*
	Number of years attending this chiropractic clinic	-0.002	0.003	-0.025	-0.733	0.464
	Satisfaction with chiropractic care	0.312	0.066	0.154	4.27	<0.001*
2	Age dichotomized	-0.11	0.07	-0.051	-1.51	0.13
	Mental health condition	0.347	0.149	0.077	2.33	0.02*
	Number of providers seen in the past year	0.04	0.024	0.047	1.43	0.15
	Number of chiropractic visits in the past year	0.009	0.002	0.127	3.86	<0.001*
	Number of years attending this chiropractic clinic dichotomized	-0.155	0.058	-0.089	-2.66	0.008*
	Satisfaction with chiropractic care dichotomized	0.515	0.089	0.188	5.78	<0.001*

**= Significant at 0.05*

In Model 2, having a mental health condition, number of chiropractic visits in the past year, number of years attending their chiropractor’s clinic (dichotomized), and satisfaction with chiropractic care dichotomized contributed significantly to the prediction, $p<0.05$ (see Table 5.9). According to Model 2 the Overall PACIC score would decrease by 0.11 if patients were 65 years of age or older, it would also increase by 0.347 if the patient had a mental health condition and by 0.04 for each additional health care provider that the patient saw in the past year. Each chiropractic visit in the past year would increase Overall PACIC score by 0.009, while attending their chiropractor’s clinic for 10 years or more would decrease Overall

PACIC score by 0.155, and Overall PACIC score would increase by 0.515 for patients who indicated being ‘very satisfied’ (5 on the satisfaction scale) with the chiropractic care that they received. The resulting equation for Overall PACIC score based on Model 2 is:

> Overall PACIC = 2.60 - (0.11 x age dichotomized) + (0.347 x having a mental health condition) + (0.04 x # providers seen in past year) + (0.009 x # chiropractic visits in past year) - (0.155 x # years attending chiropractic clinic dichotomized) + (0.515 x Satisfaction dichotomized)

Neither of the regression models created to predict Overall PACIC score in the regression had high R^2 or adjusted R^2 values. The R^2 and adjusted R^2 values would be considered low or weak. The highest R^2 values came from Model 2 with 7.5% of the variance explained, with Model 1 explaining only 6.7% of the variance.

5.5 CHIROPRACTOR SAMPLE CHARACTERISTICS

Out of 100 chiropractor questionnaires distributed, 31 chiropractors met the inclusion criteria and completed the chiropractor questionnaire for analysis. Data from three other chiropractors was not included in the analysis, one due to the informed consent form not being signed and two more due to incomplete data. The number of chiropractors who worked at the involved clinics was not ascertained as I simply distributed five questionnaires to each of the 20 involved clinics and asked them to be completed by the chiropractors at each clinic on a first come, first served basis. Thus, an inclusion rate could not be determined.

Of the 31 chiropractors included in the chiropractor sample, 13 were located in Ontario, 6 in Saskatchewan, 4 in Alberta, 3 in British Columbia, 2 each in Manitoba and Nova Scotia, and

1 in Newfoundland. These chiropractors had been in practice for a mean of 15.08 years (SD = 12.41) with a median of 16 years and ranging from 1 to 45 years. Among them there were 21 males (67.7%) and 10 females (32.3%). The majority of the included chiropractors received their chiropractic training from a Canadian institution, specifically the Canadian Memorial Chiropractic College (80.6%), while the rest (19.4%) graduated from American chiropractic educational institutions.

From this sample of chiropractors, 7 participated in the individual semi-structured interviews. Among them there were 2 females (28.67%) and 5 males (71.4%). These chiropractors had been in practice for a mean of 22.3 years in practice with a range from 14 to 40 years, and practised in 4 Canadian provinces (British Columbia, Alberta, Saskatchewan, and Ontario).

5.6 CHIROPRACTOR PRACTICE PATTERNS

Most of the chiropractors in the sample indicated practicing in a multidisciplinary setting (80.6%), while the rest (19.4%) practised in settings with multiple chiropractors only. There were no chiropractors who indicated being in solo practice or in practice in other settings. Table 5.10 further characterizes the practice patterns of the involved chiropractors in the main study. The involved chiropractors reported seeing a mean of 88.45 patients and spending 31.85 hours in patient care weekly, giving a calculated mean of 2.80 patients seen per hour. The number of patients seen per week varied considerably from 15 to 250, as did the number of hours spent seeing patients each week from 13 to 55. Even the calculated number of patients seen per hour varied, ranging from less than 1 per hour to nearly 7 patients per hour.

Table 5.10. Chiropractor practice data (n=31).

Variable	Mean (SD)	Range	Median
Hours seeing patients per week	31.85 (10.09)	13 - 55	30
Patients seen per week	88.45 (55.44)	15 - 250	80
Patients seen per hour	2.80 (1.54)	0.68 - 6.94	2.86

5.7 DESCRIPTIVE ANALYSIS OF THE PPOS

Table 5.11 summarizes the PPOS scores from the 31 chiropractors included in the study. The average PPOS Overall score was 4.35. The average scores on the PPOS subscales were 4.20 on the Sharing subscale and 4.50 on the Caring subscale. The PPOS data were normally distributed on both the Shapiro-Wilk and Kolmogorov-Smirnov tests as seen in Table 5.12. As such it was determined that parametric testing would be employed when assessing for associations and correlations with overall PPOS and subscale scores.

Table 5.11. Chiropractor PPOS Scores (n=31)

Variable	Mean (SD)	95% CI	Median	Range
PPOS Overall	4.35 (0.46)	4.18-4.52	4.33	3.61 – 5.44
PPOS Sharing	4.20 (0.69)	3.95-4.45	4.22	3.11 – 5.56
PPOS Caring	4.50 (0.42)	4.35-4.66	4.44	3.78 – 5.67

Table 5.12. PPOS Normality Test Results

	Kolmogorov-Smirnov test	Shapiro-Wilk test
PPOS Overall	D(31) = 0.08, p = 0.20	W(31) = 0.97 p = 0.52
PPOS Sharing	D(31) = 0.10, p = 0.20	W(31) = 0.96, p= 0.28
PPOS Caring	D(31) = 0.13, p = 0.20	W(31) = 0.95, p= 0.20

This study used Krupat's (Krupat et al., 2000) original definition of the PPOS Sharing subscale as "the extent to which the respondent believes that patients desire information and should be part of the decision making process". This was exemplified when chiropractors described patient involvement as critical to making decisions around their care, *"I try and ask them about their ideas. I definitely feel like I try to engage the patient and work with them in* *the entire decision process and I try to be flexible with them and meet them where they are at"* (DC6). Chiropractors felt that patient care and decision making was a team-based process with the patient ideally holding the central role and the chiropractor working in a more supportive capacity. *"It is a huge role when they (*patients*) are able to be the main part of the team and you (*the chiropractor*) are more like an assistant that helps guide those goals"* (DC7).

However, different levels of patient involvement and engagement are possible and mentioned by chiropractors: *"I think it is how you approach it with the patients, so if you take what I would call a patient-centered approach right off the bat and you try and encourage their involvement in the decision-making process they are more likely to be a willing participant in that. Whereas, if you take an approach where you just kind of dictate to them what you think should happen, they are not going to be an active participant"* (DC6). As described above, the mean PPOS Sharing scores were lower than the mean PPOS Caring scores. This could be due to some chiropractors prioritizing their own professional experience or the best available research evidence over patient input, for example, *"So yeah, I think we, if we get stumped, we always give them the option, but if it is going according to what my treatment plan is and what protocol is based on best evidence and past experience, I think we don't give them maybe as much input into it"* (DC3).

Sharing information with patients appeared to be a challenge for some chiropractors. One chiropractor explained that they only gave patients basic information on their condition and treatment and only when they felt it was necessary, and indicated a preference for keeping patient education in-house and more under the chiropractor's control, *"I don't give them much homework or take home (*materials*) on those things. When provided with the diagnosis* *some of them will ask for more but I also try to just provide education within the visit, education on expectations, education on how they will feel and that kind of stuff. So, education on how the chronicity of the issue may cause this or that, so there are those kinds of things, but I don't provide much education on their specific condition as a take-home or in video form or handout form."* (DC7). Chiropractors described hesitance around patients accessing low quality health information at home or online and thus tried to give them sufficient information in the office, for example, *"I will give them the description, like the diagnosis, of it (*their condition*) so that they can go and do Google MD…. I hate Google MD. I am a firm believer that if you give them (*patients*) the power to diagnose or the power to research it they are going to do it. So, I will give them what I think is going on so at least they are on the right track and then hopefully they will use that appropriately"* (DC3). Some patients indicated that their chiropractor provided them with information about their condition mainly when requested - *"I don't think he feels that I need to know any more information, but if I do have questions, I'll get a thorough answer, but it's been the same problem ongoing"* (FG4 – Patient 3).

The study used Krupat's (Krupat et al., 2000) definition of the PPOS Caring subscale as "the extent to which the respondent sees the patient's expectations, feelings, and life circumstances as critical elements in the treatment process." Chiropractors indicated that taking the time to listen and acknowledge the chronic pain patient's history was necessary for understanding and relating to the patient, as noted here, *"As far as treating chronic pain….be thoughtful, take your time, and acknowledge the patient, that they had a long journey before they came to see you. So, they are going to have to kind of sift through that and be as thoughtful as you possibly can"* (DC4). The importance of trying to ensure that patient expectations were sought and addressed and aligned with the chiropractor's expectations was also discussed, for example, *"My expectations for every patient, like my expectations in terms of where they want to go and where we want to get them to, is going to be in line with their expectations. So, there is no point in me wanting to have this happen when they have no interest in that and they want something completely different"* (DC5).

Chiropractors placed importance on treating each patient as an individual and customizing their care plans to fit within the context of that patient's life, *"Ultimately, I tailor it to the patient and their circumstances and work with them on that.* (DC6). Chiropractors acknowledged that with chronic pain patients that the cases can be complex and require a unique approach in each instance, *"So, it is very individuated and is based upon such a multitude of factors, that I don't have a specific approach"* (DC2).

The higher mean PPOS Caring subscale scores aligned with statements from both patients and chiropractors that emphasized the compassion and concern that chiropractors have for patients, as evident in this quote: *"You feel like the chiropractor cares about you, you know? Yeah, and that makes a big difference and (*the chiropractor*) wants to make you feel better, you know, and treat you like a person like not just you know a slab of meat on the table"* (FG4). The level of caring and attention chiropractors given to patients appeared to contribute to patient results and satisfaction with chiropractic care. *"I've been fortunate that the chiropractors I've seen in town have truly cared about making me as pain free as I can be and give me the best options, so I'm happy with them"* (FG1). Chiropractors further stressed the importance treating patients respectfully and conscientiously. *"I treat every patient like they were my parents. That is my thing….if I see someone who is close to my parent's age then I just always envision how would I want my mother or father treated when they went to a clinic."* (DC7).

5.8 PPOS SCORE BIVARIATE ANALYSIS

Table 5.13 provides the results of comparisons of the mean differences between groups for several variables from the chiropractor questionnaire. The mean PPOS Overall, Sharing and Caring scores did not differ significantly between male and female chiropractors, although all 3 scores were higher for female chiropractors and the difference in PPOS Caring scores was approaching significance (p=0.054). Interestingly, a male chiropractor provided some ideas for a difference in practitioner attitudes based on gender: *"I think females are generally more attentive to people's needs. They are more willing to take time and listen, not all cases by any means, but I think females are more observant, better communicators, and may be less interested in dollars and quantity of care and more perhaps in quality of care"* (DC6).

There were no significant differences in mean scores for any of the 3 PPOS scales based on the chiropractic educational institution that the chiropractors attended or their style of practice. Chiropractors who attended the Canadian Memorial Chiropractic College had higher mean scores on all 3 PPOS scales, although the differences were not statistically significant. The number of patients that the chiropractors indicated seeing per week was dichotomized to 99 or fewer and 100 or more, and those who indicated seeing 100 or more patients per week had significantly higher mean PPOS Overall and Sharing scores, while PPOS Caring scores were higher for chiropractors who see 99 patients or fewer on average, although not to a significant degree.

Table 5.13. Average PPOS scores for categorical variables

Variable	Average PPOS Overall (95% CI)	Average PPOS Sharing (95% CI)	Average PPOS Caring (95% CI)
Gender[1]			
Female (n=10)	4.50 (4.10-4.90)	4.29 (3.78-4.79)	4.71 (4.33-5.09)
Male (n=21)	4.28 (4.10-4.46)	4.16 (3.84-4.47)	4.40 (4.25-4.55)
	t=1.27 (p=0.216)	t=0.486 (p=0.631)	t=2.01 (p=0.054)
Chiropractic Institution[1]			
CMCC (n=25)	4.38 (4.18-4.58)	4.25 (3.96-4.55)	4.51 (4.32-4.70)
Other (n=6)	4.22 (3.94-4.51)	3.98 (3.34-4.62)	4.46 (4.17-4.75)
	t=0.76 (p=0.453)	t=0.865 (p=0.394)	t=0.248 (p=0.806)
Practice Style[1]			
Solo (n=0)	N/A	N/A	N/A
Multi-chiropractor (n=6)	4.37 (3.88-4.86)	4.30 (3.54-5.05)	4.44 (3.99-4.90)
Multidisciplinary (n=25)	4.35 (4.16-4.54)	4.18 (3.89-4.46)	4.52 (4.34-4.69)
Other (n=0)	N/A	N/A	N/A
	t= -0.11 (p=0.91)	t= -0.37 (p= 0.71)	t= 0.37 (p=0.72)
Patients seen per week[1]:			
99 or fewer (n=21)	4.22 (4.01-4.42)	3.90 (3.64-4.17)	4.53 (4.34-4.73)
100 or more (n=10)	4.63 (4.37-4.89)	4.82 (4.52-5.12)	4.43 (4.13-4.73)
	t= -2.52 (p= 0.017)*	t= -4.40 (p <0.001)*	t= 0.62 (p= 0.54)

[1] *Independent samples t-test, equal variances assumed based on Levine's test*

[2] *One-way ANOVA with Scheffe's S post-hoc test (not used as practice style was collapsed)*

** = Significant at 0.05*

Table 5.14 shows Pearson correlations between the PPOS Overall and subscale scores and other continuous variables from the chiropractor questionnaire. There were no strong correlations between the PPOS Overall or subscale scores and any of the chiropractor demographic or practice variables including years in practice, hours spent per week seeing patients, or patients seen per week or per hour. However, a number of significant correlations of moderate or weak strength were found. There was a significant moderate correlation between the number of years that the chiropractors had been in practice and PPOS Overall and Sharing scores, and weak significant correlation with PPOS Caring scores. There was also a moderate significant correlation observed between PPOS Sharing subscale scores and the number of reported patients seen per week and patients seen per hour. The number of hours per week spent seeing patients did not correlate significantly with any of the PPOS Overall or subscale scores.

Table 5.14. Correlations between continuous variables and PPOS scores (Pearson correlation)

Independent variable	PPOS Overall	PPOS Sharing	PPOS Caring
Years in practice	0.517 (p=0.003)*	0.457 (p=0.01)*	0.374 (p=0.038)*
Patients seen per week	0.256 (p=0.165)	0.489 (p=0.005)*	-0.246 (p=0.182)
Patients seen per hour	0.333 (p=0.067)	0.528 (p= 0.002)*	-0.144 (p=0.440)
Weekly hours seeing patients	-0.167 (p=0.368)	-0.048 (p=0.798)	-0.284 (p=0.122)

**= Significant at 0.05*

Other significant correlations were noted between patients seen per week and years in practice (r= 0.443, p <0.05), patients seen per week and patients seen per hour (r= 0.909, p <0.001), and years in practice and patients seen per hour (r = 0.488, p<0.01). PPOS Overall score was very strongly correlated with PPOS Sharing (r =0.899, p<0.001) scores and strongly correlated with PPOS caring (r =0.696, p<0.001) scores.

5.8.1 PPOS MULTIPLE LINEAR REGRESSION ANALYSIS

Multiple linear regressions using the Enter method (Field, 2009) were calculated to predict dependent variables of PPOS Overall, PPOS Caring, and PPOS Sharing scores based on independent variables with significant or near significant (p<0.1) between group mean differences or correlations with PPOS Overall, Caring, and Sharing scores respectively in the bivariate analysis. For both the PPOS Overall and PPOS Sharing scores the multiple linear regression were calculated based on patients seen per week (dichotomized), years in practice, and patients seen per hour (which was significantly correlated with PPOS Sharing score while it approached significance with PPOS Overall, $p=0.067$). For PPOS Caring scores the multiple linear regression was calculated based on years in practice and gender (which approached significance, $p=0.054$). Preliminary analysis was performed to ensure that the data was normally distributed and assumptions regarding collinearity, normality, and other requirements were met for each of the models. Significant regression models were found for each of the dependent variables, PPOS Overall, as well as its Sharing and Caring subscales (see Table 5.15).

Table 5.15. Descriptions of variables used in multiple linear regression models to predict PPOS Overall, Sharing, and Caring scores with equations.

Dependent variable	Description of Independent Variables	Equation	R^2
PPOS Overall	Independent variables with significant or near-significant associations and correlations from bivariate analysis	$F(3,27) = 4.709$, $p=0.009$	0.344
PPOS Sharing	Independent variables with significant associations and correlations from bivariate analysis	$F(3,27) = 7.819$, $p=0.001$	0.465
PPOS Caring	Independent variables with significant or near-significant associations and correlations from bivariate analysis	$F(2,28) = 5.048$, $p=0.013$	0.265

As seen in Table 5.16, only ‘years in practice’ contributed significantly to the prediction for PPOS Overall, $p<0.05$, while only ‘patients seen per week dichotomized’ added significantly to the prediction for PPOS Sharing, $p<0.05$. Both ‘years in practice’ and ‘gender’ added significantly to the prediction for PPOS Caring, $p<0.05$.

Table 5.16. Linear regression using Enter method of PPOS Overall, Sharing, and Caring scores as a function of independent variables with significant or near significant between-groups differences and significant correlations.

Dependent Variable	Independent Variable	β	Standard Error (SE)	Standardized β	t-value	p-value
PPOS Overall	Patients seen per week dichotomized	0.346	0.207	0.361	1.668	0.107
	Patients seen per hour	-0.042	0.069	-0.141	-0.608	0.548
	Years in practice	0.017	0.007	0.459	2.569	0.016*
PPOS Sharing	Patients seen per week dichotomized	0.734	0.283	0.506	2.595	0.015*
	Patients seen per hour	0.024	0.094	0.054	0.260	0.797
	Years in practice	0.014	0.009	0.253	1.566	0.129
PPOS Caring	Gender	-0.312	0.143	-0.354	-2.184	0.038*
	Years in practice	0.013	0.005	0.378	2.33	0.027*

**= Significant at 0.05*

Seeing more patients per week contributed significantly to increased PPOS Sharing scores and non-significantly to higher PPOS Overall scores. Seeing 100 patients or more per week increased PPOS Overall scores by 0.346 and increased PPOS Sharing scores by 0.734. This contrasted from interview data, as chiropractors suggested that a heavier patient load may reflect weaker attitudes towards patient-centredness and decrease the ability to provide patient-centred care in general, “*the busier you are, the busier you make yourself, the less attentive I think you will be to the patient's needs”* (DC1). Spending less time with patients due to increased patient loads was felt to likely lead to mainly passive care being provided, *“…if they (*other chiropractors*) are trying to see a greater number of patients in a certain period of time whether within an hour, a day, or a week, they end up with, there are only so many hours in a day so you end up squishing more patients into a smaller time period, so you spend less time with the patient, and it ends up becoming a lot more like a passive type of approach, conveyor belt type of practice where if you are only spending 5 minutes with a* *patient you can't educate, coach, reassure, and treat the patient in those visits and you can't effectively manage a patient with complex chronic problems that way"* (DC6).

The regression analysis indicated that each increase in patients seen per hour would lower the PPOS Overall score non-significantly by 0.042. Conversely, the PPOS Sharing results contradicted typical expectations as each increase in patients seen per hour would increase the PPOS Sharing score non-significantly by 0.024. Exploration of the impact of appointment length and focus group participants indicated that shorter appointment times (i.e., seeing more patients per hour) might again reflect attitudes that were less patient-centred, *"I remember the one (*chiropractor*), previous to the one I have, I used to go to him, and you would literally walk in there, very little speech, lay on the table, crack you, and you were gone. And I mean you were in there maybe six minutes or maybe or five"* (FG4). Conversely, longer appointments with patients (i.e., seeing fewer patients per hour) were felt to reflect a more patient-centred approach, for example, *"If you just spend a little bit more time with your patients and maybe spread out the treatments a little bit, inevitably you are going to be more patient-centered, because you are in less of a rush and you are going to be more focused on the patient and not 'how many patients can I get through the door?' or 'how much money can I make in a day?'"* (DC6).

In the regression analysis being in practice for longer durations contributed significantly to PPOS Overall scores, which increased by 0.017 for each year in practice. Longer durations in practice also contributed significantly to PPOS Caring scores which increased by 0.013 for each year in practice. However, additional years in practice did not contribute significantly to PPOS Sharing score, increasing it by 0.014 for each year in practice.

In the regression model gender contributed significantly to decreased PPOS Caring score, as being male lowered PPOS Caring scores by 0.312. In these regressions, ‘gender’ was coded as ‘0’ for females and ‘1’ for males, while ‘patients per week dichotomized’ was coded as ‘0’ for 99 or fewer patients per week and ‘1’ for 100 or more patients per week. The equations for the PPOS Overall score as well as the Sharing and Caring subscale scores are as follows:

PPOS Overall = 4.103 + (0.346 x patients seen per week dichotomized) - (0.042 x patients seen per hour) + (0.017 x years in practice)

PPOS Sharing = 3.684 + (0.734 x patients seen per week dichotomized) + (0.024 x patients seen per hour) + (0.014 x years in practice)

PPOS Caring = 4.521 + (0.013 x years in practice) - (0.312 x gender)

Of the 3 models created to predict PPOS score, the highest R^2 values came from the PPOS Sharing Model with 46.5% of the variance explained, followed by the PPOS Overall model which explained 34.4% of the variance, and the PPOS Caring model which explained 26.5% of the variance.

5.9 THEMATIC ANALYSIS RESULTS

Following the quantitative data collection and preliminary analysis, the focus group interviews with patients were conducted, along with the individual interviews with chiropractors. Upon analysis of the fourth focus group interview it was felt that data saturation had been reached, and a planned fifth focus group interview was not required.

Similarly, following the seventh individual chiropractor interview, it was felt that saturation had been achieved, and recruitment ceased.

As per the study design, the analysis of the qualitative interview data was used to help explain the quantitative results. The qualitative analysis also led to the identification of 5 themes related to the patient-centredness of chiropractic care. Within each of the themes, at least 2 sub-themes were identified. The themes and their corresponding subthemes can be found in Table 5.17.

Table 5.17. Themes and subthemes identified through the thematic analysis.

Theme	Subthemes
Experience of and Living with Chronic Pain	- Psychosocial - Expectations
Chiropractic Approach	- Holistic - Patient Specific - Active Care - Distinct Qualities - Visits and Follow-Up
Chiropractor-Patient Interaction	- Rapport and Relationship - Information Exchange
Decision Making	- Balance of Power - Goal Setting - Barriers to Patient-Centredness
Multidisciplinary Management of Chronic Musculoskeletal Conditions	- Collaboration - Referrals

One of the themes, ‘Experience of and Living with Chronic Pain’ was predominantly related to patients, while the ‘Chiropractic Approach’ was only related to chiropractors. Two of the

3 themes, ‘Chiropractor-Patient Interaction’ and ‘Decision Making’ largely dealt with the relationship between chiropractors and patients as choices for management of the patient’s chronic musculoskeletal condition(s) are made and care is provided. The final theme, ‘Multidisciplinary Management of Chronic Musculoskeletal Conditions’, further characterized the interaction between chiropractors, patients, and other healthcare providers. The following passages provide the definitions, descriptions, and representative quotes for each of those themes and subthemes.

5.9.1 THEME - EXPERIENCE OF AND LIVING WITH CHRONIC PAIN

Patients who have chronic pain have a different experience than those with acute conditions due to the long-standing presence of their symptoms. This theme was defined as “the way that having chronic pain makes patients feel and how it impacts their lives in multiple ways, along with the long-term prognosis for chronic pain and expectations of the care for such conditions”. Two subthemes were also identified within this theme, “Psychosocial” and “Expectations”. As the interview data supported, for some patients, having chronic pain becomes an almost all-consuming experience, dominating their lives, as expressed by this patient: *“The biggest thing in your life seems to be this pain. It just takes over everything because you can’t do stuff, you don’t feel like going out, you don’t feel like talking to people, you spend an inordinate amount of time just being with it”* (FG3 – Patient 2).

Patients described negative implications from the perceived permanence of their chronic pain conditions, such as *“I feel like it’s a life sentence almost with my lower back and my neck.”* (FG2 – Patient 3). However, others reported acceptance of their pain and appeared to be trying to move on with their lives despite the potential permanence of their condition, for example, *“I would say with chronic pain there’s kind of like a grieving process with it where* *you do you know get depressed, get angry, you kind of accept that your way of life is going to continue on in a certain way and you just have to manage it from that point forward"* (FG1), and *"I'm beyond the point of being discouraged that it's probably a life sentence, it's just the way it's going to be"* (FG2).

Patients had different experiences of how their family, friends, and others reacted to their chronic MSK condition. Several patients mentioned frustration with a lack empathy or support to the point of disbelief from people in their lives or members of the general public, as noted in this quote: *"Where I used to work, I used to hear a lot of comments that someone would complain (*about pain*) and the other staff would talk about them and say 'oh, they're looking for days off' or they would think that they're building up to taking a week off sick time or something if they complained .... so people were hesitant to complain because then you didn't want them to think badly of you or you were setting the system up to use sick time"* (FG4). Patients rationalized this emotion by describing chronic pain as being 'invisible' when compared with other disabling conditions, *"...people think if you're parked in a disability parking spot, you're supposed to have a wheelchair. Well, there's all kinds of disabilities and some of them are not visible. You can have mental disabilities and people don't understand it because they can't see it so, chronic pain I guess is the same, they can't see it so...."* (FG2 – Patient 2) and *"I think years ago if you weren't bleeding, you weren't injured and .... the hidden injury wasn't seen, even though it was there, it was real to you and the people just didn't accept it"* (FG2 – Patient 8). However, other patients found that there were improvements in terms of how people and society supported chronic pain patients, namely, *"I think more people are understanding of chronic injury and chronic pain, so when you voice that concern then you have a human resource team (*at work*) that is understanding and can put you on modified duties or anything like that"* (FG2).

5.9.1.1 SUBTHEME - PSYCHOSOCIAL

This subtheme was identified as psychological and social factors can affect chronic pain patient health and the perpetuation of chronic conditions. As one chiropractor described, chronic MSK conditions can affect all aspects of a patient's life, and that can be taxing on the patient in many ways, *"I think people who have chronic MSK conditions are absolutely in every way emotionally, physically, mentally and psychologically exhausted"* (DC2). Chronic pain can isolate sufferers as patients described withdrawing from family, social, and other activities due to their pain and becoming fixated on themselves and their pain as one of the patient described, *"I think when the pain's really bad, like really extreme, I find myself becoming very inward focused and when you come out of it I realize how much I haven't paid attention to other people and what's going on with them because all I can seem to focus on inwardly is 'this hurts', so you, I become very self-centred .... your world becomes very small when it's really bad"* (FG3 – Patient 2).

Chronic pain and psychosocial factors interact and can affect each other, producing cases that can be difficult to manage, as noted by one chiropractor: *"Chronic patients tend to be more complex, there are different issues going on, you know maybe not just the mechanical issues, there might be some other psychosocial or other aspects contributing to their problem"* (DC6). The presence of psychosocial factors makes the management of chronic pain patients more involved, and one chiropractor discussed how such patients require support both during and between appointments, *"With chronic pain if somebody does have a lot of psychosocial overlay it is really easy (*for the patient*) to give up, right? And it is hard, it is hard to kind of work yourself back to that point where you feel a little bit more in control and so they do need that ongoing support. It doesn't necessarily need to be treatment in the office although sometimes that can help just to get them a little bit more mobile and decrease their pain at* *the moment so they feel a bit more confident going out but sometimes it is just knowing like if they have questions they can e-mail or having a discussion just be like 'is everything going okay?' you know 'are you finding success with those tools?', 'what do you need going forward?'"* (DC5).

5.9.1.2 SUBTHEME – EXPECTATIONS

This subtheme arose as chronic MSK condition patients described expectations for their conditions and how they want to be treated by their healthcare professionals. Patients acknowledged that they expected their chronic MSK conditions to persist but tried to maintain positive outlooks, as noted here: *"I think when I was first diagnosed, I made a very conscious decision that I would not be defined by this and my life would not be defined by it and so, I try very hard to live to that"* (FG3 – Patient 2).

Patients indicated that they expected their chiropractor to listen to them and be honest about their prognosis and treatment needs from the outset, as exemplified in these quotes, *"Being honest about what can be done here, are there limitations like' I'm not going to cure you, this is manageable, it's going to be chronic but we can deal with it, we can manage the pain, the pain can be lessened', so listening and being honest and open I think is important because I want to know, maybe not everybody wants to know, in the end but I'm sure they do if they're there, they want to know what the endgame, what the end result is going to be"* (FG3), and *"I think just be honest about the prognosis of the problem and explain what you're going to do and how long it's going to take and how often you need to see me."* (FG2 – Patient 2). Similarly, chiropractors indicated that they were realistic with their patients about their prognoses, while still offering them hope that there were ways that their condition could be managed, as one chiropractor explained, *"So I will tell them that this is a chronic condition,* *not a disease, but it is a chronic condition and you are going to have (*it*), it didn't happen overnight, and it's been years in the making and you're going to have it the rest of your life, that is the bad news, but the good news is that it is very manageable if you do the right type of exercises and use the right kinds of positions and do the right kinds of movements"* (DC6).

Chiropractors felt that discussions of patient expectations between them and their patients can be particularly helpful if their expectations are aligned, for example, *"Then also a conversation around expectations with that patient like you know 'What are your expectations coming to see me?' 'If you have had this for a long time and you have seen other people, why are you seeing me now or if you haven't seen anybody why have you made that decision?' and so looking at patient expectations and that is also going to be able to tailor what we are actually going to do for them and what they expect to be part of their treatment plan especially functionally"* (DC5).

Patients accepted that having chronic pain meant that ongoing treatment would be necessary, as one patient described, *"So, for me things are pretty well maintained as long as you come back (*for treatment*) once a month and I expect to do that for the rest of my life and that doesn't bother me at all, because I'd rather do that then be moaning and groaning"* (FG2). Patients who have seen their chiropractors for longer periods mentioned expectations for continued positive results from treatment, *"....my expectation is that it's going to be just a standard treatment, keep me moving, keep me feeling good, headache free and that's what it's been for 12, 13 years"* (FG2 – Patient 3).

5.9.2 THEME - CHIROPRACTIC APPROACH

This theme was defined as "the way that chiropractors approach the care of patients with chronic pain." A further five subthemes were identified under this theme, "Holistic", "Patient Specific", "Active Care", "Distinct Qualities", and "Visits and Follow-Up". Interviews with the chiropractors demonstrated that they provide care that is typically more frequent and long-term in nature for patients with chronic musculoskeletal conditions, as one chiropractor described, *"Chiropractors tend to see patients multiple times over a treatment plan, whether the visits are shorter or longer, but you end up following-up with the patient at least a number of times and chiropractors like to pride themselves on taking a more holistic approach of actually listening to patients"* (DC6).

Chiropractors described devoting time to visits with chronic MSK condition patients to provide manual therapy and to get to know and develop a close relationship with patients and determine their healthcare needs. One chiropractor described the role that they play in supporting their patients, *"I always feel like I am more like their cheerleader and their advocate and holding them to task, keeping them accountable for some of the changes that they are having to make in their life because with most chronic conditions what we are doing in the office, my hands-on treatment is only one tiny, small part and they have to go back out into the world right. So we need to keep them on task with the changes that they are trying to make to themselves in the bigger world"* (DC5).

5.9.2.1 SUBTHEME – HOLISTIC

This subtheme was identified as it was apparent from the interview data that chiropractors took a holistic approach in their management of patients with chronic MSK pain. Chiropractors described trying to learn about all aspects of a patient's life and considering that when trying to find solutions, *"With a chronic (*patient*) I am doing more, trying to figure out why it is a chronic issue, so I am trying to figure out is it a job-related issue, is it a sleep-related issue? Whereas if it is acute you know there is an episodic thing that caused it, whereas chronic (*conditions*) you don't have the specific episode and it is not usually as specific an area that you are treating so you have to treat more globally"* (DC3). One chiropractor illustrated the importance of considering the entire clinical picture, even if at times they have narrowed their focused to a few symptoms - *"Sometimes I can get into a little bit of symptom focus and it is important to back up a little bit and look at what is important about this, what is the impact, what is the relevance of this?"* (DC1).

Patients agreed that their chiropractors were holistic in their approach to their health concerns, for example, *"I would say that all the chiropractors I've seen have taken into account the whole being including occupation and family, extracurricular…."* (FG1), and *"I think he's dealing with your whole body, your head, like he wants to know how you're feeling, communicates and looks at you, treats you like a real person not something else and uh he listens, he hears what you're saying and acts on it and gives you a chance to respond"* (FG4). One patient felt that the hands-on nature of chiropractic treatments required chiropractors to have increased information needs from their patients, *"….because it's so hands-on it really has to be in a sense you've got to know so much more about the patient and all the things that feed into the body like stress or anger or other illnesses that might be affecting things"* (FG3).

5.9.2.2 SUBTHEME – PATIENT SPECIFIC

This subtheme arose from interview data that showed chiropractors considering patients as individuals and customizing or tailoring treatment plans specific to each patient, one chiropractor described this process: *"I usually always try and tailor the treatment method or treatment approach to the patient and their circumstances"* (DC6). Chiropractors specifically mentioned preferring an individualized approach to patient care as opposed to following a system or formula for patient management, as described in this quote: *"I wouldn't say that I have a heavily systematized approach and so it really is patient-specific, or patient-centered in that way. I don't try to fit people into a mould of my care. I just take every patient as an individual because some patients want very little, and some want more than I can give"* (DC1). Chiropractors indicated their preference for creating treatment plans that were tailored for chronic pain patients as opposed to pre-determined approaches, *"I find especially with the chronic (pain) patient that it is really hard to create any kind of a cookie-cutter approach which I am not very a big fan of anyways"* (DC2).

Patients described their chiropractor eliciting information that was relevant for their individual case and indicated that the care that they received could change from visit to visit depending on their particular needs, as one patient explained: *"He (*the chiropractor*) really takes time to listen to my current complaint, asks questions that are relevant regarding my current sleeping habits, lifestyle. What has changed? What's better? what's worse? And the care is often different each time I go in, so I know he's really focusing on what my complaints are"* (FG3). Patients discussed how changes in life circumstances can lead to changes in healthcare needs, but felt that their chiropractor was responsive to that, as noted here, *"I think as your life evolves your needs are going to change of course so, when you're pregnant you need different care and obviously that's different from what I need now so, I would say as long as you're communicating with them yes, your needs change but they (*the chiropractor*) will just change with you"* (FG1 – Patient 1).

5.9.2.3 SUBTHEME – ACTIVE CARE

This subtheme came from discussion of how chiropractors provide recommendations for self-management strategies that patients carry out themselves. Chiropractors opined that chronic pain patients have the ability to control their symptoms and conditions at home but may need recommendations from their chiropractor, as one chiropractor described, *"We try to make them realize that they actually have the power to decrease their pain and increase their function and manage on a day-to-day basis"* (DC5). Similarly, patients described how chiropractors recommending self-care was key to empowering patients and helping them learn how to gain control of their condition, for example: *"I think it's important, maybe that's part of being empowered, is you need to take responsibility for your care and the chiropractor is there to help you but they cannot just cure you…. I think it's important that they (*chiropractor*s) help to be clear and honest and 'this is what I'm going to do for you but this is what you need to do for you and if you need I can help you, you let me know how I can help you'."* (FG3).

Chiropractors often stressed the finite availability of clinical treatment and the chronic pain patient's participation in their care by adhering to home exercise plans or other recommendations made by the chiropractor, as one chiropractor detailed, *"I will tell the patients that 'you are in here and you might see me once or twice a week or maybe once or twice a month or even once or twice a year for 15 minutes at a time that is not a lot of time' so that is where I really emphasize their active participation in the care plan because we can't expect everything to happen in one short visit here or there so they need to be doing for example exercises on a daily basis, they need to be active, they need to be thinking about how they are working or at home during the day if they are sitting at a computer all day they have to be getting up and moving around because again I can only do so much for them and with* *them in a short treatment visit whereas they need to be doing a lot on their own to really complement what I'm trying to do with them"* (DC6). One chiropractor discussed how they placed less emphasis on passive care and recommended several elements of self-management for chronic pain patients: *"The treatment* (plan*) definitely focuses a lot less on what I am doing in the office and making sure they have the tools in their tool belt to be able to address all those other issues whether it is anxiety or stress or something to be able to give them a lot more tools for all facets of their life"* (DC5).

5.9.2.4 SUBTHEME – DISTINCT QUALITIES

This subtheme related to how the approach and experience of seeing a chiropractor is different than seeing other health care practitioners. In particular, the discussion from patients in the focus groups frequently contrasted the experience of seeing a chiropractor with that of seeing family medical doctors (also known as general practitioners). Among the differences mentioned by patients was the perception of a more caring approach by chiropractors, as exemplified by this quote, *"I feel like my chiropractor really cares about me, if I go to a medical doctor I don't even talk about things that I would talk to my chiropractor about because he doesn't care"* (FG1). As described previously, patients reiterated that they felt that chiropractors look at them more holistically, one patient detailed what they felt was holistic in their chiropractor's approach, *"I think he (*the chiropractor*) sort of has a holistic approach, I mean he asks you how you are, he asks you about your family, he's asking you questions so he's getting an idea of your emotional health and your physical health and so, it's almost like a little mini check-up plus your adjustment and I just find that you know he just seems more interested in you than a lot of (*other*) professionals are"* (FG2 – Patient 2). Patients indicated that they see their chiropractors more often than their medical doctors and that produced a closer relationship than they have with their medical doctors, as noted here, *"I see my chiropractor once a month. I see my family doctor maybe once a year so, yeah, it's a big difference"* (FG2). Patients had often seen both their chiropractor and medical doctor for a long period of time but noted that there was a difference in the relationships, as they felt much closer to their chiropractor, as one patient noted, *"It's just when you've seen them (*chiropractor*s) for a long time it (*the relationship*) just kind of evolves and not in the same way as an MD where you've seen them forever and you're just another number*" (FG1).

Patients further mentioned the perception of chiropractors being better listeners than other professionals, for example, *"I think the chiropractor has time even though your appointment is only ten minutes or so, he still has time to listen to what how you're feeling and react to that, as opposed to your medical doctor where there's a sign out front that says you have ten minutes to discuss all your issues. You only get in there once or twice a year you jolly well better get it all down to this much, because you're not going to get it done"* (FG2 – Patient 7). Patients also described valuing the unique approach and musculoskeletal expertise of their chiropractors, as noted here, *"I look for relief, but I also look for a different viewpoint……my experience with chiropractors I've had is they actually take the time to listen"* (FG3).

5.9.2.5 SUBTHEME – VISITS AND FOLLOW-UP

This subtheme arose from interview data regarding the contents and frequency of chiropractic visits with chronic MSK condition patients, as well as the methods that chiropractors employ to follow-up with patients. Chiropractors indicated that there are numerous tasks to perform and topics to potentially discuss during a visit, as described in this quote, *"So subsequent visits are really just about checking it but not only checking it with the physical but also the other factors: How is your stress? Are you sleeping? That kind of stuff. So to be able to* *actually look at them from that biopsychosocial model which obviously applies to everybody but is especially important in chronic patients. Then being able to obviously give them the treatment that they need hands on and then review the stuff that they are doing when they are out of the office"* (DC5).

A typical visit with chiropractors includes assessment and the provision of treatment, usually manual therapy or chiropractic adjustments, but potentially including other adjunctive therapies, education, and recommendations, as one chiropractor described, "*My interactions on a follow-up visit are pretty low key actually. It is (*spinal*) manipulation, exercise, and education and that is really all I end up doing and that depends on the patient on what the heck we are going to talk about there too"* (DC4). Focus group patients described the routine of a typical treatment similarly, *"he pretty well does the same (*treatment*) every month, I know he feels around, and I guess knows what needs to be adjusted, so I don't really think every month we can adjust what he's going to do…… he does what he needs to do and that's been working*" (FG2 – Patient 2). During visits chiropractors determine the patient's status or progress and provide encouragement and support to help with their pain management. Chiropractors felt that these conversations and recommendations could be even more important than the actual physical treatments, as exemplified in this quote, *"Some of those visits, and maybe all of them, could be spent not even applying treatment but just focussing on the education and reassuring and coaching components. I feel those are important that way* (DC6).

The use of maintenance care, where patients attend on a regular basis to manage their pain and prevent exacerbations, was frequently mentioned by patients, for example: *"I think the regular maintenance (*care*) has helped, not saying that I don't (*have pain*) since I've had that* (but) *I've rarely had a really bad bout where I've been incapacitated, having a lot of trouble to just walk around"* (FG1). Due to this regular attendance by chronic pain patients, chiropractors often use regular visits as their most common means to follow-up with patients, *"Usually, it (*follow-up*) is in the office and so we have people who tend to drop by, or we will have a set sort a re-evaluation period where people will come in"* (DC5). Chiropractors felt regular care serves an important purpose so that they can provide physical interventions and treatments while engaging and supporting chronic pain patients and providing suitable follow-up, one chiropractor rationalized this as follows: *"Much like a patient with diabetes they get their blood tested every so often and different things, you are having follow-up visits or follow-up checks and I think that is the approach I would use mostly in clinic is follow-up visits…….most of the follow-up would be done in office with visits"* (DC6).

5.9.3 THEME - CHIROPRACTOR-PATIENT INTERACTION

In the provision and receipt of healthcare professionals and patients come together to address the patient's health needs. In doing so, a relationship and pattern of communication between the parties is established. Accordingly, this theme was defined as "the ongoing relationship and communication between the chiropractor and patient". An additional two subthemes were identified within this theme, "Rapport and Relationship" and "Information Exchange". The majority of relationship building and interaction between patients and chiropractors happens during clinical visits, which patients described as being typically positive encounters. *"It's a good experience when you go there and know that you're not just a number and I think that it eases your mind right there, I know this guy cares"* (FG4 – Patient 4).

Chiropractors appeared to understand the importance of contextual factors in creating an environment and exchanges that are conducive to patient's feeling welcomed, comfortable, and understood - *"It is even more than just trust, it is like everything, it is the whole environment when they come in, you know? Do you maintain eye contact when they talk to you? Do they feel heard? Do they feel like you are actually addressing the issues that they have? Do they feel like you actually care and you are not just kind of going through the motions? All of that is not only going to contribute to whatever improvement that they are seeking but it is going to make that relationship so much better and they are going to trust you a lot more in terms of your advice and sort of the difficult decisions you could potentially be asking them to make in terms of changing aspects of their life."* (DC5). Patients emphasized how their chiropractor listening to them was integral to their satisfaction with chiropractic care, as evident in this quote, *"I'd say I think it (*my satisfaction*) relates to how well I think they're listening to me, understanding my specific needs"* (FG1 – Patient 1).

5.9.3.1 SUBTHEME - RAPPORT AND RELATIONSHIP

This subtheme relates to the development of good rapport and a comfortable ongoing relationship between patients and their chiropractors. Chiropractors acknowledged the importance of a strong relationship between them and their patients as they work together to manage the patient's condition, as one chiropractor explained, *"You ask people if they come and see you for some time why you think that is and I think it is the relationship; it is a connection and relationship where you are trusted and where you trust that person to communicate with you as well"* (DC2). Patients agreed with the importance of the relationship with their chiropractor and that such a relationship can take time to establish, *"The longer you've been seeing this, your chiropractor, the relationship has to be better because you wouldn't be there, or I wouldn't be there if that relationship hadn't gotten* *stronger. You're the first couple times it's like dating you're figuring out who each other are and by the time you've gone on in for several years okay, you know way too much about (*me*), he knows way too much about you as a patient (laughs)"* (FG1 – Patient 4). One way to establish rapport between chiropractors and patients is through more frequent visits in the beginning of the treatment plan, as one chiropractor described, *"I like to see a patient, especially if I have never seen them before, at least a couple times a week for a few different weeks partly to provide care, partly to see how they respond to care, but also partly to start to get to know them and develop that rapport because I think it helps in working with them down the road"* (DC6).

Interview data indicated that the establishment of a trusting relationship and practitioner understanding of the patient can help lead to enhanced patient satisfaction. Patients strongly emphasized the trust that they had in their chiropractor, for example, *"I don't know if I could go to another place…I was very skeptical when I first started having chiropractic care. In fact, the first couple of times it's like 'ahh I don't know if I'm going to do this' and once the trust, relationship was developed then it was like 'okay, well nobody else is touching me', because when I feel when somebody is working with your neck and it you have to have trust in that person. I mean you hear all these things about strokes and yada, yada, yada, so when you're having your neck adjusted I need to trust you and we have developed that trust and so, 'if you want to adjust my neck go ahead, if you want to twist my arm do that too because I trust you, I totally trust you'."* (FG1). Chiropractors indicated that the modalities included in a treatment could almost be irrelevant as long as the patient felt that they were being heard and understood by their chiropractor, as exemplified in this quote, *"Our treatment can be whatever we want and if they know we are focused on their problem and understand them then I think you are going to probably have a better successful outcome"* (DC4).

5.9.3.2 SUBTHEME – INFORMATION EXCHANGE

This subtheme explores how establishing a relationship was felt to be helpful for chiropractors in obtaining clinical information, putting patients at ease, and ensuring that the chiropractor has a comprehensive understanding of the patient. Interview data demonstrated that patients value how their chiropractors communicate with them and the use of patient-centred communication techniques by chiropractors -*"I think he's dealing with your whole body, your head like he wants to know how you're feeling, communicates and looks at you, treats you like a real person not something else and he listens, he hears what you're saying and acts on it and gives you a chance to respond"* (FG4). Chiropractors explained that it was particularly important in the first few visits with a patient to gain an understanding of the patient and their priorities as that might help drive the process of setting goals with them, as exemplified by this quote: *"I try especially on the first visit I try and get an idea of maybe of what is important to them. So, let's say if they want to golf or they want to play with grandkids. I try and focus on that as a sort of a functional goal for managing the patient. So, I might tell them you might always have pain but if we can get you on the golf course or playing with your grandkids even though you might still have pain that still will be a success and a lot of patients I think they realize that they have had pain for, if they go away but yeah if they can do some of these other activities that are important to them they will be happy.*" (DC6).

Having a good relationship and communication between patients and chiropractors was described as helpful in the management of persistent MSK conditions. Chiropractors described how having a close long-term relationship enabled them to learn more about their patients -*"It is not a friendship, it is still a doctor/patient relationship, but I do feel that the more that you see a patient the more they literally will trust you with anything, the more that* *the conversations are going to open up and you know give you things like an arthritic patient may now talk to you about different injuries, they normally do already tell you, but other parts of their life too"* (DC7). The additional information that chiropractors glean from patients during the conversations in a visit can be invaluable clinically, as illustrated in this quote, *"So sometimes you will just tease out little tidbits during a random conversation during a treatment that makes you realize that there is this whole aspect that hasn't been addressed that is really affecting that patient. The better relationship you have with them the more you know about what is going on with them, the more you are going to be able to figure out different ways to help them."* (DC5).

5.9.4 THEME - DECISION MAKING

This theme related to the manner in which a plan of management is formulated between chiropractors and their patients. Three subthemes were identified within this theme, "Balance of Power", "Goal Setting", and "Barriers to Patient-Centredness". Most of the chiropractors assigned importance to engaging the patient when determining a plan of action, listening to their concerns, and tailoring it to them, *"You have to be willing to work with the patient at looking at their circumstances and their needs and respecting their choice. So you might have an idea or a plan of what you think would work best with the patient but ultimately it is what they are most comfortable with and is where you are going to succeed. Just respecting their choice and involving them in the decision-making process that is how you will succeed with a chronic patient"* (DC6). Chiropractors frequently discussed the importance of respecting patients and their choices - *"Take your time and respect them and support them in the fact that they are the ones making the choices; they are communicating their preferences to you, and respect that"* (DC2). Chiropractors emphasized how care plans should be personalized for patients and their preferences, for example, *"So if I am talking with somebody about* *lowering their stress level I am not going to make them go for a walk in the woods if they hate that, we are going to talk maybe about something that is a little bit easier or something that fits in with their life that is going to be an actual valuable tool to them. Same thing with a treatment plan, I will suggest something but it is always going to be a conversation with them about 'this is my recommendation but does that make sense to you? Does that ring true to you? Do you feel like that is what you need right now? Do you have any issues with that?' 'Let's have a conversation about that to make sure that we are all on the same page'."* (DC5).

Patients corroborated their chiropractors inviting them into the decision-making process, as noted in this exchange, *"I always get offered like 'this is what we're going to do today is this does this agree, do you agree with this?',' yes' or 'what about this, can we do this?' So, I feel like I get that already and I definitely would expect that."* (FG1 – Patient 1) and *"I feel like I get that as well."* (FG1 - Patient 6). However, patients also indicated that while they played a role in decision making at the beginning of their relationship with their chiropractor, that role frequently decreases over time, particularly after they have established a care routine, as exemplified in this quote, *"It's been a while since I actually had anything like that (*input into the decision-making process*) but it's more just usually just the ongoing dealing with what goes on and that you know we're on the same page."* (FG1 – Patient 2).

Not all chiropractors were as inclined to involve patients in the decision-making process. One chiropractor discussed how they favoured following their previous experience and research evidence in decision making, particularly if the patient was responding to care. However, if there was a lack of treatment response or less clinical certainty they might allow the patient more choice or input, "*If we get stumped we always give them the option but if it is going* *according to what my treatment plan is and what protocol is based on best evidence and past experience, I think we don't give them maybe as much input into it"* (DC3). Patients can present with uncertainty in what to do about their condition and look to their chiropractor for guidance, as one chiropractor described, *"Most I find though too they just want some proper direction, 'Can I do this?', "Can I do that?'* (DC4).

5.9.4.1 SUBTHEME – BALANCE OF POWER

This subtheme was demonstrated by the potential for disparity in power sharing between patients and their chiropractors. Chiropractors frequently take the lead when making clinical decisions, particularly when it comes to treatment planning while still trying to respect patient choices. One of the chiropractors described their use of the evidence-based practice model, initiating treatment plans through suggestions to their patients, but respecting their preferences, *"I definitely subscribe to the evidence-based model of care in which 1 of the 3 pillars is patient preference or respecting patient choice… I might recommend something that I have had good experience with and there is good evidence for, but if you are not comfortable with it, we are not going to use that method, because if we do something that you are not comfortable with we are not going to get good successful results."* (DC6). Chiropractors indicated trying to involve patients by presenting management options or ideas with the patient either agreeing or making the final decision, as noted in this quote, *"I try to engage the patient and work with them in the entire decision-making process and I try to be flexible with them and meet them where they are at"* (DC6). One chiropractor described the decision-making process as being entirely in the patient's control and that the chiropractor's role is to give the patient options and information as they make their decision, *"All their decision. I always tell them these are my recommendations; we in the medical and healthcare field*(s) *exist to provide expertise to you not to tell you what to do, to provide some insight* *that is not always 100% correct but we do the best we can to provide to you what we feel is the best in terms of diagnosis, treatment recommendations, and interprofessional referrals if necessary"* (DC2).

Patients felt that it was important for their chiropractors to empower them to make decisions about their care and carry out self-care, as one patient noted, *"I also think it's really important to empower the patient to feel that their health is within their own hands, that they have a role to play in getting better and helping them understand that role and encouraging and empowering them with information tools, whatever it is, to be able to take care of themselves outside of that office"* (FG2 – Patient 2). Some patients felt that they had a suitable amount of input and say in their care with their chiropractor, for example, *"I have enough feedback and I feel like the relationship I have with my practitioner is two-ways so, I feel comfortable talking to them about my needs"* (FG1). However, other patients were reticent to say that their chiropractor was successful in empowering them, as evident by this quote, *"I think he's empowering me in the sense* (that*) I always get a say. I think he could be more empowering in the sense of doing other things but..... I don't know if I would consider my chiropractor particularly empowering"* (FG3 – Patient 3). Other patients described paternalistic approaches from their chiropractors, with apparently little patient input and empowerment, as exemplified by this quote, *"Usually when you go to a chiropractor, they kind of diagnose what you're going through and then recommend treatment and they just do it"* (FG1).

5.9.4.2 SUBTHEME – GOAL SETTING

This subtheme related to chiropractors and patients establishing goals for treatment outcomes or for patients to work towards. Goals are typically set through discussion between the patient and chiropractor. In these the discussions the chiropractor tries to learn what is important to the patient, set personalized goals with them, and eventually re-evaluate those goals for progress. Chiropractors emphasized these goal setting and re-evaluation processes as important aspects of care for chronic pain patients, for example, *"You need to listen; you need to ask questions on why it is they are visiting you and what they would like to achieve, and you have to try and help them set some goals to keep them accountable and to keep you accountable on checking in on them… let's see where we can get to in the next four weeks and then we can check-in and do a quick examination, check in again in eight weeks after that"* (DC7). Chiropractors described challenges in working with patients with long-standing pain or injuries and how setting goals with such patients can allow them to notice and be encouraged by even small improvements, as one chiropractor discussed, *"..some people are either so injured or deeply entrenched and invested in chronicity and that happens. I have to realize that every small gain is a huge victory with people who aren't orientated towards recovery. They don't expect it; they don't even imagine it and so setting small goals can often be the key to working with them"* (DC1). The methods and timing used to establish goals with patients can vary, although chiropractors often described setting goals during the first few visits with patients, as noted here: *"We usually try to come up with one or two goals at the end of that first visit like what are some functional things in your life that you haven't been able to do because of this chronic problem and what they want to do and then that is what we can follow on down the road"* (DC5). However, one chiropractor described a more interpretative method to determine patient goals and an informal method to track patient goals, *"No, I don't write it down, but it is those informal conversations we have there too though, right? I mean other than me commonly still using a paper and pen for charting is that I am a big fan of using sticky notes so I will be writing down right afterwards my* *thoughts of goals and what their goals might be there too though, and as a reminder as we go through care"* (DC4).

The goals most commonly discussed by the chiropractors related to improving function and being able to carry out activities of daily living or certain recreation activities, as exemplified in this quote: *"It's springtime here so then they want to get out to the golf course then. Okay, fine we have a good goal to go to, or if it is picking up a grandchild or what have you"* (DC4). For some chiropractors and patients, the goals could be more long-term, as noted here, *"We talk about goals of care very specifically. It is now December, what do you want to be doing in the summer? Are you a golfer? Do you want to be surfing in Tofino with your teenagers or what do you want to be doing? So goals of care in terms of aspirations"* (DC2). The goals that patients and chiropractors set reflected patient priorities, as given the choice, patients typically assigned a priority to function over pain as exemplified in this exchange, *"I think the priority is function and then look and then once you have that function, to make sure the pain is addressed. I think, I mean as a mother and a wife and just being able to care for yourself and care for others is being able to go walk the dog, go shopping and get in the car and drive like there are times when I'm out and I can't get in a car and drive so to be able to do my day-to-day is the priority if I need to take the Advil, I take the Advil, and sometimes it helps and sometimes it doesn't, but to be able to do what I have to do I think is the priority, and then ideally address the pain but I think I think functionality for me it is a priority"* (FG3 – Patient 3), and *"If I'm pain free but I can't function, would I be happy? And the answer would be no. But if I could function, even if I have pain, I would still be happier than to have no pain and not be able to function"* (FG3 – Patient 2).

5.9.4.3 SUBTHEME – BARRIERS TO PATIENT-CENTREDNESS

This subtheme was identified as interview data indicated that increased patient caseloads were felt to limit the ability of chiropractors to provide patient-centred care, as one chiropractor opined, *"I think and hope that we are going to see more and more chiropractic practices getting away from how many patients can I see in an hour or in a day or a week and more emphasis placed on quality of care and it will naturally be a patient-centered approach"* (DC6). One of the concerns that chiropractors expressed with practitioners being too busy is that they may be unable to address all patient concerns due to time constraints - "*Certainly, being too busy would create that one complaint scenario, you know, if you had back pain and knee pain (*and the response from the chiropractor was*) 'well, sorry we will deal with one of them today and that is all we are going to do'. I don't like that and I don't appreciate that myself and I don't like to provide that kind of care. I would rather spend a little bit more time and be a little bit more thorough"* (DC1). Patients similarly discussed how limited time spent in appointments led to dissatisfaction with care, as described by one patient: *"I've been to some clinics where it's five minutes in and out and you're just getting adjusted and that's not my jive, I do not want (*that*). I expect more than that for the money I'm paying"* (FG1- Patient 1). Patients also indicated that sometimes the success or popularity of a chiropractor limits the availability of appointment times, which could in turn impact patient satisfaction, *"When you find a chiropractor that's good sometimes it's hard to get your preferred times for appointments"* (FG2 – Patient 6).

Another barrier to patient-centred care identified by patients in the focus group interviews arose from expressions of concern about repetitive care from their chiropractors. One patient commented on how the care from their chiropractor did not change over time with their evolving needs, and this led to dissatisfaction and they eventually changed chiropractors, *"I* *had a chiropractor who at first I was very comfortable with and then I found out that no matter what my complaint, the same thing was done every single time…. it was just sort of a top-to-bottom 'okay, we'll do adjustments here and here' and it wasn't working physically for me and then I wasn't feeling that they were understanding my problems"* (FG3 – Patient 2). Chiropractors also expressed concern over the use of chiropractic techniques or in-office systems, which they felt could limit the ability of chiropractors to provide care that is tailored to each patient and their needs, as one chiropractor described: *"A practice that is very system-orientated to move patient's through expeditiously that is very focused on the technique driven type of practice. The patient comes in with an ankle complaint and 'okay we will adjust your low back and see you tomorrow'. I don't think that is particularly patient-centered or specific for a patient complaint and I do hear that in chiropractic practices. I hear it from patients that the chiropractor did the same thing for weeks or months and 'I never felt better and never had any effect on my problem'. So, I think that can be a weakness in some chiropractic practices"* (DC1).

5.9.5 THEME - MULTIDISCIPLINARY MANAGEMENT OF CHRONIC PAIN

Chiropractors are frequently one of several healthcare professionals to treat patients with chronic MSK conditions. This theme was defined as "the ways that chiropractors work with other healthcare professionals (HCPs) to manage chronic pain patients." Two subthemes were identified under this theme, "Collaboration" and "Referrals". Chiropractors described a preference for multidisciplinary care with chronic MSK patients, for example, *"I definitely refer to physio and massage and I am a huge advocate of getting people multimodal care for sure"* (DC3). There are numerous other health professionals that patients can see for chronic MSK conditions, and chiropractors can take on different roles in the provision of multidisciplinary care. Chiropractors may simply provide care to patients as part of multidisciplinary care, but in other instances they take on more of a leadership role and provide patients with guidance and recommendations to see other professionals for care that may aid their progress, as exemplified in this quote, *"So being able to help steward somebody through the healthcare system and be their advocate and make sure that they are getting what they need from different practitioners. So, guiding them through so they don't have this hodgepodge of stuff going on and it is more organized with a goal"* (DC5). Patients described their chiropractor giving them suggestions of other professionals that they could see based on their current presentation, as noted in this quote, *"He (*the chiropractor*) might say 'this is really tight you should make sure you get a massage in the next couple of weeks', again probably to make his job easier the next time or (*he might recommend*) physio,' that looks very swollen like you might want to chat with this practitioner to see what you could be doing at home'."* (FG2).

Communication patterns between chiropractors, patients, and other healthcare professionals varied. In some instances, there is direct communication that involves the patient, *"I act as my own advocate and I tend not to have the practitioners talk to each other just through me*" (FG1 – Patient 1). In other scenarios the patient may relay communication between the chiropractor and the other professional, for example, *"... the patient will be a little bit of a go-between but you do have to be a little bit careful sometimes because, as we know, patients are sometimes not always very good at being accurate in their communication between practitioners"* (DC5). Finally, there are situations where the communication occurs between the chiropractor and the other professional without the patient, as noted in this quote, "*there is a place for practitioners to have a discussion without the patient"* (DC5).

5.9.5.1 SUBTHEME – COLLABORATION

This subtheme arose from interview comments centring around interprofessional cooperation and communication. Chiropractors indicated that in the past that there was relatively little cooperation between them and other healthcare professionals, medical doctors in particular, so if multidisciplinary care occurred it was typically without interdisciplinary communication and planning. Chiropractors mentioned that collaboration and interprofessional communication were facilitated by co-location with other healthcare professionals, for example, *"There are people within the office, a massage therapist, naturopath, who will often see the same patients and so we do have some discussions around care and issues that we recognize that may be relevant to the care from another practitioner"* (DC1). Chiropractors received feedback from patients who appreciated when they worked with other professionals in a collaborative manner, as evident in this quote: *"One of the compliments that we often get within our own clinic is that patients will say that a lot of other clinics have practitioners that coexist but that don't actually work in a collaborative manner. They don't actually have any conversations"* (DC7).

The chiropractors felt that there have been improvements in interprofessional communication and collaboration with medical doctors, as described by one chiropractor: "*It is getting better than I think it used to be because years ago patients were almost afraid to tell their family physician that they had gone to see a chiropractor, that they were going to see one for care, but nowadays the two professions are getting along a lot better. Communication has opened up a lot, so patients are more comfortable talking to their physicians or asking about chiropractic care for example and physicians are more open to referring patients for chiropractic, and vice a versa. I think chiropractors are more willing to work with physicians than it used to be"* (DC6). Patients also indicated that their medical doctors were receptive to them seeing chiropractors, particularly if they find chiropractic care helpful, as evident in this quote, *"My GP, a young new doctor that I had just gone to, thankfully I got a nice doctor and a nice group of doctors, I don't see him for anything particular, but he was all on-board when he did the interview. He wants to know what else you're doing and he's one in the camp where he says 'if you like it and it works for you, go for it.' So, if he didn't say that I don't know if I'd want to deal with him"* (FG2). However, patients mentioned the persistence of negative attitudes towards the chiropractic profession from other health care professionals, to the point of attempting to remove chiropractic from patient care plans, for example, *".... the doctors kept telling me 'go home, have a hot bath, go to the physiotherapy'..... 'Do not see a chiropractor', you know because I'd tell them my neck (*is painful*) and he kept saying, 'do not go to a chiropractor, do not get manipulated'. I'm like I don't listen because I got to go, I just found it very frustrating when the doctors were doing the best they could to help me but on the other hand they just kept telling me not to do what I found worked"* (FG4).

5.9.5.2 SUBTHEME – REFERRALS

Referrals to other practitioners were deemed important by chiropractors as they could be beneficial for the patient in managing their condition. Referrals are generally made after discussion with patients and obtaining their consent, as described in this quote, *"I will first run it past the patient as to what I am thinking, and a referral might be valuable and generally they are just happy that I am thinking about them and that in a more holistic way that would include someone who could be helpful for them"* (DC1). Chiropractors cited numerous reasons to refer patients to other practitioners, including a lack of response to treatment, one chiropractor described their thought process for making referrals in such cases, *"That is where that safety net has to come in. 'What can we do? You are not better, you are* *only minimally better, this is not working for you. Do we try another chiropractor? Do we refer you to something outside of chiropractic? Do we send you back for more investigation? Like, where do we go here?'"* (DC2). In some instances, referrals are made to facilitate treatment for the chiropractor - *"I remember he did do that when I was so tense, my back was so bad, he said it would be better if I went to a massage therapist and then she loosens up my muscles and then, so I kind of went to her on the Monday and then I went to see him on the Wednesday or Thursday you know so and yeah, he was right it did work better, it stayed in better too, yup"* (FG4 – Patient 2). In other cases, referrals are necessary due to limitations in the conditions that chiropractors can help with or their scope of practice, for example, *"If it is something that is sort of out of my scope (*of practice*), I refer them plain and simple….so if I think it is a kidney issue or a gallbladder or let's say a hernia, I am going to refer out immediately"* (DC3). In such cases, chiropractors indicated that it is necessary to provide information on the case to whomever they are referring the patient, *"Often, we will have to refer them out because we don't have everything here, so in that way we make sure we send a lot of communication"* (DC5).

Chiropractors discussed the importance of formal communication and follow-up on referrals with patients, with such follow-up deemed necessary for continuity of care, but also to ensure that the patient feels that their issues are being addressed, as noted in this quote: *"So if I refer someone anywhere I write a letter letting them know what is going on and then I follow up with the patient to make sure that they have been seen there and then I will often follow-up with the patient to make sure that they are doing ok and see how things are going….. I think too it is good just to have that follow-up to ensure that if they have been referred to somebody else that they are getting what they need there and they're not just kind of falling off the system if something doesn't work"* (DC5).

Patients indicated that their chiropractors frequently made referrals to other professionals and expressed appreciation for the effort, time, and consideration of their case, for example, *"So, as long as I was comfortable with it he'd just keep reaching forward and trying to figure something else out, so through him is where I got connected with physio and massage and naturopath"* (FG2). One patient also described how easier access to their chiropractor could speed up referrals to other professionals that might take longer otherwise: *"The other thing that I've found with the chiropractor and the clinic that I go to, they're more accessible than my MD and so, when you need referrals for other things they you can often get in, get your referral, and get on with your life and get fixed up that much faster. Where you call the MD and they say 'okay, two weeks on Saturday I got five minutes, or you can come on the days we drop-in'"* (FG1).

5.10 CONCLUSIONS

This chapter detailed the quantitative and qualitative results from the questionnaires and interviews, respectively. The qualitative data aided with the interpretation of the quantitative data. Several important themes and subthemes describing patient-centred care provided by chiropractors were also identified from the qualitative data. These results will be further explained in the Discussion chapter.

CHAPTER 6

DISCUSSION

CHAPTER 6: DISCUSSION

6.0 INTRODUCTION

Following a trend that began in the late 20th century, there has been an increasing movement towards patient-oriented research, policy, and practice in healthcare throughout the 21st century (Medicine and Medicine, 2001; Paparella, 2016). Researchers, clinicians, and policymakers are placing greater emphasis on the voice and experience of the patient, as well as considering the societal and ethical implications of allowing and/or encouraging patients to take a more active role to make informed decisions about their health and the care they receive (Duggan et al., 2006; Epstein and Street, 2011; Saha, Beach and Cooper, 2008). Given the importance being placed on patient-centred care, it is necessary to measure the extent to which the care that patients receive is patient-centred as this can provide clues as to areas to emphasize in pre-clinical, clinical, and post-graduate training of health professionals, along with planning the provision of healthcare services.

The chiropractic profession has been described as providing patient-centred care by chiropractic researchers and policymakers as well as other healthcare professionals (Jamison, 2001; Gatterman, 1995; Weis et al., 2016; Busse et al., 2009). However, as highlighted in the narrative review in Chapter 3, to date there has been relatively little research to determine whether that description is justified. This study's primary research question was to determine the extent that chiropractic patients with chronic MSK conditions perceive the care that they receive to be patient-centred. The secondary research question was to determine the extent that chiropractors perceive the care that they provide for patients with chronic MSK conditions to be patient-centred.

In this chapter I intend to compare the findings of this study with those in the existing literature. This includes an assessment of the patient sample (Section 6.1.1) as well as the PACIC overall (Section 6.1.2) and subscale scores (Section 6.1.3), followed by assessment of the sampled chiropractors (Section 6.1.4), along with the PPOS overall (6.1.5) and subscale scores (Section 6.1.6). The themes and subthemes developed from the qualitative interviews will be compared with the different components of the Mead and Bower model of patient-centred care (Section 6.2), the theoretical framework adopted in this thesis. Finally, the strengths and weaknesses of this study will be discussed (Section 6.3).

6.1 MAIN FINDINGS

This study's findings demonstrate that chiropractic patients with chronic musculoskeletal conditions perceive chiropractic care to be patient-centred in a manner comparable to other health professions. Chiropractic patients were highly satisfied with the chiropractic care they receive and that was positively associated with their perceiving care received to be more patient-centred. Having a mental health condition, younger age, fewer years attending their chiropractor's clinic, and number of other healthcare providers and chiropractic visits in the past year were also significantly associated with patient perceptions of more patient-centred care from their chiropractor. These factors were mostly in line with expectations and previous research in other health professions. However, the regression models constructed from these variables were weak and it seems likely that additional factors may contribute to patient perceptions of patient-centredness of chiropractic care.

This study's findings established ways in which chiropractic patients with chronic musculoskeletal conditions perceived chiropractic care to be patient-centred. Patient ratings of the PACIC subscales and interview findings indicated that chiropractors employ elements of patient-centredness by providing care that is holistic, considers patient context, involves and empowers patients, and by providing information and education to patients. However, it is also suggested that not all care provided by chiropractors is patient-centred, as related to goal setting or regular follow-up outside of clinical visits, or through care that is repetitive and overly prescriptive.

Chiropractors espouse a patient-specific holistic approach to care for patients with chronic musculoskeletal conditions. Patients perceived that as different from other health care professionals, while indicating that it is beneficial that chiropractors frequently co-manage and refer them to other professionals, often in multidisciplinary settings. Interviews demonstrated the importance of the therapeutic relationship between patients and their chiropractors and the trust that was formed through it. This was in line with expectations and previous research. The relationship between patients and chiropractors was developed through the time spent together and the communication and listening skills of chiropractors during relatively frequent appointments, particularly as a part of regular maintenance care to manage and prevent deterioration of chronic musculoskeletal conditions.

This study identified that number of years in practice and seeing more patients per week were associated with chiropractor attitudes and orientation towards patient-centred care. More patient-centred attitudes with respect to individualizing care were associated with more years in practice. More patient-centred attitudes with respect to patient involvement in decision making were associated with seeing more patients per hour and per week, as well as greater experience. The associations with higher weekly or hourly caseloads were not anticipated, and higher caseloads and potentially corresponding time constraints during visits were viewed as possibly damaging to the provision of patient-centred care during interviews.

Furthermore, doctor-centred attitudes were displayed at times as some chiropractors expressed that they place a greater emphasis on their clinical experience and/or research evidence over patient preference when making clinical decisions.

6.1.1 PATIENT SAMPLE CHARACTERISTICS

The patient sample was described by their demographics (Section 5.1), and health status (Section 5.2). The median and mean ages of the patients in the sample and focus group were all older than the median age of 43.4 years old of chiropractic patient population profiles reported by Beliveau *et al*. (Beliveau et al., 2017). The increased age of the study sample is likely due to only including patients with chronic MSK conditions whereas Beliveau *et al.* (Beliveau et al., 2017) included studies that had acute, sub-acute, and chronic populations. Chronic pain populations are typically older on average (Mills, Nicolson and Smith, 2019). In a large study of European chronic pain patients (n=4839), the mean age was 50 years old (Breivik et al., 2006), which was similar to the current study. Similarly, a study of chronic spinal pain patients who see chiropractors (n=2024) had a mean age of 48.6 years (Herman et al., 2018). In the current study, close to one quarter of participants were 65 years or older, which is similar to a recently published cross-sectional observational study in Ontario, Canada that assessed chiropractic patient profiles and characteristics and reported that 18.8% of 2423 patients were 65 years or older (Mior et al., 2019). Thus, the current study appears to be representative of chiropractic chronic pain patient populations.

The participants in this study were predominantly female, Caucasian, and well-educated. This was similar to a large recent cross-sectional study of American chronic spinal pain patients by Herman *et al.* (Herman et al., 2018). The higher representation of females was in line with expectations as chronic pain is frequently reported as being more prevalent among females than males (Breivik et al., 2006; Fayaz et al., 2016; Mills, Nicolson and Smith, 2019). Furthermore, chiropractic patient populations typically have more females. Close to two-thirds of the study participants were females, which was similar to Herman *et al.*'s (Herman et al., 2018). study which was 72.4% female, but greater than the median of 57.0% for chiropractic patient populations in studies reported by Beliveau *et al.* (Beliveau et al., 2017), and 59.0% reported by Mior *et al.* (Mior et al., 2019). Focus group participants were also nearly 80% female. Close to 90% of the patients in the study were Caucasian (n= 779, 88.0%), which was similar to Herman *et al.* (Herman et al., 2018) at 91.9%, but is not reflective of the Canadian general population as per the 2016 census, where 77.7% of respondents identified as 'Not a visible minority' (Canada, 2016). It is uncertain why there appears to be such a predominance of Caucasians among chiropractic chronic pain populations. The predominance of patients with post-secondary education in the sample again contradicts the previous literature which typically indicates chronic pain being more prevalent among those with lower levels of education (Mills, Nicolson and Smith, 2019). However, it appears that chiropractic patients with chronic pain may be more educated as the current study findings were similar to Herman *et al.*'s (Herman et al., 2018) study of chiropractic patients with chronic spine pain with respect to highest level of education.

Health Status

Study respondents had at least one chronic MSK condition for study inclusion. The most common among these were chronic spinal conditions, reported by approximately 80% of respondents. Chronic spinal pain is the most commonly cited condition and pain location among those with chronic pain (Breivik et al., 2006; Fayaz et al., 2016; Schopflocher, Taenzer and Jovey, 2011). The frequency of chronic spinal pain in the study reflected evidence that spinal pain is the most common reason for patients to attend a chiropractor (Beliveau et al., 2017; Coulter and Shekelle, 2005; Mior et al., 2019).

Multiple chronicity was highly prevalent among respondents, with nearly two-thirds reporting multiple chronic conditions. The sample had a median and mean of 2 chronic conditions and that ranged between 1 and 9 chronic conditions. This is in line with previous research as, for example, chronic back pain patients commonly have co-occurring musculoskeletal complaints including spinal pain in other regions, extremity pain, or pain in multiple sites (Øverås et al., 2021). Approximately 1 in 4 of respondents from the current study reported having at least 1 chronic non-MSK condition along with their chronic MSK condition(s). This reflects the previous literature which indicates that chronic pain patients frequently have other chronic conditions (Mills, Nicolson and Smith, 2019). Less than 5% of study respondents reported having a chronic mental health condition, which is considerably lower than typically seen in chronic pain populations where depression alone is found in between 20% and 50% of chronic pain sufferers (Breivik et al., 2006; Mills, Nicolson and Smith, 2019). A recent study found that approximately 10% of Canadians have a mental disorder, with the most common disorders being depression, followed by anxiety (Palay et al., 2019). The prevalence of mental disorders goes up to 16% among Canadians who report a chronic condition (Sporinova et al., 2019). Thus, the current study's population was largely representative of chronic pain populations in terms of multiple chronicity, but not when pertaining to mental health condition co-occurrence. This may have been due to under-reporting from the patients, potentially because patients were not asked explicitly if they had a mental health condition, rather they were asked to write down the names of any chronic conditions that they had. It is also possible that mental health conditions are not as prevalent among chiropractic patients with chronic musculoskeletal conditions. However, a previous survey of Canadian and American health by Hurwitz and Chiang (Hurwitz and Chiang, 2006) indicated that 11.0% of past-year American chiropractic patients (n=595) and 9.0% of past-year Canadian chiropractic patients (n=448) had likely experienced an episode of depression in the past year, and nearly 15% of each of those groups had seen a mental health professional for at least one visit in the past year. Similarly, Charity *et al*. (Charity et al., 2016) identified that 11% of Australian chiropractic patients in the COAST study were reported as having a psychological condition by their chiropractor. This would make an argument that mental health conditions among chiropractic patients are more common than seen in the current study, although Hurwitz and Chiang (Hurwitz and Chiang, 2006) only ascertained the likelihood of a previous episode of depression in the past year and did not inquire about an actual diagnosis of depression or any other mental health condition. Furthermore, neither of those previous studies (Charity et al., 2016; Hurwitz and Chiang, 2006) specifically reported on chiropractic patients with chronic musculoskeletal conditions.

The global health status of respondents was evaluated through use of the PROMIS Global-10 instrument. The mean PROMIS mental and physical T-scores for respondents in this study were below the calculated mean of 50±10 (±1SD) set for the United States general population, albeit within 1 standard deviation of the mean (Hays et al., 2009). This was similar to previous research by Coulter *et al.* (Coulter et al., 2002) which demonstrated that mental and physical health scores among Canadian and American chiropractic patients with back pain (n=520) were significantly lower on the SF-36 than United States general population norms and also lower than patients with back pain or sciatica who only see their medical doctor. However, the current study did not have a comparison group of patients with chronic musculoskeletal conditions who were only seeing medical doctors, and in the Coulter *et al.* study (Coulter et al., 2002) the results for back pain patients were not analyzed separately for chronic, acute, or subacute back pain. While the mean PROMIS-10 mental and physical T-scores were below the population mean, respondents predominantly self-rated their health as average or better. Similarly, Mior *et al.* (Mior et al., 2019) found that 89.28% of the 2423 Ontario chiropractic patients surveyed indicated that their health was 'good' or better. Thus, it appears that the health status of patients in the current study was representative of North American chiropractic patient populations.

6.1.2 OVERALL PACIC SCORE

The overall PACIC scores were evaluated descriptively in Section 5.3, along with bivariate analyses in Section 5.4 and through multiple linear regression analysis in Section 5.4.1. The mean overall PACIC score for the 885 chiropractic patients who met the inclusion criteria and completed the patient questionnaire was 3.21 (95% CI 3.15 – 3.27). The 95% confidence intervals were narrow, giving a good degree of confidence in the values obtained. The results were within expectations based on previous research using the PACIC in similar populations (Foley, Steel and Adams, 2020; Gogovor et al., 2019; Rosemann et al., 2007; Stuber et al., 2018). The results from the current study were not significantly different from the results from the pilot study where the overall mean PACIC score was 3.29 (95% CI 3.21- 3.46) from 78 patients with chronic conditions (Stuber, Langweiler, Mior, & McCarthy, 2018). The populations assessed in the current study and the pilot study differed slightly in that the current study required patients to have a chronic MSK condition, whereas the pilot study required patients to have some chronic condition, which was not limited to chronic MSK conditions. However, nearly 95% of the pilot study patients had chronic MSK conditions. It is uncertain if a difference should be anticipated between such populations, although the high prevalence of chronic MSK conditions in the pilot study helps explain why there was not a significant difference between the pilot study and current study overall PACIC scores.

The current study is unique in that the PACIC has not been used extensively in the chiropractic profession, nor in populations with chronic MSK conditions. Aside from the pilot study, only one study was identified from Australia that involved chiropractic patients that used the PACIC (Foley, Steel and Adams, 2020). Foley, Steel, and Adams (Foley, Steel and Adams, 2020) had patients with chronic conditions who consult complementary medicine practitioners complete the PACIC, including patients who saw chiropractors (n=25). These chiropractic patients demonstrated lower mean overall PACIC scores of 3.06 (95% CI 2.79 – 3.33) than were observed in both the current and pilot studies with Canadian chiropractic patients. The samples were similar in terms of gender distribution and education levels. It is uncertain whether the higher scores given to Canadian chiropractors, while not significantly different, are due to differences between Australians and Canadians in PACIC scores, possibly owing to societal, cultural, health care professional training, chiropractic care provision, or even health system differences. Foley's sample size was quite small and that lead to considerably wider confidence intervals than the current study.

The mean overall PACIC scores for chiropractors in Foley's study were higher than all patients gave their medical doctors at 2.95 (95% CI 2.75 to 3.15), but lower than the mean overall PACIC scores given to all other complementary medicine professions that they assessed: acupuncture (mean score = 3.19), naturopathic medicine (mean score = 4.04), massage therapy (mean score = 3.23), and osteopathy (mean score = 3.14). As such, the mean overall PACIC score from the current study from Canadian chiropractic patients was higher than reported by patients attending Australian medical doctors, chiropractors, acupuncturists, and osteopaths, and were very close to the scores given for massage therapy, but considerably lower than the scores given for naturopathic medicine. Again the reasons for these differences are uncertain, although the lower scores for chiropractic patients when compared to the naturopathic patients may be due to increased time spent by naturopaths with their patients during appointments (Oberg et al., 2014). The differences could also be due the nature of the interventions provided to patients as chiropractors tend to provide a passive therapy, manual therapy, as their main form of treatment during appointments, while naturopaths tend to provide more active interventions such as remedies and lifestyle advice to patients (Foley, Steel and Adams, 2020; Oberg et al., 2014) .

Only two other studies were identified where the PACIC was used to assess the care provided for chronic MSK populations. Gogovor *et al.* (Gogovor et al., 2019) used the PACIC with subacute and chronic low back pain patients who took part in a before-and-after trial of a six-month interdisciplinary care program that included a physician, nurse, psychologist, and physiotherapist. The mean overall PACIC scores increased from 2.6 (95% CI 2.41 – 2.79) at baseline to 3.6 (95% CI 3.45 – 3.75) at six months among 132 patients included in their study. In this instance the baseline overall PACIC score was significantly below that of the current study, but the post-intervention score was significantly higher than the current study's score. While Gogovor's study was similarly conducted in Canada, the inclusion of patients with subacute back pain and chronic pain for less than 1 year makes the population under study notably different from the current study population where patients had their condition for at least 1 year and that could explain differences in PACIC scores. Furthermore, chiropractors were not involved as practitioners in the Gogovor *et al.* study and so the professions under study could account for scoring differences. Gogovor *et al.* did not reveal the proportion of patients in their study with chronic versus subacute low back pain, nor provide separate scores for patients in these groups for comparison. It is also difficult to determine how much of the improvement seen in PACIC scores in Gogovor *et al.* was due to elements of the interdisciplinary treatment program due to the absence of a control group.

However, it is promising to note that an intervention can lead to statistically significant improvement in PACIC scores in a musculoskeletal patient population.

Rosemann *et al*. (Rosemann et al., 2007) validated a German version of the PACIC 5A in a group of 236 German osteoarthritis patients under general practitioner (GP) care. The mean overall PACIC score was 2.44 (95% CI 2.30 – 2.58), which was considerably lower than the mean overall PACIC score in the current study. This is perhaps unsurprising as Rosemann *et al*. described the German health care system as 'doctor-centred', although it is uncertain the extent to which differences between Germany and other countries in terms of health care provision, receipt, and attitudes may affect patient-centredness. Another possible reason for differences in PACIC scores between the current study and Rosemann *et al.* was their patients seeing a primary care medical doctor versus a chiropractor. The study populations between the studies were also different as patients in Rosemann *et al.* all had knee or hip osteoarthritis and the mean age of 65 years were considerably different than the current study where the mean age was just below 53 and patients had an assortment of chronic MSK conditions, with chronic spinal conditions being the most common.

When comparing the mean overall PACIC scores from the current study with previous studies of populations with various chronic conditions that included chronic pain and/or osteoarthritis receiving medical care (Table 6.1), those mean overall PACIC scores range from 1.94 to 3.22 (Carryer et al., 2010; Desmedt et al., 2017; Glasgow et al., 2005a; Jansen, Heijmans and Rijken, 2015; Levesque et al., 2012; Noel et al., 2014; Rick et al., 2012; Schmittdiel et al., 2007; Vrijhoef et al., 2009). In most of those studies the mean overall PACIC scores were below 3.0 (Carryer et al., 2010; Desmedt et al., 2017; Glasgow et al., 2005a; Jansen, Heijmans and Rijken, 2015; Levesque et al., 2012; Rick et al., 2012;

Schmittdiel et al., 2007; Vrijhoef et al., 2009). Only two studies reported mean scores greater than 3.0 (Carryer et al., 2010; Noel et al., 2014). Only one study (Noel et al., 2014) had a higher mean score than the present study.

Table 6.1. Mean overall PACIC scores from studies of medical patients with mixed chronic illness conditions that included pain and/or osteoarthritis

Lead author, year of publication, sample size (n)	Country of study	Chronic conditions (most common reported)	Mean overall PACIC score (SD)
Carryer, 2010 n= 341	New Zealand	Chronic illness – cardiac, diabetes, respiratory, pain	2.8 for GPs, 3.2 for nurses
Desmedt, 2017 n= 339	Belgium	Chronic back pain, multiple sclerosis, chronic neck pain, osteoarthritis, hypertension	2.87 (0.93)
Glasgow, 2005 n= 266	USA	Hypertension, arthritis, depression, diabetes, asthma, pain	2.60 (1.0)
Jansen, 2015 n= 1602	Netherlands	Cardiovascular disease, diabetes, arthritis, asthma, COPD	1.94 (0.74) for those without an individual care plan 2.67 (1.00) for those with an individual care plan
Levesque, 2012 n= 776	Canada	Diabetes, heart failure, arthritis, COPD	2.48 (0.98) at baseline 2.54 (0.97) at 1 year
Noel, 2014 n= 1886	USA	Any chronic illness	3.22 (1.12)
Rick, 2012 n= 2439	United Kingdom	Patients able to indicate all chronic illnesses from a checklist including arthritis	2.4 (0.87)
Schmittdiel, 2007 n= 4108	USA	Asthma, diabetes, heart failure, coronary artery disease, chronic pain	2.7 (1.1)
Vrijhoef, 2009 n= 89	Netherlands	COPD, heart failure, arthritis, geriatric disorders	2.60 (median)

In the present study the mean overall PACIC score among patients with multiple chronic conditions was 3.25 (95% CI 3.18 – 3.32). This was not significantly different (p= 0.083) from those with a single chronic MSK condition of 3.14 (95% CI 3.04 -3.23). Several previous studies have used the PACIC to assess medical care in populations with multiple chronicity that included chronic MSK conditions and/or chronic pain (Table 6.2). In these studies, the mean overall PACIC scores range from 2.4 to 4.03 (Balbale et al., 2016; Boyd et al., 2009; Petersen et al., 2014; Rodriguez-Blazquez et al., 2020). In several of those studies the mean overall PACIC scores were greater than 3.0 (Balbale et al., 2016; Boyd et al., 2009; Rodriguez-Blazquez et al., 2020), although only one had a higher mean overall PACIC score than the present study (Rodriguez-Blazquez et al., 2020) Petersen *et al*. (Petersen et al., 2014) found a significant association between number of chronic conditions and overall PACIC score, but this only reached significance when including patients with complete datasets (i.e., they omitted patients with incomplete data). Similar to the current study, other studies have found that the number of chronic conditions was not significantly associated with overall PACIC score (Balbale et al., 2016; Rick et al., 2012).

There was a very weak positive correlation that was non-significant (r=0.053, p=0.11) between overall PACIC score and number of chronic conditions in the current study, which again differed from previous studies by Glasgow *et al.* (r =0.13, p<0.05) (Glasgow et al., 2005a) and Houle *et al.* (r= 0.12, p<0.05) (Houle et al., 2012) that demonstrated significant correlations. In those studies patients mostly had chronic non-musculoskeletal conditions, although Glasgow *et al*. included chronic pain patients and that could potentially lead to these discrepancies, as could differences in practitioners seen (medical doctors versus chiropractors) and settings.

Table 6.2 Mean overall PACIC scores from studies of patients with multiple chronicity that included chronic MSK conditions and/or chronic pain

Lead author, year of publication, sample size (n)	Country of study	Mean overall PACIC score (SD)
Balbale, 2016 n= 3519	USA	3.05 (1.12)
Boyd, 2009 n= 904 (485 guided care, 419 usual care)	USA	Guided care = 3.14 Usual care = 2.85
Petersen, 2014 n= 3189	Germany	2.4 (0.8)
Rodriguez-Blasquez n= 226	Spain, Italy, Lithuania	Baseline = 3.25 (0.95) Post-intervention = 4.03 (0.82)

In the current study overall PACIC score had a significant but very weak negative correlation with patient age (r= -0.155, p<0.001). This finding was similar to Houle *et al.*'s (Houle et al., 2012) study of Canadian patients at medical teaching clinics (r= -0.10, p>0.05), but contrary to Glasgow et al.'s (Glasgow et al., 2005a) original validation study of the PACIC where they found a significant positive correlation (r=0.16, p<0.05) between age and overall PACIC score. In the present study when age was dichotomized to 18-64 (below the standard age of retirement in Canada) and 65 and older, patients in the 18-64 age group had significantly higher overall PACIC scores when compared with the 65 and older age group (p=0.003). This was similar to the study by Rick *et al.* (Rick et al., 2012) where patients with chronic conditions younger than 75 years had significantly lower overall PACIC scores than those 75 and older. However, not all studies have shown significant associations or correlations between patient age and overall PACIC score (Balbale et al., 2016; Petersen et al., 2014; Rosemann et al., 2007). Patient age made a significant negative contribution to overall PACIC score in Model 1 of the regression analysis, but did not contribute significantly to Model 2 where age was dichotomized. It is uncertain why increasing patient age would be correlated to lower PACIC scores, whether the behaviour of health professionals towards older patients differs from those of younger patients, or if the greater experience of older patients contributes to higher standards or expectations of their health professionals. Along these lines, Lyons *et al*. (Lyons et al., 2013) noted that focus groups with older adults with low back pain advocated for patient-centred communication and approaches when discussing chiropractor and medical doctor co-management of their condition.

Contradictory associations between other demographic variables and overall PACIC scores have been reported for race (Balbale et al., 2016; Jackson et al., 2008), highest education level (Balbale et al., 2016; Houle et al., 2012; Jackson et al., 2008), and gender (Glasgow et al., 2005a; Houle et al., 2012; Rick et al., 2012), although the populations in those studies were markedly different than the current study. However, as in the current study, several other studies did not find significant associations or correlations between gender and overall PACIC score (Balbale et al., 2016; Petersen et al., 2014; Rosemann et al., 2007), nor highest education level and overall PACIC score (Glasgow et al., 2005a; Petersen et al., 2014; Rosemann et al., 2007).

Researchers point to the importance of a patient-centred approach to mental health care and in working with patients struggling with mental health issues (Gask and Coventry, 2012; Miller et al., 2017). Previous research has demonstrated that psychiatric patients demonstrate positive attitudes towards concordance / shared decision making when related to medication prescription decisions (Cuevas et al., 2012). In the current study, patients reporting a mental health condition had significantly ($p=0.01$) higher overall PACIC scores (mean 3.61, 95% CI = 3.31-3.91) than those not reporting a mental health condition (3.19 , 95% CI = 3.14-3.25). Having a mental health condition contributed significantly to both models of overall PACIC score in the regression analysis. This may reflect the willingness and ability of chiropractors to acknowledge and discuss the impact of mental health conditions for chronic MSK patients as part of providing holistic care and demonstrated in chiropractor interview data.

In the present study overall PACIC score had a very weak negative correlation with the number of years that patients attended their chiropractor's clinic, although the correlation was statistically significant (r =-0.074, p=0.03). Chiropractic patients indicated that they had been seeing their chiropractor for a median of 8 years, with a mean of approximately 10 years and ranging up to 49 years. Such long-term chiropractor-patient relationships have been seen before in chiropractic patients with chronic spinal pain (Herman et al., 2018), although the mean duration in that study was approximately half of the current study. When the number of years that patients had been attending their chiropractor's clinic was dichotomized to fewer than the mean versus equal to and greater than the mean of 10 years, patients seeing their chiropractor for fewer than 10 years were significantly associated with higher mean PACIC scores (3.30, 95% CI =3.21-3.35) compared with those who have been seeing their chiropractor for 10 years or more (3.13 , 95% CI =3.04-3.22) (p<0.01). Patients seeing their chiropractor for a longer period negatively impacted overall PACIC scores. The number of years that patients attended their chiropractor's clinic made a significant negative contribution to overall PACIC score in Model 2 of the regression analysis when dichotomized, but did not contribute significantly to Model 1 when the number of years was used as a continuous variable. The lower PACIC scores among those who have been seeing their chiropractors for greater durations may be due to less attentive care from their chiropractors in terms of potentially shorter visit durations, less frequent goal setting, or inadequate follow-up. This was supported by interview data where chiropractors expressed concern over becoming complacent when seeing patients over a number of years.

In line with expectations and previous research, in the current study, chiropractic patients who were 'very satisfied' with the care from their chiropractor provided significantly higher overall PACIC scores (p<0.001) than the patients who provided any other response to the satisfaction question. Previous researchers (Kuipers, Cramm and Nieboer, 2019; Rathert, Wyrwich and Boren, 2012; Wolf et al., 2008) have reported positive relationships between patient-centred care and patient satisfaction with care. Rick *et al.* (Rick et al., 2012) similarly identified a significant association between PACIC scores with patient satisfaction with primary care. Patient satisfaction contributed significantly to both of the models of overall PACIC score in the regression analysis of the current study. Chiropractic patients reported a high level of satisfaction with chiropractic care, with nearly 90% indicating being 'very satisfied'. This was consistent with previous surveys of chiropractic patients, including those with chronic spinal conditions (Coulter and Shekelle, 2005; Herman et al., 2018). During the patient focus group interviews and semi-structured interviews with chiropractors, satisfaction was frequently discussed and appeared to be a driving impetus for patients to either continue seeing their chiropractor or otherwise go elsewhere. However, high satisfaction levels are not necessarily related to the possible provision of patient-centred care alone, as other factors such as positive treatment outcomes or other contextual factors could also contribute to patient satisfaction.

In the current study overall PACIC score had a very weak positive correlation with the number of healthcare providers seen by patients in the past year, although the correlation was statistically significant (r =0.082, p=0.015). This was similar to Houle *et al.* (Houle et al., 2012) who found that medical patients receiving interdisciplinary care was related to overall PACIC score (r=0.13, p<0.05). The study by Houle *et al.* (Houle et al., 2012). was also conducted in Canada, but in medical teaching clinics in Quebec and with patients with non-musculoskeletal conditions (diabetes, hypertension, or chronic obstructive pulmonary disease). The patients in the current study typically saw several other healthcare professionals (besides their chiropractor) in the past year. This differed from Herman *et al*. (Herman et al., 2018), who reported that approximately one-third of the chiropractic patients with chronic spinal pain in their study were currently seeing another healthcare provider and just under half of the patients in their sample saw another provider in the past 6 months, although just over three-quarters of their patients saw another provider prior to seeing their chiropractor. However, the number of healthcare providers seen in the past year in the present study did not contribute significantly to overall PACIC score as evidenced by the results from either of the Models in the regression analysis. Patients seeing more practitioners does not appear to substantially impact their perceptions of receiving patient-centred care from their chiropractor, despite the importance that chiropractors place on multidisciplinary care for patients with chronic musculoskeletal conditions during interviews.

In the current study overall PACIC score demonstrated a very weak positive correlation with the number of visits patients reported with their chiropractor in the past year, although the correlation was statistically significant (r= 0.116, p=0.001). Along these lines, Petersen *et al.* (Petersen et al., 2014) previously identified a significant association between the number of contacts that patients had with their general practitioner and overall PACIC scores, although Rick *et al.* (Rick et al., 2012) did not find that greater patient contact with their general practitioner impacted on their PACIC scores. The number of chiropractic visits in the past year contributed significantly to both of the models of overall PACIC score in this study's regression analysis. This mean number of annual chiropractic visits in the current study was somewhat similar to the amount reported by American chiropractic patients with chronic neck or back pain reported, albeit in half a year (mean 12.5, SD 15.6) (Herman et al., 2018), but higher than reported for Canadian chiropractic patients by Waalen and Mior (mean 8.6, SD 3.4) (Waalen and Mior, 2005). Waalen and Mior included patients with acute, recurrent, and chronic conditions, and that difference between populations could account for lower annual patient visits to the chiropractor. Increased visit frequency could lead to higher patient perceptions of patient-centred care due to having more time and opportunity to develop a stronger practitioner-patient relationship, be involved in the patient's care, and use patient-centred communication techniques or interventions.

The regression models constructed for overall PACIC score in the current study were weak as they accounted for a small amount of the variance in overall PACIC scores, with only 6.7% or 7.5% (in Models 1 and 2 respectively) of the variance being explained. Having a mental health condition, the number of chiropractic visits in the past year, and patient satisfaction with chiropractic care were significant predictors of overall PACIC score, $p<0.05$ in both Models 1 and 2. Patient age was also a significant negative predictor of overall PACIC score in Model 1, while dichotomized number of years attending their chiropractor's clinic was also a significant negative predictor of overall PACIC score in Model 2. Satisfaction with chiropractic care was the independent variable that contributed most strongly to both of the models according to the standardized β coefficient, which was 0.154 in Model 1 and 0.188 in Model 2. In Model 1, among independent variables that were significant predictors of overall PACIC score, satisfaction was followed closely by number of chiropractic visits in the past year and patient age, while having a mental health condition provided the least contribution. In Model 2 the contribution from dichotomized satisfaction was followed by the number of chiropractic visits in the past year, dichotomized number of years attending the chiropractic clinic, and having a mental health condition. When evaluating the variables that contributed significantly to the models of overall PACIC score there were patient factors (age and having a mental health condition), as well as variables related to interactions between patients and chiropractors (number of annual visits, number of years attending the chiropractic clinic), and a patient-reported outcome (satisfaction). As such, overall PACIC scores given to chiropractors by patients with chronic MSK conditions are affected by multiple dimensions, some modifiable (number of annual visits, years attending the chiropractic clinic), some that are not (age, having a mental health condition), and another (satisfaction) that is the result of their experiences with their chiropractor. This knowledge could help chiropractors seeking to become more patient-centred in their practices, particularly when it comes to patients with chronic MSK conditions, as they could recommend more frequent visits, consider the implications of longer-term chiropractor-patient relationships, and enact measures to enhance patient satisfaction. However, given how little of the variance in overall PACIC scores was explained by these models, this information should be viewed cautiously. It is possible that the addition of practitioner-related variables not ascertained in this study could have led to stronger models.

6.1.3 PACIC SUBSCALE SCORES

The current study demonstrated variation among the mean scores of the different PACIC subscales. There were three subscales (Problem Solving / Contextual followed by Patient Activation and then Delivery System / Decision Support) where the mean score was significantly higher than the two remaining subscales (Goal Setting / Tailoring, Follow-up / Coordination) (see Tables 5.4 and 6.3). The findings in the current study were consistent with the pilot study in terms of the highest ranked subscales (Problem Solving / Contextual followed by Patient Activation and Delivery System Design / Decision Support) and the lowest ranked subscales (Follow-up / Coordination being the lowest along with Goal-Setting /

Tailoring)(Stuber et al., 2018). The overall PACIC and subscale scores of the current study and the pilot study were not significantly different from each other.

The findings from the current study followed a similar pattern to that observed among chiropractic patients with chronic conditions by Foley, Steel, and Adams (Table 6.3) (Foley, Steel and Adams, 2020). The same three subscales of Patient Activation, Delivery System / Decision Support, and Problem Solving / Contextual had the three highest mean scores in both their study and the current study. There were slight differences between the studies, in Foley and colleague's study, the Patient Activation subscale had the highest mean score, whereas Problem Solving / Contextual had the highest mean score in the present study. Meanwhile, the same two subscales of Goal Setting / Tailoring and Follow-Up / Coordination had the lowest mean scores in both studies, with the Follow-Up / Coordination subscale having the lowest mean subscale scores in both studies. The mean scores in each subscale of the present study were slightly higher than in Foley, Steel, and Adam's, with the exception of the Goal Setting / Tailoring subscale, which was slightly higher in their study, but not significantly. The overall PACIC and subscale scores of the current study and Foley *et al.* (Foley, Steel and Adams, 2020) were not significantly different, as the 95% confidence intervals overlapped. However, the small sample sizes in each of Foley, Steel, and Adams' groups may limit the generalizability of their results. In addition, Foley *et al.* included patients with any chronic condition, similar to the Stuber *et al.* pilot study (Stuber et al., 2018), they did not limit participants to only those with chronic musculoskeletal condition as in the current study. Foley and colleagues (Foley, Steel and Adams, 2020) found the mean scores given by chiropractic patients regarding their chiropractic care were higher than the mean scores given by all the included patients for the care from their medical doctors on all five PACIC subscales. However, chiropractic care had the lowest mean scores among the complementary medicine professions on three of the five subscales (Delivery System / Decision Support, Goal-Setting / Tailoring, and Follow-Up / Coordination) and the second lowest mean scores among complementary medicine professions on both the Patient Activation and Problem Solving / Contextual subscales. Naturopathic care had the highest mean scores among all of the professions for all five PACIC subscales. Taken together, chiropractic care appears to be similar to other health professions in terms of the different PACIC subscales.

Table 6.3. Comparison of Overall PACIC and PACIC subscale mean scores and 95% Confidence Intervals between present study and other studies that used the PACIC in chronic MSK populations.

Variable	Present study mean (95% CI) n=885	Stuber pilot study mean (95% CI) n=79	Foley, 2020 mean chiropractic score (95% CI) n=25	Rosemann, 2007 mean (95% CI) n=236
Overall PACIC	3.21 (3.15-3.27)	3.29 (3.21-3.46)	3.06 (2.78-3.34)	2.44 (2.3-2.58)
PACIC 1-3 – Patient Activation	3.74 (3.68-3.81)	3.92 (3.71-4.12)	3.65 (3.25-4.05)	2.79 (2.65-2.93)
PACIC 4-6 - Delivery System Design / Decision Support	3.66 (3.61-3.72)	3.78 (3.60-3.96)	3.6 (3.29-3.91)	2.56 (2.41-2.71)
PACIC 7-11 – Goal-Setting / Tailoring	2.75 (2.68-2.82)	2.78 (2.57-2.99)	2.79 (2.48-3.1)	2.31 (2.17-2.45)
PACIC 12-15 – Problem Solving / Contextual	3.94 (3.87-4.00)	4.01 (3.83-4.20)	3.57 (3.21-3.93)	2.48 (2.33-2.63)
PACIC 16-20 – Follow-Up / Coordination	2.50 (2.42-2.57)	2.58 (2.35-2.82)	2.34 (1.97-2.71)	2.01 (1.84-2.18)

Rosemann *et al*. (Rosemann et al., 2007) is the only other study that has used the PACIC in a chronic MSK population and presented PACIC subscale scores. Similar to the current study, the same three subscales had the highest mean scores (Patient Activation, Delivery System / Decision Support, and Problem Solving / Contextual), although similar to Foley and colleagues (Foley, Steel and Adams, 2020), the Patient Activation subscale had the highest mean score among them. Once again, the Goal-Setting / Tailoring and Follow-Up / Coordination subscales had the two lowest mean scores, with the Follow-Up / Coordination subscale having the lowest mean score. The scores in the present study were significantly higher than Rosemann's study overall and on each subscale, as their mean subscale scores and 95% confidence intervals were each lower than the lower bounds of the 95% confidence interval for the corresponding overall and subscale scores in the present study.

The PACIC subscale scores from the present study should be considered cautiously as there is considerable disagreement within the literature, based on several studies that conducted factor analyses, as to whether the PACIC is most suitably deployed as a single-, two-dimensional, or five-dimensional instrument (Glasgow et al., 2005a, 2005b; Wensing et al., 2008; Aragones et al., 2008; Noel, Jones and Parchman, 2016; Vrijhoef et al., 2009; Rosemann et al., 2007; Maindal, Sokolowski and Vedsted, 2012; Krucien, Vaillant and Pelletier-Fleury, 2014; Iglesias, Burnand and Peytremann-Bridevaux, 2014; Rick et al., 2012; Gugiu, Coryn and Applegate, 2010; Spicer, Budge and Carryer, 2012; Taggart et al., 2010). Despite this ongoing debate, I deemed it important to report the subscale scores due to the similarities in the above-noted trends observed for the PACIC subscales as seen in Table 6.2, with the same subscales having the highest three and lowest two mean scores, respectively among the present study, the pilot study (Stuber et al., 2018), and other studies of similar patient populations (Foley, Steel and Adams, 2020; Rosemann et al., 2007), particularly as there were some statistically significant differences noted. Moreover, it was felt that the higher and lower subscale scores were reflected in the qualitative interview data. This was demonstrated as chiropractic patients in the focus groups, and chiropractors in the individual interviews agreed that chiropractors frequently take patient factors into consideration when designing treatment plans as in the Problem Solving / Contextual subscale. Participants further indicated that chiropractors often involve patients in the decision making process as in the Patient Activation subscale and take the time to provide patient education on conditions and treatment options and engage in collaborative care, particularly when it can be provided within their clinical space as in the Delivery System Design / Decision Support subscale. However, patients in the focus groups mentioned how goals were not formally set but existed more in the form of shared assumptions between the patient and chiropractor as in the Goal-Setting/Tailoring subscale, and follow-up was often lacking aside from booking further appointments as per the Follow-up/Coordination subscale. This represents an opportunity for chiropractors and chiropractic educators to improve patient-centredness in practice by including more emphasis on working with patients on goal-setting and tailoring treatment plans to patient needs, as well as finding additional methods to follow-up with patients beyond additional appointments alone. This may include using regular follow-up or outcome assessment through the use of technology.

6.1.4 CHIROPRACTOR SAMPLE CHARACTERISTICS

The chiropractor sample (n=31) was described according to their demographics (Section 5.5), and practice patterns (Section 5.6). This sample was representative of Canadian chiropractors as it shows similarities to other recent studies of Canadian chiropractors (Association, 2016; Howarth et al., 2020; Mior et al., 2019). Chiropractors in this sample were approximately one-third female and two-thirds male. This was nearly identical to a recent cross-sectional study by Mior *et al*. (n=42) (Mior et al., 2019) that included randomly sampled Ontario chiropractors, it was also in line with a 2016 national survey of Canadian chiropractors conducted by the Canadian Chiropractic Association (n=1793, 37% female, 63% male) (Association, 2016), and a 2020 survey completed by Ontario chiropractors (n=432, 40%

female, 60% male) (Howarth et al., 2020). However, just under 30% of the chiropractors who completed the semi-structured interviews in the current study were female, although the sample size was small and recruited for the purpose of interview participation.

The chiropractors in the current study's sample had been in practice for a mean of 15 years, which again was similar to Mior *et al.* (Mior et al., 2019). Approximately 80% of the chiropractors in the sample received their chiropractic training from a Canadian institution, which was similar to the proportions reported by both Howarth *et al.* and Mior *et al.* (Howarth et al., 2020; Mior et al., 2019). However, these rates were higher than the larger national survey where a smaller majority (65%) indicated being trained at a Canadian chiropractic institution, while the remaining respondents (35%) had trained in the United States (Association, 2016). The chiropractors who participated in the semi-structured interviews again showed some differences when compared to the current survey sample as they tended to be more experienced, with a mean of over 22 years in practice.

Chiropractor Practice Patterns

Over 80% of the chiropractors surveyed indicated being in multidisciplinary practice, while the rest practised in multi-chiropractor clinics, with none indicating being in solo practice or practicing in other settings. This differs from 2016 national survey data that found that half (50%) of the responding Canadian chiropractors practised in multidisciplinary settings, while one-third (33%) were in solo practice, and the remainder (17%) worked in multi-chiropractor clinics (Association, 2016).

The chiropractors who completed the survey reported seeing a mean of nearly 90 patients per week (mean 88.45, 95% CI 69 - 108, SD 55.44), slightly lower but not significantly different than recent surveys of Canadian chiropractors with reported means of 94 (Association, 2016) and 100 patients per week (SD 78.1) (Mior et al., 2019). In the current study there was a considerable range in the number of patients seen per week by the chiropractors, between 15 and 250, although this was similar to Mior *et al.* (Mior et al., 2019), where the reported range was 5 to 250. The chiropractors who completed the current survey also indicated spending a mean of nearly 32 hours in patient care per week (mean 31.85, SD 10.09), close to the 29 hours of weekly patient contact reported by Howarth and colleagues (mean 28.8, SD 10.0) (Howarth et al., 2020).

Taken together, the chiropractor sample in the current study showed similarities to previous recent surveys of Canadian chiropractors with respect to gender distribution, years in practice, chiropractic educational institution attended, patients seen per week, and weekly patient care hours. The only notable difference was in the professional practice patterns. As such the chiropractor sample was deemed representative of Canadian chiropractors.

6.1.5 OVERALL PPOS SCORES

The mean overall PPOS score among the 31 chiropractors who completed the questionnaire was 4.35 (95% CI 4.18 – 4.52). According to the original PPOS classification used by Krupat *et al.* (Krupat et al., 2000), the mean overall score in the current study would be considered ‘doctor-centred’ as it was below the cutoff point of 4.57, whereas scores of 5.00 or more would be considered ‘patient-centred’ with scores of between 4.57 and 5.00 being classed as ‘medium’.

The only previous study to employ the PPOS in a chiropractic setting was a cross-sectional survey completed by chiropractic students and interns (n=1858) from 7 chiropractic educational institutions in 6 countries on 3 continents (Hammerich et al., 2019). The mean overall PPOS score of 4.18 (95% CI 4.16 – 4.20) in that study was lower than observed in the current study, although not significantly. However, it is uncertain whether an individual's attitude towards patient-centredness as a student is necessarily predictive of their attitude as a practicing clinician. The mean overall PPOS score of the chiropractors in the current study compared favourably with several previous studies of medical doctor orientation to care measured through the PPOS (Wang et al., 2017; Wang, Liu and Zhang, 2020; Abiola, Udofia and Abdullahi, 2014), although not with all such studies (Krupat et al., 2000; Chan and Azman, 2012).

The regression model that was constructed for PPOS Overall score explained 34.4% of the variance. In the model, only years in practice, a demographic variable, was a significant predictor of PPOS Overall, $p<0.05$, while the other independent variables included in the model (dichotomized patients seen per week and patients seen per hour) related to chiropractor practice patterns and did not contribute significantly. Years in practice (β = 0.017 per year in practice) contributed most strongly to the model according to the standardized β coefficient followed by dichotomized patients seen per week and patients seen per hour. Interestingly, according to the regression model, seeing more than 100 patients per week should lead to higher PPOS Overall scores (β= 0.346 for 100 patients or more weekly), and yet seeing more patients per hour should lead to lower scores (β = -0.042 per patient seen per hour). The reasons for this difference are uncertain. It is possible that chiropractors who see more patients per hour would understandably have less time to discuss care with patients due to shorter appointment times, but this may be on purpose due to less patient-centred attitudes. It is also possible that chiropractors who see higher numbers of patients per week do so by spending more hours per week conducting patient care and still make time for discussion with patients.

In the current study there was a moderate and significant positive correlation between overall PPOS score and number of years in practice (r= 0.517, p=0.003). This is in line with findings from interviews with specialist trainee doctors in the United Kingdom who indicated that the process of becoming more patient-centred requires time to learn and practise (Patel et al., 2018). However, Krupat *et al.* (Krupat et al., 2000) found that years of experience was significantly associated with overall PPOS scores among medical doctors, as those with 11 to 20 years of experience were less patient-centred than those with 10 years or less or 21 years or more in practice. It is possible that the difference could be due to professional differences between chiropractors and medical doctors, although the reasons for this are uncertain.

Previous research and reviews have indicated that female doctors tend to be more patient-centred than males (Howick et al., 2017; Law and Britten, 1995; Roter and Hall, 2004). In the current study overall PPOS scores were not significantly different between female (mean 4.50, 95% CI 4.10-4.90) and male (mean 4.28, 95% CI 4.10-4.46) chiropractors, although female chiropractors scores were higher on average. Previous researchers have found that female medical doctors had significantly higher overall PPOS scores (Krupat et al., 2000; Ishikawa et al., 2018). Hammerich *et al.* (Hammerich et al., 2019) similarly found that female chiropractic students had significantly higher overall PPOS scores than male chiropractic students. Non-significant differences between male and female medical doctors in overall PPOS scores, that slightly favour the female doctors, have been noted in previous studies (Wang et al., 2017; Wang, Liu and Zhang, 2020; Abiola, Udofia and Abdullahi, 2014), although cultural influences may have impacted those studies as they were conducted in China and Nigeria. Thus, there is disagreement in the literature on whether practitioner gender significantly impacts overall PPOS score, and this study suggests that at least among Canadian chiropractors that gender does not have a substantial impact on overall PPOS score.

6.1.6 PPOS SUBSCALE SCORES

The scores from the chiropractors in the current study on both the PPOS Sharing and Caring subscales again fell within the 'doctor-centred' category according to the rankings from Krupat *et al*. (Krupat et al., 2000). The mean score from the chiropractors in the current study's sample on the Sharing subscale of the PPOS was 4.20 (95% CI 3.95 - 4.45), whereas the mean score from the Caring subscale of the PPOS was 4.50 (95% CI 4.35 – 4.66),

The mean PPOS Sharing subscale score from the chiropractors in the current study was significantly higher than that of Hammerich *et al.*'s survey (Hammerich et al., 2019) of chiropractic students where the mean Sharing subscale score was 3.89 (95% CI 3.86 – 3.92). It is possible that greater clinical experience leads to changes in practitioner attitudes toward sharing in the practitioner-patient relationship. The mean PPOS Sharing subscale score from the current study was within the range of mean scores seen in previous studies of medical doctors (Table 6.4). The mean PPOS Sharing score of the chiropractors in the present study was significantly higher than 1 study of medical doctors from China (Wang, Liu and Zhang, 2020), significantly lower than another study of American doctors (Krupat et al., 2000), and not significantly different from the remaining studies of medical doctors (Wang et al., 2017; Carlsen and Aakvik, 2006; Abiola, Udofia and Abdullahi, 2014).

The mean PPOS Caring subscale score from the chiropractors in the current study of the PPOS was not significantly different from the chiropractic students surveyed by Hammerich *et al.* (Hammerich et al., 2019) where the mean PPOS Caring subscale score was 4.48 (95% CI 4.45 – 4.50). The mean PPOS Caring subscale score in the current study was significantly lower than a previous study of American medical doctors (Krupat et al., 2000) and lower, albeit not significantly, than two studies of Chinese medical doctors (Wang, Liu and Zhang, 2020; Wang et al., 2017), although it was significantly higher than another study of Nigerian medical doctors (Abiola, Udofia and Abdullahi, 2014) (Table 6.4).

Table 6.4. PPOS Subscale scores in studies of medical doctors in comparison with the chiropractors from the current study.

First author, year of publication, country, sample size (n)	PPOS Sharing score mean (95% CI)	PPOS Caring score mean (95% CI)
Current study, Canada, n=31 (chiropractors)	4.20 (3.95-4.45)	4.50 (4.35-4.66)
Wang, 2020, China, n= 617	3.09 (3.03-3.15)	4.59 (4.54-4.64)
Wang, 2017, China, n= 116	4.08 (3.13-5.03)	4.71 (3.89-5.53)
Krupat, 2000, USA, n= 177	4.62 (4.51-4.71)	4.98 (4.91-5.05)
Abiola, 2014, Nigeria, n= 214	4.25 (4.16-4.34)	3.71 (3.63-3.79)
Carlsen, 2006, Norway, n= 41	4.31 (4.17-4.45)	N/A

Similar to the PPOS overall scores in the current study, seeing more patients per week (100 or more) was significantly associated with higher PPOS Sharing scores ($p<0.001$). Female chiropractors had higher PPOS Sharing scores than male chiropractors, but the difference was not significant, similar to several studies of medical doctors (Abiola, Udofia and Abdullahi, 2014; Carlsen and Aakvik, 2006; Wang, Liu and Zhang, 2020; Wang et al., 2017). Several significant positive moderate correlations were noted between PPOS Sharing scores with years in practice (r= 0.457, p=0.01), patients seen per week (r= 0.489, p=0.005), and patients seen per hour (r= 0.528, p=0.002). As with PPOS overall scores, Krupat *et al.* (Krupat et al., 2000) found that years of clinical experience was significantly associated with PPOS Sharing scores among medical doctors as those with 10 years or less or 21 years or more in practice had higher PPOS Sharing scores than those with 11 to 20 years of clinical experience.

The regression model constructed for the PPOS Sharing score explained a moderate amount (46.5%) of the variance. In the model only the number of patients seen per week (dichotomized to 100 or more, 99 or fewer) added significantly to the prediction for PPOS Sharing, $p<0.05$. Other independent variables added to this model (years in practice and patients seen per hour) did not contribute significantly to the predication for PPOS Sharing. As with the PPOS overall scores, there was one demographic characteristic (years in practice) that was significantly correlated with PPOS Sharing scores and part of the final regression model for PPOS Sharing score. The other variables that were part of the final regression models for PPOS overall score related to chiropractor practice patterns (patients seen per hour and patients seen per week). Patients seen per week (dichotomized) contributed most strongly to the model according to the standardized β coefficient, followed by years in practice and patients seen per hour. Thus, PPOS Sharing scores appear to be influenced by seeing more patients over time, speaking to the potential importance of clinical experience in developing the necessary attitudes towards sharing with patients in the decision-making process.

The regression model for PPOS Sharing indicated that seeing more patients per hour and more patients per week leads to higher PPOS Sharing scores, which contradicts expectations that seeing more patients would lead to lower levels of patient-centredness. There are several possible explanations for this finding, such as chiropractors who see more patients may have attitudes that reflect more sharing of useful information and patient involvement in the decision-making process, but that may or may not actually take place in visits with patients. Perhaps the activities of information sharing and decision-making occur earlier in the patient's process of receiving care (such as during the initial consultation) before subsequent visits become more routine and shorter in duration over time. It is also possible that busier chiropractors have incorporated more refined systems for patient education and information sharing that do not require lengthy visits, such as online resources or handouts. In the interviews chiropractors described having positive attitudes and frequently guiding patients toward online sources that they felt were high quality and trustworthy.

PPOS Caring scores in the present study again showed a moderate correlation with years in practice only (r=0.374, p=0.038). This was similar to a previous study of Nigerian medical doctors where PPOS Caring scores were significantly associated with more years in practice (Abiola, Udofia and Abdullahi, 2014). In the present study, female chiropractors had higher PPOS Caring scores than male chiropractors, although the difference was not significant (p=0.054). Krupat *et al.* (Krupat et al., 2000) found that American female medical doctors in their sample had significantly higher PPOS Caring scores than male doctors (Krupat et al., 2000). Other studies have reported higher PPOS Caring scores for female doctors where differences were not significant (Wang, Liu and Zhang, 2020; Abiola, Udofia and Abdullahi, 2014). Conversely, a study in China found male doctors had higher PPOS Caring scores although the difference was not significant (Wang et al., 2017). Higher PPOS Caring scores could be partially explained by a systematic review and meta-analysis that found female health practitioners to be more empathetic than male practitioners (Howick et al., 2017).

The regression model that was constructed for the PPOS Caring score explained 26.5% of the variance. In the model both gender and number of years in practice, both demographic variables, added significantly to the prediction for PPOS Caring, $p<0.05$. In the PPOS Caring model, male gender of the chiropractor leads to lower PPOS Caring scores, while being in practice for a greater number of years leads to higher PPOS Caring scores. Years in practice contributed most strongly to the model according to the standardized β coefficient followed by gender. This speaks to the potential importance of clinical experience in the development of more positive attitudes towards doctor-patient relationships and embracing a holistic approach among chiropractors. Such attitudes likely take time to develop and younger practitioners may not have the requisite maturity, nor enough time or exposure to patients to develop these attitudes.

Some of the variables included in the models for PPOS Overall, Sharing, and Caring cannot be modified such as demographic characteristics (gender, years in practice), while the rest related to practice patterns in the form of patients seen per hour and per week, and those are potentially modifiable. However, it is uncertain whether altering patient loads (hourly and/or weekly) would necessarily affect PPOS score performance as PPOS score is reflective of attitudes, which may not change even if practice patterns changed.

6.2 CHIROPRACTIC AND PATIENT-CENTREDNESS

The Mead and Bower model of patient-centredness was selected as the framework for understanding patient-centredness of chiropractic care in this study. To do so, I will compare the themes and subthemes from the qualitative component of the current study, along with relevant PACIC and PPOS scores and subscale scores with the 5 conceptual dimensions of the Mead and Bower model, as depicted in Figure 6.1.

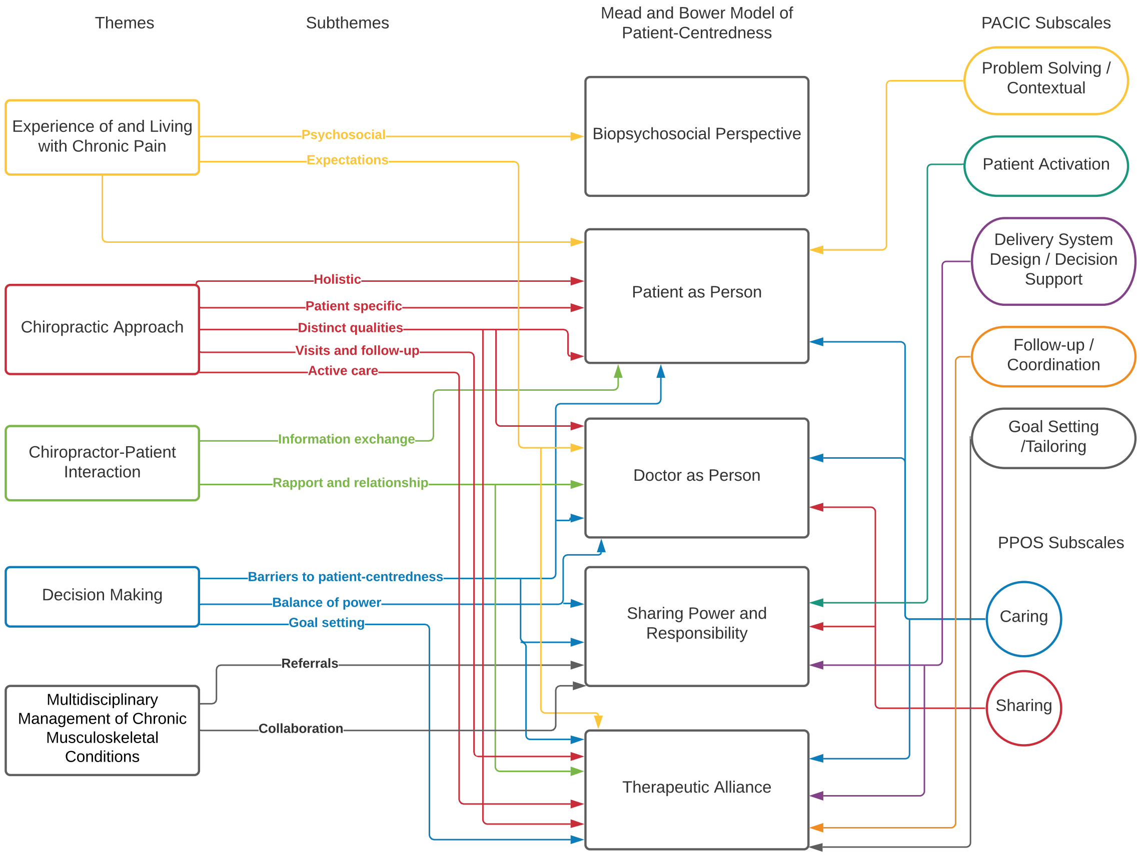

Figure 6.1. Relationship between the conceptual dimensions of Mead and Bower’s model (Mead and Bower, 2000) of patient-centredness with the themes and subthemes from the thematic analysis, and the PACIC and PPOS subscales.

6.2.1 BIOPSYCHOSOCIAL PERSPECTIVE

In order to practise patient-centred care, it was Mead and Bower’s contention that clinicians need to understand patients from a biopsychosocial perspective, meaning that they consider the biological or physical aspects of a condition, along with its’ psychological and social implications (Mead and Bower, 2000). This concept is similarly found in Stewart’s model where she described how it was necessary to ‘understand the whole person’ (Hudon et al., 2011; Stewart, 2005). The biopsychosocial model requires consideration of both the disease and the illness, where the illness encompasses the more subjective components of having a disease, including the ways that the physical, psychological and social factors interact

(Gatchel et al., 2007). Chronic musculoskeletal conditions, such as chronic low back pain, have complex biopsychosocial interactions, which can lead to the propagation and amplification of chronic pain (Edwards et al., 2016; Field, Newell and McCarthy, 2010; Gliedt et al., 2017). Field, Newell, and McCarthy previously demonstrated that increased levels of fear-avoidance beliefs, catastrophizing, and low self-efficacy can negatively affect prognosis among chiropractic patients with back pain (Field, Newell and McCarthy, 2010).

The ‘Biopsychosocial perspective’ dimension identified by Mead and Bower is similar to the “Psychosocial” subtheme from the “Experience of and living with chronic pain” theme. The “Psychosocial” subtheme described how psychological and social factors impact chronic pain, and how that pain can then cause patients to feel exhausted, overwhelmed, and lead to social isolation. Chiropractors have historically demonstrated an appreciation of, and devoted attention to, the social and emotional aspects of patients’ lives (Gliedt et al., 2017). It was clear from findings in Chapter 5 that chiropractors demonstrated an understanding of the biopsychosocial model, as they described the interaction between chronic pain and psychosocial factors, each affecting one another and contributing to the potential complexity of managing chronic pain patients. However, studies of American and Australian chiropractors have found that their attitudes or beliefs towards pain do not demonstrate preferences for either biopsychosocial or biomedical approaches (Innes et al., 2015; Lady et al., 2018). Those studies both employed the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) instrument, although both studies had low response rates, with highly targeted groups of respondents. This would call into question the generalizability of their study findings.

This study demonstrated the biopsychosocial approach that some chiropractors employ with patients with chronic pain, trying to give them support and more control over their condition. This support frequently comes in the form of regular maintenance visits, providing treatment to help with pain levels on a consistent basis while also providing advice and resources on how to manage and live with their pain. However, the lack of preference between biopsychosocial and biomedical approaches described in previous studies of chiropractors (Innes et al., 2015; Lady et al., 2018) may represent a source of tension for chiropractors in practice. Like other health professions, much of the education that a chiropractor receives as a student is biomedical in nature (Gliedt et al., 2017; Jaini and Lee, 2015). However as discussed, there is increasing support for a biopsychosocial approach. A recent publication from the World Federation of Chiropractic, which described a chiropractic rehabilitation competency framework, indicated that it was necessary to diagnose and treat patients within a biopsychosocial model when managing disability and other health conditions (Côté et al., 2019b).

6.2.2 PATIENT AS PERSON

Clinicians should try to understand each patient's experience of having their condition at an individual level (Mead and Bower, 2000) No two patients have identical personal histories, and the unique background or biography of a patient will influence the manifestation of their condition. This concept is observed in numerous other models of patient-centredness (Morgan and Yoder, 2012), such as in Stewart's model where she described how it was necessary to 'explore both the disease and illness experience'(Hudon et al., 2011; Stewart, 2005).

The Patient-as-Person dimension was represented by several themes and subthemes in the current study. For example, the “Experience of and living with chronic pain” theme described ways that chronic pain affects patients with chronic MSK conditions, not only physically, but also cognitively and in their relationships and careers. Chiropractors and patients both acknowledged and described how the experience of having chronic pain can be all-encompassing and demanding on numerous aspects of a patient’s life. This is similar to previous research findings where chronic MSK pain patients felt that their pain affects their self-identity (Harding et al., 2005).

The “Patient as person” dimension from Mead and Bower’s model was further reflected by the “Holistic”, “Distinct Qualities”, and “Patient Specific” subthemes of the “Chiropractic Approach” theme. The “Holistic” subtheme demonstrated that chiropractors attempt to gain a more complete understanding of their patients and consider more than a patient’s physical conditions alone. In order to do so, the “Information Exchange” subtheme of the “Chiropractor-Patient Interaction” theme demonstrated that chiropractors try to learn a great deal about their patients in a wide range of areas of their lives to help them understand the patient. Holistic care has been identified as a key attribute of patient-centred care (Leplege et al., 2009; Morgan and Yoder, 2012). Chiropractic has an historic tradition and identity of a holistic profession (Coulter, 1992; Rosner, 2016; Schneider, Murphy and Hartvigsen, 2016). Researchers have recently advocated for chiropractors to strengthen their positioning as spinal care experts who consider the whole person (Schneider, Murphy and Hartvigsen, 2016) Patients in the current study discussed how chiropractors have a holistic approach and may need to know more about them and their lives as that may influence the care that they offer. This was similar to previous research on physiotherapy patients who indicated that they were willing to provide additional information about their lives to therapists if it influenced their treatment (Bastemeijer et al., 2021). This was re-enforced in the “Distinct Qualities” subtheme from the “Chiropractic Approach” theme as patients felt that the holistic approach of chiropractors differentiated them from other health professionals, medical doctors in particular.

The “Patient Specific” subtheme from the “Chiropractic Approach” theme demonstrated that the chiropractors in the current study individualize care and manage patients according to their specific presentations. This was in line with results from the Problem Solving / Contextual subscale of the PACIC where patients indicated the extent that they perceived that their chiropractor considered their specific circumstances when creating treatment plans. The Problem Solving / Contextual subscale had the highest mean scores among the PACIC subscales. Patients further corroborated this in the focus group interviews, indicating that their chiropractors had adapted their care plans according to their evolving or unique needs. Similarly, previous research among hospitalized (Nepal et al., 2020) and physiotherapy (Bastemeijer et al., 2021; Cooper, Smith and Hancock, 2008) patients found that they attach importance to their health care professionals understanding them as a unique individual and are pleased to have care that is individualized for them. Individualized care has been identified as one of the defining attributes of patient-centred care (Castro et al., 2016; Leplege et al., 2009; Morgan and Yoder, 2012). Such personalized care planning can lead to improvements in physical and psychological health outcomes (Coulter et al., 2015), and clinical practice guidelines and best practice recommendations advocate for chiropractors to provide individualized care (Bussières et al., 2016b; Globe et al., 2016; Hawk et al., 2017; Whalen et al., 2019)

However, in the “Barriers to patient-centredness” subtheme of the “Decision Making” theme both patients and chiropractors expressed concerns that chiropractors having busier practices or spending less time in appointments could negatively impact how they might be able to provide care that is understanding of, attentive, or tailored to each patient’s specific situation. Patients attending chiropractic clinics where at least one of the chiropractors saw 100 or more patients per week provided lower Overall PACIC scores than those who did not, although the difference was not significant. PPOS Caring scores, which represent the degree to which practitioners consider psychosocial factors such as patient feelings and cognitions, life circumstances, and expectations important in managing the patient, were typically lower for chiropractors who indicated seeing 100 or more patients per week, although the difference was not significant. The mean PPOS Caring scores from the chiropractors were lower than those observed in several studies of medical practitioners and fell into the ‘doctor-centred’ classification originally described by Krupat *et al*. (Krupat et al., 2000). Previous research has shown that chronic pain patients express frustration when practitioners do not have the time or ability to individualize their treatment plan (Hadi et al., 2017). Numerous researchers have identified time constraints and clinician workloads as barriers to providing patient-centred care (Filler, Jameel and Gagliardi, 2020; Lloyd, Elkins and Innes, 2018; Moore et al., 2016; Vennedey et al., 2020).

The current study has detailed how chiropractors gain a comprehensive understanding of their patients during consultations and regular visits by establishing a comfortable pattern of communication and inquiry and embracing a holistic view of health. Patients and chiropractors alike indicate that chiropractors place an emphasis on trying to problem solve and determine whether the patient’s historical and current occupational, domestic, and recreational activities could be relevant to their conditions. However, when surveyed, the attitudes of chiropractors towards providing care that takes patients and their individual circumstances into consideration were not more patient-oriented than those of other healthcare professionals.

This study expanded upon the concept of the patient-as-person as it demonstrated how chiropractors use the information that they get from patients to help inform and tailor management decisions to that specific patient. When developing treatment plans the detailed information that chiropractors obtain from patients is typically used alongside other findings to individualize the proposed treatment plan. Treatment planning and the time taken in visits to discuss the plans of management and come to an agreement with patients can be time-consuming. However, the study was unable to demonstrate that decreased hourly or weekly patient loads seen by chiropractors would reflect more patient-centred attitudes.

6.2.3 DOCTOR AS PERSON

In this dimension Mead and Bower described how the qualities and subjective actions of clinicians can influence the clinician-patient relationship and how healthcare is practised (Castro et al., 2016; Fix et al., 2017; Mead and Bower, 2000). The clinician-patient relationship is a dyad with clinicians and patients impacting each other. In the current study, the “Rapport and Relationship” subtheme of the “Chiropractor-Patient Interaction” theme discussed the role of the chiropractor in establishing and maintaining therapeutic relationships with their patients. This was further described in the “Distinct Qualities” subtheme of the “Chiropractic Approach” theme as patients contrasted the communication and relationship-building skills of their chiropractors versus those with other health professionals, particularly their medical doctors. The subjective input and attitudes of chiropractors were again influential in the “Expectations” subtheme of the “Experience of and Living with Chronic Pain” theme, as chiropractors have inherent attitudes and knowledge that they would bring to their encounters with chronic pain patients, with the chiropractors that we interviewed largely encouraging a realistic view of the patient’s condition and prognosis.

The mean PPOS Overall scores from the surveyed chiropractors, as well as the PPOS Caring and Sharing subscale scores indicated more doctor-centred attitudes according to the categories originally described by Krupat *et al*. (Krupat et al., 2000). With tendencies towards doctor-centred attitudes exhibited, it is possible that chiropractors may attempt to have more influence during consultations and throughout the chiropractor-patient relationship. This influence of chiropractors on clinical encounters was exhibited in the “Decision Making” theme, in the “Balance of Power” subtheme as chiropractors were frequently felt to initiate the clinical decision-making process with patients, not unlike previous research on physiotherapists (Cruz, Moore and Cross, 2020). The influence of chiropractors on the decisions that are made with patients may also relate to the “Barriers to Patient-Centredness” subtheme of the “Decision Making” theme as chiropractors felt that colleagues espousing specific chiropractic techniques or systems that were overly structured or prescriptive could provide undue influence on relationships with patients and patient management. Other researchers have identified practitioner preferences for anatomically or biomechanically focused clinical reasoning as a potential barrier to patient-centred approaches (Stilwell et al., 2018; Cruz, Moore and Cross, 2020).

The current study demonstrated that chiropractors often develop positive relationships with their patients and have a caring, holistic approach to care that is appreciated by patients, as is the manner that they listen to patients more so than other professionals. However, chiropractors exert a substantial influence in visits with patients with chronic musculoskeletal conditions in terms of leading conversations and treatment selection. Such paternalistic tendencies can be a hindrance to engaging and involving patients and providing patient-centred care.

6.2.4 SHARING POWER AND RESPONSIBILITY

This dimension of Mead and Bower's model advocated for more equal sharing of power between patients and clinicians in the clinician-patient relationship, moving away from paternalistic clinician behaviours (Mead and Bower, 2000). Other models of patient-centredness have similar elements that emphasize partnership and patient empowerment (Leplege et al., 2009; Morgan and Yoder, 2012; Stewart, 2005). Stewart's model, for example, indicates that clinicians and patients should attempt to find common ground and found that this element of patient-centredness contributed the most to positive patient outcomes (Stewart, 2005; Stewart et al., 2000). Physical therapy patients have indicated that they value partnership, autonomy, and empowerment (Bastemeijer et al., 2021).

Several themes and subthemes from the current study reflected this dimension of Mead and Bower's model. In particular, the "Decision Making" theme and its "Balance of Power" subtheme strongly identified with this dimension. The "Decision Making" theme related to how chiropractors and their patients decide on treatment plans, while the "Balance of Power" subtheme explored power sharing and differences between patients and chiropractors. The Patient Activation subscale of the PACIC had the second highest mean and tied for the highest median score among the different PACIC subscales and also reflected the "Sharing

Power and Responsibility" domain as it demonstrates the extent to which patients perceive that their practitioners obtain patient input and involve them in decision-making.

Chiropractors and patients both indicated that patients were involved in the clinical decision-making process. The significant negative correlation between overall PACIC scores and the number of years that a patient had been seeing their chiropractor may be explained from interview data where chiropractors were described as frequently initiating clinical decisions with patients and trying to involve them by giving treatment options and allowing the patient the opportunity to decide. It was felt that the majority of patient involvement in making decisions occurred early in the chiropractor-patient relationship and diminished over time once a routine of care was established. As discussed in interviews there is a risk that complacency could set in long-term patient-practitioner relationships. This complacency could relate to how motivated chiropractors are to continue to provide patient-centred care to patients throughout the course of the chiropractor-patient relationship. Motivation has been cited as a possible barrier to patient-centred care (Dunn, 2003) as for some practitioners it can require a concerted effort to provide patient-centred care (Moore et al., 2016). Taking the time to regularly re-evaluate and engage patients in discussions on their progress towards their goals and clinical status could be a possible solution to providing patient-centred care in long-term care relationships.

In the focus group interviews patients indicated that they wanted their chiropractor to involve them in decisions about their care and to be involved in their care. However, chiropractic patient involvement in clinical decision making was not universal. While some patients were satisfied with the amount of input that they had in their care, others described their relationships with their chiropractors being paternalistic and did not feel that their chiropractors empowered them or gave them sufficient input into decisions about their care. This was similar to Cooper, Smith, and Hancock (Cooper, Smith and Hancock, 2008), who interviewed physiotherapy patients with chronic low back pain and found that some felt that they did not have enough input into treatment decisions, while most patients were comfortable with the therapist using their best judgment to make clinical decisions on their behalf.

The mean PPOS Sharing subscale scores demonstrated the extent that the responding chiropractors believe patients want information and should be involved in decision making and fell in the 'doctor-centred' category first established by Krupat *et al*. (Krupat et al., 2000). This could be explained by the "Barriers to Patient-Centredness" subtheme from the "Decision Making" theme, as it became apparent that a lack of time or shorter office visit durations and/or the use of overly systematic techniques or procedures would likely limit patient input and power sharing and considered detrimental to offering patient-centred care. Some chiropractors indicated that they based treatment planning more on their clinical experience and/or research evidence and did not invite patient input as often. These chiropractors indicated that when following an evidence-based practice model that their clinical experience and research evidence were equally as important as patient preference, and as such they do not necessarily emphasize patient preferences or input in making clinical decisions.

The results of the current study demonstrate that some of the chiropractors engage patients in shared decision making about their care. Research has shown that both patients and clinicians want to engage in shared decision making (SDM) (Coulter, 2005; Zeuner et al., 2015). Shared decision making is frequently cited as part of providing patient centred care and a means to engage patients in their care (Kaba and Sooriakumaran, 2007; Morgan and Yoder, 2012; Santana et al., 2018; Yun and Choi, 2019; Vennedey et al., 2020). As Chapter 2 of this thesis demonstrated, high quality research on SDM for chronic musculoskeletal conditions is generally lacking, and the research evidence on shared decision making for chronic conditions in general is mixed. The greatest impacts of SDM are likely on cognitive and affective outcomes such as satisfaction and quality of life (Shay and Lafata, 2015; Coulter et al., 2015; Joosten et al., 2008). As Chapter 3 of this thesis demonstrated, shared decision making has not been extensively explored in the chiropractic profession. Vining *et al.* (Vining et al., 2019) recently developed a decision aid for multimodal chiropractic care for veterans with low back pain. Although they have not reported empirical results of testing the decision aid, such tools could prove useful for chiropractors practicing in the field in engaging patients to make decisions about their care (Bowen et al., 2019; Wieringa et al., 2019). Dagenais, Brady, and Haldeman (Dagenais, Brady and Haldeman, 2012) indicated that the informed consent process and documents could be useful in engaging shared decision making by chiropractors although the informed consent forms that they reviewed from several chiropractic educational institutions were typically found unsuitable for these purposes. In the Collaborative Care for Older Adults with back pain (COCOA) pilot study (Goertz et al., 2010, 2013, 2017b; Lyons et al., 2013; Salsbury et al., 2018c; Wells et al., 2020), the Shared Care group were co-managed by chiropractors and medical doctors following a collaborative model. The clinicians in this group worked together with the patient to create and implement a shared treatment plan. Patients in all three groups improved in terms of the primary outcome measures of average back pain intensity and disability levels, although there were no significant differences reported between groups in those outcome measures. Parsons *et al.* (Parsons et al., 2012) interviewed patients, chiropractors, osteopaths, and physiotherapists, and found that they supported the use of SDM, particularly for patients with long term conditions such as chronic musculoskeletal pain, although they felt training for both groups would be required to aid implementation. Other studies have described potential barriers to SDM implementation such as concerns about patient and clinician disagreement, lack of support from mentors, and time constraints (Zeuner et al., 2015).

Financial constraints can be another potential barrier to patients accessing chiropractic care and can impact treatment decisions made by both patients and chiropractors. In Canada, most chiropractic services are paid for either by the patient personally or through extended private health insurance benefits. In a cross-sectional study, Mior *et al*. (Mior et al., 2019) found that over two-thirds (68.36%) of the Ontario chiropractic patients paid for their chiropractic care themselves, while another 30% paid through extended private health insurance. Paying for chiropractic services out-of-pocket can be difficult for patients with limited financial means and could affect the amount of care that they can obtain or their decision to seek care. While not discussed extensively, there was recognition by some focus group participants that they were paying for chiropractic services and wanted value for what they paid. Chiropractor decision making could potentially be affected by such patient expectations or by being aware of a patient having limited financial means and altering their approach to the patient's care in response.

The Delivery System Design / Decision Support subscale had the third highest mean and median subscale scores among the PACIC subscales. This was explained by chiropractors providing information to patients to help them understand their health conditions and care that they receive. The "Multidisciplinary Management of Chronic Pain" theme and its "Collaboration" subtheme also help explain these higher scores due to chiropractors organizing care for patients and patient involvement in clinical decision making as the roles and involvement of patients, chiropractors, and other professionals in the multidisciplinary management of the patient's condition were explored. The communication patterns among these stakeholders can vary, with patient involvement at times, but in other cases with an absence of patient input. The "Referrals" subtheme also demonstrated how chiropractors involve patients and obtain their feedback and consent in the decision of whether to refer the patient to another professional. In the COCOA study (Goertz et al., 2010, 2013, 2017b; Lyons et al., 2013; Salsbury et al., 2018c; Wells et al., 2020), patients indicated that referrals to medical doctors were typically directed by chiropractors and they were not engaged in the decision making process, although telephone consultations between chiropractors and medical doctors in the Shared Care group allowed opportunity to discuss patient preferences. Referrals by chiropractors to other health professionals, medical doctors in particular, are common (Salsbury et al., 2018b; Smith et al., 2006). Smith *et al*. (Smith et al., 2006) found that over 40% of Iowa chiropractors responding to their survey indicated that they advised patients to contact their medical doctors themselves, while the other nearly 60% formally initiated the referral on behalf of the patient.

The current study demonstrated through both patient and chiropractor questionnaires and interviews that some chiropractors are adept at sharing power with patients. This is accomplished by chiropractors inviting patient involvement and input in a shared decision-making process and helping to facilitate multidisciplinary care for the patient. This study has also provided clarification that such patient involvement happens more frequently in the earlier stages of the chiropractor-patient relationship. However, there was inconsistency in the study findings as chiropractors in the current study on average espoused attitudes that were more doctor-centred as pertains to patient involvement in the clinical decision-making process. Some chiropractors did not feel that patient input was as important as either their clinical experience and preferred treatment techniques, or research evidence. Compounding these attitudes are time constraints often experienced in practice. Previous research indicates that most chiropractors hold favourable attitudes towards evidence-based practice and feel that they are skilled in its application (Bussières et al., 2015, 2016a), but to practise in an evidence-based manner it is important to balance patient preferences and context with the best available evidence and the clinical experience of the practitioner (Alexopulos et al., 2021; Haynes, Devereaux and Guyatt, 2002; Sackett et al., 1996). This makes evidence-based practice a form of shared decision-making if the best evidence is shared with the patient and not presented as the only choice. The emphasis placed on both evidence-based practice and shared decision making in clinical practice will likely continue to increase for both practicing health professionals and the institutions that educate them.

6.2.5 THERAPEUTIC ALLIANCE

The therapeutic alliance results from the development of a personal relationship and connection between health professionals and the patient (Babatunde, MacDermid and MacIntyre, 2017; Mead and Bower, 2000). Mead and Bower (Mead and Bower, 2000) identified the therapeutic alliance as an essential component of patient-centred care. The therapeutic alliance is one of many contextual factors that can facilitate either positive (placebo) or negative (nocebo) contextual effects for patients. Contextual factors are defined as "physical, psychological and social elements that characterize the therapeutic encounter with the patient" (Rossettini, Carlino and Testa, 2018). Rossettini, Carlino, and Testa (Rossettini, Carlino and Testa, 2018) categorized contextual factors into internal (characteristics of the patient), external (treatments and where they take place), and relational (the patient-practitioner relationship and communication). Stilwell and Harman (Stilwell and

Harman, 2017a) placed the therapeutic alliance at the centre of their model of contextual factors for exercise adherence for chronic low back pain, indicating that it provides the foundation for, and interacts with, other contextual factors such as expectations of success or failure, mastery and control of a problem, patient education, and attributions of success or failure.

The chiropractors in the current study discussed making use of contextual factors such as an inviting office environment, positive interaction, and a close relationship/therapeutic alliance with patients and felt that they could impact patient satisfaction and compliance in particular. Contextual factors such as those, and others associated with chiropractic including the therapeutic benefit of touch, can have important effects on patients (Newell, Lothe and Raven, 2017; Rossettini, Carlino and Testa, 2018). Haas and colleagues (Haas et al., 2014) found that a favourable opinion of the chiropractor-patient encounter had an effect comparable to spinal manipulative therapy (SMT) on pain outcomes for chiropractic patients with chronic low back pain. However, these authors did not find that intake expectations had a similar impact on pain intensity. That differed from a recent Swedish study (Eklund et al., 2019a) that found that chiropractic patients with recurrent or chronic lower back pain who have higher baseline expectations of recovery were more likely than those with lower expectations to see improvement in their low back pain by their fourth visit. However, it is notable that the two studies were looking at different outcome measures as Haas *et al*. (Haas et al., 2014) were concerned with pain intensity, while Eklund *et al.* (Eklund et al., 2019a) focused on subjective improvement.

Numerous descriptions of patient-centred care address the importance of the doctor-patient relationship (Castro et al., 2016; Morgan and Yoder, 2012; Scholl et al., 2014; Stewart, 2005)

For example, “Enhancing the patient-doctor relationship” is one of the components of Stewart’s model of patient-centredness (Stewart, 2005). Mead and Bower (Mead and Bower, 2000) indicated that there was therapeutic benefit that could be realized from the alliance between patients and practitioner. This has been supported by research that has demonstrated that the alliance between patients with chronic musculoskeletal conditions and physical rehabilitation practitioners can have a positive impact on treatment outcomes and adherence (Babatunde, MacDermid and MacIntyre, 2017; Ferreira et al., 2013; Hall et al., 2010; Rossettini, Carlino and Testa, 2018).

Several themes and subthemes from the qualitative analysis and subscales of the PACIC and PPOS reflected Mead and Bower’s Therapeutic Alliance dimension as well as the 5 components of the therapeutic alliance identified by Lambers and Bolton (Lambers and Bolton, 2016): empathy, trust, collaboration, agreement on treatment goals and strategies, and patient-centred communication. Most notably, the “Chiropractor-Patient Interaction” theme and in particular, the “Rapport and Relationship” subtheme demonstrated the importance that patients and chiropractors assigned to the establishment and maintenance of a therapeutic relationship and communication during consultations in serving the patient’s needs. Lambers and Bolton (Lambers and Bolton, 2016) found that after their third visit that pairs of chiropractors and patients in the Netherlands both indicated having a very positive working alliance. However, there was generally poor agreement between the patients and chiropractors in the same relationship on the Working Alliance Inventory-12 (WAI-12).

Several beneficial elements of a doctor-patient relationship were described by Stewart (Stewart, 2005), among these were empathy, warmth, encouragement, and a positive affect, as well as allowing patients to express their feelings, ideas, and expectations. Most of these elements were identified by patients and chiropractors in the interviews, with a particular focus on the warmth and caring shown towards patients by chiropractors. Similarly, Bastemeijer *et al*. (Bastemeijer et al., 2021) found that physiotherapy patients with chronic or recurrent musculoskeletal pain attach importance to the partnership with their therapist, as well as the therapist being compassionate and responsive.

In the interview data chiropractic patients frequently mentioned the importance of a trusting relationship with their chiropractor and that trust is a key part of the therapeutic alliance. These findings are consistent with those of Stillwell and Harman (Stilwell and Harman, 2017b) who identified a trusting relationship and clinical rapport between patient and chiropractor as facilitating the formation of a therapeutic alliance and patient-centred care from interviews with chiropractors and chronic low back pain patients when it comes to exercise adherence in particular. In their exploratory mixed methods work with chiropractors, Connell and Bainbridge (Connell and Bainbridge, 2020) identified 4 key themes to describe how chiropractors establish trust with their patients consisting of honesty, communication, perceived competence, and caring. This relates to the “Distinct Qualities” subtheme from the “Chiropractic Approach” theme as patients perceived that their chiropractors had a more caring approach and listened to them more than other health professionals and both patients and chiropractors emphasized the importance of the chiropractor listening to and understanding patients. This further related to the PPOS Caring subscale, as chiropractors obtained higher mean scores on the PPOS Caring subscale than the PPOS Sharing subscale. However, like the mean PPOS Sharing scores, the mean PPOS Caring scores were lower than several studies involving medical doctors, and would similarly be categorized as ‘doctor-centred’ as per Krupat *et al.*’s original classification (Krupat et al., 2000). The ‘Expectations’ subtheme of the “Experience of and living with chronic pain” theme explored how patients with chronic MSK conditions repeatedly indicated that they expected their chiropractor to listen to them and be honest about their prognosis and treatment needs from the outset. Patients who had seen their chiropractors for longer periods mentioned expectations for continued positive results from treatment. Both patients and their chiropractors anticipated the patient's condition to persist into the future, but typically held forward-looking attitudes and felt that even if they could not eliminate pain or other symptoms that they could potentially see improvement or at least be able to maintain function and quality of life. Such positive thoughts and attitudes could help patients develop resilience that could be helpful in managing chronic pain (Gatchel et al., 2007; Gliedt et al., 2017).

The "Chiropractic Approach" theme, and in particular the "Visits and Follow-Up" subtheme highlighted an important manner through which chiropractors develop relationships with their chronic musculoskeletal conditions patients via visits that are both frequent and over a long period of time. This was referred to as "maintenance care" by both chiropractors and patients. By seeing patients regularly over the course of months or years it becomes easier to get to know the patient and develop a close relationship with them. Maintenance care visits allow chiropractors to provide passive interventions such as manual therapy, and give support and advice/education on exercise, pain management, or other relevant lifestyle topics. In the "Distinct Qualities" subtheme from the "Chiropractic Approach" theme, patients described how they formed a closer relationship with their chiropractors by seeing them more often and often over a longer period than their family doctors. Similarly, Bastemeijer *et al.* (Bastemeijer et al., 2021) noted that a deeper relationship can form between physiotherapists and patients due to the length and increased frequency of visits. They described how physiotherapy patients found that increased personal contact led to increased patient comfort and allowed for greater exchange between patient and therapist.

Maintenance care has been described as a secondary (preventing recurrence) or tertiary (preserving current state of health) prevention strategy employed by chiropractors, typically for patients with chronic or recurrent spinal pain who have responded favourably to chiropractic treatment (Iben, Lise and Charlotte, 2019; Myburgh et al., 2013).   Maintenance care typically takes place between every 1 to 3 months, as in the current study where patients saw their patients for a median of 12 visits annually. Myburgh *et al.* (Myburgh et al., 2013) described maintenance care as being patient-oriented and facilitated by a strong therapeutic relationship between the patient and chiropractor. Recent research has pointed to maintenance care being potentially more effective than symptom-guided treatment for patients with persistent or recurrent low back pain who had shown a positive response to chiropractic care (Eklund et al., 2018, 2020). The current study supports these findings as patients and chiropractors described maintenance care as helpful for providing ongoing pain management and support for chronic musculoskeletal conditions.

Chiropractic patients gave the Follow-Up / Coordination subscale of the PACIC the lowest mean and median scores among all of the 5 PACIC subscales. This subscale was described by Glasgow *et al.* (Glasgow et al., 2005a) as the extent to which patients perceive that their healthcare professional arranges care beyond that that takes place in the office and monitors patient progress proactively. These lower scores agreed with interview data as patients and chiropractors both described follow-up as typically occurring as part of regular maintenance care visits, with relatively few other means of follow-up being discussed. In the "Barriers to Patient-Centredness" subtheme from the "Decision Making" theme patients expressed concerns about care from their chiropractors that was repetitive and did not change over time and this had the potential to produce dissatisfaction. Stillwell and Harman (Stilwell and

Harman, 2017b) identified a poor clinical relationship and patients feeling misunderstood by their chiropractor as 2 key barriers to forming a therapeutic alliance and patient-centred care from interviews with chiropractors and chronic low back pain patients when it comes to exercise adherence. The lack of follow-up identified in the current study could limit understanding of the patient by chiropractors. A clinician having a limited understanding of a patient could certainly be detrimental to the patient-clinician relationship and development of a therapeutic alliance.

Patient-centred care is often described as beneficial as it can facilitate self-management for patients (Bastemeijer et al., 2021; Morgan and Yoder, 2012; Santana et al., 2018; Stewart, 2005; Yun and Choi, 2019). In the “Chiropractic Approach” theme, the “Active Care” subtheme explored how chiropractors empower their patients by encouraging and providing support and advice for self-management of their conditions as part of the therapeutic alliance. This again reflected the PACIC’s Delivery System Design / Decision Support subscale, particularly with respect to educating patients, and the Follow-Up / Coordination subscale. The “Delivery System Design / Decision Support” subscale had the third highest mean and median subscale scores, while the “Follow-Up / Coordination” subscale had the lowest scores.

In the Active Care subtheme, chiropractic patients and chiropractors alike described the active care recommendations offered by chiropractors to patients often to one or more of exercise prescription, patient education, and individual advice. These active care elements were mentioned among the many activities performed and topics discussed in a consultation in the “Visits and Follow-Up” subtheme from the “Chiropractic Approach” theme. These active care components align with previous studies that have found them to be commonly performed by chiropractors (Beliveau et al., 2017; Fikar, 2015; French et al., 2013; MacPherson et al., 2015; Stilwell and Harman, 2017b). Of note, a survey of 540 chiropractic patients in the United Kingdom reported that 96% of participants indicated that their chiropractor gave them advice for how to self-manage their condition between visits (MacPherson et al., 2015). Incidentally, 97% of those respondents indicated that they expected to receive such advice, so most of those patients saw their expectations met. Numerous clinical practice guidelines recommend exercise and advice in the management of chronic musculoskeletal conditions (Bussières et al., 2016b, 2018, 2021; Côté et al., 2016, 2019a; (NICE), 2014; Wong et al., 2016). However, Stilwell and Harman identified numerous barriers to exercise prescription by chiropractors and adherence by patients with chronic low back pain such as fear-avoidance by both patients and chiropractors, over-emphasis on structural diagnoses and passive solutions to those structural conditions, and not spending enough clinical time on exercises (Stilwell and Harman, 2017b). They also noted that over-prescription of exercises, a high degree of difficulty or complicated exercises, lack of explanation, and a poor chiropractor-patient relationship can also present barriers to patient completion of exercises. Patients and chiropractors in the current study described how chiropractors encouraged patients to complete self-management activities such as home exercises by leveraging their positive relationships with their patients. These positive relationships are increasingly seen as important for practitioners when trying to facilitate patient engagement and adherence to advice in managing their musculoskeletal conditions (Babatunde, MacDermid and MacIntyre, 2017; Hall et al., 2010).

The “Goal Setting” subtheme from the “Decision Making” theme also related to the “Therapeutic Alliance” dimension from Mead and Bower’s model (Mead and Bower, 2000) as patients and chiropractors typically discussed identifying patient goals together, and chiropractors indicated that doing so with patients was an important aspect of care. However, the Goal Setting / Tailoring subscale of the PACIC had the second lowest mean and median scores, indicating that the execution of goal setting in practice is inconsistent according to patient perceptions. Interviews with patients indicated that this could be owing to goal setting being a greater priority earlier in the clinician-patient relationship but happening less frequently as the patient sees their chiropractor over the course of the relationship. As other authors have noted, goal setting is an important way to facilitate patient involvement for clinicians trying to provide patient-centred care (Leplege et al., 2009; Santana et al., 2018). Mutually agreed upon and understood goals contribute to the doctor-patient relationship (Kaba and Sooriakumaran, 2007; Stewart, 2005). Stilwell and Harman (Stilwell and Harman, 2017b) found that chiropractors setting meaningful goals with patients facilitated the formation of a therapeutic alliance and patient-centred care between chiropractors and patients when it came to exercise prescription adherence. There is evidence for the use of goal setting in offering patient-centred care, particularly in the fields of rehabilitation or chronic disease management (Vermunt et al., 2017; WMM, 2014; Yun and Choi, 2019; Zimmermann et al., 2014). Previous research on goal-setting interventions for patients with chronic low back pain have demonstrated improvements in numerous outcome measures including pain intensity, disability, quality of life, self-efficacy, and fear avoidance / kinesiophobia (Coppack, Kristensen and Karageorghis, 2012; Gardner et al., 2016, 2019). Goal setting has not been explored extensively among chiropractic patients or chiropractors. Herman *et al.* (Herman et al., 2019) asked chiropractic patients with chronic spinal pain to select from 4 treatment goals and the 2 most commonly indicated were curing pain and temporary pain relief by approximately one-third of patients each, followed by preventing recurrence and preventing a worsening of pain. A previous survey of United Kingdom chiropractors regarding their health promotion behaviours found that they included goal setting for various health related topics such as smoking, alcohol consumption, stress, posture, diet, exercise, and movement (Fikar, 2015). Slightly more than 40% of those chiropractors indicated that goal setting or goal re-evaluation took place in over half of patient visits. In the COCOA study (Goertz et al., 2010, 2013, 2017b; Lyons et al., 2013; Salsbury et al., 2018c), clinicians in all 3 groups worked with patients to identify health goals, although there was a greater focus on goal setting in the Shared Care group. However, the Shared Care group did not significantly outperform the other two groups in any of that study's outcome measures.

This study demonstrated that chiropractors are adept at forming a therapeutic alliance in the form of close relationships with patients, and they use that rapport and other contextual factors advantageously. The chiropractor-patient relationship develops as chiropractors gain patients' trust by listening and were perceived by patients as understanding and demonstrating care and concern about them. The therapeutic alliance that chiropractors and patients establish develops over time and frequently benefits from the regular visits and attention that patients receive through maintenance care. However, chiropractors were not typically perceived as providing follow-up to care aside from additional clinical visits. This could create concerns about over-reliance on such visits and passive care, even though patients and chiropractors both agree that chiropractors do provide advice and encourage the patient to self-manage their conditions. The regularity of visits for chiropractic patients could also be problematic in terms of being perceived as patient-centred if the care is repetitive and doesn't evolve with the patient's changing needs and that could be reflected by the PPOS scores which reflected more doctor-oriented attitudes. Similarly, while chiropractors acknowledge the importance of goal setting with patients with chronic musculoskeletal conditions, patients perceived that goal setting and follow-up on goals does not take place regularly.

6.3 STUDY STRENGTHS AND LIMITATIONS

This study had several strengths and limitations. One of the main strengths of the study was the use of mixed methods, which allowed for learning the perspectives of both patients and chiropractors on patient-centred care (Regnault, Willgoss and Barbic, 2018). Obtaining the views of these key stakeholders using both quantitative and qualitative methods reflects the complementary nature of mixed methods research (Creswell, 2004; Ivankova, Creswell and Stick, 2006). Sequential explanatory designs such as this allow for the further understanding of the quantitative data through the qualitative data. They provide results that are generalizable while providing a more in-depth perspective.

There were numerous points where there was meaningful integration of the quantitative and qualitative aspects of this study. This began in the design and planning of the study methods. The sampling frame allowed for integration as the qualitative samples (patients in the focus group interviews and chiropractors from the individual interviews) arose from the respective quantitative samples; there was further integration as data was collected from both patients and their chiropractors whose care I was attempting to characterize. Further to that the interview guides for qualitative data collection were developed from theory on patient-centred care (Mead and Bower, 2000; Wagner et al., 2001a) as well as empirical evidence from the quantitative aspects of the study and previous experience from the pilot study. The qualitative data was used to aid with interpretation of the quantitative data. A weaving approach was used to report results, particularly in using the qualitative data to try to explain the quantitative data (Guetterman, Fetters and Creswell, 2015; Fetters, Curry and Creswell, 2013; Ivankova, Creswell and Stick, 2006).   Finally, in the Discussion there was occasion to assess areas where the quantitative and qualitative findings demonstrated agreement or discrepancies.

Among the other strengths of this study was the large number of patients with chronic MSK disorders who completed the patient questionnaire, close to 900, exceeding the minimum sample size of 860 participants. The sample was representative of chiropractic patients with chronic musculoskeletal conditions and showed many similarities to chiropractic patient populations as a whole. The overall questionnaire completion and subject inclusion rate was 68.1%, which pointed to the success of the involved clinics as a whole to recruit patients and represents the largest number of chiropractic patients with chronic conditions who have been asked for their perceptions of the patient-centredness of the care that they receive from chiropractors through completion of the PACIC. This may have been due to the pragmatic approach to patient recruitment, as clinics were given flexibility to recruit patients in the manner that was most suitable for their workflow. Another strength that may have aided the recruitment rate was the creation of a standardized training program for the involved clinics including training materials and a training video made available for viewing prior to data collection.

The study was further strengthened in trying to reduce measurement error the study through the use of valid and reliable instruments such as the PROMIS GHS (Bryan et al., 2014; Cella et al., 2010; Hays et al., 2009) to assess health-related quality of life, a modified version of the PACIC (Drewes et al., 2012; Glasgow et al., 2005a; Noel, Jones and Parchman, 2016; Rick et al., 2012; Taggart et al., 2010) to assess the extent to which patients with chronic musculoskeletal conditions perceive the care that they receive from chiropractors to be patient-centred, and the PPOS (Krupat et al., 2000; Shaw, Woiszwillo and Krupat, 2012) to assess chiropractors' patient-centred communication and attitudes toward the relationship and sharing of power and control between them and their patients. However, as the questionnaires completed by patients and chiropractors were entirely self-reported, there exists the potential for inaccuracy or recall bias, any of which could lead to possible issues with internal and external validity.

For the qualitative data component, taking into consideration pragmatic and feasibility factors and the literature on acceptable numbers of interviews to conduct to ensure sufficient sample size, it was decided *a priori* to conduct 3 to 5 focus group interviews, along with 6 to 12 individual interviews with chiropractors to try to achieve data saturation. Ultimately four focus group interviews were conducted as data saturation was achieved after analysis of the fourth focus group interview. This was within the acceptable number of focus group interviews recommended in the literature (Fusch and Ness, 2015; Guest, Namey and McKenna, 2016; Onwuegbuzie et al., 2009). A further seven individual chiropractor interviews were completed, and it was determined that data saturation was achieved following analysis of the seventh interview. This would be considered a relatively small number of individual interviews for a qualitative study, but was deemed acceptable within the confines of a mixed methods study. Between both the individual and focus group interviews saturation was achieved in finding patient and chiropractor perspectives on how chiropractors provide patient-centred care along with convergence with the quantitative data.

Credibility in the qualitative data was established by using several forms of triangulation (Korstjens and Moser, 2017). By collecting data from multiple sources (patients and chiropractors) in different locations and in different manners, there was methodological and data triangulation allowing rich data to be obtained and a more thorough exploration of chiropractic patient-centredness (Anderson, 2010; Creswell, 2004; Fusch and Ness, 2015; Korstjens and Moser, 2017; Lambert and Loiselle, 2008; Morse, 1991). There was also investigator triangulation as the researcher and a supervisor who was not a chiropractor, independently coded and analyzed the interview data (Korstjens and Moser, 2017). Validity in the qualitative data was established through constant comparison and the integration of patient focus group and individual chiropractor interview data in the analysis (Anderson, 2010; Creswell, 2004; Fusch and Ness, 2015; Lambert and Loiselle, 2008; Morse, 1991).

There were some limitations in this study. As could be anticipated, some of the participating clinics were more successful in their recruitment efforts than others, although the reasons for this were not investigated further. Managing data collection from 20 clinics in 7 provinces presented challenges, such as periods of non-response from some of the contact chiropractors during the data collection period. There was some degree of non-response bias as nearly one-quarter of the questionnaires were not returned, a further 5% were returned incomplete, and another 7% were completed by patients who did not indicate having a chronic MSK condition.

Clinics from 7 different Canadian provinces were recruited to allow for a greater representation of Canadian chiropractic patients with chronic MSK conditions. However, the number of clinics and patients recruited differed from province-to-province, with the largest numbers being from Ontario (n=320) and the fewest from Newfoundland (n=51). Clinics were not recruited from 3 provinces, nor any of the 3 Canadian territories. Clinics from Quebec and New Brunswick were not recruited due to concerns about translating the questionnaire into French as those are the only 2 Canadian provinces with French as an official language, along with the requirement to validate the translated version. Clinics from Prince Edward Island and the Canadian territories were not recruited due to their small populations and number of practicing chiropractors. With these provinces and territories not represented, it is uncertain whether the study's sample was completely representative of Canadian chiropractors or chiropractic patients across the country, although as discussed it shows similarity to recent studies that characterized Canadian chiropractors in terms of gender distribution, years in practice, and chiropractic educational institutions attended (Association, 2016; Howarth et al., 2020; Mior et al., 2019). It is recognized that only assessing Canadian chiropractic settings may impact the transferability of the results to international populations or other health professionals (Korstjens and Moser, 2017). This could have been addressed by collecting data in other countries and from other health professions. The study by Foley, Steel and Adams (Foley, Steel and Adams, 2020) provides an example of one way that data can be collected from multiple health professions, although they did not follow a mixed methods design and their sample was considerably smaller than the current study.

The number of chiropractors who completed the chiropractor questionnaire was small as they were recruited out of convenience from the participating clinics. The chiropractor response rate is unknown as the number of DCs working at each participating clinic was not ascertained. Chiropractors were not recruited from clinics outside of the study clinics. However, in many respects the respondents to the chiropractic questionnaire appeared to be representative when compared to previous studies that characterized Canadian chiropractors (Association, 2016; Howarth et al., 2020; Mior et al., 2019), although none in this sample were in engaged in solo practice and the majority trained at the Canadian Memorial Chiropractic College. Despite best efforts when recruiting the chiropractors who participated in the individual semi-structured interviews, that group over-represented male chiropractors, those who had more years in practice, and those who were educated at Canadian chiropractic educational institutions.

The patient results may have suffered from a selection effect due to the non-probability sampling strategy of having clinic staff recruit participants sequentially. There was no study staff on site for quantitative data collection, thus clinic staff and chiropractors may have introduced selection or sampling bias by only recruiting patients known to respond well to or be particularly positive about chiropractic care. Thus, the sample may not necessarily have been representative of all chronic MSK condition patients at the participating clinics and this could have influenced the results in both the quantitative and qualitative components of the study. While in many ways the sample was similar to previous studies of Canadian chiropractic patients or those with chronic MSK conditions, in other respects it was not representative of these populations, as for example there was an over-representation of Caucasians and those with higher levels of education. There was also a relatively small proportion of the patients who disclosed having a mental health condition, which is not typical for a population with chronic pain (Breivik et al., 2006, 2013; Mills, Nicolson and Smith, 2019). The sample also tended to be slightly older and have more females than a typical chiropractic population, although this could be due to the typical composition of chronic pain populations (Mills, Nicolson and Smith, 2019).

Both the patient and chiropractor questionnaires would have benefitted from the addition of several items. In the patient questionnaire, additional items asking patients about medication intake would have been useful, particularly as Canada and much of the world faces an opioid crisis (Belzak and Halverson, 2018). Such information could be valuable as recent research has shown that chiropractic patients have approximately a 50% reduced risk of filling an opioid prescription than those who do not see a chiropractor (Whedon et al., 2020). However, as this was not an area of focus it was not considered in the study design. It would have also been helpful to ask patients how their chiropractic care was paid for, whether privately out of their own pocket, or through public or private health insurance benefits or workplace or motor vehicle collision insurance. Previously, both the COAST (French et al., 2013) and O-COAST (Mior et al., 2019) studies asked chiropractic patients for this information, although in the current study that was not considered until payment for treatment was mentioned by focus group participants. Finally, it would have been useful if the patient questionnaire included questions asking the patient about their usual chiropractor, such as the chiropractor's gender, number of years in practice, ethnicity, college of graduation, etc. This could have allowed for greater linkage between the chiropractor and patient samples; however, it is uncertain if patients are necessarily able to answer such questions about any of their health care providers. The only linkage that was established was between the patients and whether the clinic that they attended had a chiropractor who saw 100 patients or more per week, indicating a high caseload. However, it was undetermined which of the chiropractors at a participating clinic the patient was seeing.

The chiropractor questionnaire would have been aided by obtaining greater description of clinic staff composition, such as the number of other chiropractors who worked at the clinic, and in multidisciplinary clinics asking specifically which other disciplines they worked with. The role of the chiropractor within their clinic was uncertain, such as whether they were the clinic's owner, a partner, associate, employee, or independent contractor. Chiropractors were not asked about additional education past their chiropractic training, so it uncertain how many had graduate degrees or specialist training. Similar to previous studies (Innes et al., 2015;

Lady et al., 2018) , the PABS-PT instrument could have been added to the chiropractor questionnaire to determine chiropractor orientation towards biopsychosocial or biomedical orientations.

One of the considerations when conducting sequential explanatory mixed methods studies is that participants may learn from the quantitative component of the study (such as the questionnaires that they complete) and that may affect their responses in the qualitative components that follow. In this study, both patients and chiropractors completed a questionnaire prior to either focus group (with patients) or individual interviews (with chiropractors). However, it was not apparent to the researcher whether such learning occurred and influenced participant responses.

There were difficulties encountered in recruiting patients for the focus groups. One of the issues may have been participant fatigue and another may have been the time elapsed from when patients completed the questionnaires until when the focus groups were held. This is another potential limitation of sequential explanatory studies as time is required to enter and analyze quantitative data to aid with the qualitative data collection (Ivankova, Creswell and Stick, 2006). The time elapsed may have reduced participant willingness to engage in the focus group interviews. Due to these recruitment difficulties the number of participants in the focus groups varied from 3 to 6, which meant that some of the focus groups were relatively small, but that may have been beneficial in allowing each participant more time to participate in the discussion. The focus group sample had a slightly greater proportion of females and was somewhat older on average than the group that it was sampled from. Another consideration is that there was some unintentional familiarity between patients in two of the focus groups in smaller communities (Cambridge and Swift Current). One of the potential sources of concern in conducting focus group interviews are issues with groupthink or social desirability bias, where participants agree with one another too frequently and there are too few dissenting opinions (Fusch and Ness, 2015). To mitigate this, probing and follow-up questions asked if participants had different experiences or thoughts than others. In the focus group interviews despite many of the participants having overwhelmingly positive impressions of their chiropractors, there was discussion from some participants of instances where they were not satisfied or had negative experiences with previous chiropractors or where their current chiropractors had fallen short of their expectations, particularly as related to topics relevant to patient-centred care such as goal-setting, follow-up, or empowerment.

Most patients indicated on the questionnaire that they were highly satisfied with the chiropractic care they receive, making it difficult to sample dissatisfied patients for the focus group interviews. This poses a potential drawback to this particular study design and could limit generalizability of the findings. It might be beneficial to sample patients who are dissatisfied with chiropractic, such as patients who have left chiropractic care. However, that would not be feasible in the current study as it required participants to be active chiropractic patients. Recruiting participants from other settings, such as medical or physiotherapy clinics may pose a solution for future studies.

In both the individual semi-structured interviews with the chiropractors and the patient focus group interviews, participants were aware that the researcher/interviewer (KS) was a chiropractor. Thus, the presence of the researcher/interviewer may have introduced researcher bias and affected subject responses (Anderson, 2010; Fusch and Ness, 2015; McGrath, Palmgren and Liljedahl, 2018). This could also lead to some concern about social desirability response bias with the interview participants attempting to portray the chiropractic profession or chiropractors in a more sympathetic light. To detect this the researcher employed reflexivity (Anderson, 2010; Creswell, 2014; Fusch and Ness, 2015; McGrath, Palmgren and Liljedahl, 2018; Ritchie and Lewis, 2003), and an observer was present in two of the focus group interviews, although neither of the observers reported concerns with such bias. In addition, during the qualitative data analysis the interpretation may have been influenced by the researcher, a chiropractor, conducting the qualitative analysis (Anderson, 2010). The researcher practised reflexivity (Anderson, 2010; Creswell, 2014; Fusch and Ness, 2015; McGrath, Palmgren and Liljedahl, 2018; Ritchie and Lewis, 2003) to be aware of this possibility and mitigate it. In addition, another investigator who was not a chiropractor also conducted the analysis, and the two investigators came to consensus where disagreements were resolved by a third investigator if necessary.

Member checking was not employed in the qualitative components of the study, which poses another potential threat to the credibility of the qualitative data (Korstjens and Moser, 2017). Member checking was not considered from the outset of the study as it was determined that there would be difficulties with participant recall from the focus group interviews due to the presence of multiple participants and that it would also prove difficult pragmatically with participants from across Canada.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.0 OVERVIEW

This study adds to the limited research on patient and chiropractor perspectives of patient-centredness of chiropractic care, in particular for patients with chronic musculoskeletal conditions. This study's findings provide evidence that patients with chronic musculoskeletal conditions who see chiropractors rate chiropractic care comparably to other professions in patient-centredness when compared with the available literature. The study identified associations between the characteristics of chiropractic patients with chronic musculoskeletal conditions and their perceptions of patient-centredness of chiropractic care.

The study also evaluated the associations between chiropractors' characteristics and their perceptions of and attitudes towards patient-centredness in the care they provide. Chiropractor attitudes towards patient-centredness were more doctor-oriented, although comparable to those reported in other health professions in the existing literature in terms of involving patients in decision making and considering their individual history and viewpoints in managing their health. Chiropractor experience and workload were associated with more patient-centred attitudes, indicating that such attitudes may be learned through greater clinical experience with patients.

The study used interview information from both patients and chiropractors to elucidate and contextualize the findings from the completed questionnaires. In doing so, the voices of both patients and practitioners were heard with respect to their roles in the care of chronic musculoskeletal conditions and the manners in which chiropractic care is patient-centred. Chiropractors were described as trying to learn as much as they could about their patients.

Chiropractors try to empower patients by engaging them in making decisions about their health by presenting information and treatment and referral options for their condition, and encouraging them to participate in self-management activities. However, in a departure from patient-centred care, some chiropractors described preferences for their clinical experience or research evidence over patient preferences, and thus patient participation and consideration of their preferences and values in their care varied.

Chiropractors employ other elements of patient-centredness by establishing a therapeutic alliance and by providing individualized care tailored to a patient's specific context and needs. The importance of strong relationships between patients and chiropractors was emphasized, as was the trust that patients had in their chiropractors. Patients perceived chiropractors as having a different approach to care when compared to other health care providers, indicating that they felt that they were better listeners who spent more time with patients over the course of the treating relationship. The chiropractic approach was described as holistic and specific to each patient, with chiropractors trying to involve patients in self-management of their chronic musculoskeletal conditions typically through home exercise recommendations, although numerous other self-management strategies could be involved. Chiropractors frequently practise in multidisciplinary environments which facilitate co-management and referrals to other professionals, and those options were found to be beneficial for patients with chronic musculoskeletal conditions.

However, patients also discussed how their chiropractors offered care that was not patient-centred, such as the general absence of follow-up care that extends beyond consultations or regular goal setting. Chiropractors felt that engaging patients in goal setting was important for chronic musculoskeletal conditions, although patients did not believe that such processes took place regularly during care. Follow-up from chiropractors between visits was described as lacking; however, as patients with chronic musculoskeletal conditions typically receive frequent care and follow-up from their chiropractor in the form of maintenance care visits, this did not appear to be as essential. Patients and chiropractors described maintenance care as important for chronic musculoskeletal conditions as it could help prevent exacerbations or deterioration of their condition. Maintenance care also allows chiropractors to regularly provide patient education and follow-up on patient progress and participation in their self-management activities.

7.1 CONTRIBUTION TO THE FIELD

This study is the largest to evaluate perceptions of patient-centredness of chiropractic care among chiropractic patients with chronic MSK conditions. Furthermore, it is among the first to use mixed methods among the chronic MSK population, providing patient and clinician perspectives through the qualitative aspects and allowing for explanation of the quantitative data obtained from patients and clinicians. This allowed for a more complete assessment and description of the manners in which chiropractic care is patient-centred for patients with chronic MSK conditions and how that compares with well-established models of patient-centredness such as the one described by Mead and Bower (Mead and Bower, 2000). This study demonstrated that the Mead and Bower model is applicable to chiropractic encounters as each of their model's dimensions were supported through patient and chiropractor questionnaire findings, and themes and subthemes derived from the interview data from the current study. However, a chiropractic approach for patients with chronic musculoskeletal conditions that is distinct from other health care professionals was identified as care that is more holistic and chiropractors were felt to be more caring, better listeners and to have a greater understanding of their patients. Those unique attributes contribute to the formation of a close therapeutic alliance between patients and their chiropractor. The use of regular maintenance care for patients with chronic musculoskeletal conditions was also unique as it serves as the main vehicle for follow-up and typically consists of the delivery of manual therapies along with self-management recommendations, such as exercise prescriptions. Regular maintenance care also allows for the growth of the therapeutic alliance as it contributes to greater familiarity between patients and chiropractors due to the increased visit contact time when compared to what patients experience with other professionals.

This study is the first to employ the PACIC among patients with a variety of chronic MSK conditions, demonstrating the utility of the PACIC in this patient group. Previous studies that have used the PACIC with only chronic MSK populations have only assessed one chronic MSK condition, such as chronic back pain or osteoarthritis (Gogovor et al., 2019; Rosemann et al., 2007). This study was able to identify demographic, health care use, and health care experience variables that were associated with PACIC scores that chronic musculoskeletal condition patients assigned to their chiropractors.

This study is the first to use the PPOS to measure how patient-centred chiropractors are in their attitudes and approach to care. Previously, the PPOS had only been used in one survey of chiropractic students (Hammerich et al., 2019). The PPOS has been used extensively in other healthcare professions, particularly in educational settings. This study identified chiropractor demographic and practice pattern variables associated with PPOS Overall and subscale scores.

7.2 RECOMMENDATIONS AND FUTURE WORK

There is considerable work being conducted in the field of patient-centred care in healthcare in general. However, as discussed throughout this thesis, and highlighted in Chapter 3, there has been relatively little research done in this area in chiropractic, as well as in many other complementary and allied health professions. As this project has highlighted, the care that Canadian chiropractors provide to patients with chronic MSK conditions is similar in terms of how patient-centred it is when compared with other health professions.

The findings of this study provide numerous opportunities for further research. Future research using similar methods could be undertaken in specialized populations (such as pediatrics, geriatrics, military, athletic, or under-served communities) and other Canadian jurisdictions, or internationally to determine if patient-centredness of care provided by chiropractors differs in such settings. Such future studies should examine topics missing from the current study, such as asking patients about medication intake or asking chiropractors for more information about their education, biopsychosocial or biomedical orientations, or staffing and roles at their clinics. It would also be beneficial to be able to tell which patients see which particular chiropractors, so it could be determined if additional features of the individual chiropractor might be associated with patients providing higher PACIC scores, such as the number of years that the chiropractor had been in practice, where they completed their chiropractic education, their practice volume, orientation to care, etc. Such linkage has been employed at the visit level in previous studies with chiropractic patients (French et al., 2013; Mior et al., 2019). Future studies may also consider using patient features from their health care records such as verifying the number of treatments per year, diagnoses, etc., although issues such as privacy of health care information would need to be thoroughly addressed. This study did not follow-up with patients; future studies should include follow-up to determine if changes occur over the course of care or throughout the patient-chiropractor treating relationship.

There appears to be a need for further investigation into the elements of chiropractic care that facilitate patient-centredness, such as the role played by contextual factors (Rossettini, Carlino and Testa, 2018; Rossettini et al., 2020). There should also be further investigation into barriers to patient-centred care among chiropractors. While this study was the first to use the PPOS with practicing chiropractors, the sample size was small (n=31) and warrants a larger scale study of chiropractor attitudes towards patient-centred care using either the PPOS or a similar instrument.

As seen from the PACIC subscale scores in the current study and based on discussion from the qualitative interviews, two areas where there was noticeable room for quality improvement in terms of the care that patients with chronic MSK conditions receive from chiropractors were in goal setting / tailoring and follow-up / coordination. Thus, designing studies to assess the effect of interventions aimed at improving these aspects of practice, such as continuing professional development programs or technology implementation, may lead to improvements in terms of the extent that patients perceive chiropractic care to be patient-centred. For example, the use of technology-based systems that prompt patients and practitioners to re-evaluate progress on goals and other outcomes may warrant investigation in chiropractic settings (Newell, Diment and Bolton, 2016).

As Chapter 2 highlighted, there is a need for high-quality research on the effectiveness of patient-centred care interventions in the management of chronic MSK conditions. The pilot study by Goertz *et al*. (Goertz et al., 2017b) was the first involving chiropractors to compare a patient-centred approach involving collaborative shared decision making between patients, medical doctors, and chiropractors, with more conventional approaches of either medical care alone or medical care and chiropractic care without collaboration. Such clinical studies are important to determine which patient-centred interventions are both clinically effective in populations with chronic musculoskeletal conditions and feasible to implement in chiropractic practice.

Ultimately, if members of the chiropractic profession and their stakeholders desire a more patient-centred approach by chiropractors (Salsbury et al., 2018a), it must be addressed through research, as well as education and policy. As Innes and Kimpton (Innes and Kimpton, 2020) described, recently published graduate competencies for chiropractic program accreditation in Australasia require graduating students to be proficient in the provision of patient-centred care. There should be investigation into how patient-centred care is taught to chiropractic students through curricular audits with resulting curriculum design interventions, if necessary. Both graduating and practicing chiropractors should receive theoretical and practical training in patient-centred approaches and interventions such as those investigated in the studies included in the systematic review in Chapter 2 and consistent encouragement to implement them. Previous research has demonstrated that training interventions in patient-centred approaches can positively impact patient satisfaction, health behaviours, and outcomes (Dwamena et al., 2012). As Hammerich *et al.* (Hammerich et al., 2019) found, the attitudes of chiropractic students towards patient-centred care are not necessarily better than those of students of other health professions. Further studies that assess the impact of resulting curricular changes and augmented training in patient-centred approaches on student and practitioner attitudes and behaviour are warranted.

Policymakers and other stakeholders should encourage patient-centred approaches by chiropractors through both policy and advocacy campaigns. For example, the World Federation of Chiropractic (WFC) describes its vision for the future of the chiropractic profession as one that is evidence-based, people-centred, interprofessional, and collaborative (EPIC), and further place that vision and the integration of patient values and principles as part of evidence-based practice among their 20 guiding principles https://www.wfc.org/website/index.php?option=com_content&view=article&id=534&Itemid=230&lang=en, accessed February 3, 2022). Similar policy initiatives from advocacy and regulatory bodies, along with private and public insurers at local, national, and international levels could further encourage patient-centred care by chiropractors.

7.3 CLOSING REMARKS

In conclusion, it is important to consider the voices of both patients and clinicians when trying to characterize an important element of health care quality such as patient-centredness. This study used multiple methods of inquiry with both chiropractic patients and chiropractors to assess their perceptions of the extent that chiropractic care is patient-centred. This study suggests that chiropractic patients with chronic MSK conditions perceive that, in several ways, they receive patient-centred care and derive satisfaction from chiropractic care. The study found that both patients and chiropractors place importance on the therapeutic alliance and continuity established by regular care with the chiropractor as part of a holistic patient-specific multidisciplinary approach to chronic MSK conditions. The study also determined ways that chiropractic care could become more patient-centred, such as through regular goal-setting and follow-up, ensuring that care changes with patient needs, and monitoring patient loads and possible time constraints with patients. Finally, the findings suggest that chiropractors develop increasingly patient-centred attitudes toward care as they gain clinical experience. Thus, there is a need for greater opportunities for mentorship and continuing professional development and training in patient-centred care for chiropractors.

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APPENDICES

Appendix 1. Ovid Medline search

Search Strategy. Database(s): Ovid MEDLINE: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily and Ovid MEDLINE® 1946-September 15, 2020.

#	Searches	Results
1	Chronic Pain/	14917
2	Multiple Chronic Conditions/	465
3	(chronic* adj5 pain*).ab,kf,ti.	71900
4	exp Musculoskeletal Pain/	5186
5	musculoskeletal*.ab,kf,ti.	53745
6	Whiplash Injuries/	3252
7	Neck Pain/	7083
8	Neck Injuries/	4970
9	Radiculopathy/	5154
10	neck pain*.ab,kf,ti.	9958
11	whiplash*.ab,kf,ti.	3162
12	neck injur*.ab,kf,ti.	1927
13	(neck ache* or neckache*).ab,kf,ti.	56
14	brachial plexus neuropath*.ab,kf,ti.	224
15	torticollis*.ab,kf,ti.	3381
16	exp Back Injuries/	24790
17	exp Back Pain/	39212
18	Intervertebral Disc Degeneration/	5319
19	Intervertebral Disc Displacement/	18751
20	Piriformis Muscle Syndrome/	140
21	Sciatica/	5002
22	back pain*.ab,kf,ti.	48325
23	low* back pain*.ab,kf,ti.	30258
24	(lumbar disc* adj3 (extruded or degenerat* or herniat* or prolapse* or sequestered or slipped)).ab,kf,ti.	4778
25	(lumbar disk* adj3 (extruded or degenerat* or herniat* or prolapse* or sequestered or slipped)).ab,kf,ti.	808
26	(back adj3 (ache* or injur* or pain*)).ab,kf,ti.	52831
27	(backache* adj3 (injur* or pain*)).ab,kf,ti.	277
28	exp Osteoarthritis/	63620
29	Osteoarthritis, Spine/	172
30	Spinal Diseases/	21283
31	Spinal Stenosis/	6171
32	(osteoarthritis adj3 (neck or cervical or shoulder or thoracic or spin* or lumbar or low back or hip or knee)).ab,kf,ti.	21614
33	osteoarthritis.ab,kf,ti.	66899
34	spondylosis.ab,kf,ti.	3540
35	(lumbar adj3 (pain or facet or nerve root* or osteoarthritis or radicul* or spinal stenosis or spondylo* or zygapophys*)).ab,kf,ti.	10922
36	degenerative joint disease*.ab,kf,ti.	2880
37	degenerative disk disease*.ab,kf,ti.	342
38	degenerative disc disease*.ab,kf,ti.	2169
39	spinal stenosis.ab,kf,ti.	5343
40	piriformis syndrome.ab,kf,ti.	293

41	rheumatoid arthritis.ab,kf,ti.	106902
42	arthritis.ab,kf,ti.	182705
43	muscle pain*.ab,kf,ti.	3910
44	fibromyalgia*.ab,kf,ti.	10510
45	myalgia*.ab,kf,ti.	8874
46	chronic widespread pain.ab,kf,ti.	777
47	myofascial pain*.ab,kf,ti.	2238
48	headache*.ab,kf,ti.	85956
49	migraine*.ab,kf,ti.	35782
50	exp Cumulative Trauma Disorders/	13777
51	Bursitis/	3432
52	Shoulder Pain/	4874
53	Shoulder Impingement Syndrome/	1777
54	exp Arm Injuries/	31029
55	Wrist Injuries/	6289
56	exp Hand Injuries/	18188
57	exp Tendinopathy/	12287
58	exp Median Neuropathy/	9022
59	exp Radial Neuropathy/	553
60	exp Ulnar Neuropathies/	1700
61	Thoracic Outlet Syndrome/	2138
62	upper extremit* injur*.ab,kf,ti.	703
63	bursitis.ab,kf,ti.	2998
64	cumulative trauma disorder*.ab,kf,ti.	367
65	tendinosis.ab,kf,ti.	949
66	tendinopath*.ab,kf,ti.	4355
67	(repetit* adj3 (strain* or sprain* or injur* or disorder*)).ab,kf,ti.	2104
68	(upper extremit* adj3 (strain* or sprain* or injur* or disorder*)).ab,kf,ti.	2277
69	(upper limb* adj3 (strain* or sprain* or injur* or disorder*)).ab,kf,ti.	1181
70	(shoulder* adj3 (injur* or pain*)).ab,kf,ti.	12195
71	(arm* adj3 (injur* or pain*)).ab,kf,ti.	3701
72	(elbow* adj3 (injur* or pain*)).ab,kf,ti.	2819
73	(wrist* adj3 (injur* or pain*)).ab,kf,ti.	3803
74	(forearm* adj3 (injur* or pain*)).ab,kf,ti.	1163
75	(hand* adj3 (injur* or pain*)).ab,kf,ti.	8487
76	carpal tunnel syndrome*.ab,kf,ti.	8688
77	(medial and (epicondylitis or epicondylosis or epicondylopathy)).ab,kf,ti.	202
78	(lateral and (epicondylitis or epicondylosis or epicondylopathy)).ab,kf,ti.	1155
79	biceps tend?nitis.ab,kf,ti.	87
80	frozen shoulder.ab,kf,ti.	1039
81	thoracic outlet syndrome*.ab,kf,ti.	1820
82	tennis elbow.ab,kf,ti.	1050
83	epicondyl*.ab,kf,ti.	4184
84	(median adj neuropath*).ab,kf,ti.	239
85	(radial adj neuropath*).ab,kf,ti.	110
86	(ulnar adj neuropath*).ab,kf,ti.	941
87	exp Hip Injuries/	31002
88	exp Leg Injuries/	97244
89	exp Knee Injuries/	25564
90	exp Foot Injuries/	4362

91	exp Ankle Injuries/	9857
92	Fasciitis, Plantar/	859
93	(lower adj3 (extremit* or limb* or injur*)).ab,kf,ti.	107965
94	(buttock* and (injur* or pain*)).ab,kf,ti.	2123
95	(hip* adj3 (injur* or pain*)).ab,kf,ti.	9568
96	(knee* adj3 (injur* or pain*)).ab,kf,ti.	20410
97	(leg* adj3 (injur* or pain*)).ab,kf,ti.	9919
98	(thigh* adj3 (injur* or pain*)).ab,kf,ti.	1810
99	(ankle* adj3 (injur* or pain*)).ab,kf,ti.	5273
100	(foot* adj3 (injur* or pain*)).ab,kf,ti.	5234
101	patellofemoral pain syndrome*.ab,kf,ti.	714
102	patellar tendon*.ab,kf,ti.	5245
103	plantar fasciitis.ab,kf,ti.	1307
104	(patient* adj3 (tailor* or centered* or centred* or focus* or oriented*)).ab,kf,ti.	52972
105	(person* adj3 (tailor* or centered* or centred* or focus* or oriented*)).ab,kf,ti.	10342
106	(client* adj3 (tailor* or centered* or centred* or focus* or oriented*)).ab,kf,ti.	2492
107	(individualiz* or individualis*).ab,kf,ti.	65051
108	exp Patient-Centered Care/	20485
109	Professional-Patient Relations/	27183
110	Professional-Family Relations/	14901
111	Physician-Patient Relations/	72771
112	Patient Participation/	26085
113	Patient Care Planning/	38614
114	(patient* adj3 (empower* or engag* or activat*)).ab,kf,ti.	24789
115	Decision Making/	95881
116	Decision Making, Shared/	501
117	104 or 105 or 106 or 107 or 108 or 109 or 110 or 111 or 112 or 113 or 114 or 115 or 116	398181
118	Randomized Controlled Trials as Topic/	136304
119	Controlled Clinical Trials as Topic/	5533
120	exp Case-Control Studies/	1104462
121	exp Cohort Studies/	2032616
122	Double-Blind Method/	159876
123	Single-Blind Method/	29048
124	Placebos/	35091
125	randomized controlled trial.pt.	513444
126	controlled clinical trial.pt.	93845
127	randomized.ab,kf,ti.	535031
128	(random* adj4 (allocat* or assign* or control* or clinical* or trial*)).ab,kf,ti.	568239
129	(cohort adj4 (study or studies or analys* or design*)).ab,kf,ti.	271379
130	(case adj control*).ab,kf,ti.	131888
131	((followup or follow-up) adj3 (stud* or design*)).ab,kf,ti.	75749
132	comparative.ab,kf,ti.	353793
133	(longitudinal* adj3 (stud* or design*)).ab,kf,ti.	114739
134	(prospective* adj3 (stud* or design*)).ab,kf,ti.	406744
135	(retrospective* adj3 (stud* or design*)).ab,kf,ti.	342247
136	((double or single) adj3 blind*).ab,kf,ti.	170990
137	placebo*.ab,kf,ti.	218832
138	118 or 119 or 120 or 121 or 122 or 123 or 124 or 125 or 126 or 127 or 128 or 129 or 130 or 131 or 132 or 133 or 134 or 135 or 136 or 137	3753378
139	(shoulder* adj3 (pain* or strain* or sprain* or injur* or impair* or impingement)).ab,kf,ti.	13034

140	(glenohumeral adj3 (pain* or sprain* or strain* or injur*)).ab,kf,ti.	188
141	(scapul* adj3 (pain* or sprain* or strain* or injur*)).ab,kf,ti.	479
142	(acromioclavicular adj3 (pain* or sprain* or strain* or injur*)).ab,kf,ti.	411
143	(rotator cuff adj3 (injur* or disorder*)).ab,kf,ti.	849
144	(rotator cuff adj3 (sprain* or strain* or tear* or bursitis or tendinitis or impingement)).ab,kf,ti.	6129
145	(shoulder* adj3 (tendinopathy or tendinitis or tendonitis or capsulitis)).ab,kf,ti.	769
146	(supraspinatus adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	835
147	(infraspinatus adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	188
148	(subscapularis adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	462
149	(teres minor adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	17
150	(teres major adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	10
151	(trapezius adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	148
152	(deltoid adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	108
153	(bicep* adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	303
154	(bicipital adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	39
155	(coracobrachialis adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.	1
156	(shoulder adj3 (sprain* or tear*)).ab,kf,ti.	386
157	(capsul* adj3 (sprain* or tear*)).ab,kf,ti.	763
158	(buttock* adj3 (injur* or pain*)).ab,kf,ti.	753
159	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83 or 84 or 85 or 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101 or 102 or 103 or 139 or 140 or 141 or 142 or 143 or 144 or 145 or 146 or 147 or 148 or 149 or 150 or 151 or 152 or 153 or 154 or 155 or 156 or 157 or 158	921860
160	117 and 138 and 159	3806
161	160 not (animal* not human*).ab,kf,ti.	3794
162	limit 161 to english language	3605
163	(comment or editorial or letter or clinical conference or review or guideline or practice guideline or case reports).pt.	6361262
164	162 not 163	

Appendix 2. Peer Review of Electronic Search Strategies (PRESS) Checklist

SEARCH SUBMISSION: THIS SECTION TO BE FILLED IN BY THE SEARCHER

Searcher: Kent Stuber	Email: kjstuber@gmail.com
Date submitted: June 5, 2020	Date requested by: September 21, 2020

Systematic Review Title:
Are patient-centred care interventions effective for the management of chronic musculoskeletal conditions? A systematic review

This search strategy is …

X	My PRIMARY (core) database strategy — First time submitting a strategy for search question and database
	My PRIMARY (core) strategy — Follow-up review NOT the first time submitting a strategy for search question and database. If this is a response to peer review, itemize the changes made to the review suggestions
	SECONDARY search strategy— First time submitting a strategy for search question and database
	SECONDARY search strategy — NOT the first time submitting a strategy for search question and database. If this is a response to peer review, itemize the changes made to the review suggestions

Database
MEDLINE

Interface
Ovid Technologies Inc

Research Question
Are patient-centred care interventions effective for the management of chronic musculoskeletal conditions when compared with other interventions or no intervention?

PICO Format
(Outline the PICOs for your question — i.e., Patient, Intervention, Comparison, Outcome, and Study Design — as applicable)

P	Adult patients (≥ 18 years old) with chronic musculoskeletal conditions
I	Non-surgical patient-centred treatment programs that involve patient participation in the decision making process and/or individualized/tailored treatment.
C	Other interventions or no intervention, wait list (wait and see), placebo/sham
O	Clinical outcomes (pain intensity/severity, disability), self-rated or functional recovery, health-related quality of life, self-efficacy, satisfaction
S	RCT, cohort studies, case control studies

Inclusion Criteria

The inclusion criteria for articles to be included in the systematic review consist of the following:

1. published in peer-reviewed journals;
2. written in the English language;
3. published since inception to September 15, 2020
4. outcome measures include pain intensity/severity, disability, self-rated or functional recovery, health-related quality of life, self-efficacy, satisfaction
5. study designs consist of randomized controlled trials, case control, and cohort studies;
6. Studies in which at least one treatment arm includes non-surgical patient-centred care interventions that include patient participation in the decision making process and/or tailored/individualized treatment plans.

For the purposes of this systematic review, chronic musculoskeletal conditions were defined as any condition affecting the muscles, joints, bones, ligaments, tendons, fascia or other connective tissues for a minimum of three months.

Exclusion Criteria

Articles will be excluded from the systematic review if they:

1. do not include or separately analyze patients with chronic musculoskeletal conditions;
2. are studies that only assess surgical interventions;
3. are studies that only assess administrative outcomes;
4. are pilot studies, cross-sectional studies, qualitative designs, case series and reports, study protocols, narrative, scoping, or systematic reviews, consensus statements or clinical practice guidelines, biomechanical or laboratory studies, cadaveric or animal studies, conference proceedings, meeting abstracts, dissertations, lectures and addresses, books and book chapters, commentaries, letters, or editorials, or unpublished manuscripts.

Was a search filter applied?

No ■ ■

Please copy and paste your search strategy here, exactly as run, including the number of hits per line. ***[mandatory]***

1. Chronic Pain/
2. (chronic adj5 pain*).ab,kf,ti.
3. Multiple Chronic Conditions/
4. **or/1-4 [**chronic conditions]**

5. exp Musculoskeletal Pain/
6. musculoskeletal*.ab,kf,ti.
7. Whiplash Injuries/
8. Neck Pain/
9. Neck Injuries/
10. Radiculopathy/
11. neck pain*.ab,kf,ti.
12. whiplash*.ab,kf,ti.
13. neck injur*.ab,kf,ti.
14. (neck ache* or neckache*).ab,kf,ti.
15. brachial plexus neuropath*.ab,kf,ti.
16. Torticollis*.ab,kf,ti.
17. exp Back Injuries/
18. exp Back Pain/
19. Intervertebral Disc Degeneration/
20. Intervertebral Disc Displacement/

21. Piriformis Muscle Syndrome/
22. Sciatica/
23. back pain*.ab,kf,ti.
24. low* back pain*.ab,kf,ti.
25. (lumbar disc* adj3 (extruded or degenerat* or herniat* or prolapse* or sequestered or slipped)).ab,kf,ti.
26. (lumbar disk* adj3 (extruded or degenerat* or herniat* or prolapse* or sequestered or slipped)).ab,kf,ti.
27. (back adj3 (ache* or injur* or pain*)).ab,kf,ti.
28. (backache* adj3 (injur* or pain*)).ab,kf,ti.
29. exp Osteoarthritis/
30. Osteoarthritis, Spine/
31. Spinal Diseases/
32. Spinal Stenosis/
33. (osteoarthritis adj3 (neck or cervical or shoulder or thoracic or spin* or lumbar or low back or hip or knee)).ab,kf,ti
34. osteoarthritis.ab,kf,ti
35. spondylosis.ab,kf,ti.
36. (lumbar adj3 (pain or facet or nerve root* or osteoarthritis or radicul* or spinal stenosis or spondylo* or zygapophys*)).ab,kf,ti.
37. degenerative joint disease*.ab,kf,ti.
38. degenerative disk disease*.ab,kf,ti
39. degenerative disc disease*.ab,kf,ti
40. spinal stenosis.ab,kf,ti
41. piriformis syndrome.ab,kf,ti.
42. rheumatoid arthritis.ab,kf,ti
43. arthritis.ab,kf,ti
44. muscle pain*.ab,kf,ti
45. fibromyalgia*.ab,kf,ti
46. myalgia*.ab,kf,ti.
47. chronic widespread pain.ab,kf,ti
48. myofascial pain*.ab,kf,ti.
49. headache*.ab,kf,ti
50. migraine*.ab,kf,ti
51. exp Cumulative Trauma Disorders/
52. Bursitis/
53. Shoulder Pain/
54. Shoulder Impingement Syndrome/
55. exp Arm Injuries/
56. Wrist Injuries/
57. exp Hand Injuries/
58. exp Tendinopathy/
59. exp Median Neuropathy/
60. exp Radial Neuropathy/
61. exp Ulnar Neuropathies/
62. Thoracic Outlet Syndrome/
63. upper extremit* injur*.ab,kf,ti.
64. bursitis.ab,kf,ti.
65. cumulative trauma disorder*.ab,kf,ti.
66. tendinosis.ab,kf,ti.
67. tendinopath*.ab,kf,ti.
68. (repetit* adj3 (strain* or sprain* or injur* or disorder*)).ab,kf,ti.
69. (upper extremit* adj3 (strain* or sprain* or injur* or disorder*)).ab,kf,ti.
70. (upper limb* adj3 (strain* or sprain* or injur* or disorder*)).ab,kf,ti.
71. (shoulder* adj3 (pain* or strain* or sprain* or injur* or impair* or impingement)).ab,kf,ti.
72. (glenohumeral adj3 (pain* or sprain* or strain* or injur*)).ab,kf,ti.
73. scapul* adj3 (pain* or sprain* or strain* or injur*)).ab,kf,ti.

74. (acromioclavicular adj3 (pain* or sprain* or strain* or injur*)).ab,kf,ti.
75. (rotator cuff adj3 (sprain* or strain* or tear* or bursitis or tendinitis or impingement
76. (shoulder* adj3 (tendinopathy or tendinitis or tendonitis or capsulitis)).ab,kf,ti.
77. (supraspinatus adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
78. (infraspinatus adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
79. (subscapularis adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
80. teres minor adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
81. teres major adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
82. trapezius adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
83. (deltoid adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
84. (bicep* adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
85. (bicipital adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
86. (coracobrachialis adj3 (impingement or strain* or tear* or pain*)).ab,kf,ti.
87. shoulder adj3 (sprain* or tear*)).ab,kf,ti.
88. (capsul* adj3 (sprain* or tear*)).ab,kf,ti.
89. (arm* adj3 (injur* or pain*)).ab,kf,ti.
90. (elbow* adj3 (injur* or pain*)).ab,kf,ti.
91. (wrist* adj3 (injur* or pain*)).ab,kf,ti.
92. (forearm* adj3 (injur* or pain*)).ab,kf,ti
93. (hand* adj3 (injur* or pain*)).ab,kf,ti.
94. carpal tunnel syndrome.ab,kf,ti.
95. (medial and (epicondylitis or epicondylosis or epicondylopathy)).ab,kf,ti.
96. (lateral and (epicondylitis or epicondylosis or epicondylopathy)).ab,kf,ti.
97. biceps tend?nitis. ab,kf,ti.
98. frozen shoulder.ab,kf,ti.
99. (shoulder and capsul* and (sprain* or tear*)).ab,kf,ti.
100.thoracic outlet syndrome*.ab,kf,ti.
101.tennis elbow.ab,kf,ti.
102.epicondyl*.ab,kf,ti.
103.(median adj neuropath*).ab,kf,ti.
104.(radial adj neuropath*).ab,kf,ti.
105.(ulnar adj neuropath*).ab,kf,ti.
106.exp Hip Injuries/
107.exp Leg Injuries/
108.exp Knee Injuries/
109.exp Foot Injuries/
110.exp Ankle Injuries/
111.Fasciitis, Plantar/
112.(lower adj3 (extremit* or limb* or injur*)).ab,kf,ti.
113.(buttock* and (injur* or pain*)).ab,kf,ti.
114.(hip* adj3 (injur* or pain*)).ab,kf,ti.
115.(knee* adj3 (injur* or pain*)).ab,kf,ti.
116.(leg* adj3 (injur* or pain*)).ab,kf,ti.
117.(thigh* adj3 (injur* or pain*)).ab,kf,ti.
118.(ankle* and (sprain* or strain* or injur*)).ab,kf,ti.
119.(foot* adj3 (injur* or pain*)).ab,kf,ti.
120.patellofemoral pain syndrome*.ab,kf,ti.
121.patellar tendon*.ab,kf,ti.
122.plantar fasciitis.ab,kf,ti
123.or/6-123 [MSK pain]**
124.4 OR 123 [chronic MSK]**

125.patient* adj3 (tailor* or centered or centred or focus* or oriented).ab,kf,ti.
126.person* adj3 (tailor* or centered or centred or focus* or oriented).ab,kf,ti.
127.client* adj3 (tailor* or centered or centred or focus* or oriented).ab,kf,ti.
128.(individualiz*or individualis*)*.ab,kf,ti.
129.exp Patient-Centered Care/

130.Professional-Patient Relations/
131.Professional-Family Relations/
132.Physician-Patient Relations/
133.Patient Participation/
134.Patient Care Planning/
135.patient* adj3 (empower* or engag* or activat*)).ab,kf,ti.
136.Decision Making/
137.Decision Making, Shared/
138.or/125-137 [patient centred]**

139.Randomized Controlled Trials as Topic/
140.Controlled Clinical Trials as Topic/
141.exp Case-Control Studies/
142.exp Cohort Studies/
143.Double-Blind Method/
144.Single-Blind Method/
145.Placebos/
146.randomized controlled trial.pt.
147.controlled clinical trial.pt.
148.randomized.ab,kf,ti.
149.(random* adj4 (allocat* or assign* or control* or clinical or trial*)).ab,kf,ti.
150.(cohort adj4 (study or studies or analys* or design*)).ab,kf,ti.
151.(case adj control*).ab,kf,ti.
152.((followup or follow-up) adj3 (stud* or design*)).ab,kf,ti.
153.comparative.ab,kf,ti.
154.(longitudinal* adj3 (stud* or design*)).ab,kf,ti.
155.(prospective adj3 (stud* or design*)).ab,kf,ti.
156.(retrospective adj3 (stud* or design*)).ab,kf,ti.
157.((double or single) adj3 blind*).ab,kf,ti.
158."placebo*".ab,kf,ti.
159.or/139-158 [study designs]**

160.124 and 138 and 159 [chronic musculoskeletal AND patient centred AND study designs]**

161.160 not (animal* not human*).ab,kf,ti.

162.Limit 161 to english language

163.(comment or editorial or letter or clinical conference or review or guideline or practice guideline or case reports).pt.

164.162 NOT 163

PEER REVIEW ASSESSMENT: THIS SECTION TO BE FILLED IN BY THE REVIEWER

Reviewer: Anne Taylor-Vaisey	Email: Anne.TaylorVaisey@uoit.ca Date: August 10, 2020

1. TRANSLATION

A ---No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	☐

If “B” or “C,” please provide an explanation or example:

2. BOOLEAN AND PROXIMITY OPERATORS

A ---No revisions	x
B --- Revision(s) suggested	☐
C --- Revision(s) required	☐

If “B” or “C,” please provide an explanation or example:

3. SUBJECT HEADINGS

A ---No revisions	x
B --- Revision(s) suggested	☐
C --- Revision(s) required	☐

If “B” or “C,” please provide an explanation or example:

4. TEXT WORD SEARCHING

A ---No revisions	☐
B --- Revision(s)suggested	x
C --- Revision(s) required	☐

If “B” or “C,” please provide an explanation or example:

Some words should have * applied, to increase the retrieval. See lines 24, and between # 39- #50.

Why use .mp when ab,kf,ti has already been used? See lines 2, 35, 39. I have made notes on the chronic section. I would rename this “chronic conditions”, since the research question addresses more than pain.

5. SPELLING, SYNTAX, AND LINE NUMBERS

A ---No revisions	x
B --- Revision(s)suggested	☐
C --- Revision(s) required	☐

If “B” or “C,” please provide an explanation or example:

6. LIMITS AND FILTERS

A ---No revisions	☐
B --- Revision(s) suggested	☐
C --- Revision(s) required	x

If “B” or “C,” please provide an explanation or example:

Using the “human” limit in Ovid limits to records fully indexed with MeSH terms. Many recent records not yet indexed with MeSH terms would be lost. (I checked!)

OVERALL EVALUATION (Note: If one or more “revision required” is noted above, the response below must be “revisions required”.)

A ---No revisions	☐
B --- Revision(s) suggested	x
C --- Revision(s) required	☐

Additional comments:

This is a very thorough search strategy that addresses the research question very well. I have made comments on the search strategy in red, but I address nothing major.

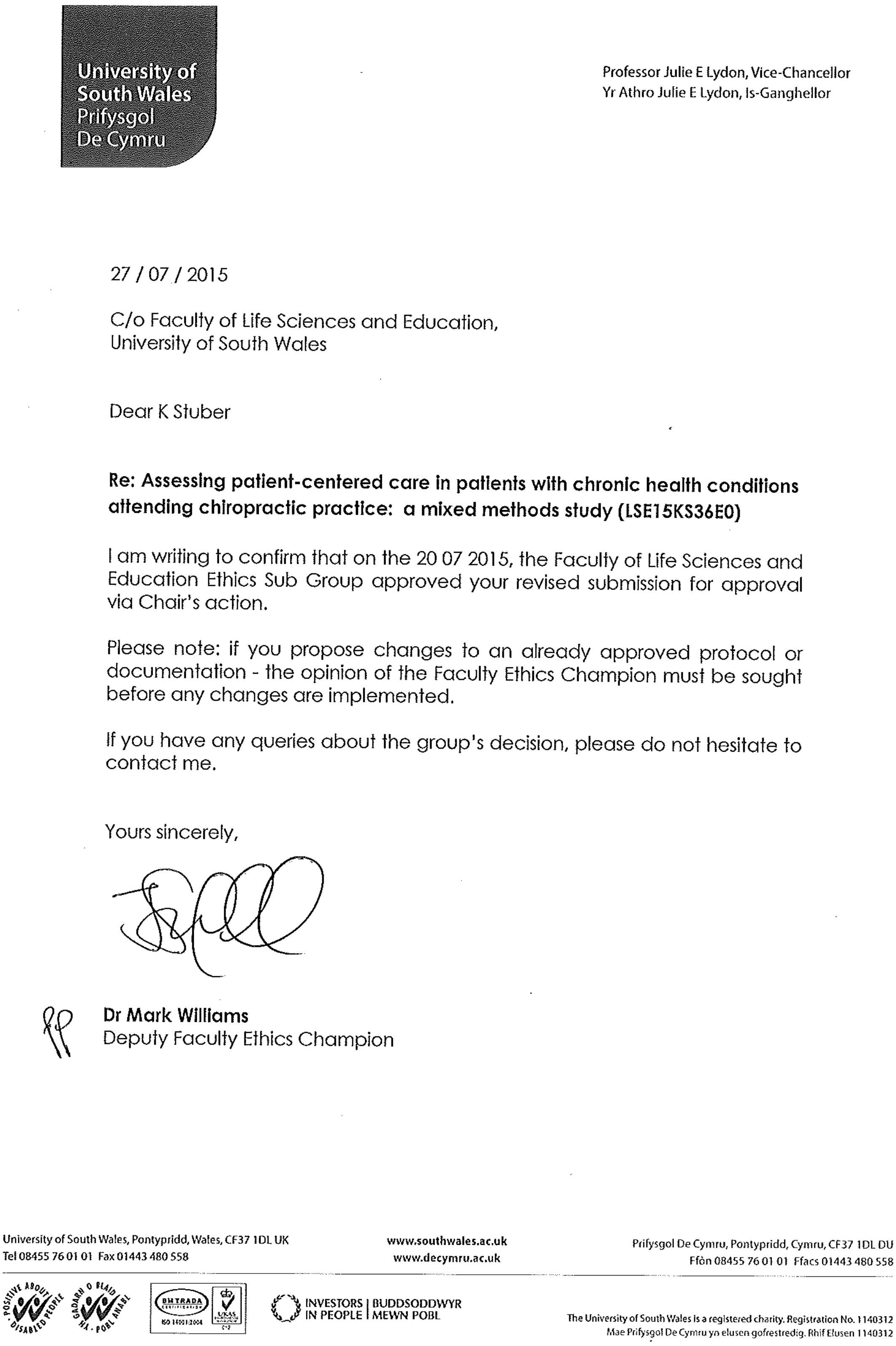
I have a problem with the “human” limiter, because using this would exclude a large number of recent publications. Some animal studies could be excluded by including a set of animal MeSH terms, and NOTing these out. I suspect there would not be many animal studies in a search involving patient centred care. I would like to see how a second librarian reviewer would handle this problem of retrieving animal studies.

My suggestions will increase the results in several sections of the strategy, but when all are combined, the results should not be unmanageable. I would like to have seen the results included with the search strategy.

Overall, an excellent strategy! I hope that my suggestions will refine it.

Sincerely,
Anne

Appendix 3. Ethics approvals



University of
South Wales
Prifysgol
De Cymru

Professor Julie E Lydon, Vice-Chancellor
Yr Athro Julie E Lydon, Is-Ganghellor

27 / 07 / 2015

C/o Faculty of Life Sciences and Education,
University of South Wales

Dear K Stuber

Re: Assessing patient-centered care in patients with chronic health conditions attending chiropractic practice: a mixed methods study (LSE15KS36E0)

I am writing to confirm that on the 20 07 2015, the Faculty of Life Sciences and Education Ethics Sub Group approved your revised submission for approval via Chair's action.

Please note: if you propose changes to an already approved protocol or documentation - the opinion of the Faculty Ethics Champion must be sought before any changes are implemented.

If you have any queries about the group's decision, please do not hesitate to contact me.

Yours sincerely,

Dr Mark Williams
Deputy Faculty Ethics Champion

University of South Wales, Pontypridd, Wales, CF37 1DL UK
Tel 08455 76 01 01 Fax 01443 480 558

www.southwales.ac.uk
www.decymru.ac.uk

Prifysgol De Cymru, Pontypridd, Cymru, CF37 1DL DU
Ffôn 08455 76 01 01 Ffacs 01443 480 558

University of South Wales
Prifysgol De Cymru

Professor Julie E Lydon OBE, Vice-Chancellor
Yr Athro Julie E Lydon OBE, Is-Ganghellor

Monday, 20th November 2017

Mr Peter McCarthy
C/o Faculty of Life Sciences and Education University of South Wales

Dear Kent Stuber,

Faculty Ethics Sub Group Feedback – 'Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study.' [2017KS1101]

I am writing to confirm that on the 20th November 2017, the Faculty of Life Sciences and Education Ethics Sub Group approved your submission for ethical approval.

Please note:

i. Approval is valid for 2 years from the date of issue, you will be notified when approval has expired but you are expected to be mindful of this expiration. Upon the expiration of this ethics approval you may apply for an extension.
ii. The approved documents are attached. If you intend on deviating from the approved protocol, research team, or documentation you will need to seek approval for any changes.
iii. This approval does not confirm that indemnity or insurance are in place for this project.
iv. Please confirm when your research project has closed (a one page closure report highlighting any recruitment issues, adverse events, publications etc. should be appended).

If you have any queries about the committee's decision, please do not hesitate to contact me. Yours sincerely,

Professor Peter McCarthy
Chair of Faculty Ethics Committee

University of South Wales, Newport City Campus,
Usk Way, Newport, NP20 2BP UK
Tel 03455 76 01 01 Fax 01633 432 046

www.southwales.ac.uk
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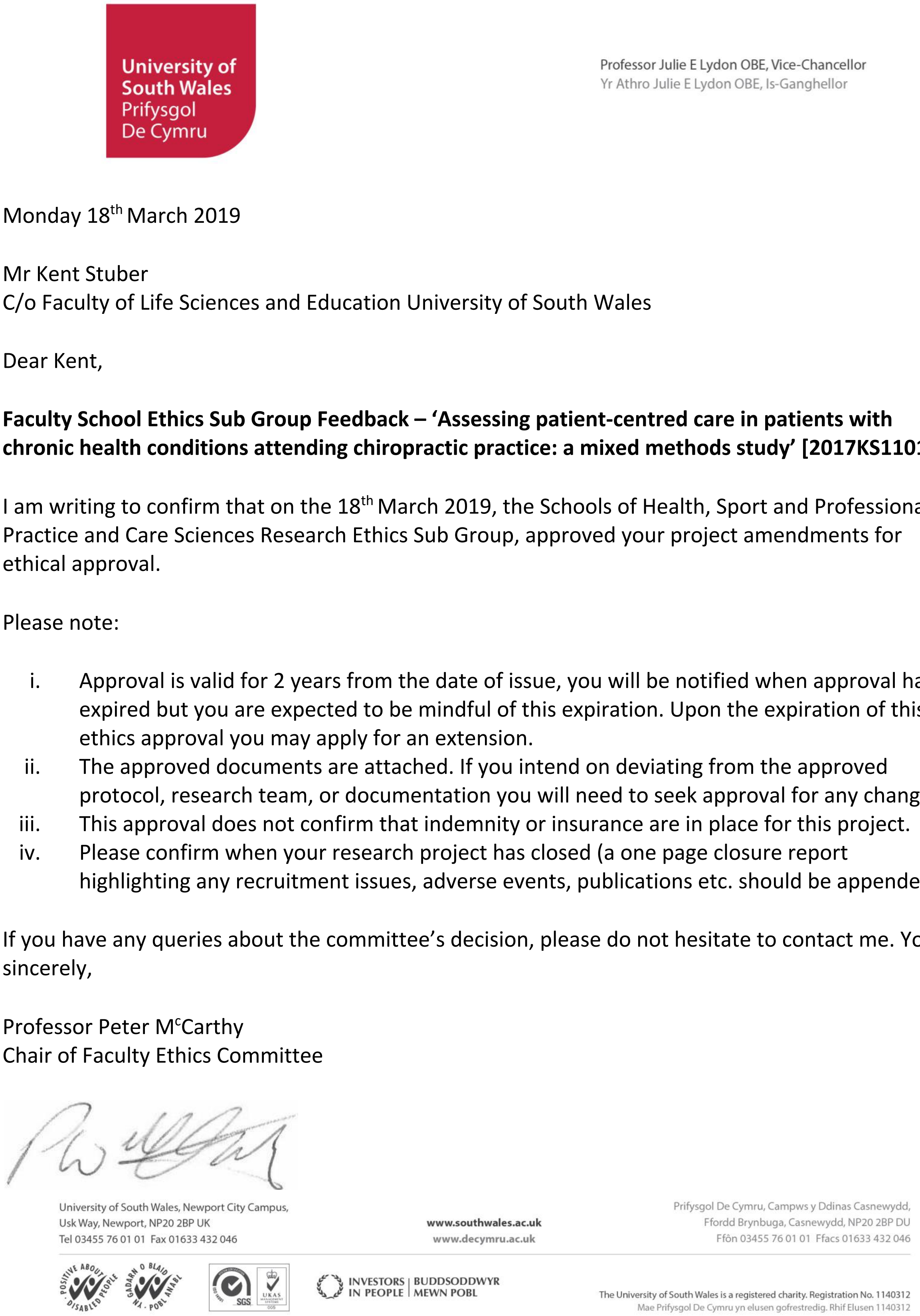

University of South Wales
Prifysgol De Cymru

Professor Julie E Lydon OBE, Vice-Chancellor
Yr Athro Julie E Lydon OBE, Is-Ganghellor

Monday 18th March 2019

Mr Kent Stuber
C/o Faculty of Life Sciences and Education University of South Wales

Dear Kent,

Faculty School Ethics Sub Group Feedback – 'Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study' [2017KS1101]

I am writing to confirm that on the 18th March 2019, the Schools of Health, Sport and Professional Practice and Care Sciences Research Ethics Sub Group, approved your project amendments for ethical approval.

Please note:

i. Approval is valid for 2 years from the date of issue, you will be notified when approval has expired but you are expected to be mindful of this expiration. Upon the expiration of this ethics approval you may apply for an extension.
ii. The approved documents are attached. If you intend on deviating from the approved protocol, research team, or documentation you will need to seek approval for any changes.
iii. This approval does not confirm that indemnity or insurance are in place for this project.
iv. Please confirm when your research project has closed (a one page closure report highlighting any recruitment issues, adverse events, publications etc. should be appended).

If you have any queries about the committee's decision, please do not hesitate to contact me. Yours sincerely,

Professor Peter M^{c}Carthy
Chair of Faculty Ethics Committee

University of South Wales, Newport City Campus,
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Tel 03455 76 01 01 Fax 01633 432 046

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Ffôn 03455 76 01 01 Ffacs 01633 432 046

Certificate of REB Approval

Project Number 152020

Principal Investigator Stuber, Kent

Faculty Supervisor Faculty Project

REB Approval 1510X01

The project entitled Assessing patient-centered care in patients with chronic health conditions attending chiropractic practice: pilot study for a mixed-methods study.

has received CMCC REB Approval as of: 01-Oct-15

This approval expires in one year. The status of the project must be reported in advance of: 01-Oct-16

The investigator, or in the case where this pertains to a Student Investigative Project, the faculty supervisor, is responsible for ensuring that the work is conducted in accordance with the CMCC's Research Policy and the Research Procedure manual.

The investigator/faculty supervisor is responsible for notifying the ORA when this study is completed.

John Triano DC, PhD

October-01-15

John Triano, DC, PhD

Chair, Research Ethics Board

Certificate of REB Approval

Project Number 152020

Principal Investigator Stuber, Kent

Faculty Supervisor Faculty Project

REB Approval 1609X07

The project entitled Assessing patient-centered care in patients with chronic health conditions attending chiropractic practice: pilot study for a mixed-methods study.

has received CMCC REB Approval as of: 01-Oct-16

This approval expires in one year. The status of the project must be reported in advance of: 01-Oct-17

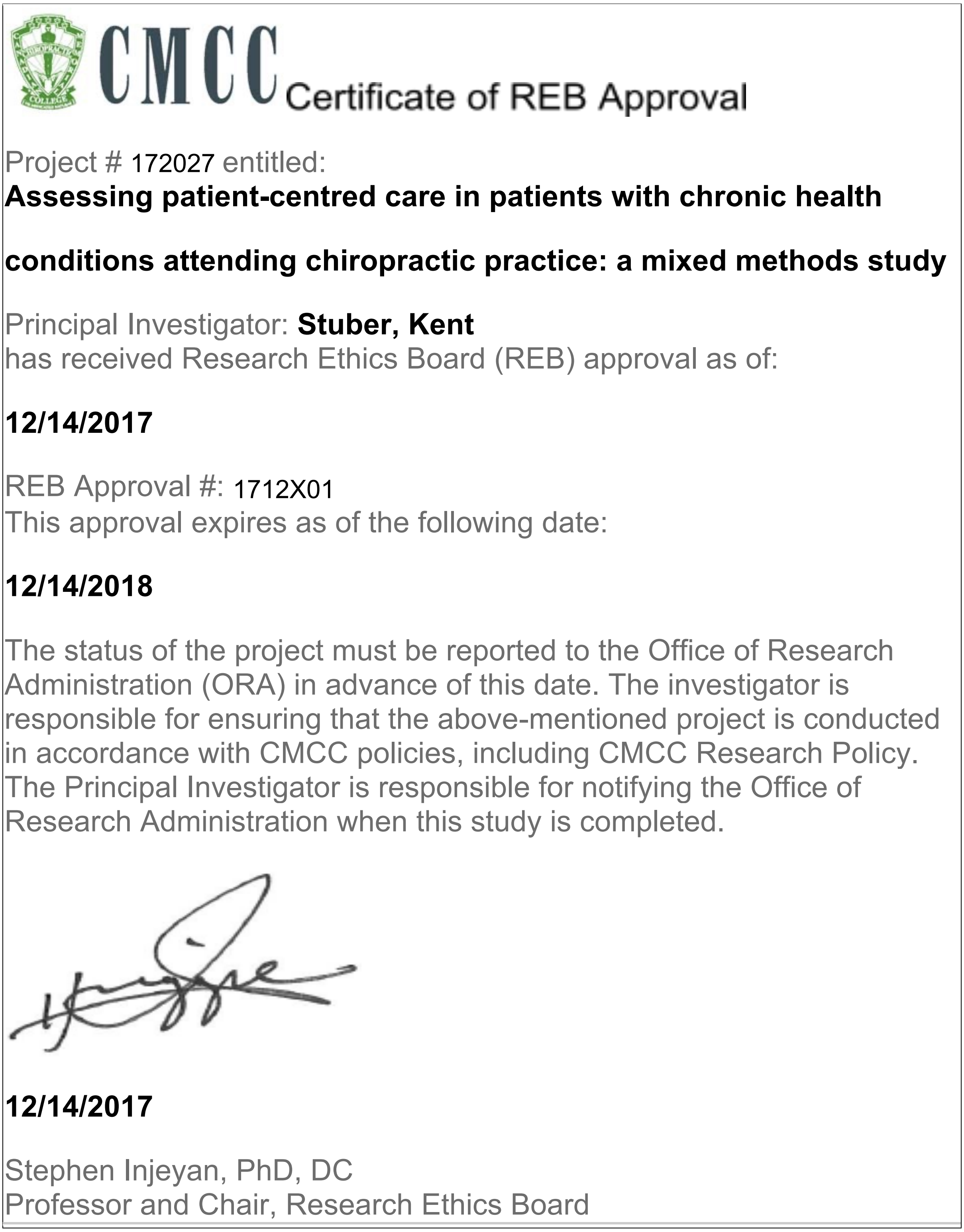
The investigator, or in the case where this pertains to a Student Investigative Project, the faculty supervisor, is responsible for ensuring that the work is conducted in accordance with the CMCC's Research Policy and the Research Procedure manual.

The investigator/faculty supervisor is responsible for notifying the ORA when this study is completed.

September-26-16

Mark Fillery, BA

Research Administrator, Office of Research Administration



CMCC Certificate of REB Approval

Project # 172027 entitled:

Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study

Principal Investigator: **Stuber, Kent**
has received Research Ethics Board (REB) approval as of:

12/14/2017

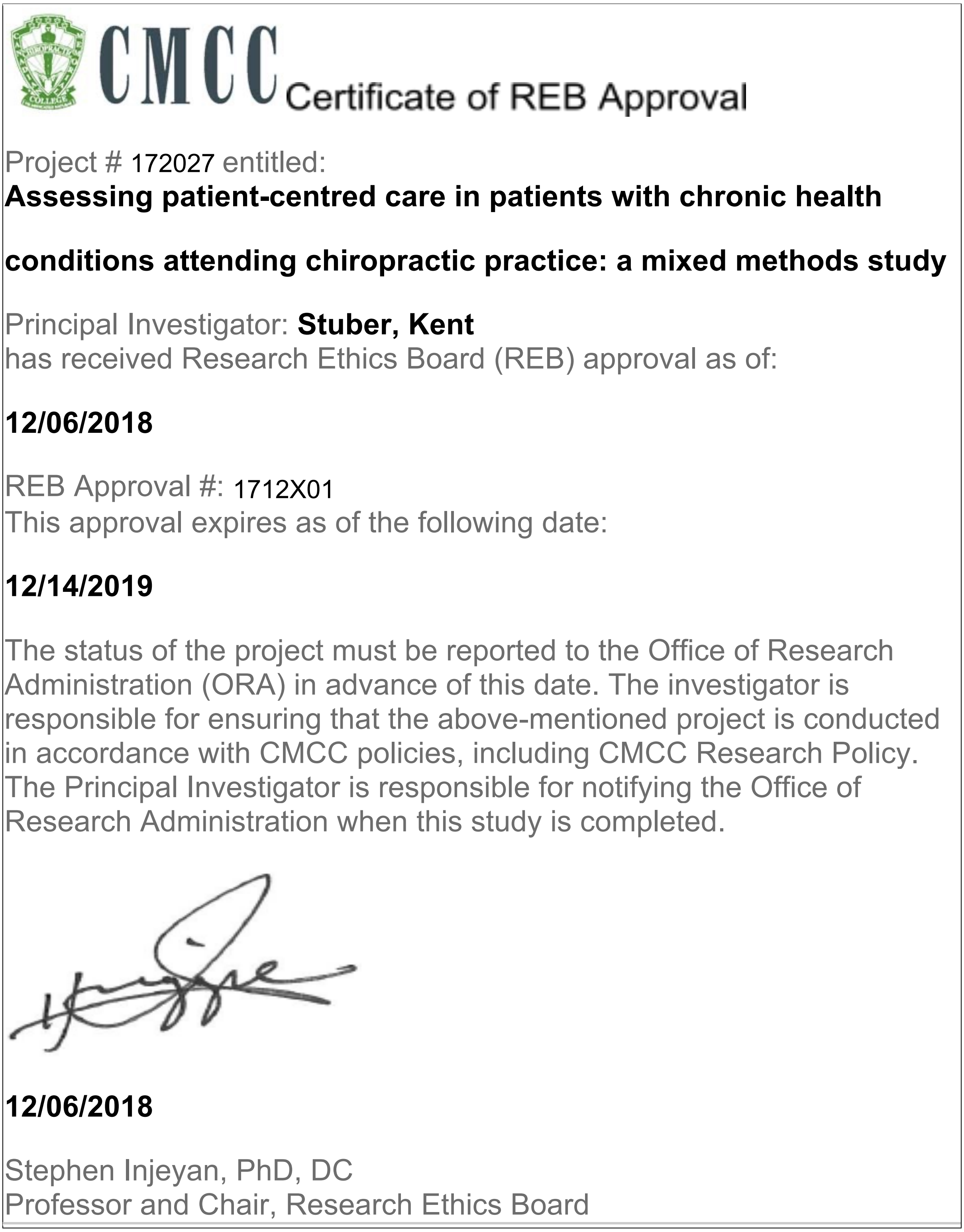
REB Approval #: 1712X01
This approval expires as of the following date:

12/14/2018

The status of the project must be reported to the Office of Research Administration (ORA) in advance of this date. The investigator is responsible for ensuring that the above-mentioned project is conducted in accordance with CMCC policies, including CMCC Research Policy. The Principal Investigator is responsible for notifying the Office of Research Administration when this study is completed.

12/14/2017

Stephen Injeyan, PhD, DC
Professor and Chair, Research Ethics Board



CMCC Certificate of REB Approval

Project # 172027 entitled:

Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study

Principal Investigator: **Stuber, Kent**
has received Research Ethics Board (REB) approval as of:

12/06/2018

REB Approval #: 1712X01
This approval expires as of the following date:

12/14/2019

The status of the project must be reported to the Office of Research Administration (ORA) in advance of this date. The investigator is responsible for ensuring that the above-mentioned project is conducted in accordance with CMCC policies, including CMCC Research Policy. The Principal Investigator is responsible for notifying the Office of Research Administration when this study is completed.

12/06/2018

Stephen Injeyan, PhD, DC
Professor and Chair, Research Ethics Board

Appendix 4. Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a protocol for a mixed methods study

Stuber *et al. Chiropractic & Manual Therapies* (2016) 24:15
DOI 10.1186/s12998-016-0095-x

Chiropractic &
Manual Therapies

METHODOLOGY Open Access

Assessing patient-centered care in patients with chronic health conditions attending chiropractic practice: protocol for a mixed-methods study

Kent Jason Stuber[1,2*], Mark Langweiler[2], Silvano Mior[3] and Peter William McCarthy[2]

Abstract

Background: The management of chronic health conditions increasingly requires an organized, coordinated, and patient-centered approach to care. The Chronic Care Model (CCM) has been adopted in primary care to improve care delivery for those with chronic health conditions. Chiropractors manage chronic health conditions; however, little is known if such care is patient-centered. The primary aim of this study is to determine to what extent chiropractic patients with chronic health conditions perceive their care is patient-centred. We will assess concordance with the CCM using the Patient Assessment of Chronic Illness Care (PACIC) survey in study patients. We will also explore perception of how patient-centered the care provided by chiropractors is for those with chronic health conditions according to patients and chiropractors.

Methods/design: We will use a sequential mixed methods design with quantitative priority. In the quantitative component patients will complete a written questionnaire providing sociodemographic, health status, and health care interaction information, all of which will serve as the independent variables. Patients will also complete a modified version of the PACIC; the average overall score will be the dependent variable. In the qualitative component semi-structured interviews and focus groups with patients and chiropractors will be conducted. A pilot study will be conducted to determine if the modified PACIC will perform adequately in measuring concordance with the CCM for chiropractic care. Pilot testing will also allow for assessment of the interview and focus groups guides. Variables found to be significantly associated will be included in a multivariate linear regression analysis to identify significant predictors of the dependent variable. Qualitative data will be analyzed using an inductive thematic analysis to provide meaning to the quantitative results.

Discussion: There is a paucity of research describing the extent to which chiropractic care for patients with chronic health conditions is concordant with the CCM. This study will examine this relationship and the perceptions and experiences of patients and chiropractors regarding how patient-centered chiropractic care is for these patients.

Keywords: Chronic, Chiropractic, Patient-centered, Mixed methods, Study protocol, Chronic Care Model

---

* Correspondence: kstuber@cmcc.ca
[1] Division of Graduate Education and Research, Canadian Memorial Chiropractic College, Toronto, Ontario, Canada
[2] Faculty of Life Sciences and Education, University of South Wales, Treforest, Wales
Full list of author information is available at the end of the article

Background

Introduction

Chronic non-communicable health conditions are highly prevalent in Western society. The World Health Organization identifies four main chronic conditions: cardiovascular diseases, respiratory diseases, diabetes, and cancer [1]. Notwithstanding this, other chronic conditions including musculoskeletal conditions, e.g. arthritis, also have substantial impact on quality of life, mobility and independence, resulting in significant health care costs [2–4]. A large European study found that 19 % of respondents had moderate or severe chronic pain [5]. In that study among the most commonly cited body regions for chronic pain were back pain (lower back and unspecified back pain), knee pain, and head pain [5]. The most commonly cited causes of chronic pain were arthritis/osteoarthritis, herniated/deteriorating discs, and traumatic injury [5]. Population estimates of the prevalence of chronic conditions vary, often due to its differing definitions, but typically range between 25 and 50 % of the adult population [3, 6–8]. A commonly noted trend is the increasing prevalence of chronic conditions with advancing age [2, 4, 6–9]. Furthermore, as age increases, so too does the frequency of multiple chronic conditions within the same patient [6, 8]. Chronic conditions will become more prevalent as the demographics change and the population ages, with concomitant increases in health care demands and economic burdens [2, 9]. While there is still no consensus definition, typically a condition is defined as chronic if it has a prolonged duration and imposes a functional limitation on the patient that requires some form of health care intervention [9]. The length of the duration required for a disease to be classed as chronic can vary from 3 months to 1 year [9].

Chronic health conditions present unique challenges for patients, families, and health care professionals alike [10]. The long-term course of chronic conditions and their frequently changing impact on patients' lives lead to a need for ongoing planning and decision-making with respect to treatment and self-management [10, 11]. As a result, Wagner et al. [11] developed the Chronic Care Model (CCM) to improve the delivery of care in patients with chronic health conditions [10]. The CCM is a multi-dimensional framework that has been widely adopted for managing chronic health conditions in a proactive, organized, patient-centered, and evidence-based manner, whether in large health care organizations or small clinics [10–12]. The CCM consists of six interrelated elements: health care system organization, links to community resources, self-management support, delivery system design, decision support, and clinical information systems [10]. Studies evaluating the implementation of the CCM suggest improved quality of care and outcomes in patients with chronic health conditions [12]. Preliminary evidence suggests that it may also be cost-effective in the long-term [12].

The CCM is patient-centered and emphasizes patient self-management in concert with organized care [13]. In 2001 the Institute of Medicine (IOM) identified patient-centered health care as one of its six specific aims for the improvement of health care [13]. The IOM defined patient-centered care as "care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions [13]." Patient-centered health care is multifaceted; for example, the framework set forth by Mead and Bower [14] is composed of five dimensions: the biopsychosocial perspective, acknowledging the patient-as-person, sharing power and responsibility, creation of a therapeutic alliance, and acknowledging the doctor-as-person. Being patient-centered is a reasonable goal at both individual clinical and system-wide levels as it allows patients more input and control over their own health. There is increasing evidence that patient-centered approaches to care improve patient satisfaction, health behaviours and status for patients particularly when providers receive training in patient-centeredness and provide condition-specific educational materials and/or training for patients [15].

Chiropractic has been identified as being patient-centered [16–18]. Chiropractors predominantly see patients with musculoskeletal complaints; with spinal pain accounting for the majority of patients they see [19–22]. Chronic back and neck pain are common amongst these patients [23–27], who regularly present with other chronic conditions [20]. In Canada those with chronic back pain are three times more likely to see a chiropractor than those without chronic back pain [28]. Alarmingly, the rates of chronic back pain appear to be on the rise [23, 24] and spinal pain remains common as people age [26, 29].

Previous interview-based research with chiropractors has indicated that they consider patient-centeredness to be an important component of care [30, 31]. Surveys of other health professions have indicated that they perceive chiropractic care to be patient-centered [32, 33]. Increasingly authors are calling on chiropractors to be part of patient-centered collaborative care models [34–36] and trials are emerging that evaluate such models [37, 38]. However there are no published studies, to the authors' knowledge, that address the degree to which chiropractic care for patients with chronic conditions is patient-centered. Given the emphasis placed on patient-centered care by patients and policy makers [13], it is imperative that the chiropractic profession quantifies the extent to which chiropractors practice in a patient-centered manner for those with chronic conditions. Such studies could lead to initiatives that promote changes in practitioner behavior, which would help align the profession more with the components of a patient-centered practice model, if necessary.

Study aims

The primary aim of this study is to determine to what extent chiropractic patients with chronic health conditions perceive the care that they receive to be patient-centred. The primary objective of this study is to determine how patient-centered chiropractic care is for patients with chronic health conditions by assessing concordance with the Chronic Care Model as measured by the Patient Assessment of Chronic Illness Care (PACIC) [39–41].

A secondary aim of this study is to assess both the patients' and chiropractors' perception of how "patient-centered" the care provided by chiropractors is perceived to be for those with chronic health conditions. Perceptions and experiences will be explored using individual semi-structured interviews and focus groups guided by the framework of patient-centered care.

Framework

Mead and Bower's [14] model of patient-centered care will be used to frame our understanding of patient-centeredness. Strengths of this model include the equal emphasis placed on the patient and clinician and the importance of their relationship and communication, as well as the holistic approach to patients in how their life affects and is affected by their health problems. This model is suitable in a chiropractic setting given the holistic approach to care typically espoused by chiropractors [17] and the importance of a therapeutic alliance and communication between the chiropractor and patient [18].

Methods

This project will begin with a pilot study. Both the pilot study and the main study will consist of two main components, a quantitative component followed by a qualitative component. The pilot study will be conducted to test the feasibility of the protocol and purposeful selection criteria and to develop the instruments and semi-structured interview questions. Upon completion of the pilot study any problems identified with the methods will be modified before initiating the main study. Such problems will be determined by asking participating patients, clinicians and clinical staff for their opinions. The investigators will keep a log of problems identified and determine appropriate solutions.

The study will employ a sequential mixed methods design, with a quantitative priority and a complementary qualitative approach [42–44]. This design has been chosen as it will allow the strengths of both qualitative and quantitative methods to be interwoven to provide an in-depth understanding of patients' and chiropractors' perspectives, perceptions, and experiences of patient-centered care in chiropractic. The qualitative data will be utilized to help inform and bring a deeper understanding of the quantitative data [42–45].

Sampling

The pilot study will take place in two private chiropractic clinics in Calgary, Alberta, Canada. One is a large multidisciplinary sports injury clinic (including chiropractic, sports medicine, naturopathic medicine, physiotherapy, and massage therapy) with a chiropractor whose focus is primarily on musculoskeletal injuries and a smaller clinic that offers chiropractic and massage therapy and has more of a general chiropractic practice focus, meaning that there is no identifiable clinical specialization in areas such as sports injuries, pediatrics, geriatrics, rehabilitation, orthopedics, etc. The chiropractors at both clinics each have over 10 years of experience.

The main study will take place in fifteen chiropractic clinics across Canada. Different demographic areas will be represented by purposefully selecting private clinics located in municipalities with fewer than 50,000 residents, those between 100,000 and one million residents, and centres with more than one million residents. Private clinics will be recruited so that there is fair representation of both genders among clinicians, different levels of clinician experience, and types of practice (solo versus group versus interdisciplinary/multi-disciplinary), as well as chiropractic philosophical orientations. Clinics will represent at least five of the Canadian provinces to help ensure generalizability across Canada. Calgary, Alberta; Toronto, Ontario and Swift Current, Saskatchewan will be the sites for focus group interviews in the main study.

All patients will be recruited from the participating chiropractic clinics. Both chiropractors and office staff will be trained in patient recruitment methods by a Power Point presentation. This training will inform them of the inclusion and exclusion criteria in particular (described below) and provide advice of how to approach potential participants. A poster informing patients of the study will be placed in the reception/waiting area of all participating chiropractic clinics. Front desk staff at the respective clinics will ask consecutive patients if they are interested in participating in a research study. If so, they will be asked to read a Participant Information Sheet in the waiting room and consider their involvement. They will be able to ask the clinician questions about the study if necessary. After their visit, the staff will ask them if they are still interested in participating. After due consideration if they agree to participate they will then be asked to complete an Informed Consent form and accompanying questionnaire.

For the qualitative component, a subgroup of patients who provide their names, e-mail address or telephone numbers will be contacted by the Principal Investigator to arrange a time and place for the interview.

Purposeful selection

For inclusion in the study all participants must be adults (over the age of 18 years) and able to read and speak English. Participating patients must have seen the same chiropractor at the respective clinic at least three times. This number of visits was selected so that patients would have sufficient familiarity with the chiropractic clinic and their approach to care to answer the questions posed to them. Participating patients must also have a chronic health condition. For the purposes of this study, a chronic health condition will be defined as any condition having a minimum 1 year duration affecting an organ system, including musculoskeletal, neurological, cardiovascular, etc. that has required health care treatment and/or resulted in some form of functional limitation or disability [9]. The chronic health condition does not necessarily have to be treated by a chiropractor to be considered eligible for inclusion. Participating chiropractors must be licensed to practice chiropractic in their province, and actively engaged in practice.

Potential participants will be excluded from the study if they are under the age of 18 years old, are unable to read and speak English, or are being treated for a new condition or re-aggravation of a previous condition. Chiropractors will be excluded from the study if they are not engaged in active practice or licensed in their respective provincial jurisdiction.

Quantitative data collection

The questionnaire will ask sociodemographic and clinical information along with the modified version of the Patient Assessment of Chronic Illness Care (PACIC) [39–41]. Sociodemographic questions will include age, gender, ethnicity, and highest educational level. Clinical information will include the types of chronic health conditions that patients have, the types of health care providers that they see besides their chiropractor, the number of times they saw a chiropractor in the past 12 months, the length of time that they had been a patient at that clinic, and a subjective overall health rating.

The PACIC will be the primary outcome measure of this exploratory study. The PACIC is based upon the Chronic Care Model and measures the "receipt of patient-centered care" [39] and experience of care for those with chronic conditions [46]. The PACIC is widely used for assessing patients with a variety of chronic conditions and has been found to be reliable and valid [39–41, 46, 47]. Studies assessing individual subscale and overall PACIC Cronbach alpha scores have shown good internal consistency [39, 40, 47, 48]. Test-retest reliability for the subscales and overall PACIC score have also been found to be good [39, 41]. Glasgow et al. [39] worked with a large group of experts to develop the content validity of the PACIC and when tested the overall PACIC score had moderate to strong correlation with several convergent validity measures. Recent evidence supports construct validity of the PACIC as a measure of chronic illness care [40, 47, 48]. However, as Spicer and colleagues report (2012) [41], both confirmatory and exploratory factor analyses have provided mixed results, though they still recommend the widespread use of the PACIC. The PACIC has been validated for use in several different languages [47, 49, 50]. The PACIC is comprised of twenty questions including five subscales. The five subscales are:

i) Patient activation (three questions)
ii) Delivery system design/decision support (three questions)
iii) Goal setting/tailoring (five questions)
iv) Problem solving/contextual (four questions)
v) Follow-up/coordination (five questions).

Each question is scored using a five-point response scale where patients are asked to rate the frequency with which they receive a certain aspect of chronic care ranging from 1 = 'almost never' to 5 = 'almost always'. The overall PACIC score is generated as an average by summing the scores for each question and dividing by the total number of questions (twenty). To generate subscale scores the average scores of the questions in each particular subscale are obtained. The overall mean PACIC score and subscore means each have a score between one and five, where higher scores are indicative of care that adheres more to the CCM and as such is more patient-centered [33, 39, 42, 51].

This will be the first study to use the PACIC in a chiropractic practice setting, although it has been used in a primary care setting for patients with a musculoskeletal condition, in particular with osteoarthritis [52]. Some items of the PACIC were modified for this study based on consultation with several practicing chiropractors, thus making it more appropriate for the chiropractic practice environment. The modified version replaces "health care team" and "physician" with "chiropractor" in the instructions and removes a sentence describing the possible composition of a health care team. One of the items from the original PACIC version had "medicines" replaced with "treatments" in the modified version. Another item from the original PACIC version replaced "doctor" and "nurse" with "chiropractor" in the modified version. In three additional items "health professionals" replaced "doctors", "eye doctor" "specialist", "dietitian", "health educator", and/or "counselor". The modified version of the PACIC will not have any differences in terms of analysis methods when compared with the original PACIC.

Questionnaires will be distributed and collected by clinical staff onsite and stored securely upon completion. Completed questionnaires and consent forms will be placed into separate envelopes, sealed by the patient, and then collected by clinic staff and kept in a separate accordion-style file folder in a locked filing cabinet before being returned to the research team by secured courier. The Principal Investigator will store all questionnaires in a locked filing cabinet in a locked private office. Each questionnaire will be given a code known only to the Principal Investigator and maintained in a codebook that will be kept secured in a locked filing cabinet in a locked private office. The de-identified data in the questionnaires will be entered into a spreadsheet that is password protected on a computer that is further password protected.

For the pilot study, at each clinic forty consecutive willing patients with chronic health conditions will be enrolled in the quantitative component for a total of 80 participants [53, 54]. For the main study, participating clinics will continue to recruit subjects until the final sample size is reached. The final sample size determination for this quantitative component will be made after the pilot study [55]. However, Krucien et al. [47] identified 23 studies that have used the PACIC and sample sizes have ranged from 89 to 4108 subjects with an average of 1036 and median of 892.

Quantitative data analysis

Quantitative analysis will include the reporting of descriptive statistics for sociodemographic, health status, and health care interaction variables, the means of the five different PACIC subscores, and the overall mean PACIC score with 95 % confidence intervals for those means [39, 51]. As per Jackson et al. [56] a mean minimum score of 3.5 on the different PACIC subscales and overall PACIC score will be set as a cutoff to indicate a high level of CCM concordance. Proportions of patients indicating high versus lower levels of CCM concordance will also be reported for the individual subscales and overall score. Bivariate analyses will be conducted by testing Pearson correlations for continuous variables and *t* tests for categorical variables. This will identify independent variables that are significantly associated with the dependent variable. The dependent variable in the model is the overall PACIC score, while sociodemographic characteristics (age, gender, ethnicity, educational level), health status (number of chronic health conditions, self-rated health), and health care interaction (number of health professionals interacted with and number of times seeing the chiropractor in the past year, length of time attending that particular clinic) will be tested as the independent variables. The majority of these independent variables have been evaluated in previous studies using the PACIC [47, 56–59]. Any independent variables found to be significantly associated with PACIC scores through the bivariate analyses will be included in a multivariate linear regression analysis to identify significant predictors of the overall PACIC score [60]. The coefficient of determination (R^2), adjusted R^2, F-test of overall significance and its p-value, and standardized (beta) and unstandardized (B) coefficients and their significance, will be determined. The model will also account for clustering around practice location [57].

Qualitative data collection

The qualitative component will consist of three parts: (i) individual semi-structured patient interviews, (ii) individual semi-structured clinician interviews, and (iii) three focus group meetings that will include both patients and clinicians together. The Primary Investigator will conduct all interviews and focus group sessions, all of which will be approximately one to two hours in length and audio recorded with backup. If there are any occasions during the interviews where there is ambiguity or confusion surrounding something that a participant has said the interviewer will ensure that they ask for clarification and elaboration of the points being made. Another interviewing technique that could be used in such an event would be to reiterate what the participant said either verbatim or by paraphrasing and ask the participant to confirm or correct their understanding of the points being made. When the interviewer and participant are both satisfied that there is no longer any confusion, they will proceed to the next line of questioning. The qualitative components will take place after the analysis of the quantitative component with the focus groups following the individual interviews. The results of the quantitative analysis will form the basis of the interview guides developed for the qualitative components to aid with the understanding of the quantitative results. Similarly the quantitative and interview analyses will be used to help inform the focus group sessions.

i) Patient interviews - A subset of patients who complete the quantitative component and indicate interest in participating in individual interviews by providing their name and a contact phone number or e-mail address on their questionnaire will be asked to participate in individual interviews. The Primary Investigator will make attempts to have equal numbers of male and female subjects representing a range of ages interviewed. Between six and eight patients total will undergo the pilot patient individual interviews. Previous pilot studies of protocols involving semi-structured interviews have involved between two and 11 subjects [61, 62]. For the main study a sample size of 15 to 20 patient subjects is proposed, but recruitment will end once theoretical saturation has been achieved [63, 64]. A determination of theoretical saturation will be made as interview data are concurrently analyzed with interview data collection. The interviewer will meet the subjects at a neutral location at their convenience and conduct the interview in a private room with a single interviewer. Patients who are unable to attend the interview physically will be offered to be interviewed by telephone or videoconference.

In the patient interviews, subjects will be asked open-ended questions regarding their perceptions and experiences of how patient-centered the care they receive is. An interview guide will be developed using the analysis of the quantitative component data and will also reflect Mead and Bower's [14] framework of patient-centered care. These questions will be followed with probing questions to develop a deeper understanding of the patient's perspective of the care they received.

ii) Clinician interviews - Chiropractors at the participating clinics will be asked to participate in individual semi-structured interviews. The purpose of collecting this information will be to present a different perspective of patient-centered care, that of the clinician and allow chiropractors to indicate how they perceive the care that they offer to be patient-centered for patients with chronic health conditions. This will allow for comparison with the information garnered in the patient interviews. The clinics will be recruited so that there is fair representation of both genders, different levels of clinician experience, locations (smaller versus larger centres and in different provinces), and types of practice (solo versus group versus interdisciplinary). In the pilot study four clinicians will be interviewed. For the main study, a sample size of 15 clinicians is proposed or until theoretical saturation is achieved [63, 64]. A determination of theoretical saturation will be made as interview data will be analyzed concurrently with interview data collection.

The interviews will employ a similar structure to the patient interviews. If clinicians are unable to attend the interview physically, they will be offered the options of a telephone or videoconference interview. A separate interview guide will be developed for the clinicians based upon the analysis of the quantitative component data as well as the qualitative patient interview results and reflect the Mead and Bower framework [14]. These questions will be followed with probing questions to develop a deeper understanding of the clinician's perspective of the care they provide and how it is patient- centered.

iii) Focus Groups – In the pilot, study patients from one of the selected clinics who are interested in participating in individual interviews will also be asked if they would like to take part in a pilot focus group interview as well. The pilot focus group interview will include one chiropractor and three-to-four patients as a "mini-focus group" [65]. In the main study focus group meetings will be conducted in three different municipalities (Swift Current, Saskatchewan; Calgary, Alberta; and Toronto, Ontario,). These municipalities are of different sizes ranging from fifteen thousand people to over five million people. One municipality (Swift Current) is in a rural setting, whereas suburban clinics will be used in another setting (Calgary), and the last (Toronto) is a large urban centre. Patients interested in participating in the individual interviews will also be asked to participate in the focus group sessions. Each of the three main study focus group meetings will include ten subjects consisting of two to three practicing chiropractors and seven or eight patients [65, 66]. It is desirable to have a greater number of patients due to possible perceived power differences in clinician-patient relationships.

The purpose of the focus group sessions is to bring clinicians and patients together and have them engage in discussions about their perceptions and experiences of patient-centered care. The Primary Investigator will moderate the focus groups and meet all of the subjects at a neutral location at a time of their mutual convenience and conduct the interview in a private meeting room. For the focus group sessions, a separate interview guide will be developed. It will explore the findings of the quantitative and qualitative analysis from the individual interviews as well as both the Mead and Bower [14] and Chronic Care Models [10].

Qualitative data analysis

The audio recordings from individual and focus group interviews will be transferred into password-protected audio digital files on a secure USB flash drive. All audio digital files will be copy protected. The secure USB flash drive will be stored in a locked filing cabinet in a locked private office. The audio digital files on the secure USB flash drive will be transcribed into a word processing document by a professional transcriptionist, saved only onto the secure USB flash drive and uploaded via the secure USB flash drive to a password-protected computer accessed only by the Principal Investigator in a locked private office. The documents will also be password protected. Participants in the interviews and focus groups will be given a code known only to the Principal Investigator and maintained in a codebook that will be kept secured in a locked filing cabinet in a locked private office. A professional transcriptionist will transcribe all interviews and focus group recordings verbatim with voice inflections and sounds described in parentheses. The primary investigator will double-check a random sample of 20 % of the transcripts against the audio recordings for accuracy.

Qualitative analysis of both interview components and the focus group sessions will consist of an inductive approach using "thematic analysis" methods [67]. As such emerging themes from the interview data will be developed through the analysis, not *a priori.* The Primary Investigator, along with an experienced social scientist (known hereafter as the reviewers), will conduct the analysis of the individual and focus group meeting data using qualitative data analysis software (NVivo). For the individual patient and clinician interviews the reviewers will code interviews separately and meet after coding the first five patient or clinician interviews respectively to ensure that they are generating similar codes. After every five subsequent interviews, the reviewers will meet to ensure that they are coding consistently. A third reviewer will resolve any disagreements. After fifteen patient or clinician interviews have been conducted the reviewers will each generate themes and subthemes emerging from the coded data [67]. These emerging themes will be discussed and refined between the two reviewers with any disagreements resolved by a third reviewer [67]. For the focus group interviews, the two reviewers will code the data after each focus group session and meet to ensure consistency in coding with a third reviewer resolving any disagreements. After all three focus group meetings have been completed and the interviews have been coded, the reviewers will generate emerging themes and subthemes. These will be discussed and refined by the reviewers with a third reviewer resolving any disagreements. Triangulation of sources will be done by comparing the themes and subthemes generated through the qualitative analysis of the practitioner and patient interviews and focus group interviews [45].

In studies employing qualitative methods a potential source of bias is that coming from the researchers themselves. To account for this the reviewers will ground themselves using self-reflection by keeping a journal throughout the process of data collection and analysis [68]. The journal will be used to write memos to track thoughts and consider how that may impact the way the study is conducted or analyzed.

Ethical considerations

An information sheet and consent form will be presented to the participants by clinical front desk staff. Participants will be asked to review the information sheet and allowed to ask either the chiropractor or front desk staff questions about the project. If, after reading the study information sheet the patient is willing to volunteer for the study, the staff will witness their signature on the consent form. It is anticipated that most patients will choose whether or not to participate right away, but they will be allowed time to consider this and return at a later date (within 2 weeks) to complete the questionnaire if they so choose. A separate informed consent form will also be completed at the individual and focus group interviews.

All responses will be kept confidential. Patients will place their completed questionnaires in an envelope and seal them before giving them to clinic staff for secure storage. All records from the study will be kept private and appropriately secured. No personal information that may identify participants will be associated with participant responses in any reports. No publication that results from this study will contain identifiable information such as subject names. Manuscripts and presentations will be thoroughly reviewed and any possible identifying information will be removed.

During data entry each questionnaire will be given a code known only to the Principal Investigator for the purposes of tracking information. Any other members of the research team will only have access to de-identified data.

Those who choose to participate in the interviews or focus groups will be asked to provide their name and an e-mail address or telephone number so that the Primary Investigator alone may contact them to make suitable arrangements. Subjects will be asked not to provide their name or other identifying characteristics on the audio recording. Participants will be given a code known only to the Principal Investigator for use during the audio recording. Other members of the research team will only have access to de-identified data. The audio recordings will be transcribed by a professional transcriptionist to a password protected word processing file and uploaded to a password-protected computer accessed only by the Primary Investigator in a locked private office. At no point will the transcriptionist have access to any information that can identify the volunteers. Only the research team will have access to the data. All collected data will be retained for a period of 5 years. At that point, the Principal Investigator will shred all paper-based data and erase all data-containing digital and audio files from the audio recorders, secure USB flash drive, and computer.

Identified risks to both participating chiropractors and patients are deemed minimal and no physical risks are anticipated. The only identified disadvantage of taking part is due to the time involved in completing the questionnaire and/or the interview sessions. The greatest risk to participants is the disclosure of information provided to the research team in a manner in which the participant can be identified. Complete anonymity regarding focus group participation in this study cannot be guaranteed. Although focus group participants will be asked not to disclose anything that is discussed during the focus group, complete confidentiality cannot be assured. There is also the potential for patients and clinicians to know other individuals in the focus group sessions. The focus group sessions will take place in Toronto, Ontario; Swift Current Saskatchewan; and Calgary, Alberta and the use of only a small number of clinics in these settings is anticipated, consequently the potential for crossover of participants although possible, is deemed minimal. However, such an eventuality could reduce the anonymity of those sessions and may make some participants uncomfortable, therefore, attempts will be made to include only those patients who are not seeing the clinicians included in the study.

The only other identified risk in the individual and focus group sessions is that there is the small chance that an upsetting topic or memory may be discussed or cause some psychological distress. In the event that occurs, a referral to appropriate support services would be made available if further support is required. The topics discussed in the patient interviews should not be of a sensitive nature and, therefore it we do not expect to upset participants.

Participants who participate in the in-person qualitative interviews or focus group sessions will each receive a $50.00 gift card or pre-paid credit card in Canadian dollars to offset the costs of parking and transportation.

This study protocol has received ethical approval from the University of South Wales Faculty of Life Sciences and Education ethics subgroup (July 2015, approval LSE15KS36EO). A subsequent local approval was obtained from the Canadian Memorial Chiropractic College's Research Ethics Board (October 2015, approval 1510X01). The researchers will not have access to patient files, personal details or diagnosis, other than that freely disclosed by the patient in the interviews or on the questionnaires.

Discussion

The purpose of this study is to investigate how and to what extent chiropractic patients with chronic health conditions perceive the care that they receive to be patient-centred. To our knowledge this study will be the first to evaluate how patient-centered chiropractic care is for patients with chronic health conditions by assessing concordance with the CCM as measured by the Patient Assessment of Chronic Illness Care (PACIC).

Among the strengths of this study protocol is the use of mixed methods where both quantitative and qualitative data will be obtained including both individual patient and clinician interviews and focus group interviews that bring patients and clinicians together to assess perceptions and experiences of patient-centered care in chiropractic treatment. Another strength is use of a sequential mixed methods design, as the quantitative data will be used to help interpret the qualitative data. Finally collecting from a variety of different chiropractic clinical settings across Canada will help strengthen the generalizability of the results.

This study does not involve an intervention to increase patient-centeredness in chiropractic because of its exploratory design. However the results could potentially be used to inform future research to create interventions to address patient-centeredness in chiropractic.

Abbreviations

CCM: Chronic Care Model; IOM: Institute of Medicine; PACIC: Patient Assessment of Chronic Illness Care.

Competing interests

KJS is the Editor-in-Chief of the Journal of the Canadian Chiropractic Association; he receives a stipend from the Canadian Chiropractic Association for his duties as Editor. KJS is a member of the Canadian Memorial Chiropractic College's Board of Governors; his travel expenses (airfare, meals, and hotels) are paid for by the College when travelling on Board business.

KJS is an adjunct professor in the Canadian Memorial Chiropractic College's Division of Graduate Education & Research and does not receive any compensation for this position but does receive research administrative support in the form of access to research resources.

Authors' contributions

KS conceived and designed the study and prepared the manuscript. ML provided supervision and input into study design throughout and made suggestions to the manuscript during the revision process. SM provided supervision and input into study design throughout and made suggestions to the manuscript during the revision process. PM provided supervision and input into study design throughout and made suggestions to the manuscript during the revision process. All authors read and approved the final manuscript.

Authors' information

KJS is a research student (MPhil) in the Faculty of Life Sciences and Education at the University of South Wales. The other authors (PM, SM, ML) comprise KJS' supervisory committee.

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Author details

[1]Division of Graduate Education and Research, Canadian Memorial Chiropractic College, Toronto, Ontario, Canada. [2]Faculty of Life Sciences and Education, University of South Wales, Treforest, Wales. [3]Canadian Memorial Chiropractic College, Toronto, Ontario, Canada.

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Appendix 5. A pilot study assessing patient-centred care in patients with chronic health conditions attending chiropractic practice

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A pilot study assessing patient-centred care in patients with chronic health conditions attending chiropractic practice

Kent J. Stuber[a,b,*], Mark Langweiler[b], Silvano Mior[a], Peter W. McCarthy[a]

[a] *Division of Graduate Education and Research, Canadian Memorial Chiropractic College, 6100 Leslie Street, Toronto, Ontario, M2H 3J1, Canada*
[b] *Faculty of Life Sciences and Education, University of South Wales, Treforest, Wales, UK*

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ABSTRACT

Objectives: The primary aim of this pilot study was to determine the feasibility of conducting a mixed- methods study assessing the extent patients with chronic health conditions perceive chiropractic care to be patient-centred.
Design: A sequential mixed methods feasibility study with a quantitative priority.
Setting: Two private chiropractic clinics in Calgary, Alberta, Canada.
Main outcome measures: Feasibility outcomes included pilot study participation, consent and completion rates. Demographic and health information and a modified version of the Patient Assessment of Chronic Illness Care (PACIC).
Results: Over three weeks, 90 participants were recruited, 86 enrolled, and 78 provided complete data, with only one who commented on the clarity of paperwork. Included participants were on average 47.1 years of age and 60.3% were female. They had an average of 1.8 chronic conditions with 60% having chronic spinal pain. They reported seeing an average of 2.9 other health professionals for their chronic health condition and averaged 12.9 chiropractic visits in the past year. The average overall modified PACIC score was 3.29 on a 5-point scale. Higher scores were seen on the 'patient activation', 'delivery system design/decision support', and 'problem solving/contextual' subscales, with lower scores seen on the 'goal-setting/tailoring' and 'follow-up/coordination' subscales. Interview data generally supported those findings.
Conclusions: The pilot study results support the feasibility of the methods for a subsequent large-scale study. These preliminary results suggest that the degree of patient-centredness compares favourably to similar studies in primary medical care.

1. Introduction

Patient-centredness is an increasingly important component of modern health care. The earliest models of evidence-based care prioritized the identification and application of the highest levels of evidence in resolving clinical questions.[1–4] This may have unintentionally led some clinicians, researchers, patients, and policy makers to consider evidence-based care and patient-centred care as distinctly independent or even antagonistic of one another.[4] However, more recent models of evidence-based care place greater emphasis on patient preferences, values, and actions within the context of clinical decision-making, suggesting patient-centredness and evidence-based care can and should work closely together.[1,2,4]

The Institute of Medicine defined patient-centredness as "care that is respectful of and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions".[5] Several models of patient-centredness have been proposed.[6] They are typically complex and multi-dimensional, with different overlapping and inter-related dimensions; e.g., Mead and Bower's[7] model consisting of five dimensions: a biopsychosocial perspective, sharing power and responsibility, the patient-as-person, the doctor-as-person, and the therapeutic alliance.

Chronic health conditions are inherently complex and, given that their management often does not align with the traditional biomedical model, they challenge both clinicians and patients.[8] Therefore, there is a need for both evidence-based and patient-centred management approaches to chronic conditions.[8] The Chronic Care Model (CCM) has been presented as a framework to organize effective, high quality, patient-centred care systems to manage chronic health conditions.[8,9] Studies suggest that implementation of the CCM can lead to improved patient care and outcomes.[9]

The prevalence of chronic low back pain and chronic neck pain have

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[*] Corresponding author at: Division of Graduate Education and Research, Canadian Memorial Chiropractic College, 6100 Leslie Street, Toronto, Ontario, M2H 3J1, Canada.
E-mail addresses: kstuber@cmcc.ca (K.J. Stuber), mark.langweiler@southwales.ac.uk (M. Langweiler), smior@cmcc.ca (S. Mior), peter.mccarthy@southwales.ac.uk (P.W. McCarthy).

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been reported to be between 4% and 20% [10–12] and 13% and 22% [13,14], respectively. Chiropractors predominantly see patients with musculoskeletal conditions, particularly of the back and neck.[15] When evaluating the practices of 692 Ontario chiropractors, Waalen and Mior[16] noted a ratio of approximately two patients with chronic/recurrent complaints seen for every one acute complaint. There is evidence to support the use of spinal manipulative therapy (SMT), whether alone or in combination with other therapies, for chronic spinal complaints [17–21]; a treatment modality most commonly employed by chiropractors.[22–24]

The chiropractic profession generally considers itself to have a holistic approach to patient care.[25,26] A holistic approach considers all aspects of a person's life when approaching their health (physical, psychosocial, cultural, spiritual, and environmental factors).[27] Chiropractors also appear to consider patient-centredness an important component of their approach to caring for injured workers.[28] Similar opinions toward chiropractors providing patient-centred care have been noted among other health professionals.[29,30] Different models incorporating patient-centredness into chiropractic practice, teaching and research settings have been proposed or described,[31–33] as well as models advocating the inclusion of chiropractors into patient-centred collaborative practices.[34–38] However, to date little is known about how patient-centred the care provided by chiropractors really is, particularly for those with chronic health conditions. To our knowledge, there has been little study into the perceptions of either chiropractors or their chronically ill patients towards chronic health problems, including how chiropractors approach them and how patient-centred the delivered care is perceived to be.

The aim of this pilot study was to determine the feasibility of conducting a mixed-methods study designed to assess the extent patients with chronic health conditions perceive chiropractic care to be patient-centred. Patient-centredness will be determined using concordance with the Chronic Care Model as measured by the Patient Assessment of Chronic Illness Care (PACIC).[39]

2. Materials and methods

We used a sequential mixed methods design with a quantitative priority. The methods have been previously described.[40]

2.1. Participants and setting

The pilot study was carried out in two private chiropractic practices in Calgary, Alberta, Canada. The investigators had no affiliation with either clinic. Study advertisements were displayed in each clinic and promoted by staff who were trained by the Primary Investigator (PI) (KS). Participants (patients) needed to be over 18 years old, able to read and speak English, have at least one chronic health condition, and had seen the same chiropractor at the participating clinic at least three times. A chronic health condition (a condition affecting any organ system for at least one year) did not necessarily have to be under the direct care of the chiropractor.

2.2. Interventions

The study questionnaire included demographic and health information and the modified 20-item version of the PACIC.[39,40] Answers for each item on the PACIC are scored on a five-point scale indicating the frequency that certain activities took place during care. For scoring purposes, the score for each item is converted to a numerical value from 1 to 5, summed and then averaged into an overall PACIC score.[39] Higher scores indicate care is more patient-centred. The PACIC was slightly modified for a chiropractic setting by changing "doctor" to "chiropractor" where appropriate (Table 1). As this was considered a minor change, we assumed the validity and comparability with the original PACIC would not be affected.

Questionnaires were completed anonymously. Subjects interested in participating in either interviews or focus groups provided their first name and contact information on a separate form. The completed questionnaires and informed consent forms were placed in separate envelopes and sealed by the participant. Envelopes were collected by clinical staff, placed in an accordion folder and stored in a locked filing cabinet for later collection by the study team.

All individual semi-structured interviews with patients (n = 6) and chiropractors (n = 4) were conducted by the PI. Patients were selected using purposive sampling technique to obtain a representative sample from each clinic, sorted by gender and age. The PI also facilitated a focus group session comprising three patients and one chiropractor. The focus group was conducted to explore the extent and nature of the interaction between patients and a chiropractor. Interview questions were based on the PACIC and elements of the Mead and Bower model of patient-centred care.[7] (see Table 1). Individual and focus group interviews were digitally audio-recorded.

2.3. Objectives

The primary purpose of this study was to assess the feasibility of the study methods, specifically to test the study questionnaire for ease of use and acceptability to participating chiropractic patients; assess the methods of questionnaire distribution for acceptability to clinic staff; determine recruitment, consent, and completion rates; gain initial insight into the nature and spread of questionnaire data; assess the viability of the interview guides, and determine emerging themes from initial interviews.

Our secondary purpose was to assess how patient-centred the care delivered to chiropractic patients with chronic health conditions was perceived.

2.4. Outcomes

Feasibility outcomes included: participation, consent and completion rates. Participation rate was defined by the number of patients who accepted a study package, as well as the percentage who agreed to participate in an interview. The consent rate was defined as the number who completed an informed consent form, and completion rate was the number who actually completed the questionnaire correctly. The modified version of the PACIC was used to assess the extent care was perceived by patients as being patient-centred. Interview data were used to explore patient and provider patient-centred perspectives.

2.5. Sample size

The number of participants recruited per site was based upon previous study sample estimates and determined to be approximately 40 per site.[40] To accommodate for an estimated 10% of surveys with incomplete or scoring errors, we provided each site with 45 patient intake packages.

2.6. Feasibility criteria

We considered the pilot study a success if 40 of the 45 questionnaire packages per clinic were distributed and completed within a one-month time span. This allowed for analysis of participation, consent, and completion rates. Other objectives such as ease and acceptability of the questionnaire and the distribution methods were assessed qualitatively based on feedback from patients and clinic staff.

2.7. Data analysis

Quantitative data were analysed descriptively and correlations between demographic and health-related variables with overall mean PACIC score calculated. For the categorical variables, the average

Table 1
Modified PACIC (adapted from Glasgow et al.[39]) and items on the PACIC subscales and example questions from the qualitative interviews.

Subscale	PACIC item	Sample questions from the qualitative interviews
Patient Activation	Asked for my ideas when we made a treatment plan	“What input did you have in the treatment plan? Were your ideas considered when coming up with a treatment plan?”
	Given choices about treatment to think about	“Does the chiropractor ask for your input and/or involve you in the decision-making about your care?”
	Asked to talk about any problems with my treatments or their effects	“What kinds of choices were you given about the treatment you were to receive?”
Delivery system design/decision support	Given a list of things I should do to improve my health	“How does your chiropractor plan your care and give you information to enhance your understanding of your care?”
	Satisfied that my care was well organized	“Does your chiropractor show you how to do the things you need to do to take care of yourself or help manage your condition?”
	Shown how what I did to take care of myself influenced my condition	“Do you have a written list of exercises or other things to improve your health, even websites to consult?”
Goal setting/tailoring	Asked to talk about my goals in caring for my condition	“Does your chiropractor help you set specific goals that you can work on? Was this done together?”
	Helped to set specific goals to improve my eating or exercise	“What goals did you create with respect to diet or exercise?”
	Given a copy of my treatment plan	“Were these goals written down as part of a treatment plan?”
	Encouraged to go to a specific group or class to help me with my chronic condition	“Have you been given suggestions for groups or classes in the community that could help you with your condition?”
	Asked questions, either directly or on a survey, about my health habits	
Problem solving/contextual	I am sure that my chiropractor thought about my values, beliefs, and traditions when they recommend treatments to me.	“How do you and your chiropractor discuss how your chronic condition affects your life in general?”
	Helped to make a treatment plan that I could carry out in my daily life	“Does your chiropractor consider your personal or occupational situations when making your treatment plan?”
	Helped to plan ahead so I could take care of my condition even in hard times	“In what ways do you have a treatment plan that could be carried out in your daily life?”
	Asked how my chronic condition affects my life	
Follow-up/coordination	Contacted after a visit to see how things were going	“How does your chiropractor provide care that goes beyond what happens in the clinic?”
	Encouraged to attend programs in the community that could help me.	“Does your chiropractor contact you about how your feeling or how you’re coming along?”
	Referred to another health professional	“Did your chiropractor refer you or recommend you see another health care professional?”
	Told how my visits with other health professionals helped my treatment	
	Asked how my visits with other professionals were going	“Does your chiropractor ask about your care from other health professionals?”

PACIC scores for different items were compared. Analyses were completed using SPSS statistical package version 23 (IBM, Chicago, IL).

All interviews were transcribed verbatim by the PI (KS) and double-checked against the recordings following transcription. Data were coded hierarchically using a thematic analysis.[41] Two study team members independently analysed, generated codes, then met and reviewed each transcript for consistency. Interview transcripts and corresponding codes were entered into Dedoose (Version 7.6.6, Socio-Cultural Research Consultants, LLC, 2017), a qualitative data analysis program. Codes were then clustered into categories and draft themes generated and finalized by the study team.

2.8. Ethics

The pilot study protocol was approved by the Institutional Review Board of the Canadian Memorial Chiropractic College (approval 1510 × 01) and the Ethics Committee of the Faculty of Life Science and Education, University of South Wales (approval LSE15KS36E0).

3. Results

3.1. Recruitment and participant flow and feasibility outcomes

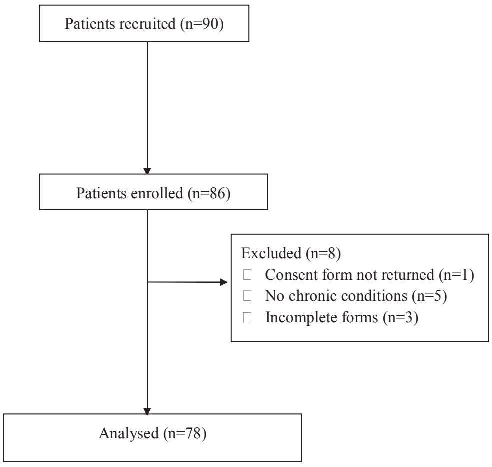

Fig. 1. Study flow diagram.

All participants were recruited over three weeks in February 2017. As depicted in Fig. 1, 86 of the 90 study packages were returned, one participant did not complete the informed consent form. A further seven participants were excluded as three questionnaires contained incomplete data, and five participants did not indicate having a chronic condition. Ultimately 78 participants were included in the study: 39 from each clinic. There were no deviations from the proposed protocol. All of participating chiropractors took part in interviews, with over half of the patients (n = 41) indicating their interest in participating in a qualitative interview. Thematic saturation was not achieved through

Table 2
Patient demographic and health information.

Characteristic	Study respondents (n = 78)
Age (mean)	47.1 years
Gender	
Females	47 (60.3%)
Ethnicity	
Caucasian	74 (94.9%)
Asian	2 (2.6%)
Latino/Hispanic	2 (2.6%)
Highest education level	
Did not complete high school	7 (9%)
Completed high school	4 (5.1%)
Some university/college/technical school	7 (9%)
Completed university/college/technical school	46 (59%)
Completed professional or graduate school	14 (17.9%)
Average number of chronic conditions	1.8 (SD = 0.98)
Chronic conditions	
Spinal pain	47
Lower extremity	18
Upper extremity	12
Degenerative or rheumatologic	18
Headaches	1
Jaw pain	4
Non-musculoskeletal condition	19
Subjective overall health	
Excellent	9 (11.8%)
Very good	26 (34.2%)
Average	34 (44.7%)
Below average	7 (9.2%)
Poor	0 (0%)

the pilot study interviews.

The questionnaire was found to be acceptable by participants; only one participant submitted written feedback suggesting the instructions to the modified PACIC should be clearer. Participating clinic staff provided minimal feedback, suggesting study methods were not burdensome nor impacted upon their work duties. Participating chiropractors also indicated that study methods did not interfere nor impact with the delivery of patient care.

3.2. Baseline data

Participating patients had an average age of 47.1 years, 60.3% were female, were predominantly Caucasian, with the majority having completed post-secondary education (Table 2).

Nearly half of participants (44.7%) indicated having ‘average’ overall health, but none indicated having ‘poor’ overall health. Participants had an average of 1.8 chronic conditions with the majority being musculoskeletal in nature (Table 2), of which the most common was chronic spinal pain. Just over half (52.6%) reported having more than one chronic condition. Over three-quarters of participants (75.6%) had only reported chronic musculoskeletal conditions. Nearly one quarter of participants (24.4%) indicated having a chronic non-musculoskeletal condition, but over three-quarters (78.9%) of those also indicated having a chronic musculoskeletal condition. Five of the 19 participants with chronic non-musculoskeletal conditions reported endocrine conditions, four had some type of respiratory condition, three had a cardiovascular condition (hypertension in each case), three had a digestive condition, two had allergies and two reported a mental health condition. Interestingly, five of these 19 also had more than one non-musculoskeletal condition.

Participants averaged 12.9 visits to the chiropractor in the past year (SD = 8.18) and had been attending the clinic for an average of 4.9 years (SD = 3.53). Participants had seen an average of 2.9 health professionals for their chronic conditions in the past year (SD = 1.31). Besides seeing the chiropractor for their chronic conditions, the next most commonly seen health profession in the past year was massage therapist (n = 55), followed by the family doctor or general practitioner (n = 42), physical therapist (n = 26), and psychologist (n = 8). A small number of participants indicated seeing other health professionals or medical specialists.

Table 3
PACIC scores (n = 78).

Overall score	3.29 (95% CI (3.21, 3.46))
PACIC subscales	
Patient activation	3.92 (95% CI (3.71,4.12))
Delivery system design/decision support	3.78 (95% CI (3.60,3.96))
Problem solving/contextual	4.01 (95% CI (3.83,4.20))
Goal-setting/tailoring	2.78 (95% CI (2.57,2.99))
Follow-up/coordination	2.58 (95% CI (2.35,2.82))

3.3. Outcomes

The average overall PACIC score was 3.29 (Table 3). One health care related variable, the number of health care providers seen in the past year, showed a weak but significant correlation with average overall PACIC score (r = 0.26, p = .02). Weak but statistically insignificant correlations were seen between average overall PACIC score and number of chronic conditions (r = 0.18, p = .13) and number of years attending the clinic (r = 0.18, p = .12). There was no correlation between participant age (r = 0.05, p = .67) and number of visits to the chiropractor in the past year (r = 0.02, p = .84) with average overall PACIC score.

Average overall PACIC scores appeared slightly higher for women [3.31, 95% CI (3.12,3.52); n = 47] compared to men [3.26, 95% CI (2.98,3.53); n = 31]. Average overall PACIC scores for those who completed high school [3.52, 95% CI (3.03,4.04); n = 11] also appeared slightly higher than those who had completed at least some post-secondary education [3.26, 95% CI (3.07,3.43); n = 67]. Participants who subjectively rated their health as ‘above average’ or ‘excellent’ had lower overall average PACIC scores [3.23, 95% CI (2.97, 3.50); n = 35] when compared with those who reported ‘average’ health [3.37, 95% CI (3.09, 3.63); n = 34] or ‘below average’ or ‘poor’ health [3.40, 95% CI (3.18, 3.61); n = 7].

The PACIC subscale with the highest average score was the “problem solving/contextual” subscale, followed closely by “patient activation”. These findings were supported by interview data suggesting the chiropractic approach to managing chronic pain was holistic, reflective, emphasizing problem solving and active care, while considering numerous internal and external factors that could affect chronic conditions.

> “*Probably in the sense of, kind of looking at that whole body health and maybe looking outside the box, or knowing that she thinks of me when she reads something or there are things that will remind her of me and talking about work, stress, life and factoring all of those things in.*” (Patient 6)

> “*I think there are lots of elements to it. Just the level of care and the time that's spent, so it's not just you're in and out. The effort to do other things, other suggestions that chiropractors have made to try and improve my health.*” (Focus group Patient 1)

> “*For me, definitely, because not only do I get a treatment, every time I go there I get good advice, whether it's ‘have you tried this’? Or with respect to changing your eating habits or some exercises…. ‘You know every time I go, it's almost like I get a little nugget of information to get a shot to make the quality of my life better.*” (Patient 2)

Interviewees mentioned that treatment planning was typically proposed by the chiropractor with their agreement. However, this finding did not correspond with the higher scores on the ‘patient activation’ subscale, which includes items dealing specifically with treatment choice and patient involvement in generating ideas for treatment plans. Interviewees indicated that patient involvement in clinical decisions was typically limited, whether by the chiropractor or the patient themselves.

> *"He proposed something and asked if it sounded reasonable and I said he's the professional, and let's do it."* (Patient 4)

Patients related having a great deal of trust in their chiropractors and feeling comfortable with them.

> "*Having people like her who actually give a shit and want you to have a better quality of life, I'm to a point where I can have times where I can forget that I've got it.*" (Patient 5)

> *"We have a great relationship and we talk a lot during the treatments so I feel like my needs are being met."* (Patient 6)

> *"It's easy to feel like you're friends with those kinds of professionals."* (Patient 3)

Chiropractors and patients both placed an emphasis on the importance of listening and time spent during encounters.

> "*You know, and I think that's the difference, I know my chiropractor is going to listen to me first, as compared to my MD who I think will partially listen.*" (Focus group Patient 2)

> "*You try to direct the discussion as much as possible but give the patient the time to really explain what their experience has been, you know? I find that breaks down barriers really quickly and builds trust and confidence in a new person.*" (Chiropractor 1)

> *"I'll easily spend 30 min with them and just sometimes it almost seems like some of them require a little bit more time than just rushing them in and out. That'll often go against all of the other (health care) experiences that they've had, they're usually pretty used to people rushing them in and out."* (Chiropractor 3)

The lowest average PACIC subscale scores were on the "goal-setting/tailoring" and "follow-up/coordination" subscales. Interviewees corroborated this, indicating a lack of goal-setting processes and organized follow-up by chiropractors, other than in the form of appointments and reminders to make appointments.

> "*No I've never actually actively done it (goal setting) with her (the chiropractor), other than in my mind saying, 'okay next time I come to see her I want to brag that I did this!*"' (Patient 5)

> "*Not as much (goal setting) as I should…. It's usually centered around their activity*." (Chiropractor 2)

4. Discussion

4.1. Feasibility

Overall, the results of the pilot study met the feasibility criteria for success and support the design and methods. The majority of the questionnaires distributed were returned (86/90) and most of those (n = 78) were appropriately completed and included in the analysis (Fig. 1). We slightly underestimated the completion rate, perhaps because we did not account for questionnaires that were not returned. Therefore, a more realistic estimate of 75% completed and eligible questionnaires will be used in the larger study.

Questionnaires were completed over three weeks in two clinics in the same city. The PI retrieved study packages in person, as both clinics were conveniently located. However, in a larger study consideration of clinics located in different Canadian regions will necessitate packages being delivered and retrieved by secured courier. Unfortunately, we did not assess the feasibility of clinics completing and forwarding data directly to our study team.

Also, we did not determine what proportion of patients attending the participating clinics during the data collection period actually took part in the study. This information would be useful to determine timelines for patient recruitment for the larger study. However, as both clinics were able to distribute questionnaires to 45 participants over a three-week period, we are confident that clinics in a larger study would be able to recruit at a similar rate.

The interview participation rate was 52.6% (41/78), suggesting that most patients were interested in participating in semi-structured interviews. The interview data provided a degree of explanation of the survey results but suggested the need to more deeply explore several categories in a larger study in order to reach saturation. We will continue to further characterize and explore the nature of the chiropractic care received by patients with chronic conditions by collecting additional data on their chiropractic treatment plans and frequency. The interview guide will be modified to reflect this in a larger study.

4.2. Preliminary findings on patient-centredness

This study provides preliminary results on patient-centredness of chiropractic care for patients with chronic health conditions. The average overall PACIC score of participants in our pilot study was 3.29; higher than that seen in most other studies.[42] Despite higher than average scores on the other three PACIC subscales, low scores were noted for the goal-setting/tailoring and follow-up/coordination subscales. These lower scores were supported by interview data suggesting that goal setting was not often used by chiropractors in managing their chronic pain patients.

The majority of participants in our study reported at least one chronic musculoskeletal condition. Only one previous study used the PACIC in patients with chronic musculoskeletal conditions, specifically osteoarthritis.[43] That study reported an overall mean PACIC score of 2.79 for men and 2.67 for women, both lower than in our study.[43] However, these scores may have been impacted by the substantially higher average age (66 years) of their patients. Unlike Rosemann et al.[43], we did not find that patient age correlated with overall PACIC score. Other studies employing the PACIC have included patients with chronic pain, arthritis and sciatica, but did not stratify PACIC scores by chronic musculoskeletal conditions.[44,45] Houle and co-workers' study in several Canadian teaching settings reported patients with chronic illnesses had an average overall PACIC score of 2.8.[46] Although their gender distribution was similar to that presented here, the average subject age was higher, and their subjects averaged 4.7 chronic conditions compared with 1.8 in our study.[46] Hurwitz and Chiang reported that 34.2% of Canadian chiropractic patients in their study had at least one of ten non-musculoskeletal conditions, which is higher than the 24.4% of participants in this study who reported at least one non-musculoskeletal condition.[47]

4.3. Generalizability

The participant characteristics in the feasibility study compared favourably to previous studies,[15,16,35,47] except that Caucasians and the highly educated were over-represented, likely due to our small sample size. Previous studies of Canadian chiropractic patients have shown average annual chiropractic visits ranging between seven and nine: Lischyna and Mior 7.4 (SD = 11.3) [15]; Waalen and Mior 8.6 (SD = 3.4) [16]; Hurwitz and Chiang 8.8 (median 5)[47] which is lower than the 12.9 (SD = 8.18) reported here. The patient populations in those studies included both acute and chronic condition sufferers.[15,47] The higher visit frequency average seen in our study may be due to all participating patients having chronic conditions, which is consistent with previous studies of patients with chronic spinal pain and chronic musculoskeletal disorders.[10,48–50] In a larger study, only patients with chronic spinal pain and/or other chronic musculoskeletal disorders will be eligible to participate. This should further enhance the external validity of the study. Participants averaged nearly five years of attending the involved clinics. This raises the question of the nature of their care, whether it was more on a maintenance or supportive basis. This can be further explored in a larger study, particularly during focus group interviews to elicit participant perspectives on why they attend or continue to see their chiropractor.

4.4. Limitations

This was a pilot study aimed at testing the feasibility of the protocol design and methods and providing initial data. As such these preliminary results should be viewed with caution. Only two clinics in a single city were selected (convenience sample) and while the involved clinics were assumed to reflect a typical Canadian chiropractic clinic, the results may not be representative of chiropractic clinics and their patient base in other jurisdictions across Canada. As mentioned, 41 of the 78 participants indicated their interest in being interviewed; unfortunately, we did not collect reasons for those who were not interested. Future research should provide a space on the questionnaire to capture reasons for those who were not interested in being interviewed.

5. Conclusion

This pilot study supports the feasibility of the protocol design and methods and justifies conducting a large-scale study. Our study provides preliminary results suggesting the degree of patient-centredness reported by patients with chronic health conditions receiving care from chiropractors compares favourably to similar studies in primary medical care. However, these findings need to be corroborated in a larger, confirmatory study.

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Declarations of interest

None.

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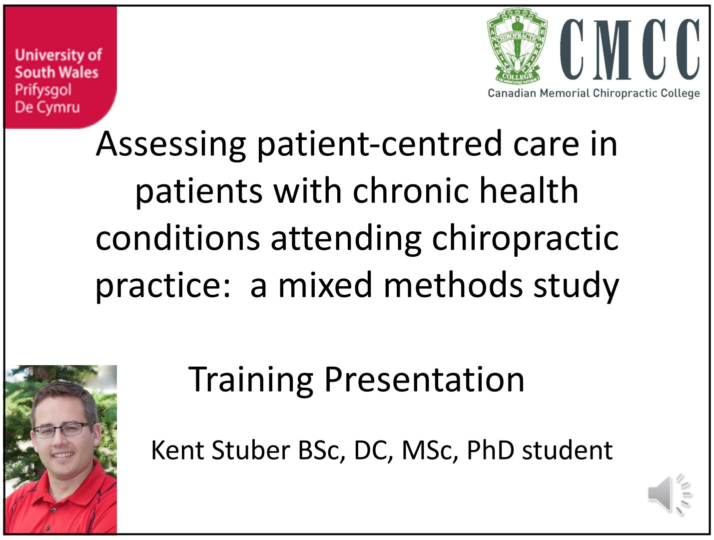
Appendix 6. Clinic training manual



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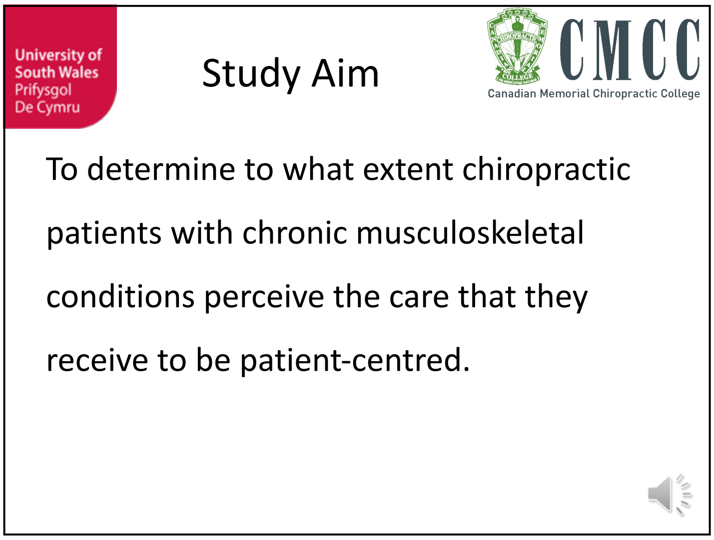
Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study

Training Presentation

Kent Stuber BSc, DC, MSc, PhD student



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Study Aim

To determine to what extent chiropractic patients with chronic musculoskeletal conditions perceive the care that they receive to be patient-centred.

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Study Components

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1. **Questionnaire component (done in the office)**
2. Interview component

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Materials Provided

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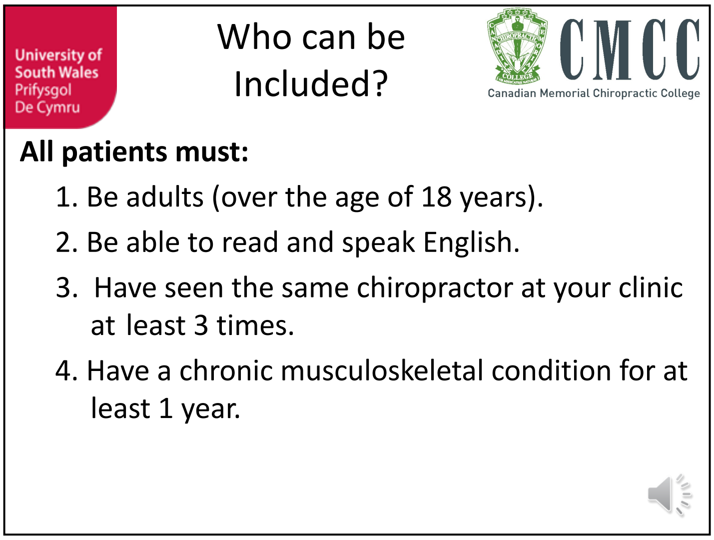
- 1 study box
- 65 patient study packages
- 5 chiropractor study packages
- Promotion posters
- Accordion folder
- Pens
- Training manual



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Who can be Included?

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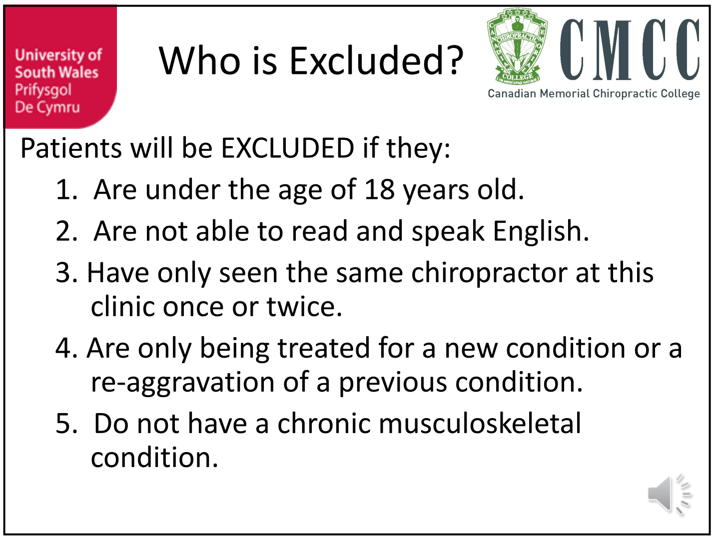
All patients must:

1. Be adults (over the age of 18 years).
2. Be able to read and speak English.
3. Have seen the same chiropractor at your clinic at least 3 times.
4. Have a chronic musculoskeletal condition for at least 1 year.



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Who is Excluded?

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Patients will be EXCLUDED if they:

1. Are under the age of 18 years old.
2. Are not able to read and speak English.
3. Have only seen the same chiropractor at this clinic once or twice.
4. Are only being treated for a new condition or a re-aggravation of a previous condition.
5. Do not have a chronic musculoskeletal condition.

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Distributing Surveys

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At the beginning of the day:

1. Review schedule for potential participants.

Upon patient arrival at the clinic:

2. Tell them about the study and direct them to the promotional poster.
3. Ask if they are interested in participating.
4. Provide them with the participant information sheet to read over.

Promotional poster

A STUDY OF CHIROPRACTIC PATIENT EXPERIENCE

- Do you have a chronic musculoskeletal condition (one that you have dealt with for one year or more)?

- Have you seen your chiropractor at least 3 times?

- You may be eligible to participate in this study!

This clinic is participating in a research study where we are asking adult patients with chronic musculoskeletal conditions about their views of the care they're receiving. For more information, please speak with your chiropractor or contact Kent Stuber BSc, DC, MSc, the Principal Investigator at kstuber@cmcc.ca or 403-389-4722

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This study has been reviewed by and received ethics clearance by the University of South Wales and the Canadian Memorial Chiropractic College.

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Distributing Surveys: Post-Visit

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1. Ask if they are still willing to participate in the study.
2. Provide informed consent sheet and questionnaire.
3. Patients place completed forms in separate provided envelopes and seal them. **Please witness the informed consent sheet.**
4. Collect sealed envelopes with completed forms.
5. Store all completed questionnaires in a secure place.

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What do Patients Have to do?

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1. Read the participant information sheet.
2. Ask the chiropractor if they have questions.
3. Complete the informed consent form and questionnaire, have the consent form witnessed, and place each in a separate envelope.
4. Some patients may be willing to take part in further components of the study.

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Participant Information Sheet and Consent Form

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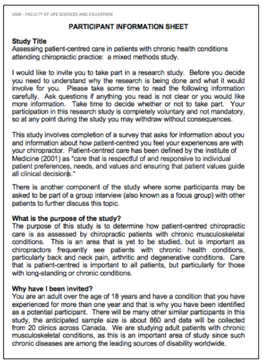


USW - FACULTY OF LIFE SCIENCES AND EDUCATION

PARTICIPANT INFORMATION SHEET

Study Title
Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study.

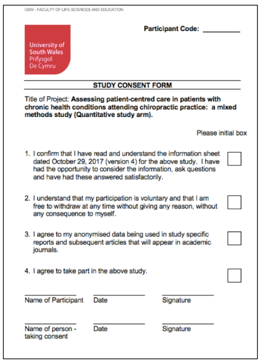
I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take some time to read the following information carefully. Ask questions if anything you read is not clear or you would like more information. Take time to decide whether or not to take part. Your participation in this research study is completely voluntary and not mandatory, so at any point during the study you may withdraw without consequences.

This study involves completion of a survey that asks for information about you and information about how patient-centred you feel your experiences are with your chiropractor. Patient-centred care has been defined by the Institute of Medicine (2001) as "care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions."

There is another component of the study where some participants may be asked to be part of a group interview (also known as a focus group) with other patients to further discuss this topic.

What is the purpose of the study?
The purpose of this study is to determine how patient-centred chiropractic care is as assessed by chiropractic patients with chronic musculoskeletal conditions. This is an area that is yet to be studied, but is important as chiropractors frequently see patients with chronic health conditions, particularly back and neck pain, arthritic and degenerative conditions. Care that is patient-centred is important to all patients, but particularly for those with long-standing or chronic conditions.

Why have I been invited?
You are an adult over the age of 18 years and have a condition that you have experienced for more than one year and that is why you have been identified as a potential participant. There will be many other similar participants in this study, the anticipated sample size is about 860 and data will be collected from 20 clinics across Canada. We are studying adult patients with chronic musculoskeletal conditions, as this is an important area of study since such chronic diseases are among the leading sources of disability worldwide.



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Participant Code: ________

STUDY CONSENT FORM

Title of Project: **Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study (Quantitative study arm).**

Please initial box

1. I confirm that I have read and understand the information sheet dated October 29, 2017 (version 4) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without any consequence to myself. ☐
3. I agree to my anonymised data being used in study specific reports and subsequent articles that will appear in academic journals. ☐
4. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of person - taking consent	Date	Signature

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Patient Questionnaire

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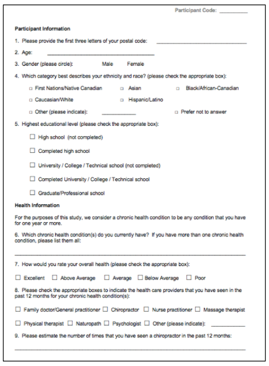


Participant Code: ________

Participant Information

1. Please provide the first three letters of your postal code: ____________________
2. Age: ____________________
3. Gender (please circle): Male Female
4. Which category best describes your ethnicity and race? (please check the appropriate box):
   - ☐ First Nations/Native Canadian ☐ Asian ☐ Black/African-Canadian
   - ☐ Caucasian/White ☐ Hispanic/Latino
   - ☐ Other (please indicate): ________ ☐ Prefer not to answer
5. Highest educational level (please check the appropriate box):
   - ☐ High school (not completed)
   - ☐ Completed high school
   - ☐ University / College / Technical school (not completed)
   - ☐ Completed University / College / Technical school
   - ☐ Graduate/Professional school

Health Information

For the purposes of this study, we consider a chronic health condition to be any condition that you have for one year or more.

6. Which chronic health condition(s) do you currently have? If you have more than one chronic health condition, please list them all:

____

7. How would you rate your overall health (please check the appropriate box):

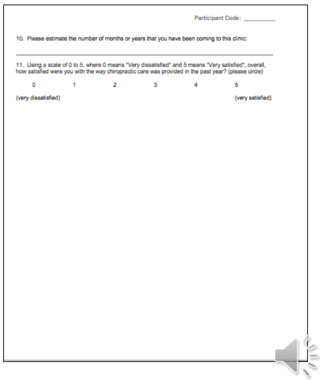
☐ Excellent ☐ Above Average ☐ Average ☐ Below Average ☐ Poor

8. Please check the appropriate boxes to indicate the health care providers that you have seen in the past 12 months for your chronic health condition(s):

☐ Family doctor/General practitioner ☐ Chiropractor ☐ Nurse practitioner ☐ Massage therapist
☐ Physical therapist ☐ Naturopath ☐ Psychologist ☐ Other (please indicate): ________

9. Please estimate the number of times that you have seen a chiropractor in the past 12 months:

____



Participant Code: ________

10. Please estimate the number of months or years that you have been coming to this clinic:

____

11. Using a scale of 0 to 5, where 0 means "Very dissatisfied" and 5 means "Very satisfied", overall, how satisfied were you with the way chiropractic care was provided in the past year? (please circle)

0	1	2	3	4	5
(very dissatisfied)					(very satisfied)

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Patient Questionnaire – Part 2

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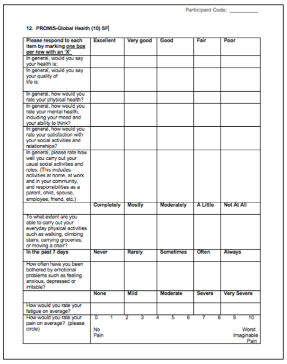

Participant Code: ________

12. PROMIS-Global Health (10) SF

Please respond to each item by marking one box per row with an 'X'	**Excellent**	**Very good**	**Good**	**Fair**	**Poor**
In general, would you say your health is:					
In general, would you say your quality of life is:					
In general, how would you rate your physical health?					
In general, how would you rate your mental health, including your mood and your ability to think?					
In general, how would you rate your satisfaction with your social activities and relationships?					
In general, please rate how well you carry out your usual social activities and roles. (This includes activities at home, at work and in your community, and responsibilities as a parent, child, spouse, employee, friend, etc.)					
	Completely	**Mostly**	**Moderately**	**A Little**	**Not At All**
To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?					
In the past 7 days	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
How often have you been bothered by emotional problems such as feeling anxious, depressed or irritable?					
	None	**Mild**	**Moderate**	**Severe**	**Very Severe**
How would you rate your fatigue on average?					
How would you rate your pain on average? (please circle)	0 1 No Pain	2 3	4 5 6	7 8	9 10 Worst Imaginable Pain

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Patient Questionnaire – Part 3

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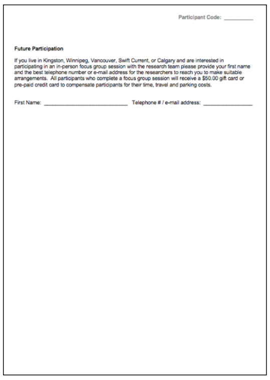

Participant Code: ________

Future Participation

If you live in Kingston, Winnipeg, Vancouver, Swift Current, or Calgary and are interested in participating in an in-person focus group session with the research team please provide your first name and the best telephone number or e-mail address for the researchers to reach you to make suitable arrangements. All participants who complete a focus group session will receive a $50.00 gift card or pre-paid credit card to compensate participants for their time, travel and parking costs.

First Name: ____________________ Telephone # / e-mail address: ____________

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Patient Questionnaire – Part 4

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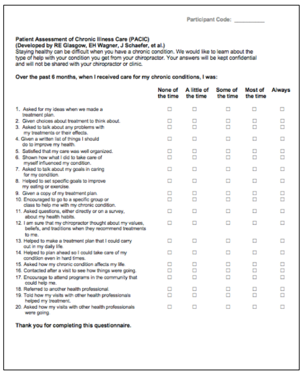

Participant Code: ________

Patient Assessment of Chronic Illness Care (PACIC)
(Developed by RE Glasgow, EH Wagner, J Schaefer, et al.)
Staying healthy can be difficult when you have a chronic condition. We would like to learn about the type of help with your condition you get from your chiropractor. Your answers will be kept confidential and will not be shared with your chiropractor or clinic.

Over the past 6 months, when I received care for my chronic conditions, I was:

	None of the time	A little of the time	Some of the time	Most of the time	Always
1. Asked for my ideas when we made a treatment plan.	☐	☐	☐	☐	☐
2. Given choices about treatment to think about.	☐	☐	☐	☐	☐
3. Asked to talk about any problems with my treatments or their effects.	☐	☐	☐	☐	☐
4. Given a written list of things I should do to improve my health.	☐	☐	☐	☐	☐
5. Satisfied that my care was well organized.	☐	☐	☐	☐	☐
6. Shown how what I did to take care of myself influenced my condition.	☐	☐	☐	☐	☐
7. Asked to talk about my goals in caring for my condition.	☐	☐	☐	☐	☐
8. Helped to set specific goals to improve my eating or exercise.	☐	☐	☐	☐	☐
9. Given a copy of my treatment plan.	☐	☐	☐	☐	☐
10. Encouraged to go to a specific group or class to help me with my chronic condition.	☐	☐	☐	☐	☐
11. Asked questions, either directly or on a survey, about my health habits.	☐	☐	☐	☐	☐
12. I am sure that my chiropractor thought about my values, beliefs, and traditions when they recommend treatments to me.	☐	☐	☐	☐	☐
13. Helped to make a treatment plan that I could carry out in my daily life.	☐	☐	☐	☐	☐
14. Helped to plan ahead so I could take care of my condition even in hard times.	☐	☐	☐	☐	☐
15. Asked how my chronic condition affects my life.	☐	☐	☐	☐	☐
16. Contacted after a visit to see how things were going.	☐	☐	☐	☐	☐
17. Encourage to attend programs in the community that could help me.	☐	☐	☐	☐	☐
18. Referred to another health professional.	☐	☐	☐	☐	☐
19. Told how my visits with other health professionals helped my treatment.	☐	☐	☐	☐	☐
20. Asked how my visits with other health professionals were going.	☐	☐	☐	☐	☐

Thank you for completing this questionnaire.

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What do chiropractors have to do?

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1. Read the participant information sheet.
2. Complete the informed consent form and questionnaire.
3. Place completed forms each in a separate envelope and seal them.
4. Individual interviews via phone / videoconference.

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Chiropractor Questionnaire

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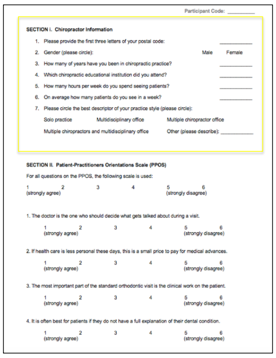

Participant Code: __________

SECTION I. Chiropractor Information

1. Please provide the first three letters of your postal code: __________
2. Gender (please circle): Male Female
3. How many of years have you been in chiropractic practice? __________
4. Which chiropractic educational institution did you attend? __________
5. How many hours per week do you spend seeing patients? __________
6. On average how many patients do you see in a week? __________
7. Please circle the best descriptor of your practice style (please circle):

Solo practice Multidisciplinary office Multiple chiropractor office
Multiple chiropractors and multidisciplinary office Other (please describe): __________

SECTION II. Patient-Practitioners Orientations Scale (PPOS)

For all questions on the PPOS, the following scale is used:

1 (strongly agree) 2 3 4 5 6 (strongly disagree)

1. The doctor is the one who should decide what gets talked about during a visit.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

2. If health care is less personal these days, this is a small price to pay for medical advances.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

3. The most important part of the standard orthodontic visit is the clinical work on the patient.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

4. It is often best for patients if they do not have a full explanation of their dental condition.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

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Chiropractor Questionnaire

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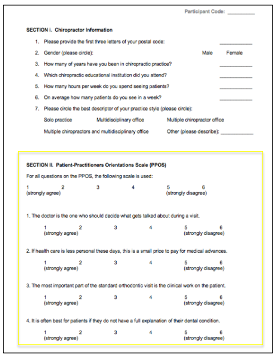

Participant Code: __________

SECTION I. Chiropractor Information

1. Please provide the first three letters of your postal code: __________
2. Gender (please circle): Male Female
3. How many of years have you been in chiropractic practice? __________
4. Which chiropractic educational institution did you attend? __________
5. How many hours per week do you spend seeing patients? __________
6. On average how many patients do you see in a week? __________
7. Please circle the best descriptor of your practice style (please circle):

Solo practice Multidisciplinary office Multiple chiropractor office
Multiple chiropractors and multidisciplinary office Other (please describe): __________

SECTION II. Patient-Practitioners Orientations Scale (PPOS)

For all questions on the PPOS, the following scale is used:

1 (strongly agree) 2 3 4 5 6 (strongly disagree)

1. The doctor is the one who should decide what gets talked about during a visit.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

2. If health care is less personal these days, this is a small price to pay for medical advances.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

3. The most important part of the standard orthodontic visit is the clinical work on the patient.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

4. It is often best for patients if they do not have a full explanation of their dental condition.
1 (strongly agree) 2 3 4 5 6 (strongly disagree)

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FAQs

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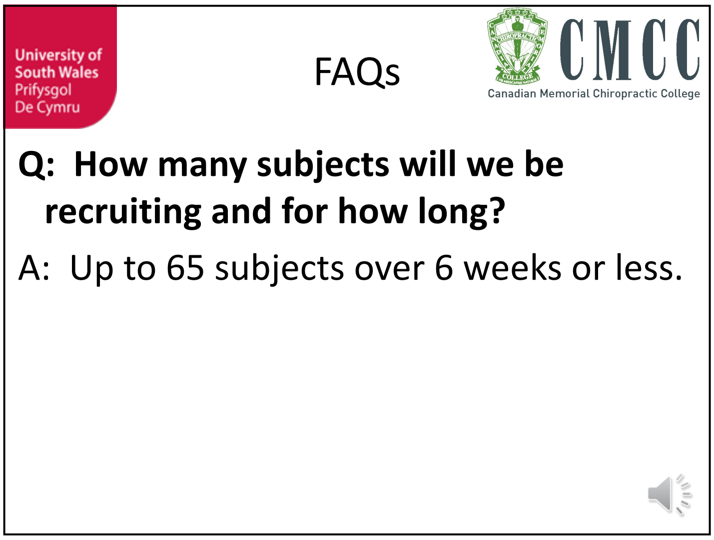
Q. Has this study received ethics approval?

A. Yes, from the University of South Wales Faculty of Life Science and Education and the Canadian Memorial Chiropractic College Research Ethics Board.



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FAQs

CMCC
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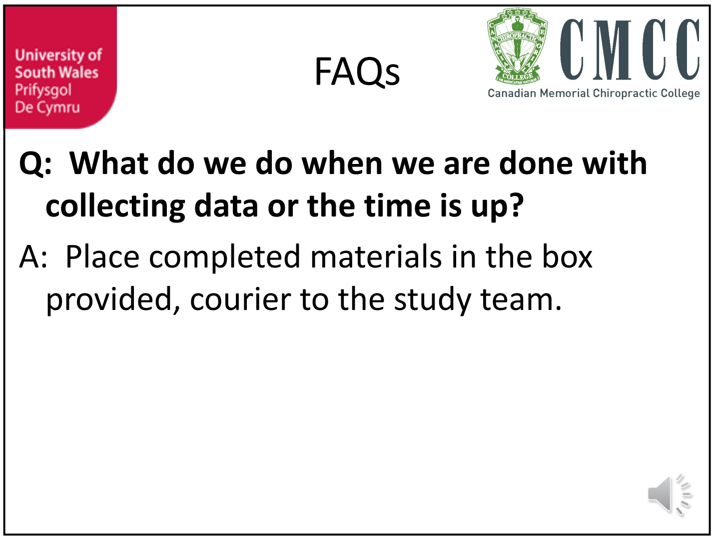
Q: How many subjects will we be recruiting and for how long?

A: Up to 65 subjects over 6 weeks or less.



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FAQs

CMCC
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Q: What do we do when we are done with collecting data or the time is up?

A: Place completed materials in the box provided, courier to the study team.

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Contact us

CMCC
Canadian Memorial Chiropractic College

- If you have any questions please do not hesitate to contact me at 403-389-4722 or by e-mail at kstuber@cmcc.ca

Appendix 7. Patient questionnaire

Participant Code: __________

Participant Information

1. Please provide the first three letters of your postal code: ________________________________

2. Age: ______________________________________

3. Gender: ______________________________________

4. Which category best describes your ethnicity and race? (please check the appropriate box):

☐ First Nations/Native Canadian ☐ Asian ☐ Black/African-Canadian

☐ Caucasian/White ☐ Hispanic/Latino

☐ Other (please indicate): ____________ ☐ Prefer not to answer

5. Highest educational level (please check the appropriate box):

☐ High school (not completed)

☐ Completed high school

☐ University / College / Technical school (not completed)

☐ Completed University / College / Technical school

☐ Graduate/Professional school

Health Information

For the purposes of this study, we consider a chronic health condition to be any condition that you have for one year or more.

6. Which chronic health condition(s) do you currently have? If you have more than one chronic health condition, please list them all:

____

7. How would you rate your overall health (please check the appropriate box):

☐ Excellent ☐ Above Average ☐ Average ☐ Below Average ☐ Poor

8. Please check the appropriate boxes to indicate the health care providers that you have seen in the past 12 months for your chronic health condition(s):

☐ Family doctor/General practitioner ☐ Chiropractor ☐ Nurse practitioner ☐ Massage therapist

☐ Physical therapist ☐ Naturopath ☐ Psychologist ☐ Other (please indicate): ____________

9. Please estimate the number of times that you have seen a chiropractor in the past 12 months:

____

10. Please estimate the number of months or years that you have been coming to this clinic:

____

11. Using a scale of 0 to 5, where 0 means "Very dissatisfied" and 5 means "Very satisfied", overall, how satisfied were you with the way chiropractic care was provided in the past year? (please circle)

0 1 2 3 4 5

(very dissatisfied) (very satisfied)

12. PROMIS-Global Health (10) SF

Please respond to each item by marking one box per row with an 'X'	**Excellent**	**Very good**	**Good**	**Fair**	**Poor**
In general, would you say your health is:					
In general, would you say your quality of life is:					
In general, how would you rate your physical health?					
In general, how would you rate your mental health, including your mood and your ability to think?					
In general, how would you rate your satisfaction with your social activities and relationships?					
In general, please rate how well you carry out your usual social activities and roles. (This includes activities at home, at work and in your community, and responsibilities as a parent, child, spouse, employee, friend, etc.)					
	Completely	**Mostly**	**Moderately**	**A Little**	**Not At All**
To what extent are you able to carry out your everyday physical activities such as walking, climbing stairs, carrying groceries, or moving a chair?					
In the past 7 days	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
How often have you been bothered by emotional problems such as feeling anxious, depressed or irritable?					
	None	**Mild**	**Moderate**	**Severe**	**Very Severe**
How would you rate your fatigue on average?					
How would you rate your pain on average? (please circle)	0 1 2 3 4 5 6 7 8 9 10 No Pain … Worst Imaginable Pain				

Future Participation

If you live in Toronto, Cambridge, Halifax, Swift Current, or Calgary and are interested in participating in an in-person focus group session with the research team please provide your first name and the best telephone number or e-mail address for the researchers to reach you to make suitable arrangements. All participants who complete a focus group session will receive a $50.00 gift card or pre-paid credit card to compensate participants for their time, travel and parking costs.

First Name: ______________________________ Telephone # / e-mail address: _________________

Patient Assessment of Chronic Illness Care (PACIC)

(Developed by RE Glasgow, EH Wagner, J Schaefer, et al.)

Staying healthy can be difficult when you have a chronic condition. We would like to learn about the type of help with your condition you get from your chiropractor. Your answers will be kept confidential and will not be shared with your chiropractor or clinic.

Over the past 6 months, when I received care for my chronic conditions, I was:

	None of time	**A little of the time**	**Some of the time**	**Most of the time**	**Always the**
1. Asked for my ideas when we made a treatment plan.	☐	☐	☐	☐	☐
2. Given choices about treatment to think about.	☐	☐	☐	☐	☐
3. Asked to talk about any problems with my treatments or their effects.	☐	☐	☐	☐	☐
4. Given a written list of things I should do to improve my health.	☐	☐	☐	☐	☐
5. Satisfied that my care was well organized.	☐	☐	☐	☐	☐
6. Shown how what I did to take care of myself influenced my condition.	☐	☐	☐	☐	☐
7. Asked to talk about my goals in caring for my condition.	☐	☐	☐	☐	☐
8. Helped to set specific goals to improve my eating or exercise.	☐	☐	☐	☐	☐
9. Given a copy of my treatment plan.	☐	☐	☐	☐	☐
10. Encouraged to go to a specific group or class to help me with my chronic condition.	☐	☐	☐	☐	☐
11. Asked questions, either directly or on a survey, about my health habits.	☐	☐	☐	☐	☐
12. I am sure that my chiropractor thought about my values, beliefs, and traditions when they recommend treatments to me.	☐	☐	☐	☐	☐
13. Helped to make a treatment plan that I could carry out in my daily life.	☐	☐	☐	☐	☐
14. Helped to plan ahead so I could take care of my condition even in hard times.	☐	☐	☐	☐	☐
15. Asked how my chronic condition affects my life.	☐	☐	☐	☐	☐
16. Contacted after a visit to see how things were going.	☐	☐	☐	☐	☐
17. Encourage to attend programs in the community that could help me.	☐	☐	☐	☐	☐
18. Referred to another health professional.	☐	☐	☐	☐	☐
19. Told how my visits with other health professionals helped my treatment.	☐	☐	☐	☐	☐
20. Asked how my visits with other health professionals were going.	☐	☐	☐	☐	☐

Thank you for completing this questionnaire.

Appendix 8. Study information package

PARTICIPANT INFORMATION SHEET

Study Title

Assessing patient-centred care in patients with chronic health conditions attending chiropractic practice: a mixed methods study.

I would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for you. Please take some time to read the following information carefully. Ask questions if anything you read is not clear or you would like more information. Take time to decide whether or not to take part. Your participation in this research study is completely voluntary and not mandatory, so at any point during the study you may withdraw without consequences.

This study involves completion of a survey that asks for information about you and information about how patient-centred you feel your experiences are with your chiropractor. Patient-centred care has been defined by the Institute of Medicine (2001) as “care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.“

There is another component of the study where some participants may be asked to be part of a group interview (also known as a focus group) with other patients to further discuss this topic.

What is the purpose of the study?

The purpose of this study is to determine how patient-centred chiropractic care is as assessed by chiropractic patients with chronic musculoskeletal conditions. This is an area that is yet to be studied,but is important as chiropractors frequently see patients with chronic health conditions, particularly back and neck pain, arthritic and degenerative conditions. Care that is patient-centred is important to all patients, but particularly for those with long-standing or chronic conditions.

Why have I been invited?

You are an adult over the age of 18 years and have a condition that you have experienced for more than one year and that is why you have been identified as a potential participant. There will be many other similar participants in this study, the anticipated sample size is about 860 and data will be collected from 20 clinics across Canada. We are studying adult patients with chronic musculoskeletal conditions, as this is an important area of study since such chronic diseases are among the leading sources of disability worldwide.

Do I have to take part?

It is up to you to decide and completely voluntary. After going through this information sheet (which you may keep), you will be asked to sign a consent form to show you agreed to take part. You are free to withdraw at any time without penalty and also without giving a reason. This will not affect the standard of care you receive.

What will happen to me if I take part?

The chiropractic care that you receive will not be affected by your participation in this study in any way. Your treatment will not be affected by your decision whether to participate or not.

The five-page questionnaire that we ask you to complete today should take approximately ten minutes to finish. This questionnaire will ask you for some demographic information (date of birth, gender, etc) and information about your condition, and ask you to complete an instrument known as the Patient Assessment of Chronic Illness Care (PACIC). You will be asked if you are interested in attending a focus group session. If so, you will provide the research team with your e-mail address or telephone number so that they can contact you to make suitable arrangements. Upon completion, please place the questionnaire in an envelope and seal it and hand it back to your chiropractor or their front desk staff.

Should you agree to participate in a focus group session, it would take place at a local hotel conference room at a pre-determined time and would be a maximum of two hours long. Other chiropractic patients would attend. There would be no more than twelve total participants in the focus group. The focus group would be audio-recorded by the investigator. The purpose of the focus group sessions is to bring patients together to discuss their perceptions of how patient-centred the chiropractic care that they receive is and their experiences of patient-centred care. Not everyone who indicates an interest in participating in the focus group interviews will be interviewed, as the researcher will be attempting to interview equal numbers of men and women covering a range of different ages. No further meetings with or contact from the study team would be required.

Expenses and payments

You will incur the normal costs of your chiropractic treatment as well as for parking and travel. There would be no additional charges. Should you choose to participate in the focus group sessions you would incur the normal costs for parking and travel if needed. Those participating in the focus group sessions will receive a $50.00 gift card as a thank-you for participating in these sessions and in lieu of parking and travel costs. These will be distributed at the focus group meetings.

What are the possible disadvantages and risks of taking part?

The only identified disadvantage of taking part is due to the time involved in completing the questionnaire and/or the focus group interview sessions. The risks to the study participants are considered to be minimal. The greatest risk to participants is the disclosure of information provided to the research team in a manner in which the participant can be identified. Although focus group participants will be asked not to disclose anything that is discussed during the focus group, complete confidentiality cannot be assured. There is also the potential for patients to know other individuals in the focus group sessions. This could reduce the anonymity of those sessions and may make some participants uncomfortable.

The only other identified risk in the focus group sessions is that there is the small chance that an upsetting topic or memory may be discussed. In the event that occurs, a referral to appropriate support services would be made available if further support is required.

What are the possible benefits of taking part?

We cannot promise the study will help you but the information that we obtain from the study will help to increase the understanding of the importance of patient-centred care for chiropractic patients and treatment needs of patients with chronic health conditions. This may lead to improvements in the treatment of people with chronic health conditions by chiropractors.

What if there is a problem?

Given the topics to be discussed it is highly unlikely that anything arising from the meetings will cause you distress or require reporting to any authority or regulatory body. In the unlikely event that such information is disclosed (such as cases of abuse or assault, unprofessional, unethical, or illegal activity), appropriate referrals to either legal authorities or regulatory bodies will be made. If an upsetting topic or memory is discussed or causes some psychological distress please tell the researcher who will help you find an appropriate support service if further support is required.

If you have any questions or concerns about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. Please contact the researcher, Dr Kent Stuber, at 403-389-4722 or e-mail him at kstuber@cmcc.ca. If you remain unhappy and wish to complain formally you can do this through the researcher's supervisor, Prof Peter McCarthy at peter.mccarthy@southwales.ac.uk. He is willing to address any other questions or concerns. The University of South Wales is the institution through which this study is being completed and they have a formal complaints procedure, if you are unsatisfied with the response from either of the above, please contact the University of South Wales Governance officer Mr J. Sinfield at jonathan.sinfield@southwales.ac.uk .

Will my taking part in the study be kept confidential?
All information which is collected from or about you during the course of the research will be kept strictly confidential. Data will be collected using paper-based questionnaires and if you choose to participate in the interview or focus group by audio recording.

The questionnaires will be placed in a sealed envelope and then collected by clinic staff and kept in a separate accordion-style folder in a locked filing cabinet before being returned to the research team by secured courier. The researcher will store all questionnaires in a locked filing cabinet in a locked private office. The answers that you provide to the questionnaire will be entered into a password-protected spreadsheet and stored on a password-protected computer, and any information linking your identity to your responses will be destroyed. During analysis all questionnaires will be identified only by a research code known only to the researcher and maintained on a master code list that will be kept in a locked filing cabinet in a secured office.

To help maintain confidentiality during analysis focus group participants will be given a code known only to the researcher and maintained on a master digital code list that is password protected on a password-protected computer. The audio recordings will be transcribed by a professional transcriptionist to a password protected word processing file and uploaded to a password-protected computer accessed only by the researcher in a locked private office. At no point will the transcriptionist have access to any of your identifiable information.

When analyzing focus group data any information that you provide will be made anonymous and assigned a unique code. Any publication or report that results from this study will not use identifiable or personal information such as your name so that you cannot be recognized. Individual participants will not be identified at any time. The only circumstance under which confidentiality could be broken is if there is any mention of potential harm that might occur to a participant, the researcher, or a third person. In such an event, suitable authorities would be notified. All records from the study will be kept private and appropriately secured in a locked filing cabinet in the researcher's. All the material obtained will be used specifically for research purposes and will not be used for any other purpose either during or after the completion of this study. Only the research team will have access to the data. All collected data will be retained for a period of five years. At that point, the researcher will shred all paper-based data and erase all data-containing digital and audio files.

Complete anonymity regarding focus participation in this study cannot be guaranteed. You will be asked not to provide your name or other identifying characteristics on the corresponding audio recordings. Although focus group participants will be asked not to disclose anything that is discussed during the focus group, complete confidentiality cannot be assured.

This research project has received research ethics approval from the University of South Wales Faculty of Life Sciences and Education Faculty Ethics Sub-Group.

What will happen if I don't carry on with the study?
Your participation in this research study is voluntary and not mandatory in any way. At any point in time during the study, you may withdraw without penalty or consequence. If you withdraw from the study all the information and data collected from you to that date will be destroyed and your information removed from all the study files.

What will happen to the results of the research study?
The results of this study will form the researcher's PhD thesis and will be submitted for publication in peer-reviewed open-access research journals and for presentation at scientific conferences. You will not be identified in any report or publication. Exact quotations may be included but at no point

will you be identified. Should you be interested in receiving a copy of any published materials from this study, please e-mail the researcher at kstuber@cmcc.ca and he will provide them to you.

Who is organising or sponsoring the research?

The University of South Wales is the sponsoring academic institution. The research is self-funded but the investigators are seeking supporting grants from chiropractic research organizations.

Further information and contact details:

If you have any questions or should you require any further general information or have any concerns about this research project, please contact Dr Kent Stuber at 403-389-4722 or kstuber@cmcc.ca. If you are unsure whether or not you should participate, please contact Prof Peter McCarthy at peter.mccarthy@southwales.ac.uk.

Appendix 9. Clinician questionnaire

Participant Code: __________

SECTION i. Chiropractor Information

2. Please provide the first three letters of your postal code:

   ____

3. Gender (please circle): Male Female
4. How many of years have you been in chiropractic practice?

   ____

5. Which chiropractic educational institution did you attend?

   ____

6. How many hours per week do you spend seeing patients?

   ____

7. On average how many patients do you see in a week?

   ____

8. Please circle the best descriptor of your practice style (please circle):

   Solo practice Multidisciplinary office Multiple chiropractor office

   Multiple chiropractors and multidisciplinary office Other (please describe):

____

SECTION II. Patient-Practitioners Orientations Scale (PPOS)

For all questions on the PPOS, the following scale is used:

1	2	3	4	5	6
(strongly agree)				(strongly disagree)	

1. The doctor is the one who should decide what gets talked about during a visit.

1	2	3	4	5	6
(strongly agree)				(strongly disagree)	

2. If health care is less personal these days, this is a small price to pay for medical advances.

1	2	3	4	5	6
(strongly agree)				(strongly disagree)	

3. The most important part of the standard visit is the clinical work on the patient.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

4. It is often best for patients if they do not have a full explanation of their condition.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

5. Patients should rely on their doctors' knowledge and not try to find out their conditions on their own.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

6. When doctors ask a lot of questions about a patient's background, they are prying too much into personal matters.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

7. If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

8. Many patients continue asking questions even though they are not learning anything.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

9. Patients should be treated as if they were partners with the doctor, equal in power and status.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

10. Patients generally want reassurance rather than information about their health.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

11. If a doctor mainly relies on being open and warm, the doctor will not have a lot of success.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

12. When patients disagree with their doctor, this is a sign that the doctor does not have the patient's respect and trust.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

13. A treatment plan cannot succeed if it is in conflict with a patient's lifestyle or values.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

14. Most patients want to get in and out of the doctor's office as quickly as possible.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

15. The patient must always be aware that the doctor is in charge.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

16. It is not that important to know a patient's culture and background to treat the person's condition.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

17. Humor is a major ingredient in the doctor's treatment of the patient.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

18. When patients find out medical information on their own, this usually confuses more than it helps.

1 2 3 4 5 6
(strongly agree) (strongly disagree)

Appendix 10. Study recruitment poster

A STUDY OF CHIROPRACTIC PATIENT EXPERIENCE

- Do you have a chronic musculoskeletal health condition (one that you have dealt with for one year or more)?

- Have you seen your chiropractor at least 3 times?

- You may be eligible to participate in this study!

This clinic is participating in a research study where we are asking adult patients with chronic health conditions about their views of the care they're receiving. For more information, please speak with your chiropractor or contact Kent Stuber BSc, DC, MSc, the Principal Investigator at kstuber@cmcc.ca or 403-389-4722.

University of South Wales
Prifysgol De Cymru

This study has been reviewed by and received ethics clearance by the University of South Wales and the Canadian Memorial Chiropractic College.

CMCC
Canadian Memorial Chiropractic College

Appendix 11. Patient focus group interview guide

Patient Focus Group

Introduction (5-10 minutes):

Discuss and collect signed informed consent prior to audio recording – confirm that individuals will not be identified, none of the quotes attributed to individuals personally. Ask if participants have any questions about the reason for, or content of, the informed consent. Subjects will need to sign the informed consent form prior to commencement of focus groups.

Introductory Script:

Welcome

"Good morning/afternoon and welcome. Thanks for taking the time to join us to share your experiences of living with a chronic musculoskeletal condition and seeing a chiropractor. My name is Kent Stuber and I am the lead investigator on the research team, I'm a researcher from the Canadian Memorial Chiropractic College and a PhD student at the University of South Wales.

Purpose

The purpose of this focus group is to talk about the chiropractic care you receive and how you view your role in such care. Among the things we want to discuss is how the care focuses on putting the interests and needs of patients first and involving patients in the decisions that are made about their care.

You may recall, that last year you completed a questionnaire that asked you about this, and now we're here to discuss it and learn about your experience in your own words.

Guidelines

You've probably noticed the recorder here. We're recording the session because we don't want to miss any of your comments. I want to confirm that everyone had an opportunity to read and sign the consent form and that you consent to be recorded today. People say really helpful things in these discussions, and we can't write fast enough to get them all down. So let's outline a couple of rules that will help during this recording and later transcribing:

1) We ask that each of you identify yourself by the number on the card in front of you (e.g. Patient 1, Patient 2, etc..) only prior to speaking, this will help ensure your anonymity.

2) To maintain confidentiality and privacy, we ask that you do not disclose where it is that you were recruited from or the name of any clinician that has provided you treatment.

3) We are interested in hearing from each of you so feel free to chime in at any point. Having said that, it will help if only one person talks at a time. If several of you are talking at the same time, the recording gets garbled and we’ll miss your comments when we’re transcribing the recording. We want to ensure that everyone’s voice is heard. I’ve got a number of questions that I want to ask, but my job is really to listen. This will be more interesting for all of us if we treat this like a conversation. If someone says something, feel free to follow up on it or share a different point of view. You don’t need to address all your comments to me. I may need to interrupt to get through all the questions. I apologize ahead of time if I need to do this.

4) There are no right or wrong answers, only different points of view. We expect that each of you will have different experiences, so please feel free to share your point of view, even if it differs from what others have said. You don't need to agree with others, but you must listen respectfully as others share their views. Each of your views are important. Keep in mind that we're just as interested in negative comments as positive comments, and at times the negative comments can be the most helpful.

5) If you have a cell phone, please put it on silent mode now.
If you need to take a call, or make a bathroom visit, please step out and then return as quickly as possible. The bathroom is down the hall.
We are going to be informal here tonight, so feel free to get up for more coffee or refreshments.

6) Please be aware during this discussion, that anything you chose to declare which is illegal or indicates unprofessional practice will need to be passed on to the appropriate authorities for action.

Alright let’s begin…I will start with an easy question…[ice breaker question]”

Core Interview Questions (90-115 minutes):

PART 1: Living with chronic conditions

Questions:

- Can you describe what is it like for you to live with a chronic musculoskeletal condition? By chronic I mean a condition that you've had for more than 6 months.
    - Can you tell me a bit more about that?
    - Can you give me an example of that?
    - What kinds of difficulties do you experience in your day-to-day life in living with a chronic musculoskeletal condition?

- Do you think those closest to you (family, friends, work colleagues) understand what it's like for you to live with a chronic musculoskeletal condition?
    - What about those outside this circle of family and friends – e.g. employers, society?
    - Can you tell me more about the attitudes of people towards chronic pain?
    - Do you think that there is a stigma (i.e. shame, dishonour, mark) attached to having chronic pain?
        - Can you give me an example of that?
    - Do you receive support from people in helping you manage your condition?
        - Please describe the nature of this support or assistance

- What health care services or providers have you used for your condition?
    - Do or did you find them helpful for your condition?
        - Is there a difference in their approach compared to your chiropractor?

    - What sort of resources or organizations in your community have or are you using?
        - Do or did you find them helpful for your condition?

PART 2: Chiropractic care for chronic musculoskeletal conditions

Let's begin with sharing some of your expectations of the chiropractic care that you have received:

Questions:

1. What do you expect when seeing a chiropractor?
    - In what ways does your chiropractor meet your expectations? Have these changed over time?
    - Are there any ways that your chiropractor doesn't meet your expectations?
    - What could your chiropractor do differently to help meet your expectations?
    - Do you go to the chiropractor with the expectation of your condition being cured or is it more about managing your pain?

2. Does your chiropractor ask for your input and/or involve you in decision-making about your care? (Patient Activation) (Sharing Power & Responsibility)
    - Please describe.
    - Do or did you play a role in deciding the type of care you would receive for your condition from the chiropractor?
        - Is this consistent with the role you ideally like to, or expect, to play in deciding about your care? Please explain.
    - Would you like to be given a choice of treatments?
        - Why did you go with the treatments that you chose?
    - Does the role that you play in your chiropractic care differ from the one you play when you see your medical doctor? A specialist or other health professional?

3. In what ways do you feel your chiropractor considers your personal or occupational or environmental circumstances in managing your condition? (Problem-Solving/Contextual) (biopsychosocial perspective)
    - Can you give me an example of that? How did the chiropractor incorporate consideration of your circumstances into your care plan?
    - Do you want more from your chiropractor when it comes to considering your individual situation? Please describe.

4. Do you work together with your chiropractor to set specific health-related goals for you to work on? (Goal Setting/Tailoring)
    - What kinds of goals have you set?

  - Is the progress towards these goals monitored?
  - If you do not have any goals specifically set, do you want goals and if so, how would you want to set them?
  - Do you think that it is important to set goals?

5. What do you think of the care you receive from your chiropractor?

    - Are you satisfied or dissatisfied with the care?
        - Explain your response.
    - Do you feel that your satisfaction is affected by how well you think that your chiropractor understands you and your specific health care needs? (Patient-as-person)
        - Please describe why you think this might be

    - Do you think the length of time that you've been seeing your chiropractor influences how you view working with them on your health concerns? (Therapeutic Alliance)
        - Could you tell me more about that?

6. How often do you go to your chiropractor?

    - Does anything limit you from seeing the chiropractor? (money, time, etc.)
    - Do you think that seeing the chiropractor more often would influence your doctor-patient relationship? (sharing power and responsibility)
        - Could you explain that further?

7. Are there any other characteristics of your chiropractor that you think could influence how attentive they are to your specific needs? (patient-as-person)

    - E.g. how busy they are, how long they've been in practice, their gender, the office environment

8. Does your chiropractor provide care that goes beyond what happens in the clinic? (Follow-up/Coordination)

    - What types of advice did you receive for caring for yourself when you can't see the chiropractor or between visits? Examples could include exercise or using heat or ice, etc.
    - How easy is it to remember or complete the things that are advised?
    - Do the chiropractor and/or their staff maintain contact with you?

    - Do you want to be followed-up? Why? How - With e-mails? Telephone calls? Text messages? How often do you want follow-ups to take place

9. Does your chiropractor give you information to enhance your understanding of your condition and the care for it? (Delivery system design/Decision support)

    - How do you want to receive information from your chiropractor? E.g. by e-mail or handout? During a visit?
    - What kinds of information would you want in a handout or e-mail, etc.?
    - How often would you want such information?

10. Does your chiropractor communicate with other health care professionals (e.g. your family doctor, massage therapist, physiotherapist) about your case and coordinate care between them? (Follow-up/coordination)

    - Could you give an example of when this was done in your case?
    - Is there a role for you as a patient to play in the collaboration between your care-givers? How?

11. Have your impressions of what you require from your chiropractor changed over time?
    - Is there anything else about you that might influence what you're looking to get from your chiropractor?
    - Give me an example.

12. If you had one minute to give advice to chiropractors working with patients with chronic musculoskeletal conditions, what would you say?"

    - Why do you say that?

Conclusion

- Do you have any final comments or suggestions that you would like to make to chiropractors about your experiences with chiropractic or to help them become more patient-centered?
- Verbal acknowledgement and thank you:
  "We have come to the end of our focus group. Once again we'd like to thank you for joining us today and sharing so openly and honestly about your experiences.

Summary (3 minutes or less)
Here is a brief summary of the main points we heard today…..[insert here]…..Is there anything we have missed? Does that reflect the conversation you heard? What would you add to or change about that summary

Ok we'd like to wish you're a safe journey home. I will direct you to the table on the left where [insert name] will provide you with our 'thank you' gift to you."

- Provide them with reimbursement gift card.

Appendix 12. Individual chiropractor interview guide

Chiropractor Individual Interviews

Introduction (5-10 minutes):

Discuss and collect signed informed consent prior to audio recording – confirm that individuals will not be identified, none of the quotes attributed to individuals personally. Ask if participant has any questions about the reason for, or content of, the informed consent. Subjects will need to sign the informed consent form prior to commencement of the interviews**.**

Introductory Script:

Welcome

"Good morning/afternoon and welcome. Thanks for taking the time to join me to talk about chronic musculoskeletal conditions and chiropractic care.

Purpose

The purpose of this interview is to obtain your perspectives and experiences in working with patients with chronic musculoskeletal conditions and how patients are involved in the decisions that are made surrounding their care. We also want to find out about the care you provide for these patients and how you view their role in such care. Last year you completed a questionnaire that asked you about this, and now we're here to discuss it and learn about in your own words.

Guidelines

We're audio-recording the session because I don't want to miss any of your comments. People say really helpful things in these interviews, and I can't write fast enough to get them all down. To maintain confidentiality and privacy, I ask that you do not disclose where it is that you were recruited from or the name of the clinic or city where you work.

I've got a number of questions that I want to ask, but my job is really to listen. This will be more interesting if we treat this like a conversation. I may need to interrupt to get through all the questions. I apologize ahead of time if I need to do this.

There are no right or wrong answers, only different points of view. Keep in mind that we're just as interested in negative comments as positive comments, and at times the negative comments are the most helpful.

Please be aware during this discussion, that anything declared which is illegal or indicates unprofessional practice will need to be passed on to the appropriate authorities for action.

Alright let's begin…I will start with an easy question…[ice breaker question]"

Core Interview Questions (40-50 minutes):

1. What is a typical visit like when seeing a patient with a chronic musculoskeletal condition?
    - What types of things do you talk about?
        - Do you ask patients about how their chronic condition affects their life? (Problem-Solving/Contextual)
        - Do you discuss their health habits? (Goal setting)
2. In what ways are patients with chronic musculoskeletal conditions different from those with an acute condition?
    - Does your approach differ between these patient populations?
    - Do you have an example that might illustrate this?
    - What are your expectations when caring for a patient with chronic pain?
3. How do you design treatment plans for patients with chronic msk conditions?
    - What role do patient values play in the plan?
    - Are a patients' personal, social and/or occupational circumstances considered when making recommendations? Describe. (Problem-Solving/Contextual)
    - What role do patients play in decision-making about their care? (Patient Activation)
        - Do you ask for or take patient ideas into consideration when coming up with a treatment plan? (Patient Activation)
4. How do you provide care that goes beyond what happens in the clinic? (Follow-up/Coordination)
    - How does your treatment plan enable patients to implement during their daily life and between visits? (Problem-Solving/Contextual)
        - What take-home resources or advice do you give your patients?
        - Do you give your patients information to enhance their understanding of their condition and the care for it? (Delivery system design/Decision support)
        - Do you give information to patients? Describe (probe: such as a written list of exercises or other things to improve patient health, even websites to consult? (Delivery system/decision support)
        - Do you recommend specific groups or classes in the community that may help with their condition? (yoga, pilates,

tai chi, support groups) (Follow-up / coordination)

- What role does following-up with patients play in their care? (Follow-up / coordination)
    - What is your process? Why do you follow-up in this manner?
    - How often do you follow-up?

5. Do you and your patient establish goals in caring for their condition? (Goal setting)

    - What kinds of goals do you set?
    - Do you write those goals down as part of a treatment plan and monitor them? (Goal setting)

6. Do you communicate and coordinate care with other health care professionals for patients with chronic msk conditions? Describe (Follow-up / coordination)
    - Could you give an example of when you have done this?
    - Is there a role for the patient to play in the collaboration between care-givers? How?

7. Are there any characteristics of chiropractors that you think could influence how attentive they are to a patient's specific needs? (Patient-as-person)
    - E.g. how busy they are, how long they've been in practice, their gender, the office environment and practice atmosphere
    - Do you think the length of time that you've been seeing a patient influences how they view working with you on their health concerns? (Therapeutic Alliance)
        - Could you tell me more about that?

8. What is your opinion about how patient satisfaction is affected by how well they think that you understand them and their specific health care needs? (Patient-as-person)
    - Please describe why you think this might be
    - Do you think that seeing a patient with a chronic condition more often would influence your doctor-patient relationship? (sharing power and responsibility)
    - Could you explain that further?

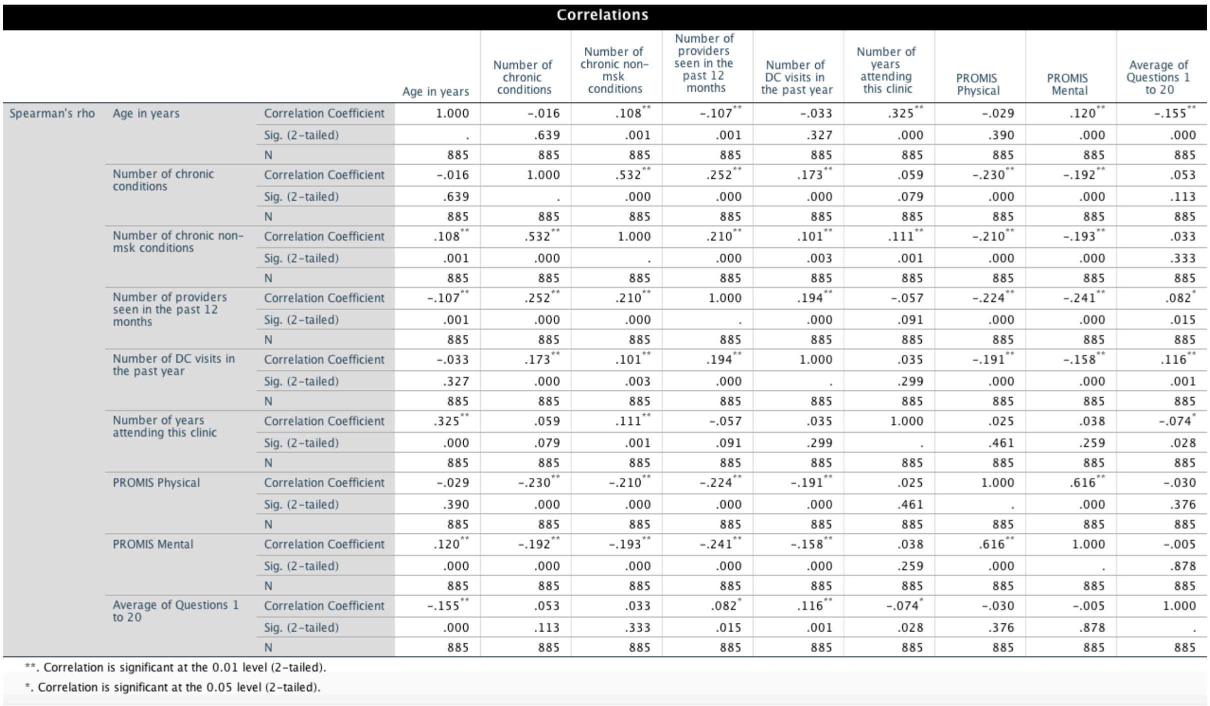
9. If you had one minute to give advice to other chiropractors working with patients with chronic musculoskeletal conditions, what would you say?
    - Why do you say that?

Conclusion (5-10 minutes)

Summary (3 minutes or less)

- Here is a brief summary of the main points we heard today…..[insert here]…..Is there anything I have missed? Does that reflect the conversation we had? What would you add to or change about that summary?
- Do you have any final comments regarding your experiences treating patients with chronic musculoskeletal conditions that you would like to add?
- Do you have any recommendations to other chiropractors to help them become more patient-centered?
- Verbal acknowledgement and thank you:
  "We have come to the end of our interview. Once again I'd like to thank you for joining me today and sharing your experiences so openly and honestly.

Appendix 13. PACIC score correlation table



Correlations

			Age in years	Number of chronic conditions	Number of chronic non-msk conditions	Number of providers seen in the past 12 months	Number of DC visits in the past year	Number of years attending this clinic	PROMIS Physical	PROMIS Mental	Average of Questions 1 to 20
Spearman's rho	Age in years	Correlation Coefficient	1.000	-.016	.108**	-.107**	-.033	.325**	-.029	.120**	-.155**
		Sig. (2-tailed)	.	.639	.001	.001	.327	.000	.390	.000	.000
		N	885	885	885	885	885	885	885	885	885
	Number of chronic conditions	Correlation Coefficient	-.016	1.000	.532**	.252**	.173**	.059	-.230**	-.192**	.053
		Sig. (2-tailed)	.639	.	.000	.000	.000	.079	.000	.000	.113
		N	885	885	885	885	885	885	885	885	885
	Number of chronic non-msk conditions	Correlation Coefficient	.108**	.532**	1.000	.210**	.101**	.111**	-.210**	-.193**	.033
		Sig. (2-tailed)	.001	.000	.	.000	.003	.001	.000	.000	.333
		N	885	885	885	885	885	885	885	885	885
	Number of providers seen in the past 12 months	Correlation Coefficient	-.107**	.252**	.210**	1.000	.194**	-.057	-.224**	-.241**	.082*
		Sig. (2-tailed)	.001	.000	.000	.	.000	.091	.000	.000	.015
		N	885	885	885	885	885	885	885	885	885
	Number of DC visits in the past year	Correlation Coefficient	-.033	.173**	.101**	.194**	1.000	.035	-.191**	-.158**	.116**
		Sig. (2-tailed)	.327	.000	.003	.000	.	.299	.000	.000	.001
		N	885	885	885	885	885	885	885	885	885
	Number of years attending this clinic	Correlation Coefficient	.325**	.059	.111**	-.057	.035	1.000	.025	.038	-.074*
		Sig. (2-tailed)	.000	.079	.001	.091	.299	.	.461	.259	.028
		N	885	885	885	885	885	885	885	885	885
	PROMIS Physical	Correlation Coefficient	-.029	-.230**	-.210**	-.224**	-.191**	.025	1.000	.616**	-.030
		Sig. (2-tailed)	.390	.000	.000	.000	.000	.461	.	.000	.376
		N	885	885	885	885	885	885	885	885	885
	PROMIS Mental	Correlation Coefficient	.120**	-.192**	-.193**	-.241**	-.158**	.038	.616**	1.000	-.005
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.259	.000	.	.878
		N	885	885	885	885	885	885	885	885	885
	Average of Questions 1 to 20	Correlation Coefficient	-.155**	.053	.033	.082*	.116**	-.074*	-.030	-.005	1.000
		Sig. (2-tailed)	.000	.113	.333	.015	.001	.028	.376	.878	.
		N	885	885	885	885	885	885	885	885	885

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).