

BARRIERS AND FACILITATORS TO PRESCRIBED EXERCISE ADHERENCE IN  
CHIROPRACTIC PATIENTS WITH NON-SPECIFIC CHRONIC LOW BACK PAIN:  
A FOCUSED ETHNOGRAPHY

by

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## Abstract

**Background:** Non-specific chronic low back pain (NS-CLBP) is an increasing global burden. Chiropractors see a significant proportion of the NS-CLBP population, commonly prescribing exercise as a treatment. Exercise is one of the few interventions for NS-CLBP that has been demonstrated to reduce pain and improve function. However, patient adherence to prescribed exercise is poor.

**Aim:** An exploration of chiropractors' and patients' experiences and beliefs regarding the barriers and facilitators to prescribed exercise adherence was undertaken to help inform future exercise prescription.

**Methods:** A focused ethnographic approach was taken, involving semi-structured interviews with six chiropractors who frequently prescribe exercise and six NS-CLBP patients who are currently under chiropractic care and have been prescribed exercise.

**Results:** Identified barriers and facilitators revolved around: Exercise Delivery, the Practitioner-Patient Relationship, Attributions and Expectations, and Pain.

**Conclusion:** Prescribed exercise adherence is impacted by the complex patient-practitioner relationship, with most barriers and facilitators appearing to be modifiable.

## **List of Abbreviations Used**

<b>ADL</b>	Activities of Daily Living
<b>BCT</b>	Behavior Change Technique
<b>CLBP</b>	Chronic Low Back Pain
<b>CBT</b>	Cognitive Behavior Therapy
<b>CMCC</b>	Canadian Memorial Chiropractic College
<b>COREQ</b>	Consolidated Criteria for Reporting Qualitative Research
<b>CPG</b>	Clinical Practice Guideline
<b>CT</b>	Computed Tomography
<b>EPA</b>	Electrophysical Agent
<b>HCP</b>	Health Care Practitioner
<b>IFC</b>	Interferential Current
<b>LBP</b>	Low Back Pain
<b>MRI</b>	Magnetic Resonance Imaging
<b>NS-CLBP</b>	Non-Specific Chronic Low Back Pain
<b>SMT</b>	Spinal Manipulative Therapy



## Glossary

**Adherence:** The extent to which a person's behaviors correspond with agreed recommendations from a health care provider (World Health Organization, 2003).

**Adult:** 18-65 years old.

**Attributions:** Explanations about oneself or another linked to motives, behaviors, thoughts, and feelings; it is a way of making sense of things that have occurred in the past (Weinberger, 1995).

**Behaviour Change Technique:** Observable, replicable, and irreducible component of an intervention intended to alter or redirect causal processes that regulate behavior (Michie et al., 2013; Michie et al., 2011; Michie & Johnston, 2011).

**Evidence Based/Informed Medicine/Practice:** "The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research" (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996, p. 71). "It requires a bottom up approach that integrates the best external evidence with individual clinical expertise and patients' choice" (Sackett et al., 1996, p. 72).

**Expectations:** Beliefs about anticipated links between a set of behaviours (oneself or another persons') and resulting consequences or future outcomes (Maddux, 1999; Ozegovic, Carroll, & Holm, 2012).

**Non-Specific Chronic Low Back Pain:** Low back pain (LBP) or discomfort not readily attributed to a specific pathology (Deyo, Rainville, & Kent, 1992). Pathology examples include, but are not limited to: infection, tumor, fracture, structural deformity, inflammatory disorder, or radiculopathy secondary to a low back dysfunction. This pain or discomfort must be persisting for 3 months or longer, ranging from the lower costal margin to the horizontal gluteal crease, with or without leg pain (Airaksinen et al., 2006).

**Prescribed Exercise:** Exercise or movement recommended by a health care practitioner (HCP) for health or therapeutic purposes. This could include aerobic, resistance, and/or flexibility/motion training.

**Self-efficacy:** An individual's belief in their ability to perform a specific behavior in a specific situation (Bandura, 1977).

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## Chapter 1: Introduction

Addressing the highly prevalent problem of back pain is complicated and continues to be the focus of much health research. Back pain has been identified as the leading cause of disability worldwide (Vos et al., 2013). Low back pain (LBP) has been found to affect approximately 70-80% of people at some point in their lives and results in significant economic costs, work absenteeism, and personal distress (Andersson, 1999; Rubin, 2007). Approximately one third of all patients seeking professional care for LBP consult with a chiropractor, and a significant portion of them have chronic low back pain (CLBP) (Carey et al., 1995; Carey et al., 1996; Côté, Cassidy, & Carroll, 2001; Coulter et al., 2002; Hawk, Long, Boulanger, Morschhauser, & Fuhr, 2000; Hurwitz, Coulter, Adams, Genovese, & Shekelle, 1998; Shekelle, Markovich, & Louie, 1995). Generally, up to 73% of those with acute LBP will have a recurrence within 12 months (Pengel, Herbert, Maher, & Refshauge, 2003), and studies of CLBP indicate that 60-80% of those seeking health care will continue to have LBP after one year (Hayden, Dunn, Van der windt, & Shaw, 2010). Studies of chiropractic care have similar results, as illustrated by a recent prospective observational cohort study looking at 1082 patients presenting to chiropractors and general practitioners that found that the clinical course of LBP can be complex, with most patients not becoming pain-free within a year despite receiving care (Kongsted, Kent, Hestbaek, & Vach, 2015). Clearly, there is an ongoing need for research in this area.

Even with advances in technology, the increased use of imaging and novel interventions for CLBP, disability from back pain has actually increased, and created a ubiquitous strain on health care systems (Deyo, Mirza, Turner, Martin, 2009). To add to the complexity, individuals with CLBP suffer with complex mental health issues in addition to their persistent, distressing pain. This includes a sense of loss, lowered self-worth, depression, and fear of the future (Snelgrove & Lioffi, 2013). Despite the many available LBP clinical practice guidelines (CPG) and consensus statements providing practitioners with management guidance, LBP health care appears to be increasingly guideline-discordant, with no shortage of gurus claiming to possess answers and a new cure for LBP (Mafi, McCarthy, Davis, & Landon, 2013; Jevne, 2015). And, because there

is no “magic bullet” and success with interventions is often slow and unsatisfactory, individuals with LBP often end up utilizing self-management techniques, such as exercise, which can provide significant and lasting relief (Crowe, Whitehead, Jo Gagan, Baxter, & Panckhurst, 2010).

Therapeutic exercise is one of the few interventions for CLBP that has been demonstrated to reduce pain and improve function (Chou & Huffman, 2007; van Middelkoop et al., 2010). When patients with LBP promptly adhere to treatment sessions including prescribed exercise, not only is there decreased opioid medication use and reduced likelihood of invasive interventions, but also there are reduced total LBP care costs (Childs et al., 2015). Since prescribed exercise is an effective self-management technique that can be used at home, it appears to be the most cost-effective, evidence-informed intervention currently available for CLBP.

To obtain successful CLBP outcomes through exercise, adherence to an exercise regime is key (Hayden, van Tulder, & Tomlinson, 2005). Throughout this thesis, adherence will be defined as: the extent to which a person’s behaviors correspond with agreed recommendations from a health care provider (World Health Organization, 2003). Unfortunately, adherence to prescribed exercise is poor and there is a significant gap between practitioners’ recommendations and patients’ expectations and behaviors (Hoffmann, Del Mar, Strong, & Mai, 2013; Medina-Mirapeix et al., 2009). A recent systematic review highlighted how only a small percentage of individuals with CLBP adhered to prescribed at-home exercise programs, despite the potential for exercise to help these individuals self-manage their discomfort and improve their function (Beinart, Goodchild, Weinman, Ayis, & Godfrey, 2013). In addition, consensus statements recommend that all CLBP patients visiting chiropractic offices should receive an exercise assessment and appropriate patient-specific exercise advice (Globe, Morris, Whalen, Farabaugh, & Hawk, 2008; Hawk, Schneider, Evans, & Redwood, 2012). Despite the high number of CLBP patients under chiropractic care and the push to prescribe exercise, little is known from the patients’ and chiropractors’ perspectives regarding the issue of prescribed exercise adherence. It has been suggested that an exploration of patients’ and exercise-prescribing health care practitioners’ (HCP) experiences and beliefs may provide a better understanding of this adherence issue and inform the development of strategies to

improve exercise prescription and subsequent patient engagement (Bernart et al., 2013; Hayden et al., 2005).

**Research Problem: Using a focused ethnographic approach, an in-depth exploration of chiropractors' and patients' experiences and beliefs regarding the barriers and facilitators to prescribed exercise adherence in adults with CLBP was undertaken. Through a series of semi-structured interviews that were conducted and analyzed by two researchers with deep contextual knowledge of the topic, the perspectives of chiropractic patients who have been prescribed exercises, as well as chiropractors who frequently prescribe exercise were explored. The aim was to add to the small literature base on this topic and to help inform the development and delivery of more effective patient-centered exercise prescription in the future.**

## Chapter 2: Literature Reviews

### 2.1 Non-Specific Chronic Low Back Pain

A challenge with the LBP population is that most individuals have no specific pain generator that can be readily identified, and spinal imaging techniques provide little help in the diagnostic and treatment process (Brinjikji et al., 2015; van Tulder, Assendelft, Koes, & Bouter, 1997). This group, making up the majority of CLBP cases, is classified as having non-specific chronic low back pain (NS-CLBP) (Deyo et al., 1992). The “chronic” component of NS-CLBP has been defined as pain or discomfort for three months or longer (Airaksinen et al., 2006). The location of the pain or discomfort has been defined as being below the costal margin and above the inferior gluteal folds (Airaksinen et al., 2006).

Practitioners face the challenge of reassuring patients while adequately explaining their pain in the absence of readily identifiable pain generating structures. This difficulty often leads to imaging for NS-CLBP, which is contrary to CPGs [that state imaging is unnecessary for this population in the absence of red flags or indications of significant pathology (Dagenais et al., 2010; Koes et al., 2010)] and results in increased health care costs and unnecessary radiation exposure (Chou et al., 2011; Schlemmer, Mitchiner, Brown, & Wasilevich, 2015). Even more concerning than the costs is that early non-indicated x-rays and magnetic resonance imaging (MRI) may also lead to worse patient outcomes (Kendrick et al., 2001; Webster, Bauer, Choi, Cifuentes, & Pransky, 2013). Practitioners may use non-indicated imaging to reassure their patients; however, paradoxical iatrogenic effects have been found, such as a cascade of investigations and treatments for clinically irrelevant imaging findings and an overall decrease in patients’ sense of wellbeing (Ash et al. 2008; Deyo, 2002; Modic et al., 2005). To complicate the matter even more, individuals who receive non-indicated imaging are more satisfied with their care, despite having poorer outcomes than those who did not receive imaging (Kendrick et al., 2001). This creates a predicament for the HCP of following CPGs for evidence-based practice, while also aiming to satisfy their customer/patient. While spinal imaging is important to detect the rarer causes of LBP such as tumor, infection, or fracture, many individuals with NS-CLBP continually seek out diagnostic testing and

imaging in an attempt to receive a specific diagnosis for a non-specific condition (Cooper, Smith, & Hancock, 2009; Liddle, Baxter, & Gracey, 2007; Sloots et al., 2010). This is especially concerning if evidence-informed treatments are avoided while these individuals engage in a fruitless and frustrating quest to find satisfying answers and an anatomic cause of their persistent pain. This “cost of satisfaction” dilemma has been well documented in the context of medicine (Fenton, Jerant, Bertakis, & Franks, 2012).

This cost of satisfaction dilemma is not restricted to imaging only; it is also evident in the context of musculoskeletal treatment. A systematic review found that treatment outcome was infrequently and inconsistently associated with patient satisfaction (Hush, Cameron, & Mackey, 2011). It is possible that a caring and convincing spinal practitioner can create the illusion that the patient is receiving the best care, yet in reality they may not be receiving evidence-informed management that is tied to long-term positive outcomes. This highlights the concept that temporarily satisfied NS-CLBP patients might not always be the healthiest patients, especially in the long-term.

Unfortunately, it is not only the patients who engage in a fruitless quest. The discrepancies between pain and structural low back findings are well established, yet many HCPs appear to still have an affinity for a biomedical approach when managing LBP (Andrade, Ashton, Wray, Brown, & Bartanusz, 2015; Brinjikji et al., 2015; Cieszanowski et al., 2014; Mcnee et al., 2011). Manual therapists with a biomedical orientation may have an increased intolerance to uncertainty, resulting in poor adherence to CPGs (Simmonds, Derghazarian, & Vlaeyen, 2012). Instead of prompting their NS-CLBP patients to return to work and engage in enjoyable physical activity, they may inappropriately focus on tissue-based treatments, further spinal investigation, and rest, propagating fear-avoidance behaviors (Daykin & Richardson, 2004; Wertli, Rasmussen-barr, Weiser, Bachmann, & Brunner, 2014).

Psychosocial factors have been linked to LBP chronicity and poor outcomes, prompting the use of the biopsychosocial model of care rather than the biomedical model (Deyo, 2015; Kendal, 1999). Current LBP CPGs consistently state that practitioners should no longer take a solely biomedical approach when assessing and managing NS-CLBP and that psychosocial factors should be screened for and appropriately addressed (Dagenais et al., 2010; Delitto et al., 2012; Koes et al., 2010). Unfortunately, a recent

systematic review suggests that HCPs may stigmatize or feel unprepared to treat individuals with LBP and the psychosocial factors that influence recovery (Synnott et al., 2015).

Since LBP is mostly non-specific in nature and often persistent, even if patients seek medical or chiropractic care (Kongsted et al., 2015), there has been a recent call for practitioners and patients to reconceptualize the way they view and manage NS-CLBP (Jevne, 2015). This reconceptualization advocates that practitioners should no longer treat patients like a mechanic treating a car; instead, their biological, psychological, and social factors should be addressed, while providing patients with reassurance, increased self-efficacy, and self-management techniques such as exercise (Deyo, 2015, Deyo et al., 2009; Jevne, 2015).

## **2.2 Exercise Benefits and Mechanism of Action**

Systematic reviews and randomized controlled trials have consistently concluded that exercise has a broad range of health benefits, including benefits for back pain sufferers. A review of the evidence for a LBP CPG for the American College of Physicians /American Pain Society found that exercise is one of the few conservative interventions demonstrated to reduce pain and improve function in individuals with CLBP (Chou & Huffman, 2007). Subsequently, another review of the evidence from randomised controlled trials demonstrated that exercise is effective at reducing pain and improving function in individuals with CLBP (van Middelkoop et al., 2010). Further adding to the literature base, a recent 1-year longitudinal study found that individuals seeking care for CLBP who engaged in higher levels of leisurely physical activity (moderate to vigorous) reported less pain and disability compared to those who were more sedentary (Pinto et al., 2014). Even further support for prescribed exercise was demonstrated in another recent study, finding that when patients with LBP promptly adhere to exercise-based treatment, not only is there decreased opioid medication use and reduced likelihood of invasive interventions, there is also a reduction in total LBP-care costs (Childs et al., 2015). Overall, the literature has consistently found that prescribed exercise is a valuable treatment option for NS-CLBP.



Although the effect sizes of exercise for NS-CLBP are modest (Keller, Hayden, Bombardier, & Van tulder, 2007; Slade & Keating, 2006; van Middelkoop et al., 2010), exercise prescription still appears to be the most cost-effective evidence-informed intervention currently available for NS-CLBP. In terms of which exercise to prescribe, HCPs must use their clinical judgment because there is an absence of high quality evidence supporting the effectiveness of one form of exercise over another (Aleksiev, 2014; Macedo, Maher, Latimer, & Mcauley, 2009; Macedo, Smeets, Maher, Latimer, & Mcauley, 2010; O’Keeffe et al., 2014; Saner et al., 2015; Smith, Littlewood, & May, 2014; Van der giessen, Speksnijder, & Helders, 2012; van Middelkoop et al., 2010; Wang et al., 2012; Yamato et al., 2015). Studies examining the impact of exercise on NS-CLBP continue to be conducted and an update to the 2005 Cochrane review on exercise therapy for the treatment of NS-CLBP is underway (Hayden, Cartwright, Riley, & van Tulder, 2012). The published protocol states that the update will be combined with an individual participant data meta-analysis to examine differential treatment effects across individuals, providing insight into how patients’ characteristics modify treatment benefit (Hayden et al., 2012). Numerous explanations have been proposed as to the mechanisms whereby exercise improves NS-CLBP. Evidence is building to suggest that we should be looking beyond the spine. For example, a systematic review by Steiger and colleagues (2012) highlighted how the treatment effects of exercise therapy for NS-CLBP do not appear to be directly attributable to changes in the musculoskeletal system, such as mobility or trunk strength and endurance. Subsequently, a randomized controlled trial found that exercises targeting motor control impairment in patients with NS-CLBP provided no additional benefit compared to general exercise (Saner et al., 2015). These findings challenge long held beliefs that motor control, stability, and/or mobility interventions have regional structural or biomechanical outcomes that are the key to successful NS-CLBP rehabilitation. Alternatively, as suggested in the literature review by Steiger and colleagues (2012), the benefits of exercise for NS-CLBP patients may be due to cortical reorganization, changes in psychological variables such as fear-avoidance beliefs, catastrophizing, and self-efficacy regarding pain control, or even a positive therapeutic practitioner-patient relationship. Wand and O’Connell (2008) discussed how HCPs and researchers may want to look at the cortical alterations and degeneration in patients with

NS-CLBP and how this can be changed, rather than focusing on subgrouping NS-CLBP and blaming past disappointing clinical trial results on heterogeneity.

The understanding of the supraspinal mechanisms related to exercise and NS-CLBP is still in its infancy, with pain neuroscience-informed prescribed exercise looking promising, but still needing time to develop (Moseley & Flor, 2012; Nijs, Lluch gibrés, Lundberg, Malfliet, & Sterling, 2015; Wand et al. 2011). Despite pain neuroscience developments, many clinicians and researchers continue to have a strict biomechanical focus. A recent trend of utilizing movement assessments has emerged, where chiropractors and other HCPs are looking for signs of dysfunction possibly leading to increased injury rates or repetitive micro-trauma and maladaptive tissue changes leading to the propagation of LBP. Some HCPs hold the belief that dysfunction can be identified and subsequent interventions, including specific corrective exercises, can be applied to diminish pain. Although this biomechanical approach is useful for many musculoskeletal conditions, its relevance to the NS-CLBP population is unclear (Frost, Beach, Campbell, Callaghan, & McGill, 2015; Frost, Beach, Callaghan, & McGill, 2013; Glaws, Juneau, Becker, Di stasi, & Hewett, 2014; Gulgin & Hoogenboom, 2014; Whiteside, 2014). It is also unclear if correcting these identified dysfunctions through exercise can improve pain through motor and/or biomechanical changes or, if non-specific factors are at play, such as the cognitive restructuring of pain accompanying a graded exposure to painful movements or exercises.

In light of the extensive literature delineating similar effect sizes for diverse exercise protocols for NS-CLBP, it is reasonable to believe that central non-specific factors are also contributing to improvements. If this is true, continued development and focus on even the most targeted and specific exercises for NS-CLBP may provide effects that are no different from pleasurable, patient-preferred exercise. Overall, the literature is still unclear, and it is likely that a combination of factors are at play, highlighting the continued need to look at biological, psychological, and social factors influencing NS-CLBP, while not holding any particular treatment so close that it blocks future innovation.

At this point in time, regardless of the type and specific mechanisms behind exercise for NS-CLBP, it is well established that adherence to an exercise program is key

to its success (Aleksiev, 2014; Hayden et al., 2005). A recent prospective cohort study identified that adherence to the exercise program for CLBP almost doubled the probability of a favourable outcome (Cecchi et al., 2014). Unfortunately, as noted in the introduction, it has consistently been found that only a small percentage of individuals with CLBP adhere to prescribed exercise programs (Beinart et al., 2013). This prompted a literature review examining the barriers and facilitators to prescribed exercise adherence in adults with NS-CLBP, from the perspective of patients, as well as HCPs.

## **2.3 Barriers and Facilitators to Prescribed Exercise Adherence**

### **2.3.1 Literature Overview**

Strategies to improve exercise adherence are needed and an exploration of patients' past experiences, beliefs, and preferences may provide a better understanding of the issue (Hayden et al., 2005; van Middelkoop et al., 2010). In addition, understanding and subsequently enhancing patient-practitioner communication is advocated to improve adherence to prescribed at-home exercise programs (Beinart et al., 2013). Qualitative methods, such as interviews and focus groups, allow participants to discuss issues in-depth. In particular, semi-structured interviews provide a platform for participants (HCPs and patients) to discuss the context and rationale behind their beliefs and preferences. In light of this, a narrative review of qualitative literature (face-to-face interviews and focus groups) was conducted with the aim of exploring the barriers and facilitators to prescribed exercise adherence in adults with NS-CLBP from the perspectives of HCPs who prescribe exercise and/or patients who have been prescribed exercise. Considering the global burden of NS-CLBP, it was surprising that relatively few (n=12) qualitative studies were identified (Cook & Hassenkamp, 2000; Cooper et al., 2009; Crowe et al., 2010; Dean, Smith, Payne, & Weinman, 2005; Keen et al., 1999; Liddle et al., 2007; Morris, 2004; Slade, Molloy, & Keating, 2009A & 2009B; Slade, Molloy, & Keating, 2012; Sloots et al., 2010; Sokunbi, Cross, Watt, & Moore, 2010).

A meta-ethnographic phased approach adapted from the works of Noblit and Hare (1988) was used to synthesize identified studies. This included gathering and reading the qualitative studies on the topic of interest. These studies were read several times to

become familiar with the content and themes. The next phase involved the process of broadly determining how the studies are related. Key themes and concepts from each study were then juxtaposed and towards the end of this phase, assumptions were made as to whether the themes were parallel or contradictory. The next phase involved the translation or merging of the results of the studies into one another through a deeper inductive analysis.

Three deep-rooted themes emerged from the literature, and were labeled: 1) Diagnostic Dilemma, 2) Fear-avoidance, and 3) Self-Efficacy. These themes are described in more detail in sections 2.3.2, 2.3.3, and 2.3.4.

Unexpectedly (as there was no published protocol), subsequent to the completion of this narrative literature review, Slade and colleagues (2014) published a systematic review of qualitative studies exploring the beliefs and perceptions about exercise in patients with NS-CLBP. While the systematic review by Slade and colleagues (2014) did not have the specific objective of examining the barriers and facilitators to prescribed exercise adherence in adults with NS-CLBP, the targeted literature overlapped considerably and provided other insights regarding this topic. Slade and colleagues (2014) presented four primary themes in their paper: 1) Perceptions and classification of exercise. This included the subthemes: perceived differences between medically and non-medically prescribed exercise, individual preferences for types and formats of exercise, and the importance of individualized exercise. 2) Role and impact of the health professional. This included the subthemes of how effective and good health care provider communication skills are important and how the provision of education and information is important. 3) Exercise and activity enablers/facilitators. 4) Exercise and activity barriers. This included subthemes: time, diagnostic uncertainty, and fear of movement and pain aggravation: fear avoidance.

Although Slade and colleagues (2014) did not examine the HCPs perspectives, there was still remarkable congruency between their exercise adherence related themes and the practitioner-patient derived themes identified in the narrative review for this thesis. The three themes derived from the narrative qualitative literature review for this thesis will now be discussed, with some reference to relevant quantitative literature to contextualize the findings.

### 2.3.2 Diagnostic Dilemma

In the reviewed literature patient participants were found to be critical or wary of the vague diagnosis of NS-CLBP. Apprehension was evident when no specific pain generating structure could be identified, yet specific exercises were being prescribed. Also, there was often a need to prove that their complaint was real. This dilemma often led to poor prescribed exercise adherence. An example of this was demonstrated in the study by Cooper and colleagues (2009) where one patient participant would not return to physiotherapy because they wanted “an X-ray instead” (no quote identifier). This was also demonstrated in the study by Sloots and colleagues (2010) where a patient participant stated: “In the institute they said: ‘We cannot find anything ...’ Then I thought; just leave it [they will not be able to offer me something] that is why I stopped the programme” (Patient 1). In the same study, another patient participant expressed a similar concern regarding frustration with practitioners: “... it feels as if they do not want to believe me, if I am not taken seriously. That is why I asked for an MRI, then I am able to prove that I really have those complaints, the proof of my complaints. But they do not want to do that” (Patient 5). In the same study, a HCP had a different perspective: “Often they bring the results of a MRI, which is often a side step [in the rehabilitation process]. Then the results of such a MRI needs to be evaluated again. Patients in this situation think they have new information, which might lead to a solution [of their pain complaints]. In many cases this is not the case. The MRI shows something, which is not the cause of the complaint” (Physician 3).

The focus groups conducted by Liddle and colleagues (2007) support this theme further as demonstrated in the following quotes: “. . . there was a real element of the doctor, you know, stabbing at different treatments, you know? Cause I was never properly diagnosed em . . . you know, you try this, try exercises, physiotherapy, tablets, put you in traction then for a while . . . (Alicia agreeing). It was just, I mean, nobody’s ever, you know, if they can’t put their finger on what it is . . . then they can’t sort of . . . you know . . . treat it” David (FG3). “Diagnosis yeah . . . it’s a specialist subject. . . and treatment, and I don’t think . . . that they (GPs) should take that on board . . . really if anybody goes to their GP, I would push . . . to see a professional and not take advice from the GP” Elaine (FG2).

In the study by Slade and colleagues (2012), they examined how HCPs prescribe exercise therapy for patients with NS-CLBP in the absence of a specific diagnosis. They identified that HCPs perceive that care-seekers want a clear diagnosis and are challenged by diagnostic uncertainty. Supporting quotes for this include: “You have to give them some sort of diagnosis...even if I’m not a hundred per cent sure that it’s facet I’ll just tell them it’s facet, tell them it’s a disc strain so they know it’s going to get better” (Jean). “It’s very easy to say, you’ve got a disc that’s bulging out this way, if you do this McKenzie technique that pushes it back in, and we know that that’s probably not true, but it’s a simplistic way for patients to understand and you can give them a model” (Linda). “I generally talk about instability. . .you’ve got instability at this level and your movement pattern aggravates and it’s because you’re moving through one area too much” (Peter). Unfortunately, when patients failed to improve, some HCPs resorted to patient blaming, which suggests that they had exhausted their resources in regards to explaining NS-CLBP. This is demonstrated in the quotes: “You’ve got to sell it, show them what they do wrong, and that’s the hardest thing” (Margaret), and in reference to a patient, “It’s because you’re doing everything wrong, you’ll continue to get your back pain” (Laura).

Overall, it appeared that many patient participants were not content when HCPs could not consistently point to a specific pain-causing structure, while continuing to prescribe exercise. This was a significant barrier to exercise adherence. Subsequently, these participants questioned the utility of exercise and unfortunately, many then pursued more diagnostic tests or sought out fruitless consultations from a range of HCPs. Frustration was also clearly expressed by the HCP participants as they struggled to educate their patients about the complex and persistent nature of NS-CLBP while treating them.

### **2.3.3 Fear-Avoidance**

Attempts to explain the progression from acute to chronic musculoskeletal pain has led to the development of several important theories. Among them, the fear-avoidance model, first proposed by Lethem and colleagues (1983). This model suggested that fear of pain can either be confronted or avoided; confrontation reducing fear, while avoidance propagating it (Lethem, Slade, Troup, & Bentley, 1983). Over the years, the model has

been refined and its application to musculoskeletal pain has been explored. This includes an exploration of negative affect, anxiety, muscle reactivity, guarded movement, and disuse associated with fear-avoidance (Vlaeyen & Linton, 2000). There is a body of research that consistently links psychosocial factors, including fear-avoidance, to poor outcomes in patients with LBP, and the associated recommendations for HCPs to address these factors to enhance patient outcomes (Dagenais et al., 2010; Delitto et al., 2012; Hayden, Chou, Hogg-Johnson, & Bombardier, 2009; Koes et al., 2010). The concept of fear-avoidance was a recurrent theme in the qualitative literature as outlined below.

Fear of injury or worsening pain consistently surfaced in the qualitative literature and appeared to be a significant barrier to ADLs and therapeutic exercise. In addition, lack of patient knowledge regarding pain vs. tissue damage (hurt vs. harm) appeared to act as a barrier. These concepts are evident in the following quotes: “I wanted to play tennis and was afraid it was going to really hurt me” (G1:F29) and “When we played tennis we felt we had a similar sort of fear avoidance thing going on” (G1:F38) (Sokunbi et al., 2010). The uncertainty and fear surrounding NS-CLBP was highlighted by both HCPs and patients in the study by Dean and colleagues (2005) as demonstrated in the following quotes: “...people know they are going to get over a sprained ankle it’s, you know, it’s got a finite end and whatever, back pain doesn’t seem to be perceived in quite the same way...” (Lesley, a physiotherapist). “. . . and it was the thought of, I thought I would never, the pain was so bad that I’d never be able to walk again. I couldn’t have pictured this pain leaving me, you know” (Kim, a patient).

Overall, many patient participants’ fear of pain and uncertainty regarding the integrity of their spine prompted them to be overly cautious, avoiding previously enjoyed activities as well as the exercises prescribed by their HCP. The HCP participants acknowledged the impact of fear-avoidance on prescribed exercise, finding it a difficult cycle to break.

#### **2.3.4 Self-Efficacy**

The concept of self-efficacy is derived from the works of Albert Bandura and is defined as an individual’s belief in their ability to perform a specific behavior in a specific situation (Bandura, 1977). A recent synthesis of systematic reviews identified

self-efficacy as one of the most consistent predictors of physical activity in adults (Bauman, Reis, & Sallis, 2012). Interestingly, a reciprocal relationship between exercise behavior change and self-efficacy has been demonstrated. Simply put: participation in exercise tends to increase exercise self-efficacy, which in turn reinforces exercise behavior and continued exercise participation (Weinberg & Gould, 2003). This concept of self-efficacy was a recurrent theme in the qualitative literature as outlined below.

As an indicator of low self-efficacy, patient participants reported relying heavily on HCPs and desiring continued face-to-face guidance and support. The study by Cook and Hassenkamp (2000) supports this theme as noted in the following quotes regarding face-to-face exercise sessions and consultations with HCPs: “At least in that environment you know that everything you’re being told to do is OK” (no quote identifier). “It’s your job to help us and make us feel better, even if you can’t make us better.” (no quote identifier). The following quote regarding exercise from Keen and colleagues (1999) also supports this theme: “... I was worried about doing the wrong thing... the fact that a physiotherapist was actually there watching you, gave you confidence” R14 male 31.

Other patient participants in the papers reviewed reported that they were able to self-manage their back troubles more independently with exercise; however, they often requested long-term support and guidance from their HCPs. This is displayed in the following quotes regarding follow up after rehabilitation: “It would be helpful. . . if maybe there was somebody you could phone and say well, you know my background, this is how I’m feeling, is there some exercises I should be starting again, or is there something else I could try” (Participant 14, 41-year-old male) (Cooper et al., 2009). “If somebody E-mailed you after a month and said ‘How are you getting on doing the exercises?’ Just to gee you up a bit” (Participant 12, 63-year-old male) (Cooper et al., 2009).

Patient participants’ reliance or continued dependence appeared to impact exercise self-efficacy, acting as a barrier to at-home exercise adherence. Instead, patient participants often sought out a “fix” for their back pain and expected primarily passive care. When this expectation was present, exercise was often devalued and the potential benefits were not apparent. This is especially evident in the following quote regarding drop out from a rehabilitation program: “I thought I was going to have an operation or to



receive an injection and that they would try to do something to relieve my pain. But it turned out differently, all I did before with physical therapists I had to do here also, but then with exercises” (Patient 3) (Sloots et al., 2010).

Facilitators for self-management and increased exercise self-efficacy were identified when patient participants appeared to be educated effectively by HCPs or had existing exercise knowledge and experience. These patient participants appeared to value the benefits of long-term active care and understood the limited utility of continued passive care. An example of this is found in the study by Sokunbi and colleagues (2010) regarding an educational session and core stability program: “It has sort of changed my attitude towards doing something for myself rather than having to wait till I have an acute pain and they send me to a ‘Physio’ or Chiropractor which obviously is very expensive, it has made me realize I can do it myself” (G2:F38). The HCP guidance towards this self-management was highlighted in the following quote from the study by Dean and colleagues (2005): “It’s a matter of just tuning in and guiding everyone in the right direction as far as {not} giving them a quick fix” (Jane, a physiotherapist).

Enhancing self-efficacy is central to principles of behavior change. Cognitive behaviour therapy (CBT) is form of psychotherapy that is used to help address maladaptive thinking and behaviours (Beck, 2011). CBT utilizes specific behaviour change techniques (BCT) with the goal of shaping, prompting, and reinforcing adaptive behaviours, facilitating positive outcomes (Jensen, Nielson, & Kerns, 2003; Turk & Flor, 1987). BCTs have been defined as observable, replicable, and irreducible component of an intervention intended to alter or redirect causal processes that regulate behavior (Michie et al., 2013; Michie et al., 2011; Michie & Johnston, 2011). For NS-CLBP, CBT has been found to positively influence cognitive, behavioural, as well physical variables (Sveinsdottir, Eriksen, & Reme, 2012). Expectations also have a role in behavior change, with expectancy theory suggesting that individuals choose to behave in a specific way, due to the fact that they are motivated to choose an action or behaviour over other actions based on what they anticipate will result from the chosen action (Oliver, 1976).

Overall, decreased patient participant self-efficacy resulted in poor exercise engagement and a greater expectancy for passive care. Alternatively, increased self-efficacy allowed patient participants to be more independent; however, they still often

requested ongoing support from their HCP. Of importance was that the HCP has been found to help increase patients' self-efficacy, facilitating exercise adherence and patient independence.

### **2.3.5 Limitations**

The qualitative studies identified fall on a spectrum of rigor/trustworthiness based on the level of reporting suggested by the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong, Sainsbury, & Craig, 2007). Several limitations were identified. In the papers reviewed, the underlying philosophy or methodological framework utilized was often vague or not discussed in detail. This made it difficult to determine what lens the authors analyzed the data with. In addition, researchers' background, credentials, or incoming bias were usually not described at all or described poorly. Another limitation noted was that there were limited participant characteristics presented, with a vague description of eligibility criteria. This made it difficult to gauge the functional limitations and pain levels of the participants. Additionally, it was difficult to determine if individuals in some of the studies truly had NS-CLBP with no underlying pathology. This is important because individuals with specific low back pathology may have contraindications to exercise or a clear anatomic structure that explains their pain, and therefore, different perspectives and experiences than those with NS-CLBP. Member checking was not always utilized or was not performed with all the participants, which decreases the rigor and trustworthiness of the presented themes.

Most of the studies identified were conducted in the United Kingdom. No North American studies were identified. In addition, none of the identified studies looked specifically at chiropractors or chiropractic patients with NS-CLBP who have exercise prescription experiences. This was surprising, given that chiropractors see a large percentage of the back pain population and it is recommended that they prescribe exercise to their NS-CLBP patients. These findings demonstrate the need for well-reported, chiropractic-based studies in North America examining the barriers and facilitators to prescribed exercise adherence in adults with NS-CLBP.

## **Chapter 3: Methods and Methodology**

An exploration of chiropractors' and NS-CLBP patients' experiences and beliefs regarding the barriers and facilitators to prescribed exercise adherence was undertaken using a focused ethnographic approach. The aim was to add to the small literature base on this topic and to help inform the development and delivery of more effective patient-centered exercise prescription for NS-CLBP in the future.

### **3.1 Focused Ethnographic Design**

A focused ethnographic design was used to explore the shared exercise prescription experiences of chiropractors and adults with NS-CLBP. The features of a focused ethnography are listed below (Cruz & Higginbottom, 2013; Higginbottom, Pillay, & Boadu, 2013). Such studies are:

- Conducted by researcher(s) who possess background knowledge in the area of interest.
- Problem-focused and context-specific.
- Focused on a specific group(s) shared experiences.
- Limited to a small number of participants.
- Conducted in a short time frame.
- Not required to include fieldwork/participant observation, especially when participants are not currently residing in, or from the same area.
- Conducted to help explain the complex nature of the specific shared experiences and issues within the targeted group(s).
- Often used to help enhance health care services and practices.

The primary features that make a focused ethnography significantly different than a traditional ethnography are the short duration and limited fieldwork involved in a focused ethnographic study. However, as noted above, a focused ethnography requires the researcher(s) to have background knowledge in the area of interest (Cruz & Higginbottom, 2013). In this thesis study, Peter Stilwell and Katherine Harman have unique experiences and background knowledge relevant to the topic of interest. This

includes experiences as patients who have been prescribed exercise and as practitioners prescribing exercise (See section 3.2). Reflexivity was important throughout the study and memoing was vital as the study developed. The COREQ was used to guide the design of this focused ethnographic study to promote validity, transparency, and overall trustworthiness of the study (Tong et al., 2007).

To obtain unprimed information from the participants, there was a deceptive component to this study. The participants did not know that the researchers were specifically studying prescribed exercise adherence. Instead, participants were advised that the interviews would be broader, exploring chiropractic treatment preferences in adults with CLBP. Semi-structured interviews provided the interviewees (NS-CLBP and chiropractor participants) with the opportunity to provide a rationale regarding their past and current behaviors and discuss in-depth the issues that they believed were important regarding NS-CLBP management. With this method, participants were asked for clarification of information in a dynamic fashion and answers to questions were obtained in an unrehearsed, non-contrived manner.

### **3.2 Background Knowledge and Reflexivity**

Qualitative research is becoming more transparent as researchers have increased their self-disclosure (Creswell, 2013). All writing is “positioned” and readers can better understand this stance if the researcher(s)’ background knowledge and incoming values are identified (Creswell, 2013). This “reflexivity” contextualizes qualitative studies and provides readers with an insight into the lenses the researchers viewed the participants through.

#### **3.2.1 Researchers’ Background**

As described above, Focused Ethnographies require researchers to possess background knowledge in the area of interest. Katherine Harman and Peter Stilwell collaborated as researchers throughout this thesis study. Peter Stilwell has degrees in Kinesiology and Chiropractic. In the past, he has been a patient with NS-CLBP, having numerous positive and negative exercise prescription experiences with both chiropractors and physiotherapists. Despite this, exercise worked for him as a patient, and he believes

that exercise is an effective intervention. He has worked in various roles in rehabilitation settings since 2006. He has been in private practice as a chiropractor for almost two years, primarily treating NS-CLBP and sport-related injuries. He is also a Chiropractic Sports Sciences Resident and Sport First Responder, asked to assess and treat injuries at various local and national sporting events.

When treating NS-CLBP, he uses primarily education, therapeutic exercise, and short-term manual therapies. His primary goal is to dampen his patients' pain, while giving them the tools to increase their function and independently self-manage in the future. While he enjoys delivering manual therapies, he has found that patients can easily become dependent. Therefore, he strives to engage patients early on, focusing on teamwork while letting patients know that they are their own best health care provider.

Peter Stilwell has been involved in various chiropractic-related activities in Nova Scotia over the last two years. This resulted in him being in contact with most of the chiropractors in Halifax. This has provided him with exposure to insider knowledge, specifically the beliefs and practice patterns of Nova Scotian chiropractors. Prior to conducting this thesis study, Peter had informal contact with five out of the six chiropractors interviewed in this study. This provided him with some incoming knowledge regarding their personalities and practice styles. Although this exposure was limited, it appeared to facilitate a candid conversation during the audio-recorded interviews. Peter did not have any contact with any of the patient participants prior to conducting the study.

Katherine Harman has worked as a professor in the School of Physiotherapy at Dalhousie University for 17 years, the University of Ottawa for 11 years and has been a licensed physiotherapist for 34 years. In addition, her focus of practice (until she stopped treating patients in 1998), research, and teaching has been in the musculoskeletal field with a focus on pain. She has published peer-reviewed journal articles based on her research that used both quantitative and qualitative methods, and mostly on topics related to pain and rehabilitation. She has been a patient for low back pain and other musculoskeletal problems, has experienced both active and passive care and exercise has worked for her as a patient. She believes that exercise is an effective intervention. She is very familiar with manual therapy and exercise approaches to rehabilitation of NS-CLBP.

Many of the chiropractic approaches are similar to those of physiotherapy, and therefore during the interviews, she understood the technical language and discussions of a technical nature. She did not personally know, nor did she recognize any of the participants in the study.

There was a complex dynamic when engaging with the participants during the interviews. This was due to Katherine's background as a physiotherapist and a LBP patient combined with Peter's background as a chiropractor and a LBP patient. Before each interview, Peter attempted to set a tone that facilitated participant comfort. This included statements prompting participants to freely and honestly discuss their beliefs, experiences, and opinions. Participants knew of the interviewers' professional backgrounds, and at times comments were made that suggested that the individual might be thinking of changing what they would say in response to a question (for example, if they were making a comparison between physiotherapy and chiropractic). However, both Peter and Katherine assured the participants that their views were welcome and, in fact, we hoped to hear their opinions, freely expressed. Peter also disclosed his history with LBP when interviewing patient participants. This was done in an attempt to establish a connection and to stimulate an open discussion about the challenges patients often face, while receiving chiropractic care and other forms of treatment. Overall, it appeared as though all the participants felt comfortable during the interview process as they shared their uncensored narratives.

### **3.2.2 Chiropractic Diversity**

Chiropractic is the largest regulated health care profession traditionally practicing outside of mainstream medicine (Meeker & Haldeman, 2002). Chiropractic has its foundations in the manipulation of the spine (Dagenais & Haldeman, 2002); however, treatment approaches in the profession are now quite diverse, being likened to a chimera, a mythical creature possessing the head of a lion, the body of a goat, and the tail of a snake (Gleberzon, Cooperstein, & Perle, 2005). A recent North American survey exploring the identity of chiropractic and its future role in the health care system paints a confusing picture (Gliedt et al., 2015). Chiropractic students reported the desire to participate in mainstream health care and embrace evidence-informed care, yet still had a

clear affinity for traditional chiropractic philosophies that have limited scientific support (e.g., vertebral subluxation model) (Gliedt et al., 2015; Keating et al., 2005). Despite an attraction to traditional chiropractic philosophies, the majority of respondents in the survey believed that chiropractors should be providing more than spinal manipulation (Gliedt et al., 2015). It has been reported that there are now hundreds of chiropractic technique systems, also referred to as “brand-named techniques” or “proprietary techniques” (Cooperstein & Gleberzon, 2004). These technique systems involve step-by-step protocols for diagnosing and treating patients through some form of hands-on (passive) care. Interestingly, many of these techniques do not involve spinal manipulation and newer technique systems are not replacing existing ones, creating a wealth of options for chiropractors to choose from (Cooperstein & Gleberzon, 2004). A study of technique systems used by post-1980 graduates of the Canadian Memorial Chiropractic College (CMCC) practicing in Canada found that practitioners sought out instruction in 187 different technique systems other than the one technique system they were taught at CMCC (Mykietiuk, Wambolt, Phillipow, Mallay, & Gleberzon, 2009).

As already identified, treating NS-CLBP is challenging. Having too many chiropractic technique systems to choose from may further complicate the matter, especially when there is a paucity of research suggesting that one technique is superior to another (Gleberzon, 2001) and none specifically for NS-CLBP. The lure of new technique systems combined with patients’ expectations for a quick fix through passive care appears to lower chiropractors’ prioritizing of evidence-informed treatments they have been trained to deliver, such as exercise prescription.

A challenge of letting go of the focus on passive interventions is the fact that there is often a strong, immediate positive effect on the patient, and all they had to do was relax. This powerful, passive fix may not be long lasting, nor effect any significant change in the patients’ tissues, but the patient feels better immediately, and knows where to come back to, to get another fix. The associated patient expectation and steady stream of paying patients makes this model of treatment difficult to let go of, even if there is little evidence to support it as an effective long-term intervention. In addition, a mirage of passive care treatment efficacy may be created as clinicians and patients are unknowingly buying time as the patient gets better through: natural history, by slowly regressing to the

mean, or by becoming less fear-avoidant leading to increased physical activity levels.

In the past, it has been stated that the chiropractic profession should be uniformly based on evidence-informed spinal care and integrated into the mainstream health care system. In addition, the reliance on obsolete principles of chiropractic philosophy and passive care was believed to hinder this, threatening the future of the profession (Nelson et al., 2005). Almost a decade later, the debate continues regarding the identity and future of the chiropractic profession, with the continued suggestion that chiropractors should take on the role of being primary spinal care providers or conservative spinal experts, requiring the profession to decrease its strict focus on passive treatment and traditional chiropractic philosophies (Erwin, Korpela, & Jones, 2013). This role would standardize the profession, requiring practitioners to rationally deliver evidence-informed conservative interventions focused on long-term outcomes for spinal disorders. This would include exercise prescription where it is demonstrated to be effective (i.e. NS-CLBP).

### **3.2.3 Chiropractic and Exercise Prescription**

It is well known that there is a lag between health research discoveries and their incorporation into clinical practice, with some suggesting an elusive 17-year gap (Balas & Boren, 2000; Green, Ottoson, García, & Hiatt, 2009). This appears to be especially true for chiropractic. In the late nineties, Dr. Stuart McGill, a world-renowned biomechanics professor, published a paper in the Journal of the Canadian Chiropractic Association suggesting that some chiropractors are lagging behind in the practice and prescription of low back exercises, continuing to provide passive care while neglecting long-term implications (McGill, 1999). He stated that progressive chiropractors prescribe evidence-informed exercise protocols combined with their passive therapies, and urged others to follow suit. This opinion piece resonated with many chiropractors. Around this same time, there was growing popularity in the biopsychosocial model and the spinal rehabilitation content published by chiropractor, Craig Liebenson (Haldeman, 2004; Liebenson, 1996). In the following years, chiropractic educational institutions began to focus on advancing exercise and rehabilitation course work and continuing education (Haldeman, 2004) facilitating a growing interest in rehabilitation, patient self-



management through exercise and lifestyle advice, as well as how to improve chiropractic patients' adherence to prescribed exercise (Ainsworth & Hagino, 2006; Freburger et al., 2009; Haldeman, 2004; Jamison, 2002; Milroy & O'Neil, 2000).

There is a growing foundation of evidence specific to chiropractic practice to support clinical decision-making and treatment planning. A recent chiropractic Delphi process consensus statement suggests that all chiropractors should be inquiring about their patients' physical activity levels and encouraging appropriate patient-based exercise (Hawk et al., 2012). For LBP specifically, a consensus statement was published, recommending that chiropractors should be helping patients self-manage and become more independent through exercise as they progress out of the acute/subacute phase (Globe et al., 2008). For NS-CLBP, the Canadian Chiropractic Association recommends that chiropractors follow the National Institute for Health and Clinical Excellence (NICE) guideline, highlighting the importance of patient self-management, exercise prescription, and short-term passive care (Canadian Chiropractic Association, 2015).

Currently, chiropractors who take a multimodal approach to musculoskeletal care, including the prescription of exercise, are not only following CPGs for NS-CLBP, they are also more integrated (Blanchette, Rivard, Dionne, & Cassidy, 2004). However, the profession still has many guideline-discordant chiropractors, utilizing technique systems for NS-CLBP that advocate long-term care without self-management or active care components. And, because of the clinicians who have not adopted evidence-informed approaches to care, the chiropractic profession is criticized by some of the medical community (Busse et al., 2011). Chiropractors are well equipped to follow CPGs, including advice for patient self-management and the prescription of exercise for spinal disorders. It appears that it is a matter of shifting clinical priorities, including the investment of time in the effective and efficient delivery of exercise, promoting long-term positive patient outcomes.

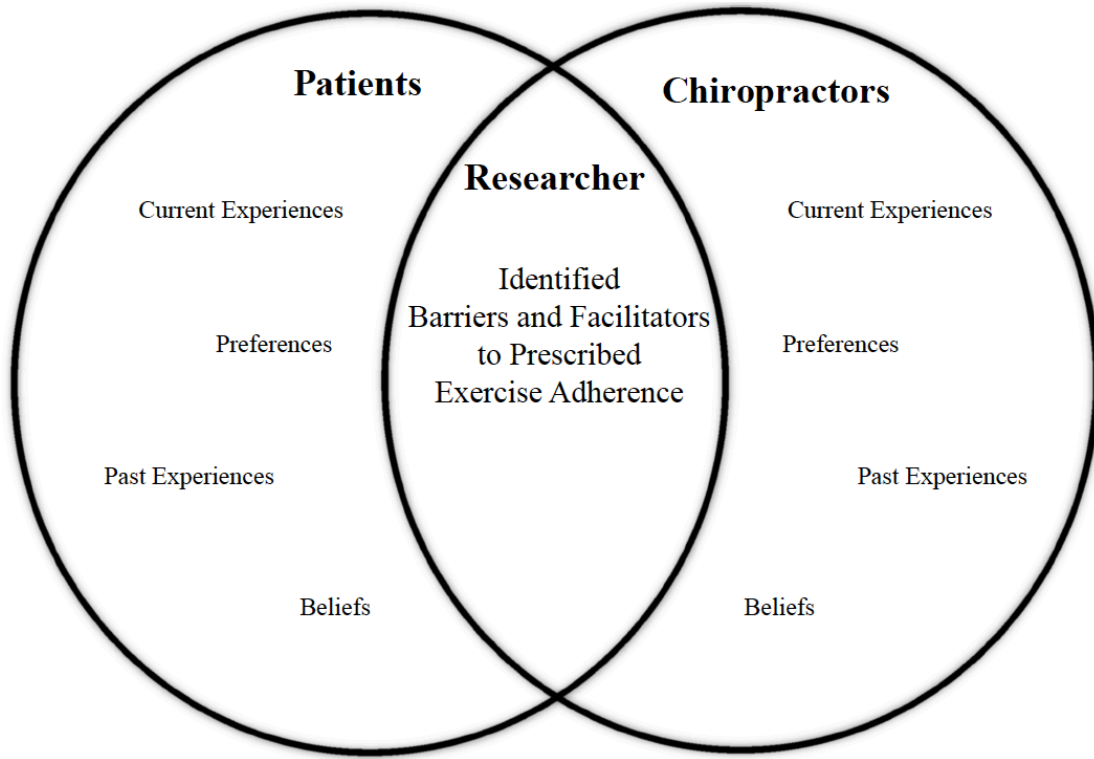
I hope during my career that I will see more of a trend in chiropractic where “maintenance care” for NS-CLBP no longer focuses on mechanical treatments targeting local tissues. Instead, I would find it admirable to see practitioners adopt a primary focus on patient empowerment through exercise and healthy lifestyle choices, reinforcing the idea that the spine is sturdy and adaptable, while still using the power of touch and

manual therapies as needed to modulate pain that cannot be self-managed. It would be great to see less passive dependence, and more patient confidence in movement, having practitioners in the background for support when needed. This is in line with the literature suggesting that HCPs, in general, are over-treating CLBP and that we need to reconceptualize it as something that, although may be a part of everyday life, is manageable with a better understanding of pain and support for the ecosystem that is the human body (Deyo et al., 2009; Jevne, 2015; Slade et al., 2014).

### **3.3 Post-Positivist Paradigm/Framework**

This study was positioned in the post-positivist paradigm that advocates a structured scientific approach. The approach taken by the researchers appreciated that each study participant had their own unique perspective and experiences; however, there were attempts at illuminating/approximating a “single reality” (Creswell, 2013, p. 36) and to “...see the whole picture...” (Ryan, 2006, p. 18). The goal was not to obtain pure objectivity, but to strive towards objectivity by using triangulation as well as rigorous and transparent methods. The researchers used their knowledge and background not to influence the participants, but to activate their “stock of knowledge” (Ritchie & Rigano, 2001). In other words, the researchers elicited a reactivity that is reflective of the participants’ true experiences and position, as opposed to the researchers being seen as contaminating or disturbing the participants’ narratives (Hammersley & Atkinson, 1983). However, as suggested by Spradley (1980), caution was taken by the researchers to avoid complete immersion with the study participants prior to the interviews. This reduced the impact of the researchers on the participants, assisting with the aspirations towards learning about the “truth”. In this study, the practitioner and patient interviews were triangulated to help the researchers identify overarching explanations regarding the barriers and facilitators to prescribed exercise adherence. Figure 1 is a Venn diagram demonstrating this triangulation. This diagram assisted in the development of the interview guides and acted as a framework during the data analysis.

**Figure 1.** Framework guiding the researcher identified barriers and facilitators to prescribed exercise adherence in adults with NS-CLBP.



### **3.4 Participants**

#### **3.4.1 Inclusion and Exclusion Criteria**

Potential chiropractor and patient participants were screened via email (Appendices 2 and 4). This screening included a deceptive component (see section 3.4.2). Ambiguous or unclear answers were followed up on by email. Adults with NS-CLBP who have been prescribed exercise for their back pain in the past six months by a HCP (medical doctor, physiotherapist, or chiropractor) and were currently receiving care from a different chiropractor were eligible to participate. Prescribed exercise in this study was defined as exercise or movement recommended by a health care professional for health or therapeutic purposes. This could include aerobic, resistance, and/or flexibility/motion training. The patient participant eligibility criteria allowed for an exploration of the patient's past experiences with prescribed exercise adherence as well as their beliefs and preferences upon returning to the health care system for the assessment and treatment of

their low back by another health care practitioner (chiropractor).

To be included in the study as a **NS-CLBP patient participant**, the following criteria had to be met:

- Currently receiving chiropractic care
- Have been prescribed exercise for their low back by another HCP (medical doctor, physiotherapist, or chiropractor) in last six months
- Between 18-65 years old
- Not pregnant or possibly pregnant
- Have no known current pain generating pathologies or diagnoses causing LBP of significance (such as infection, tumor, fracture, or significant structural changes such as spinal stenosis or a confirmed clinically relevant disk herniation within the last 10 years causing radicular signs/symptoms.)

To be included in the study as a **Chiropractor participant**, the following criteria had to be met:

- Working at a clinic in Halifax as a licensed chiropractor
- “Very Often” prescribe at home exercise for patients with NS-CLBP

### **3.4.2 Deception**

As indicated above, there was an intentional misdirection towards the focus of the study. This was done to reduce the perception of judgment by the researchers regarding exercise adherence. If the chiropractor and NS-CLBP patient participants were to know beforehand that the focus was on exercise adherence, it may have changed how they answered the interview questions. As seen in the participant screening questionnaires (Appendices 2 and 4) and informed consent forms (Appendices 3 and 5) the topic of exercise was intentionally buried amongst various other interventions to conceal the fact that the study was focusing primarily on exercise adherence. In addition, the title of the study was presented to the participants as an “Exploration of chiropractic treatment preferences in adults with chronic low back pain”. The deception carried through the interview, as questions about other interventions and participant’s perceptions of other

aspect of chiropractic care of NS-CLBP were posed. The deception was disclosed via email to the chiropractor and NS-CLBP patient participants after the study was completed. A part of that email included the option to withdraw their consent of the use of their interviews in light of the deception (Appendix 8).

### **3.4.3 Recruitment**

Twelve participants were recruited and subsequently interviewed (six chiropractors and six chiropractic patients). This sample size estimate was predetermined with the anticipation of reaching saturation. This estimate was based on the works of Birks and Mills (2011), Charmaz (2014), Creswell (2013), Thorne (2008), consultations with several experienced qualitative researchers at Dalhousie University, and the allotted timeframe for a thesis project. A larger sample size may have produced deviating experiences and minor themes; however, this would have expanded beyond the aim of the study and allotted timeframe.

Online searches were conducted using the Nova Scotia College of Chiropractors website ([knowyourback.ca](http://knowyourback.ca)) using the “Find a Chiropractor” feature. Forty-seven registered chiropractors in private clinics in Halifax were contacted via the email addresses provided. Alternatively, if an email address could not be obtained, their clinic was contacted via email or phone. The chiropractor at the clinic where Peter Stilwell works was not included because he was aware of the nature of the study. The email template inviting and screening chiropractors to participate in the study is found in Appendices 1, 2, and 4. Appendix 11 includes the email templates that were sent to non-eligible and eligible chiropractors. Interested and eligible chiropractors were emailed the consent form (Appendices 3 and 5) to review and were asked to sign a hard copy before their interview.

To recruit patient participants, posters (Appendix 12) were placed on local community bulletin boards and distributed to Nova Scotian chiropractic offices. Once Peter Stilwell received an email from a potential patient participant, via email, purposeful sampling took place based on a series of questions via email (Appendix 4). If there was any question as to whether an individual had NS-CLBP, they were emailed by Peter

Stilwell for clarification. Potential participants were emailed the consent form (Appendix 5) to review and were asked to sign a hard copy before their interview.

### **3.4.3a Recruitment Challenges**

Initially, the study had a complex design, requiring chiropractic clinic receptionists to recruit NS-CLBP patients. Eligible participants with NS-CLBP were required to have a history of prescribed exercise by a practitioner in the past three months and currently seeking care from a participating chiropractor at the clinic. It was planned so that interviews with the NS-CLBP participants would take place before their initial chiropractic consult and would focus on past experiences with exercise prescription as well as their expectations, beliefs, and preferences upon returning to the health care system for the assessment and treatment of their low back. A follow up interview was planned to be conducted with the NS-CLBP participants after participating chiropractors assessed and treated them, including exercise prescription. It was planned so that the chiropractor participants would have also been interviewed at that point in time, with a focus on the participating NS-CLBP patient they just treated, as well as their general experiences and beliefs surrounding exercise prescription and exercise adherence in the NS-CLBP patient population.

While chiropractors and receptionists stated that they were willing to participate, several months went by without any patient participant being recruited. Peter then called, emailed, or personally visited the participating clinics in an attempt to facilitate recruitment; however, this was unsuccessful. Barriers to recruitment identified by clinic staff included: lack of time to screen new patients, forgetting to screen new patients, and a lack of new patients that fit the eligibility criteria. Several chiropractors also stated that they felt uncomfortable with the study design and feared judgment if they were tied to a “difficult patient”. Therefore, the dyad (chiropractor and NS-CLBP patient) was broken and a new study design (described above) was submitted and approved by the Dalhousie Research Ethics Board. No recruitment challenges occurred with this new design.

### **3.5 Data Collection**

Before the NS-CLBP participants' interview, they were asked to fill out the Keele STarT Back clinical measurement tool and the Revised Oswestry Disability Index; these tools have been shown to be valid and reliable and have utility in everyday clinical practice as well as research settings (Chapman et al., 2011; Fairbank & Pynsent, 2000; Hill et al., 2011; Hill et al., 2008). The Keele STarT Back clinical measurement tool is designed to help objectively measure the severity of the domains screened by the Keele STarT Back Screening Tool, while also grouping patients into one of three categories: low, medium, or a high-risk of poor outcomes (persistent disabling symptoms). Low risk patients are considered to have a low risk of chronicity and require limited health care intervention, while higher risk patients are considered to have psychological obstacles and may require face-to-face interventions and a more rigorous treatment approach. The Revised Oswestry Disability Index allows clinicians to quantify the level of disability that an individual is having. The scoring of this index ranges from minimal disability (0-20) up to the highly disabled findings of: "bed bound or exaggerated symptoms" (81-100).

The scores and grouping from the Keele STarT Back clinical measurement tool and the Revised Oswestry Disability Index were collected along with demographic data including age, gender, and duration of low back pain to create a clinical profile of the NS-CLBP participants in the study (Table 1: Results section). This information enhanced the understanding of the participants' perspectives. Using this type of quantitative information in a qualitative study contextualizes the sample, assists with qualitative data analysis, and improves the overall rigor of the study based on the COREQ (Tong et al., 2007). The questionnaires were strictly used to contextualize the interviews; therefore, the results of these questionnaires were not specifically discussed with the research participants.

Interview guides are found in Appendices 9 and 10. Initially, four pilot interviews were led by Peter, transcribed, and coded by Katherine and Peter. These pilot interviews included two practicing physiotherapists and two Dalhousie students with NS-CLBP who had been prescribed exercises by physiotherapists and/or chiropractors. The pilot interviews helped refine the flow and comprehension of the interview questions.

The chiropractor and patient participant audio-recorded semi-structured interviews were led by Peter in a quiet and private room in the Forrest Building at Dalhousie

University. Katherine attended each interview to contextualize the data, enriching her coding of the transcripts. Her attendance also allowed her to ask the participants occasional questions, clarifying their narratives. Each interview was between 50 and 90 minutes in duration and came to a natural end after it was deemed that the interview guide questions were adequately addressed. The interview questions were strategically positioned so that broad questions were asked first, establishing comfort and easing the participant into the interview. However, the interview guides were not followed rigidly. As the interview unfolded naturally, specific questions from the interview guide were asked as needed. Although the focus of the study was to understand perspectives regarding prescribed exercise adherence, only focusing the questions on this topic may have influenced the participant responses. Therefore, the interviewer followed the lead of the participants and molded the interview to elicit significant exercise-related information while also exploring other areas that were important to the participants. Immediately after each interview, Peter and Katherine debriefed and considered if other questions or topics needed to be explored.

The interviews were transcribed and the participants were provided with a copy of the transcript via email and given the opportunity to provide clarifications or feedback. After the study was completed, additional information about the study (including a debriefing about the deception) was emailed to each participant (Appendix 8). Consistent with the COREQ, member checking was conducted to increase the validity of the generated themes. Study participants were emailed a summary of the final categories and themes and given the option to express disagreement, clarification, or feedback.

### **3.6 Analysis**

The audio-recorded interviews were transcribed verbatim and imported into NVIVO™ 10 software for analysis. A systematic approach for analyzing ethnographic data developed by Roper & Shapira (2000) was used. This eclectic approach was developed through simplifying and incorporating various other data analysis techniques into five steps. It is important to note that this data analysis process is not linear, and moving back and forth between steps was expected (Roper & Shapira, 2000). A brief description of the five steps of data analysis is outlined below:



1) Coding for descriptive labels:

This step involves separating the data into small chunks relevant to the area of inquisition. This is done by coding (assigning descriptive labels) to sections of the data. By summarizing the content, the data becomes more manageable.

2) Sorting for patterns:

This step involves the grouping of descriptive labels (codes) into a smaller number of sets/categories. As connections between codes are made, the researchers may begin to hypothesize as to why things are occurring the way they are. These hypotheses are further investigated as data collection continues and as patterns develop. This progression increases the level of understanding and abstraction regarding the area of interest.

3) Identification of outliers or negative cases:

This step involves the identification of individuals or scenarios that do not fit with the others being examined. These exceptional cases can be compared to the other individuals or scenarios in the study and the general findings/patterns that are developing. This comparison can strengthen the explanatory power of the general themes generated from the study.

4) Generalizing with constructs and theories:

This step involves the integration of theories and constructs to explain conceptual relationships generated from the data. This step also allows for more abstract ideas to develop, which can have explanatory power regarding the area of interest.

5) Memoing including reflective remarks:

This step occurs throughout the study and includes the documentation of thoughts about the data, which promotes the development of codes, categories, and themes. As questions and thoughts are documented and reviewed, new and more abstract connections can be made. Memoing also provides a track record of the progress being made and is a valuable platform promoting deep reflexivity. Throughout the study, Peter Stilwell and Katherine Harman documented their reflexivity.

Peter Stilwell and Katherine Harman coded the data independently. Regular meetings were held throughout this process to discuss and merge the coding, while mutually developing themes and categories. No significant disagreement occurred during this collaborative phase, so committee members were not asked to arbitrate.

## Chapter 4: Research Findings

### 4.1 Summary of Findings

An exploration of chiropractors' and NS-CLBP patients' experiences and beliefs regarding the barriers and facilitators to prescribed exercise adherence was undertaken using a focused ethnographic approach within a post-positivist paradigm. The aim was to add to the small literature base on this topic and to help inform the development and delivery of more effective patient-centered exercise prescription for NS-CLBP in the future.

Fifteen chiropractors submitted screening questionnaires. Eleven chiropractors indicated that they "Very Often" prescribe at-home exercise for their patients with NS-CLBP; therefore, they were eligible to participate. The first six chiropractors to schedule an interview time were included in the study. The other four chiropractors that submitted screening questionnaires indicated that they "Often" prescribe at-home exercise, rendering them ineligible to participate in the study based on the pre-defined eligibility criteria. Eight patients submitted screening questionnaires and six met the eligibility criteria and subsequently participated in the study. Of the two ineligible patients, one was not prescribed exercise in the past 6 months; the other had specific low back pathology (lumbar spinal stenosis with radicular symptoms). Data saturation was reached and no participants withdrew their data from the study after the deception was revealed. No participants requested transcript alterations or expressed disagreement after receiving a summary of the categories and themes through email.

Quantitative characteristics of the included participants are delineated in Table 1 and 2. Because Halifax has a relatively small number of chiropractors, to help protect their identity, the number of years in practice was put on a continuum.

**Table 1. Patient Participants' Characteristics**

<b>Participant ID</b>	<b>Age</b>	<b>Sex</b>	<b>LBP Duration</b>	<b>STarT Back Subgroup</b>	<b>Revised Oswestry Score</b>
<b>Patient 1</b>	<b>27</b>	<b>Female</b>	<b>9-10 Years</b>	<b>Low Risk</b>	<b>28</b>
<b>Patient 2</b>	<b>47</b>	<b>Female</b>	<b>7 Years</b>	<b>Low Risk</b>	<b>36</b>
<b>Patient 3</b>	<b>19</b>	<b>Male</b>	<b>16 Weeks</b>	<b>Low Risk</b>	<b>10</b>
<b>Patient 4</b>	<b>19</b>	<b>Male</b>	<b>3-4 Years</b>	<b>Low Risk</b>	<b>6</b>
<b>Patient 5</b>	<b>46</b>	<b>Male</b>	<b>20 Years</b>	<b>Low Risk</b>	<b>16</b>
<b>Patient 6</b>	<b>49</b>	<b>Female</b>	<b>20+ Years</b>	<b>Low Risk</b>	<b>26</b>

**Table 2. Chiropractor Participants' Characteristics**

<b>Participant ID</b>	<b>Sex</b>	<b>Years in Practice</b>
<b>Chiropractor 1</b>	<b>Male</b>	<b>5-10</b>
<b>Chiropractor 2</b>	<b>Male</b>	<b>0-5</b>
<b>Chiropractor 3</b>	<b>Male</b>	<b>20-25</b>
<b>Chiropractor 4</b>	<b>Male</b>	<b>5-10</b>
<b>Chiropractor 5</b>	<b>Male</b>	<b>10-15</b>
<b>Chiropractor 6</b>	<b>Female</b>	<b>0-5</b>

**Table 3. Summary of Findings**

<b>Categories</b>	<b>Themes</b>	<b>Exercise Barrier Examples</b>	<b>Exercise Facilitator Examples</b>
4.1.1 Exercise Delivery	a. Explanation of Exercise Purpose	Practitioner provides no, or poor explanation of the purpose behind exercises.	Practitioner provides a clear explanation of the purpose behind exercises.
	b. Structured Simple Exercise Plan with Measurable Goals	Complicated, prescribed exercises with no timeline.	Having exercise timeline where practitioner/patient looks for progress.
	c. Demonstration, Review, Follow-up Support	Little time spent on exercises in the clinic.	Repeated exercise demonstration and review.
4.1.2 Practitioner-Patient Relationship	a. Therapeutic Alliance	Poor clinical relationship.	Trust and rapport developed.
	b. Patient-Centered Care	Patient perceives the practitioner does not understand them.	Patient-specific goals identified by the practitioner.
4.1.3 Attributions and Expectations	a. Diagnostic Dilemma	Patient concerned about diagnostic uncertainty.	Practitioner provides a reasonable pain explanation.
	b. Attributions and Passive Treatment Expectations	Practitioner and/or patient expect a passive “fix” or “cure”.	Practitioner confronts maladaptive passive and active attributions and expectations.
4.1.4 Pain	a. Passive-Active Balance	Exercise Overload: too many prescribed exercises, too early.	Manual care provided, while maintaining priority of active care.
	b. Pain as a Motivator to Avoid or Confront	Patient fear-avoidance.	Practitioner addresses maladaptive exercise beliefs that are associated with pain.

The entire interviews were coded, using the concepts in figure 1 as a guide. Although it was not apparent early in the coding, having a broad interview guide and focusing on non-exercise therapies (SMT, acupuncture, tape, EPAs ect.) not only allowed the researchers to deceive the participants, it also nicely revealed the patient and chiropractor participants' all-inclusive treatment beliefs and priorities. The comprehensive inquiry of chiropractic treatment approaches for NS-CLBP provided a context and informed the researchers of where exercise was placed in the hierarchy of available treatments and how it was used in the overall management of NS-CLBP.

The qualitative data was organized and classified into four categories: 1) Exercise Delivery, 2) Practitioner-Patient Relationship, 3) Attributions and Expectations, and 4) Pain. Each category contains two to three themes (see Table 3). Although labels are assigned to each category, there was significant conceptual overlap, with many quotes fitting into several categories. Attempts are made to showcase quotes that supported each category, while also respecting their fluid nature. The researchers developed these categories using the framework in Figure 1, triangulating the patients' and the chiropractors' perspectives. Each category is labeled in a neutral fashion; the themes within each category contain dimensions along a continuum, ranging from barrier to a facilitator. The decision to present the results this way stemmed from discussions between Katherine and Peter about the inclusion of all the participants, including negative cases. For example, the results suggested that pain motivated some patient participants to adhere to prescribed exercise, while it acted as a barrier to prescribed exercise adherence in others. Another example is how some practitioners appeared to take the time to provide their patients with a detailed explanation of the purpose regarding prescribed exercise, which was a facilitator to prescribed exercise adherence. In contrast, other practitioners appeared to provide minimal explanation of the purpose, which acted as a barrier to prescribed exercise adherence. Surprisingly, some participants presented contradictory thoughts during their interview, suggesting the changing of beliefs upon self-reflection or the possibility of cognitive dissonance surrounding prescribed exercise. Once again, the decision to present the results on a continuum accommodated this spectrum of beliefs and behaviors, spanning from barriers to facilitators, and leaving few outliers.

Table 3 provides a summary of the results. Each category and associated themes are described below with supporting quotes drawn from both the patient and chiropractor interviews. Although the categories do have input from both patient and chiropractor perspectives, there appears to be some weighting of each. This weighting suggests that certain barriers and facilitators within each category develop more as a result of patients' or chiropractors' beliefs and behaviors.

#### **4.1.1 Exercise Delivery**

Regardless of the type of exercise being prescribed, both patient and chiropractor participants identified the importance of the delivery. This category includes three themes: 1) Explanation of Exercise Purpose, 2) Structured Simple Exercise Plan with Measurable Goals, and 3) Demonstrations, Review, Follow-up Support.

##### **4.1.1a Explanation of Exercise Purpose**

Both patients and chiropractors explained that a clear, yet detailed explanation of the purpose of the exercises being prescribed facilitated an understanding of the long-term benefits of exercise. This, in turn was reported by the patients to improve their long-term adherence to the program, and the chiropractors felt that it made a significant difference in patients continuing with their exercises over time. In contrast, a poor patient understanding secondary to inadequate explanation or direction from the HCP acted as a barrier to prescribed exercise adherence. Quotes supporting this theme from the patients' perspectives include:

Interviewer: *“What do you think would make it easier for people to do those?”*

Patient 1: *“To do exercises? I think if they knew what benefit they would have in the long run. I’m sure they told me too, and I just didn’t really listen, or it just went over my head, but I think if people could really emphasize that point that these exercises are going to help you feel better. Then I think people will hopefully listen”. “But I think honestly it’s very personal, you have to realize how important it is, and I guess a chiropractor can kind of direct how you receive it...”*”.

Patient 4: *“I guess, in my case, um.. he could explain, like really specifically that once you.. strengthen these particular muscles, what would happen and where everything would position and how that would help you long term to get better”. “...Instead of just.. sort of.. just printing off some exercises and just doing them sort of thing. Just explain what’s important...”*

A supporting quote from the chiropractors’ perspective:

Chiropractor 1: *“We try to really map it out in layman’s terms, this is why this is affected and this is why if we can take the time to put in the work, it’s going to help. I think that’s been the most effective approach for sure, for adherence. I think they just need to understand that this isn’t just, I’m not giving you three random things to work on at home because I feel like you should do exercise. I’m giving you **this** because of **this**, I’m giving you **this** because of **this**, and **this** is going to do **this**. I think knowledge is power, and once they can understand, and I’ve had the light bulb moment where you just try to throw in exercise versus this is what’s happening here, this is how this is going to address that problem and I think that gap is huge”.*

#### **4.1.1b Structured Simple Exercise Plan with Measurable Goals**

Both the chiropractor and patient participants preferred exercises that were simple to deliver and receive. They reported improved at-home adherence with easy, yet effective exercises. There was an emphasis from the chiropractors’ perspective that the best exercises are the ones that the patient will actually do. Chiropractor 6 cited the literature on NS-CLBP and exercise, concluding that many types of exercises can be helpful to diminish pain and improve function; therefore, she stated that she attempts to find any simple way for her NS-CLBP patients to incorporate more physical activity into their daily lives.

Having a structured plan with a tentative timeline as well as measurable goals was also reported to facilitate exercise adherence. Patients were clear that difficult, complicated, or too many exercises with no timeline or measurement of progress made it difficult to adhere to a program. Both chiropractor and patient participants noted that “buy

in” was facilitated when patients can see their progress. Supporting quotes for this theme are outlined below:

Patient 5: *“But he had a plan, he said ‘this is where I expect us to be...’ and she (previous practitioner) never really had that plan.... With the chiro, he said ‘here we are (patient’s name), here’s where I expect us to be’... and after a month, he said ‘we’re a little bit off but we’re pretty much right on track’ and that made it.. that made me.. kind of dive in, right? We’re seeing results and we’re right where we should be...”*

Patient 2: *“He (the chiropractor) only gave me a couple (exercises). And they’re part of my repertoire, and they do work. Just simple stuff...”*

Chiropractor 2: *“Yeah, for me it’s kind of, the simple ones, just because of ease of use...we’ll actually do the exercises that are the best and convenient, ... the best exercise is the one that they’ll do”. “... I try to have some quantifiable or at least strongly qualitative component to the exercise ... When they did a plank, they held a plank for 15 seconds before they started shaking. ...I usually use it on my accountability standpoint, I say, ‘listen I saw you hold this for 15 seconds, I know people get better when they do this,.. Four weeks from now if you hold it for 15 seconds, you’re going to have a hard time saying that you did them.’ It’s just a way, come on, you’re going to get better at them, or, if they did a bird dog they, you know, they twisted this way or they had this compensatory pattern, some kind of cue that when I look at my notes the next day I’ll say look for this again...”*

#### **4.1.1c Demonstration, Review, Follow-up Support**

Both chiropractor and patient participants highlighted the importance of demonstrating and practicing the exercises in the clinic to develop their confidence, improving at-home adherence. Taking the time to show patients the exercises in the clinic, with frequent review, demonstrated to the patients that exercise is a priority, while facilitating exercise self-efficacy. After exercises were prescribed, follow up support and motivational prompts were seen as facilitators. Some patient participants identified a need



for more motivation and prompting to initiate exercise. Low practitioner exercise priority where exercises were “swept in” at the end of treatments, or where patients had to go to another practitioner for exercise prescription, or left without any instruction, but told to exercise, acted as a barrier to prescribed exercise adherence. Quotes supporting this theme include:

Chiropractor 2: *“Well yeah, exactly, well obviously it doesn’t seem that important, I only spent three minutes on it and they didn’t even ask me about it at the second visit. I agree with patients, how important could it be? You didn’t assess it, you showed me in two minutes and ever since then you just ask me if I’m doing it? You don’t even ask me, don’t even watch me do it again, you don’t even test me? Imagine if the school system was like that? Did you study? Yeah, I studied. Great, you passed, 80%, there you go, you don’t have to write the test”. “If you just kind of like sweep in exercise, activity, kind of with everything else, it’s not really viewed as important. Or if it’s thrown in at the end of the treatment. You see it all the time, do this, do that, I’ve got three minutes, do this exercise and you show them really fast and then scoot them out the door”.*

Chiropractor 1: *“So we map everything out very clear, and once again I just think supervision is great initially because if you can show them how to move and they can do it safely and effectively, that’s confidence, and so they’ll probably be more in tune to work on that at home as opposed to here you go, do this twice a day, three sets of 8 to 10”. “I think videos are great, and actually what I’ve started doing probably over the last year... I just ask them if I can film them, and then so I dictate everything, so I have them do the movements as I talk and I film, and then they just have it on their phone, and ... Yeah, I think it’s even more valuable than just here’s some pictures and descriptions, you’re talking about abduction and extension, like sometimes people read, even though we try and map it out, it’s a science, being able to communicate that information, so I think the video is good, probably one of the better things. ...it’s my voice that they’ve heard how many times, so it’s familiar, and we go through step by step every little detail, and if I see them do something during the movement we’re correcting it on the video, so there’s also that reinforcement”.*

Patient 6: *“If it’s part of the treatment, it needs to be done. I just think you have to give people examples, and people are so data, you know, if there were apps for the iPad and apps for your phone, check-in, you can send out a text message to all your patients and just say, it’s a great day, maybe go outside and walk, or something like that. That’s all motivational...”*

Patient 5: (Regarding previous practitioner) *“First of all, I have to make sure I was doing it right, and sometimes I wasn’t sure if I was or not”.*

(Regarding the chiropractor) *He did it with me.. he did it with me twice.. he showed them to me the next.. well whenever the next appointment was... usually the next time I’d come in he’d add another one in.. do this one as well..--- like this kind of deal, but ---- he showed me these same exercises four or five times, which was good. ... I knew I was doing them right then, I felt pretty confident that I was doing them right”.*

In-clinic exercise demonstration and instruction, as well as follow-up, was not only important for adherence, but also to reduce fear and improve patient safety. An example of this is demonstrated in the following quotes where Patient 3 was told to “stretch” but was not given appropriate instructions, resources, or a referral to someone who could safely prescribe exercise and outline the time it takes to see benefits.

Unfortunately, this lack of guidance led to Internet searches for possible diagnoses as well as stretches and exercises. The YouTube videos he watched gave him the idea that low back surgery may be warranted because he did not get immediate short-term pain relief from the exercises. Later on, consultation with a chiropractor helped diminish his belief that he needed surgery.

Interviewer: *“So tell us about those first interactions with the medical doctors in the clinics”.*

Patient 3: *“Well they did a couple of tests and I went to the clinic three times, and the first two times they said that it’s probably just muscle and if I rest or do a couple of stretches it’s going to go away soon, but it didn’t help at all”.*

*“I even got to the point that I thought maybe it was a scoliosis and researched some videos for those. I found some stretches but those didn’t help...”*

*“I was concerned about the scoliosis. I thought maybe I should get surgery at some point....”*

Interviewer: *“What exactly were you looking at? What came to the conclusion that maybe you need some surgery?”*

Patient 3: *“Just the videos (searched on the internet for exercises) that I saw, most of them were stretches and exercises and they were like if these don’t help, maybe something you should get surgery, but that’s the point I thought yeah probably I might need that at some point...”*

Overall, the importance of exercise delivery was discussed by both patient and chiropractor participants. Participants highlighted how a thorough explanation and demonstration of the prescribed exercises was important, in addition to the exercises being simple to perform. Creating and measuring exercise-based goals was also helpful, with in-clinic review helping to increase adherence. This category appeared to be predominantly influenced by the chiropractor participants as seen in Figure 2, and explored in the discussion.

#### **4.1.2 Practitioner-Patient Relationship**

All the participants discussed the importance of the congruency and working relationship between patients and their exercise-prescribing practitioners. This category included two themes: 1) Therapeutic Alliance and 2) Patient-Centered Care.

##### **4.1.2a Therapeutic Alliance**

A good practitioner-patient relationship was highly valued by both chiropractor and patient participants. Trusting the practitioner and having a good rapport appeared to increase the likelihood of patients following the active care recommendations they were given. A poorly developed clinical relationship acted as a barrier to following clinical advice, including prescribed exercise. Quotes supporting this theme include:

Patient 2: *“It’s a partnership, it really has to be a partnership, because if he’s saying to you, you need to do those things (exercises), he’s not going home and thinking, ha ha, we’ve got her doing that for nothing...”*. And then the patient went on to describe the high level of trust she had for the chiropractor by saying *“I think (chiropractor’s name) personality being what it is, once I got to know him, he probably could have told me he was going to flip me inside out and up off the roof and I probably would have let him!”*.

Patient 4 differentiated between two practitioners in terms of the relationship that they had. He said that he preferred the one with whom he was able to talk to easily, and he also worked hard with his exercises with that practitioner:

Patient 4: *“It was like a pretty friendly relationship ... he knew me pretty well cause I’ve seen him a lot of times, so it was like a really comfortable environment, when I went over and saw him and he looked at everything and worked on it”*. *“...he knew everything about what I was doing and everything”*.

Interviewer: *“Yeah, did you find that helped your back? Like him knowing more about you...”*

Patient 4: *“I guess like, the trust and everything”*.

#### **4.1.2b Patient-Centered Care**

Some chiropractors stated that they invested time, focusing on interpersonal communication. These practitioners got to know their patients, understanding their goals and limitations. They subsequently attempted to provide patient-centered active living advice or prescribed exercises that would be more valued by their patients in an attempt to increase exercise adherence. In contrast, a poorly developed relationship, where the practitioner did not “understand” the patient, resulted in the perception that the practitioner was less credible, and the patient was less convinced of the importance of the exercises prescribed. This acted as a barrier to prescribed exercise adherence. Quotes supporting this theme include:

Chiropractor 3: *“So their expectations are somebody is actually going to pay more attention to their problem. Let’s be fair, this is my interpretation of their expectation because what I’m trying to do is satisfy them. I think the reason that they’re frustrated is they’re not getting the focus on their problem”. “The issue is that we have to make sure that the people understand that there’s more to life than just not being in pain. It still comes down to patient wants, I try as much as I can to focus my treatment on what the person wants...”. “...They’re coming because they’re an athlete and they want to jump higher or they want to do something, well then my focus is how do we do that, right? If you’re coming because you’re in pain, well let’s, you want to be out of pain, let’s see how we can get you out of pain. So the focus should be revolving around their wants, not trying to subjugate their wants to my own, but at the same time, sometimes people can’t see past that pain. They’re so buried in the pain that the idea that they could be out of pain is totally foreign, but then in addition the idea that they would think past the pain and wonder what will I do with my life if it didn’t hurt? .... So I think it’s important .... as people start coming out of the pain .... start letting them see the variance, you know, you’ve got options. So what are we going to do now that you’re feeling well ..... trying to help people, you could do more exercise, you could do more stuff, you don’t have to still not do things for fear”.*

Chiropractor 6: *“I think it’s the red light green light thing we were talking about a minute ago, like, finding the window, finding what fits in their lifestyle and in their paradigm of who they wanna be, right? It’s different for everyone”.*

All of the participants discussed the importance of the practitioner-patient relationship, finding that improving the therapeutic alliance as well as patient-centered care facilitated exercise adherence. Along with the previous discussed category (Exercise Delivery) this category also appeared to be predominantly influenced by the chiropractor participants as seen in Figure 2, and explored in the discussion.

A second set of categories has a bit more of the patient’s side of the interaction in it (See Figure 2). Although the chiropractors spoke of their own and their patients’ expectations and attributions about exercise prescription, it seemed as though the patients’

perspective had a stronger effect on exercise adherence. In the same way, the effect of experiencing pain had a stronger influence on exercise adherence from the patients' perspective than the chiropractors'.

### **4.1.3 Attributions and Expectations**

Chiropractor and patient participants' attributions and expectations were highly discussed topics. Two themes were developed, each overlapping significantly with each other: 1) Diagnostic Dilemma and 2) Attributions and Passive Treatment Expectations.

#### **4.1.3a Diagnostic Dilemma**

This concept revolved around the finding that patients often expect a specific diagnosis that pinpoints a pain-generating structure. When imaging was discussed, patient participants felt that their high levels of pain equated to significant structural damage and that a specific diagnosis (through imaging) was required for a targeted treatment plan to be identified and delivered. Overall, when the chiropractor participants discussed the diagnostic dilemma, they stated that a specific, reasonable, and understandable diagnosis or explanation of pain was required for a patient to follow the practitioners' treatment plan, including exercise.

Patient participants discussed their perceptions of their past and current practitioners' credibility in regards to their ability to provide an accurate diagnosis. Diagnostic uncertainty led the patient participants to question their practitioners' credibility and subsequently question the treatment they were offering. This lack of practitioner credibility was seen as barrier to prescribed exercise adherence. The chiropractors recognized this dilemma, discussing the complexity of NS-CLBP. They expressed how delivering a diagnosis is difficult and that there is no "cook-book" when it comes to treatment. Quotes supporting this theme include:

Chiropractor 1: *"...they've kind of been through the system and as we know with non-specific low back, failure to get a diagnosis often leads to ... I don't know if it's shopping but people... they end up in a lot of clinics for sure". "There's no cook book, and so that's a problem. You can't just see someone sitting there and okay, this is the problem,*

*oh it's low back pain, well this is what I do for low back pain, I wish... Not even close, maybe originally that's what you think but..."*

*Chiropractor 2: "... because it's complex, right, as we know, it's not as simple as people make it out to be. That's often the challenge. It's easy, it's your SI joint, it's your facet joint, they love that, right, they tell their friends that it's their joint, and that's the problem it's the joint on this side at this level and that's why I'm in pain. That's often the challenge". "It's tough because patients don't often take too kindly to assumptions, right, they often come expecting an answer, you're the expert you should be able to tell me what's going on exactly as opposed to could be this, could be that, comes off sometimes as inexperience over lack of knowledge".*

*Chiropractor 4: "...I've probably sent people for x-rays as peace of mind for the patient, knowing that, okay, it's likelihood something isn't really going on, I probably have gotten a lot better at just communicating with the patient saying no, this is not valuable".*

*Patient 3: "...second time I went I think I actually asked the doctor if I should get an x-ray or something and they said x-rays is for a skeletal, and your's probably just muscles so it's not going to show anything". "... I thought maybe I did something to my bones or cracked them or there is a fracture or something. But the doctor says muscle and nervous system..."*

#### **4.1.3b Attributions and Passive Treatment Expectations**

Patient participants' perceived low back treatment successes and failures in the past appeared to influence their current exercise expectations and adherence to active care recommendations. In addition, patient participants' observations of others' successes and failures appeared to establish and reinforce positive or negative beliefs surrounding NS-CLBP management and the utility of exercise. Chiropractor participants recognized this and some of the chiropractor participants have tried to break maladaptive associations contributing to negative exercise expectations. The most common maladaptive association that was identified was the belief that NS-CLBP can be cured or fixed in a

short period of time through passive care. Existing positive exercise associations were also identified, and some chiropractor participants discussed how they attempt to strengthen these to facilitate exercise adherence.

Based on the interview discussions, it appeared that many chiropractors (ones in and outside of study) do not confront maladaptive associations and actually unknowingly reinforce them, which was seen as a barrier to prescribed exercise adherence. An example of this includes the continued focus on tissue-based passive care, with exercise having a low priority in the treatment plan. These tissue-focused fixes appeared to make their patients feel good in the short-term, reinforcing the need for long-term passive maintenance care by a practitioner without concomitant active care. However, some patients reflected on their dependency (and cost of treatment) and came to realize that passive care is not the key to long-term success and that they can take more control of their condition by incorporating exercise into their lifestyle. Supporting quotes for these concepts from the chiropractor participants are highlighted below:

Chiropractor 1: “... *they still feel like they need or they want the adjustment, you know what I mean, so what we do if we need to adjust or if we think, we will for sure, but we don't just kind of cater to expectations or wants from previous experiences...*”. “*I think a lot kind of stems in their previous experiences, so essentially when you look at aggravating factors, so if it's certain activities, then often times, some of these people have been in offices where they've been given pretty substantial exercise regimes where there are pretty advanced movements, so I think there's a break maybe in standardization of protocols of how to get these chronic low back patients moving, and I think that sometimes we overdo it out of the gate and then obviously that's a negative experience, so then you kind of get that knock against, so we see that quite often, oh you know 'I've tried exercises and it just made me way worse', that's a typical line... So I think that we just reassure them, that you probably overdid it and this is where we should start and then we start very basic movements, and just instill confidence, that's the most important aspect for sure*”.



Chiropractor 2: *“And I think maybe the past is valued more because that’s what they have thinking going in. Versus if you really spend the time, and I do to the best of my ability for all conditions, is say this (exercise) is what is shown to work the best...”*

*“For exercise I find the big one is ‘my friend doesn’t have any pain and she does all these things’ ‘my other friend is overweight, he doesn’t have any pain why do I need to do exercise?’ ‘I was fine up until I picked up the socks off the floor and threw my back, that’s something so silly. Why do I need to do exercise I was fine before then’”.*

Chiropractor 4: *“If you can somehow explain to patients and show them, and identify things that they’ve done that have helped with their pain, especially something that has occurred several times in their life and you can attribute to their improvement and to their function as partly a result of them being physically active, I think that’s one of the biggest things you can do. And it’s not that you’re really doing anything specifically to motivate them other than just helping them identify and see the difference that it has provided them”.*

Chiropractor 5: *“He’s like, ‘well how come you can’t just crack my back? the chiropractor that I saw 10 years ago just did that and it was fine’. ... I saw him .... in passing and he didn’t look happy to see me. Because he wanted me to do what the guy had done before and I didn’t, and he’s not feeling as good as he thought he could be, and now he’s feeling like he’s getting worse even with the little bit of treatment that I did”.*

The following patient participant quotes highlight the importance of past positive experiences with exercise. Patient 4 had a history of several sport-related injuries and he valued the active rehabilitation, even when it was tough in the beginning phases.

Patient 4: *“I guess just to be patient with how long it takes to sort of get over the immediate aggravation of the pain that it would be causing them and to try your hardest to stick to the exercises so that you can strengthen it as quick as possible”*

*“I guess I understood why I needed to do a lot more (exercise) ... if I wanted to get a lot better...”. “And just like I said, it gets better.. if you work on it”.*

In contrast, the Patient 6 refused to exercise because she felt that certain types of passive care (spinal manipulation) were the key to success, while other passive techniques were not. This attribution appeared to be stemming from her past experience, then reinforced by her current chiropractors.

Interviewer: *“So you’ve seen the massage therapist, helpful, not helpful?”*

Patient 6: *“Not for me”.*

Interviewer: *“What was it that wasn’t helping you?”*

Patient 6: *“I don’t know if it wasn’t putting those discs back where they belong? ... Whereas chiro I could feel that instantly, that movement...”. “...Because I think my back deteriorates. I think in my head, I think that little disc that pushes out a little bit every once in a while, and then I bend over or then I twist the wrong way, and then the final little pop happens, and then I’m a mess. Whereas if I went and got aligned on a regular basis, it would never come out as much”.*

Her current chiropractors appeared to reinforce this notion, telling her that:

Patient 6: *“...these flare-ups wouldn’t happen as often, maybe you could come back and keep strong (though regular “maintenance” spinal manipulation)”*

The concept of a quick passive fix expectation was frequently discussed. The expectation of a passive fix or a cure was a significant barrier to a patient participant’s receptivity to exercise prescription. In contrast, as previously highlighted, some patient participants with past sport/exercise backgrounds valued the benefits of exercise in the long-term, seeing passive treatment as a step towards becoming more active and less as a fix.

Some chiropractor participants were quick to downplay the existence of a magic bullet or a fix; instead they focused on exercise as the best treatment for NS-CLBP. In contrast, there were patient participant reports of other chiropractors that did not focus on exercise at all, and appeared to propagate the concept of a passive fix as a viable long-term solution. The immediate relief with passive care, combined with minimal effort from

the patient, acted as a barrier to prescribed exercise adherence. Quotes supporting these concepts are outlined below:

Patient 6: *“I paid her to fix my back. I didn’t pay her to teach me how to fix my back. ...Maintenance (chiropractic adjustments) is huge. That should be stressed more. Because if I had known that way back when, I might have been better”. “...I say that all the time, yeah chiro, physio gives too much homework”.*

Interviewer: *“What’s going on with the homework they gave you?”*

Participant: *“Just exercises for low back.... Don’t waste paper by photocopying that for me”. “What really worked in physio where I used to go, she had a traction machine, and that was amazing, the relief that gave. .... So she tried to do it with a towel, and it was like, yeah, this isn’t the same. So if something doesn’t work, I stop.”*

Chiropractor 1: *“you do get a person who is sitting there and they think something should be a magic bullet where you do an intervention and they’re better, so we’re quick to downplay that”.*

Chiropractor 5: *“...they’re expecting the traditional chiropractic adjustments. Can’t you just pop that back into place? Well, if it’s truly out of place, I’m not the guy you should be seeing”.*

Patient 1: *“I think it’s just kind of like, annoying. Not that you don’t believe them but you are just like, meh, I’m going to these chiropractic sessions, so these should help, you know what I mean? So I think it’s that mentality of just being like oh I have an appointment with a chiropractor, I’m going and receiving treatment and they don’t believe that the exercise is part of the treatment process”. “And they also gave me exercises to do but I didn’t find them very helpful. So I went to massage therapist thinking that I could just massage the soft tissues to see if that would work”.*

Patient 1 admitted that her daily pain levels were quite low, that she had received treatment from several physiotherapists, a massage therapist and four chiropractors, and

for the most part did not adhere to exercises prescribed. Although during the interview she began to reflect on the utility of exercise and its long-term importance (its ability to help her manage potential flare-ups in the future, which could get in the way of her work) she still was on a quest for a passive fix:

Patient 1: “...*I think, yeah, I’m going to continue with chiropractic care. I’ve heard of osteopaths also, I know a friend who went to an osteopath .... she said that that really helped, and so maybe I’ll seek that out in the future, but for now I think sticking with chiropractic care and doing my exercises, and just trying to limit stress, I think*”.

All the participants discussed their attributions and expectations with the findings that diagnostic and treatment uncertainty can affect adherence to prescribed exercise and that the patient expectation for a passive fix is a challenging barrier to overcome. Figure 2 in the discussion outlines how the barriers and facilitators in this category develop more as a result of patients’ beliefs and behaviors rather than the chiropractors’.

#### **4.1.4 Pain**

The last category is about the experience of pain. Both chiropractic and patient participants discussed pain at length. In the context of exercise adherence, two themes developed: 1) Passive-Active Balance and 2) Pain as a Motivator to Avoid or Confront.

##### **4.1.4a Passive-Active Balance**

There were quite a few stories in this theme that described both successful balanced and unbalanced approaches, both from patient and chiropractors’ perspectives. Patient participants strongly expressed the need for passive care, especially when pain levels were high. Chiropractor participants confirmed this need and expressed willingness to help. On the other hand, some chiropractors discussed how even in the acute or “flare-up” phase, that the patient should understand and expect active care to be a priority in the future. This was done in an attempt to minimize passive care dependency and facilitate future exercise adherence. Some patient participants understood this balance, and sought out exercise interventions, while others continued to rely on passive care long-term. Some

chiropractors held their exercise-resistant patients accountable; the challenge was to do this without blaming or making the patient feel guilty.

At the opposite end of the spectrum, patient participants identified exercise overload, where too many exercises were prescribed or they were prescribed too early, affecting their pain experience and resulting in decision paralysis and decreased adherence. Chiropractor participants confirmed this as something to be aware of because it can act as a barrier to prescribed exercise adherence. Supporting quotes for this theme include:

Chiropractor 2: “... I say ‘these are the results that you are probably expected to get for passive care.’ And they go, and some people, I swear, they go ‘okay I’m cool with that.’ And I say ‘well you can’t complain to me then if you’re not 100 percent better right?’”  
“If they come up with a flare-up, from like bending, they’ll kind of look at me with that look, like ‘you’re going to laugh at me because you know I screwed up’...”

“So if you want to look for something to help your pain for today, tomorrow or maybe a couple of days from now, that passive stuff will do a pretty good job at that and it will help you along the way, but if you really want to get better long term, and I often say, you know, ‘if I want to go to the gym, I want to get my biceps bigger or my legs bigger, I can put the muscle stim on it for a day, sure it might feel pretty good, but it’s the every day stuff’ and most people are fine with that, they get it and they kind of buy in a little bit”.  
“And don’t get me wrong, for chronic low back, acupuncture, adjustments, soft tissue helps for sure, and even working in around the pelvis, big time. But I say ‘it’s like a stock market thing, we want to see a positive trend long term as opposed to just those two or three days of awesome. You’re really just tricking the body in a sense.’ And I usually use that analogy if they’ve ever had IFC (interferential current). ‘Oh I love the IFC machine.’ ‘Did you love it the next day?’ ‘Well no’, ‘well there you go’. It’s a way of just kind of calming things down, tricking things, and you feel great when you leave”.

Chiropractor 1 discussed his treatment approach, which included transitioning his patients from passive to active care while attempting to empower them in the process:

Chiropractor 1: *“If you look at active and passive care, so the big thing that we talk about with specifically this population is that really it’s not going to be me, it’s more going to be you, and we’ll show you the way, and we’ll give you the guidance but it’s more about what you’re going to do away from here, and so some people aren’t really comfortable with that aspect either. They’d rather get the fix. In one treatment”*

*“So I think what it comes down to is then you really have to have the discussion about passive versus active care, if they’ve been in the position where they’ve done physiotherapy, they’ve done massage therapy, you know what I mean? And so that’s usually the selling point. And it’s onus, you know, you give them control and I think that’s huge when all of a sudden they have someone sitting in front of them saying, ‘listen, you can really help yourself here’ and that’s very empowering”.*

*“So typically what I do is I outline for two or three treatments we’re going to be doing quite a bit of passive care ... I take the onus a little bit at the start but within two to three treatments it’s a lot less me and more of them for sure. And they know that from day one, we have that chat for sure”.*

Patient 2 discussed how passive care has value, but exercise also provides results and is affordable in the long-term:

Interviewer: *“Is it something that’s even a high priority, exercise, compared to other types of treatments... Where is exercise on the scale?”.*

Patient 2: *“In some ways I think it’s more important. The treatment is important, god knows, but nobody’s going to see a physio forever. Even with a chiropractor, you can only afford to do so much...”.* *“The treatment keeps everything where it needs to be and I think, as I said, with (reference to chiropractor) when I’m flared up it can bring me back to where I need to be. But I really think it’s the exercising at home that gets the results. Just keeping yourself conditioned and keeping your muscles loose. The treatment is very important, but the exercises, if you’re not doing your exercises, you may as well not go to your appointment”.*

Patient 5 described the experience of being prescribed exercise too early, and it caused his pain to flare up:

Patient 5: *“Well I mean, it’s some of the stuff that they ask you to do, it’s... in the beginning she was asking me to do ... I was like I’m not gonna do that exercise, I mean it was causing me pain, you know the point is.. I don’t think it’s helping me, and then like when I saw (the chiropractor), he did a bunch of treatments and then he told me to do stuff (exercise) and at that point I was able to do this stuff, and I did do them”.*

#### **4.1.4b Pain as a Motivator to Avoid or Confront**

The concept of pain as a motivator to behave in a certain manner was brought up by all the participants, especially the patient participants. This topic was complex, with all the patient participants going into care with certain dispositions and exercise beliefs, some maladaptive, others adaptive. Chiropractor participants and one patient participant discussed how practitioners could restructure negative or maladaptive pain cognitions in the context of exercise, getting patients to push through “good pain”; therefore, facilitating exercise adherence.

An example of fear-avoidance and poor active coping was found in the following quote from Patient 6:

Patient 6: *“When it flares, I am bed-ridden for six days... the longest was 14 days”.*  
*“...Straight bed, like would go from my bedroom to my bathroom, that would be it”.*

More active coping was seen in the following quote from Patient 1, where the thought of future pain motivated the patient participant to become consistent with her exercises:

Patient 1: *“... I was really stressed out, mentally and physically, and I had a really bad flare-up, and I was like, I need to go to school but this is killing me and I think it took about a week for it to resolve, so I’m kind of scared for the future, especially next year on how it’s going to affect me and how I can prevent that from happening. So I think that’s*

*kind of what's motivating me to do these exercises, as regular as I am now, because I really don't have time for that next year..."*

The following chiropractor participant quotes outline the importance of addressing patients' maladaptive fears and discussing "hurt vs. harm" in an attempt to empower them and increase their active coping mechanism and adherence to prescribed exercise.

Chiropractor 1: *"We tread lightly, like I said, small changes. So at the start my big thing is to make them do something that they couldn't do if I can. That's goal one for sure. Just to show them, and that's confidence. They feel good, I feel better, it helps everybody, and that's rapport". "... I think the biggest thing I do and just from experience and with knowing the literature the first thing we do is we just have a chat, you know what I mean, and I think the biggest thing is reassurance and we just try, within reason, we try to make them understand that nine times out of ten they are not broken. We just try to change the mind-set right out of the get go".*

Chiropractor 6: *"They'll come in with some kind of fear. So they'll come in with a fear.. they're like 'my back will never feel better' or 'I'll never be able to pick up my two year old niece' or that kind of thing? So I try to.. empower them, and teach them that it's not that their back is broken, it's just that their back hurts, right? ... So it's like allaying fears and educating, really".*

Patient 4 surprised us with a well-thought out description of what is essentially a graded *in vivo* exposure technique. He was explaining for us a method he thought that practitioners could use to help address "hurt vs. harm" and restructure maladaptive exercise-related pain beliefs:

Patient 4: *" Yeah, it's kind of hard to know, cause everyone's perception of pain is different and they don't necessarily know that, so I guess something that you could do to help, that would be, sort of like, doing movements similar to the exercises and (the health care professional) saying 'what hurts and how much?' And doing a standard assessment*



*of pain tolerance or something like that...". "depending on the situation... if I was doing a certain exercise on my back, on the lower back to help strengthen it, and then I did it with a chiropractor, and just do it, a certain amount of times, or (at) a certain difficulty, and (then have the patient) say when it hurts and how much and then he can do a quick pain tolerance exercise or something and then, compare it to the standard and see what's good and what's bad."*

This final category discussed the importance of pain and how it often prompts passive care seeking and motivates patients to either avoid or confront physical activity. Both the chiropractic and patient participants discussed these concepts; however, this category appeared to be primarily patient influenced as demonstrated in Figure 2 and explored in the discussion.

## Chapter 5: Discussion

This may be the first qualitative study that has explored the barriers and facilitators to prescribed exercise adherence utilizing chiropractors as well as chiropractic patients with NS-CLBP. The findings from this study are quite congruent with the existing qualitative literature, despite previous studies being non-chiropractic focused and conducted outside North America. Probably the most important, consistent finding across studies (including this one) was that the barriers and facilitators to prescribed exercise adherence appear to be modifiable (Slade et al., 2014).

This thesis study is unique in that it intentionally explored both sides of the therapeutic chiropractic relationship, and in doing so found that most features overlapped in terms of the barriers and facilitators to prescribed exercise in adults with NS-CLBP. However, of the four categories in our findings, two appeared to be dominantly influenced or modifiable by the chiropractor side of the therapeutic relationship and the other two by the patient side. Together, they can be considered through the model in Figure 2, where this two-sided balance is represented (the chiropractor in the top box and the chiropractic patient in the bottom box). The *Relationship (Practitioner-Patient)* and *Exercise Delivery* were dominantly chiropractor driven. *Expectations and Attributions*, as well as *Pain* were the categories that were more patient driven.

It is necessary to acknowledge that despite the best intentions of the treating chiropractor, all patients will not adhere to prescribed exercise. The results of this study suggest ways to improve adherence in those who might perform prescribed exercises. Of particular interest, and a primary focus throughout the discussion, is how easy or difficult it might be for chiropractors to modify the barriers and facilitators in each of the four categories. First, the category interplay will be discussed, focusing on the chiropractor driven categories (section 5.1.1) and then the primarily patient driven categories (section 5.1.2). This will be followed by discussions on enhancing chiropractic practice (section 5.2), facilitating exercise self-efficacy and behavior change (section 5.3), cultural practice (section 5.4), testing new approaches for exercise adherence (section 5.5), and finally, unexpected findings and limitations (section 5.6).

## 5.1 Category Interplay

Of the four categories, the only one that appeared to be simple to modify by the chiropractors was *Exercise Delivery*. The other three categories appeared to be modifiable by the chiropractor as well; however, they were more complex, potentially requiring additional chiropractic education/training to be effectively influenced. This led to an inquiry as to whether modifying chiropractors' behaviors could alter their patients' behaviors, ultimately improving prescribed exercise adherence. These ideas are discussed further below.

**Figure 2. Category interplay between the patient and chiropractor participants**

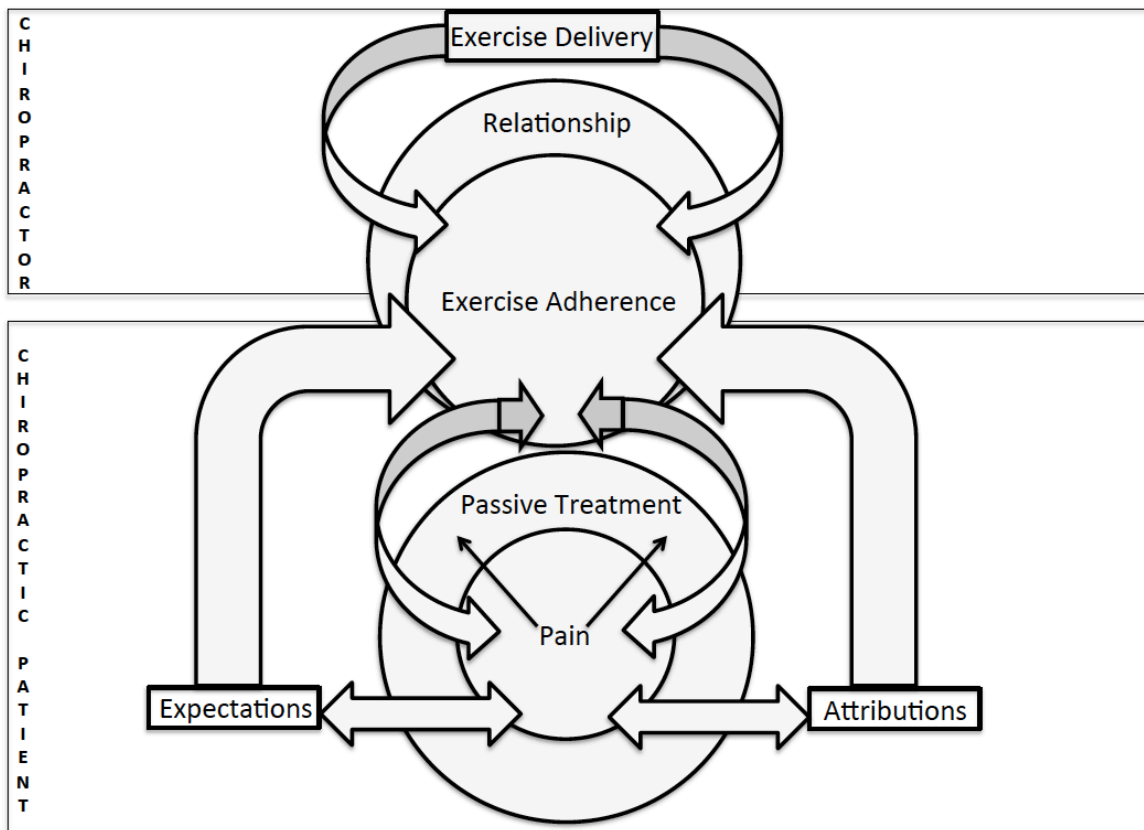


Figure 2 demonstrates how exercise adherence is not simply the patient following instructions to perform prescribed exercise, but it is the product of an interplay between the patient and the chiropractor, with influences from the practitioner-patient relationship and the exercise delivery (principally from the chiropractor's side), and a somewhat complicated set of influences from the patient. This includes patient expectations about treatment (passive or active interventions) as well as the influence of patient pain as a

motivator or a deterrent to exercise. Additionally, attribution had an influence on the patient, where both past active and past passive intervention successes and failures were taken into consideration.

### **5.1.1 Chiropractor Driven Categories**

#### **5.1.1a Exercise Delivery**

The first primarily chiropractor driven category, *Exercise Delivery*, included the themes: Explanation of Exercise Purpose, Structured Simple Exercise Plan with Measurable Goals, and Demonstrations, Review, Follow-up Support. As mentioned above, out of the four categories derived from this study, this category and its associated themes appear to be the most simple to modify by the chiropractor. In the clinical encounter, as outlined in this study, the chiropractor has power over what exercises are prescribed, how these are communicated to the patient, and how often the exercise is reviewed and progress measured. The chiropractor is seen as the primary driver in this category as they have the ability to plan for success, taking the time to thoroughly prescribe exercise, while also taking into consideration the second category where they are also the primary driver, the *Practitioner-Patient Relationship*.

#### **5.1.1b Practitioner-Patient Relationship**

There is an inherent power differential in the *Practitioner-Patient Relationship*, and its themes, the Therapeutic Alliance and Patient-Centered Care. These themes are seen as modifiable by the chiropractor; however, they are complex and appear to be more difficult to modify compared to the themes discussed in the previous category. Some of the chiropractors in this study discussed how they strived to truly get to know their patients and get them involved in the decision-making surrounding prescribed exercise. This took time, effort, and persistence, especially in a busy private practice. In contrast, other chiropractors had less of a connection with their patients as they administered mostly passive care with unilaterally driven exercises, and without patient preference coming into the conversation. In both scenarios, the chiropractor had the choice as to what extent they were going to include the patient. Unfortunately, based on the patient

and chiropractor participant interviews, a patriarchal, unilaterally driven exercise prescription approach appeared to be the choice most frequently made by chiropractors. Part of the reason for this may be due to deep-rooted power differentials built into the health care system, where HCPs are seen as experts that know what is best for the patient. The combination of these systemic issues with the time and financial pressures of private practice are barriers to achieving trust, rapport, and practicing with a genuine patient-centered approach.

Overall, regarding the chiropractor driven categories, the results of this study suggest that the chiropractor can focus on being an effective driver of change, enhancing exercise adherence. However, some themes are quite complex, requiring systemic health care changes that would empower patients to be more involved in their health care decisions and the chiropractors to take the time to shift their priorities, focusing more on patient-centered care.

### **5.1.2 Patient Driven Categories**

#### **5.1.2a Attributions and Expectations**

The first primarily patient driven category was *Attributions and Expectations*, with the themes, the Diagnostic Dilemma and Attributions and Passive Treatment Expectations. Interestingly, the diagnostic dilemma was not a major theme derived from the patient participant interviews. Instead, every chiropractor participant identified this as a potential barrier to exercise adherence stemming from his or her NS-CLBP patients (see section 5.6 regarding the diagnostic dilemma). Regarding the second theme in this category, the patient and chiropractor participants consistently discussed patient attributions of past passive care success and future expectations for successful passive treatment.

These passive care success attributions appeared to facilitate future health care seeking with expectations for passive care relief, minimizing the priority for prescribed exercise in the long-term. Interestingly, when the patient participants were probed regarding the long-term effects of their perceived successful passive treatments, they appeared conflicted. When these discussions were followed by questions asking about

their future management plans for their low back, surprisingly, many patient participants indicated that they felt they should be engaging in exercise more regularly, or at least started to question as to whether exercise might be for them (stages of change). Yet, one patient participant (number 6) demonstrated little desire to engage in prescribed exercise, highlighting how powerful the attribution and expectation of a passive fix can be. She had been prescribed exercise from various HCPs in the past, and when she did not get immediate pain relief with exercise, she refused to engage in it. She sought out chiropractors that were willing to provide regular passive care without any exercise focus, and was satisfied with the relief she obtained, reinforcing her belief that she needs to be continuously fixed through passive care. She told the story of how after passive treatment for flare-ups, she would then return back to her baseline level of pain that was manageable, holding the attribution that passive care fixed her. She also discussed the belief (expectation) that receiving scheduled spinal manipulation would prevent her flare-ups.

Overall, patient participant 6 expressed satisfaction with the interventions she was receiving and was not at all interested in trying active care. This demonstrates how difficult it is for HCPs to challenge patients' attributions and expectations when attempting to facilitate prescribed exercise adherence. This may evoke frustration in HCPs who are prescribing exercise in an attempt to follow CPGs, striving to improve their patients' independence and long-term health outcomes. When patients refuse to follow HCPs exercise recommendations, it may also make the HCPs feel uncomfortable because the patient is exerting their autonomy and the choice to engage in behaviors that are contrary to "expert" HCP advice. Alternatively, HCPs may welcome their patients' choices to not exercise or strive for independence, as patient preference/choice is a pillar of evidence-based medicine (Sackett et al., 1996). Additionally, increased passive care visits to private clinics are self-serving from the chiropractors' perspective, as it increases revenue. Chiropractor participant 3 in this study clearly understood this dynamic, firmly believing that all of his NS-CLBP patients should be given options to self-manage, including prescribed exercise to help reduce their pain, improve their function, and enhance their overall health. However, he did not impose exercise on his exercise resistant patients. Instead, he was transparent, stating:

*“I say ‘if you want to do that (not exercise), and you want to pay me to treat you every couple days, okay, I’ll get a new car. I’m not going to be upset with you’ ... So you try and let them see the fact that they’re in control of how that process is going to land and they’re going to get back what they put into it, and I can help them with the process”.*

The strong passive care seeking by patient participant 6 in an attempt to relieve pain or fix the low back issue combined with a refusal to engage in prescribed exercise is consistent with the existing literature outlined in section 2.3.4. In particular, the narrative of patient participant 6 paralleled the narratives of those who dropped out of a low back rehabilitation program in the study by Sloots and colleagues (2010). Most of the NS-CLBP participants in that study cited that their expectations for prompt pain relief were not met, leading to dropout from the exercise program (Sloots et al., 2010). Overall, the category of *Attributions and Expectations* is seen as complex and difficult to modify. Patient participant 6 also nicely highlighted the second primarily patient driven category (*Pain*), which has themes that also appear to be challenging to modify.

### **5.1.2b Pain**

The category of *Pain* had two themes, Passive-Active Balance and Pain as a Motivator to Avoid or Confront. Continuing with a discussion regarding patient participant 6, her debilitating pain was a motivator to seek passive care, seeing it as a fix. If this passive care was not immediately available, she demonstrated fear-avoidance as she engaged in prolonged bed rest, sometimes for weeks on end. Her passive care seeking was so strong, that it trumped numerous attempts by her previous HCP to help her self-manage through exercise. This example demonstrates how complex and difficult it can be to introduce exercise when a patient has high levels of pain and a rapid, although temporary, pain relieving solution through passive care.

Patient participant 5 also discussed the need for passive care and the avoidance of prescribed exercise when facing high levels of pain; however, he saw this passive care seeking as a temporary solution to reduce pain levels to the point where he could exercise relatively comfortably, facilitating his long-term positive outcomes. This highlights a challenge that HCPs face as they decide when to prescribe exercises and when to provide

advice for relative rest while providing passive treatment. Patient participant 4 provided insight into how HCPs could address this passive-active balance and apprehension regarding exercise. He discussed how HCPs should prescribe exercises that are safe to do, but may cause “good” pain. As previously discussed, he essentially provided a description of graded *in vivo* exposure, where the HCP explains the difference between good pains and bad pains (hurt versus structural harm) as they get the patient to do various exercises in the clinic. The aim would be to reduce fear and help patients cognitively reappraise their pain, facilitating at-home exercise confidence and adherence when it is safe to do so. This is consistent with existing literature discussing the challenge of managing psychosocial factors and passive-dependency in patients with NS-CLBP. A recent systematic review found that fear-avoidance beliefs are a prognostic factor for poor outcomes in patients with NS-CLBP, reinforcing the need for early interventions focused on minimizing fear-avoidance and passive fix expectations that can contribute to chronicity and poor active care engagement (Wertli et al., 2014).

Overall, regarding the patient driven categories, the results of this study suggest that patients’ pain, as well as their attributions and expectations can act both as significant barriers and facilitators to exercise adherence. Although these patient driven categories and associated themes appear to be modifiable by the practitioner, the results of this study suggest that well-meaning attempts by practitioners to get their patients active can be met with significant resistance when the patient expectation for a passive fix is high, especially when combined with fear-avoidance of pain. This highlights the need for practitioners to be able to effectively manage these maladaptive beliefs and poor-active coping skills, while facilitating patient independence and optimal long-term outcomes through exercise behavior change.

## **5.2 Enhancing Chiropractic Practice**

As already noted, an important concept identified in this and other studies is that most of the barriers and facilitators to prescribed exercise adherence appear to be modifiable. This suggests that chiropractors and other HCPs in contact with the NS-CLBP population can play a significant role in helping to remove these barriers, while strengthening the facilitators. Michie and colleagues (2009) performed a systematic



review and meta-regression of behavioral interventions to improve physical activity levels. The following behavior interventions were demonstrated to be effective: self monitoring of behavior, prompting intention formation, prompting specific goal setting, providing feedback on performance, and prompting review of behavioral goals. Interestingly, these behavioral interventions showing efficacy overlap nicely with our findings that appeared to be more easily modified by chiropractors (*Exercise Delivery* category). Although Michie and colleagues (2009) looked at healthy populations and further research is needed in this area, their work provides some support that chiropractors and other HCPs who prescribe exercise may benefit from behavior change training for non-psychologists. The results from a small qualitative study (Cook & Hassenkamp, 2000) suggest that cognitive behavior approaches should be introduced more widely in the uni-professional setting in the context of physiotherapy. The finding from this thesis study also suggests this, but for chiropractors practicing in non-multidisciplinary settings. The work of Beinart and colleagues (2013) also support this idea, as they found that the use of BCTs with motivational strategies improves at-home exercise adherence in patients with CLBP.

Interestingly, the results from this thesis study show that some of the chiropractors, unknowingly, described the use of specific BCTs to help their patients to adhere to prescribed exercise. Compared to the BCT checklist used in a study of exercise-based BCTs identified by Harman and colleagues (2014), the chiropractor participants clearly described the use of: cognitive restructuring, graded exposure, providing information on consequences, setting graded exercises, booster sessions, prompting review of behavior exercise goals, and providing feedback on exercise performance. The use of these BCTs in the context of teaching patients the exercises being prescribed would contribute significantly to building the self-efficacy required for them to perform those same exercises independently.

### **5.3 Facilitating Exercise Self-efficacy and Behavior Change**

Several patient participants in this thesis study described exercise experiences that suggested that increased self-efficacy facilitated their prescribed exercise adherence. Patient participants 3, 4, and 5 had past exercise experience including playing recreational

and/or competitive sports. These past experiences appeared to influence their expectations that they could successfully and independently perform prescribed exercise for their NS-CLBP. Although patient participants 3 and 5 expressed some apprehension when exercising during the acute phase of their pain or during a significant flare-up, at the time of the interviews, all three patient participants had NS-CLBP and were consistently exercising.

Patient participant 4 was particularly confident in his ability to engage in his prescribed exercises, despite initial pain when exercising. This appeared to be tied to his attributions and expectations as well as the themes within the category *Exercise Delivery*. He welcomed “good” pain when exercising, seeing it as a part of the rehabilitation process, as he strived towards obtaining better outcomes. He discussed past sport-related injuries and confirmed that he was able to now differentiate between good and bad exercise-related pain. Past successful experiences managing pain/injuries with prescribed exercise appeared to increase his belief that he is on the right track regarding the management of his NS-CLBP. This appeared to create a strong expectancy that his back pain, although complicated, would be similar to other injuries he has experienced; he believed that if he worked hard, he would get positive results in the long-term. He did discuss seeking passive treatment, but he appeared to view it differently than other patient participants. While he sought out passive care from chiropractors, he saw their role as guides rather than fixers. He described how the chiropractors he saw would provide exercise support as they reviewed the prescribed exercises and monitored his exercise progress. He also discussed how the chiropractors helped him more frequently through passive care in the past, but now he appeared quite functional, making reference to his ability to independently perform rehabilitation exercises moving towards independent self-management.

Overall, the beliefs and behaviors of patient participant 4 are consistent with the literature review in section 2.3.4 discussing how self-efficacy is one of the most consistent predictors of physical activity in adults (Bauman, Reis, & Sallis, 2012). Patient participant 4 also nicely demonstrated the reciprocal relationship between exercise behavior change and self-efficacy (Weinberg & Gould, 2003). His participation in prescribed exercises increased his exercise self-efficacy, which in turn reinforced future

exercise behavior and continued exercise participation. In addition, it was interesting to see how the themes within the category *Exercise Delivery* appeared to facilitate his behavior change. This is now briefly discussed.

The three themes: Explanation of Exercise Purpose, Demonstration, Review, Follow-up Support, and Structured Simple Exercise Plan with Measurable Goals have the main three elements (cognitive, behavioral, and motivational) of a behavioral change intervention that aligns with the newest model of behavior change theory, COM-B (Capability, Opportunity, Motivation and Behavior) (Michie et al., 2013). The chiropractors treating patient participant 4 appeared to consciously or unconsciously incorporate these elements; however, there was room for improvement, as patient participant 4 described how having a better understanding of the purpose behind his prescribed exercises may have improved his motivation to exercise more than he already was. The development and delivery of continuing education courses for chiropractors and physiotherapists could help teach them how to use these BCTs, prompting their intentional use to increase exercise self-efficacy, therefore improving prescribed exercise adherence. An exploration of potential incentives to engage HCPs in this type of continuing education and subsequently incorporate gained knowledge into clinical practice is warranted. NS-CLBP patients may also benefit from chiropractors having their own maladaptive beliefs and behaviors explored, which will now be discussed.

#### **5.4 Cultural Practice**

Although the interviewed chiropractors had the capacity and confidence to prescribe exercise for NS-CLBP (in fact they self-reported that they prescribed exercise “Very Often”), in the interviews, it became apparent that it was in fact a low priority for several of the chiropractor participants. The patient participants also revealed that many of their chiropractor encounters had little or no focus on prescribed exercise for their NS-CLBP, and instead, there was a long-term focus on tissue-based passive care interventions. Similar findings have been identified in the physiotherapy literature. Daykin and Richardson (2004) discussed how biomedical focused physiotherapists tend to have different pain and CLBP management beliefs and practices as compared to evidence-informed physiotherapists who followed a biopsychosocial model of care. The

authors discussed how biomedical focused physiotherapists have the tendency to want to fix identified structural and tissue-based problems through passive modalities/interventions, contrary to current CPGs. Practitioners' biomedical attributions were also found to influence how the physiotherapist explained the patients' LBP. Darlow and colleagues (2013) further explored this concept, finding that practitioners' words can have a lasting negative impact, with patients often viewing their backs as fragile and needing to be protected. They found that these beliefs might result in hyper-vigilance and guilt surrounding poor exercise adherence. Additionally, Darlow and colleagues (2013) suggested that practitioners could instill confidence in their patients through reassurance, while also providing advice that can facilitate physical activity. To improve patient care, Daykins and Richardson (2004) recommended that physiotherapists need to reflect not only on their patients' beliefs and behaviors, but also their own. The authors also concluded that physiotherapists need support and guidance to follow best practices advocating a biopsychosocial approach to LBP care. This thesis study also found this to be the case, but for chiropractors, which will now be discussed further.

There is some evidence that chiropractors have even more of a biomedical focus than physiotherapists (Pincus et al., 2007). Although this study did not explore this idea, a greater biomedical focus, and the fact that they operate entirely in the private sector, suggests that chiropractic care may deviate further than physiotherapists from best practices for NS-CLBP (Pincus et al., 2007). Most of the chiropractors interviewed for this thesis study had a biomedical focus. It seems that there is little incentive (from a business perspective) for chiropractors and other HCPs in the private sector to focus on evidence-informed care, including the prescription of exercise for NS-CLBP. Striving for short-term patient satisfaction combined with time and financial restrictions is likely a significant barrier to the promotion of long-term positive outcomes through exercise prescription. Shifting chiropractors' treatment priorities for NS-CLBP is a worthy, but likely challenging endeavor. However, some positive trends facilitating this shift are currently being seen in the chiropractic profession.

The recent trend of "Exercise is Medicine" ([www.exerciseismedicine.ca](http://www.exerciseismedicine.ca)) illustrates the extent to which the benefits of exercise have pervaded the delivery of health care. Chiropractors, physiotherapists, and physicians have recently joined forces with

other exercise-prescribing professionals to advocate active living, with the intention of improving the health of Canadians. It has recently been suggested that chiropractors should be doing a better job at fighting the inactivity epidemic in Canada, with the Royal College of Chiropractic Sports Sciences (Canada) in combination with Exercise is Medicine (Canada) facilitating this (Laframboise, 2014). Increased awareness through this campaign aims to help more chiropractors re-think their treatment options, and the positive impact increased physical activity can have, which will be especially beneficial for the large NS-CLBP population they treat. Investigation of how to engage guideline-discordant chiropractors in these types of initiatives is warranted. There also needs to be more experimental research into different methods of enhancing adherence, such as studies looking at the effectiveness of applying different BCTs to exercise delivery, like a recent study using text messaging to motivate chiropractic patients. This will now be discussed further.

### **5.5 Testing New Approaches for Exercise Adherence**

Even when practitioners have a high priority for exercise, and effectively activate their patients, a lack of motivation to sustain physical activity behavior change is still a major challenge (Beinart et al., 2013). Participants in this study confirmed this, discussing how hard it is to maintain an exercise program, and the need for motivation and continued support to facilitate long-term adherence to prescribed exercise. Interestingly, both a patient and a chiropractor participant argued that practitioners need to understand how technology is central part of patients' lives in today's society, and how electronic devices can be used to increase exercise adherence. One patient participant specifically discussed how text message reminders could facilitate prescribed exercise adherence. This is consistent with the findings in the qualitative study by Cooper and colleagues (2009) where patients expressed the need for motivation, including the use of electronic devices (email). The concept of using text messaging has recently been quantitatively explored, with a prospective pilot clinical trial in Germany published in 2012, finding that chiropractic patients who received text message reminders were six times more likely to complete their prescribed exercise program as compared to the group not receiving text messages (Newell & Beyer, 2012). Annoyance scores found that the patients did not find

the messaging troublesome. In 2013, a systematic review on text messaging interventions to promote physical activity found positive effect sizes; however, as identified by the authors, further research is needed in this area (Buchholz, Wilbur, Ingram, & Fogg, 2013).

## **5.6 Unexpected Findings and Limitations**

Among the findings that were surprising was that the patient participants were less focused on finding the cause of their LBP than was expected. This is contrary to existing literature (Slade et al., 2014; Sloots et al., 2010). Through memoing and reflexivity, Peter realized that his prior knowledge of the literature surrounding the diagnostic dilemma combined with his clinical experience created a strong expectancy that the patient participants would be focused on finding an anatomical explanation for their persistent pain. While some participants did express a desire to better understand the cause of their pain, they were not ruminating over it as was expected. However, the chiropractor participants in this study confidently stated that most NS-CLBP patients that they have seen were seeking answers during their initial chiropractic consult and that they were often frustrated when they did not receive an adequate explanation or diagnosis in the past (this was more consistent with Peter's expectations). In addition, the chiropractor participants clearly identified that, in their experience if the NS-CLBP patient is not satisfied with the description of their back pain, they are less likely to follow treatment recommendations, including prescribed exercise.

The discrepancy between patients' diagnostic uncertainty in this study and the existing literature may be due to participant heterogeneity across studies. Specifically, all the participants in this thesis study happened to be "low risk" on the Keele STarT Back tool and the eligibility criteria was set up so that each patient participant had seen at least two practitioners for their LBP. Five out of the six patient participants in this study had seen four or more different practitioners for their LBP, so it is possible that they were no longer in a "seeking answers" phase when they were interviewed. All of the patient participants in this study had extensive contact time with chiropractor(s); therefore, it is also possible that those chiropractors explained NS-CLBP to their patients in a way compared to other HCPs that reduced diagnostic uncertainty. Specifically, chiropractors'

biomedical focus with a tendency to attach clinic diagnoses to NS-CLBP, such as lumbar facet dysfunction or myofascial pain syndrome, may reduce diagnostic uncertainty. Existing literature to support this concept and its relationship to exercise adherence was not identified. However, based on the chiropractor participants' experiences in this study as well as Peter's biased observations, it appears that attitudes towards chiropractic treatment plans, including prescribed exercise, improves when chiropractic patients feel that they have a clear understanding of the anatomical basis of their persistent pain, even when no obvious objective pain generating structures can be identified. This appears to be facilitated further with an early discussion surrounding the limited utility of further diagnostic tests, imaging, or further consults. However, the challenge is for chiropractors to explain patients' pain and subsequent treatment plans without medicalizing or pathologizing NS-CLBP. More research is needed surrounding the positive and/or negative impact of chiropractor-delivered low back diagnoses and explanations of their patients' persistent pain.

One limitation of this thesis study is that there was little variability in patient participants' pain severity and risk of chronicity based on the administered questionnaires. This may have impacted their views on exercise prescription, being more receptive to exercise due to their reduced pain and higher level of functioning. Ideally there would have been more of a diverse range of pain intensities and levels of disability, providing more of an opportunity to contrast and compare patient participant narratives.

Another limitation is that the study only included chiropractors that prescribe exercise "very often" based on the screening questionnaire. This may have produced a selection bias, targeting those who are more rehabilitation focused, refining their exercise delivery. Therefore, the study may have unintentionally included chiropractors that were more likely to identify positive exercise prescription experiences and facilitators rather than barriers. However, the interviews did provide a window to explore the practices of other chiropractors through patient and chiropractor participant second hand reports. No chiropractor returned a survey indicating that they "Never", "Rarely", or "Sometimes" prescribe exercises. However, it would have been interesting to seek out these practitioners and inquire as to why they don't consistently prescribe exercise despite

training and CPGs suggesting they should. Having this diversity in the sample may have provided more of a representation of the chiropractic profession.

## **5.7 Conclusion**

Contrary to many clinicians' beliefs, there is still no proven, highly effective passive treatment for NS-CLBP, especially in the long-term. Exercise appears to be the most cost-effective, evidence-informed intervention currently available for NS-CLBP. Identified barriers and facilitators to prescribed exercise adherence in chiropractic patients with NS-CLBP revolved around Exercise Delivery, the Practitioner-Patient Relationship, Attributions and Expectations, and Pain. Most of the barriers and facilitators to prescribed exercise adherence appeared to be modifiable by the HCP, highlighting the need for clinicians to strengthen facilitators and break down barriers. While poor exercise adherence is often seen as a patient problem, this study has revealed the dilemma of the well-intentioned chiropractor prescribing exercise in a manner that may not optimize adherence in those who will perform the exercise. There is a complex interplay between the patient and the practitioner who prescribes the exercise, involving common factors that can act as either facilitators or barriers. Further research is warranted to examine this practitioner-patient relationship in the context of exercise adherence as well as how to positively influence HCPs' and patients' beliefs and behaviors, facilitating positive patient health outcomes in the long-term.



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## **Appendix 1: Clinic Invitation**

Could you please kindly forward this to the clinic chiropractors?

I would like to invite you to participate in a research study being conducted by myself (Peter Stilwell BKin, DC) and Katherine Harman PT, PhD, Dalhousie University. The research study is a part of my Master of Science Degree. Participation in this study is voluntary and you can withdraw from the study at any time. The study is described below.

### Purpose of the Study

This study aims to explore the chiropractic treatment preferences in adults with chronic low back pain.

### Study Design

To explore the chiropractic treatment preferences in adults with chronic low back pain, this study will include interviews with willing chiropractors and patients. Interviews will be conducted separately.

Specifically, the questions will revolve around what patients and chiropractors find to be helpful and effective when managing back discomfort that lasts longer than 3 months. The chiropractors and the patients may benefit from having these interviews; however, this is unknown. It is expected that the valuable information provided by the chiropractors and patients involved in the study will enhance future low back pain care.

Interviews will be conducted at Dalhousie University and participants will be compensated for their time. If you are interested, please fill out the attached screening questionnaire to see if you are eligible to participate. If you are eligible to participate, you will be asked to review and sign the consent form before your interview.

**You should contact me to discuss any questions you have about this study. Please email me at [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca).**

**Thanks for your time. I am looking forward to your response.**



## Appendix 2: Chiropractor Screening



### **Chiropractor Screening**

**Study:** Exploration of chiropractic treatment preferences in adults with chronic low back pain. Please return the following completed questionnaire via email to:

[peterstilwell@dal.ca](mailto:peterstilwell@dal.ca)

When treating patients with chronic non-specific/mechanical low back pain over the last year, what treatments did you administer and at what frequency? Beside each form of treatment please select the **closest** frequency by **bolding** or coloring Never, Rarely, Sometimes, Often, **or** Very Often.

**Soft Tissue Therapies (using hands):** Never Rarely Sometimes Often Very Often

**Instrument Assisted Soft Tissue Therapies:** Never Rarely Sometimes Often Very Often

**Spinal Manipulation or Mobilizations:** Never Rarely Sometimes Often Very Often

**At Home Exercise Prescription:** Never Rarely Sometimes Often Very Often

**Referral for Exercise:** Never Rarely Sometimes Often Very Often

**Nutritional Advice/Supplements:** Never Rarely Sometimes Often Very Often

**Referral for Nutritional Advice/Supplements:** Never Rarely Sometimes Often Very Often

**Acupuncture:** Never Rarely Sometimes Often Very Often

**Referral for Acupuncture:** Never Rarely Sometimes Often Very Often

**Laser:** Never Rarely Sometimes Often Very Often

**Micro-current/Tens/IFC:** Never Rarely Sometimes Often Very Often

**Ultrasound:** Never Rarely Sometimes Often Very Often

**Cryotherapy/Thermotherapy:** Never Rarely Sometimes Often Very Often

**Taping Techniques:** Never Rarely Sometimes Often Very Often

**Referral for pain medication:** Never Rarely Sometimes Often Very Often

**Please list other treatments/techniques used:**

### Appendix 3: Chiropractor Participant Consent Form



Faculty of Health Professions: School of Physiotherapy

#### **Chiropractor Participant Consent Form**

**Title:** Exploration of chiropractic treatment preferences in adults with chronic low back pain.

**Principle Investigator:**

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Chiropractor and MSc Graduate Student

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## **Introduction**

We invite you to take part in a research study being conducted by Peter Stilwell who is a chiropractor and graduate student at Dalhousie University. This study is a part of his Master of Science Degree. Your participation in this study is voluntary and you may withdraw from the study at any time. The study is described below. This description tells you about the risks, inconvenience, or discomfort that you might experience. Participating in the study might not benefit you, but we might learn things that will benefit others. You should discuss any questions you have about this study with Peter Stilwell at [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca).

## **Purpose of the Study**

This study aims to explore the chiropractic treatment preferences in adults with chronic low back pain.

## **Study Design**

The study will include audio-recorded interviews with chiropractors and chiropractic patients. Interviews will be conducted separately. In total, you will be audio-recorded one time.

Once your interview is complete, you will be provided with a copy of the transcript via email and given the opportunity to provide clarifications or feedback. During the interview, Katherine Harman (Associate Professor, Dalhousie University) will be present. Three to six patients as well as three to six chiropractors will be involved in the study, all being interviewed individually.

## **Who will be conducting the Research?**

Peter Stilwell will be conducting and audiotaping the interview with you. A transcriptionist or Peter Stilwell will type out the interview. Katherine Harman as well as Peter Stilwell will read the transcripts from the interviews and discuss the findings of the study. Other members of the research team (Anne Fenety and Emma Whelan) and Amy Barrette (a graduate student) may also review the transcripts and discuss the findings.

**What you will be asked to do**

You will be contacted via email and a mutually agreed upon time will be arranged for you to be interviewed by Peter Stilwell at Dalhousie University. The interview will be 60 to 90 minutes in duration. Once your audio-recorded interview is transcribed, you will be provided with a copy of the transcript via email and given the opportunity to provide clarifications or feedback. In total, you should not have to commit more than 2.5 hours of your time, excluding travel time to Dalhousie University.

**Special considerations of interview studies**

During the interview, some of the information that you disclose may be particularly helpful in making a point or supporting a research idea or concept. Using your quotations in published research may be valuable. When doing this, we will not use your name or readily identifiable information. At the end of the consent form, we ask you to provide explicit consent to use quotations from the interviews and other information derived from the study.

**Possible Risks and Discomforts**

This study involves sitting down and having a discussion with Peter Stilwell on one occasion as well as answering several emails from Peter Stilwell. During the interview, issues may be raised or questions posed regarding your clinical practice. It is possible that some questions may make you feel uncomfortable. It is important to note that you are not required to answer all the questions that are asked, and Peter can simply move on to another question or you may discontinue at any point in time.

**Possible Benefits**

You may benefit from discussing your clinical practice experiences with the researcher, but it is unknown if that will be the case. Otherwise, there are no anticipated direct benefits to you by participating in this study. We expect that the results of the study will enhance our understanding of low back treatment preferences and will benefit others in the future.

### **Compensation / Reimbursement**

After completing the interview, you will be entitled to receive 50 dollars in compensation for your time. You will be asked to sign a form showing that you received it.

### **Confidentiality & Anonymity**

The findings from this study may help inform the future treatment of low back pain and may be published as a research paper and used for educational purposes.

**Confidentiality:** All personal information including audio-recordings will be stored on a password protected computer. Any hard copy private information (e.g., transcripts, consent forms) will be stored at Dalhousie University, inside a room that has security-controlled entrance, and also behind a locked door. These data will be stored for seven years after publication. When it comes to publishing the study and using information for educational purposes, your name or readily identifiable information will not be used.

**Anonymity:** Any report or publication derived from this study will not use your name or readily identifiable information, for example the clinic name. In rare circumstances, there is a duty to disclose information you have provided us with to the appropriate authorities. This would include situations such as abuse or neglect of a child, or an adult in need of protection.

### **Questions**

If you have any questions about the study, you can reach Peter Stilwell at 902-817-2280 or by email: [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca)

Any new information that might become available during the study that could affect your decision to participate in the study will be communicated to you.

### **Problems or Concerns**

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Catherine Connors, Director, Research Ethics, Dalhousie University for assistance at (902) 494-1462, [ethics@dal.ca](mailto:ethics@dal.ca)

**Chiropractor Participant: CONSENT FORM - Signature Page**

**Title:** Exploration of chiropractic treatment preferences in adults with chronic low back pain.

The audio-recorded interview will be analyzed and information and/or substantial quotations may be useful for reports, manuscripts or for educational purposes. As mentioned above, any report or publication derived from this study will not identify you. If you consent to participate in the study, once the study is complete, your consent will be confirmed and you can decide to no longer allow the researchers to use of your information. In addition, if you consent to participate in the study AND consent to allow the researchers to use substantial quotations, you may also revoke this consent after the study is complete.

I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study and allow the investigators to use my information derived from the study. However I realize that my participation is voluntary and that I am free to withdraw from the study at any time.

\_\_\_\_\_  
Printed name of participant

\_\_\_\_\_  
date

\_\_\_\_\_  
Signature of participant

Here we request your explicit consent for the use of quotations: I hereby consent to allow the investigators to use substantial quotes from the audio-recording in publications, reports or for educational purposes:

- YES
- NO

Prior to using substantial quotations from this study, I need to review the material:

- YES, you can contact me at \_\_\_\_\_.
- NO, I do not need to review substantial quotations.

## Appendix 4: Low Back Pain Screening



### **Low Back Pain Screening**

Thank you for expressing interest in the research study being conducted by myself, Peter Stilwell (chiropractor and MSc graduate student at Dalhousie University) and Katherine Harman PT, PhD (Associate Professor School of Physiotherapy, Dalhousie University). First, we must determine if you are eligible for the study. To do this, you must answer the following questions and return your answers via email to: [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca).

Are you currently receiving chiropractic treatment?

How long have you had low back pain? Please estimate in days or weeks.

How old are you?

What is your gender?

Is it possible that you might be pregnant?

Do you have any current or past low back diagnoses or conditions that create low back pain (such as spinal stenosis, disk herniation, fractures ect.)? If so, please state what they are.

Have you had any imaging of your low back, such as x-rays, CT scans, or MRI? If so, can you recall if there were any findings?

Do you have significant weakness, pain, or altered sensation below your knees?

Have you received any of the following in the past 12 weeks for your back from a health care practitioner (Medical doctor, physiotherapist, or chiropractor)? Please put yes or no beside each of the following:

Soft tissue therapies (such as massage)

Spinal manipulation/adjustments or mobilization

Nutritional advice or prescribed supplements (non-prescription)

Prescription medication

Exercises or exercise advice

Acupuncture

Electrical modalities for your low back (Micro-current, Tens, IFC, Ultrasound, or Laser)

Taping techniques

Ice or heat



## Appendix 5: Low Back Pain Participant Consent Form



**Faculty of Health Professions: School of Physiotherapy**

**Low Back Pain Participant: Consent Form**

**Title:** Exploration of chiropractic treatment preferences in adults with chronic low back pain.

**Principle Investigator:**

Peter Stilwell

Chiropractor and Graduate Student

School of Physiotherapy

Dalhousie University

Email: peterstilwell@dal.ca

**Co-Investigator and Supervisor:**

Katherine Harman

Associate Professor

Dalhousie University

Email: k.harman@dal.ca

Room 429 Forrest Bldg

Dalhousie University campus

5869 University Ave.

Halifax, NS

B3H 4R2

Phone: 902.494.8820

FAX: 902.494.1941

## **Introduction**

We invite you to take part in a research study being conducted by Peter Stilwell who is a chiropractor and graduate student at Dalhousie University. This study is a part of his Master of Science Degree. Your participation in this study is voluntary and you may withdraw from the study at any time. The quality of your health care will not be affected by whether or not you participate. The study is described below. This description tells you about the risks, inconvenience, or discomfort that you might experience. Participating in the study might not benefit you, but we might learn things that will benefit others. You should discuss any questions you have about this study with Peter Stilwell at [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca).

## **Purpose of the Study**

This study aims to explore the chiropractic treatment preferences in adults with chronic low back pain.

## **Study Design**

The study involves the completion of a screening questionnaire initially to determine if you are eligible. If eligible, you will be asked to fill out two commonly used low back pain questionnaires before having an audio-recorded interview with Peter Stilwell. This interview will not include your chiropractor and information discussed will not be disclosed to your chiropractor. After your interview, you will be provided with a copy of the transcript via email and given the opportunity to provide clarifications or feedback. During the interviews, Katherine Harman (Associate Professor, Dalhousie University) will be present. Three to six patients as well as three to six chiropractors will be involved in the study, all being interviewed individually.

## **Who can participate in the study?**

If you have a low back issue and meet the eligibility criteria for the study (though email screening), you are able to participate.

**Who will be conducting the research?**

Peter Stilwell will be conducting and audiotaping the interview with you. A transcriptionist or Peter Stilwell will type out the interview. Katherine Harman as well as Peter Stilwell will read transcripts from the interviews and discuss the findings of the study. Other members of the research team (Anne Fenety and Emma Whelan) and Amy Barrette (a graduate student) may also review the transcripts and discuss the findings.

**What you will be asked to do**

During a mutually agreed upon time, you will meet with Peter Stilwell at Dalhousie University and will be asked to review and sign this consent form. Subsequently, you will be asked to fill out two questionnaires and then an audio-recorded interview with Peter Stilwell will take place in a quiet room on the Dalhousie Campus. The interview should take 60-90 minutes and will involve questions regarding your low back troubles, past low back treatment, and current expectations and treatment preferences. After the interview, you will be provided with a copy of the transcript via email and given the opportunity to provide clarifications or feedback. In total, you should not have to commit to more than 3 hours of your time, excluding travel time to Dalhousie University.

**Special considerations of interview studies**

During the interviews, some of the information that you disclose may be particularly helpful in making a point or supporting a research idea or concept. Using your quotations in published research may be valuable. When doing this, we will not use your name or readily identifiable information. At the end of the consent form, we ask you to provide explicit consent to use quotations from the interviews and other information derived from the study.

**Possible Risks and Discomforts**

This study involves sitting down and having a discussion with Peter Stilwell as well as completing several questionnaires and answering several emails from Peter Stilwell. During the interview, issues may be raised or questions posed about your back troubles and your past and present treatment experiences. It is possible that some questions may

make you feel uncomfortable. It is important to note that you are not required to answer all questions that are asked, and Peter can simply move on to another question or you may discontinue at any point in time.

### **Possible Benefits**

You may benefit from discussing your back pain and treatment experiences with the researcher, but it is unknown if that will be the case. Otherwise, there are no anticipated direct benefits to you by participating in this study. We expect that the results of the study will enhance our understanding of low back treatment preferences and will benefit others in the future.

### **Compensation / Reimbursement**

After completing the interview, you will be entitled to receive 50 dollars in compensation for your time. You will be asked to sign a form showing that you received it.

### **Confidentiality & Anonymity**

The findings from this study may help inform the future treatment of low back pain and may be published as a research paper and used for educational purposes.

**Confidentiality:** All personal information including audio-recordings and questionnaire scores will be stored on a password protected computer. Any hard copy private information (e.g., transcripts, consent forms) will be stored at Dalhousie University, inside a room that has security-controlled entrance, and also behind a locked door. These data will be stored for seven years after publication. As noted above, any information you share with us will not be disclosed to your chiropractor. When it comes to publishing the study and using information for educational purposes, your name or readily identifiable information will not be used.

**Anonymity:** Any report or publication derived from this study will not use your name or readily identifiable information. In rare circumstances, there is a duty to disclose information you have provided us with to the appropriate authorities. This would include situations such as abuse or neglect of a child, or an adult in need of protection

## **Questions**

If you have any questions about the study, you can reach Peter Stilwell at 902-817-2280 or by email: **[peterstilwell@dal.ca](mailto:peterstilwell@dal.ca)**

Any new information that might become available during the study that could affect your decision to participate in the study will be communicated to you.

## Problems or Concerns

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Catherine Connors, Director, Research Ethics, Dalhousie University for assistance at (902) 494-1462, [ethics@dal.ca](mailto:ethics@dal.ca)

**Low Back Pain Participant: CONSENT FORM - Signature Page**

**Title:** Exploration of chiropractic treatment preferences in adults with chronic low back pain.

The audio-recorded interview will be analyzed and information and/or substantial quotations may be useful for reports, manuscripts or for educational purposes. As mentioned above, any report or publication derived from this study will not identify you. If you consent to participate in the study, once the study is complete, your consent will be confirmed and you can decide to no longer allow the researchers to use of your information. In addition, if you consent to participate in the study AND consent to allow the researchers to use substantial quotations, you may also revoke this consent after the study is complete.

I have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I hereby consent to take part in this study and allow the investigators to use my information derived from the study. However I realize that my participation is voluntary and that I am free to withdraw from the study at any time.

\_\_\_\_\_  
Printed name of participant

\_\_\_\_\_  
date

\_\_\_\_\_  
Signature of participant

Here we request your explicit consent for the use of quotations: I hereby consent to allow the investigators to use substantial quotes from the audio-recordings in publications, reports or for educational purposes:

- YES
- NO

Prior to using substantial quotations from this study, I need to review the material:

- YES, you can contact me at \_\_\_\_\_.
- NO, I do not need to review substantial quotations.



## Appendix 7: Revised Oswestry Disability Index

### The Revised Oswestry Disability Index (for low back pain/dysfunction)

Patient name: \_\_\_\_\_ File # \_\_\_\_\_ Date: \_\_\_\_\_

This questionnaire has been designed to give the doctor information as to how your back pain has affected your ability to manage everyday life. Please answer every section and mark in each section only the ONE box that applies to you. We realize that you may consider that two of the statements in any one section relate to you, but please just mark the box that most closely describes your problem.

#### SECTION 1-PAIN INTENSITY

- The pain comes and goes and is very mild.
- The pain is mild and does not vary much.
- The pain comes and goes and is moderate.
- The pain is moderate and does not vary much.
- The pain comes and goes and is very severe.
- The pain is severe and does not vary much.

#### SECTION 2-PERSONAL CARE

- I would not have to change my way of washing or dressing in order to avoid pain.
- I do not normally change my way of washing or dressing even though it causes some pain.
- Washing and dressing increases the pain, but I manage not to change my way of doing it.
- Washing and dressing increases the pain and I find it necessary to change my way of doing it.
- Because of the pain, I am unable to do some washing and dressing without help.
- Because of the pain, I am unable to do any washing and dressing without help.

#### SECTION 3-LIFTING

- I can lift heavy weights without extra pain.
- I can lift heavy weights, but it causes extra pain.
- Pain prevents me from lifting heavy weights off the floor, but I manage if they are conveniently positioned (e.g., on a table).
- Pain prevents me from lifting heavy weights off the floor.
- Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- I can only lift very light weights at the most.

#### SECTION 4-WALKING

- I have no pain on walking.
- I have some pain on walking, but it does not increase with distance.
- I cannot walk more than one mile without increasing pain.
- I cannot walk more than 1/2 mile without increasing pain.
- I cannot walk more than 1/4 mile without increasing pain.
- I cannot walk at all without increasing pain.

#### SECTION 5-SITTING

- I can sit in any chair as long as I like.
- I can only sit in my favorite chair as long as I like.
- Pain prevents me from sitting more than one hour.
- Pain prevents me from sitting more than 1/2 hour.
- Pain prevents me from sitting more 10 minutes.
- I avoid sitting because it increases pain right away.

#### SECTION 6-STANDING

- I can stand as long as I want without pain.
- I have some pain on standing, but it does not increase with time.
- I cannot stand for longer than one hour without increasing pain.
- I cannot stand for longer than 1/2 hour without increasing pain.
- I cannot stand for longer than 10 minutes without increasing pain.
- I avoid standing because it increases the pain right away.

#### SECTION 7-SLEEPING

- I get no pain in bed.
- I get pain in bed, but it does not prevent me from sleeping well.
- Because of pain, my normal night's sleep is reduced by less than 1/4.
- Because of pain, my normal night's sleep is reduced by less than 1/2.
- Because of pain, my normal night's sleep is reduced by less than 3/4.
- Pain prevents me from sleeping at all.

#### SECTION 8-SOCIAL LIFE

- My social life is normal and gives me no pain.
- My social life is normal, but increases the degree of pain.
- Pain has no significant effect on my social life apart from limiting my more energetic interests, e.g., dancing, etc.
- Pain has restricted my social life and I do not go out very often.
- Pain has restricted my social life to my home.
- I have hardly any social life because of the pain.

#### SECTION 9-TRAVELLING

- I get no pain while travelling.
- I get some pain while travelling, but none of my usual forms of travel makes it any worse.
- I get extra pain while travelling, but it does not compel me to seek alternative forms of travel.
- I get extra pain while travelling, which compels me to seek alternative forms of travel.
- Pain restricts all forms of travel.
- Pain prevents all forms of travel except that done lying down.

#### SECTION 10-CHANGING DEGREE OF PAIN

- My pain is rapidly getting better.
- My pain fluctuates, but is definitively getting better.
- My pain seems to be getting better, but improvement is slow at present.
- My pain is neither getting better nor worse.
- My pain is gradually worsening.
- My pain is rapidly worsening.



## Appendix 8: Follow-up: Deception Email Template

Thanks again for participating in the research study by Peter Stilwell and Katherine Harman through Dalhousie University.

While the study looked at general chiropractic treatment preferences in adults with chronic low back pain, another major focus of the study was to understand the **barriers and facilitators to prescribed exercise adherence**. Exercise is an effective intervention for chronic low back pain; however, adherence to prescribed exercise is poor. Therefore, we were especially interested in the preferences, beliefs, and expectations of patients who have been prescribed exercise and chiropractors that typically prescribe exercise. We were also interested in the interactions and relationships between patients and their health care providers. Not specifically detailing our areas of interest before the interview was done so that an uninhibited conversation could be had.

Your dedication to the study is greatly appreciated. In light of this new information, if you now have changed your mind and want to remove your consent to use your information in this study, please let us know. Otherwise, as was agreed at the beginning, information we have collected may be used for research and educational purposes. To protect your confidentiality, your name or information that could readily identify you will not be published or used for educational purposes. So if you are a patient, your chiropractor will not know what you specifically said in your interviews and vice versa.

Attached is copy of your transcript, which was transcribed by a transcriptionist. If you would like to alter, correct, or remove sections – please let me know. Depending on what box you checked on your informed consent, you may or may not be contacted again to approve the use of substantial quotations for research or educational purposes.

If you have any questions regarding the study please contact me at [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca)

Thanks again!

Peter Stilwell

## **Appendix 9: NS-CLBP Participant Interview Guide**

### **Audio-Recorded NS-CLBP Participant Interview Guide**

- Thanks again for participating in the research study. We are now going to start recording our conversation.
- Tell me a bit about yourself and your back troubles?
- Prompt questions:
  - When did your back troubles first begin?
  - How have your back troubles affected your life and work?
  - What low back diagnoses have you had in the past?
  - Have health care providers been able to explain your back troubles?
- Were the assessments what you expected them to be?
- Prompt questions:
  - Tell me what was different than what you expected?
- Tell me about the types of treatments you have tried for your low back, this includes things you have tried at home?
- How effective do you think the treatment or advice you received was?
- Prompt questions:
  - What did you find was helpful?
  - What do you find has not been helpful?
  - Why do you feel that \_\_\_\_\_ was helpful/not helpful?
  - What exercises or activity recommendations do you feel were most helpful for your back pain?
  - What exercises or activity recommendations do you feel were the least helpful for your back pain?
- Can you think of any issues that limited your low back treatment progress?
- Can you think of anything that enhanced the treatment of your low back?
- What has really worked for you in the past?
- What do you feel you really need in the future?
- Tell me more about the exercise or activity recommendations you were given and how often were you supposed to do this exercise or activity?
- Prompt questions:

- How many times a day?
  - How many times a week?
  - How long was this advice or program recommended for?
- Overall, how did the exercise or activity go?
- Prompt questions:
  - Why do you feel you did/didn't follow the recommendations?
  - Specifically, what parts of the exercise or activity recommendations did you follow or not follow?
- Overall, do you feel that the activity or exercise recommendations you were given were beneficial for your back pain?
- Prompt question:
  - Why do you feel that way?
- Do you think that the exercise or activity recommendations you were given would be beneficial for other individuals with similar low back pain?
  - Why do you feel that way?
- Can you think of any barriers you had to following the exercise recommendations you were given?
- Prompt Question
  - Can you think of anything at all that made it harder to complete your given exercise or activity recommendations?
  - Can you think of anything that made it easier to follow the exercise or activity recommendations that you were given?
- What could have been done to make your treatment better?
- What types of treatment have you been receiving from the chiropractor?
- What do you like/don't like?
- Overall, what do you think they think of you and your back pain?
  - What did they do or say that made you think this way?
- Moving forward, what types of assessments, tests, or treatment do you think would be the best for your low back, if anything at all?
- Was there anything you found that motivated you or made you more consistent with the low back advice you were given?

- Do you feel that any of the treatments or recommendations you were given would be helpful in the long-term or when you are pain free?
- That is everything I wanted to discuss today. I appreciate you taking the time to do this interview. Once again, I will transcribe this interview and send it to you. Also, I will confirm your agreement to use this information for research purposes.

## **Appendix 10: Chiropractor Participant Interview Guide**

### **Audio-Recorded Chiropractor Participant Interview Guide**

- Thanks again for participating in the research study. We are now going to start recording our conversation.
- Tell me a bit about yourself and your practice style?
- How long have you been in practice?
- Tell me about the types of treatments you typically use for mechanical or non-specific chronic low back pain?
- What treatments do you find are the most effective?
- Prompt questions:
  - Why do you feel that \_\_\_\_\_ was important/not important?
- Why do you think patients with non-specific low back pain seek to be assessed and treated by chiropractors?
- I have a series of questions that I would like to ask about what you think NS-CLBP patients think/expect:
  - What do they expect you to do during your initial assessment?
  - What do they think of the diagnosis you give them?
  - What do they expect for treatment in the short term and the long-term?
  - How many treatments do you think these patients typically think they will need?
  - How often do these patients think they will need treatment?
  - How long do these patients typically think they will need to engage in treatment for?
  - What do they think of you?
  - Can you think of any barriers these patients typically have, from their perspective, when it comes to following the exercise recommendations you give?
  - What things do they say to make you think this way?
    - How do they act around you to make you think this way?
    - Were there any comments that they made to make you feel this way?
- Now I want to ask some questions about the diagnostic process.
  - How do you explain mechanical or non-specific back pain to patients?

- Do you run into difficulties?
  - How do you explain patients' chronicity?
  - Do you feel they understand the information you provide them with?
- Now I'm interested in what you personally think:
- What issues do you think may arise that may limit these patients low back treatment progress?
- What types of things do you think enhance the treatment of these patients?
- What could the patients do to enhance their low back treatment outcomes?
- Tell me more about the exercise or activity recommendations that you typically give these patients?
- Do you find that patients follow these exercise or activity recommendations?
- Prompt questions:
  - Why do you feel they do/don't follow the recommendations?
  - Specifically, what parts of the exercise or activity recommendations do they follow or not follow?
- Can you think of anything that makes it easier for them to follow the exercise or activity recommendations that you give?
- What could chiropractors do to increase therapeutic exercise adherence in these patients?
- Is there anything that you find that motivates or makes patients more consistent with the low back advice or exercise that you give?
- Can you think of anything that makes it easier for them to follow the exercise or activity recommendations that you give?
- Do you think these patients could use motivation or support in the long-term?
- Is there anything you would like to add regarding your experience treating non-specific low back pain patients?
- I appreciate you taking the time to do this interview. I will transcribe this interview and send it to you. Also, I will confirm your agreement to use this information for research purposes.

## Appendix 11: Eligibility Emails

**Chiropractor Not Eligible:** Thank you for showing interest in our research study and completing the screening questionnaire. Unfortunately, you do not meet the eligibility criteria so we are unable to include you in the study. We appreciate your time.

Peter Stilwell

**Chiropractor Eligible:** Thank you for showing interest in our research study and completing the screening questionnaire. You are eligible to participate in the study. Attached is a copy of the consent form to participate in the study, please review this to determine if you would like to participate. You will be asked to sign it before we conduct the interview. Below I listed various potential times/dates to do the interview. Please let me know if any of these times work. Thanks again, we appreciate your time.

(Various Dates/Times will be listed)

Peter Stilwell

**NS-CLBP Not Eligible:** Thank you for showing interest in our research study and completing the screening questionnaire. Unfortunately, you do not meet the eligibility criteria so we are unable to include you in the study. We appreciate your time.

Peter Stilwell

**NS-CLBP Eligible:** Thank you for showing interest in our research study and completing the screening questionnaire. You are eligible to participate in the study. After agreeing to participate and signing the attached consent form, we will do the interview. Below I listed various potential times/dates for me to meet you at Dalhousie University. Please let me know if any of these times work. I will have a hard copy of the consent form for you to sign before the interview. Thanks again, we appreciate your time.

(Various Dates/Times and location will be listed)

Peter Stilwell

## Appendix 12: NS-CLBP Recruitment Poster



*Faculty of Health Professions*

**Chiropractic patients with low back pain are invited to volunteer for a study being conducted at Dalhousie University**

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**Study: Exploration of  
chiropractic treatment  
preferences in adults with  
chronic low back pain**

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**You may be eligible to participate if you:**

- Have low back pain of at least 12 weeks duration
- Are between 18 and 65 years old
- Are a currently receiving chiropractic treatment
- Have received low back treatment or advice from another health care provider (medical doctor, physiotherapist, or chiropractor) in the past 6 months

You will be asked to complete questionnaires and then have an audio-recorded interview with a researcher at Dalhousie University.

Time commitment: 3 hours

You will receive an honorarium of \$50 for your time.

**If interested, please email Peter at: [peterstilwell@dal.ca](mailto:peterstilwell@dal.ca)**