

Evidence-based Practice for Non-specific Low Back Pain: Canadian Physiotherapists'
Adherence, Beliefs, and Perspectives

by

Tamires Cristina do Prado

A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

College of Rehabilitation Sciences

University of Manitoba

Winnipeg

Copyright © 2019 by Tamires Cristina do Prado

Abstract

Incidence and prevalence of low back pain (LBP) continue to grow in Canada and world-wide; associated psychosocial demands often lead to long-term disability increasing individual and socioeconomic burden. In spite of efforts to develop and update evidence-based clinical practice guidelines (EBCPGs), a gap remains between research findings and physiotherapists' practice. Registered Canadian physiotherapists (n=525) completed a cross-sectional online survey including demographic and practice characteristics, a clinical scenario, a questionnaire to assess back pain beliefs (PABS-PT), and a scale to measure self-efficacy in implementing evidence-based practice (EPIC). Treatment choices related to the clinical scenario were scored on a 4-point scale according to recent EBCPGs, and 77.3% of respondents were deemed to have higher adherence (score of 3 or 4) to EBCPGs; however, only 29.5% of respondents chose interventions to directly address psychosocial demands. Physiotherapists with higher adherence to EBCPGs had significantly lower biomedical (mean difference: -3.6, $p < 0.001$, 95% CI(-5.1, -2.1)) and significantly higher behavioural (mean difference: 2.6, $p < 0.001$, 95% CI(1.6, 3.6)) scores on the PABS-PT questionnaire compared to the other group; scores on the EPIC scale were no different between the groups (mean difference: 1.7, $p = 0.299$, 95% CI(-1.5, 4.8)). A binary logistic regression analysis was conducted to identify predictors of group membership. Physiotherapists' intention to use EBCPGs, subjective norms regarding use of EBCPGs, biomedical beliefs, and having post-graduate training were significant predictors; the latter being the strongest predictor of higher-adherence. Seven Manitoban physiotherapists were interviewed and reported being highly satisfied with the care they have been providing to patients with LBP even when psychosocial issues are present. Interviewees did not perceive a need for immediate change in their practice but described that it is their responsibility to remain up to date with evidence and identify areas that need improvement. Although overall adherence was high,

Canadian physiotherapists do not address psychosocial demands of LBP patients as frequently and do not perceive it as an issue that requires practice changes. Further education and training in EBCPGs and how to address psychosocial demands for physiotherapists in Canada is warranted.

Acknowledgements

First, I would like to thank my advisor, Dr. Joanne Parsons, for trusting me and diving into this project by my side. We have learned so much together and I will be forever grateful for your guidance and patience. To my committee members, Dr. Jacquie Ripat and Dr. Shaelyn Strachan, thank you for all your support in making this project better than I could have imagined. To Robert Balshaw for his endless patience with my questions and much appreciated guidance in statistical methods. To my friends and family, for each of their words of encouragement and support.

My special thanks to the University of Manitoba, in particular, the College of Rehabilitation Sciences and the Faculty of Graduate Studies, and to the Manitoba Physiotherapy Association for providing me with funding and allowing me to focus on my education.

Finally, my gratitude to the Canadian provincial physiotherapy regulatory bodies, to the Canadian Physiotherapy Association and its provincial branches, and to all the physiotherapists and researchers who supported this project through recruitment of participants.

Dedication

I dedicate this thesis to my parents, Ivonete Alves and Aduino Prado, who are my greatest examples of strength and determination, and who have never stopped supporting me in my great endeavours. I owe you two everything that I am. I love you more than I can say! I also dedicate this thesis to my amazing partner, Leonard Tector, who stood by my side every step of the way and held me together when I needed it the most. I would not have made it this far without you.

Table of Contents

Abstract.....	ii
Acknowledgements.....	iv
Dedication.....	v
Table of Contents.....	vi
List of Tables	viii
List of Figures.....	ix
List of Appendices	x
Introduction.....	11
Literature Review.....	14
Epidemiology of Low Back Pain.....	14
Classification of Low Back Pain.....	15
Disability Development	16
Socioeconomic Burden of Low Back Pain-related Disability	18
Biopsychosocial Model of Care.....	19
Conservative Management of Low Back Pain.....	20
Current Physiotherapy Practice.....	25
Theoretical Framework.....	33
Objectives	39
Hypotheses.....	40
Methods.....	41

Study Design.....	41
Quantitative Component: Cross-Sectional Survey	41
Qualitative Component: Interpretive Description of Manitoban Physiotherapists' Use of Guidelines for NSLBP	49
Data Analysis.....	51
Statistical Analyses.....	58
Results.....	61
Quantitative Component: Cross-Sectional Survey	61
Qualitative Component: Individual Interviews.....	70
Discussion.....	86
Practice Recommendations.....	93
Limitations	94
Future Research Directions.....	96
Conclusion	97
References.....	98

List of Tables

Table 1: Classification of interventions presented in the survey to respondents	55
Table 2: Comparison of demographic characteristics of the sample and population	62
Table 3: Demographic and practice characteristics of the sample.....	64
Table 4: Respondents' familiarity with published EBCPGs for NSLBP	65
Table 5: Comparison of biomedical and behavioural beliefs towards NSLBP (PABS-PT questionnaire) between higher- and lower-adherence groups.....	67
Table 6: Univariate binary logistic regression coefficients for guideline adherence.....	68
Table 7: Multivariate binary logistic regression coefficients for guideline adherence.....	69
Table 8: Demographic characteristics of interview participants.....	70
Table A1: Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT)	128
Table A2: Evidence-based Practice Confidence (EPIC) Scale.....	130

List of Figures

Figure 1: The theory of planned behaviour35

Figure 2: The knowledge to action cycle.....37

Figure 3: Algorithm to determine adherence to EBCPGs for the management of NSLBP with associated psychosocial factors.....54

Figure 4: Survey access and cases excluded from analysis61

Figure 5: Distribution of total adherence scores among survey respondents66

List of Appendices

Appendix A: Survey Instrument.....	120
Appendix B: Interview Guide.....	131
Appendix C: Interview Consent Form.....	133
Appendix D: Research Ethics Board Approval.....	137
Appendix E: Copyrighted Material Use Permissions.....	143

Introduction

It is expected that about 85% of all people will experience at least one episode of low back pain (LBP) during their lifetime (G. B. J. Andersson, 1998). Global incidence and prevalence of LBP increased about 18% between 2006 and 2016 (Vos et al., 2017), and are both higher in Canada than the world-wide estimates (Global Burden of Disease Collaborative Network, 2017). The natural course of LBP is often favourable, with most people experiencing great pain improvement within six weeks of onset (Menezes Costa et al., 2012). However, 30% of the cases still present with pain after 12 weeks (Downie et al., 2016), and it is estimated that one third of the fully recovered individuals will experience a recurrent episode in the first year (da Silva et al., 2017). Low back pain has been described as the global leading cause of years lived with disability since 1990 (Vos et al., 2017), extensively impacting the individual's social and economic relationships (Froud et al., 2014), and generating a large burden to society (Ma, Chan, & Carruthers, 2014).

Not all cases of LBP have an identifiable cause. Over 90% of cases cannot be associated with any specific pathophysiological sources, and are, therefore, called non-specific low back pain (NSLBP; Maher, Underwood, & Buchbinder, 2017). This discrepancy between the impact of LBP and the lack of pathophysiological explanation has been justified by the biopsychosocial model of care for LBP since the 1980's (Waddell, 1987). This model highlights that NSLBP-related disability results not only from physical dysfunction, but also from psychological distress and abnormal illness behaviour (Waddell, 1987). A relationship that has been confirmed by more recent evidence demonstrates that lifestyle, social interactions, and emotional health influence the development and outcomes of NSLBP (Hartvigsen et al., 2018; Maher et al., 2017). For that reason, a holistic approach is paramount when developing strategies for management (O'Sullivan, Caneiro, O'Keeffe, & O'Sullivan, 2016).

Management of NSLBP is largely conservative (i.e., non-surgical) and based on duration of symptoms and associated dysfunctions (Maher et al., 2017). Clinicians often struggle to stay updated on, and have difficulties making informed decisions about, the best course of treatment (Straus, Tetroe, & Graham, 2013). As a result, knowledge tools such as evidence-based clinical practice guidelines (EBCPGs) that can facilitate the use of evidence in practice are developed to summarize the best available evidence into a manageable amount of information (Brouwers, Stacey, & O'Connor, 2013).

In spite of continuous efforts to develop and update EBCPGs, a significant gap remains between research findings and practice among physiotherapists (Foster et al., 2018; Scott, Moga, & Harstall, 2010). A number of studies have identified gaps in the management of NSLBP, and their findings are of concern. For example, Ladeira, Cheng, and da Silva (2017) found that only about 30% of American physiotherapists address psychosocial demands of patients with NSLBP; while in Brazil, de Souza, Ladeira, and Costa (2017) found that less than 20% of physiotherapists recommended that individuals with NSLBP remain active, and 75% failed to refer patients with potential serious spinal pathology for medical evaluation, both of which are procedures recommended in EBCPGs. In Canada, research on this topic derives from older studies (Li & Bombardier, 2001; Mikhail, Korner-Bitensky, Rossignol, & Dumas, 2005), which were based on EBCPGs that have subsequently been replaced by more recent evidence. In addition, the Canadian studies included only physiotherapists from Ontario (Li & Bombardier, 2001) and Quebec (Mikhail et al., 2005), which hinders any potential for conclusions about national physiotherapy practice.

Given that NSLBP has increasingly become a global health issue, gaps between evidence and practice have been identified in multiple countries, and definitive conclusions about Canadian practice cannot be made based on the identified studies, our primary goal was to

describe the adherence of Canadian physiotherapists to EBCPGs for the management of clients with NSLBP and psychosocial demands.

Employing an explanatory sequential mixed methods design, we undertook an online cross-sectional survey of Canadian physiotherapists, followed by interviews to gather physiotherapists' perceptions about the care they have been providing to NSLBP clients and potential aspects of practice in need of improvement.

Literature Review

Epidemiology of Low Back Pain

Low back pain affects up to 85% of all people at least once during their lifetime (G. B. J. Andersson, 1998). Incidence and prevalence rates of LBP vary between global regions; however, multiple authors agree that LBP is no longer an exclusive concern of western high-income countries, but instead, a global health issue (Hoy, Brooks, Blyth, & Buchbinder, 2010; Manchikanti, Singh, Falco, Benyamin, & Hirsch, 2014; Meucci, Fassa, & Faria, 2015; Vos et al., 2017, 2012). Both incidence and prevalence of LBP increased about 18% globally between 2006 and 2016 (Vos et al., 2017). The Global Burden of Diseases, Injuries and Risk Factors Study estimated that there were about 250 million new episodes of LBP in 2016, demonstrating a global incidence of 3.3% (Vos et al., 2017). The same study estimated that over 510 million people were living with LBP at any point of 2016, which represents a global point prevalence of 6.8%, higher than for any other musculoskeletal disorder for that year (Vos et al., 2017). The reasons for such increase are unclear but commonly attributed to increased reporting to medical services (Freburger et al., 2009) and lifestyle changes reflected by increased body mass index and occupational risks (Vos et al., 2017).

In Canada there were over two million new episodes of LBP in 2011, for an incidence rate of 5.9% (Global Burden of Disease Collaborative Network, 2017). Two Canadian cohort studies have also identified that the annual incidence of LBP increases with age, ranging from 7.5% among young adults aged 21-34 (Mustard, Kalcevich, Frank, & Boyle, 2005) to 18.9% when including adults up to 69 years of age (Cassidy, Côté, Carroll, & Kristman, 2005). The point prevalence of LBP in Canada has been estimated at 12.2%, with almost 4.5 million Canadians living with LBP at any point in time (Global Burden of Disease Collaborative Network, 2017). The lower back has been identified as the most common site of chronic pain

among adults in Canada (Schopflocher, Taenzer, & Jovey, 2011), and has become a frequent cause of recurrent medical visits, particularly among the older adult population (Beaudet, Courteau, Sarret, & Vanasse, 2013).

Traditionally, most cases of LBP were expected to resolve within 6 weeks of onset with or without any interventions (Maher et al., 2017), and a meta-analysis of cohort studies showed that patients with LBP experience the greatest improvement within 6 weeks of the pain onset (Menezes Costa et al., 2012). However, Itz, Geurts, Kleef, and Nelemans (2013) identified that only one third of individuals present a full recovery within 12 weeks of pain onset, and after one year, more than 60% of individuals still present with pain. The findings of a more recent study on the trajectories of LBP supports the latter; about 30% of cases failed to experience a full recovery within 12 weeks, and about half of those cases developed into fluctuating or severe ongoing pain (Downie et al., 2016).

Of additional concern are estimates that about 33% of individuals experience recurrent LBP within one year of the first episode (da Silva et al., 2017). These findings demonstrate that the natural course of LBP is still not completely clear and likely dependent on many individual and contextual factors. Given the evidence that LBP has become a global health issue, a continuous pursuit for understanding of the disorder and its impact upon individuals and society is necessary to improve the management of this condition.

Classification of Low Back Pain

Low back pain can originate from a variety of disorders, including physical and psychological conditions (Hartvigsen et al., 2018). Some of the known causes of LBP include vertebral fractures, infections, malignancies, inflammatory diseases, and compressive syndromes (Hartvigsen et al., 2018). However, the vast majority of cases (over 90%) cannot be associated

with any specific pathophysiological abnormalities, and therefore, are called non-specific low back pain (NSLBP; Maher et al., 2017).

The most commonly used classification system for NSLBP is the duration of symptoms. The time limit for differentiation between acute and chronic pain is well established as 12 weeks from time of onset (H. I. Andersson, Ejlertsson, Leden, & Rosenberg, 1993; Kovacs, Abaira, Zamora, & Fernández, 2005; Merskey & Bogduk, 1994). However, delineation between the acute and subacute stages of pain is much less defined. Some authors suggest that acute pain lasts up to four weeks, while subacute pain follows from four to 12 weeks (Knight & Draper, 2013). That definition however, is largely based on the idea that pain originates from tissue damage, where the acute pain represents local inflammation (Knight & Draper, 2013). Kovacs et al. (2005) demonstrated that determinants of disability, quality of life, and chronicity can be noticed as early as two weeks after the onset of NSLBP, therefore suggesting that the two-week timeframe may be a more appropriate definition for the beginning of the subacute stage of NSLBP.

Although classifying NSLBP by its episode duration may be insufficient (Kongsted, Kent, Axen, Downie, & Dunn, 2016; Menezes Costa et al., 2012), evidence-based recommendations are largely based on the length of time since pain onset (Qaseem, Wilt, McLean, Forciea, & Clinical Guidelines Committee of the American College of Physicians, 2017; Wong et al., 2017), with some EBCPGs just beginning to include factors that influence the development of disability in the long-term (Chenot et al., 2017; National Institute for Health and Care Excellence [NICE], 2016).

Disability Development

Disability is defined by the International Classification of Functioning, Disability and Health (ICF), as an outcome of the interactions between an individual's health conditions and

contextual factors, including environmental and personal characteristics (World Health Organization, 2002). In the context of NSLBP as a health condition, it is generally accepted that only a small proportion of individuals presenting with NSLBP will develop any related disability (Hartvigsen et al., 2018); however, the global impact of such disability is extensive (Maher et al., 2017; Vos et al., 2017). It is estimated that only about one quarter of cases of persistent NSLBP develop severe symptoms, but those cases represent about 77% of all NSLBP-related disability (Murray et al., 2015). Since 1990, LBP has been the global leading cause of years lived with disability, and in 2016, it was the major cause of age-adjusted disability for both men and women in high-income countries, including Canada (Vos et al., 2017).

A number of physical, psychological, and social characteristics have been associated with higher risk of NSLBP-related disability and are common for men and women of different ages (Hartvigsen et al., 2018; Lardon, Dubois, Cantin, Piché, & Descarreaux, 2018; Lin et al., 2011; Rundell et al., 2017; Salvetti, Pimenta, Braga, & Corrêa, 2012; Scott Davis et al., 2013). Physical and lifestyle characteristics include being overweight, smoking, reporting higher pain intensity and longer pain duration, and practicing less physical activity (Hartvigsen et al., 2018; Lardon et al., 2018; Lin et al., 2011; Rundell et al., 2017; Salvetti et al., 2012; Scott Davis et al., 2013). Psychological characteristics encompass a history of depression, fatigue, anxiety, fear-avoidant beliefs (i.e., avoidance of specific activities for fear of increasing the pain), kinesiophobia (i.e., fear of movement), and low pain-related self-efficacy (Hartvigsen et al., 2018; Rundell et al., 2017; Salvetti et al., 2012; Scott Davis et al., 2013). Social characteristics, such as fewer years of formal education, lower family income, absence of a paid job, compensated work leave, and work dissatisfaction, have also been shown to predict disability among patients with NSLBP (Hartvigsen et al., 2018; Lardon et al., 2018; Salvetti et al., 2012). Altogether, these

multidimensional factors implicate consequences that are felt by both the individual presenting with NSLBP and society.

Socioeconomic Burden of Low Back Pain-related Disability

Individuals with NSLBP often find themselves in a dilemma between meeting their social and economic obligations, while also having their pain and disability acknowledged by health care professionals, family, and peers (Froud et al., 2014). Disabling NSLBP has been associated with individual loss of social identity and perception of inability to perform daily activities at home and work (Bailly, Foltz, Rozenberg, Fautrel, & Gossec, 2015). In the United States, LBP is one of the costliest conditions causing work disability, and it is estimated that nearly 150 million workdays are missed per year (Ma et al., 2014). Individuals with NSLBP also seek explanations and reassurance from health care providers about their symptoms and prognosis (Froud et al., 2014), which increases health care utilization and personal and public health-related costs (Childs et al., 2015; Ma et al., 2014).

The United States has the highest expenses for LBP care (Hartvigsen et al., 2018). Estimates are that the direct costs related to health services and care for LBP in the United States exceed \$30 billion dollars per year, while the indirect costs associated with wages and productivity loss total just under \$80 billion dollars per year (Dagenais, Caro, & Haldeman, 2008; Katz, 2006; Ma et al., 2014). Most studies do not account for other indirect expenses related to LBP, including costs for complementary and alternative therapies, informal help (e.g., caregivers), and other non-medical services (e.g., transportation for appointments), likely resulting in an underestimation of total LBP-related costs (Hartvigsen et al., 2018).

The costs to the individual with LBP in Canada are likely lower than in the United States, but not as well described in the literature. Canadian health systems differ from that of the United States, with coverage of health care being provided by the provinces and territories, partially

subsidized by the federal government under the Canada Health Act (Government of Canada, 2005; Madore, 2005). This reduces expenses for the individual; nevertheless, it is estimated that \$6 to \$12 billion are spent yearly on medical services (i.e., direct costs) for LBP in Canada (Bone and Joint Canada, n.d.), which is at least twice the amount spent in other high-income countries such as Australia, Netherlands, and the United Kingdom (Dagenais et al., 2008; Hartvigsen et al., 2018). Given the social and economic implications of NSLBP, we need to provide cost-effective, appropriate management to reduce related disability and further consequences.

Biopsychosocial Model of Care

For over 30 years, evidence has shown that LBP-related disability is not exclusively contingent on the physical impairment or pain but determined by a combination of factors (Waddell, 1987). From making the decision to seek medical attention, to the reporting of symptoms to health care professionals, individuals suffering from LBP are influenced by their own beliefs and illness perceptions (Waddell, 1987).

The biopsychosocial model of care for LBP proposed by Waddell (1987) accounts for physical, psychological, and social aspects of an individual as potential determinants of their illness perceptions and consequent disability. The model suggests that clinicians should take a holistic approach to patients by placing themselves in the position of a counselor and share responsibility with the individual through the process of recovery, rather than acting as a healer of a passive individual (Waddell, 1987). Expectations are that this approach to the management of LBP will positively influence the individual's perceptions of illness and reduce the likelihood they will develop LBP-related disability (Waddell, 1987). This is in contrast to the biomedical model of disease that places psychological elements as secondary and relatively unimportant to recovery (Waddell, 1987). The biomedical model purports that medical treatments should be guided by the underlying physical pathology, since it assumes that any disability is a

consequence of the pain, which is exclusively caused by and proportional to the existing physical damage (Waddell, 1987). The development of the biopsychosocial model can be seen as an important mark towards shifting the view of health care professionals to a more holistic perspective, leading to the currently held view that the biomedical model is outdated.

More recent evidence has confirmed the complex interaction of physical, psychological, and social factors in how individuals of all ages respond to NSLBP (Lehner, Meesen, & Wenderoth, 2017; Thomas & France, 2007; Wertli, Rasmussen-Barr, Weiser, Bachmann, & Brunner, 2014). This highlights the need for consideration of such factors in the planning of interventions for prevention and management of NSLBP and NSLBP-related disability (O'Sullivan et al., 2016).

Conservative Management of Low Back Pain

The conservative (i.e., non-surgical) management of NSLBP includes pharmacological and non-pharmacological interventions that depend on symptom duration (Qaseem et al., 2017), pain, and associated dysfunction (Maher et al., 2017). Non-pharmacological interventions may include advice and education for a healthy lifestyle, as well as physical, psychological, or multidisciplinary therapies (Qaseem et al., 2017).

Adequate conservative management, including early physiotherapy referral, has been shown to reduce health care system utilization and costs in the United States (Childs et al., 2015). Reductions have been observed in the number of future physician consultations; advanced diagnostic imaging exams; expensive treatment procedures, including spinal injections and spinal surgeries; emergency department visits; and prescription medication use, including the use of opioids (Childs et al., 2015). Furthermore, a recent systematic review of randomized trials concluded that there is no difference in functional outcomes between patients who undergo spinal fusion surgery and those who receive conservative management including physical and

cognitive therapy (Wang, Wanyan, Tian, & Hu, 2015). Individuals undergoing surgery, however, often present with complications and require follow up health care utilization, therefore increasing health care costs (Wang et al., 2015). Conservative management, offers little risk and has been shown to decrease future health care utilization (Childs et al., 2015).

Clinical practice guidelines. In the past few decades, there has been a marked increase in the number of health sciences research publications, particularly in physiotherapy (Cory & Vilella, 2009; Vercelli, Ravizzotti, & Paci, 2018; Wiles, Matricciani, Williams, & Olds, 2012). Although empirical evidence is imperative to validate and advance clinical practice (Vercelli et al., 2018), the increasing number of publications makes it unmanageable for clinicians with busy schedules to remain up to date (Straus et al., 2013). For that reason, evidence-based clinical practice guidelines (EBCPGs) are developed to summarize the best available empirical evidence from current research into a manageable amount of information (Brouwers et al., 2013). As systematically-developed knowledge translation tools, EBCPGs also aim to aid the process of shared decision-making between health care professionals and patients (Committee to Advise the Public Health Service on Clinical Practice Guidelines, 1990), thus facilitating the integration of research evidence into practice (Brouwers et al., 2013).

A number of EBCPGs have been developed for the conservative management of LBP. As research advances, most of the EBCPGs have been updated with multidisciplinary input (Delitto et al., 2012), including recommendations for diagnosis, and pharmacological and non-pharmacological interventions. A systematic review of published and unpublished EBCPGs for the management of acute and chronic NSLBP prepared by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration (Wong et al., 2017), as well as three recently updated EBCPGs (Chenot et al., 2017; National Institute for Health and Care Excellence (NICE), 2016;

Qaseem et al., 2017) demonstrate high methodological quality and represent the most recent summary of evidence for the non-pharmacological conservative treatment of NSLBP.

OPTIMa Collaboration 2017. The interventions from the 10 high-quality EBCPGs identified by the Collaboration were grouped into three categories of treatment: (a) recommended, (b) not recommended, or (c) lacking evidence for or against its use, for both acute and chronic NSLBP (Wong et al., 2017). For the management of acute NSLBP, recommended interventions include: education on the natural course of NSLBP and self-management options; early return to activities; and spinal manipulation if the previous two options have failed. For chronic NSLBP, recommendations include: education on self-management and remaining active; exercises; spinal mobilization or manipulation; multimodal rehabilitation including physical and psychological interventions; massage; and acupuncture. For both acute and chronic NSLBP, electrotherapy, laser therapy, and therapeutic ultrasound are not recommended. Evidence was lacking for, or against, the use of spinal traction.

NICE 2016. The National Institute for Health and Care Excellence (NICE) guideline development group involves an advisory team and includes a variety of stakeholders from specialist and generalist clinicians to patients and caregivers. Non-pharmacological treatment recommendations include: offering education on self-management strategies; exercise, return-to-work, and a combination of physical and psychological programmes, when appropriate; as well as manual therapy, but only if associated with an exercise programme. For persistent NSLBP with or without sciatica, a group programme combining physical and psychological interventions is also recommended. NICE 2016 does not recommend orthotics, electrotherapy, therapeutic ultrasound, spinal traction, or acupuncture to patients with NSLBP with or without sciatica, regardless of duration of symptoms.

ACP 2017. The American College of Physicians (ACP) presents their updated EBCPGs with three key recommendations for clinicians regarding non-pharmacological management of adults with acute, subacute, and chronic NSLBP (Qaseem et al., 2017). Recommendation one proposes that for acute and subacute cases of NSLBP, appropriate treatment should include: education on the natural course of NSLBP and self-management options; advice to adopt an active lifestyle; superficial heat; massage; acupuncture; and/or spinal manipulation. Recommendation two addresses chronic NSLBP, and prioritizes exercise, multidisciplinary rehabilitation, acupuncture, and mindfulness-based stress reduction; followed by other physical and psychological modalities which have lower-quality evidence for use. Recommendation three offers pharmacological options for patients with chronic NSLBP who not responded well to non-pharmacological treatment.

NDMG 2017. The German Disease Management Guidelines (NDMG) were prepared through a collaborative effort of multidisciplinary societies and associations, and organized for publication by the German Association for Quality Assurance in Medicine (Chenot et al., 2017). The NDMG 2017 guidelines recommend an early assessment of psychological and work-related risk factors. Multidisciplinary assessment is recommended after 12 weeks of persistent pain, or as early as 6 weeks if high risk for disability has been identified at the initial assessment. The guidelines advise an early return to usual activities for all patients. Chronic NSLBP patients should receive exercise therapy associated with education based on behavioural-therapeutic techniques (i.e., addressing social-cognitive demands) as first-line of care. Passive modalities including superficial heat therapy, spinal mobilization and manipulation, massage, back school (i.e., group education including exercises and strategies to prevent and manage NSLBP), and acupuncture can be used for chronic NSLBP, but only in association with an exercise programme. A multimodal (i.e., physical and psychological) treatment programme is

recommended for subacute and chronic NSLBP if less intensive strategies fail to produce benefits. The NDMG 2017 guidelines recommend against the use of electrotherapy, laser therapy, therapeutic ultrasound, cryotherapy, magnetic field therapy, kinesiotaping, and spinal traction regardless of the duration of symptoms.

Overview. This summary of EBCPG recommendations demonstrates that there are still some disparities between guidelines. One possible reason is that high quality original research is scarce in the field (Qaseem et al., 2017), placing ultimate recommendation decisions in the hands of EBCPG developers, who come from varied backgrounds (i.e., clinicians, researchers, stakeholders). For example, in the instance of inconclusive evidence (i.e., low-quality studies and mixed outcomes) for the use of acupuncture for the management of NSLBP, the ACP (Qaseem et al., 2017), NDMG (Chenot et al., 2017), and OPTIMa Collaboration (Wong et al., 2017) guidelines recommend its use in addition to exercise programs, while NICE (2016) takes a more conservative approach and does not recommend its use by clinicians. In addition, NICE (2016) and NDMG (Chenot et al., 2017) present recommendations for both assessment and treatment of NSLBP, whereas ACP (Qaseem et al., 2017) and OPTIMa Collaboration (Wong et al., 2017) focus exclusively on the management. Both NICE (2016) and NDMG (Chenot et al., 2017) assessment recommendations target the risk of disability development, which includes the evaluation of psychological and social aspects of the individual, as proposed by the biopsychosocial model of care (Waddell, 1987).

Other discrepancies in EBCPGs relate to their adopted classifications of NSLBP. ACP (Qaseem et al., 2017) establishes their recommendations based on the duration of symptoms, defining NSLBP as acute if symptoms are present for less than four weeks; subacute if lasting between four and 12 weeks; and chronic if symptoms occur for more than 12 weeks. The OPTIMa Collaboration (Wong et al., 2017) included EBCPGs which grouped NSLBP in

multiple ways within their recommendations, hindering the Collaboration's overall conclusions about specific timing of interventions. NICE (2016), on the other hand, does not use time as a basis for their guidelines. Their recommendations depend on the existence of risks assessed at the beginning of treatment, with more support and earlier intervention indicated for individuals identified with higher chance of developing disability. NDMG (Chenot et al., 2017) presents some general guidance using duration of symptoms similar to that of ACP (Qaseem et al., 2017), however, the described time limits are secondary to the identification of risk for disability as described by NICE (2016).

Overall, the holistic view proposed by the biopsychosocial model of care is present across ECBPGs. Regardless of the assessment of risk for disability being formally included in the recommendations or not, advice to educate individuals to become an active component of the recovery process is common to all guidelines. Likewise, recommendations for multidisciplinary interventions, with some variation in timing and proportion, are prevalent across all documents. Further, all EBCPGs included in this summary target their guidance at clinicians, regardless of their specialty. Added to their holistic recommendations, this denotes that EBCPG developers recognize the importance of involving a multidisciplinary team to maximize positive outcomes in the rehabilitation of NSLBP patients.

Current Physiotherapy Practice

Physiotherapists are an essential component of the health care team in the diagnosis and management of NSLBP, as they are first-line providers of the conservative non-pharmacological management care recommended by EBCPGs (Chenot et al., 2017; Delitto et al., 2012; National Institute for Health and Care Excellence (NICE), 2016; Qaseem et al., 2017; Wong et al., 2017). However, in spite of the constant efforts to produce and update EBCPGs, a substantial gap still remains between current evidence and clinical practice for the management of NSLBP (Foster et

al., 2018; Scott et al., 2010). Such a knowledge gap engenders unnecessary burden to individuals and health care systems because time and financial resources are spent on ineffective interventions (Foster et al., 2018); while evidence-based care for NSLBP has been shown to reduce future health care utilization and costs (Childs et al., 2015; Davies et al., 2011). Therefore, it is paramount that physiotherapists continuously update their practice to meet evidence-based recommendations (Foster et al., 2018).

A number of original studies investigating the adherence of physiotherapists to EBCPGs have been conducted to ensure best practices are followed. Their findings were less than optimal and varied between countries, depending on the physiotherapists' level of specialization and on the patients' characteristics.

New Zealand. Using a clinical scenario, Hendrick, Mani, Bishop, Milosavljevic, and Schneiders (2013) surveyed New Zealand physiotherapists to identify their adherence to three specific EBCPG recommendations for NSLBP (i.e., return to work, return to activity, and avoidance of bed rest), as well as their perception of EBCPG utility in practice, and factors influencing their use of EBCPGs in clinical decision making. The study had a response rate of approximately 17% (n=170), and the sample was composed of members of manipulative or sports physiotherapy professional associations.

Most of the physiotherapists recommended return to work (60%), return to usual activities (87.6%), and avoidance of bed rest (63%) for a patient with acute NSLBP, which were treatment choices broadly in line with EBCPGs. The "broadly in line" definition allowed leniency in advice to return to work and activity (i.e., part-time, on light duty, or within patient's tolerance), and to avoid bed rest as much as possible. A smaller proportion of respondents were deemed "strictly in line" with EBCPGs for advice to return to work without restrictions (35.3%), return to usual activities without restrictions (5.3%), and to avoid bed rest entirely (24.1%). More

than 80% of respondents reported they were aware of guidelines, and about half of the participating physiotherapists reported using EBCPGs in their decision-making. The overall findings highlight awareness of and a generally broad adherence to EBCPG recommendations for LBP among this group of physiotherapists in New Zealand.

Sweden. Bernhardsson, Öberg, Johansson, Nilsen, and Larsson (2015), conducted a survey of 271 Swedish physiotherapists to identify their usual practice for the management of subacute NSLBP. No clinical vignette was used in this study. The response rate was 65%, and the sample was composed of physiotherapists employed in a public setting in Sweden.

Swedish physiotherapists reported using up to 16 different interventions for the management of subacute NSLBP, with a median of 7 interventions. Advice on posture (94%) was the most frequently reported intervention, followed by advice to stay active (92%), and stabilization exercises (82%). Laser therapy, therapeutic ultrasound, and lumbar supports were selected by less than 5% of the respondents. Nearly all physiotherapists (99%) selected at least one intervention considered by the authors as strongly or moderately recommended for use (advice to stay active, stabilization, and McKenzie exercises). However, 99% of the respondents also reported using at least one intervention with insufficient evidence based on the authors' literature review, such as advice on posture, acupuncture, electrotherapy, traction, and massage. The findings of this study highlight the heterogeneity of interventions used by physiotherapists in the management of subacute NSLBP in the public health system in Sweden and raises concerns about employment of public resources towards interventions for which there is insufficient evidence of effectiveness.

Australia. Keating et al. (2016) conducted a survey in 2009 to determine the adherence of physiotherapists to Australian EBCPGs that assert imaging tests for acute NSLBP should be avoided, and patients should be advised to remain active (Australian Acute Musculoskeletal Pain

Guidelines Group, 2004). The response rate for the study was 36% (n=203). Five clinical vignettes were presented to the physiotherapists, accompanied by lists of possible imaging tests and interventions. Respondents were asked to report which, if any, imaging test they would recommend, as well as the interventions they would undertake or recommend for each clinical vignette. A large heterogeneity of responses was identified for advice to remain active, with recommendations being correctly provided by 37% to 82% of respondents, depending on the scenario. Overall, moderate adherence to EBCPG recommendations was identified for Australian physiotherapists regarding advice to stay active for acute and subacute scenarios of LBP, however, adherence varied depending on the patient described by the scenario.

United States. More recently, Ladeira, Cheng, and da Silva (2017) investigated the adherence of American physiotherapists to the American Physical Therapy Association (APTA) EBCPGs for the management of LBP (Delitto et al., 2012), as well as the impact of clinical specialization on adherence. All participants were members of orthopaedic or manual therapy professional associations, and data from 410 complete surveys were included in the analysis. Four different clinical vignettes were used, and findings showed that the alignment of treatment choices with EBCPG recommendations varied depending on the patient presentation and level of specialization of the physiotherapist.

Seventy-two percent of American physiotherapists chose treatment options in line with EBCPG recommendations for patients with NSLBP accompanied by leg pain. The appropriateness of treatment was lesser for NSLBP with a mobility deficit (57%), NSLBP with coordination impairment (46%), and the lowest for NSLBP accompanied by fear-avoidant behaviour (30%). Professionals with a high level of specialization (i.e., orthopaedic fellowship and clinical specialization) adhered more to the APTA EBCPG recommendations than professionals with an interest in musculoskeletal practice but without formal post-graduate

education. This was true for all clinical vignettes. The lowest overall adherence to APTA recommendations (10.7%) was found among the physiotherapists without formal specialization, with the scenario involving fear-avoidant behaviour. All in all, the results show heterogeneity among treatment choices of specialist versus non-specialist American physiotherapists, varying levels of adherence to EBCPGs depending on patient presentations, and general low adherence to recommendations for NSLBP patients with psychosocial demands.

Brazil. Similarly, de Souza, Ladeira, and Costa (2017) used a survey with six different clinical vignettes of patients with LBP to assess adherence to the APTA EBCPG and the ability to identify red and yellow flags among Brazilian physiotherapists who were members of professional associations. The response rate for the survey was about 36% (n=189). Adherence to the APTA guidelines was graded as complete, partial, or no adherence. Complete adherence (i.e., both of the two correct mandatory interventions were selected) was low across scenarios and ranged from 5 to 25%. Partial adherence (i.e., one of the two correct mandatory interventions selected), however, was higher, ranging from 42 to 75%.

Less than 2% of Brazilian physiotherapists recommended bed rest or use of lumbar braces, representing high adherence to EBCPGs in these two areas. On the other hand, advice to “pursue or maintain an active lifestyle” was selected by less than 20% of professionals for all scenarios, going against recommendations for five of the six cases. In spite of the abundant evidence against the use of passive interventions in LBP, electrotherapy was selected by up to 40% of professionals across different clinical vignettes. Partial adherence was observed for more than 75% of practitioners in the presence of orange flags (i.e., when a concurrent psychological disorder is present), but for less than half of the respondents when kinesiophobia (i.e., fear of movement) was present. For the most part in this study, at least one of the mandatory interventions recommended in the APTA EBCPGs were followed in each case, which can be

interpreted as a tendency towards evidence-based practice. However, use of non-recommended passive modalities was high, which is of concern.

Canada. Li and Bombardier (2001) conducted a survey of Ontario physiotherapists regarding their management of acute and subacute NSLBP. The study used three clinical vignettes to assess self-reported examinations and treatments used with this clinical population. Data from 274 physiotherapists who reported an LBP-caseload of 10% or more were included in the analysis. Of those 274 physiotherapists, 25% reported more than one post-secondary degree, and over 90% reported completion of at least one post-graduate course on manual therapy.

Patient education on back care, including proper posture and body mechanics (99%), as well as exercises (80 – 96%) were the most selected treatment strategies across scenarios. For the vignette presenting a subacute patient who has not returned to work for six weeks due to the pain, correct advice to return to work with modifications and referral to a physician were chosen by more than 84% of the respondents. Short-term bed rest was recommended by more than 60% of the respondents across scenarios, and between 65 and 83% of responses included passive physical modalities such as ice, heat, and electrotherapy. Other treatment modalities such as spinal mobilization, manipulation, and traction were selected to a lesser extent. The study concluded that Ontario physiotherapists followed most of the Agency for Health Care Policy and Research guidelines (Bigos et al., 1994). However, more recent evidence contradicts those recommendations and so adherence may have been overestimated.

Mikhail, Korner-Bitensky, Rossignol, and Dumas (2005) used a clinical vignette during a phone interview to assess the practices of physiotherapists from Quebec in the examination and management of an acute NSLBP patient. One hundred physiotherapists participated in the study. One open-ended question was used to collect data on the interventions chosen by participants to manage the patient described in the scenario. The level of evidence available for each

intervention mentioned was then assessed using the Dutch Physiotherapy Guidelines for Low Back Pain (Bekkering et al., 2003) and a series of Cochrane Back Reviews; see Mikhail et al. (2005).

Vertebral mobilization (68%), ice (66%), therapeutic ultrasound (61%), and interferential current (56%) were the interventions most commonly reported (Mikhail et al., 2005). Only 3% of participants chose to advise the hypothetical patient to stay active and avoid bed rest, i.e., the two interventions with strong evidence of effectiveness according to the recommendations followed by the study. Ninety percent of the participants reported they would use interventions with limited or contradictory evidence of effectiveness (e.g., electrotherapy, massage, and acupuncture), and 96% chose interventions with unknown evidence such as postural correction, ice, heat, functional and work conditioning, and education. Topics covered by patient education included postural and ergonomic recommendations, anatomical causes of LBP, lifting and sleeping posture, biomechanical awareness during activities, avoidance of activities that increase symptoms, and advice on leisure activities. Finally, 93% of the participants reported they would use some intervention for which there is, according to the EBCPGs used in the study, moderate evidence of ineffectiveness. Those included back stabilization exercises; lumbar range of motion, stretching, and strength exercises; McKenzie approach; and manual traction. Most physiotherapists (86 – 93%) reported not being aware of the recommendations from the Dutch Physiotherapy Guidelines for LBP or the Cochrane Back Reviews.

Physiotherapists from Quebec emphasized passive interventions with limited or unknown evidence of effectiveness for the management of NSLBP, while neglecting to give advice with strong evidence of effectiveness (i.e., staying active and avoiding bed rest). The findings also highlight the lack of awareness of EBCPGs, which is conceivably a result of flaws in the translation of knowledge from EBCPG developers to practitioners.

More recently, Poitras, Durand, Côté, and Tousignant (2012) used semi-structured individual interviews to identify barriers to the use of EBCPGs for the prevention of LBP-related disability, as well as similarities and differences between physiotherapists, occupational therapists (OTs), and general practitioners (GPs) in Quebec. As part of the study, clinicians were asked to apply the recommendations from the Clinic on Low Back Pain in Interdisciplinary Practice (CLIP) guidelines (Rossignol, Arsenault, et al., 2007; Rossignol, Poitras, et al., 2007) with a minimum of two actual patients consulting with them for the first time with LBP complaints, and then individual interviews were used to assess clinicians' perceptions towards clinical use of the guidelines.

All three groups of clinicians reported limited knowledge of some recommendations and how to apply the overall guidelines to practice. Physiotherapists and GPs agreed with the recommendation to provide advice to stay active. Physiotherapists and GPs had mixed opinions for the recommendations of patient reassurance and importance of assessing psychosocial factors, as recommended by the CLIP guidelines; some agreed with the recommendations, but many felt that by reassuring patients they would be denying the patient's physical condition. Occupational therapists felt their current practice was compatible with recommendations, while physiotherapists and GPs did not consider management of psychosocial factors to be their role; physiotherapists thought they were not trained to manage those factors; and physiotherapists and GPs felt the CLIP guidelines lacked pathophysiological explanations for NSLBP and because of that, these guidelines would have little impact on their practice.

Although the Ontario study (Li & Bombardier, 2001) found high use of patient education and exercise, the study was performed almost 20 years ago, and current recommendations for the treatment of NSLBP differ from the referent EBCPGs (Bigos et al., 1994). The study from Quebec (Mikhail et al., 2005) identified modest use of advice that is strongly recommended by

current EBCPGs, as well as common use of interventions for which there is inconclusive evidence. Similar to the studies from other countries (Bernhardsson et al., 2015; de Souza et al., 2017; Hendrick et al., 2013; Keating et al., 2016; Ladeira et al., 2017), the Canadian studies relied on self-reported measures, making their findings subject to social desirability bias, which skews results towards what is expected as a correct answer, rather than reflective of actual practice (Althubaiti, 2016; Brunner, Probst, Meichtry, Luomajoki, & Dankaerts, 2016). In addition, the findings from the more recent Quebec study (Poitras et al., 2012) highlight that many years later, clinicians still had reservations and difficulties applying EBCPG recommendations.

The lower than optimal adherence to EBCPGs, combined with the possible influence of social desirability bias, and the development of newer guidelines, suggests further study is needed to understand Canadian physiotherapists' practice. Moreover, since we are not aware of any evidence for physiotherapy clinical practice behaviour regarding the management of NSLBP in other provinces, conclusions cannot be drawn about national practice.

Theoretical Framework

Health care professionals' clinical behaviour is no different from other human behaviours. In the context of physiotherapy practice, it is the physiotherapist who actively decides whether or not to perform a particular behaviour such as prescribe exercise, apply some physical modality, or refer the patient to another professional (Nilsen, Roback, Broström, & Ellström, 2012). It is known, however, that human behaviour is a complex variable that results from the interaction of multiple aspects (Eccles, Grimshaw, Walker, Johnston, & Pitts, 2005; Nilsen et al., 2012).

Many theories on behaviour change have been applied to identify the best predictors of health care professionals' clinical behaviour (Bernhardsson, Johansson, Nilsen, Öberg, &

Larsson, 2014; Eccles et al., 2007, 2005; Kortteisto, Kaila, Komulainen, Mäntyranta, & Rissanen, 2010; Nilsen et al., 2012). However, due to the complexity of human interactions and attitudes, no consensus has been reached on the best theory to predict use of EBCPGs in clinical practice, and hypotheses are that no single theory will ever be able to account for all the influencing factors (Eccles et al., 2012; Nilsen, 2015).

Theory of planned behaviour. The theory of planned behaviour (TPB) is often used to predict health care professionals' clinical behaviour, including use of EBCPGs in practice (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008; Kortteisto et al., 2010; Nilsen et al., 2012). This theory has been found to explain up to 30% of the variance in the intention of physicians and dentists to prescribe and perform specific procedures (Eccles et al., 2012), and about one third of the variance in the intention of nurses and other allied health care professionals to use EBCPGs (Kortteisto et al., 2010). A number of qualitative studies seeking to understand factors that influence the clinical decision-making of physiotherapists and other health care professionals have also employed the TPB as a framework (F. L. Bishop et al., 2015; Gardner et al., 2017; Jeffrey & Foster, 2012).

The TPB was described by Ajzen in 1988 as a development of the theory of reasoned action to include the construct of perceived control (Ajzen, 1991). The theory describes that one's intention to engage in a particular behaviour is the closest determinant of the actual behaviour (Conner & Sparks, 2005). One's intention is an outcome of the interactions among their (a) attitudes towards the behaviour, (b) subjective norms (i.e., beliefs that one is expected to engage in said behaviour), and (c) the individual's perceived control over the behaviour. Intention to engage in a task combined with the individual's perceived control over it will then predict the likelihood of the behaviour occurring (Ajzen, 1991; Conner & Sparks, 2005). The concept of perceived control has been characterized as the equivalent of the self-efficacy

construct described by Bandura's social cognitive theory (Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987) and refers to the individual's confidence in their own ability to successfully perform the behaviour (Kortteisto et al., 2010).

If following EBCPG recommendations for the management of a patient with NSLBP with psychosocial demands is the behaviour under assessment, according to the TPB, we can expect that physiotherapists' attitudes towards using EBCPGs, their perception of the expectation to use EBCPGs, and their self-efficacy towards evidence-based practice will be determinants of their intention to perform the behaviour, and therefore, predictors of the behaviour. Figure 1 depicts the relationship among the constructs of the theory.

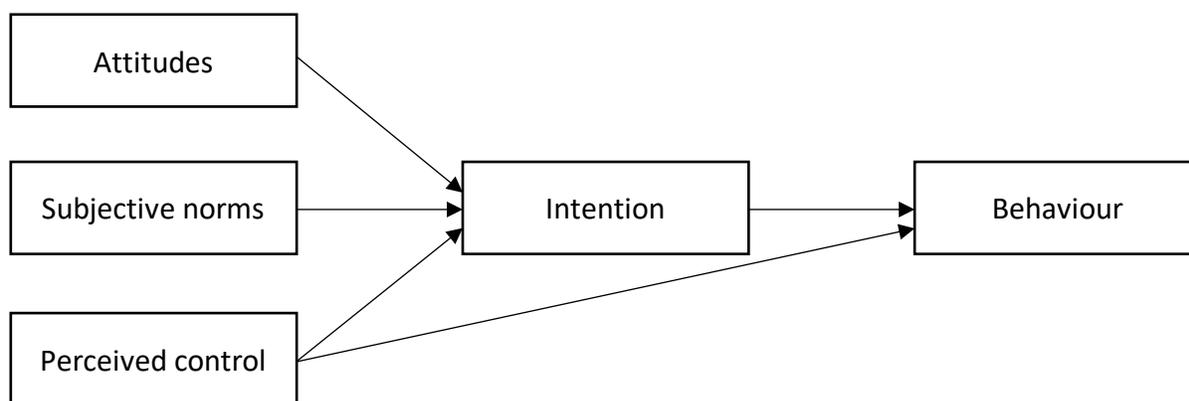


Figure 1. The theory of planned behaviour. This figure illustrates the relationship among the theoretical constructs that determine an individual's intention and likelihood to engage in a behaviour.

Steps towards improving practice. As discussed earlier, the existence of evidence alone has not been sufficient to ensure its application in clinical practice for the management of NSLBP (Bernhardsson et al., 2014; de Souza et al., 2017; Ladeira et al., 2017; Poitras et al., 2012). This gap between research findings and actual clinical management needs to be addressed in order to provide higher-value care, reduce the impact on patients and society, and maximize

the return of resources invested in research (Bérubé et al., 2018; Foster et al., 2018; Straus et al., 2013). The first step towards reaching those goals is to identify the knowledge gaps and recognize the need to fill them; steps which are part of the knowledge translation process (Straus et al., 2013).

Knowledge translation (KT) involves more than simply publishing research findings or the promotion of continuing education (Straus et al., 2013). It is a long-term process that consists of the “synthesis, dissemination, exchange, and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products, and strengthen the health care system” (Canadian Institutes of Health Research [CIHR], 2005, para. 1). Knowledge translation is a developing field and by no means an exact science. To guide researchers through this interactive process, Graham et al. (2006) proposed the knowledge to action framework (see Figure 2) containing the stages of knowledge creation and the action cycle for application.

Knowledge creation funnel. Graham et al.’s (2006) framework describes three generations of knowledge represented in the funnel. The idea of the funnel is to demonstrate that each level of knowledge is a refinement of its predecessor, with the first-generation consisting of original research, while the second-generation includes reviews and synthesis, and the third-generation encompasses knowledge tools such as EBCPGs and patient decision aids (Brouwers et al., 2013; Graham et al., 2006; Straus et al., 2013).

In the context of the conservative management of patients with NSLBP with or without associated psychosocial factors, a plethora of original and review studies exist, and an increasing number of knowledge tools including EBCPGs have become available (Coupé, van Hooff, de Kleuver, Steyerberg, & Ostelo, 2016; Fairbank et al., 2011; Foster, Hill, O’Sullivan, & Hancock, 2013; Sepucha et al., 2016; Wong et al., 2017). Therefore, it would appear, with some

reservations regarding quality and adequacy, that NSLBP treatment knowledge has been successfully refined through all three stages.

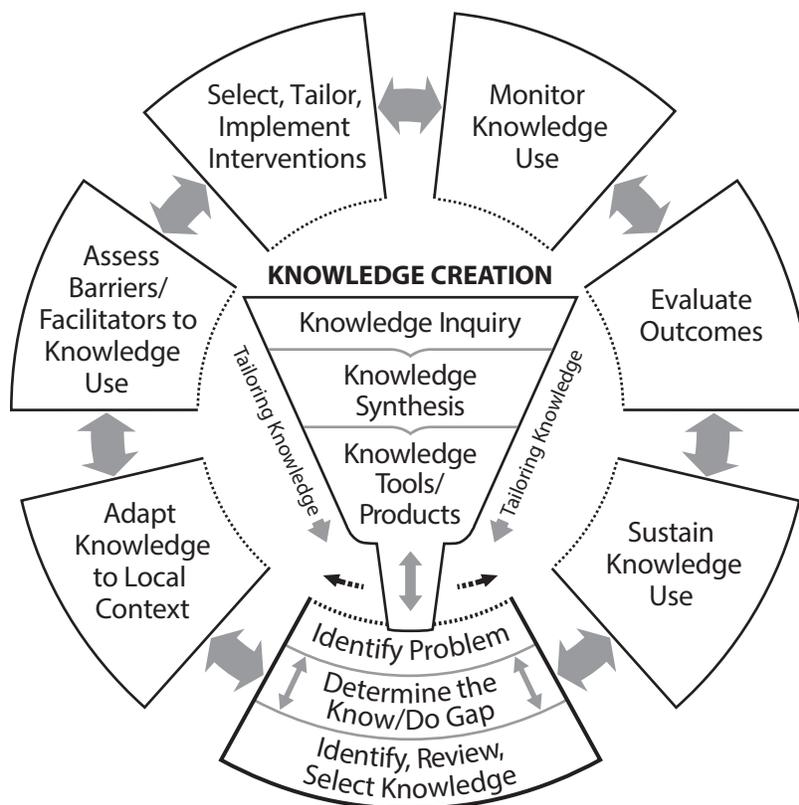


Figure 2. The knowledge to action cycle. This figure illustrates the three generations of knowledge and the seven steps to implementation of evidence first described by Graham et al. (2006). Reproduced with permission from Straus, S. E., Tetroe, J., & Graham, I. D. (Eds.). (2013). *Knowledge translation in health care: moving from evidence to practice* (2nd ed.). Chichester, West Sussex: Wiley-Blackwell BMJ|Books. Copyright © 2013 by John Wiley &

Action cycle. Following down the knowledge creation funnel, the framework of Graham et al. (2006) presents the beginning of the action cycle, which contains the steps to implementation of the refined knowledge into practice. The steps of the cycle are dynamic and influence one another, while still being connected with the knowledge creation stages (Graham et al., 2006; Straus et al., 2013). The transition step identifies the “know-do gaps” as a problem, and is followed by assessing local needs and contextual factors that conceivably hinder the uptake of

the evidence into practice (Graham et al., 2006; Straus et al., 2013). This is where the proposed study fits in.

The studies previously described in this review have identified gaps between the evidence available and the clinical application of the knowledge in the physiotherapy practice of middle- and high-income countries, including Canada. However, the studies assessing Canadian practice are dated, and employed EBCPG recommendations that have since been updated with more recent evidence. Therefore, it is necessary to assess how contemporary Canadian physiotherapists manage patients with NSLBP presenting with psychosocial demands. The identification and description of a “know-do gap” in current Canadian practice, will create opportunity to raise awareness about evidence-based treatment for NSLBP, and move further into the action cycle to determine how future KT interventions can improve awareness and use of EBCPGs.

Given that NSLBP has increasingly become a global health issue, gaps between evidence and practice have been identified in multiple countries, and definitive conclusions about Canadian practice cannot be made based on the identified studies, the primary purpose of this study is to describe the adherence of physiotherapists in Canada to EBCPG recommendations regarding the management of NSLBP when psychosocial factors are present. Secondary aims are to 1) determine whether physiotherapists’ beliefs and attitudes towards back pain, as well as their self-efficacy towards evidence-based practice, differ among practitioners who present higher and lower adherence to guidelines; 2) identify predictors of adherence to EBCPG recommendations; and 3) explore the views of a select group of physiotherapists about the care they have been providing to NSLBP clients, including their perceptions of need for improvement in practice.

Objectives

1. To describe the adherence to EBCPGs for clients with NSLBP and associated psychosocial factors among Canadian physiotherapists (via assessment of a clinical vignette).
2. To compare biomedical and behavioural beliefs and attitudes towards back pain (via the Pain Attitudes and Beliefs Scale for Physiotherapists [PABS-PT]), as well as self-efficacy towards evidence-based practice (via the Evidence-based Practice Confidence [EPIC] scale) between Canadian physiotherapists with higher and lower adherence to guideline recommendations.
3. To identify predictors of guideline-adherence among Canadian physiotherapists for the management of NSLBP with associated psychosocial demands.
4. To understand Manitoban physiotherapists' satisfaction with their current care provided to clients with NSLBP and associated psychosocial demands, and the aspects of practice perceived by practitioners as in need for improvement.

Hypotheses

1. Less than 50% of physiotherapists in Canada adhere to EBCPGs when selecting interventions for a client with NSLBP with associated psychosocial factors.
2. Biomedical beliefs towards back pain will be higher among practitioners with lower adherence to guidelines, whereas behavioural beliefs regarding back pain and self-efficacy towards evidence-based practice will be higher among physiotherapists with higher adherence to guidelines.
3. Canadian physiotherapists' self-efficacy towards evidence-based practice, their biomedical beliefs towards back pain, years of experience, post-professional degree, post-graduate training, familiarity with EBCPGs, attitudes and subjective norms towards, and intention to use EBCPGs for NSLBP will be significant predictors of their adherence to EBCPG recommendations.

Methods

Study Design

Following the guidance of Creswell (2014), an explanatory sequential mixed-methods design was used to fulfill the purposes of this project. The primary component of the study comprised a cross-sectional survey of Canadian physiotherapists, while the secondary component consisted of interviews using an interpretive description design (Thorne, 2008).

Quantitative Component: Cross-Sectional Survey

Sample size. The population of physiotherapists actively working in the field in Canada was estimated to be 21,699 in 2016 (Canadian Institute for Health Information [CIHI], 2017, sec. 1). Of those, approximately 85% work in areas of practice where clients with low back pain would typically be seen such as general practice, prevention, health promotion and wellness, and other areas of direct service (Canadian Institute for Health Information [CIHI], 2017, sec. 17). That resulted in a target population of 18,444 physiotherapists. To estimate the proportion of adherence to EBCPG recommendations among Canadian physiotherapists with 95% confidence, and within a margin of error of 5%, the minimum required sample was 377 individuals (“Sample size calculator,” n.d.).

Recruitment. Considering that response rates of physiotherapists to online surveys range from approximately 9% (Laliberté et al., 2017) to 65% (Bernhardsson et al., 2014), and only about 60% of practicing individuals are members of the Canadian Physiotherapy Association (Canadian Physiotherapy Association [CPA], 2018), we approached recruitment through multiple sources, as an attempt to maximize response and acquire a representative sample of professionals. Upon approval from the Health Research Ethics Board at the University of Manitoba, invitation to participate in the survey along with a link to access the questionnaire were distributed via email, social media, and word of mouth. Emails were sent by the Canadian

Physiotherapy Association as well as participating provincial association branches and physiotherapy regulatory bodies. The same professional association and regulatory bodies published the invitation on social media through their institutional accounts when they possessed one. Additional advertising on social media was undertaken by the researchers through accounts created for the purposes of this study on Twitter, Instagram, and Facebook. Advertisements contained a brief description of the study purpose, the early bird incentive, and a link to access the online survey.

Inclusion and exclusion criteria. Physiotherapists were eligible to participate if they reported to be (a) registered for practice in any of the 13 Canadian provinces and territories; (b) currently employed as a part- or full-time physiotherapist clinician; (c) working with an outpatient clientele either in private or public settings; (d) treating clients with low back pain at least once a week; and (e) able to effectively communicate in written and spoken English.

Respondents were excluded from the study if they (a) reported working exclusively in neurological, cardiorespiratory, or paediatric rehabilitation; or (b) failed to meet any of the inclusion criteria described above.

Survey instrument. Survey data were collected using Research Electronic Data Capture (REDCap, Vanderbilt University, Nashville, version 7.4.9) tools hosted at the Rady Faculty of Health Sciences at the University of Manitoba (Harris et al., 2009). The full survey instrument can be found in Appendix A.

Once respondents accessed the survey link from the advertisement, they were presented with a cover page including further description of the study, the risks and benefits associated with participation, as well as the estimated time for participants to answer the entirety of the questionnaires. Five graduate students and three faculty members with physiotherapy background piloted the survey and provided feedback on the clarity of the content and time to

complete it. During development and piloting of the survey, the time to complete the survey was found to be 10 minutes, with the occasional individual taking up to 20 minutes. Informed consent was provided by participants selecting a radio button that read “Yes, I consent to participate in this survey” at the end of the first survey page and submitting their responses.

Survey section I: participant screening. The first set of questions presented to respondents consisted of eight screening items referring to the inclusion and exclusion criteria described above. Items were asked as direct questions requiring a dichotomous answer (“Yes” or “No”). For the purposes of determining respondents’ eligibility for the study, answers to all the items in this section were mandatory. Respondents deemed as ineligible were directed to a thank you page at the end of this section.

Survey section II: self-generated unique identifier. To prevent duplicate entries, eligible respondents were asked to generate a unique identifier (Midwestern University Institutional Review Board, 2015). The identifier consisted of seven characters, three letters and four numbers, extracted from four unchangeable, not identifiable pieces of information unique to each respondent (Midwestern University Institutional Review Board, 2015). It consisted of (a) the first letter of the respondent’s first car; (b) the first two letters of the street the respondent grew up on; (c) the year the respondent started physiotherapy school in two-digit format; and (d) the day of the respondent’s birth in two-digit format.

Survey section III: demographic data and theoretical constructs. Demographic questions were based on the instrument used by Ladeira et al. (2017). It consisted of questions about the respondents’ personal and practice characteristics, including age, sex, type of physiotherapy degree, years of clinical experience, additional degrees and training, membership in professional associations, province, and sector of practice. Respondents were also asked about their practice environment, that is, whether they work by themselves or within a team of

physiotherapists or other health care professionals, how many clients they see in a typical day, and their LBP client caseload. Respondents' familiarity with EBCPGs for NSLBP, their attitudes towards using them, the subjective norms of EBCPG use for NSLBP, and their intention to use them were also assessed in this section. Questions were presented as multiple-choice, open-ended questions, Likert-type scale, or semantic differential questions as applicable.

The information collected in this section was used to describe the sample of respondents participating in the study, compare the characteristics of our sample with those of the population data from the CIHI (2017), and assess if some of those characteristics were able to predict our primary outcome (i.e., guideline adherence) measured through the data collected in the following section of the survey.

Survey section IV: guideline adherence. This survey section assessed the adherence of respondents to existing EBCPGs (Chenot et al., 2017; National Institute for Health and Care Excellence (NICE), 2016; Qaseem et al., 2017; Wong et al., 2017) using a clinical vignette of a client with NSLBP and associated psychosocial factors.

Clinical vignettes are generally considered valid and inexpensive instruments to measure health care professionals' clinical recommendations (Peabody et al., 2004; Rutten, Harting, Rutten, Bekkering, & Kremers, 2006). Although a more recent study comparing physiotherapists' recommendations to patients with NSLBP via clinical vignettes and the gold standard measure (i.e., standardized patients) concluded that there was poor agreement between the two methods - about 50% of the time; (Brunner et al., 2016), some limitations in their study need to be considered. First, advice provided in response to clinical vignettes was clearer and more specific than that provided to standardized patients. Second, about 50% of the standardized patients were identified as such by physiotherapists during the consultation. Lastly, the rating of the quality of the physiotherapists' recommendations was provided by the actors instead of

experts or by using audio or video recording of the standardized patient encounter (Brunner et al., 2016). Clinical vignettes also allow for consistent assessment of large numbers of professionals (Peabody et al., 2004; Rutten et al., 2006), and present more accurate records of health care professionals' behaviour than patient chart reviews (Peabody, Luck, Glassman, Dresselhaus, & Lee, 2000; Peabody et al., 2004). Therefore, clinical vignettes allow an affordable and effective measurement of health care professionals' treatment recommendations on a large scale and were deemed as appropriate for this study.

Respondents were presented with one clinical vignette and asked to select a minimum of two and a maximum of five of their treatment recommendations for that client from a list of physiotherapy interventions. This followed the procedure employed by Ladeira et al. (2017) and de Souza et al. (2017). The clinical scenario described a 50-year-old client, who had a 6-week history of NSLBP, had been away from work due to the pain, and presented fear-avoidant beliefs, such as avoiding movement and performance of leisure activities because he believed it would aggravate his pain.

The list of possible interventions was modified from that used by Ladeira et al. (2017) to reduce ambiguity of alternatives and to include interventions from other, more recent guidelines (Chenot et al., 2017; National Institute for Health and Care Excellence (NICE), 2016; Qaseem et al., 2017; Wong et al., 2017), as the study by Ladeira et al. (2017) was based solely on the guidelines published by the American Physical Therapy Association (Delitto et al., 2012). The list of interventions for our study contained 30 alternatives, presented in alphabetical order, in addition to open-ended options for participants to add interventions not addressed by the pre-determined list. Possible interventions ranged from education on a variety of topics to referral to different professionals and included different types of therapeutic modalities such as exercises, electrotherapy, and manual therapy.

Survey section V: attitudes and beliefs towards LBP. The following survey section assessed respondents' attitudes and beliefs towards back pain using the Pain Attitude and Beliefs Scale for Physiotherapists (PABS-PT). The PABS-PT is a self-administered tool differentiated into a biomedical and a behavioural treatment orientation (Ostelo, Stomp-van den Berg, Vlaeyen, Wolters, & de Vet, 2003).

The biomedical treatment orientation is characterized by the practitioner's belief that pain and disability are closely related and are derived from tissue damage, following the biomedical model of disease (A. Bishop, 2010). The behavioural treatment orientation, on the other hand, is characterized by the practitioner's belief that pain and disability can be independent from each other and influenced by factors other than tissue damage, such as psychological and social influences, following the biopsychosocial model of disease (A. Bishop, 2010).

Multiple versions of the PABS instrument have been developed to accommodate different health care professionals (A. Bishop, Foster, Thomas, & Hay, 2008), as well as to strengthen the psychometric characteristics of the tool (Mutsaers, Peters, Pool-Goudzwaard, Koes, & Verhagen, 2012). In this study, we used the version developed by Houben et al. (2005), given that it presents the best balance between the number of items loading each treatment orientation factor, and the internal consistency of each subscale (Mutsaers et al., 2012). The internal consistency for this version of the instrument has been rated as excellent (Cronbach's $\alpha = 0.8$) and inadequate (Cronbach's $\alpha = 0.68$) for the biomedical and behavioural subscales, respectively (Andresen, 2000; Houben et al., 2005). Construct validity of the instrument is estimated as reasonable ($0.3 \leq \text{Pearson's } r \leq 0.65$) when compared to instruments assessing similar variables (e.g., kinesiophobia, fear-avoidant beliefs), since there is no gold standard for the concept of attitudes and beliefs towards back pain (Houben et al., 2005).

It is noteworthy that the behavioural subscale has not achieved a satisfactory level of internal consistency (Cronbach's $\alpha \geq 0.7$) according to the classification proposed by Andresen (2000). However, some authors argue that the PABS-PT is still in its developmental stage (A. Bishop, 2010; A. Bishop, Thomas, & Foster, 2007; Mutsaers et al., 2012), and consider that the achieved level of reliability (Cronbach's $\alpha \geq 0.68$) is acceptable given the subjectivity and complexity of a construct such as one's approach to treatment (A. Bishop, 2010; A. Bishop et al., 2007; Eland, Kvåle, Ostelo, & Strand, 2017; Fullen, Baxter, Doody, Daly, & Hurley, 2011; Mutsaers et al., 2012). Furthermore, the PABS is the only measurement tool identified for the assessment of behavioural orientation of health care professionals (A. Bishop et al., 2007; Magalhães, Costa, Ferreira, & Machado, 2011), and some hypothesize that the difficulty in reaching higher consistency for the subscale is due to the complexity of the construct itself (Emanuel et al., 2018). Therefore, the behavioural subscale score was compared between higher and lower adherence groups, but not included as a potential predictor of adherence in the regression model developed in this study given that its reliability requires further attention.

Houben's version of the PABS-PT (Houben et al., 2005) contains 19 items, with 10 items in the biomedical subscale and nine items in the behavioural subscale. Respondents were asked to report their level of agreement or disagreement with each of the 19 statements on a Likert-type scale ranging from 1 to 6 labeled: (1) totally disagree, (2) largely disagree, (3) disagree to some extent, (4) agree to some extent, (5) largely agree, (6) totally agree (Ostelo et al., 2003). Final biomedical and behavioural scores were obtained by adding the score for all statements of each subscale.

Survey section VI: self-efficacy towards evidence-based practice. The last section of the electronic survey assessed physiotherapists' self-efficacy towards evidence-based practice using the Evidence-based Practice Confidence (EPIC) scale. The EPIC scale is an instrument

developed to assess health care professionals' self-efficacy to completing the process of evidence-based practice (Salbach & Jaglal, 2011). The instrument is self-administered and contains 11 items for which respondents report their confidence in performing a task on a scale from 0% to 100%, in increments of 10%. The anchors of the scale are labeled as “not at all confident” (0%), and “completely confident” (100%). The EPIC scale has shown excellent internal consistency (Cronbach's $\alpha = 0.89$), excellent test-retest reliability (intraclass correlation coefficient (ICC) = 0.89), and acceptable construct validity among physiotherapists (Andresen, 2000; Salbach, Jaglal, & Williams, 2013).

Closing page. Based on their total adherence score and province of practice, respondents were taken to one of two possible closing pages. Because the REDCap Survey tool cannot collect or store personal identifiable information, including names or email addresses, respondents were presented a closing page containing a thank you note, as well as a link to a questionnaire hosted by Google Forms (<https://docs.google.com/forms/>) if they wanted to be entered into a draw for a \$100 gift-card as a thank you for their participation. Manitoban respondents with total scores of less than or equal to two (i.e., lower adherence to EBCPG recommendations) were taken to a similar closing page that also included an optional invitation to participate in an individual interview and redirected to a separate questionnaire hosted by Google Forms to provide us with their contact information.

Both Google Forms questionnaires contained a statement at the top informing participants that their responses to the survey could not be linked to the contact information form. Open-ended items recorded the respondents' preferred name (e.g., first name or nickname), email address, and phone number for contact. Due to Canadian Federal law, it was necessary that the respondents answered a skill-testing question correctly in order to qualify for a chance to win the prize. Therefore, a mathematical expression question was included, as well as

a dichotomous item asking if they would like to be contacted for future studies. For participants deemed as having lower-adherence, an additional item asked if they would like to be contacted for the interview.

End of the survey. The online survey was open for responses for seven weeks, beginning on October 1st, and ending on November 18th, 2018. The seven-week period was determined based on contact between the researcher and the CPA and regulatory bodies regarding the dissemination of invitations to their members, given that each organization has their own policy and schedule for distribution of such materials. Depending on each partner organization's availability, one, two, or three invitations were sent to physiotherapists via email, with, on average, two-week intervals between contacts. We undertook additional recruitment efforts on social media during all seven weeks.

Upon closing of the online survey, a list of respondents who provided their contact information to be entered in the prize draw was exported to a Microsoft Excel file. A random digit generator function associated each name with a random number. Entries time-stamped by October 20th were duplicated as to receive an additional number, and thus an additional chance at winning the prize. The highest number was awarded the \$100 gift-card prize.

Qualitative Component: Interpretive Description of Manitoban Physiotherapists' Use of Guidelines for NSLBP

Once a "know-do" gap has been identified, the first step to addressing it is to understand the perspectives of the stakeholders involved and their willingness to engage in strategies to fill the gap (Grimshaw, Eccles, Lavis, Hill, & Squires, 2012; Straus et al., 2013). Therefore, it was deemed appropriate to use a qualitative method of inquiry to investigate how open Canadian physiotherapists are to change their practice. Interpretive description methods allow us to understand the experiences of treating patients with NSLBP and associated psychosocial

demands through the views of the therapists who interact with those patients and have a full understanding of the clinical routine's challenges (Carpenter & Suto, 2008). That results in an opportunity to develop knowledge translation interventions that are meaningful and better accepted by clinicians (Grimshaw et al., 2012; S. Thorne, Kirkham, & MacDonald-Emes, 1997).

Sample and recruitment. Initially, we intended that a minimum of five and maximum of ten Manitoban physiotherapists who were deemed as having lower adherence to EBCPG recommendations based on their answers to the clinical vignette would be selected using a random number generator in Microsoft Excel from the list of professionals who provided their contact information. However, due to the limited number of participants with lower adherence who displayed interest in being contacted for interviews, we expanded the criteria to include any Manitoban respondents who wished to participate. This resulted in a convenience sample of physiotherapists who could provide information about the barriers and facilitators of implementing EBCPGs into the Manitoban clinical routine, and the aspects of physiotherapy practice that may require attention from future knowledge translation interventions, following the theoretical framework of the current study.

An initial email was sent out to all Manitoban survey respondents who had agreed to be contacted for future studies. The initial contact email reiterated the goals of the study and the interview and included the individual consent form for their review. Potential participants were provided with the opportunity to ask questions via email or phone and asked to return the signed consent form via email or fax to the researcher if they agreed to participate in the interview. Once informed consent was obtained, the participant and researcher mutually arranged a day and time for the interview and chose the best means to conduct the interview (i.e., via phone or video call). In the case participants did not respond to the initial contact via email within a week, a

reminder email was sent out. All physiotherapists who consented to participate within the timeline of the study were interviewed.

Interview data collection. On the scheduled day and time, the researcher called the participant via phone or FaceTime as agreed upon. The researcher was alone, in a quiet and private room at her home for all interviews. Participants were asked to participate from a quiet and private room as well. Interviews were recorded using a digital audio recorder. At the beginning of the calls, participants were reminded that the interview would be audio recorded, reassured that their data would remain confidential, and that their consent to participate in the interview could be withdrawn up to 14 days after the date of the interview. Interviews lasted from 15 to 40 minutes.

A detailed interview guide with structured open-ended questions was followed. The interview guide was developed following the recommendations of Patton (2002) and can be found in Appendix B. Participants were asked at the end of the interview if they would like to provide feedback on the collective data after analysis, a process described as member-checking and used to ensure data credibility (Letts et al., 2007). Following each interview, the researcher made reflective notes keeping a data collection journal. The reflective notes included a description of how the researcher felt performing each of the interviews and whether she felt her personal beliefs might have influenced her interviewing. Notes were read by the researcher later during analysis to remind her of the context of each interview.

Data Analysis

Survey data analysis. Data collected through the survey instrument were exported from REDCap servers at the University of Manitoba to an SPSS data file. Survey data were sorted and transformed as described below in preparation for statistical analysis. Prior to data

transformations, ineligible cases and those who left the survey before completing section IV (guideline adherence) were excluded from the dataset.

Demographics and theoretical constructs. Text answers added by respondents under the “other” options were individually assessed and grouped as appropriate for each variable. Respondents’ familiarity with EBCPGs for NSLBP was obtained by giving a score of one to respondents that reported to be at least somewhat familiar with at least one published ECBPG, and zero to those who reported not being familiar at all with published EBCPGs for NSLBP. Attitudes towards using EBCPGs for NSLBP, subjective norms regarding EBCPG use for NSLBP, and intention to use them were obtained by averaging their answers to the semantic differential questions within each construct. Categorical variables used in the regression model were collapsed into dichotomous variables to accommodate for a smaller subsample (lower adherence group) than anticipated, therefore allowing all variables of interest to be included in the model.

Given that the distribution of responses was different from that of the population of physiotherapists as described by the CIHI (2017), a subgroup analysis was undertaken to assess the impact of weighting the responses by sex and province of practice. Subgroup analysis by sex resulted in no differences from the entire sample, therefore weighting by sex was unnecessary. Subgroup analysis by province of practice, however, highlighted substantial differences from the study sample analysis, therefore leading us to performing a weighted analysis to obtain a likely more representative national estimate. Provincial weights were calculated through dividing the proportion of the population by the proportion of our study sample for each province. Nunavut, Northwest Territories, and the Yukon were collapsed since data specific to each territory is not available from CIHI.

Guideline adherence. Since no standardized criteria exist for the assessment of adherence and non-adherence to the EBCPGs included in this study, we developed our own based on the work of Ladeira et al. (2017), who employed the same clinical vignette; and on the recommendations for treatment of NSLBP from ACP (Qaseem et al., 2017), NDMG (Chenot et al., 2017), NICE (2016), and OPTIMa Collaboration (Wong et al., 2017) guidelines (Figure 3). Following the recommendations of all four EBCPGs, we classified the list of intervention options that were provided to respondents into five categories: (1) interventions to address psychosocial factors; (2) education to prevent long-term disability; (3) interventions not recommended by guidelines; (4) interventions not addressed in the literature, or with contradictory, or inconclusive evidence; and (5) recommended exercise programs. Table 1 describes the list of interventions included in each category. Responses were scored by an automated algorithm built into the REDCap electronic data capture tools (Vanderbilt University, Nashville, version 7.4.9). Respondents were awarded either a score of one or zero for each of the following four criteria: (1) psychosocial; (2) disability prevention; (3) not recommended; and (4) active-passive for a total possible score of four (see Figure 3 for scoring criteria). Respondents who followed more than 50% of guideline recommendations, that is, scored three or four points, were considered having higher adherence.

Text answers added under the “other” intervention category were individually assessed and grouped as necessary. Additional consultation of the EBCPG documents (Chenot et al., 2017; National Institute for Health and Care Excellence (NICE), 2016; Qaseem et al., 2017; Wong et al., 2017) was undertaken to ensure newly added responses were accurately classified. Respondents’ adherence scores were then adjusted, if necessary.

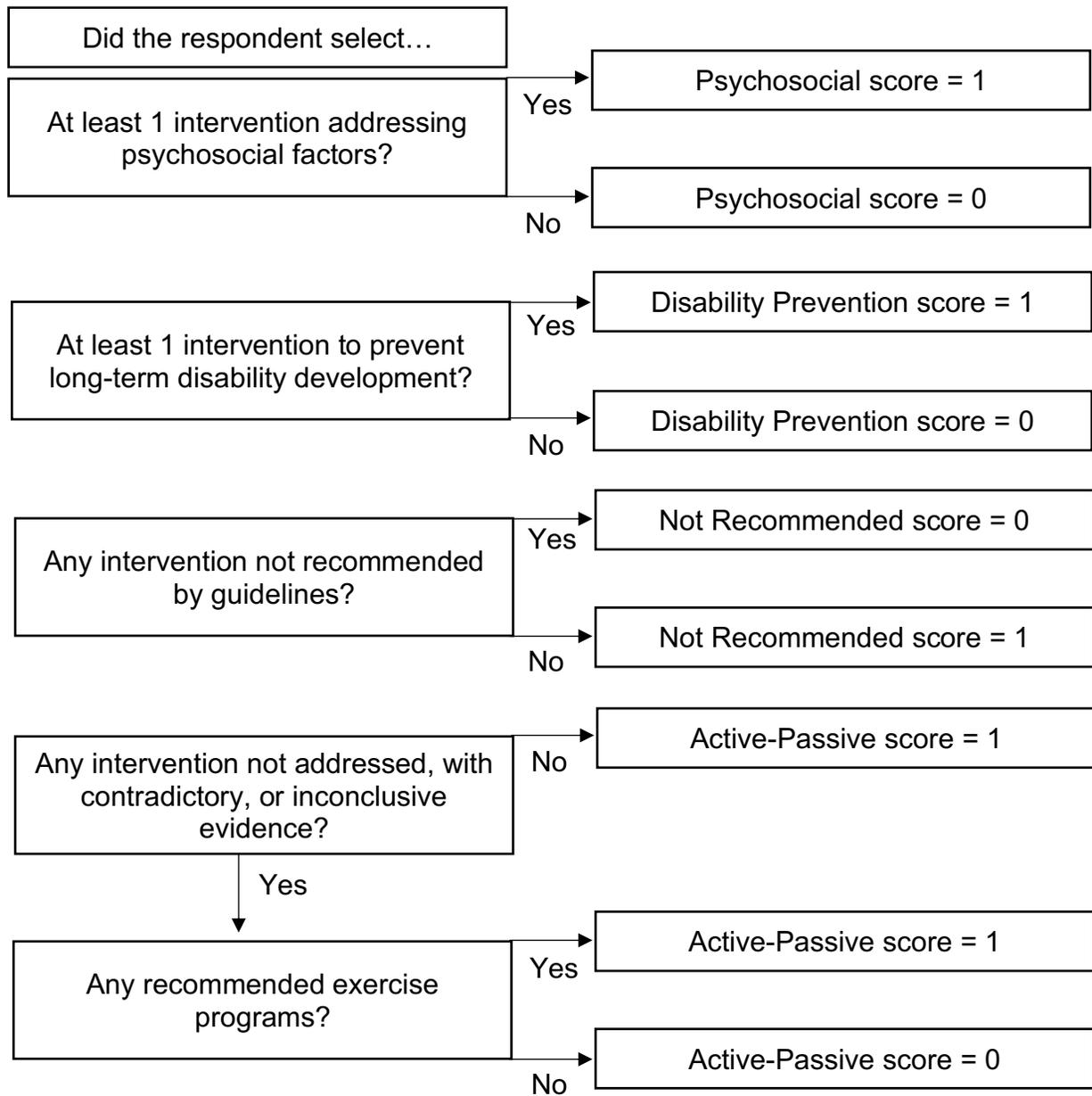


Figure 3. Algorithm to determine adherence to EBCPGs for the management of NSLBP with associated psychosocial factors.

Table 1

Classification of interventions presented in the survey to respondents

Interventions addressing psychosocial factors	Interventions to prevent disability development	Interventions not recommended	Interventions not addressed, with contradictory, or inconclusive evidence	Recommended exercise programs
a. Education to address negative affective tendencies	a. Education on expected course of recovery	a. Bed rest	a. Acupuncture	a. Home exercises
b. Refer to multimodal rehabilitation with physical and psychological interventions	b. Education on self-management strategies	b. Interferential current	b. Dry needling	b. Supervised individual exercises
	c. Education to pursue/maintain an active lifestyle	c. Lumbar brace or corset	c. Heat	
	d. Recommend early return to work and activities	d. Refer to a physician without intervention	d. Ice	c. Supervised group exercises
		e. Refer to a psychologist without intervention	e. Low-level laser therapy (LLLT)	
		f. Transcutaneous electrical nerve stimulation (TENS)	f. Massage	
		g. Ultrasound	g. Neurodynamic mobilization	
			h. Refer to a physician	
			i. Refer to a psychologist	
			j. Spinal manipulation	
			k. Spinal mobilization	
			l. Spinal traction	
			m. Taping	
			n. Work modification	

Attitudes and beliefs towards LBP. Answers for items 3, 6, 8, 9, 10, 11, 12, 15, 16, and 19 were added to obtain the biomedical orientation score, while the behavioural orientation score was achieved by summing the answers from items 1, 2, 4, 5, 7, 13, 14, 17, and 18 of the PABS-PT questionnaire for each respondent (Houben et al., 2005). Biomedical orientation possible scores ranged from 10 to 60, while behavioural orientation scores could range from nine to 56.

Self-efficacy towards evidence-based practice. A final self-efficacy score towards evidence-based practice was calculated for each respondent by obtaining the average of all 11 answers on the EPIC scale items (Salbach & Jaglal, 2011).

Missing data. Survey data were checked for missing items and as data appeared to be missing at random in most cases, different strategies were employed. For descriptive statistics and comparisons, we employed case wise deletion, i.e., missing cases were not included in the analysis.

A single imputation method was used prior to the regression analysis in order to maximize the number of cases available for analysis allowing the inclusion of all of our predictors of interest (Amsterdam Public Health [APH], 2015). For continuous variables, missing items were imputed as the mean of the observed cases. For categorical variables, the most common category among observed responses was imputed for missing cases. A sensitivity analysis was undertaken to assess the impact of these imputation strategies and no differences were identified between missing and imputed dataset analyses. It is noteworthy here that when missing cases were not included in the analysis, the number of cases in the smallest of the two adherence groups (lower adherence) is smaller than the minimum sample required for binary logistic regression therefore impacting the power of the predictive test.

Interview data analysis. Interview recordings were transcribed verbatim by a transcribing agency, who signed a confidentiality agreement prior to transcription. All transcripts

were then read by the researcher who performed the interviews to ensure they had been transcribed verbatim. Analysis followed the methods outlined by Braun (2013). Initial coding of interview data was performed inductively by me (TCP) and an experienced researcher (JLP) and overseen by an expert qualitative researcher (JR). Interview transcripts were coded to identify participants' experiences, feelings, and opinions regarding the use of guidelines and the support for physiotherapists in dealing with psychosocial issues in the management of NSLBP.

All three researchers individually coded one of the interviews then met to discuss line by line coding and address any discrepancies. Using the coding structure agreed upon at that meeting JLP and TCP individually coded another interview and met to discuss line by line coding. Discrepancies in the coding were discussed by the two researchers and the agreed upon codes were reviewed by JR. At that point there was substantial agreement in the individual coding so JLP and TCP continued to code each of the remaining interviews individually, then TCP compared the transcripts and made the final decision on discrepant items.

Codes and supporting quotes were extracted from transcripts to a table in Microsoft Word for sorting. Codes were sorted as to aggregate similar ideas; at this point it became clear to the researchers that using a directed content analysis would allow better integration of the qualitative and quantitative findings of the study without leaving out additional perspectives raised by participants. Directed content analysis is traditionally used to validate or expand a theory or previously identified frameworks (Hsieh & Shannon, 2005). In our study, the directed approach to content analysis was used as a means to integrate physiotherapists' perspectives of managing NSLBP to the criteria used in the study to assess adherence to EBCPG recommendations.

The four criteria used to assess guideline adherence described in Figure 3 served as base categories for the content analysis and were labeled as follows: (a) psychosocial factors in NSLBP; (b) patient education; (c) balancing passive and active interventions; and (d) knowing

what is and what is not recommended by evidence. An overarching category labelled “guidelines” was included to accommodate codes related to general perceptions of EBCPGs, and one additional category described physiotherapists’ satisfaction with their work with NSLBP patients.

Following analysis, a one-page descriptive summary of the findings was sent to participants for review. Participants were given one week to respond with any comments or additions, with the direction that if no response was obtained, it would be assumed that participants agreed with the findings.

Trustworthiness of the findings was addressed by (1) providing a description of the interview participants and the study setting; (2) keeping a journal with reflective notes; (3) using quotes to support categories; (4) having two researchers independently analyse the data (i.e., researcher triangulation); (5) obtaining confirmation from participants on collective findings (i.e., member-checking); (6) discussing analytical decisions with an expert qualitative researcher; and (7) keeping an audit-trail of the analytical decisions made throughout the analysis process (Letts et al., 2007).

Statistical Analyses

Statistical analyses were conducted using SPSS Statistics for Mac (version 25.0). A $p \leq 0.05$ was taken as the level of statistical significance for all applicable tests. Achieved power was calculated for each applicable test using G*Power (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, version 3.1.9.3).

The following assumptions were assessed prior to the application of each corresponding test as per Leech, Barrett, and Morgan’s (2015) recommendations: (a) normality of data distribution using the Shapiro-Wilk test as well as skewness and kurtosis values, and the histogram distribution for each continuous variable; (b) homogeneity of variances, when

applicable, using the Levene's test; (c) multicollinearity among independent variables using correlations; (d) absence of outliers using standardized z-scores; and (e) linearity of relationships between independent variables and the log odds of the dependent variable through Box-Tidwell test. Independence of observations was assumed since data collected in the survey were anonymous, precluding our ability to assess potential dependencies.

Demographics and theoretical constructs. Descriptive statistics (i.e., means, standard deviations, frequencies, proportions, and confidence intervals for the means) were calculated for each variable, as applicable. One sample t-tests and goodness of fit chi-square tests were used where applicable to compare the survey respondents to the characteristics of the national population of physiotherapists described by the CIHI (2017).

Guideline adherence. Descriptive statistics (i.e., frequency and proportion) were calculated for adherence to each of the four criteria (i.e., partial adherence scores) and total scores. The hypothesis that the proportion of Canadian physiotherapists with higher adherence to EBCPG recommendations is less than 50% was tested using a one sample binomial test.

Attitudes and beliefs towards LBP. Mean and standard deviation were calculated for each treatment orientation (i.e., biomedical and behavioural). Independent samples t-tests were employed to test the hypotheses that the biomedical orientation score is higher among physiotherapists with lower adherence to EBCPG recommendations, while behavioural treatment orientation score is higher among those physiotherapists with higher adherence. Effect sizes were estimated using Cohen's *d* (Cohen, 1992) and presented with 95% confidence intervals for the means.

Self-efficacy towards evidence-based practice. Similarly, descriptive statistics (i.e., mean and standard deviation), as well as the 95% confidence interval for the mean, and Cohen's *d* effect size (Cohen, 1992) were calculated for the lower and higher adherence groups. The

hypothesis that self-efficacy towards evidence-based practice is higher among physiotherapists with higher adherence to EBCPG recommendations was tested with an independent samples t-test.

Identifying predictors of adherence to EBCPG recommendations. A binary logistic regression model was developed to test if demographic and practice characteristics, as well as theoretical constructs found to influence health-care professionals' clinical behaviours in previous studies (Bernhardsson et al., 2014; Eccles et al., 2012; Korteisto et al., 2010) can predict adherence to EBCPG recommendations.

Results

Quantitative Component: Cross-Sectional Survey

Sample. The online survey received a total of 900 accesses. Of those, 700 were eligible and consented to participate, and 525 respondents were included in the analysis as they had completed the survey section that assessed the primary outcome of the study (guideline adherence). Figure 4 presents the flow of participants in the study and the reasons for exclusion.

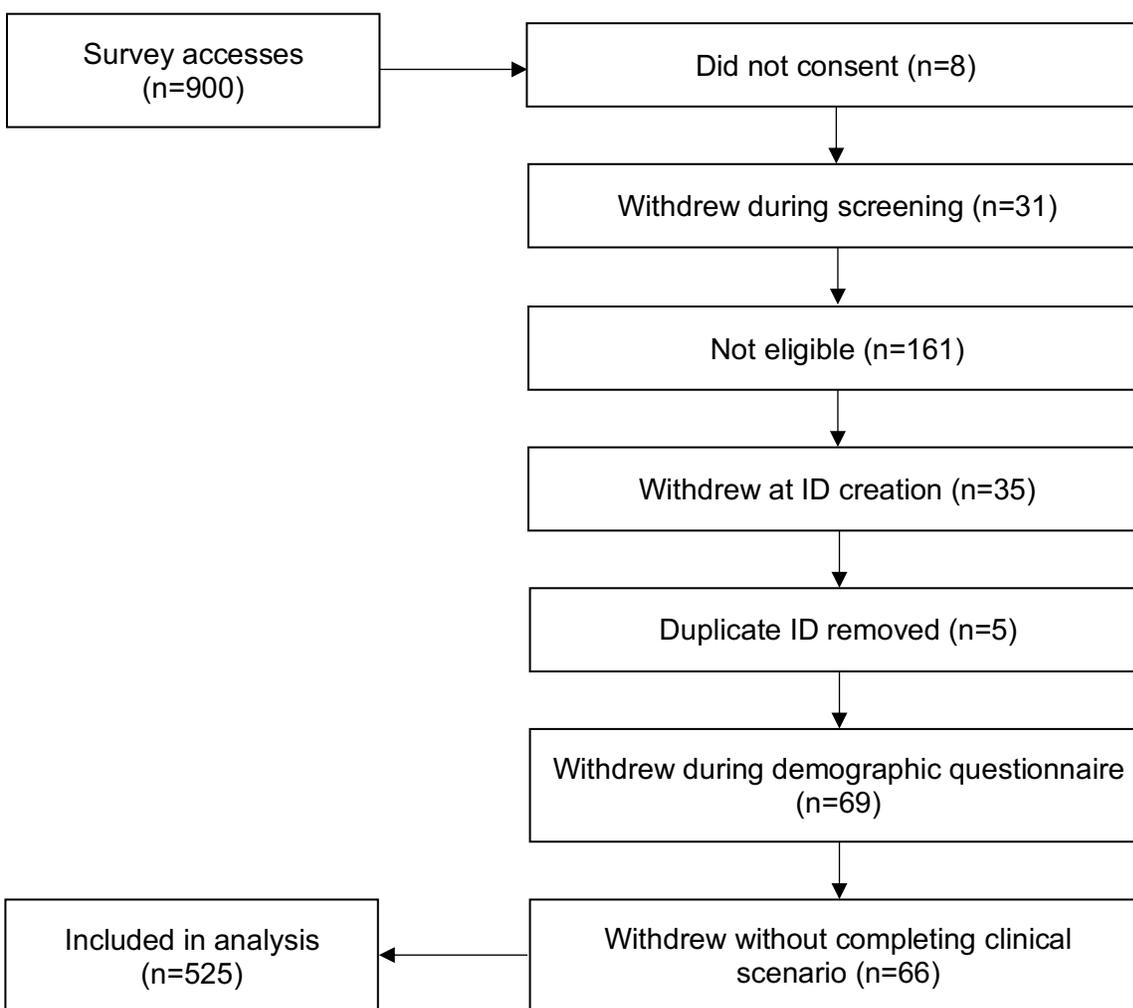


Figure 4. Survey access and cases excluded from analysis.

Demographics. Survey participants were mostly female (n=363, 69.1%), with an average age of 38.8 ± 10.7 years, and 13.7 ± 4.6 years of clinical experience. The sample differed significantly from the physiotherapist population described by the Canadian Institutes of Health Information (2017) in age (study sample was younger) and sex (sample contained lower proportion of females) as presented in Table 2. The distribution of province of practice in the sample was visibly different from the physiotherapist population (see Table 2), however, a statistical test (i.e., Chi-square statistic) could not be run to compare the distributions due to the low count of expected cases for Prince Edward Island and the Territories. As a result, weighted analysis was undertaken for some tests as described below.

Table 2

Comparison of demographic characteristics of the sample and population^a

		Sample	Population CIHI	p-value
Age (years)		38.8 ± 10.7	$42.1 \pm$ unknown	< 0.001
Sex	Females	363 (69.1)	16,624 (74.4)	0.02
	Males	156 (29.7)	5,706 (25.6)	
Province of Practice ^b	AB	157 (29.9)	2,770 (12.4)	
	BC	45 (8.6)	3,538 (15.8)	
	MB	65 (12.4)	730 (3.3)	
	NB	18 (3.4)	516 (2.3)	
	NL	6 (1.1)	279 (1.2)	
	NS	14 (2.7)	671 (3.0)	
	ON	139 (26.5)	8,513 (38.0)	
	PE	4 (0.8)	91 (0.4)	
	QC	14 (2.7)	4,505 (20.1)	
	SK	58 (11.0)	733 (3.3)	
	Territories	3 (0.6)	45 (0.2) ^c	

Note. ^aData presented as mean \pm standard deviation or N (%). ^bChi-square test could not be performed given some expected frequencies being fewer than 5. ^cPopulation proportion data from CIHI (Canadian Institute for Health Information) available for Yukon territory only.

Most respondents reported practicing in the prairie provinces, within a multidisciplinary team, in private practice, and in an urban location. The majority of respondents were members of the Canadian Physiotherapy Association, reported seeing more than 10 patients a day, and patients with LBP represented between 26 and 50% of their case load. Almost half of the participants had an entry-to-practice bachelor's degree, while a similar proportion had a Master of Physical Therapy degree. About one fifth of respondents had a post-professional degree, such as Master of Science, Clinical Science, and Doctorate degrees, while the vast majority had some post-graduate training in areas such as pain science, acupuncture, manual therapy, or exercise methods. Table 3 displays the complete demographic characteristics of the sample.

Table 3

Demographic and practice characteristics of the sample^a

Variable	Description	
Experience (years)	13.7 ± 11.2	
Physiotherapy degree	Diploma	11 (2.1)
	Bachelor	251 (47.8)
	Master	253 (48.2)
	Doctorate	5 (1.0)
Post-professional degree	None	408 (77.7)
	MSc ^b	59 (11.2)
	PhD ^c	4 (0.8)
	Doctorate	13 (2.5)
	Others	37 (7.1)
Post-graduate training	None	45 (8.6)
	Acupuncture	294 (56.0)
	Mackenzie	187 (35.6)
	Manual Therapy	371 (70.7)
	Pain	161 (30.7)
	Others	191 (36.4)
CPA ^d Membership	Yes	413 (78.7)
	No	108 (20.6)
Sector of employment	Public	91 (17.3)
	Private	378 (72.0)
	Both	53 (10.1)
Location of employment	Urban	444 (84.6)
	Rural	76 (14.5)
	Remote	1 (0.2)
Practice environment	Alone	75 (14.3)
	Team of Physiotherapists	163 (31.0)
	Multidisciplinary team	285 (54.3)
Other members of multidisciplinary team	Athletic Therapist	41 (7.8)
	Dietician/Nutritionist	64 (12.2)
	Kinesiologist	131 (25.0)
	Massage Therapist	173 (33.0)
	Nurse	67 (12.8)
	Occupational Therapist	120 (22.9)
	Physician	131 (25.0)
	Physiotherapist	202 (38.5)
	Psychologist	67 (12.8)
	Respiratory Therapist	20 (3.8)
	Chiropractor	53 (10.1)
	Others	66 (12.6)
Daily patient workload	1-5	29 (5.5)
	6-10	176 (33.5)
	11-15	229 (43.6)
	15+	88 (16.8)
LBP ^e caseload	≤ 25%	156 (29.7)
	26-50%	309 (58.9)
	51-75%	48 (9.1)
	> 75%	8 (1.5)

Note. ^a Data presented as mean ± standard deviation or N (%). ^b MSc: Master of Science. ^c PhD: Doctor of Philosophy. ^d CPA: Canadian Physiotherapy Association. ^e LBP: low back pain.

Theoretical constructs towards EBCPGs. About one third of respondents (31.2%) reported they were not familiar at all with guidelines for the management of NSLBP, including the EBCPGs followed by this study (see Table 4 for details). Therapists' attitudes towards using EBCPGs for NSLBP were slightly positive, with a mean score of 4.6 ± 1.3 (range 1-7, higher score represents more positive attitude). Respondents felt slightly not pressured to use guidelines for NSLBP (3.4 ± 1.5 , range 1-7, higher score represents greater perception of pressure to engage in EBCPG use) and reported a slight perception that their peers and managers do not engage in guideline use for NSLBP (3.4 ± 1.9 , range 1-7, higher score represents greater perception of peer use of EBCPGs). However, 153 (29.1%) respondents reported they did not know whether or not their peers used guidelines for NSLBP, and 108 (20.6%) therapists did not know the behaviour of their manager or supervisor. Respondents displayed slightly high intention to engage in the use of EBCPG for NSLBP within the forthcoming month (4.6 ± 1.8 , range 1-7, higher score represents greater intention).

Table 4

Respondents' familiarity with published EBCPGs^a for NSLBP^b

	Not familiar at all N (%)	Somewhat familiar N (%)	Very familiar N (%)
NICE (2016)	343 (65.3)	145 (27.6)	33 (6.3)
ACP (2017)	286 (54.5)	185 (35.2)	47 (9.0)
NDMG (2017)	480 (91.4)	33 (6.3)	5 (1.0)
OPTIMa (2017)	354 (67.4)	135 (25.7)	30 (5.7)
Others	349 (66.5)	81 (15.4)	55 (10.5)

Note. ^a EBCPGs: evidence-based clinical practice guidelines. ^b NSLBP: non-specific low back pain.

Guideline adherence. Seventy-seven percent of respondents (n=406) were deemed as having higher adherence (i.e., scoring 3 or 4 out of 4) to EBCPG recommendations for NSLBP. Contrary to our first hypothesis, we found strong evidence that, in fact, at least 50% of Canadian physiotherapists adhere to guideline recommendations for the conservative management of NSLBP (one-sample binomial test, $p < 0.001$, Cohen's $g = 0.27$, power = 1.00). The distribution of adherence scores based on the criteria described in the methods section of this manuscript (page 52) is displayed in Figure 5.

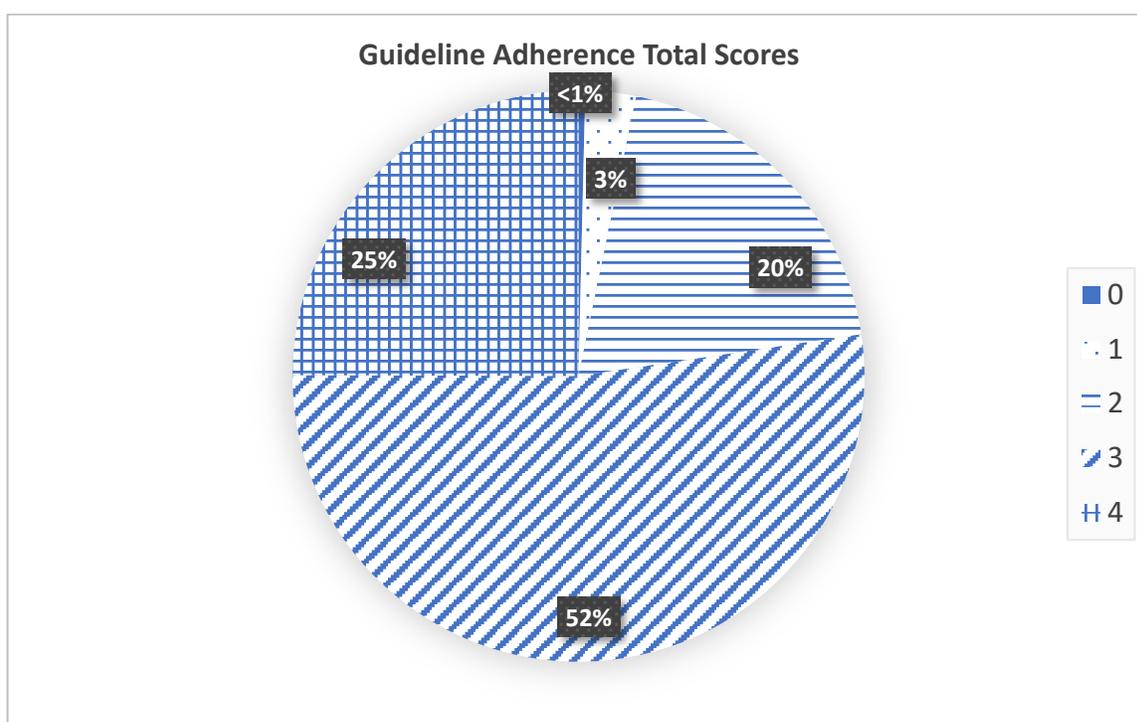


Figure 5. Distribution of total adherence scores among survey respondents.

Partial adherence scores. In spite of 77.3% of survey respondents demonstrating higher adherence to guidelines, only one quarter of the participating therapists achieved an adherence score of 4 (i.e., addressed all the core recommendations of the EBCPGs followed by this study). Therefore, a sub analysis of the interventions selected by respondents on Section IV of the

survey revealed that while 91.4% of therapists addressed the recommendation of favouring active interventions over passive and controversial modalities, and 96.2% provided at least some type of education or advice to prevent long-term disability development, only 29.5% addressed the psychosocial demands of the patient described in the scenario. In addition, 18.5% of respondents selected one or more interventions for which evidence exists against their use in the management of NSLBP.

Attitudes and beliefs towards LBP. As hypothesized, biomedical beliefs, as measured by the PABS-PT questionnaire, were significantly stronger among physiotherapists deemed as having lower adherence to EBCPG recommendations for NSLBP. Likewise, behavioural belief scores on the PABS-PT questionnaire were significantly higher among therapists who displayed higher adherence to guideline recommendations (see Table 5).

Table 5

Comparison of biomedical and behavioural beliefs towards NSLBP (PABS-PT questionnaire) between higher- and lower-adherence groups

	Higher-adherence group	Lower-adherence group	p-value ^a	95% CI ^b Mean Difference ^c	Effect size ^d	Power
Biomedical beliefs score	24.69 (6.24) n = 405	29.28 (7.02) n = 88	< 0.001	-6.07, -3.11	0.69	1.00
Behavioural beliefs score	35.42 (4.79) n = 404	31.41 (4.90) n = 89	< 0.001	2.90, 5.11	0.83	1.00

Note. ^a Independent samples t-tests' p-values. ^b CI: confidence interval. ^c Mean difference calculated as higher-adherence group mean – lower-adherence group mean. ^d Effect sizes calculated using Cohen's *d* index. Scores presented as: mean (standard deviation). Analyses weighted by province of practice, cases with missing data excluded.

Self-efficacy towards evidence-based practice. Self-efficacy scores measured through the EPIC scale were similar across respondents, regardless of their adherence to EBCPG recommendations. Contrary to our hypothesis, there was no difference between the higher-

adherence group (69.44 ± 13.48 , $n = 374$) and lower-adherence group (70.09 ± 15.90 , $n = 88$) scores ($p = 0.65$, Cohen's $d = 0.04$, power = 0.10, 95% CI Mean Difference [-3.90, 2.61]). The analysis was weighted by province of practice and cases with missing data were excluded.

Identifying predictors of adherence to EBCPGs. Independent variables were tested individually for their impact on adherence; Table 6 presents the coefficients of those tests. On their own, intention to use EBCPGs within the upcoming month, being familiar with at least one guideline for NSLBP, therapists' biomedical beliefs towards back pain, possessing a post-professional degree, and having some post-graduate training were significant predictors of EBCPG adherence.

Table 6

Univariate binary logistic regression coefficients for guideline adherence

	β	p-value	Odds Ratio	95% CI ^a Odds Ratio
Attitude towards EBCPGs ^b	0.127	0.127	1.136	0.964, 1.337
Subjective norms towards EBCPGs	-0.037	0.620	0.964	0.833, 1.115
Intention to use EBCPGs	0.187	0.001	1.206	1.076, 1.352
Intention to use EBCPGs Squared	0.027	< 0.001	1.027	1.013, 1.042
Familiarity with EBCPGs	0.474	0.039	1.606	1.025, 2.516
EPIC ^c Scale	-0.001	0.949	0.999	0.984, 1.016
PABS ^d Biomedical	-0.104	<0.001	0.901	0.868, 0.935
Experience (years)	0.013	0.200	1.013	0.993, 1.034
Post-professional degree	0.813	0.007	2.254	1.246, 4.077
Post-graduate training	1.670	< 0.001	5.311	2.811, 10.036

Note. ^a CI: confidence interval. ^b EBCPGs: evidence-based clinical practice guidelines. ^c EPIC: evidence-based practice confidence. ^d PABS: pain attitudes and beliefs scale.

Given the distribution of respondents in the higher- and lower-adherence groups, a predictive model based solely on guessing that all respondents would have higher adherence to

EBCPG recommendations would be accurate 80% of the time. With the inclusion of the demographic and theoretical constructs in the model, we noted a 3.5% increase in its predictive ability; the model with the additional factors is significantly better than guessing only (Omnibus test of model coefficients, Chi-square = 77.569, p-value < 0.001; Hosmer-Lemeshow test, Chi-square = 10.833, p-value = 0.211). Generally speaking, we can estimate that approximately 22% of the variance in the probability of a physiotherapist being highly-adherent to EBCPG recommendations is accounted for by the variables in our model (Nagelkerke pseudo-R² = 0.22). Table 7 presents the coefficients of the multivariate model.

Table 7

Multivariate binary logistic regression coefficients for guideline adherence

	β	p-value	Odds Ratio	95% CI ^a Odds Ratio	Power
Attitude towards EBCPGs ^b	-0.112	0.388	0.894	0.693, 1.153	0.200
Subjective norms towards EBCPGs	-0.233	0.024	0.792	0.647, 0.970	0.856
Intention to use EBCPGs	-0.292	0.379	0.747	0.389, 1.432	0.158
Intention to use EBCPGs squared	0.079	0.045	1.082	1.002, 1.169	0.465
Familiarity with EBCPGs	0.520	0.065	1.682	0.969, 2.918	0.632
EPIC ^c Scale	-0.013	0.157	0.987	0.968, 1.005	0.445
PABS ^d Biomedical	-0.103	< 0.001	0.902	0.866, 0.940	0.999
Experience (years)	0.001	0.955	1.001	0.977, 1.025	0.051
Post-professional degree	0.524	0.129	1.690	0.858, 3.326	0.564
Post-graduate training	1.078	0.004	2.937	1.41, 6.119	0.767
Constant	4.453	0.001	85.925	-----	-----

Note. ^a CI: confidence interval. ^b EBCPGs: evidence-based clinical practice guidelines. ^c EPIC: evidence-based practice confidence. ^d PABS: pain attitudes and beliefs scale.

Qualitative Component: Individual Interviews

Interview sample. Seven Manitoban physiotherapists participated in interviews; one participant was from the lower-adherence group and six participants had higher-adherence based on our survey. Participants were mostly experienced physiotherapists who have worked with orthopaedic clientele both in private practice and in the public sector as either consultants or community-based therapists and described themselves as very familiar with NSLBP patients, often seeing multiple NSLBP patients in a day. Table 8 displays the demographic characteristics of participants.

Table 8

Demographic characteristics of interview participants

Participant ID	Age	Sex	Years of Experience	Type of Physiotherapy Degree	Sector of Employment	Location of Employment
P01	34	M	10	Bachelors	Private	Urban
P02	63	F	41	Bachelors	Private	Urban
P03	35	F	12	Bachelors	Private	Urban
P04	27	M	<1	Masters	Private	Urban
P05	52	M	20	Bachelors	Both	Urban
P06	70	F	50	Bachelors	Public	Remote
P07	34	F	12	Bachelors	Both	Urban

Satisfaction with support for NSLBP patients. Participants reported a high level of satisfaction with the support they have been providing to their NSLBP patients and went on to describe the things that have led them to those conclusions.

Positive patient outcomes. Participants listed the positive outcomes from their treatment as the primary reason for being highly satisfied with the support they have been providing to their NSLBP patients: “I feel like the satisfaction of getting the patient back to work because of the treatment you provided is correct and within a better time period gives you quite a bit of satisfaction” (P04).

There was a general consensus that satisfaction is based on patient improvement according to the objective outcome measures used in clinical practice:

I think it’s mostly like based on whether it’s an objective outcome measure, where they’re feeling better, they’re able to functionally do the tasks that they want to be doing, they’re moving better, their outlook, on things, is a little bit better, so, kind of a holistic approach (P03).

Patient feedback. Participants described that they also consider patient feedback when evaluating their personal satisfaction: “you can seek their [the patient’s] feedback as well. Are they happy with the treatment they received or are they not? Do they feel like they’re getting better or do they not? ...” (P05).

One participant listed patient self-referral as a means of feedback as it is connected to their perception of usefulness of the services she provides: “I’m satisfied that it’s a useful job that I’m doing and that it does help a lot of people because they wouldn’t be self-referring if they didn’t feel that it was useful” (P06). Meanwhile, another participant described that, in his view, the fact that patients do not return after discharge is an indicative of success that positively influences his satisfaction: “it [patients’ feedback] is subjective right, cause, they’re not coming back so I think that’s a good thing” (P04).

Overall, participants reported high satisfaction with support provided to NSLBP patients even when the patients present with psychosocial demands. Satisfaction was mostly based on objective outcome measures and patient feedback.

Clinical practice guidelines. Participants described their level of familiarity with guidelines for NSLBP, the advantages of guideline implementation, and some barriers and facilitators to EBCPGs use.

Familiarity with guidelines. There was a continuum of levels of familiarity with guidelines for the management of NSLBP among participants. Responses ranged from “I think I’m quite familiar” (P05) to “if I had to take a test right now, I might not pass” (P02).

Some participants referred to different terms when asked about clinical practice guidelines, which demonstrated a potential confusion between clinical practice guidelines and classification systems or clinical pathways. For instance, one participant referred to clinical pathways when asked about the challenges to implementing clinical practice guidelines for NSLBP in her work environment: “... there has been a tendency lately to apply clinical pathways in a very black and white kind of way, you know. I mean, I do approve of clinical pathways ...” (P06).

Advantages of guidelines. Several advantages were identified from the use of guidelines in clinical practice. There was a general consensus that guiding the therapist during the clinical reasoning process to develop an evidence-based treatment plan was one main advantage of using guidelines: “it [guidelines] gives the therapist the backbone to apply treatment, modalities and treatment methods and like I said earlier it consolidates the evidence on a somewhat regular occurrence” (P01). Some participants also described guidelines as a means of reassurance to the therapist with regards to knowing which treatments are effective and preventing mistakes:

... it's not that it just keeps you from forgetting anything but the fact that you are following a path and you're going to identify the deviations if they are needed, it's kind of a control of your thinking process so that you don't lose things (P06).

Participants also described how clinical practice guidelines are a useful resource to educate patients with regards to the best available treatment options for their conditions and can facilitate communication with other health care professionals who might be involved in the treatment:

If you're applying treatments that aren't effective or people that come to see you that have had back pain for a long time that have had, you know, a lot of passive treatment or a lot of manipulations and really not a lot of instruction or active based component to their treatment, ... then the guidelines are quite useful for having those discussions (P05).

Barriers to implementation of guidelines. Many challenges and barriers to implementing guidelines were identified by participants. Some participants pointed to time constraints and not being able to prioritize updating their knowledge on guidelines in their agendas as the main barriers to their implementation. Participant P01 described: "yah, truly time. I'm a business owner, I work full time as well as other personal concerns, and interests and other things. It's truly a time management issue."

Interest in guidelines was described by some participants as something apart from their professional development and therefore it was not prioritized:

I should probably look at them [guidelines] more, you know. And I haven't taken a course on low back pain in a while, and perhaps that's one of the things that's really... stressed, you know, this is where we're at now. And, even though this might be a small part of furthering your professional practice this is still the framework I tend to be

more looking at techniques or reviewing things and I'm sort of not looking at that template (P02).

One participant highlighted that some personal biases might lead physiotherapists to disregard the evidence and further direct their interests away from guidelines that make recommendations contrary to some of their own beliefs. He described: "sometimes you choose not to believe the evidence if it doesn't suit you. So, I think the biggest challenge is looking at the research and the evidence and then taking it for what it is and applying it" (P05).

A few participants also identified the fact that guidelines are meant to be only a guide as a challenge to implementation. For instance, one participant stressed how physiotherapists would like to have more specific guidelines for exercise prescription for NSLBP:

The main challenge would be that the guidelines often are somewhat vague. Like when it comes to exercise, so, the guidelines say like exercise prescription, but as a therapist we always want to know - there are ten thousand different types of exercise prescription for different types of low back pain, but it doesn't really have recommendations into the specifics of that, or nothing that I've seen anyways (P07).

Several other participants raised the issue that most guidelines for NSLBP focus on the anatomical and mechanical aspects of pain and do not help therapists to better understand or intervene in other factors that might be present, therefore being applicable to a restricted group of patients: "... for the most part all of the guidelines are very mechanical, so it doesn't really bring those other emotional, social, psychological factors into play as you're moving forward in treatment with people" (P03).

One participant listed the lack of access to research databases for private practice clinicians as a barrier: "just as a private practice clinician, we like, we don't have access to any,

like, research platforms to look for articles on anything” (P03). While another participant described her dislike for the electronic format of information, which creates a barrier for her:

P02: I don't like reading online, oh I'm so mad that they don't give me my paper copy, I'm from that era, I'm afraid, you know I don't like being on the computer or my iPad so it's not a good format for me, you know.

Finally, one participant brought up the financial (and potentially ethical) concern of implementing guidelines in clinical practice as some clinicians might choose to ignore the recommendations to sustain a business:

I think the biggest challenge is probably from a financial perspective. The clinical- in private practice if you're fee for service the clinical practice guidelines aren't very conducive to, you know, long-term passive forms of treatment. So, people like having passive treatment. They feel - they get temporary relief from it, it's easy to do in the clinic setting, you can go for it and you can advise people that it's a good form of treatment for them to have and it can be a money maker for you (P05).

Facilitators of guideline implementation. Participants identified facilitators that address access to guidelines as well as the lack of interest from professionals to seek guidelines. The Canadian Physiotherapy Association was described by several participants as a facilitator for access to guidelines: “we have a lot of resources through CPA and if you have subscriptions to those divisions, right, so, you have access to those researches and stuff” (P04). Some participants also recognized the availability of resources in different formats and from diverse sources including social media and other electronic resources, as well as continuing education courses which facilitated access:

I think most of the guidelines that are provided are provided in a number of different formats and you can read them, you can attend courses, and they're pretty well cited in a variety of different journals and the literature (P05).

With regards to stimulating interest in physiotherapists, participants listed their environment of practice and patients' conditions as facilitators. For instance, one participant described that the environment of working with patients through the Workers Compensation Board requires a strong evidence-based background for treatments and that guidelines are able to provide that: "I mean, in this environment we have to be pretty evidence-based I think like anything if you're working in that environment you have to have a certain amount of drive to do that [search for guidelines]" (P05). Several participants agreed that physiotherapists will seek guidelines to further their knowledge if their patients' conditions challenge the therapist's current skills: "I think people will look things up if they, you know, if you have a client that you're not sure, then people will look things up, so I think they will find the resources in that way" (P03).

Overall there was an agreement that guidelines are useful to guide clinical reasoning and treatment planning, as well as educating patients and other health care professionals about the best available care. However, familiarity with guidelines for the management of NSLBP was not consistent and many barriers to guideline implementation were identified, including time management, access to high quality information, and personal biases and interests. Some facilitators were also identified to address some of the barriers and those include the resources provided by the Canadian Physiotherapy Association in a variety of formats, the environment of practice, and patients' characteristics.

Psychosocial factors in NSLBP. Participants talked about the individualities of their NSLBP patients, the variety of factors they perceived to influence patients' recovery and described the physiotherapist's role in the management of NSLBP.

Patients are unique and must be seen as a whole. Participants stressed that patients with NSLBP are quite unique and should be seen as an individual case rather than treated as a group of people with similar characteristics: “I mean, there’s always going to be those people that don’t go as you hope ... not everyone would fall exactly into that picture-perfect diagnosis” (P03). Participants also described that such individuality must be considered in the treatment planning and “you don’t want to start thinking because you got a hammer that everything is something that needs to be hammered” (P06).

There was a consensus that looking at patients from a holistic perspective was necessary to address all the individual characteristics that might be interfering with recovery, which may include physical comorbidities, social, or psychological issues. Participants described that they are frequently not able to directly address all the patient’s needs but they can try “to address any sort of support that I can outside of my own treatment, making sure that they are essentially well within the medical system, well approached to help in a holistic way” (P01).

Psychosocial influences on recovery. Participants identified both positive and negative ways in which psychosocial factors influenced recovery. There was a consensus that the greater the variety of factors present, the more challenging it becomes, often leading to longer treatment times and sometimes having negative impact on the therapist’s confidence:

P07: ... there are always preconceived notions of low back pain and each individual can come with those. If they have psychosocial problems they’re definitely- there can be an increase in a person’s sensation of pain or their ability to recover, which obviously will then make it more challenging as well.

Participants also described that NSLBP patients may have some personal beliefs derived from their past experiences that often create a barrier to recovery. For instance, one participant described how some of his patients believed that physiotherapists must study all of their

diagnostic images prior to engaging in their treatment: “the type of patients that come with their binder and you need to look at my binder first before you need to treat me sort of deal ... it’s those patients that are quite- are much harder to treat” (P04). Another participant exemplified how one patient’s beliefs might be contrary to the therapist’s and hinder the potential for recovery: “she has a very strong personality and she feels that she can orchestrate things herself, but I look at it and think no, not really, she’s really not addressing the things that need to be addressed” (P02).

On the other hand, one participant pointed out how social demands might have a positive influence on recovery when living situations, such as living in a remote community, prevent patients from becoming inactive:

For one thing, it’s much harder to avoid physical activity, which in most ways I think is a benefit because whether or not a person is feeling that they want to restrict their activity, they tend to not restrict; there’s not a lot of social support for restricting your activity (P06).

Similarly, one participant highlighted that health care professionals and the health care system can facilitate recovery by focusing on the functional goals and not reinforcing the beliefs and behaviours associated with the psychosocial issues:

It’s more about not catastrophizing or medicalizing their back pain. That’s important and it’s probably more important with people with, you know, a variety of psychosocial issues ... that tends to help to keep those psychosocial factors more manageable or more at bay (P05).

The role of physiotherapists. Participants explained that managing psychosocial issues is not part of the physiotherapists’ role in the treatment of NSLBP. They described that their

expertise is on treating mechanical causes of pain and although they are trained to identify psychosocial issues, it is out of their scope to intervene on them:

I kind of know my role in it where if I think that most of their symptoms are more coming from psychosocial versus something more mechanical or nerve where I feel like that's where my forte is. So, if I think it's more psychosocial Like that's not my field (P03).

One participant described such situations as daunting as she often feels there is more to be done but she is not prepared to get involved and can only try to support her patients to the best of her abilities: "it's a bit daunting, you know, because you think, oh my gosh, this person needs more than my help You find yourself sort of taking on a role that you hope you're saying the right thing" (P02).

Some participants also agreed that even though physiotherapists do not directly treat psychosocial issues, it is important to listen to the patients' concerns and the conversation alone might be enough to incorporate some psychosocial benefit, although those conversations were not perceived as part of the treatment per se:

I think for most times, like a higher percent of them, they just want to be heard in my opinion because typically they are the ones that are coming in with chronic back pain have seen tons of people so I feel like listening to them and spending more time with them conversation wise is more helpful than the actual treatment itself (P04).

A few participants reported a growing interest in the psychosocial aspects of NSLBP, including a wish for more continuing education resources on understanding those issues as they believed it is also a responsibility of the physiotherapist to identify and understand those issues:

I wish there were more courses to take with regards to understanding psychological and psychosocial and maybe there have been and maybe I've been a little more focused on

my professional development, you know, and thinking that that's going to be somebody else's responsibility, but it is our responsibility, I understand that (P02).

Conversely, several other participants described that their role is to refer patients on to other services if the psychosocial issues are creating a barrier to recovery from NSLBP and interfering with the physiotherapists' treatment plan: "if they [the psychosocial issues] are a barrier to that patient improving then they should be- then I would suggest they get resources, provide external help, maybe counseling or something to help with those if it's an absolute barrier to improvement" (P07).

Overall, participants recognized the need for an individualized and holistic approach to NSLBP patients given the variety of biological, psychological, and social factors that may influence their recovery. Although some participants acknowledged that it is helpful to understand the patient's psychosocial issues, the role of physiotherapists was described as limited to the mechanical aspects of NSLBP as they were not prepared to address the patient's needs in any other way.

Patient education. Participants recognized the importance of educating NSLBP patients and the impact education has on how patients approach the rehabilitation process. Participants identified some strategies they use to include education in their therapeutic environment.

Pain education. Participants described how pain education plays an essential role in LBP recovery, as it allows the therapist to find ways to work around the pain to achieve functional goals. This was particularly pertinent when patients had previous negative experiences with pain or therapy and when the patient was reluctant to engage in activities that resulted in ongoing pain: "if it is simply a patient that has... that has had previous bad experiences with pain often I'll be providing reassurance or talking about pain science" (P07). One participant highlighted

how pain education has become a large component of physiotherapy practice, yet that she had not received any explicit teaching on how to provide this education:

As health care professionals we're often not really taught the basics of teaching ... and some people, like me, have been kind of rolled into teaching without really being aware that it was becoming such a large component of treating people (P06).

Participants identified the relevance of focusing on pain education early in their treatment sessions, sometimes even before delving into physical interventions. Participant P04, for example, described: "the first two or three sessions would be more for educational purposes so less hands on in my opinion, and just talking to them about their pain".

Educated patients take ownership over their issues. Some participants discussed how patient education may influence the patients' attitudes towards the rehabilitation process. For instance, one participant emphasized that patients will decide whether to adhere or not to a treatment plan and that the education provided influenced that decision:

If we can clear up the educational part of what's going on and give people explanations that are within the context of their lives so they can kind of apply functionally, most of them are quite compliant with suggestions because, they're at least trying to do something, and they are actually in control of whether or not they take the advice (P06).

Presenting patients with clear, evidence-based education was a key to achieving positive outcomes; however, some participants cautioned that the language in which education was presented was important in empowering patients:

... people are not as alert as they could be, and this goes for doctors and nurses and physios and whatever that they- we forget that we were taught a language to think and teach in and to communicate with our cohorts with that is not necessarily accessible to

our patients. And what success I've had with a lot of my patients has been more success in translating so they understand what they're actually dealing with (P06).

Overall, there was general agreement among the participants that patient education is of the utmost importance to achieving positive outcomes. Education for NSLBP was often focused on pain science, and should be evidence-based, provided in a clear manner using a language that was familiar to patients, and relevant to their context as to empower them to take ownership over their rehabilitation process.

Balancing active and passive interventions. Participants identified the main goal of physiotherapy for NSLBP and listed some considerations of focusing on an active treatment approach.

Focus is on getting people active. Participants stressed that helping patients with NSLBP to become more active is the primary goal of physiotherapy: "I think the whole issue around, especially non-specific low back pain, is not over-medicalizing it and helping people understand that they, you know, that they really just need to get moving and get stronger" (P05). Some participants highlighted that physiotherapy interventions should focus on promoting exercise and active lifestyles as those have been repeatedly proven effective for NSLBP patients: "if getting more people more active and doing exercise is time and time again on the list that's what we should be doing" (P02). Participants described that it is important that therapists understand the limitations of passive modalities but that a treatment plan that combines both passive modalities and exercise can be useful to assist with the transition to a more active treatment approach for some patients:

I think it's good to have a combination of both, right?! So, I might not necessarily just gonna tell them to do exercise right away. I might introduce, okay so I'm going to use an example here: so, Mr. Smith you've used modalities before and then if they found value

to it then, you know, I might use it for the first two sessions and then wean them off of it and introduce practice in the mean term, so using more of a transitional period per se (P04).

Lastly, a sense of physiotherapist-driven treatment was expressed by some participants when discussing the choice of more active or passive interventions: “I apply the best clinical reasoning process towards their- my impression of their injury” (P01). Yet, participants acknowledged that in some situations they should consider the patients’ current needs and might have to change their treatment plan to accommodate those, which may include not only focusing on active interventions:

... except for those situations where you have somebody who has a major social or psychosocial or socioeconomic crisis going on in which case, they often have to supersede what you thought you might be going to do with that patient (P06).

In general, there was a consensus that the focus of physiotherapists should be placed on active treatment interventions, such as exercise, but some patients might require other types of support, and passive modalities might have their place in a transitional phase for those patients.

Knowing what is and what is not recommended by evidence. Participants talked about their feelings of uncertainty around what is recommended and what is the best approach for each patient and described their strategies to try and overcome those feelings.

Feeling of uncertainty. Participants described they often felt some level of uncertainty when treating patients with NSLBP and that that feeling grew in the presence of psychosocial demands. They described that they often find themselves thinking “how can I best address the needs of these people when I’m not even necessarily sure of it myself?” (P02). One participant brought up the weakness of evidence for those areas and described that he uses a common-sense approach to determine whether or not to use an intervention:

And then there are certain parts of the evidence that are a little bit weaker and, I mean, those are always the grey area with back pain. So, there's a variety of different treatment modalities that you can use but at the end of the day if they're not- you're not getting any kind of improvement and outcomes then really you shouldn't be using, you know, those modalities (P05).

Another participant explained that some of his less experienced peers used a trial and error approach to NSLBP treatment given the uncertainty of the evidence:

You know, I've had a lot of my classmates that tell me 'oh, we used to do a bunch of stuff until one works', right, but if you do a bunch of stuff, you don't really know what's working, right?! (P04).

Physiotherapists take responsibility for their practice. Participants described that they have a responsibility of reflecting on their own practice and identifying the gaps that might need improvement, including the constant search for answers to best meet the needs of their patients: "I honestly think it's on each clinician to reflect on their practice and to know maybe where they're weak and where they're strong and where they can spend more of their time improving themselves" (P03). There was an agreement that physiotherapists must be primarily evidence-based and that entailed an ongoing life-long process of learning:

... you can't lose the ability to check what you're doing against what you know is scientifically defensible at this point, you know, and that means that, you know, next year when another couple of studies come out and they start showing something that we hadn't quite thought of that yet you have to know that too (P06).

Continuing education was described as a core strategy to remain updated with the evidence and further physiotherapists' knowledge and experiences in NSLBP: "I think it's just a matter of continually speaking about cases and mentorship with current coworkers and

colleagues and regular attendance to conferences here and there. I think it's just making sure you're on top of things" (P01).

Finally, although participants acknowledged that there will always be room for improvement in clinical practice, they did not identify any drastic changes to be made in order to better support their NSLBP patients with psychosocial demands, but described that remaining up-to-date with the evidence is necessary and reported they would be open to changing their practice accordingly:

I think for now I don't see a real need [for change] but that could change, right, depending on what new evidence comes out. Sometimes it changes with respect to the advice that we give people around other interventions that they might be seeking ... certain things around active based treatment and what you do and what you don't do certainly evolves and changes over time. So, for now I feel like yes things are pretty current but certainly it evolves over time (P05).

Overall there was a consensus that there is some level of uncertainty in the management of NSLBP and experience must be used hand-in-hand with evidence. However, no immediate need for change was identified in practice.

Discussion

The objectives of this study were to: (1) describe Canadian physiotherapists' adherence to EBCPG recommendations regarding the management of NSLBP when psychosocial factors are present; (2) to compare attitudes and beliefs towards back pain and self-efficacy towards implementing evidence-based practice between higher- and lower-adherence groups; (3) to identify predictors of adherence; and (4) to understand physiotherapists' satisfaction with the care provided and to identify perceptions of need for change in practice.

Results demonstrate that Canadian physiotherapists largely adhere to EBCPG recommendations when treating patients with NSLBP and associated psychosocial demands, with 77% of respondents demonstrating higher-adherence. That approaches the behaviour of physiotherapists from New Zealand (Hendrick et al., 2013) whose advice to return to work, return to usual activities, and avoid bed rest were considered at least broadly in line with guideline recommendations 87% to 95% of the time. In our survey, 96.2% of respondents provided some type of education to prevent disability development, which included advice to maintain or pursue an active lifestyle and early return to work and usual activities.

On the other hand, our findings contrast with studies performed in the United States (Ladeira et al., 2017) and Brazil (de Souza et al., 2017) where only 29.5% and 48.5% of respective participating physiotherapists selected treatment options for NSLBP patients with associated psychosocial factors that were in line with EBCPG recommendations. However, those studies followed the APTA guidelines (Delitto et al., 2012) only and assessed whether or not physiotherapists selected two mandatory interventions to address the demands of the described patient: a) education to address negative affective tendencies (i.e., kinesiophobia); and b) education to pursue or maintain an active lifestyle. Those options were also considered correct answers in our study under the a) addressing psychosocial demands and b) preventing disability

development criteria for adherence to guideline recommendations as previously described. In our Canadian sample, the proportion of physiotherapists adherent to recommending the specific items to address psychosocial demands (i.e., education to address negative affective tendencies or refer to multimodal rehabilitation with physical and psychological interventions) was 29.5%, making our results very similar to the American study (Ladeira et al., 2017) in that regard. Overall, Canadian physiotherapists were highly adherent to EBCPG recommendations for NSLBP, especially regarding education to prevent disability development and providing exercise-focused programs. However, when it comes to addressing psychosocial demands, there is still a lot of room for improvement in Canadian practice.

Interviewed Manitoban physiotherapists described that their role in the management of NSLBP was to focus on the physical causes of pain. Although our interview findings reinforced that physiotherapists understand the influence of multiple factors in NSLBP recovery (O'Sullivan et al., 2016; O'Sullivan, Smith, Beales, & Straker, 2017; Sanders, Foster, Bishop, & Ong, 2013), tackling psychosocial issues was considered outside the scope of physiotherapists' practice. Patient conversations that provide the therapist with an understanding of the patients' context and may incorporate some psychosocial benefit (Alexanders, Anderson, & Henderson, 2015; Ferreira et al., 2013; Pinto et al., 2012) are not considered by physiotherapists to be part of their treatment. Further, the study of Singla, Jones, Edwards, and Kumar (2015) as well as the review of Synnott et al. (2015) have identified that physiotherapists often feel unprepared to address the multidimensional aspects of NSLBP, particularly in relation to psychosocial issues. Our qualitative findings support this feeling of unpreparedness among physiotherapists to face psychosocial demands in NSLBP patients and highlight the issue of uncertainty physiotherapists have regarding the best course of treatment for each individual case in light of inconclusive and sometimes contradictory evidence. Nevertheless, the proportion of Canadian physiotherapists in

our study who chose non-recommended interventions (18.5%) was nearly half of the 40% identified in Sweden (Bernhardsson et al., 2015) and Brazil (de Souza et al., 2017). That indicates that in spite of the uncertainty expressed by Canadian physiotherapists, they tend to limit the use of passive interventions that are not recommended for NSLBP more frequently than Swedish and Brazilian physiotherapists.

Regarding beliefs and attitudes towards NSLBP, results demonstrate that Canadian physiotherapists who had a lower adherence to EBCPGs also had stronger biomedical and weaker behavioural beliefs than their peers who demonstrated higher adherence to EBCPG recommendations. A comparable relationship between beliefs and advice to return to work was identified among a sample of physiotherapists and general practitioners in the United Kingdom (A. Bishop et al., 2008); the higher the biomedical and the lower the behavioural beliefs scores, the more likely clinicians were to advise NSLBP patients to stay off work, advice which contradicts EBCPGs. Different beliefs have also been studied and identified among physiotherapists of varying ages, levels of post-graduate training, and practice settings (private vs. public) in Quebec (Derghazarian & Simmonds, 2011; Simmonds, Derghazarian, & Vlaeyen, 2012). However, to the best of our knowledge, this is the first study to compare biomedical and behavioural beliefs towards NSLBP between groups of physiotherapists with higher- and lower-adherence to EBCPGs. Hendrick et al. (2013) attempted to investigate such a relationship among physiotherapists in New Zealand but were unable to obtain a sufficiently powerful comparison due to the highly adherent study sample.

Biomedical beliefs among Canadian physiotherapists in our study, regardless of their adherence to guidelines, were at least five points lower than the median possible score of 35 and weaker than those reported for physiotherapists from Quebec (Simmonds et al., 2012), Brazil (Magalhães, Costa, Cabral, & Machado, 2012), New Zealand (Hendrick et al., 2013), Norway

(Eland, Kvåle, Ostelo, de Vet, & Strand, 2019), and the Netherlands (Houben et al., 2005).

Behavioural beliefs were similar to the samples in those same studies. Furthermore, behavioural beliefs from the higher-adherence group (35.4; possible range 9-54) in our study were stronger than those identified in all the studies previously mentioned, with the exception of the results from the Netherlands (37.5; Houben et al., 2005). Since the biomedical scores in our sample were lower than previous studies and lower than the middle point of the scale, and the behavioural scores were at least at the middle point of the scale, we can presume that the obsolete conception that NSLBP is consistently related to tissue damage has been replaced by a more contemporary understanding of the multifactorial components of NSLBP among Canadian physiotherapists.

The use of the EPIC scale to compare self-efficacy towards evidence-based practice between physiotherapists with higher and lower adherence to EBCPG recommendations was another novel characteristic of our study. No differences were observed between the groups, however overall self-efficacy among Canadian physiotherapists was generally high and very similar to that observed in samples of physiotherapists (Salbach et al., 2013) and occupational therapists (Clyde, Brooks, Cameron, & Salbach, 2016) from Ontario. Furthermore, the mean self-efficacy of about 70% identified in our study was higher than the baseline self-efficacy of 56% observed in a sample of Californian physiotherapists (Tilson et al., 2016). Although the identified overall self-efficacy in engaging in evidence-based practice could be considered good, it appears to not be a determinant in whether or not Canadian physiotherapists engage in the use of EBCPGs. Our results put into question whether Canadian physiotherapists perceive the use of EBCPGs as a component of evidence-based practice; interviews revealed that some physiotherapists confuse guidelines with other terms and concepts such as clinical pathways or patient classification systems, and they do not consider being knowledgeable of guidelines part

of the professional development process. This identifies a potential gap in physiotherapists' understanding of EBCPGs and a possible important area to address with knowledge translation initiatives, particularly by guideline development groups in their process of dissemination of the knowledge tools.

Our regression model identified that the greatest impact on adherence to EBCPG recommendations was predicted by possessing post-graduate training. Alone, having at least one area of post-graduate training made physiotherapists 431% more likely to be highly-adherent to guideline recommendations; when controlling for the other variables, therapists who had at least one area of post-graduate training were still 194% more likely to have higher adherence. A comparable relationship has been described among American physiotherapists (Ladeira et al., 2017). Similarly, with all else being equal, having a one-point higher biomedical beliefs score on the PABS-PT questionnaire reflected a 10% lower likelihood of being highly adherent to EBCPGs. That contrasts with the findings of Hendrick et al. (2013) that stronger biomedical beliefs were the only significant predictor of perceiving guidelines as helpful in the decision making process for physiotherapists in New Zealand. However, a more recent systematic review by Gardner et al. (2017) agrees with our findings and concluded that stronger biomedical beliefs were associated with recommendations to delay return to work and activities, extended treatment length, and perceptions of harmfulness in daily activities, none of which are recommended by EBCPGs.

As expected per the theory of planned behaviour (Conner & Sparks, 2005), physiotherapists' intention to engage in the use of EBCPGs resulted in an 8.2% greater likelihood of being highly-adherent to guideline recommendations, when all other variables remained the same. However, the low power of this prediction (0.47) and the fact that intention to engage in the use of EBCPGs was not linearly related with the log odds of the independent

variable and required a transformation may suggest a more complex relationship with the covariates and adherence to EBCPGs. Further study in this area is warranted.

An additional indication of a more complex relationship among variables is the fact that subjective norms was not a significant predictor of adherence on their own but became significant in the presence of other covariates. This variable also showed a direction of influence contrary to what would be expected: a one-unit increase in therapists' subjective norms score (i.e., perceiving greater pressure to engage in the use of guidelines and perceiving their peers and superiors to use guidelines) resulted in a 20% lower likelihood of being highly-adherent to EBCPGs with all other variables held constant. In contrast with that is the interviewees' perception that mentorship and peer-support are helpful strategies to remain up to date with the evidence and could facilitate implementation of EBCPGs. Accordingly, a recently published series of focus groups (Klaic, Mcdermott, & Haines, 2019) identified that Australian allied health professionals, including physiotherapists, presented low normative beliefs in relation to their workplace (i.e., they believed their workplace does not value evidence-based practice) but higher normative beliefs towards their patients and caregivers (i.e., they believed patients and caregivers expected them to be knowledgeable and able to explain why they are using one treatment over the other). That also speaks to our qualitative findings, as participants identified inquisitive patients and those with signs or symptoms that are new to the therapist as a source of their interest to seek knowledge, and a catalyst for physiotherapists to remain up to date with EBCPGs. This suggests that patient-centred care creates an environment that encourages evidence-based practice.

Although not statistically significant when controlling for other variables in the model, being familiar with guidelines for NSLBP and having a post-professional degree were associated with a 70% increase in likelihood of being highly-adherent to EBCPG recommendations. Ladeira

et al. (2017), Bernhardsson et al. (2014), and Hendrick et al. (2013) identified similar relationships among American, Swedish, and New Zealander physiotherapists. On the other hand, years of clinical experience and self-efficacy in pursuing the steps of evidence-based practice, as measured by the EPIC scale, did not appear to have any impact on adherence to guidelines for NSLBP. Previous findings have demonstrated, however, that health care professionals' age and years of experience influence their decision to use EBCPGs or not, with older and more experienced professionals often relying more on experiential evidence (Bernhardsson et al., 2014; Francke, Smit, de Veer, & Mistiaen, 2008). Further, Bernhardsson et al. (2014) identified that physiotherapists' confidence in their ability to find useful research evidence and treat patients accordingly, as well as having a positive attitude towards EBCPGs were related to higher reporting of guidelines use. Those relationships were not confirmed among our participants which points to either individuals' social desirability bias when reporting on EBCPGs use or potential misconceptions around the use of the term "guidelines".

Interviewed Manitoban physiotherapists reported a high level of satisfaction with the support they have been providing to their NSLBP patients. Although physiotherapists reported their confidence was affected by the presence of patients' psychosocial issues, their satisfaction seemed not to be as impacted. Positive outcomes and patient feedback were reported as the source of physiotherapists' satisfaction with the support they provided. Patients expect physiotherapy treatment for NSLBP to involve education, listening, pain relief, and a friendly environment (Toms & Salvatore, 2017), and those factors have also been associated with patients' satisfaction (Ali & May, 2017; Henschke, Wouda, Maher, Hush, & van Tulder, 2013; Hinchliffe & Lavin, 2018). While our survey responses and interviews revealed an extensive coverage of educational aspects and relief of physically-sourced pain, interviewees did not

consider listening as part of the physiotherapy treatment and did not discuss their perception of the impact of the therapeutic environment on outcomes.

No need for immediate change in Manitoban physiotherapy practice was identified by participants. At the time of interview, physiotherapists did not know that only 30% of survey respondents across Canada addressed the psychosocial demands of the patient described in the vignette; and we do not know whether interviewees had addressed it or not as survey data were not linked directly with the physiotherapists who were interviewed. Interviewees described the role of the physiotherapist as something apart from dealing with psychosocial demands. This depicts an image of outdated physiotherapy care wherein non-physical issues are not worthy of attention, which goes against the biopsychosocial model of care for NSLBP. Although not trained to intervene in psychological disorders or social issues, physiotherapists as primary care providers might be the only health care professional with enough direct and continuous patient contact hours to be able to identify potential issues that may interfere with recovery and guide patients towards appropriate management (Guilcher, 2018; Hartley, 2018). The role of the physiotherapy profession has evolved and continues to do so as health services change towards a holistic and patient-centred approach for the non-surgical management of long-term conditions such as NSLBP (Hartley, 2018). Therefore, physiotherapists should be intimately familiar with knowledge tools such as EBCPGs to remain up to date with evidence and be open to expanding their skill set to be able to provide the highest quality care for NSLBP patients.

Practice Recommendations

Recommendation 1. EBCPG development groups, educational institutions, and professional associations should provide clear education to physiotherapists about what guidelines are and the benefits of using them. Professional associations and regulatory bodies

should take on the responsibility of sharing up to date guidelines with their members as a means to increase awareness and indirectly influence clinicians' intention to apply EBCPGs.

Recommendation 2. Provincial regulatory bodies' continuous competence programs should strongly encourage and perhaps require post-graduate training among physiotherapists, including how to identify and address psychosocial demands in order to better support NSLBP patients with issues, as recommended by EBCPGs.

Recommendation 3. Professional associations and educational institutions should circulate self-assessment tools, such as the PABS questionnaire, to their members and graduates so that physiotherapists can become aware of their personal beliefs and biases that may influence professional choices and ultimately affect patient treatment.

Limitations

First, the study sample was different from the physiotherapist population of Canada as described by the CIHI (2017) in several aspects: age, sex, and province of practice. Survey respondents were younger, which is potentially more representative of a sub-population who might be more comfortable with accessing electronic resources (such as EBCPGs) than their older counterparts, and therefore we may have overestimated the familiarity and use of those resources. Our sample contained more males than the national physiotherapist population; however, a sub-group analyses indicated that that would not likely have influenced the results of this study. The distribution of respondents across Canadian provinces and territories was a likely consequence of two main factors: the stronger engagement in distribution of survey invitations among the regulatory bodies of the prairie provinces (i.e., Alberta, Manitoba, and Saskatchewan) and the fact that the survey was only available in English; francophone physiotherapists were unable or may have felt discouraged to participate due to the language barrier. A sub-group analysis revealed a number of discrepancies among different provinces, which could be an

indicator of different standards of practice or education across the country, or simply a result of regional barriers to accessing resources. We used weighted statistical analyses to account for those differences across provinces of practice. Further, self-selection bias might have generated a sample with greater interest in the topic, which might have led to a more knowledgeable sample and overestimated positive adherence results.

Our approach might have oversimplified the complexity of the behaviour of interest, i.e., adherence to EBCPG recommendations, which may have influenced the results in either a positive or a negative way. Additionally, our survey only included one vignette; it consisted of a specific case of sub-acute NSLBP with kinesiophobic and fear-avoidant behaviours, which limits the generalization of findings to cases of NSLBP with more or less severe psychosocial issues. Also, adherence was assessed based on criteria developed for this study, in accordance with three EBCPGs and a review of EBCPGs, none of which appear to have been extensively disseminated across Canada given the survey respondents' low familiarity with them. Furthermore, our results are based on self-reported measures of treatment choices. We cannot guarantee that responses are reflective of real practice behaviour since individuals tend to report on what they believe to be an expected behaviour – i.e., social desirability bias (Althubaiti, 2016).

Phone interviews were generally short and conducted by a novice interviewer. That might have led to missed opportunities to delve into relevant topics due to a lack of experience; however common themes and ideas were noted across participants. Because of a low response rate among the lower-adherent physiotherapists, all but one of the interviewees were physiotherapists with higher-adherence to EBCPGs based on our survey. Had the participants been from the lower-adherence group, their perceptions could have been different and other themes could have emerged. Interview participants were all from Manitoba and therefore, their

perceptions might not be transferable to physiotherapists from other areas of Canada or other countries.

Future Research Directions

Larger and more equally distributed samples are required to assess other variables and develop a stronger, more comprehensive predictive model of adherence for Canadian physiotherapists. Implementation research should assess which methods of EBCPG dissemination are more effective in increasing awareness and use among Canadian physiotherapists, particularly those with lower adherence to recommendations. Additionally, further investigation of what is taught in entry level physiotherapy educational programs and the reasons why clinicians believe it is not their responsibility to address psychosocial demands is warranted. Participatory research could assist in identifying means to prompt greater interest in and familiarity with EBCPGs among physiotherapists with lower adherence to recommendations. Finally, to ensure an effective patient-centred experience for Canadian NSLBP patients, their perspectives regarding the use of EBCPGs by their therapists should be considered in implementation research.

Conclusion

Canadian physiotherapists largely adhere to EBCPG recommendations when managing NSLBP; however, patients' psychosocial demands are not as often addressed in, or even considered part of, the scope of practice of the physiotherapist. Physiotherapists' beliefs towards NSLBP determine their treatment choices, with stronger biomedical beliefs being predictive of lower adherence to EBCPGs. Self-efficacy towards evidence-based practice does not directly influence adherence to recommendations, but continued education (i.e., post-graduate training and post-professional degrees) contributes positively to the likelihood of adherence. Psychosocial demands of patients with NSLBP are perceived as challenging, and influence Manitoban physiotherapists' confidence, but do not interfere with their satisfaction with the support provided to those patients. Physiotherapists do not perceive any immediate need for changes in practice but do take personal responsibility for remaining up to date with evidence and describe themselves as open to future changes as evidence evolves. Based on the findings of this study, we recommend that: (1) EBCPG development groups, educational institutions, and professional associations provide clear education to physiotherapists about guidelines and take on the responsibility of sharing up to date EBCPGs with clinicians; (2) provincial regulatory bodies' continuous competence programs be enforced to stimulate post-graduate training among physiotherapists, including how to identify and address psychosocial demands; and (3) professional associations and educational institutions circulate self-assessment tools to their members and graduates generating awareness of personal beliefs and biases that may influence professional choices and patient treatment.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Alexanders, J., Anderson, A., & Henderson, S. (2015). Musculoskeletal physiotherapists' use of psychological interventions: A systematic review of therapists' perceptions and practice. *Physiotherapy*, 101(2), 95–102. <https://doi.org/10.1016/j.physio.2014.03.008>
- Ali, N., & May, S. (2017). A Qualitative Study into Egyptian Patients' Satisfaction with Physiotherapy Management of Low Back Pain. *Physiotherapy Research International*, 22(2), e1647. <https://doi.org/10.1002/pri.1647>
- Althubaiti, A. (2016). Information bias in health research: Definition, pitfalls, and adjustment methods. *Journal of Multidisciplinary Healthcare*, 9, 211–217. <https://doi.org/10.2147/JMDH.S104807>
- Amsterdam Public Health (APH). (2015, May 12). Handling missing data. Retrieved January 22, 2019, from Amsterdam Public Health—Quality handbook website: <http://www.emgo.nl/kc/handling-missing-data/>
- Andersson, G. B. J. (1998). Epidemiology of low back pain. *Acta Orthopaedica Scandinavica*, 69(sup 281), 28–31. <https://doi.org/10.1080/17453674.1998.11744790>
- Andersson, H. I., Ejlertsson, G., Leden, I., & Rosenberg, C. (1993). Chronic pain in a geographically defined general population: Studies of differences in age, gender, social class, and pain localization. *Journal of Pain*, 9(3), 174–182.
- Andresen, E. M. (2000). Criteria for assessing the tools of disability outcomes research. *Archives of Physical Medicine and Rehabilitation*, 81, S15–S20. <https://doi.org/10.1053/apmr.2000.20619>

- Australian Acute Musculoskeletal Pain Guidelines Group. (2004). *Evidence-based management of acute musculoskeletal pain: A guide for clinicians*. Retrieved from <http://ccpor.ca/wp-content/uploads/Evidenced-Based-Management-of-Acute-Musculoskeletal-Pain-2004.pdf>
- Bailly, F., Foltz, V., Rozenberg, S., Fautrel, B., & Gossec, L. (2015). The impact of chronic low back pain is partly related to loss of social role: A qualitative study. *Joint Bone Spine*, 82(6), 437–441. <https://doi.org/10.1016/j.jbspin.2015.02.019>
- Bandura, A., O’Leary, A., Taylor, C. B., Gauthier, J., & Gossard, D. (1987). Perceived Self-Efficacy and Pain Control: Opioid and Nonopioid Mechanisms. *Journal of Personality*, 53(3), 563–571.
- Beaudet, N., Courteau, J., Sarret, P., & Vanasse, A. (2013). Prevalence of claims-based recurrent low back pain in a Canadian population: A secondary analysis of an administrative database. *BMC Musculoskeletal Disorders*, 14(1), 151. <https://doi.org/10.1186/1471-2474-14-151>
- Bekkering, G., Hendriks, H., Koes, B., Oostendorp, R., Ostelo, R., Thomassen, J., & van Tulder, M. (2003). Dutch physiotherapy guidelines for low back pain. *Physiotherapy*, 89(2), 82–96. [https://doi.org/10.1016/S0031-9406\(05\)60579-2](https://doi.org/10.1016/S0031-9406(05)60579-2)
- Bernhardsson, S., Johansson, K., Nilsen, P., Öberg, B., & Larsson, M. E. (2014). Determinants of guideline use in primary care physical therapy: A cross-sectional survey of attitudes, knowledge, and behavior. *Physical Therapy*, 94(3), 343–354.
- Bernhardsson, S., Öberg, B., Johansson, K., Nilsen, P., & Larsson, M. E. H. (2015). Clinical practice in line with evidence? A survey among primary care physiotherapists in western Sweden. *Journal of Evaluation in Clinical Practice*, 21(6), 1169–1177. <https://doi.org/10.1111/jep.12380>

- Bérubé, M.-È., Poitras, S., Bastien, M., Laliberté, L.-A., Lacharité, A., & Gross, D. P. (2018). Strategies to translate knowledge related to common musculoskeletal conditions into physiotherapy practice: A systematic review. *Physiotherapy, 104*(1), 1–8. <https://doi.org/10.1016/j.physio.2017.05.002>
- Bigos, S. J., Bowyer, O. R., Braen, G. R., Brown, K. C., Deyo, R. A., Haldeman, S., ... Weinstein, J. (1994, December). *Clinical practice guideline number 14: Acute low back problems in adults*. Retrieved from <https://www.chirobase.org/07Strategy/AHCPR/clinicians.pdf>
- Bishop, A. (2010). Pain Attitudes and Beliefs Scale (PABS). *Journal of Physiotherapy, 56*(4), 279. [https://doi.org/10.1016/S1836-9553\(10\)70014-X](https://doi.org/10.1016/S1836-9553(10)70014-X)
- Bishop, A., Foster, N. E., Thomas, E., & Hay, E. M. (2008). How does the self-reported clinical management of patients with low back pain relate to the attitudes and beliefs of health care practitioners? A survey of UK general practitioners and physiotherapists: *Pain, 135*(1), 187–195. <https://doi.org/10.1016/j.pain.2007.11.010>
- Bishop, A., Thomas, E., & Foster, N. E. (2007). Health care practitioners' attitudes and beliefs about low back pain: A systematic search and critical review of available measurement tools. *Pain, 132*(1), 91–101. <https://doi.org/10.1016/j.pain.2007.01.028>
- Bishop, F. L., Dima, A. L., Ngui, J., Little, P., Moss-Morris, R., Foster, N. E., & Lewith, G. T. (2015). “Lovely pie in the sky plans”: A qualitative study of clinicians' perspectives on guidelines for managing low back pain in primary care in England. *Spine, 40*(23), 1842–1850. <https://doi.org/10.1097/BRS.0000000000001215>
- Bone and Joint Canada. (n.d.). Low Back Pain. Retrieved May 18, 2018, from Bone and Joint Canada website: <http://boneandjointcanada.com/low-back-pain/>

- Braun, V. (2013). *Successful qualitative research: A practical guide for beginners*. London: SAGE.
- Brouwers, M. C., Stacey, D., & O'Connor, A. (2013). Knowledge translation tools. In S. E. Straus, J. Tetroe, & I. D. Graham (Eds.), *Knowledge translation in health care: Moving from evidence to practice* (2nd ed., pp. 50–62). Chichester, West Sussex: Wiley BMJIBooks.
- Brunner, E., Probst, M., Meichtry, A., Luomajoki, H., & Dankaerts, W. (2016). Comparison of clinical vignettes and standardized patients as measures of physiotherapists' activity and work recommendations in patients with non-specific low back pain. *Clinical Rehabilitation*, 30(1), 85–94. <https://doi.org/10.1177/0269215515570499>
- Canadian Institute for Health Information (CIHI). (2017, December 7). *Physiotherapists, 2016: Data Tables*. Retrieved from <https://secure.cihi.ca/estore/productFamily.htm?locale=en&pf=PFC3600&media=0>
- Canadian Institutes of Health Research (CIHR). (2005, October 27). Knowledge translation—CIHR. Retrieved April 8, 2018, from Canadian Institutes of Health Research website: <http://www.cihr-irsc.gc.ca/e/29418.html>
- Canadian Physiotherapy Association (CPA). (2018). *Media kit 2018*. Retrieved from Canadian Physiotherapy Association website: https://physiotherapy.ca/sites/default/files/cpa_media_kit_2018_final.pdf
- Carpenter, C., & Suto, M. (2008). *Qualitative research for occupational and physical therapists: A practical guide*. Oxford ; Ames, Iowa: Blackwell Pub.
- Cassidy, J. D., Côté, P., Carroll, L. J., & Kristman, V. (2005). Incidence and course of low back pain episodes in the general population. *Spine*, 30(24), 2817–2823. <https://doi.org/10.1097/01.brs.0000190448.69091.53>

- Chenot, J.-F., Greitemann, B., Kladny, B., Petzke, F., Pflingsten, M., & Schorr, S. G. (2017). Clinical practice guideline: Non-specific low back pain. *Deutsches Arzteblatt Online*, *114*, 883–890. <https://doi.org/10.3238/arztebl.2017.0883>
- Childs, J. D., Fritz, J. M., Wu, S. S., Flynn, T. W., Wainner, R. S., Robertson, E. K., ... George, S. Z. (2015). Implications of early and guideline adherent physical therapy for low back pain on utilization and costs. *BMC Health Services Research*, *15*(1), 150–159. <https://doi.org/10.1186/s12913-015-0830-3>
- Clyde, J. H., Brooks, D., Cameron, J. I., & Salbach, N. M. (2016). Validation of the Evidence-Based Practice Confidence (EPIC) Scale With Occupational Therapists. *American Journal of Occupational Therapy*, *70*(2), 7002280010p1. <https://doi.org/10.5014/ajot.2016.017061>
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155–159.
- Committee to Advise the Public Health Service on Clinical Practice Guidelines. (1990). *Clinical Practice Guidelines: Directions for a New Program* (M. J. Field & K. N. Lohr, Eds.). <https://doi.org/10.17226/1626>
- Conner, M., & Sparks, P. (2005). Theory of planned behaviour and health behaviour. In M. Conner & P. Norman (Eds.), *Predicting health behaviour: Research and practice with social cognition models* (2nd ed.). Maidenhead, England; New York: Open University Press.
- Coupé, V. M. H., van Hooff, M. L., de Kleuver, M., Steyerberg, E. W., & Ostelo, R. W. J. G. (2016). Decision support tools in low back pain. *Best Practice & Research Clinical Rheumatology*, *30*(6), 1084–1097. <https://doi.org/10.1016/j.berh.2017.07.002>

- Coury, H. J. C. G., & Vilella, I. (2009). Profile of the Brazilian physical therapy researcher. *Brazilian Journal of Physical Therapy, 13*(4), 356–363. <https://doi.org/10.1590/S1413-35552009005000048>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks: SAGE Publications.
- da Silva, T., Mills, K., Brown, B. T., Herbert, R. D., Maher, C. G., & Hancock, M. J. (2017). Risk of recurrence of low back pain: A systematic review. *Journal of Orthopaedic & Sports Physical Therapy, 47*(5), 305–313. <https://doi.org/10.2519/jospt.2017.7415>
- Dagenais, S., Caro, J., & Haldeman, S. (2008). A systematic review of low back pain cost of illness studies in the United States and internationally. *The Spine Journal, 8*(1), 8–20. <https://doi.org/10.1016/j.spinee.2007.10.005>
- Davies, S., Quintner, J., Parsons, R., Parkitny, L., Knight, P., Forrester, E., ... Schug, S. A. (2011). Preclinic group education sessions reduce waiting times and costs at public pain medicine units. *Pain Medicine, 12*(1), 59–71. <https://doi.org/10.1111/j.1526-4637.2010.01001.x>
- de Souza, F. S., Ladeira, C. E., & Costa, L. O. P. (2017). Adherence to back pain clinical practice guidelines by Brazilian physical therapists: A cross-sectional study. *Spine (03622436), 42*(21), E1251–E1258. <https://doi.org/10.1097/BRS.0000000000002190>
- Delitto, A., George, S. Z., Van Dillen, L., Whitman, J. M., Sowa, G., Shekelle, P., ... Godges, J. J. (2012). Low back pain: Clinical practice guidelines linked to the international classification of functioning, disability, and health from the orthopaedic section of the American Physical Therapy Association. *Journal of Orthopaedic & Sports Physical Therapy, 42*(4), A1–A57. <https://doi.org/10.2519/jospt.2012.42.4.A1>

- Derghazarian, T., & Simmonds, M. J. (2011). Management of low back pain by physical therapists in Quebec: How are we doing? *Physiotherapy Canada*, 63(4), 464–473. <https://doi.org/10.3138/ptc.2010-04P>
- Downie, A. S., Hancock, M. J., Rzewuska, M., Williams, C. M., Lin, C.-W. C., & Maher, C. G. (2016). Trajectories of acute low back pain: A latent class growth analysis. *PAIN*, 157(1), 225–234. <https://doi.org/10.1097/j.pain.0000000000000351>
- Eccles, M. P., Grimshaw, J. M., Johnston, M., Steen, N., Pitts, N. B., Thomas, R., ... Walker, A. (2007). Applying psychological theories to evidence-based clinical practice: Identifying factors predictive of managing upper respiratory tract infections without antibiotics. *Implementation Science*, 2, 26. <https://doi.org/10.1186/1748-5908-2-26>
- Eccles, M. P., Grimshaw, J. M., MacLennan, G., Bonetti, D., Glidewell, L., Pitts, N. B., ... Johnston, M. (2012). Explaining clinical behaviors using multiple theoretical models. *Implementation Science*, 7, 99. <https://doi.org/10.1186/1748-5908-7-99>
- Eccles, M. P., Grimshaw, J. M., Walker, A., Johnston, M., & Pitts, N. B. (2005). Changing the behavior of healthcare professionals: The use of theory in promoting the uptake of research findings. *Journal of Clinical Epidemiology*, 58(2), 107–112. <https://doi.org/10.1016/j.jclinepi.2004.09.002>
- Eland, N. D., Kvåle, A., Ostelo, R. W. J. G., de Vet, H. C. W., & Strand, L. I. (2019). Discriminative Validity of the Pain Attitudes and Beliefs Scale for Physical Therapists. *Physical Therapy*, 99(3), 339–353. <https://doi.org/10.1093/ptj/pzy139>
- Eland, N. D., Kvåle, A., Ostelo, R. W. J. G., & Strand, L. I. (2017). The pain attitudes and beliefs scale for physiotherapists: Dimensionality and internal consistency of the norwegian version. *Physiotherapy Research International*, 22(4), e1670. <https://doi.org/10.1002/pri.1670>

- Emanuel, B., André, M., O'Sullivan, K., Baldew, S.-S., Wim, D., & Michel, P. (2018). Factor structure of the German version of the pain attitudes and beliefs scale for physiotherapists. *Physiotherapy Theory and Practice*, 1–9. <https://doi.org/10.1080/09593985.2018.1461285>
- Fairbank, J. M., Gwilym, S. E., France, J. C., Daffner, S. D., Dettori, J., Hermsmeyer, J. B., & Andersson, G. (2011). The role of classification of chronic low back pain. *Spine*, 36(21S), S19–S42. <https://doi.org/10.1097/BRS.0b013e31822ef72c>
- Ferreira, P. H., Ferreira, M. L., Maher, C. G., Refshauge, K. M., Latimer, J., & Adams, R. D. (2013). The Therapeutic Alliance Between Clinicians and Patients Predicts Outcome in Chronic Low Back Pain. *Physical Therapy*, 93(4), 470–478. <https://doi.org/10.2522/ptj.20120137>
- Foster, N. E., Anema, J. R., Cherkin, D., Chou, R., Cohen, S. P., Gross, D. P., ... Woolf, A. (2018). Prevention and treatment of low back pain: Evidence, challenges, and promising directions. *The Lancet*. [https://doi.org/10.1016/S0140-6736\(18\)30489-6](https://doi.org/10.1016/S0140-6736(18)30489-6)
- Foster, N. E., Hill, J. C., O'Sullivan, P., & Hancock, M. (2013). Stratified models of care. *Best Practice & Research Clinical Rheumatology*, 27(5), 649–661. <https://doi.org/10.1016/j.berh.2013.10.005>
- Francke, A. L., Smit, M. C., de Veer, A. J., & Mistiaen, P. (2008). Factors influencing the implementation of clinical guidelines for health care professionals: A systematic meta-review. *BMC Medical Informatics and Decision Making*, 8(1), 38. <https://doi.org/10.1186/1472-6947-8-38>
- Freburger, J. K., Holmes, G. M., Agans, R. P., Jackman, A. M., Darter, J. D., Wallace, A. S., ... Carey, T. S. (2009). The rising prevalence of chronic low back pain. *Archives of Internal Medicine*, 169(3), 251–258. <https://doi.org/10.1001/archinternmed.2008.543>

- Froud, R., Patterson, S., Eldridge, S., Seale, C., Pincus, T., Rajendran, D., ... Underwood, M. (2014). A systematic review and meta-synthesis of the impact of low back pain on people's lives. *BMC Musculoskeletal Disorders*, *15*, 50. <https://doi.org/10.1186/1471-2474-15-50>
- Fullen, B. M., Baxter, G. D., Doody, C., Daly, L. E., & Hurley, D. A. (2011). General practitioners' attitudes and beliefs regarding the management of chronic low back pain in Ireland: A cross-sectional national survey. *Journal of Pain*, *27*(6), 542–549. <https://doi.org/10.1097/AJP.0b013e31821771e2>
- Gardner, T., Refshauge, K., Smith, L., McAuley, J., Hübscher, M., & Goodall, S. (2017). Physiotherapists' beliefs and attitudes influence clinical practice in chronic low back pain: A systematic review of quantitative and qualitative studies. *Journal of Physiotherapy*, *63*(3), 132–143. <https://doi.org/10.1016/j.jphys.2017.05.017>
- Global Burden of Disease Collaborative Network. (2017). *Global Burden of Disease Study 2016 (GBD 2016) Results*. Retrieved from <http://ghdx.healthdata.org/gbd-results-tool>
- Godin, G., Bélanger-Gravel, A., Eccles, M., & Grimshaw, J. (2008). Healthcare professionals' intentions and behaviours: A systematic review of studies based on social cognitive theories. *Implementation Science*, *3*, 36. <https://doi.org/10.1186/1748-5908-3-36>
- Government of Canada. (2005, May 16). Canada Health Act—Frequently Asked Questions. Retrieved May 18, 2018, from <https://www.canada.ca/en/health-canada/services/health-care-system/canada-health-care-system-medicare/canada-health-act-frequently-asked-questions.html#a3>
- Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions*, *26*(1), 13–24. <https://doi.org/10.1002/chp.47>

- Grimshaw, J. M., Eccles, M. P., Lavis, J. N., Hill, S. J., & Squires, J. E. (2012). Knowledge translation of research findings. *Implementation Science*, 7(1), 50.
- Guilcher, S. J. T. (2018). The Value of Physiotherapists in Primary Health Care Clinics: Optimizing (Self-) Management Supports for Persons with Complex Health and Social Needs. *Physiotherapy Canada*, 70(1), 1–2. <https://doi.org/10.3138/ptc.70.1.gee>
- Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, 42(2), 377–381. <https://doi.org/10.1016/j.jbi.2008.08.010>
- Hartley, S. E. (2018). Re-imagining the role of the physiotherapist when managing people with long-term conditions. *Physiotherapy Theory and Practice*, 1–10. <https://doi.org/10.1080/09593985.2018.1467989>
- Hartvigsen, J., Hancock, M. J., Kongsted, A., Louw, Q., Ferreira, M. L., Genevay, S., ... Woolf, A. (2018). What low back pain is and why we need to pay attention. *The Lancet*. [https://doi.org/10.1016/S0140-6736\(18\)30480-X](https://doi.org/10.1016/S0140-6736(18)30480-X)
- Hendrick, P., Mani, R., Bishop, A., Milosavljevic, S., & Schneiders, A. G. (2013). Therapist knowledge, adherence and use of low back pain guidelines to inform clinical decisions – a national survey of manipulative and sports physiotherapists in New Zealand. *Manual Therapy*, 18(2), 136–142. <https://doi.org/10.1016/j.math.2012.09.002>
- Henschke, N., Wouda, L., Maher, C. G., Hush, J. M., & van Tulder, M. W. (2013). Determinants of patient satisfaction 1 year after presenting to primary care with acute low back pain. *Clinical Journal of Pain*, 29(6), 512–517. <https://doi.org/10.1097/AJP.0b013e318274b3e6>

- Hinchliffe, N. C., & Lavin, N. (2018). Why do patients with low back pain choose not to engage with physiotherapy following assessment? *International Journal of Therapy & Rehabilitation*, 25(3), 120–127. <https://doi.org/10.12968/ijtr.2018.25.3.120>
- Houben, R. M. A., Ostelo, R. W. J. G., Vlaeyen, J. W. S., Wolters, P. M. J. C., Peters, M., & Berg, S. G. M. S. (2005). Health care providers' orientations towards common low back pain predict perceived harmfulness of physical activities and recommendations regarding return to normal activity. *European Journal of Pain*, 9(2), 173–183. <https://doi.org/10.1016/j.ejpain.2004.05.002>
- Hoy, D., Brooks, P., Blyth, F., & Buchbinder, R. (2010). The epidemiology of low back pain. *Best Practice & Research Clinical Rheumatology*, 24(6), 769–781. <https://doi.org/10.1016/j.berh.2010.10.002>
- Hsieh, H.-F., & Shannon, S. E. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*, 15(9), 1277–1288. <https://doi.org/10.1177/1049732305276687>
- Itz, C. J., Geurts, J. W., Kleef, M. van, & Nelemans, P. (2013). Clinical course of non-specific low back pain: A systematic review of prospective cohort studies set in primary care. *European Journal of Pain*, 17(1), 5–15. <https://doi.org/10.1002/j.1532-2149.2012.00170.x>
- Jeffrey, J. E., & Foster, N. E. (2012). A qualitative investigation of physical therapists' experiences and feelings of managing patients with nonspecific low back pain. *Physical Therapy*, 92(2), 266–278.
- Katz, J. N. M. (2006). Lumbar disc disorders and low-back pain: Socioeconomic factors and consequences. *Journal of Bone*, 21–24. <https://doi.org/10.2106/JBJS.E.01273>

Keating, J. L., McKenzie, J. E., O'Connor, D. A., French, S., Walker, B. F., Charity, M., ...

Green, S. E. (2016). Providing services for acute low-back pain: A survey of Australian physiotherapists. *Manual Therapy, 1*, 145–152.

<https://doi.org/10.1016/j.math.2015.11.005>

Klaic, M., Mcdermott, F., & Haines, T. (2019). Does the Theory of Planned Behaviour Explain Allied Health Professionals' Evidence-Based Practice Behaviours? A Focus Group Study. *Journal of Allied Health, 48*(1), 9.

Knight, K. L., & Draper, D. O. (2013). *Therapeutic modalities: The art and science* (2nd ed.). Baltimore: Lippincott Williams & Wilkins, a Wolters Kluwer business.

Kongsted, A., Kent, P., Axen, I., Downie, A. S., & Dunn, K. M. (2016). What have we learned from ten years of trajectory research in low back pain? *BMC Musculoskeletal Disorders, 17*, 220. <https://doi.org/10.1186/s12891-016-1071-2>

Kortteisto, T., Kaila, M., Komulainen, J., Mäntyranta, T., & Rissanen, P. (2010). Healthcare professionals' intentions to use clinical guidelines: A survey using the theory of planned behaviour. *Implementation Science, 5*, 51. <https://doi.org/10.1186/1748-5908-5-51>

Kovacs, F. M., Abraira, V., Zamora, J., & Fernández, C. (2005). The transition from acute to subacute and chronic low back pain: A study based on determinants of quality of life and prediction of chronic disability. *Spine, 30*(15), 1786–1792.

<https://doi.org/10.1097/01.brs.0000172159.47152.dc>

Ladeira, C. E., Cheng, M. S., & da Silva, R. A. (2017). Clinical specialization and adherence to evidence-based practice guidelines for low back pain management: A survey of US physical therapists. *Journal of Orthopaedic & Sports Physical Therapy, 47*(5), 347–358. <https://doi.org/10.2519/jospt.2017.6561>

- Laliberté, M., Mazer, B., Orozco, T., Chilingaryan, G., Williams-Jones, B., Hunt, M., & Feldman, D. E. (2017). Low back pain: Investigation of biases in outpatient Canadian physical therapy. *Physical Therapy, 97*(10), 985–997. <https://doi.org/10.1093/ptj/pzx055>
- Lardon, A., Dubois, J.-D., Cantin, V., Piché, M., & Descarreaux, M. (2018). Predictors of disability and absenteeism in workers with non-specific low back pain: A longitudinal 15-month study. *Applied Ergonomics, 68*, 176–185. <https://doi.org/10.1016/j.apergo.2017.11.011>
- Leech, N. L., Barrett, K. C., & Morgan, G. A. (2015). *IBM SPSS for intermediate statistics: Use and interpretations* (5th ed.). New York, NY, US: Routledge/Taylor & Francis Group.
- Lehner, R., Meesen, R., & Wenderoth, N. (2017). Observing back pain provoking lifting actions modulates corticomotor excitability of the observer's primary motor cortex. *Neuropsychologia, 101*, 1–9. <https://doi.org/10.1016/j.neuropsychologia.2017.05.003>
- Letts, L., Wilkins, S., Law, M., Stewart, D., Bosch, J., & Westmorland, M. (2007). *Guidelines for critical review form: Qualitative studies (version 2.0)*. Retrieved from <https://srs-mcmaster.ca/wp-content/uploads/2015/05/Guidelines-for-Critical-Review-Form-Qualitative-Studies.pdf>
- Li, L. C., & Bombardier, C. (2001). Physical therapy management of low back pain: An exploratory survey of therapist approaches. *Physical Therapy, 81*(4), 1018–1028. <https://doi.org/10.1093/ptj/81.4.1018>
- Lin, C.-W. C., McAuley, J. H., Macedo, L., Barnett, D. C., Smeets, R. J., & Verbunt, J. A. (2011). Relationship between physical activity and disability in low back pain: A systematic review and meta-analysis. *PAIN®, 152*(3), 607–613. <https://doi.org/10.1016/j.pain.2010.11.034>

- Ma, V. Y., Chan, L., & Carruthers, K. J. (2014). Incidence, prevalence, costs, and impact on disability of common conditions requiring rehabilitation in the United States: Stroke, spinal cord injury, traumatic brain injury, multiple sclerosis, osteoarthritis, rheumatoid arthritis, limb loss, and back pain. *Archives of Physical Medicine and Rehabilitation*, *95*(5), 986-995.e1. <https://doi.org/10.1016/j.apmr.2013.10.032>
- Madore, O. (2005). *The Canada Health Act: Overview and options* (p. 27). Canada: Library of Parliament.
- Magalhães, M. O., Costa, L. O., Cabral, C., & Machado, L. A. (2012). Attitudes and beliefs of Brazilian physical therapists about chronic low back pain: A cross-sectional study. *Brazilian Journal of Physical Therapy*, *16*(3), 248–253.
- Magalhães, M. O., Costa, L. O. P., Ferreira, M. L., & Machado, L. A. C. (2011). Clinimetric testing of two instruments that measure attitudes and beliefs of health care providers about chronic low back pain. *Brazilian Journal of Physical Therapy*, *15*(3), 249–256. <https://doi.org/10.1590/S1413-35552011000300012>
- Maher, C., Underwood, M., & Buchbinder, R. (2017). Non-specific low back pain. *The Lancet*, *389*, 736–747. [https://doi.org/10.1016/S0140-6736\(16\)30970-9](https://doi.org/10.1016/S0140-6736(16)30970-9)
- Manchikanti, L., Singh, V., Falco, F. J. E., Benyamin, R. M., & Hirsch, J. A. (2014). Epidemiology of low back pain in adults. *Neuromodulation: Technology at the Neural Interface*, *17*, 3–10. <https://doi.org/10.1111/ner.12018>
- Menezes Costa, L. da C., Maher, C. G., Hancock, M. J., McAuley, J. H., Herbert, R. D., & Costa, L. O. P. (2012). The prognosis of acute and persistent low-back pain: A meta-analysis. *Canadian Medical Association Journal*, *184*(11), E613–E624. <https://doi.org/10.1503/cmaj.111271>

- Merskey, H., & Bogduk, N. (Eds.). (1994). *Classification of chronic pain: Descriptions of chronic pain syndromes and definitions of pain terms* (2nd ed.). International Association for the Study of Pain.
- Meucci, R. D., Fassa, A. G., & Faria, N. M. X. (2015). Prevalence of chronic low back pain: Systematic review. *Revista de Saúde Pública*, *49*, 73. <https://doi.org/10.1590/S0034-8910.2015049005874>
- Midwestern University Institutional Review Board. (2015, September). *Generating Unique Identifiers*. Retrieved from https://www.midwestern.edu/Documents/protected/student_employee/ORSP/Generating%20Unique%20Identifiers.pdf
- Mikhail, C., Korner-Bitensky, N., Rossignol, M., & Dumas, J.-P. (2005). Physical therapists' use of interventions with high evidence of effectiveness in the management of a hypothetical typical patient with acute low back pain. *Physical Therapy*, *85*(11), 1151–1167. <https://doi.org/10.1093/ptj/85.11.1151>
- Murray, C. J. L., Barber, R. M., Foreman, K. J., Ozgoren, A. A., Abd-Allah, F., Abera, S. F., ... Vos, T. (2015). Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: Quantifying the epidemiological transition. *The Lancet*, *386*, 2145–2191. [https://doi.org/10.1016/S0140-6736\(15\)61340-X](https://doi.org/10.1016/S0140-6736(15)61340-X)
- Mustard, C. A., Kalcevich, C., Frank, J. W., & Boyle, M. (2005). Childhood and early adult predictors of risk of incident back pain: Ontario child health study 2001 follow-up. *American Journal of Epidemiology*, *162*(8), 779–786. <https://doi.org/10.1093/aje/kwi271>
- Mutsaers, J.-H. A. M., Peters, R., Pool-Goudzwaard, A. L., Koes, B. W., & Verhagen, A. P. (2012). Psychometric properties of the pain attitudes and beliefs scale for

- physiotherapists: A systematic review. *Manual Therapy*, 17(3), 213–218.
<https://doi.org/10.1016/j.math.2011.12.010>
- National Institute for Health and Care Excellence (NICE). (2016). *Low back pain and sciatica in over 16s: Assessment and management*. Retrieved from
<https://www.nice.org.uk/guidance/ng59>
- Nilsen, P. (2015). Making sense of implementation theories, models and frameworks. *Implementation Science*, 10(1), 53. <https://doi.org/10.1186/s13012-015-0242-0>
- Nilsen, P., Roback, K., Broström, A., & Ellström, P.-E. (2012). Creatures of habit: Accounting for the role of habit in implementation research on clinical behaviour change. *Implementation Science*, 7(1), 53.
- Ostelo, R. W. J. G., Stomp-van den Berg, S. G. M., Vlaeyen, J. W. S., Wolters, P. M. J. C., & de Vet, H. C. W. (2003). Health care provider's attitudes and beliefs towards chronic low back pain: The development of a questionnaire. *Manual Therapy*, 8(4), 214–222.
[https://doi.org/10.1016/S1356-689X\(03\)00013-4](https://doi.org/10.1016/S1356-689X(03)00013-4)
- O'Sullivan, P., Caneiro, J. P., O'Keeffe, M., & O'Sullivan, K. (2016). Unraveling the complexity of low back pain. *Journal of Orthopaedic & Sports Physical Therapy*, 46(11), 932–937.
<https://doi.org/10.2519/jospt.2016.0609>
- O'Sullivan, P., Smith, A., Beales, D., & Straker, L. (2017). Understanding adolescent low back pain from a multidimensional perspective: Implications for management. *Journal of Orthopaedic & Sports Physical Therapy*, 47(10), 741–751.
<https://doi.org/10.2519/jospt.2017.7376>
- Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, California, USA: Sage Publications.

- Peabody, J. W., Luck, J., Glassman, P., Dresselhaus, T. R., & Lee, M. (2000). Comparison of vignettes, standardized patients, and chart abstraction: A prospective validation study of 3 methods for measuring quality. *JAMA*, *283*(13), 1715.
<https://doi.org/10.1001/jama.283.13.1715>
- Peabody, J. W., Luck, J., Glassman, P., Jain, S., Hansen, J., Spell, M., & Lee, M. (2004). Measuring the quality of physician practice by using clinical vignettes: A prospective validation study. *Annals of Internal Medicine*, *141*(10), 771.
<https://doi.org/10.7326/0003-4819-141-10-200411160-00008>
- Pinto, R. Z., Ferreira, M. L., Oliveira, V. C., Franco, M. R., Adams, R., Maher, C. G., & Ferreira, P. H. (2012). Patient-centred communication is associated with positive therapeutic alliance: A systematic review. *Journal of Physiotherapy*, *58*(2), 77–87.
[https://doi.org/10.1016/S1836-9553\(12\)70087-5](https://doi.org/10.1016/S1836-9553(12)70087-5)
- Poitras, S., Durand, M.-J., Côté, A.-M., & Tousignant, M. (2012). Guidelines on low back pain disability: Interprofessional comparison of use between general practitioners, occupational therapists, and physiotherapists. *Spine*, *37*(14), 1252–1259.
<https://doi.org/10.1097/BRS.0b013e31824b6adf>
- Qaseem, A., Wilt, T. J., McLean, R. M., Forciea, M. A., & Clinical Guidelines Committee of the American College of Physicians. (2017). Noninvasive treatments for acute, subacute, and chronic low back pain: A clinical practice guideline from the American College of Physicians. *Annals of Internal Medicine*, *166*(7), 514–530. <https://doi.org/10.7326/M16-2367>
- Rossignol, M., Arsenault, B., Dionne, C., Poitras, S., Tousignant, M., Truchon, M., ... Neveu, A. (2007). *Clinic on Low-Back Pain in Interdisciplinary Practice (CLIP) Guidelines*. Retrieved from <http://collections.banq.qc.ca/ark:/52327/bs47125>

- Rossignol, M., Poitras, S., Dionne, C., Tousignant, M., Truchon, M., Arsenault, B., ... Neveu, A. (2007). An interdisciplinary guideline development process: The Clinic on Low-back pain in Interdisciplinary Practice (CLIP) low-back pain guidelines. *Implementation Science*, 2, 36. <https://doi.org/10.1186/1748-5908-2-36>
- Rundell, S. D., Sherman, K. J., Heagerty, P. J., Mock, C. N., Dettori, N. J., Comstock, B. A., ... Jarvik, J. G. (2017). Predictors of persistent disability and back pain in older adults with a new episode of care for back pain. *Pain Medicine*, 18, 1049–1062. <https://doi.org/10.1093/pm/pnw236>
- Rutten, G. M. J., Harting, J., Rutten, S. T. J., Bekkering, G. E., & Kremers, S. P. J. (2006). Measuring physiotherapists' guideline adherence by means of clinical vignettes: A validation study. *Journal of Evaluation in Clinical Practice*, 12(5), 491–500.
- Salbach, N. M., & Jaglal, S. B. (2011). Creation and validation of the evidence-based practice confidence scale for health care professionals: Evidence-based practice confidence scale. *Journal of Evaluation in Clinical Practice*, 17(4), 794–800. <https://doi.org/10.1111/j.1365-2753.2010.01478.x>
- Salbach, N. M., Jaglal, S. B., & Williams, J. I. (2013). Reliability and validity of the Evidence-Based Practice Confidence (EPIC) scale. *Journal of Continuing Education in the Health Professions*, 33(1), 33–40. <https://doi.org/10.1002/chp.21164>
- Salvetti, M. de G., Pimenta, C. A. de M., Braga, P. E., & Corrêa, C. F. (2012). Disability related to chronic low back pain: Prevalence and associated factors. *Revista Da Escola de Enfermagem Da USP*, 46(spe), 16–23. <https://doi.org/10.1590/S0080-62342012000700003>
- Sample size calculator: Understanding sample sizes. (n.d.). Retrieved May 22, 2018, from SurveyMonkey website: <https://www.surveymonkey.com/mp/sample-size-calculator/>

- Sanders, T., Foster, N. E., Bishop, A., & Ong, B. N. (2013). Biopsychosocial care and the physiotherapy encounter: Physiotherapists' accounts of back pain consultations. *BMC Musculoskeletal Disorders*, *14*(100968565), 65. <https://doi.org/10.1186/1471-2474-14-65>
- Schopflocher, D., Taenzer, P., & Jovey, R. (2011). The prevalence of chronic pain in Canada. *Pain Research & Management: The Journal of the Canadian Pain Society*, *16*(6), 445–450.
- Scott Davis, D., Mancinelli, C. A., Petronis, J. J., Bensenhaver, C., McClintic, T., & Nelson, G. (2013). Variables associated with level of disability in working individuals with nonacute low back pain: A cross-sectional investigation. *Journal of Orthopaedic & Sports Physical Therapy*, *43*(2), 97–104. <https://doi.org/10.2519/jospt.2013.4382>
- Scott, N. A., Moga, C., & Harstall, C. (2010). Managing low back pain in the primary care setting: The know-do gap. *Pain Research and Management*, *15*(6), 392–400. <https://doi.org/10.1155/2010/252695>
- Sepucha, K. R., Simmons, L. H., Barry, M. J., Edgman-Levitan, S., Licurse, A. M., & Chaguturu, S. K. (2016). Ten years, forty decision aids, and thousands of patient uses: Shared decision making at Massachusetts General Hospital. *Health Affairs*, *35*(4), 630–636. <https://doi.org/10.1377/hlthaff.2015.1376>
- Simmonds, M. J., Derghazarian, T., & Vlaeyen, J. W. S. (2012). Physiotherapists' knowledge, attitudes, and intolerance of uncertainty influence decision making in low back pain: *The Clinical Journal of Pain*, *28*(6), 467–474. <https://doi.org/10.1097/AJP.0b013e31825bfe65>
- Singla, M., Jones, M., Edwards, I., & Kumar, S. (2015). Physiotherapists' assessment of patients' psychosocial status: Are we standing on thin ice? A qualitative descriptive study. *Manual Therapy*, *20*(2), 328–334. <https://doi.org/10.1016/j.math.2014.10.004>

Straus, S. E., Tetroe, J., & Graham, I. D. (Eds.). (2013). *Knowledge translation in health care: Moving from evidence to practice* (2nd ed.). Chichester, West Sussex: Wiley-Blackwell
BMJ|Books.

Synnott, A., O’Keeffe, M., Bunzli, S., Dankaerts, W., O’Sullivan, P., & O’Sullivan, K. (2015). Physiotherapists may stigmatise or feel unprepared to treat people with low back pain and psychosocial factors that influence recovery: A systematic review. *Journal of Physiotherapy*, 61(2), 68–76. <https://doi.org/10.1016/j.jphys.2015.02.016>

Thomas, J. S., & France, C. R. (2007). Pain-related fear is associated with avoidance of spinal motion during recovery from low back pain. *Spine*, 32(16), E460–E466. <https://doi.org/10.1097/BRS.0b013e3180bc1f7b>

Thorne, S. E. (2008). *Interpretive description*. Walnut Creek, CA: Left Coast Press.

Thorne, S., Kirkham, S. R., & MacDonald-Emes, J. (1997). Interpretive description: A noncategorical qualitative alternative for developing nursing knowledge. *Research in Nursing & Health*, 20(2), 169–177. [https://doi.org/10.1002/\(SICI\)1098-240X\(199704\)20:2<169::AID-NUR9>3.0.CO;2-I](https://doi.org/10.1002/(SICI)1098-240X(199704)20:2<169::AID-NUR9>3.0.CO;2-I)

Tilson, J. K., Mickan, S., Howard, R., Sum, J. C., Zibell, M., Cleary, L., ... Michener, L. A. (2016). Promoting physical therapists’ use of research evidence to inform clinical practice: Part 3 – long term feasibility assessment of the PEAK program. *BMC Medical Education*, 16(1). <https://doi.org/10.1186/s12909-016-0654-9>

Toms, J., & Salvatore, G. (2017). Patients’ expectations of an initial physiotherapy appointment for low back pain: A starting point for service improvement. *Physiotherapy*, 103, e73–e74. <https://doi.org/10.1016/j.physio.2017.11.035>

Vercelli, S., Ravizzotti, E., & Paci, M. (2018). Are they publishing? A descriptive cross-sectional profile and bibliometric analysis of the journal publication productivity of Italian

- physiotherapists. *Archives of Physiotherapy*, 8, 1. <https://doi.org/10.1186/s40945-017-0042-8>
- Vos, T., Abajobir, A. A., Abate, K. H., Abbafati, C., Abbas, K. M., Abd-Allah, F., ... Murray, C. J. L. (2017). Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, 390(10100), 1211–1259. [https://doi.org/10.1016/S0140-6736\(17\)32154-2](https://doi.org/10.1016/S0140-6736(17)32154-2)
- Vos, T., Flaxman, A. D., Naghavi, M., Lozano, R., Michaud, C., Ezzati, M., ... Murray, C. J. (2012). Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380(9859), 2163–2196. [https://doi.org/10.1016/S0140-6736\(12\)61729-2](https://doi.org/10.1016/S0140-6736(12)61729-2)
- Waddell, G. (1987). 1987 Volvo Award in Clinical Sciences: A new clinical model for the treatment of low-back pain. *Spine*, 12(7), 632–644.
- Wang, X., Wanyan, P., Tian, J. H., & Hu, L. (2015). Meta-analysis of randomized trials comparing fusion surgery to non-surgical treatment for discogenic chronic low back pain. *Journal of Back and Musculoskeletal Rehabilitation*, 28(4), 621–627. <https://doi.org/10.3233/BMR-140571>
- Wertli, M. M., Rasmussen-Barr, E., Weiser, S., Bachmann, L. M., & Brunner, F. (2014). The role of fear avoidance beliefs as a prognostic factor for outcome in patients with nonspecific low back pain: A systematic review. *The Spine Journal*, 14(5), 816–836. <https://doi.org/10.1016/j.spinee.2013.09.036>
- Wiles, L., Matricciani, L., Williams, M., & Olds, T. (2012). Sixty-five years of physical therapy: Bibliometric analysis of research publications from 1945 through 2010. *Physical Therapy*, 92(4), 493–506. <https://doi.org/10.2522/ptj.20110013>

- Wong, J. J., Côté, P., Sutton, D. A., Randhawa, K., Yu, H., Varatharajan, S., ... Taylor-Vaisey, A. (2017). Clinical practice guidelines for the noninvasive management of low back pain: A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. *European Journal of Pain*, *21*(2), 201–216.
<https://doi.org/10.1002/ejp.931>
- World Health Organization. (2002). *Towards a common language for functioning, disability and health: ICF*. Retrieved from
<http://www.who.int/classifications/icf/icfbeginnersguide.pdf?ua=1>

Appendix A

Survey Instrument

Cover Page

Title of the Study: "Evidence-Based Practice for Non-Specific Low Back Pain: Canadian Physiotherapists' Adherence, Attitudes, and Perspectives"

This survey is part of a research study conducted by Tamires C. do Prado as a partial requirement for her MSc degree in Rehabilitation Sciences, with the support of her advisor, Dr. Joanne L. Parsons, who is an assistant professor in the Department of Physical Therapy at the University of Manitoba.

This survey will help us learn about Canadian physiotherapists' use of interventions recommended by evidence in the management of non-specific low back pain (NSLBP) when the client presents with psychosocial factors; and factors (e.g., beliefs) that influence adherence to those guidelines.

Based on your answers to our survey questions, you may be asked to participate in a follow-up interview, where we will ask about the care you have been providing to your NSLBP clients. If you are identified as eligible for the interview, we will ask you to share your contact information.

Your participation in this online survey is completely voluntary and the survey system will not record your IP address.

The risks of participating are low. You don't have to answer any questions you don't want to (except the first 8 items that will assess your eligibility for the study).

There may or may not be any benefit to you directly from participating in this survey. Your participation may trigger a self-reflection about your practice, but your participation is important to help us understand how physiotherapists in Canada use guideline recommendations in treating clients with NSLBP.

As a thank you for your participation, you can enter to WIN A \$100 E-GIFT-CARD from Amazon.ca. At the end of the survey, you will be asked to click a Google Forms link to submit your contact information if you would like to be entered for the prize draw. The contact information you share cannot be linked to your survey responses.

The survey should take you about 10 to 20 minutes to complete. The system will not let you save your responses and return to complete them later, so it does need to be done in one sitting.

Submitted responses can be withdrawn by contacting the research staff at the email or phone number provided below by November 12th, 2018.

If you have any questions about this research study, please do not hesitate to contact Tamires C. do Prado, MSc candidate at the University of Manitoba, at Tamires.doPrado@umanitoba.ca or (204) 787-1436.

This study has been approved by the University of Manitoba Health Research Ethics Board.

By continuing on and completing the online survey you are consenting to participate in this online survey for research purposes:

- Yes, I consent to participate in this survey
 No, I do not want to participate

Section I: Participant Screening

Please answer the following questions in order to determine your eligibility to participate in this research study:

1. Are you an active registered member practicing physiotherapy in Canada?
 Yes
 No
2. Do you currently work clinically as a physiotherapist, either part- or full-time?
 Yes
 No
3. Do you currently work in an outpatient setting, either private or public?
 Yes
 No
4. Do you work exclusively in neurological rehabilitation?
 Yes
 No
5. Do you work exclusively in cardiorespiratory rehabilitation?
 Yes
 No
6. Do you work exclusively in pediatric rehabilitation?
 Yes
 No
7. Do you treat clients with low back pain at least once a week?
 Yes
 No
8. Are you able to communicate effectively in written and spoken English?
 Yes
 No

Survey Section II: Self-generated Unique Identifier

Because we are promoting our survey through multiple channels including social media, the Canadian Physiotherapy Association, and provincial physiotherapy regulators, we need you to create your own unique code so that your data will not be duplicated, and you accidentally fill out our survey more than once.

To do that, we will need you to provide the following information:

1. The first letter of the model of your first car. For example, if your first car was a Civic, answer **C**. If not applicable, answer **X**.

2. The first 2 letters of the street where you grew up. For example, if you grew up at 123 Sesame Street, answer **SE**.
3. The year you started in physiotherapy school in 2-digit format. For example, if you started physiotherapy school in the Fall 1998, answer **98**.
4. Your day of birth in 2-digit format. For example, if you were born on July 4th, answer **04**.

Please enter your answers to questions 1, 2, 3, and 4 below in the respective order, without any spaces. For example, the person described above as our example would enter **CSE9804**. If the person described in the example had never owned a car, he or she would enter **XSE9804**.

Enter your unique code here:

Section III: Demographic Data and Theoretical Constructs

This section contains general questions about you and your practice. Please answer the questions to the best of your ability and keep in mind that answers are anonymous, and we cannot identify you based on your answers.

1. What is your age?
2. What is your biological sex (sex you were assigned at birth)?
 - Male
 - Female
 - Prefer not to answer
3. What entry-to-practice physiotherapy degree do you have?
 - Diploma
 - Bachelor
 - Master
 - Doctorate
 - Other:
4. How many years of clinical practice do you have?
5. Do you have any other post-professional academic degree (not including your entry-to-practice physiotherapy degree)? Please select all that apply.
 - No, I do not have any other post-professional academic degree
 - Master of Science
 - Master of Arts
 - PhD
 - Professional Doctorate (e.g., DPT, chiropractic, osteopathy)
 - Other:
6. Do you have any post-graduate training? Please select all that apply.
 - No, I do not have any post-graduate training
 - Acupuncture

- Mackenzie Method
- Manual therapy (e.g., Mulligan, Maitland, IASTM, etc.)
- Pain science
- Other:

7. Are you a member of the Canadian Physiotherapy Association?

- Yes
- No

8. In which province or territory do you mainly practice? If more than one, select the one where you see more clients with low back pain.

- Alberta
- British Columbia
- Manitoba
- New Brunswick
- Newfoundland and Labrador
- Nova Scotia
- Northwest Territories
- Nunavut
- Ontario
- Prince Edward Island
- Quebec
- Saskatchewan
- Yukon

9. In which sector are you currently employed?

- Public
- Private (includes self-employed)
- Both

10. In which type of location do you currently work? If more than one, select the one where you see more clients with low back pain.

- Urban (population centres with 5,000 or more inhabitants)
- Rural (small towns or villages with less than 5,000 inhabitants)
- Remote (no road access in or out of the community)

11. Please select the option that best describes your physiotherapy practice environment:

- I practice by myself
- I practice within a team of physiotherapists
- I practice within a multidisciplinary team (physiotherapists and/or other health care professionals)

What other professionals are part of your team? Please select all that apply.

- Athletic therapists
- Dieticians or Nutritionists
- Kinesiologists
- Massage therapists
- Nurses
- Occupational therapists

- Physicians
- Physiotherapists
- Psychologists
- Respiratory therapists
- Other:

12. In a typical day, how many clients do you see?

- 1 – 5
- 6 – 10
- 11 – 15
- > 15

13. On average, how much of your case load consists of clients with low back pain?

- ≤ 25%
- 26 – 50%
- 51 – 75%
- > 75%

14. How familiar are you with the following clinical practice guidelines for the conservative management of non-specific low back pain?

National Institute for Health and Care Excellence (NICE): Low back pain and sciatica in over 16s: assessment and management (2016)

- Not familiar at all Somewhat familiar Very familiar

Non-invasive treatments for acute, subacute, and chronic low back pain: a clinical practice guideline from the American College of Physicians (2017)

- Not familiar at all Somewhat familiar Very familiar

German Disease Management Guidelines (NDMG) for non-specific low back pain (2017)

- Not familiar at all Somewhat familiar Very familiar

Clinical practice guidelines for the non-invasive management of low back pain: a systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration (2017)

- Not familiar at all Somewhat familiar Very familiar

Other clinical practice guidelines for non-specific low back pain

- Not familiar at all Somewhat familiar Very familiar

Please specify which one(s):

15. My attitude towards using clinical practice guidelines in my clinical decision-making to treat clients with non-specific low back pain is:

Extremely unenthusiastic	1	2	3	4	5	6	7	Extremely enthusiastic
Extremely negative	1	2	3	4	5	6	7	Extremely positive

We know that everyone tries to do the best they can in clinical practice. We are interested in WHAT YOU TYPICALLY for clients like this in your work environment. Please select the procedures you would use to manage the client described above in the FIRST WEEK OF TREATMENT.

Please choose a minimum of two (2) and a maximum of five (5) options.

- Acupuncture
- Bed rest
- Dry needling
- Education on expected course of recovery
- Education on self-management strategies
- Education to address negative affective tendencies
- Education to pursue/maintain an active lifestyle
- Heat
- Home exercises
- Interferential current
- Ice
- Low-level laser therapy (LLLT)
- Lumbar brace or corset
- Massage
- Mechanical traction
- Neurodynamic mobilization
- Recommend return to work and activities
- Refer to a physician, but also provide physiotherapy intervention
- Refer to a physician without providing any physiotherapy intervention
- Refer to a psychologist, but also provide physiotherapy intervention
- Refer to a psychologist without providing any physiotherapy intervention
- Refer to a multidisciplinary rehabilitation with physical and psychological interventions
- Spinal non-thrust manipulation
- Spinal thrust manipulation
- Supervised individual exercises
- Supervised group exercises
- Taping
- Transcutaneous electrical nerve stimulation (TENS)
- Ultrasound
- Work hardening/modification
- Other (please describe):
- Other (please describe):
- Other (please describe):

Section V: Pain Attitudes and Beliefs Scale for Physiotherapists

The purpose of this list is to help us analyse how you, the therapist, approach the most common forms of back pain. We do not mean back pain resulting from a radicular syndrome, cauda equina syndrome, fractures, infections, inflammation, a tumour or metastasis. It is not our intention to test your knowledge of back pain. We would simply like to know how you approach the treatment of back pain. We are looking for your opinion; the opinions of others are not relevant.

We would like you to indicate the level to which you agree or disagree with each statement. (Ostelo et al., 2003, pp. 221–222)

TOTALLY DISAGREE	LARGELY DISAGREE	DISAGREE TO SOME EXTENT	AGREE TO SOME EXTENT	LARGELY AGREE	TOTALLY AGREE
1	2	3	4	5	6

Table A1

Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT)

1	Mental stress can cause back pain even in the absence of tissue damage	1	2	3	4	5	6
2	The cause of back pain is unknown	1	2	3	4	5	6
3	Pain is a nociceptive stimulus, indicating tissue damage	1	2	3	4	5	6
4	A patient suffering from severe back pain will benefit from physical exercise	1	2	3	4	5	6
5	Functional limitations associated with back pain are the result of psychosocial factors	1	2	3	4	5	6
6	Patients with back pain should preferably practice only pain free movements	1	2	3	4	5	6
7	Therapy may have been successful even if pain remains	1	2	3	4	5	6
8	Back pain indicates the presence of organic injury	1	2	3	4	5	6
9	If back pain increases in severity, I immediately adjust the intensity of my treatment accordingly	1	2	3	4	5	6
10	If therapy does not result in a reduction in back pain, there is a high risk of severe restrictions in the long term	1	2	3	4	5	6
11	Pain reduction is a precondition for the restoration of normal functioning	1	2	3	4	5	6
12	Increased pain indicates new tissue damage or the spread of existing damage	1	2	3	4	5	6
13	There is no effective treatment to eliminate back pain	1	2	3	4	5	6
14	Even if the pain has worsened, the intensity of the next treatment can be increased	1	2	3	4	5	6
15	If patients complain of pain during exercise, I worry that damage is being caused	1	2	3	4	5	6
16	The severity of tissue damage determines the level of pain	1	2	3	4	5	6
17	Learning to cope with stress promotes recovery from back pain	1	2	3	4	5	6
18	Exercises that may be back straining should not be avoided during the treatment	1	2	3	4	5	6
19	In the long run, patients with back pain have a higher risk of developing spinal impairments	1	2	3	4	5	6

Note. Reproduced with permission from Houben, R. M. A., Ostelo, R. W. J. G., Vlaeyen, J. W. S., Wolters, P. M. J. C., Peters, M., & Berg, S. G. M. S. (2005). Health care providers' orientations towards common low back pain predict perceived harmfulness of physical activities and recommendations regarding return to normal activity. *European Journal of Pain*, 9(2), 173–183. <https://doi.org/10.1016/j.ejpain.2004.05.002>. © 2004 European Federation of Chapters of the International Association for the Study of Pain. Published by Elsevier Ltd.

Survey Section VI: Evidence-based Practice Confidence Scale

This questionnaire is about how confident you are in your ability to complete the steps of evidence-based practice. Please remember that there is no right or wrong answer, and your responses cannot be linked back to you. We are simply interested in how you feel about each one of these tasks.

For each of the following activities, please indicate how **confident** you are in your **current** level of ability by choosing the corresponding number *on the following rating scale*:

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at all confident										Completely confident

How **confident** are you in your ability to:

Table A2

Evidence-based Practice Confidence (EPIC) Scale

1. ... identify a gap in your knowledge related to a patient or client situation (e.g., history, assessment, treatment)?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
2. ... formulate a question to guide a literature search based on a gap in your knowledge?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
3. ... effectively conduct an online literature search to address the question?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
4. ... critically appraise the strengths and weaknesses of study methods (e.g., appropriateness of study design, recruitment, data collection and analysis)?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
5. ... critically appraise the measurement properties (e.g., reliability and validity, sensitivity and specificity) of standardized tests or assessment tools you are considering using in your practice?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
6. ... interpret study results obtained using statistical tests such as t-tests or chi-square tests?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
7. ... interpret study results obtained using statistical procedures such as linear or logistic regression?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
8. ... determine if evidence from the research literature applies to your patient's or client's situation?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
9. ... ask your patient or client about his/her needs, values and treatment preferences?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
10. ... decide on an appropriate course of action based on integrating the research evidence, clinical judgment and patient or client preferences?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%
11. ... continually evaluate the effect of your course of action on your patient's or client's outcomes?	<input type="radio"/>										
	0%	10	20	30	40	50	60	70	80	90	100%

Note. Reproduced with permission from the author from Salbach, N. M., & Jaglal, S. B. (2011). Creation and validation of the evidence-based practice confidence scale for health care professionals: evidence-based practice confidence scale. *Journal of Evaluation in Clinical Practice*, 17(4), 794–800. <https://doi.org/10.1111/j.1365-2753.2010.01478.x> © 2011 Nancy M. Salbach.

Appendix B

Interview Guide

Initial Script

Thank you for your interest in our study. Before we get started, I would like to remind you that this interview is being recorded for the purposes of this research study, and that you may withdraw your interview participation and data at any time.

Our goal today is to learn about your perspectives of treating clients with LBP, and how clinical practice guidelines may or may not influence your practice. Please remember that there is no right or wrong answer to the questions, and we are purely interested in learning about how you see these issues.

Do you have any questions before we get started?

Icebreaker

1. Could you briefly tell me about your past experience treating clients with LBP?
 - a. How often do you see clients with LBP?

Addressing Psychosocial Factors

2. How do you feel about treating NSLBP clients with psychosocial demands?

If clarification is required about psychosocial demands, explain:

Those include any social or psychological issues, such as fear-avoidant behaviour, negative thoughts about recovery, tendency or history of depression or other psychological disorders, work, or financial concerns.

- a. How do you address the psychosocial demands of your NSLBP clients?
- b. How satisfied are you with the support you have been providing to those clients?
- c. What makes you feel that way?

Using Evidence in Practice

3. How familiar are you with clinical practice guidelines for the management of NSLBP?
 - a. What do you think of those guidelines?
 - b. What do you think are the challenges to using clinical practice guidelines in the management of NSLBP clients?
 - c. What do you feel are the advantages of using clinical practice guideline recommendations in the management of NSLBP clients?

Possibilities for Improving Practice

4. Are there any aspects of your practice that you feel could be changed to improve client outcomes?
 - a. What do you think could be done to make those changes happen?
 - b. Where or who do you feel those changes should start from?

Demographics

5. Can you tell me your age?
6. What type of physiotherapy degree do you have?
7. How many years of physiotherapy clinical experience do you have?
8. Do you work in the private or public sector?
9. Do you work in an urban, rural, or remote location?

Closing

10. That covers all of our specific questions. Is there anything else you would like to add about treating clients with LBP and psychosocial demands?

Thank you very much for your time! After we compile the data from your interview and other participants, would you be willing to provide some feedback on the collective data to ensure that your ideas and thoughts have been captured and are well represented in our results? We would be sending you a document via email and any feedback you could provide would be much appreciated.

Thanks again and have a great day!



College of Rehabilitation Sciences
 R106 – 771 McDermot Avenue
 Winnipeg, Manitoba
 Canada R3E 0T6
 Phone: 204-789-3897
 Fax: 204-789-3927
 Email: CORS.info@umanitoba.ca

RESEARCH PARTICIPANT INFORMATION AND CONSENT FORM

Title of Study: “Evidence-based Practice for Non-specific Low Back Pain: Canadian Physiotherapists’ Adherence, Beliefs, and Perspectives”.

Principal Investigator: *Tamires C. do Prado, R106-771 McDermot Avenue, Winnipeg, R3E 0T6, (204) 787-1436*

Co-Investigator: *Dr. Joanne Parsons, R106-771 McDermot Avenue, Winnipeg, R3E 0T6, (204) 787-1019*

You are being asked to participate in a research study involving an individual interview through a phone or video call. Please take your time to review this consent form and discuss any questions you may have with the study staff, your friends, or family before you make your decision. This consent form may contain words that you do not understand. Please ask the study staff to explain any words or information that you do not clearly understand.

Purpose of this Study

This research study is part of a larger project that is being conducted to learn about how physiotherapists in Canada follow evidence-based guideline recommendations for the management of non-specific low back pain when the client presents with psychosocial factors. The purposes of this interview are to explore the perspectives of a smaller group of Manitoban physiotherapists about the current care provided to their clients with non-specific low back pain who demand psychosocial support, as well as the physiotherapists’ perceptions on what, if any, aspects of practice could be improved to further the support to those clients.

Participants Selection

You are being asked to participate in this interview because we believe that you, as a clinician, will be able to provide us with valuable information about the difficulties of implementing evidence-based guidelines into clinical routine and supporting clients with psychosocial demands associated with non-specific low back pain.

A total of up to 10 participants will be asked to participate in interviews.

Study procedures

If you accept to participate in this study, the principal investigator will contact you via Skype, Facetime, phone, or other video or voice call engine of your choice at a time that works with your schedule. The researcher will be in a quiet and private room either at her home or at the University

of Manitoba when she calls you. You will be asked to also be in a quiet and private room during the call.

You will be asked some questions relating to your experience with treating clients with non-specific low back pain, particularly those who present some demand for social or psychological support, and about your opinion relating to implementation of guideline recommendations into your practice. These questions will help us to better understand how physiotherapists in Manitoba feel when they are faced with clients that require specific support, and if there is anything that can be done to improve the care we provide to those clients.

The interview will be recorded using a digital audio recorder. The audio recordings will later be listened to by either the primary investigator or a professional transcriber, who will create an anonymized, verbatim written document of the interview so that the researchers can summarize and analyze the information. If a professional transcriber is used, he or she will sign a confidentiality form stating that he or she will not discuss any item on the tape with anyone other than the researchers. Both the recordings and transcripts will be stored in a password protected portable hard drive, which will be stored along with any printed copies in locked cabinets. All digital audio recordings will be permanently deleted upon completion of the data analysis, and transcripts will be destroyed 5 years after completion of this study.

If you agree, you will be contacted after a few months from the interview to provide feedback on the summary of the collective data (from you and other participants) to ensure that your perspectives have been adequately incorporated into the report. This process is called member-checking and you will be able to add any comments or suggest any changes you like. No names will be used in this summary. Yours and other participants' names will be replaced with codes such as *P1*, *P2*, etc.

Risks and Discomforts

There is very little risk involved with your participation. You may find talking about your routine practice and difficulties you encounter to be upsetting or stressful. You do not have to answer any question that makes you feel uncomfortable or that you find too upsetting, and can stop participating in the interview at any time.

Benefits

Participating in the interview may not help you directly, but information gained will help us to understand the challenges that physiotherapists like you might face when treating clients with non-specific low back pain and may allow us to develop strategies to advance our profession as well as further the support and care we provide to those clients in the future.

Costs

If you accept to participate, we will attempt to avoid any costs by selecting, in consultation with you, the communication option that is the most convenient for you. For example, if the interview is done over the phone, we can call you. However, if done using internet services, you will be responsible for any associated costs.

Payment for participation

As a thank you for your time and participation, you will be given a chance to win a prize of a \$100 e-gift card for Amazon.ca. This prize draw is separate from the one offered to you when you completed the survey. Only interview participants will be eligible for this draw.

Confidentiality

We will do everything possible to keep your personal information confidential. Your name will not be used in the study records. A list of names and contact information of interview participants will be kept in a password protected electronic file until the prize has been distributed. For participants who agree to be contacted for future studies, the contact information will be kept for five years after completion of this study. All contact information will be permanently deleted after that period of time. No information that identifies you will be shared with the Canadian Physiotherapy Association or the provincial regulators.

Results of this study may be presented to the public and we may wish to quote your words directly in reports and publications resulting from this study. Your name will not be used in any of the study publications and nobody will be able to tell that you were a part of the study. Please note that although you will not be identified as the speaker, your words may be used to highlight a specific point. The collection and access to personal information will be in compliance with provincial and federal privacy legislations.

Only the research staff will have access to the study files and know your name. The University of Manitoba Health Research Ethics Board, which is responsible for the protection of people in research and has reviewed this study for ethical acceptability, may need to check the study records for quality assurance purposes. Your personal information may be disclosed if required by law.

All physical records will be kept in a locked filing cabinet in room 355 Rehabilitation Hospital, 800 Sherbrook Street, Winnipeg, MB, which will also be locked, and only the research staff will have access to these records. Your name and all identifying information will be removed from written transcripts. Your personal information, such as your name, email address, or telephone number may leave the University of Manitoba if the researcher conducts the interview from her home. The personal information will never be left unattended, and will be transported back to the University for secure storage as soon as possible after the interview.

Voluntary Participation/Withdrawal from the Study

Your decision to take part in this study is voluntary. You may refuse to participate or you may withdraw your interview data from the study up to 2 weeks (14 days) after your interview. After that period, data will be merged with other participants' and we will no longer be able to isolate your interview from the others. If you change your mind during those 14 days and would like to withdraw your participation, please contact the research staff at (204) 787-1436 or Tamires.doPrado@umanitoba.ca.

Questions

You are free to ask any questions that you may have about participation or your rights as a research participants. If any questions come up during or after the study contact the principal investigator and the study staff: Tamires C. do Prado at (204) 787-1436 or Tamires.doPrado@umanitoba.ca; or Dr. Joanne Parsons at (204) 787-1019.

For questions about your rights as a research participant, you may contact the University of Manitoba, Bannatyne Campus Research Ethics Board Office at (204) 789-3389.

Statement of Consent

I have read all four pages of this consent form. The risks and benefits have been explained to me. I have had a chance to ask questions and have received satisfactory answers to all of my questions from the research staff.

I understand that my records, which may include identifying information, may be reviewed by the research staff working with the Principal Investigator and the agencies and organizations listed in the Confidentiality section of this document. I authorize the inspection of any of my records that relate to this study by The University of Manitoba Research Ethics Board for quality assurance purposes.

I understand that my participation in this study is voluntary and that I may choose to withdraw my participation up to 14 days after the date of my interview.

I have been provided with a copy of the consent form for my records, which was also previously signed by the Principal Investigator.

I understand that by signing this consent form I am not waiving any of my legal rights as a participant in this study. I freely agree to participate in this research study.

Participant signature _____ Date _____
(day/month/year)

Participant printed name: _____

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has knowingly given their consent

Printed Name: _____ Date _____
(day/month/year)

Signature: _____

Role in the study: _____



UNIVERSITY
OF MANITOBA

Research Ethics
and Compliance

Research Ethics - Bannatyne
P126-770 Bannatyne Avenue
Winnipeg, MB
Canada R3E 0W3
Phone +204-789-3255
Fax +204-789-3414

HEALTH RESEARCH ETHICS BOARD (HREB)
CERTIFICATE OF FINAL APPROVAL FOR NEW STUDIES
Delegated Review

PRINCIPAL INVESTIGATOR: Tamires Cristina do Prado	INSTITUTION/DEPARTMENT: U of M/Medical Rehabilitation/ Rehabilitation Sciences	ETHICS #: HS22147 (H2018:361)
APPROVAL DATE: September 14, 2018	EXPIRY DATE: September 14, 2019	
STUDENT PRINCIPAL INVESTIGATOR SUPERVISOR (If applicable): Dr. Joanne Parsons		
PROTOCOL NUMBER: NA	PROJECT OR PROTOCOL TITLE: Evidence-based Practice for Non-specific Low Back Pain: Canadian Physiotherapists' Adherence, Beliefs, and Perspectives	
SPONSORING AGENCIES AND/OR COORDINATING GROUPS: NA		
Submission Date of Investigator Documents: July 30 and September 11, 2018	HREB Receipt Date of Documents: August 22 and September 11, 2018	

THE FOLLOWING ARE APPROVED FOR USE:

Document Name	Version(if applicable)	Date
Protocol: Protocol including Clarifications as per Letter dated September 11, 2018		19Jul18
Consent and Assent Form(s): Research Participant Information and Consent Form		11Sep2018
Consent Disclosure for Online Survey		11July18
Other: Advertisements/Recruitment/Social Media Appendix		11Sep18
Questionnaires/Scales/Instruments Appendix		13July18
Contact Information Form		09Jul18

CERTIFICATION

The above named research study/project has been reviewed in a *delegated manner* by the University of Manitoba (UM) Health Research Board (HREB) and was found to be acceptable on ethical grounds for research involving human participants. The study/project and documents listed above was granted final approval by the Chair or Acting Chair, UM HREB.

HREB ATTESTATION

The University of Manitoba (UM) Research Board (HREB) is organized and operates according to Health Canada/ICH Good Clinical Practices, Tri-Council Policy Statement 2, and the applicable laws and regulations of Manitoba. In respect to clinical trials, the HREB complies with the membership requirements for Research Ethics Boards defined in Division 5 of the Food and Drug Regulations of Canada and carries out its functions in a manner consistent with Good Clinical Practices.

QUALITY ASSURANCE

The University of Manitoba Research Quality Management Office may request to review research documentation from this research study/project to demonstrate compliance with this approved protocol and the University of Manitoba Policy on the Ethics of Research Involving Humans.

CONDITIONS OF APPROVAL:

1. The study is acceptable on scientific and ethical grounds for the ethics of human use only. ***For logistics of performing the study, approval must be sought from the relevant institution(s).***
2. This research study/project is to be conducted by the local principal investigator listed on this certificate of approval.
3. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to the research study/project, and for ensuring that the authorized research is carried out according to governing law.
4. **This approval is valid until the expiry date noted on this certificate of approval.** A **Bannatyne Campus Annual Study Status Report** must be submitted to the HREB within 15-30 days of this expiry date.
5. Any changes of the protocol (including recruitment procedures, etc.), informed consent form(s) or documents must be reported to the HREB for consideration in advance of implementation of such changes on the **Bannatyne Campus Research Amendment Form**.
6. Adverse events and unanticipated problems must be reported to the HREB as per Bannatyne Campus Research Boards Standard Operating procedures.
7. The UM HREB must be notified regarding discontinuation or study/project closure on the **Bannatyne Campus Final Study Status Report**.

Sincerely,



John Arnett, PhD. C. Psych.
Chair, Health Research Ethics Board
Bannatyne Campus



Research Ethics - Bannatyne
 P126-770 Bannatyne Avenue
 Winnipeg, MB
 Canada R3E 0W3
 Phone +204-789-3255
 Fax +204-789-3414

HEALTH RESEARCH ETHICS BOARD (HREB)
 CERTIFICATE OF FINAL APPROVAL FOR AMENDMENTS AND ADDENDUMS

PRINCIPAL INVESTIGATOR: Tamires Cristina do Prado	INSTITUTION/DEPARTMENT: U of M/Medical Rehabilitation/ Rehabilitation Sciences	ETHICS #: HS22147 (H2018:361)
HREB MEETING DATE (If applicable):		APPROVAL DATE: October 24, 2018
STUDENT PRINCIPAL INVESTIGATOR SUPERVISOR (If applicable): Dr. Joanne Parsons		
PROTOCOL NUMBER: NA	PROJECT OR PROTOCOL TITLE: Evidence-based Practice for Non-specific Low Back Pain: Canadian Physiotherapists' Adherence, Beliefs, and Perspectives	
SPONSORING AGENCIES AND/OR COORDINATING GROUPS: NA		

REMINDER: THE CURRENT HREB APPROVAL FOR THIS STUDY EXPIRES: September 14, 2019

REVIEW CATEGORY OF AMENDMENT:	Full Board Review <input type="checkbox"/>	Delegated Review <input checked="" type="checkbox"/>
Submission Date of Investigator Documents: October 15, 2018	HREB receipt date of Documents: October 16, 2018	

THE FOLLOWING AMENDMENT(S) and DOCUMENTS ARE APPROVED FOR USE:

Document Name	Version(if applicable)	Date
---------------	------------------------	------

Protocol:

Protocol

12Oct18

Consent and Assent Form(s):

Other:

CERTIFICATION

The University of Manitoba (UM) Health Research Board (HREB) has reviewed the amendment to the research study/project named on this **Certificate of Approval** as per the category of review listed above and was found to be acceptable on ethical grounds for research involving human participants. The amendment and documents listed above were granted final approval by the Chair or Acting Chair, UM HREB.

HREB ATTESTATION

The University of Manitoba (UM) Health Research Board (HREB) is organized and operates according to Health Canada/ICH Good Clinical Practices, Tri-Council Policy Statement 2, and the applicable laws and regulation of Manitoba. In respect to clinical trials, the HREB complies with the membership requirements for Research Ethics Boards defined in

Research Ethics and Compliance is a unit of the Office of the Vice-President (Research and International)

umanitoba.ca/research

Division 5 of the Food and Drug Regulations of Canada and carries out its functions in a manner consistent with Good Clinical Practices.

QUALITY ASSURANCE

The University of Manitoba Research Quality Management Office may request to review research documentation from this research study/project to demonstrate compliance with this approved protocol and the University of Manitoba Policy on the Ethics of Research Involving Humans.

CONDITIONS OF APPROVAL:

1. This amendment is acceptable on scientific and ethical grounds for the ethics of human use only. ***For logistics of performing the study, approval must be sought from the relevant institution(s).***
2. This research study/project is to be conducted by the local principal investigator listed on this certificate of approval.
3. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to the research study/project, and for ensuring that the authorized research is carried out according to governing law.
4. **This approval is valid until the expiry date noted on this certificate of approval.** A **Bannatyne Campus Annual Study Status Report** must be submitted to the HREB within 15-30 days of this expiry date.
5. Any changes of the protocol (including recruitment procedures, etc.), informed consent form(s) or documents must be reported to the HREB for consideration in advance of implementation of such changes on the **Bannatyne Campus Research Amendment Form**.
6. Adverse events and unanticipated problems must be reported to the HREB as per Bannatyne Campus Research Boards Standard Operating procedures.
7. The UM HREB must be notified regarding discontinuation or study/project closure on the **Bannatyne Campus Final Study Status Report**.

Sincerely,



John Arpétt, PhD. C. Psych.
Chair, Health Research Ethics Board
Bannatyne Campus

Please quote the above Human Ethics Number on all correspondence.

Inquiries should be directed to the REB Secretary Telephone: (204) 789-3255/ Fax: (204) 789-3414



UNIVERSITY
OF MANITOBA

Research Ethics
and Compliance

Research Ethics - Bannatyne
P126-770 Bannatyne Avenue
Winnipeg, MB
Canada R3E 0W3
Phone +204-789-3255
Fax +204-789-3414

HEALTH RESEARCH ETHICS BOARD (HREB)
CERTIFICATE OF FINAL APPROVAL FOR AMENDMENTS AND ADDENDUMS

PRINCIPAL INVESTIGATOR: Tamires Cristina do Prado	INSTITUTION/DEPARTMENT: U of M/Medical Rehabilitation/ Rehabilitation Services	ETHICS #: HS22147 (H2018:361)
HREB MEETING DATE (If applicable):	APPROVAL DATE: November 21, 2018	
STUDENT PRINCIPAL INVESTIGATOR SUPERVISOR (If applicable): Dr. Joanne Parsons		
PROTOCOL NUMBER: NA	PROJECT OR PROTOCOL TITLE: Evidence-based Practice for Non-specific Low Back Pain: Canadian Physiotherapists' Adherence, Beliefs, and Perspectives	
SPONSORING AGENCIES AND/OR COORDINATING GROUPS: NA		

REMINDER: THE CURRENT HREB APPROVAL FOR THIS STUDY EXPIRES: September 14, 2019

REVIEW CATEGORY OF AMENDMENT:	Full Board Review <input type="checkbox"/>	Delegated Review <input checked="" type="checkbox"/>
Submission Date of Investigator Documents: November 19, 2018	HREB receipt date of Documents: November 20, 2018	

THE FOLLOWING AMENDMENT(S) and DOCUMENTS ARE APPROVED FOR USE:

Document Name	Version(if applicable)	Date
Protocol: Protocol		13Nov18
Consent and Assent Form(s): Research Participant Information and Consent Form		13Nov18
Other: Advertisements/Recruitment/Social Media Appendix		15Nov18

CERTIFICATION

The University of Manitoba (UM) Health Research Board (HREB) has reviewed the amendment to the research study/project named on this **Certificate of Approval** as per the category of review listed above and was found to be acceptable on ethical grounds for research involving human participants. The amendment and documents listed above were granted final approval by the Chair or Acting Chair, UM HREB.

HREB ATTESTATION

The University of Manitoba (UM) Health Research Board (HREB) is organized and operates according to Health Canada/ICH Good Clinical Practices, Tri-Council Policy Statement 2, and the applicable laws and regulation of Manitoba. In respect to clinical trials, the HREB complies with the membership requirements for Research Ethics Boards defined in

Research Ethics and Compliance is a unit of the Office of the Vice-President (Research and International)

Division 5 of the Food and Drug Regulations of Canada and carries out its functions in a manner consistent with Good Clinical Practices.

QUALITY ASSURANCE

The University of Manitoba Research Quality Management Office may request to review research documentation from this research study/project to demonstrate compliance with this approved protocol and the University of Manitoba Policy on the Ethics of Research Involving Humans.

CONDITIONS OF APPROVAL:

1. This amendment is acceptable on scientific and ethical grounds for the ethics of human use only. ***For logistics of performing the study, approval must be sought from the relevant institution(s).***
2. This research study/project is to be conducted by the local principal investigator listed on this certificate of approval.
3. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to the research study/project, and for ensuring that the authorized research is carried out according to governing law.
4. **This approval is valid until the expiry date noted on this certificate of approval. A Bannatyne Campus Annual Study Status Report** must be submitted to the HREB within 15-30 days of this expiry date.
5. Any changes of the protocol (including recruitment procedures, etc.), informed consent form(s) or documents must be reported to the HREB for consideration in advance of implementation of such changes on the **Bannatyne Campus Research Amendment Form**.
6. Adverse events and unanticipated problems must be reported to the HREB as per Bannatyne Campus Research Boards Standard Operating procedures.
7. The UM HREB must be notified regarding discontinuation or study/project closure on the **Bannatyne Campus Final Study Status Report**.

Sincerely,



John Arnett, PhD. C. Psych.
Chair, Health Research Ethics Board
Bannatyne Campus

Please quote the above Human Ethics Number on all correspondence.

Inquiries should be directed to the REB Secretary Telephone: (204) 789-3255/ Fax: (204) 789-3414

Wednesday, August 8, 2018 at 10:58:40 AM Central Daylight Time

Subject: RE: Copyrighted content on electronic survey
Date: Wednesday, April 18, 2018 at 5:04:04 PM Central Daylight Time
From: Corey Parker
To: Tamires Cristina do Prado

Hi,

Okay, thanks for the information. You have permission to use the stated material for your thesis and for the electronic survey, provided the following attribution line is used somewhere within the work:

Reprinted with permission from Ladeira CE, Cheng MS, da Silva RA. Clinical specialization and adherence to evidence-based practice guidelines for low back pain management: a survey of US physical therapists. *J Orthop Sports Phys Ther.* 2017;47:347-358. <https://doi.org/10.2519/jospt.2017.6561>. ©*Journal of Orthopaedic & Sports Physical Therapy*®

Kind regards,
Corey

Corey Parker
Copy Editor
Journal of Orthopaedic & Sports Physical Therapy
1033 N. Fairfax St., Suite 304
Alexandria, VA 22314
Phone: 571-970-1062
Fax: 703-836-2210
coreyparker@jospt.org

-----Original Message-----

From: Tamires Cristina do Prado <doprادتc@myumanitoba.ca>
Sent: Wednesday, April 18, 2018 5:51 PM
To: Corey Parker <coreyparker@jospt.org>
Subject: RE: Copyrighted content on electronic survey

Hi Corey,

Yes, it is part of my thesis project. The copyright office at the University of Manitoba advised me to ask for specific permission since I'll be sending it out on an electronic survey and not only using it on the thesis itself.

Please let me know if you need further clarification.

Thanks,

--

Tamires Prado, B.PT

M.Sc. in Rehabilitation Sciences Candidate

College of Rehabilitation Sciences

University of Manitoba

On Apr 18, 2018 4:46 PM, Corey Parker <coreyparker@jospt.org> wrote:

Hi Tamires,

Thanks for your e-mail. Is this for a thesis or dissertation? I will look into the matter this week.

Thanks,
Corey

Corey Parker
Copy Editor
Journal of Orthopaedic & Sports Physical Therapy
1033 N. Fairfax St., Suite 304
Alexandria, VA 22314
Phone: 571-970-1062
Fax: 703-836-2210
coreyparker@jospt.org

-----Original Message-----

From: Tamires Cristina do Prado <doprادتc@myumanitoba.ca>
Sent: Tuesday, April 17, 2018 3:40 PM
To: Corey Parker <coreyparker@jospt.org>
Subject: Copyrighted content on electronic survey

Good afternoon,

My name is Tamires and I'm a MSc candidate at the University of Manitoba, Canada.

As part of the study I'll be conducting as a requirement for my degree, I'll be sending out electronic surveys to physiotherapists across Canada and I would like to reproduce in the survey the case scenario #4 as well as the answer options published on Appendix B, more specifically page B5, of the following publication:

Ladeira, C. E., Cheng, M. S., & da Silva, R. A. (2017). Clinical specialization and adherence to evidence-based practice guidelines for low back pain management: a survey of US physical therapists. *Journal of Orthopaedic & Sports Physical Therapy*, 47(5), 347–358. <https://doi.org/10.2519/jospt.2017.6561>
<<https://doi.org/10.2519/%20jospt.2017.6561>>

The closest option on RightsLink to my intended use of the content I believe would be “post on a website”, however I am not sure yet of what host we will use, therefore I am unable to fill in the website URL and name requested on RightsLink at this time. So, my question is how should I proceed with the formal permission request?

Thank you for your time and consideration,

--

Tamires Prado, B.PT

M.Sc. in Rehabilitation Sciences Candidate

College of Rehabilitation Sciences

University of Manitoba

Hi Tamires,

Thanks for your e-mail. Is this for a thesis or dissertation? I will look into the matter this week.

Thanks,
Corey

Corey Parker
Copy Editor
Journal of Orthopaedic & Sports Physical Therapy
1033 N. Fairfax St., Suite 304
Alexandria, VA 22314
Phone: 571-970-1062
Fax: 703-836-2210
coreyparker@jospt.org

-----Original Message-----

From: Tamires Cristina do Prado <doprادتc@myumanitoba.ca>

Sent: Tuesday, April 17, 2018 3:40 PM

To: Corey Parker <coreyparker@jospt.org>

Subject: Copyrighted content on electronic survey

Good afternoon,

My name is Tamires and I'm a MSc candidate at the University of Manitoba, Canada.

As part of the study I'll be conducting as a requirement for my degree, I'll be sending out electronic surveys to physiotherapists across Canada and I would like to reproduce in the survey the case scenario #4 as well as the answer options published on Appendix B, more specifically page B5, of the following publication:

Ladeira, C. E., Cheng, M. S., & da Silva, R. A. (2017). Clinical specialization and adherence to evidence-based practice guidelines for low back pain management: a survey of US physical therapists. *Journal of Orthopaedic & Sports Physical Therapy*, 47(5), 347–358. <https://doi.org/10.2519/jospt.2017.6561>
<<https://doi.org/10.2519/%20jospt.2017.6561>>

The closest option on RightsLink to my intended use of the content I believe would be “post on a website”, however I am not sure yet of what host we will use, therefore I am unable to fill in the website URL and name requested on RightsLink at this time. So, my question is how should I proceed with the formal permission request?

Thank you for your time and consideration,

--

Tamires Prado, B.PT

M.Sc. in Rehabilitation Sciences Candidate

College of Rehabilitation Sciences

University of Manitoba

Wednesday, August 8, 2018 at 11:01:29 AM Central Daylight Time

Subject: RE: Copyrighted content use on electronic survey (EPIC scale)
Date: Monday, April 30, 2018 at 1:27:12 PM Central Daylight Time
From: Nancy Salbach
To: Tamires Cristina do Prado
Attachments: image001.jpg, 2010 Devt EPIC scale J Eval Clin Pract FINAL.pdf, 2013 Reliab Valid EPIC scale JCEHP.pdf, 2013 Reply to Bland JCEHP.pdf, 2016 Clyde et al AJOT Validation of EPIC scale in OTs.pdf, EPIC_scale Word version.doc

Hi Tamires, you have my permission to use the EPIC scale. Please find attached our publications on the scale and a Word version for your research purposes. Good luck with your research.

Nancy

Nancy M. Salbach, PT, PhD

CIHR New Investigator in Knowledge Translation

Associate Professor, Department of Physical Therapy, University of Toronto

160-500 University Avenue

Toronto, ON M5G 1V7 Canada

416-946-8558 (office, rm 854)

416-946-7579 (lab, rm 803)

nancy.salbach@utoronto.ca

Adjunct Scientist, Toronto Rehabilitation Institute-University Health Network

Adjunct Scientist, St. John's Rehab-Sunnybrook Health Sciences Centre

Knowledge to Action Lab: <http://www.physicaltherapy.utoronto.ca/research/ktalab/>

Faculty Profile: <http://www.physicaltherapy.utoronto.ca/faculty/nancy-salbach/>

@nancysalbach @UofT_PT

From: Tamires Cristina do Prado <doprادتc@myumanitoba.ca>
Sent: Monday, April 30, 2018 2:26 PM
To: Nancy Salbach <Nancy.Salbach@utoronto.ca>
Subject: FW: Copyrighted content use on electronic survey (EPIC scale)

Good afternoon Dr. Salbach,

My name is Tamires and I'm a MSc candidate at the University of Manitoba.

As part of the study I'll be conducting as a requirement for my degree, I'll be sending out electronic surveys to physiotherapists across Canada and I would like to reproduce in the survey the Evidence-based practice confidence (EPIC) scale published on Appendix 1, more specifically page 800, of the following publication of yours:

Salbach, N. M., & Jaglal, S. B. (2011). Creation and validation of the evidence-based practice confidence scale for health care professionals: evidence-based practice confidence scale. *Journal of Evaluation in Clinical Practice*, 17(4), 794–800. <https://doi.org/10.1111/j.1365-2753.2010.01478.x>

As you can see from the attached email, I've contacted the publisher regarding reproduction of the copyrighted material in my survey and thesis, and I was informed that you hold the copyright to the material on the publication appendix.

Therefore, I was wondering if you would be able to tell me how to proceed with a formal permission request?

Thank you for your time and consideration,

--

Tamires Prado, B.PT
M.Sc. in Rehabilitation Sciences Candidate
College of Rehabilitation Sciences
University of Manitoba

From: Wiley Global Permissions <permissions@wiley.com>
Date: Monday, April 30, 2018 at 3:02 AM
To: Tamires Cristina do Prado <doprادتc@myumanitoba.ca>
Subject: RE: Copyrighted content use on electronic survey

Dear Tamires,

Thank you for your email.

Unfortunately, we are unable to process your request, as Wiley is not responsible for the material appearing in the appendix.

Please contact corresponding author Dr Nancy Salbach at nancy.salbach@utoronto.ca for permission to use this material.

Best wishes,

Kelly Hoff
Permissions Coordinator
Copyright & Permissions
Wiley
The Atrium, Southern Gate
Chichester, PO19 8SQ

WILEY

John Wiley & Sons Ltd is a private limited company registered in England with registered number 641132. Registered office address: The Atrium, Southern Gate, Chichester, West Sussex, United Kingdom. PO19 8SQ.

From: Tamires Cristina do Prado [<mailto:doprادتc@myumanitoba.ca>]
Sent: 17 April 2018 20:47
To: Wiley Global Permissions <permissions@wiley.com>

Subject: Copyrighted content use on electronic survey

Good afternoon,

My name is Tamires and I'm a MSc candidate at the University of Manitoba, Canada.

As part of the study I'll be conducting as a requirement for my degree, I'll be sending out electronic surveys to physiotherapists across Canada and I would like to reproduce in the survey the Evidence-based practice confidence (EPIC) scale published on Appendix 1, more specifically page 800, of the following publication:

Salbach, N. M., & Jaglal, S. B. (2011). Creation and validation of the evidence-based practice confidence scale for health care professionals: evidence-based practice confidence scale.

Journal of Evaluation in Clinical Practice, 17(4), 794–800. <https://doi.org/10.1111/j.1365-2753.2010.01478.x>

The closest option on RightsLink to my intended use of the content, I believe, would be “post on a website”, however, I am not sure yet of what host we will use, therefore I am unable to fill in the website URL and name requested on RightsLink at this time. So, my question is how should I proceed with the formal permission request?

Thank you for your time and consideration,

--

Tamires Prado, B.PT
M.Sc. in Rehabilitation Sciences Candidate
College of Rehabilitation Sciences
University of Manitoba

Wednesday, August 8, 2018 at 11:00:01 AM Central Daylight Time

Subject: RE: Copyrighted content use on electronic survey
Date: Monday, May 14, 2018 at 4:28:31 AM Central Daylight Time
From: Wiley Global Permissions
To: Tamires Cristina do Prado
Attachments: image001.jpg, image002.jpg

Dear Tamires,

Thank you for your reply.

Usually we handle requests for scales, including academic usage via email rather than via RightsLink. As we have the rights to this material, please see your below permission grant for the use of the material for your thesis project:

Permission is granted for you to use the material requested for your thesis/dissertation subject to the usual acknowledgements (author, title of material, title of book/journal, ourselves as publisher) and on the understanding that you will reapply for permission if you wish to distribute or publish your thesis/dissertation commercially.

You should also duplicate the copyright notice that appears in the Wiley publication in your use of the Material. Permission is granted solely for use in conjunction with the thesis, and the material may not be posted online separately.

Any third-party material is expressly excluded from this permission. If any material appears within the article with credit to another source, authorisation from that source must be obtained.

Best wishes,

Kelly Hoff
Permissions Coordinator
Copyright & Permissions
Wiley
The Atrium, Southern Gate
Chichester, PO19 8SQ
UK

WILEY

John Wiley & Sons Ltd is a private limited company registered in England with registered number 641132. Registered office address: The Atrium, Southern Gate, Chichester, West Sussex, United Kingdom. PO19 8SQ.

From: Tamires Cristina do Prado [mailto:doprادتc@myumanitoba.ca]
Sent: 30 April 2018 19:39
To: Wiley Global Permissions <permissions@wiley.com>
Subject: Re: Copyrighted content use on electronic survey

Thank you for your email, Kelly.

I've contacted Dr. Salbach with a request.

I have one more question though, I'm planning on using a second questionnaire from a publication of yours,

which has been published on a table format within the body of the article.

Since I'll be using the questionnaire for the electronic survey as part of my thesis project, can I submit a permission request via RightsLink under the "reuse in a dissertation/thesis" category, or do I need special permission to reuse the content on the survey?

The publication I intend to use is the following:

Houben, R. M. A., Ostelo, R. W. J. G., Vlaeyen, J. W. S., Wolters, P. M. J. C., Peters, M., & Berg, S. G. M. S. (2005). Health care providers' orientations towards common low back pain predict perceived harmfulness of physical activities and recommendations regarding return to normal activity. *European Journal of Pain*, 9(2), 173–183. <https://doi.org/10.1016/j.ejpain.2004.05.002>

Thank you,

--

Tamires Prado

From: Wiley Global Permissions <permissions@wiley.com>
Date: Monday, April 30, 2018 at 3:02 AM
To: Tamires Cristina do Prado <doprادتc@myumanitoba.ca>
Subject: RE: Copyrighted content use on electronic survey

Dear Tamires,

Thank you for your email.

Unfortunately, we are unable to process your request, as Wiley is not responsible for the material appearing in the appendix.

Please contact corresponding author Dr Nancy Salbach at nancy.salbach@utoronto.ca for permission to use this material.

Best wishes,

Kelly Hoff
Permissions Coordinator
Copyright & Permissions
Wiley
The Atrium, Southern Gate
Chichester, PO19 8SQ

WILEY

John Wiley & Sons Ltd is a private limited company registered in England with registered number 641132. Registered office address: The Atrium, Southern Gate, Chichester, West Sussex, United Kingdom. PO19 8SQ.

From: Tamires Cristina do Prado [<mailto:doprادتc@myumanitoba.ca>]
Sent: 17 April 2018 20:47

To: Wiley Global Permissions <permissions@wiley.com>

Subject: Copyrighted content use on electronic survey

Good afternoon,

My name is Tamires and I'm a MSc candidate at the University of Manitoba, Canada.

As part of the study I'll be conducting as a requirement for my degree, I'll be sending out electronic surveys to physiotherapists across Canada and I would like to reproduce in the survey the Evidence-based practice confidence (EPIC) scale published on Appendix 1, more specifically page 800, of the following publication:

Salbach, N. M., & Jaglal, S. B. (2011). Creation and validation of the evidence-based practice confidence scale for health care professionals: evidence-based practice confidence scale.

Journal of Evaluation in Clinical Practice, 17(4), 794–800. <https://doi.org/10.1111/j.1365-2753.2010.01478.x>

The closest option on RightsLink to my intended use of the content, I believe, would be "post on a website", however, I am not sure yet of what host we will use, therefore I am unable to fill in the website URL and name requested on RightsLink at this time. So, my question is how should I proceed with the formal permission request?

Thank you for your time and consideration,

--

Tamires Prado, B.PT

M.Sc. in Rehabilitation Sciences Candidate

College of Rehabilitation Sciences

University of Manitoba

8/24/2019

RightsLink Printable License

**JOHN WILEY AND SONS LICENSE
TERMS AND CONDITIONS**

Aug 24, 2019

This Agreement between Miss. Tamires do Prado ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.

License Number	4655510432569
License date	Aug 24, 2019
Licensed Content Publisher	John Wiley and Sons
Licensed Content Publication	Wiley Books
Licensed Content Title	Introduction Knowledge translation: What it is and what it isn't
Licensed Content Author	Ian D. Graham, Jacqueline Tetroe, Sharon E. Straus
Licensed Content Date	Jun 9, 2013
Licensed Content Pages	10
Type of use	Dissertation/Thesis
Requestor type	University/Academic
Format	Print and electronic
Portion	Figure/table
Number of figures/tables	1
Original Wiley figure/table number(s)	Figure 1.1.1
Will you be translating?	No
Title of your thesis / dissertation	Evidence-based Practice for Non-specific Low Back Pain: Canadian Physiotherapists Adherence, Beliefs, and Perspectives
Expected completion date	Aug 2019
Expected size (number of pages)	155
Requestor Location	Miss. Tamires do Prado  Canada Attn: Miss. Tamires do Prado
Publisher Tax ID	EU826007151
Total	0.00 CAD

Terms and Conditions

TERMS AND CONDITIONS

This copyrighted material is owned by or exclusively licensed to John Wiley & Sons, Inc. or one of its group companies (each a "Wiley Company") or handled on behalf of a society with which a Wiley Company has exclusive publishing rights in relation to a particular work (collectively "WILEY"). By clicking "accept" in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the billing and payment terms and conditions established by the Copyright

8/24/2019

RightsLink Printable License

Clearance Center Inc., ("CCC's Billing and Payment terms and conditions"), at the time that you opened your RightsLink account (these are available at any time at <http://myaccount.copyright.com>).

Terms and Conditions

- The materials you have requested permission to reproduce or reuse (the "Wiley Materials") are protected by copyright.
- You are hereby granted a personal, non-exclusive, non-sub licensable (on a stand-alone basis), non-transferable, worldwide, limited license to reproduce the Wiley Materials for the purpose specified in the licensing process. This license, **and any CONTENT (PDF or image file) purchased as part of your order**, is for a one-time use only and limited to any maximum distribution number specified in the license. The first instance of republication or reuse granted by this license must be completed within two years of the date of the grant of this license (although copies prepared before the end date may be distributed thereafter). The Wiley Materials shall not be used in any other manner or for any other purpose, beyond what is granted in the license. Permission is granted subject to an appropriate acknowledgement given to the author, title of the material/book/journal and the publisher. You shall also duplicate the copyright notice that appears in the Wiley publication in your use of the Wiley Material. Permission is also granted on the understanding that nowhere in the text is a previously published source acknowledged for all or part of this Wiley Material. Any third party content is expressly excluded from this permission.
- With respect to the Wiley Materials, all rights are reserved. Except as expressly granted by the terms of the license, no part of the Wiley Materials may be copied, modified, adapted (except for minor reformatting required by the new Publication), translated, reproduced, transferred or distributed, in any form or by any means, and no derivative works may be made based on the Wiley Materials without the prior permission of the respective copyright owner. **For STM Signatory Publishers clearing permission under the terms of the [STM Permissions Guidelines](#) only, the terms of the license are extended to include subsequent editions and for editions in other languages, provided such editions are for the work as a whole in situ and does not involve the separate exploitation of the permitted figures or extracts,** You may not alter, remove or suppress in any manner any copyright, trademark or other notices displayed by the Wiley Materials. You may not license, rent, sell, loan, lease, pledge, offer as security, transfer or assign the Wiley Materials on a stand-alone basis, or any of the rights granted to you hereunder to any other person.
- The Wiley Materials and all of the intellectual property rights therein shall at all times remain the exclusive property of John Wiley & Sons Inc, the Wiley Companies, or their respective licensors, and your interest therein is only that of having possession of and the right to reproduce the Wiley Materials pursuant to Section 2 herein during the continuance of this Agreement. You agree that you own no right, title or interest in or to the Wiley Materials or any of the intellectual property rights therein. You shall have no rights hereunder other than the license as provided for above in Section 2. No right, license or interest to any trademark, trade name, service mark or other branding ("Marks") of WILEY or its licensors is granted hereunder, and you agree that you shall not assert any such right, license or interest with respect thereto
- NEITHER WILEY NOR ITS LICENSORS MAKES ANY WARRANTY OR REPRESENTATION OF ANY KIND TO YOU OR ANY THIRD PARTY, EXPRESS, IMPLIED OR STATUTORY, WITH RESPECT TO THE MATERIALS

8/24/2019

RightsLink Printable License

OR THE ACCURACY OF ANY INFORMATION CONTAINED IN THE MATERIALS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, ACCURACY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, USABILITY, INTEGRATION OR NON-INFRINGEMENT AND ALL SUCH WARRANTIES ARE HEREBY EXCLUDED BY WILEY AND ITS LICENSORS AND WAIVED BY YOU.

- WILEY shall have the right to terminate this Agreement immediately upon breach of this Agreement by you.
- You shall indemnify, defend and hold harmless WILEY, its Licensors and their respective directors, officers, agents and employees, from and against any actual or threatened claims, demands, causes of action or proceedings arising from any breach of this Agreement by you.
- IN NO EVENT SHALL WILEY OR ITS LICENSORS BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR ENTITY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR PUNITIVE DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, PROVISIONING, VIEWING OR USE OF THE MATERIALS REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.
- Should any provision of this Agreement be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, that provision shall be deemed amended to achieve as nearly as possible the same economic effect as the original provision, and the legality, validity and enforceability of the remaining provisions of this Agreement shall not be affected or impaired thereby.
- The failure of either party to enforce any term or condition of this Agreement shall not constitute a waiver of either party's right to enforce each and every term and condition of this Agreement. No breach under this agreement shall be deemed waived or excused by either party unless such waiver or consent is in writing signed by the party granting such waiver or consent. The waiver by or consent of a party to a breach of any provision of this Agreement shall not operate or be construed as a waiver of or consent to any other or subsequent breach by such other party.
- This Agreement may not be assigned (including by operation of law or otherwise) by you without WILEY's prior written consent.
- Any fee required for this permission shall be non-refundable after thirty (30) days from receipt by the CCC.
- These terms and conditions together with CCC's Billing and Payment terms and conditions (which are incorporated herein) form the entire agreement between you and WILEY concerning this licensing transaction and (in the absence of fraud) supersedes

8/24/2019

RightsLink Printable License

all prior agreements and representations of the parties, oral or written. This Agreement may not be amended except in writing signed by both parties. This Agreement shall be binding upon and inure to the benefit of the parties' successors, legal representatives, and authorized assigns.

- In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall prevail.
- WILEY expressly reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.
- This Agreement will be void if the Type of Use, Format, Circulation, or Requestor Type was misrepresented during the licensing process.
- This Agreement shall be governed by and construed in accordance with the laws of the State of New York, USA, without regards to such state's conflict of law rules. Any legal action, suit or proceeding arising out of or relating to these Terms and Conditions or the breach thereof shall be instituted in a court of competent jurisdiction in New York County in the State of New York in the United States of America and each party hereby consents and submits to the personal jurisdiction of such court, waives any objection to venue in such court and consents to service of process by registered or certified mail, return receipt requested, at the last known address of such party.

WILEY OPEN ACCESS TERMS AND CONDITIONS

Wiley Publishes Open Access Articles in fully Open Access Journals and in Subscription journals offering Online Open. Although most of the fully Open Access journals publish open access articles under the terms of the Creative Commons Attribution (CC BY) License only, the subscription journals and a few of the Open Access Journals offer a choice of Creative Commons Licenses. The license type is clearly identified on the article.

The Creative Commons Attribution License

The [Creative Commons Attribution License \(CC-BY\)](#) allows users to copy, distribute and transmit an article, adapt the article and make commercial use of the article. The CC-BY license permits commercial and non-

Creative Commons Attribution Non-Commercial License

The [Creative Commons Attribution Non-Commercial \(CC-BY-NC\) License](#) permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.(see below)

Creative Commons Attribution-Non-Commercial-NoDerivs License

The [Creative Commons Attribution Non-Commercial-NoDerivs License](#) (CC-BY-NC-ND) permits use, distribution and reproduction in any medium, provided the original work is properly cited, is not used for commercial purposes and no modifications or adaptations are made. (see below)

Use by commercial "for-profit" organizations

Use of Wiley Open Access articles for commercial, promotional, or marketing purposes requires further explicit permission from Wiley and will be subject to a fee.

Further details can be found on Wiley Online Library

<http://olabout.wiley.com/WileyCDA/Section/id-410895.html>

8/24/2019

RightsLink Printable License

Other Terms and Conditions:

v1.10 Last updated September 2015

Questions? customercare@copyright.com or +1-855-239-3415 (toll free in the US) or +1-978-646-2777.

