

Barriers and facilitators to biopsychosocial management of chronic primary pain;  
an exploration of Canadian athletic therapists' perspectives

by

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## Abstract

*Background and objectives.* One in 5 Canadians experience pain which persists longer than 3 months. The magnitude, duration and impact of that pain is determined not only by biological factors, but psychological, sociocultural and behavioral ones as well. This concept is best understood through the lens of the biopsychosocial model of disease, which is now considered most appropriate for chronic pain management. Given that certified athletic therapists (CAT(C)) in clinical practice frequently are in contact with patients experiencing chronic pain, it is essential that they be well prepared to manage this condition. Previous research has found that other healthcare professionals struggle to address psychosocial factors which influence chronic pain outcomes; athletic therapists have not been included in these studies. In this study, I will use a knowledge translation framework to assess CAT(C)s' knowledge of current pain physiology and influencing factors, and their attitudes and beliefs regarding the management of chronic primary pain. In addition, I will explore what barriers and facilitators CAT(C)s identify to incorporating a biopsychosocial approach in the management of chronic primary pain.

*Methods.* Forty-four CAT(C)s from six provinces completed the Knowledge and Attitudes of Pain Questionnaire. I then conducted in-depth semi-structured interviews with 10 athletic therapists to further explore barriers and facilitators to the use of a biopsychosocial approach to chronic pain management. The transcribed interviews were analyzed using reflexive thematic analysis and the resulting themes were compared to relevant behaviour change constructs from the Theoretical Domains Framework, which was also used to create the interview guide.

*Results.* We reported the mean scores of KNAP scales; knowledge of pain physiology and influencing factors (81.79%), treatment orientation (63.46%) and the total score (76.30%). We identified six themes and 23 subthemes; themes include therapist beliefs about pain, common approaches to chronic pain management, athletic therapy in the community, training or experience in chronic pain management, communication, and the affective side of treating chronic pain.

*Conclusion.* Athletic therapists face numerous barriers in the management of chronic pain, including knowledge gaps, and further research, training and organizational support is recommended.

*Keywords:* chronic pain, knowledge translation, athletic therapy, biopsychosocial

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## Introduction

Marina (fictional), a 45-year old woman, works as a health care aid for the local health authority. She is a 1<sup>st</sup> generation Canadian immigrant with two teenage children and a husband who is unable to work due to a serious illness. She acts as a nurse, caretaker, tutor and chauffer for her busy family, on top of a demanding physical job. She has little social support as most of her family and friends still reside in her birth country.

One morning after a particularly poor night's sleep, she is performing a patient transfer and feels a painful pulling sensation in her low back. She continues with her workday, but by the end of the day the pain is worse. After a week passes and the pain has not dissipated, Marina books an appointment with her family physician. The family physician prescribes her anti-inflammatory medication and rest. Marina is instructed to avoid lifting and bending, which makes it difficult to perform her required work duties. She must rely on her children to assist with her household responsibilities, which makes her feel frustrated and helpless. After three months she receives an MRI of her back which shows "degenerative changes" in her L4/L5 spinal region. Marina's pain has improved slightly with the reduced workload, however she is fearful that any movement might cause further injury or trigger a flare-up. Eventually, after 6 months of modified work duties she is referred to an athletic therapist for workplace reconditioning.

A typical athletic therapy assessment consists of 3-4 minutes of questioning about injury history, an active and passive range of motion assessment, strength tests and "special" tests for specific suspected pathologies. From meeting with the patient to prescribing a treatment plan this process could take anywhere from 15-60 minutes. While assessments may vary from practitioner to practitioner, these basic components are part of every athletic therapist's training. In my work as a clinical athletic therapist, I saw many patients like Marina, but very rarely did I hear their entire story. In Marina's case, many factors may have contributed to the emergence, severity, and duration of her pain, including socioeconomic factors, work environment, family stress, lack of sleep, lack of social support, negative emotions, age, sex, and gender. While rest, absence from work, and imaging are not recommended by most guidelines for low back pain, these are still common practice in primary care (Foster et al., 2018). By the time that a patient is referred to an athletic therapist, many individuals bring several months or years of medical history, as well as psychological, sociocultural, and behavioural factors which may need to be addressed for

successful rehabilitation. Athletic therapists may be well-situated to address chronic pain, given their expertise in exercise and strong recommendations that individuals with chronic pain engage in physical activity (Foster et al., 2018). However, they may also face challenges in assessing pain which is not tied to a clear injury or pathology, as well as managing the psychosocial aspects of pain. This study aimed to explore the unique experiences of athletic therapists who see patients with chronic pain in their practice, as well as the overall level of pain science knowledge in the athletic therapy community.

## **Literature Review**

### **Chronic Pain**

Chronic pain is generally understood as pain which persists past normal healing time, typically greater than 3 or 6 months, depending on the guidelines used (Aziz et al., 2015). The World Health Organization (WHO) recognizes chronic pain as a disease in its own right, and in 2015 put in place a comprehensive definition which distinguishes between chronic pain of differing etiology and location (Aziz et al., 2015). This definition distinguishes between chronic primary pain, cancer pain, post-surgical and post-traumatic pain, headache and orofacial pain, visceral pain and musculoskeletal pain. This classification has been further simplified by national health organizations into two types of chronic pain; primary and secondary (National Institute for Health and Care Excellence, 2021). Chronic primary pain is defined as “pain in 1 or more anatomic regions that persists or recurs for longer than 3 months and is associated with significant emotional distress or significant functional disability...and that cannot be better explained by another chronic pain condition” (Aziz et al., 2015). Chronic secondary pain includes the other five categories listed above, all of which arise from an underlying condition which adequately accounts for the pain and its impact on functional ability (National Institute for Health and Care Excellence, 2021). Chronic primary pain and chronic secondary pain can coexist in cases where the severity or impact of the pain is not adequately accounted for by an observable injury or disease (National Institute for Health and Care Excellence, 2021). Chronic musculoskeletal pain includes chronic inflammatory conditions such as rheumatoid arthritis, as well as structural changes which affect bones and joints such as osteoarthritis (Aziz et al., 2015). Notably, chronic musculoskeletal pain does not include pain which may be perceived as musculoskeletal, but does not arise from the musculoskeletal system or whose exact etiology is

not well understood; those cases would be categorized as primary pain (Aziz et al., 2015). The focus of this study is on chronic primary pain specifically, as my interest is in chronic pain itself rather than the management of an underlying condition. As this categorization is still relatively new, much of the literature on chronic pain does not distinguish between chronic primary or secondary pain. Whenever possible I will make this distinction, however where the author does not I will continue to use the broader term “chronic pain.”

Chronic pain is a widespread issue in Canada, where an estimated 7.6 million Canadians, or 1 in 5 Canadian adults, youth, and children suffer from chronic pain (Health Canada, 2020; Reitsma et al., 2011; Schopflocher et al., 2011). A 2011 study which used a validated telephone survey tool found that of those Canadian adults experiencing chronic pain, half reported pain lasting for more than 10 years and 30% rated their pain as severe (Schopflocher et al., 2011). Chronic pain also appears to be more prevalent in older adults; as many as 1 in 3 adults over 65 years experience chronic pain (Health Canada, 2021). Due to population growth and aging demographics, Health Canada estimates that the number of individuals experiencing chronic pain in Canada will grow by 17.5% from 2019 to 2030 (Health Canada, 2021). In addition, chronic pain disproportionately affects marginalized groups including Indigenous peoples, female people, veterans, children, people living in poverty, and people who use drugs (Health Canada, 2019).

Chronic pain also has a significant socioeconomic impact; Health Canada estimates the combined healthcare cost and indirect costs through lost production in 2019 to be between 38.2 and 40.3 billion dollars (Health Canada, 2021). Another Canadian study examined both publicly funded and private (insurance and out-of-pocket) expenditures for individuals with chronic pain while on the waitlist for a multidisciplinary treatment facility; on average, the cost of care was \$1462 per month, of which 95% was privately financed (Guerriere et al., 2010). Aside from the material impact on individuals and Canadian society, chronic pain affects numerous areas of an individual’s life, including; decreased mental health, increased risk of suicide, problems with cognitive function, increased fatigue and sleep deficits, reduced physical and social functioning, absence from school or work, reduced social connections and support, and decreased quality of life and general health (Health Canada, 2019).



## **The Biopsychosocial Model**

Given the high prevalence and cost of chronic pain in Canada, it is no surprise that there has also been a significant investment into chronic pain research and management over the past two decades. In March 2019, the Canadian Pain Task Force (CPTF) was formed to help the Government of Canada better understand and address the needs of Canadians living with pain (Health Canada, 2019). In May of 2021, the CPTF released its third and final report titled “An Action Plan for Pain in Canada.” In the introduction to this report, the CPTF states clearly that “chronic pain, like other chronic diseases, is best understood within a biopsychosocial framework” (Health Canada, 2021). They recommend taking action to increase understanding in the general population of pain as a legitimate biopsychosocial condition, increase remuneration and incentives for biopsychosocial approaches to care, and establish clear interprofessional guidelines to facilitate biopsychosocial management of chronic pain in healthcare settings (Health Canada, 2021).

What exactly is the biopsychosocial model (BPSM) and how does one put it into practice? Before we can understand how chronic primary pain is currently understood, it is helpful to understand how pain was traditionally conceptualized. The conventional biomedical model stipulates that pain is always directly linked to a pathology or injury and that when the injury is no longer observable, the pain should fade (Gatchel, 2004). These ideas are based on a dualistic view of the mind and the body as separate and independent entities (Gatchel, 2004). As exceptions to the biomedical model emerged, numerous theories of chronic disease were developed, including the biopsychosocial model of disease (Gatchel et al., 2007). The biopsychosocial model posits that disease, including chronic pain, is the result of a complex interaction between biological, psychological, social and behavioural factors (Gatchel et al., 2007). Biological factors of pain include the neurobiology of nociception, while psychological factors include both emotion and cognition (Gatchel et al., 2007). Social factors may include environmental stressors, social support, previous treatment experiences, insurance or cultural factors, among others (Gatchel et al., 2007).

This model originated from the discipline of health psychology, where it was first coined by psychiatrist George Engel (G. Engel, 1977). In Engel’s formative paper he argues that there is a crisis in medicine, which is “adherence to a model of disease no longer adequate for the scientific tasks and social responsibilities of either medicine or psychiatry” (G. Engel, 1977). He

argues that the biomedical model is limited in that it does not recognize diseases for which there is no biochemical cause, or causes for disease which are not biochemical (G. Engel, 1977). He argues that medicine must consider psychosocial factors as well as biological ones in the treatment of both disease and mental illness. In his follow-up 1980 paper, Engel expands on the application of a biopsychosocial model as a clinical methodology based on a systems approach, which takes into account everything from the micro, such as the molecules that make up the body, to the macro or the biosphere in which the person exists (G. L. Engel, 1980).

Since 1980, there has been significant research and discussion regarding the biopsychosocial model of disease and how it may be applied in the management of various conditions, including chronic pain (Bervers et al., 2016; Gatchel et al., 2007). The BPSM is now widely considered the gold standard for chronic disease management (Gatchel et al., 2007). However, despite its acceptance in health literature, the BPSM is not always well understood; a critical review of research in the physiotherapy field which mentions the BPSM found that research focused predominantly on the biological and behavioural aspects of care, while mainly ignoring the greater sociocultural context (Mescouto et al., 2020). Even in instances where an approach claims to be biopsychosocial, it does not always take into account all three components (Mescouto et al., 2020). In addition, no clinical guidelines exist for the utilization of a biopsychosocial approach in chronic pain management (Health Canada, 2021), which presents challenges for healthcare providers who find the biomedical model of care inadequate.

### **The Knowledge-to-Practice Gap**

Healthcare professionals (HCP) face significant barriers in implementing a biopsychosocial approach to chronic pain management. A recent meta-ethnography of healthcare professionals' experiences of treating chronic non-malignant pain identified six themes; the first was scepticism and a lack of trust towards chronic pain patients, in which HCPs found themselves judging whether the pain was "real" or not (Toye et al., 2017). Second, HCPs struggled to navigate the contrasting biomedical model and biopsychosocial model of pain, and many expressed a cultural pull towards the biomedical model as the default. Some HCPs felt that providing a patient with a physical diagnosis may give them emotional relief, a perspective which corroborates the difficulties reported by patients in accepting pain which does not have a clear diagnosis (Toye et al., 2013). This relates to the third theme, which describes how HCPs

struggle with navigating their relationship with the patient, and some reported making compromises or decisions that they otherwise would not make in order to maintain that relationship (Toye et al., 2017). Encompassed within this theme was the sense that empowerment of the patient was important, but that HCPs struggled with allowing patients to make decisions with which they did not agree. Other themes included the challenge of being an advocate both for the healthcare system and the patient, the emotional cost and sense of loss incurred in treating these patients, and the idea that pain management is a craft gained only through experience (Toye et al., 2017).

These themes and struggles are echoed throughout the chronic pain literature; for instance, in a qualitative study of Australian physiotherapists and their emotional engagement with patients with chronic pain, physiotherapists expressed a host of negative emotions including frustration, stress, isolation, despair, wariness, and avoidance (Barlow & Stevens, 2014). Physiotherapists in this study expressed a discomfort with and a desire to avoid distressed chronic pain patients or patients who present with “yellow flags” or psychosocial variables which impact pain (Barlow & Stevens, 2014). Overall, the physiotherapists expressed a feeling that they lacked sufficient skill and resources to provide proper care to these patients, as did those in Toye et al.’s 2017 review. Those physiotherapists with more experience in a specialized pain setting seemed to be able to emotionally engage with patients more easily, without reacting emotionally themselves (Barlow & Stevens, 2014).

Similar themes were identified in a qualitative study of outpatient physiotherapists’ attitudes towards patients with chronic pain, which was conducted as a follow-up to a systematic review (Morin Chabane et al., 2020). First the authors identified a general preference towards biomedical explanations of pain, even though the majority of therapists acknowledged the influence of psychosocial factors. The physiotherapists considered psychosocial factors as an explanation for pain only when they could not find a biomechanical explanation or when the reported pain did not match their physical examination findings (Morin Chabane et al., 2020). As in the 2017 Toye et al. review, Morin Chabane et al. identified the tendency for physiotherapists to disbelieve or distrust reported pain symptoms, leading the therapists to underestimate the pain that the patient was experiencing (2020). Finally, physiotherapists again reported feeling that they lacked the training to identify and address psychosocial factors associated with chronic pain (Morin Chabane et al., 2020).

Across these and several other studies, HCPs expressed difficulty with implementing the biopsychosocial model of pain in their treatment due to a lack of training or confidence, and showed a strong preference for biomedical explanations of pain (Ali & Thomson, 2009; Barlow & Stevens, 2014; Cowell et al., 2018; França et al., 2019; Gardner et al., 2017; Morin Chabane et al., 2020; Toye et al., 2017). A narrative review of studies which examined adherence to low back pain clinical practice guidelines found that in low, middle and high-income countries psychosocial factors are poorly managed and many recommended therapies such as exercise were underutilized, while many treatments with low evidence are overutilized (Foster et al., 2018). This is consistent with a systematic review of physiotherapist knowledge, attitudes and beliefs towards the use of psychological interventions; this review found that while physiotherapists are generally aware of psychological interventions and have positive attitudes towards them, they face barriers to incorporating these into their practice, including a lack of knowledge, role clarity, and time constraints (Driver et al., 2017). In addition, a recent meta-synthesis of qualitative studies found that even following additional training on implementing the BPSM, physiotherapists reported continued discomfort with extending their scope of practice to include psychosocial factors, despite also reporting an enhanced understanding of the role of those factors in chronic pain (Holopainen et al., 2020). A systematic review of biopsychosocial pain education randomized-controlled trials found that while these types of interventions are successful in changing HCP knowledge and attitudes about pain, the evidence is inconclusive or weak for their success in changing HCP behaviour or patient outcomes (Mankelov et al., 2021). This is indicative of a unifying theme in the literature; while HCPs may understand the biopsychosocial model theoretically, it is not currently well-translated into practice.

This disconnect between theoretical knowledge, beliefs, and practical skills has real implications for clinical practice. The tendency of HCPs to underestimate or doubt patients who report chronic pain without a clear biomedical diagnosis may lead to the stigmatization of chronic pain patients (Morin Chabane et al., 2020; Synnott et al., 2015). A systematic review of qualitative studies in which physiotherapists were questioned about managing psychosocial factors in patients with LBP found that some therapists stigmatized such patients as attention-seeking, demanding, and poorly motivated (Synnott et al., 2015). In addition, a systematic review of qualitative and quantitative evidence confirmed that physiotherapists' chronic pain beliefs affect their clinical practices; in particular, a biomedical orientation was associated with

advice to delay return to work and activity, a belief that to do so would be a danger to the patient (Gardner et al., 2017), as well as movement-avoidant recommendations (Christe et al., 2021). This stigmatization of patients with chronic pain by HCPs may be particularly harmful to patients who are struggling with their sense of credibility and self-acceptance (Toye et al., 2013) or with high fear-avoidance beliefs (Wertli et al., 2014). The fear-avoidance model describes how negative beliefs about pain may lead to catastrophizing and avoidance of activity, which ultimately contributes to loss of function and perpetuates a cycle of pain (Linton & Shaw, 2011). Previous research in an athletic therapy setting has found that patients with high catastrophizing presented with lower function at initial assessment and follow-up than those with low catastrophizing, and within that setting patients with acute pain experienced significantly greater improvements in function than those with chronic pain (Hindle et al., 2022).

### **Athletic Therapy**

We know a great deal about the knowledge, attitudes, and beliefs of a variety of healthcare providers including physiotherapists, nurses, physicians, chiropractors, and psychologists regarding the management of chronic pain (Toye et al., 2017). However, I identified only one study on athletic therapists' (known in the USA as athletic trainers) knowledge, attitudes or beliefs about pain; specifically this study examined whether their beliefs about low back pain are more biopsychosocial or biomedically oriented (MacDougall et al., 2019). They found that Canadian athletic therapists on average have more biomedical attitudes and beliefs towards low back pain, however these beliefs were moderated by the age of the practitioner and the practitioners' level of experience in general and with low back pain specifically, suggesting that beliefs may become more biopsychosocial-oriented with greater experience (MacDougall et al., 2019).

Since the practice of athletic therapy was established in Canada in 1965 with the formation of the national Canadian Athletic Therapy Association (CATA) and a certification process introduced in 1975 (Lafave & Bergeron, 2014), Certified Athletic Therapists or CAT(C)s have been best known for their role as a first responder and musculoskeletal injury expert on the sidelines of major sporting organizations, as well as being involved in the out-of-play rehabilitation and reconditioning of players (*What Is Athletic Therapy? | Canadian Athletic Therapists Association*, 2020). In recent years, the role of the CAT(C) has expanded

significantly; 65% of athletic therapists in Ontario work outside of a sports setting, including 35% in a private clinical role that is not exclusive to athletes, but includes general population clients (Hampson et al., 2014). CAT(C)s may also work in hospital or nursing home settings with elderly patients, as well as in industrial workplace safety and reconditioning (*Athletic Therapist in Canada | Labour Market Facts and Figures*, 2020). With the expansion of the scope of practice of the CAT(C), one would expect a similar expansion in the training of athletic therapy certification candidates to include not just acute conditions, but chronic ones as well, including chronic pain. In 2018, major changes were made to the certification process for an athletic therapist in Canada, most notably the elimination of the practical exam, which left graduating from an accredited academic institution and passing a written test as the primary criteria for becoming a CAT(C) (*Education and Certification | Canadian Athletic Therapists Association*, 2020). In 2021, the CATA introduced a new competency-based educational framework, which consists of 165 competencies over the following seven categories; (1) Athletic Therapy Expert, (2) Professional, (3) Collaborator, (4) Communicator, (5) Scholar, (6) Leader, and (7) Health Advocate (Lafave et al., 2021). Pain is mentioned only twice in the new competency framework, in reference to understanding of pain pharmacological agents and to control of pain and swelling, however use of psychological techniques in injury rehabilitation, as well as identification of psychological considerations are both required competencies. In addition, future athletic therapists will be expected to “identify common signs and symptoms related to mental health concerns, behavioural/emotional disorders, stress, substance abuse, and interpersonal conflict” and to “inquire about and explore the patient’s beliefs, values, preferences, context, and expectations,” among other communication strategies (Lafave et al., 2021). This indicates that some measure of competency with a biopsychosocial model of care will be expected of future graduates, however there is as of yet little information about how these competencies will be implemented across Canadian institutions and these changes may not yet be reflected in my current sample.

Given the widespread prevalence of chronic pain in the Canadian population (Reitsma et al., 2011; Schopflocher et al., 2011) and the significant effect that healthcare provider beliefs have on their treatment of patients with this condition (Gardner et al., 2017; Synnott et al., 2015; Toye et al., 2017), it is of critical importance that any healthcare professional working with the general public has a clear understanding of and competency in current chronic pain management

practice. Healthcare professionals from many fields report significant difficulties in understanding and implementing the BPSM of disease in the management of chronic pain. While there has been some recognition of the need for an athletic therapy approach which accounts for the psychological and social elements of chronic pain (Pomarensky et al., 2021), there remains a significant gap in existing research with regard to athletic therapists and chronic pain. Therefore it is worthwhile to examine the perspectives and experiences of athletic therapists in their clinical encounters with chronic pain. Previous research describes how physical therapy graduates face unique challenges in managing chronic pain that come with a lack of practical experience (Forbes & Ingram, 2021), as well as difficulties implementing the biopsychosocial model in practice (França et al., 2019). Given these unique challenges and the ongoing changes to the CATA educational framework, it is pertinent to focus then on recent athletic therapy graduates in Canada in order to more accurately reflect the needs of this population.

### **Conceptual Framework**

It is clear from the literature presented thus far that there is a gap between the biopsychosocial model and healthcare professional practice. It is a priority of the CPTF and Health Canada to bridge the gap between pain science and practice and to invest in activities that support knowledge translation and dissemination of pain management guidelines (Health Canada, 2021). Effective knowledge translation consists of changing not only the clinical practices of healthcare professionals, but of numerous others including administrators and policy makers (Cane et al., 2012).

Many theories, models and frameworks (TMF) exist in the fields of health services research, implementation science, and psychology which may be used to understand the science of behaviour change. Assessing barriers and facilitators to knowledge use is a key step in several prominent knowledge translation TMF, including the Knowledge to Action Cycle developed by Graham et al. and adopted by the Canadian Institutes of Health Research for the process of knowledge translation (Straus et al., 2013). This preliminary step is vital to developing effective behaviour change interventions, as “barriers and facilitators to knowledge use” is one of the socio-cognitive constructs which best predicts both health care professionals’ behaviour and intention (Straus et al., 2013). Interventions which are tailored to prospectively identified barriers and facilitators to knowledge use are more likely to improve clinical practice than simple

dissemination of guidelines (Straus et al., 2013). Therefore, this study will lay the groundwork for future knowledge translation interventions which can address the barriers that will be identified.

There is some evidence that theory-informed interventions may be more effective at behaviour change than those based on intuition or common-sense (Cane et al., 2012); however, the abundance of behaviour change theories may make it difficult to select and assess a specific theory, model or framework. In order to simplify these overlapping TMF and make theory more accessible to various disciplines, the Theoretical Domains Framework (TDF) was created (Cane et al., 2012). The TDF was created in collaboration between psychologists and health services researchers, and synthesized 33 theories and 128 constructs related to behaviour change into one cohesive framework (Cane et al., 2012). The result is a framework composed of 14 theoretical domains and 84 component constructs within these domains (Cane et al., 2012). These domains include; (1) Knowledge, (2) Skills, (3) Social/professional role and identity, (4) Beliefs about capabilities, (5) Optimism, (6) Beliefs about consequences, (7) Reinforcement, (8) Intentions, (9) Goals, (10) Memory, attention and decision processes, (11) Environmental context and resources, (12) Social influences, (13) Emotions, and (14) Behavioural regulation.

Several guidelines exist for the utilization of the TDF to investigate knowledge translation problems (Atkins et al., 2017) and to design behaviour change interventions (French et al., 2012). The TDF has been utilized in numerous studies as a framework to assess barriers and facilitators to knowledge use (Dyson & Cowdell, 2021), most often those which used a qualitative or mixed-methods approach (Al Zoubi et al., 2019; Eilayyan et al., 2018; Stilwell et al., 2017). The Theoretical Domains Framework is a framework rather than a theory or a model; it does not draw relationships between the constructs, rather it is simply a way of identifying and compiling those constructs which have been theorized to be determinants of behaviour change.

In this study, the TDF provided a design framework for the qualitative interview guide topics, which ensured thorough coverage of possible determinants of behaviour (Atkins et al., 2017). Following inductive thematic analysis, I identified the relevance of TDF domains and constructs to this problem, in order to facilitate the development of future knowledge translation interventions or more targeted investigations of barriers and facilitators based on my work. In addition, I solicited participant perspectives on the best approaches to address the barriers and



facilitators that they identified, with the hopes of informing an integrated knowledge translation intervention in the future (Straus et al., 2013).

### **Purpose and Objectives**

The first objective of this study was to investigate whether a gap exists between chronic pain research and healthcare professional knowledge, attitudes and beliefs, as well as treatment preferences in the profession of athletic therapy in Canada. My second objective used the Theoretical Domains Framework to investigate the barriers and facilitators that athletic therapists experience in implementing the BPSM in chronic primary pain management. I approached this problem from a pragmatist worldview, which prioritizes whichever methodology can best address the research question at hand and which includes both biased and unbiased perspectives (Creswell & Plano Clark, 2018). My research questions were;

1. What knowledge do CATCs have of the current pain neuroscience literature or the role of psychosocial factors in the management of chronic primary pain?
2. What are CATCs' attitudes and beliefs regarding the management of chronic primary pain?
3. What barriers and facilitators do CATCs identify to the use of a biopsychosocial approach in the management of chronic primary pain?

## **Methods**

### **Study Design and Positionality**

This study followed a convergent exploratory mixed-methods design, in which the qualitative and quantitative components were conducted and analyzed in parallel to answer different aspects of the research questions, then are merged in the discussion (Creswell & Plano Clark, 2018). This project was located within a pragmatist worldview, in which the research question and real-world practice are prioritized above a specific philosophical standpoint (Creswell & Plano Clark, 2018). The primary researcher was OT, a white woman, certified athletic therapist and Master's student at the University of Manitoba, who previously worked in a clinic where the majority of patients were experiencing chronic pain. OT was assisted in research design and data analysis by SS, a white female professor at the same institution.

The primary method of data collection for this study were qualitative semi-structured interviews, while the secondary method was a cross-sectional survey of a larger sample of athletic therapists. The qualitative component provided rich data about attitudes and beliefs (Braun & Clarke, 2006), as well as barriers and facilitators, while the quantitative component captured specific data about CAT(C) knowledge of pain science. The survey also assisted in the voluntary collection of participant demographic and contact information, which was used in recruitment and sampling for the qualitative component. Qualitative data collection and analysis were conducted inductively. However, the interview guide and interpretation of results following analysis were guided by the Theoretical Domains Framework (Atkins et al., 2017).

### **Participants and Recruitment**

Our target population for this study was new graduates from Canadian Athletic Therapy Association-accredited programs as well as newly certified athletic therapists (<5 years). One institution was not included in this paper (Acadia University) as they became accredited by the CATA following the completion of our data collection (Canadian Athletic Therapy Association, 2022). My focus on new graduates and newly certified members was to ensure that participants fell within a relatively small range of experience and training at the time of the study. In addition, participants who graduated or certified 5+ years prior may not recall their educational experiences and may have received significant additional training through continuing education programs. I selected the time point of five years as this is the point at which the Canadian Athletic Therapy Association (CATA) considers members no longer eligible for the new graduates' mentorship program (Canadian Athletic Therapy Association, 2021). Participants who had not yet graduated or who had graduated more than 5 years prior were asked to self-exclude in the recruitment scripts and on the survey consent form.

Ethics approval was obtained through the Human Research Ethics Board at the University of Manitoba, Fort Garry campus. We applied for and received approval through the national Canadian Athletic Therapy Association to distribute our call for participants for the survey through their monthly newsletter in December 2021, and January and February 2022. We reached out to all athletic therapy provincial chapters, as well as to the directors of accredited athletic therapy programs in Canada with the request to share our survey. The British Columbia, Saskatchewan, Manitoba, Ontario and Quebec chapters agreed to share our survey with their

network, as well as the University of Manitoba and Sheridan College athletic therapy program directors. It is unknown whether any other associations or programs shared our call for participants, as we did not receive a reply to our emails. In addition, we shared our call for participants in the popular Canadian athletic therapist Facebook group “Athletic Therapy United.” The call for participants included general information about the study purpose, inclusion/exclusion criteria, participant requirements, contact information for the principal investigators, as well as a link to the online survey.

As of May 2021, there were 2089 certified athletic therapists working within Canada, according to data provided by the CATA. It is unknown exactly how many of these are new graduates or newly certified members. However, according to information provided to me by the CATA, in 2019 there were 196 newly certified members (no exams were held in 2020 due to the Covid-19 pandemic). Over the course of five years, this provides an approximate total population size of 1000 individuals. Therefore, an appropriate target sample size for the survey with a 95% confidence interval and 5% margin of error based on this population would be 278 respondents (Qualtrics, 2018).

An online survey was conducted using the Survey Monkey platform. The first page of the survey was the survey consent form (Appendix A), which included full details as to the purpose, risks and benefits, and requirements of the study as well as questions to confirm that the potential participant meets the criteria to participate. Once consent was given by eligible participants, participants were allowed to proceed to the Knowledge and Attitudes of Pain (KNAP) questionnaire. This was followed by an optional page of demographic questions and a space to provide contact information if they were interested and willing to be contacted for the interview component or with the study results.

## **Procedures**

### ***Interviews***

My primary method of data collection was through individual, semi-structured interviews. Individual interviews are a well-established qualitative technique that have been used frequently within the healthcare field (Markula & Silk, 2011). I aimed to make participants comfortable sharing their subjective beliefs and experiences through carrying out video interviews in a location of the participants' choosing. Interviews were conducted using Zoom

video conferencing software, due to restrictions on in-person research during the Covid-19 pandemic and the national scope of the study. I used the Zoom “pro” license provided by the University of Manitoba to staff and students. Participants were audio recorded for the purpose of verbatim transcription using the built in “record meeting” function on Zoom and participants were alerted to the recording at the beginning of the interview, in addition to the consent form. As Zoom automatically creates two recordings with this function, one with video and one audio-only, the video copy was immediately destroyed. Interviews were 90-120 minutes in duration, with two interviews exceeding that timeframe.

The interview guide was structured around the 14 domains of the Theoretical Domains Framework (Atkins et al., 2017) and a modified version of the work Eilayyan et al. have conducted using this framework with Canadian chiropractors (Eilayyan et al., 2018). An additional interview topic, “Mapping Barriers and Facilitators to Intervention Strategies,” was added in order to gather knowledge user perspectives for a potential future intervention study. This is commonly a component of integrated knowledge translation studies which encourage knowledge user involvement throughout the research process (Straus et al., 2013). This interview guide was pilot tested with a person who was known to myself and who graduated from an accredited athletic therapy program less than 5 years prior. For the full interview guide see Appendix B.

Interview transcripts were transcribed using the software Otter.ai, which was approved in an amendment by the Research Ethics Board. This software uses AI to transcribe recorded audio to text. Transcribed texts were then reviewed alongside the audio by myself and corrected for accuracy and to remove any identifying information about the participants. This process was designed to lessen the physical burden of transcribing by hand. As this was added to the procedures only after 5 interviews had already been conducted, those participants who had already consented or completed an interview were asked to re-consent via email (Appendix C).

### ***Observations***

Following each interview, I recorded notes in a Word document. These included: the overall demeanor of the participant, any changes or additions to the interview questions, as well as a critical reflection portion. This reflection focused on my own assumptions, experiences, and emotions as they emerged through the interview process (Zitomer & Goodwin, 2014). These

notes did not contain any identifying information and referred to the participants only by their participant ID number. During data collection, these notes were used as a means to critically reflect on how I might improve my own performance in the next interview, including phrasing and timing of interview questions and follow-ups. I also used these notes as a means to determine when data saturation had been reached, as I had reflected over the latter two interviews that nearly all of the discussion echoed insights from the earlier interviews. During data analysis, I used these notes to reflect back on my assumptions and emotions, in order to account for and/or limit the unintentional impact of these on the analysis and results.

### *Survey*

We conducted a cross-sectional electronic survey of the athletic therapy new graduate population using the Survey Monkey platform. The first half of the survey was the Knowledge and Attitudes of Pain (KNAP) questionnaire (Beetsma et al., 2020), which I presented in a grid format rather than a list, using the original 6-point scale. Permission was not sought for the use of the KNAP questionnaire as it is available under a Creative Commons license as of the time of publication (August 2022). The KNAP survey is designed to assess knowledge and attitudes of musculoskeletal pain and modern pain neuroscience in healthcare students nearing graduation, for the purpose of creating awareness of gaps in training and evaluating educational programs. The KNAP builds off of two established questionnaires; the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS-PT) and the Neurophysiology of Pain Questionnaire (Beetsma et al., 2020). The PABS-PT has been thoroughly tested and used to measure healthcare provider knowledge, attitudes, and beliefs. However, these tests have revealed that this questionnaire does not align with or assess current pain neuroscience knowledge, and the ability to discriminate biopsychosocial from biomedical beliefs is suboptimal (Beetsma et al., 2020; Fitzgerald et al., 2020; Mutsaers et al., 2012; Ostelo et al., 2003). The 30-item KNAP is a marked improvement over previous measures with a test-retest reliability of 0.80 and internal consistency of Cronbach's  $\alpha$  0.80 (Beetsma et al., 2020). For the full KNAP questionnaire, see Appendix D. Our purpose was to utilize this questionnaire to evaluate the generate state of pain knowledge, attitudes and beliefs in athletic therapists who had recently completed their education at a Canadian institution.

This survey included demographic questions about participant age, sex, race or ethnicity, certification status, practice setting (clinic, university, hospital, etc.), years of experience, and location (province). These variables were not included in the survey analysis, but were collected for the purpose of interview sampling. Survey Monkey matched responses to an Internet protocol (IP) address, however this information was used only to identify potential duplicate responses and was not stored outside of the Survey Monkey platform. Demographic data and contact information were stored separately from responses to the KNAP questionnaire, in a private folder on UM OneDrive.

### **Data Analysis**

Qualitative and quantitative data were analyzed separately according to the methods that are best suited for each component. Data were then interpreted together following data analysis, as per our convergent mixed methods design (Creswell & Plano Clark, 2018).

#### ***Quantitative Data***

KNAP questionnaire data was cleaned according to procedures outlined by Pallant (2010), Field (2014) and Tabachniak & Fidell (2007). As less than 5% of data were missing (0.23%), mean substitution was performed for missing data (Tabachniak & Fidell, 2007). No outliers were found on inspection. Descriptive statistics were calculated by hand for each subscale (pain physiology and influencing factors, and treatment of pain), then verified using SPSS v27. A higher overall score on the KNAP questionnaire indicates knowledge and attitudes which better reflect current pain neuroscience, to a maximum of 180 points (Beetsma et al., 2020).

#### ***Qualitative Data***

Audio recordings were transcribed verbatim by Otter.ai, then reviewed by myself for accuracy, clarity and to remove any identifying information. Audio recordings were destroyed following data analysis and participants were identified only by a numerical code in the transcripts. Corresponding personal information was kept in a separate, encrypted and password-protected computer file during analysis and backed up in a private folder on UM OneDrive. The email addresses of participants who expressed a desire to be contacted with the study results are

securely stored in an encrypted and password-protected Excel file and will be destroyed 6 months following the distribution of study results. Participants were given the opportunity to review transcripts for accuracy and to offer comment.

Transcripts were analyzed using reflective thematic analysis, as outlined by Braun and Clark (2006). Thematic analysis is a method of qualitative analysis which involves searching the dataset for repeated patterns of meaning (Braun & Clarke, 2006). Data analysis was conducted inductively to generate new themes from the data rather than using an existing framework. The aim of this type of analysis is to provide a rich description of the dataset, as there was no pre-existing literature involving this population (Braun & Clarke, 2006). Our analysis included both semantic and latent themes and took a realist approach. Semantic themes are the literal interpretation of the words in the text, while latent themes include the underlying ideas, assumptions or ideologies that are interpreted as shaping the semantic text. However, our realist approach assumes that there is largely a direct relationship between language and the intended meanings and allows for interpretation in a relatively straightforward manner. An example of this would be interpreting the latent meaning behind the statement “people who abuse the system” to mean that certain people are stigmatized in this context.

The steps of our thematic analysis process, as outlined by Braun & Clark (2006), included:

1. Data transcription, re-reading data and making initial notes
2. Generating initial codes in a systematic fashion across the entire dataset
3. Organizing these codes into potential themes
4. Reviewing these themes against the coded extracts and the entire dataset
5. Naming and generating clear definitions for themes
6. Creating a report, which includes examples from the dataset and discussion of the analysis in relation to the original research question and existing literature

Steps 2-6 were conducted by OT and SS. We each coded all transcripts and met over Zoom every 3-4 transcripts to discuss the codes and tentative themes. Quotes were recorded in an Excel table and codes were adjusted on an ongoing basis as analysis proceeded. Once tentative themes were established, they were sent via email to interview participants who had expressed interest in reviewing the themes. This was to provide participants with the opportunity to provide comment or feedback (“member checking”) (Markula & Silk, 2011).

Following the completion of data collection and primary data analysis, I conducted a secondary analysis of themes and subthemes to identify relevant domains from the Theoretical Domains Framework.

### **Ethics**

While this study posed no greater risk of physical harm to the participants than daily life, there were some risks associated with participation. There was a possibility that the topics discussed could cause emotional distress to some participants, though no participants expressed emotional distress explicitly or implicitly during or following the interview. Participants were not compensated for their time as no funds were available or allocated for this purpose. There were also potential privacy concerns with the use of Zoom as a meeting platform, given that it is a privately-owned company which may collect data on its users. Participants were made aware of the risks associated with the Zoom platform, as well as other risks, during consent procedures.

In addition, my own positionality as an athletic therapist who previously worked extensively with people affected by chronic pain and as a graduate of the University of Manitoba athletic therapy program, may have indirectly influenced the types of questions I chose to ask or the corresponding answers. By disclosing my position as an athletic therapist participants may have felt more comfortable sharing their experiences. However, there is also a risk that participants may have felt pressure to provide the “right” answers given that they were speaking to another member of their profession.

Finally, there was a risk that in asking participants to discuss or recall their own experiences as healthcare professionals, they may have unintentionally revealed identifying information about a current or former patient. To mitigate this risk the interview facilitator reminded the interviewees at the beginning of each interview to avoid sharing any identifiable health information when describing their experiences. Any disclosures of identifiable information about patients or participants themselves were removed from interview transcripts.

### **Quality Criteria**

Appropriate quality criteria to assess this work are based on the selected data analysis method, as well as the researcher’s pragmatic paradigm. The former are presented by Braun and Clark in their 2020 article, which presents 20 quality criteria for researchers who are conducting



thematic analysis (Appendix E). In addition, this research should be evaluated using the criteria suggested by Lincoln (1995); these include following guidelines observed by the qualitative research community, the author's authentic positionality, acknowledgement of participants' voices, self-awareness and critical reflection, as well as establishment of trust between the researcher and participants. While I acknowledge the subjectivity of research as a whole, efforts were taken to limit the effect that my own bias and assumptions had on the research process and product. These include triangulation of data collection methods, review of tentative themes by participants, field notes, critical reflection and the involvement of other researchers in the data analysis.

This report is presented based on the consolidated criteria for reporting qualitative research (COREQ) (Tong et al., 2007) in order to provide a complete and transparent picture of the research conducted. See Appendix F for the 32-item quality criteria checklist.

### **Dissemination**

I aim to create multiple final research products for presentation to relevant knowledge users, in addition to this thesis. The objectives of these dissemination strategies are to generate awareness of the issue, inform research, and to inform decision-making. My target audience members are researchers, athletic therapy practitioners, and educators. First, an academic article will be created for the purpose of publishing in a peer-reviewed journal; this will be written in realist style as it is the most common style for journals in the field of pain science, healthcare and implementation science. A second summary report will be written in plain language and distributed to study participants who have indicated that they would like to be contacted with the results, as well as to the CATA. A third summary report will be presented to Research Manitoba in order to fulfill the requirements of the Research Manitoba Master's Studentship award. In addition, I will submit an application to present my findings in a written and visual format at the next annual CATA conference (2023).

## Results

### Survey Results

I received 44 valid responses to the initial survey. Of these, 21 participants completed the consent form, but did not respond to any questions past the consent page. Of the incomplete responses, 14 reported that they were eligible to participate, while 7 were ineligible.

Demographic data of valid survey respondents is presented in Table 1. “Other” responses to the certification status question included one participant who reported that they are a certified athletic therapist and registered massage therapist, and one who did not specify. “Other” responses to question about practice setting included participants who work in disability claims management, virtual athletic therapy, home setting, industrial or occupational health setting, freelance field work, graduate studies, or a school setting other than university.

Descriptive statistics for the KNAP questionnaire are presented in Table 2. Domain 2 responses were significantly positively skewed (skew = 1.036,  $p < 0.05$ ), with the majority of scores in the lower range. The items making up the total KNAP questionnaire scores were reliable with a Chronbach’s  $\alpha = 0.801$ , demonstrating good internal consistency in our sample. This is comparable to the reported reliability of Cronbach’s  $\alpha = 0.80$  in the development and testing of the KNAP scale (Beetsma et al., 2020). Cronbach’s alpha scores for Domain 2 were lower (0.581) compared to the overall scale score (0.801) and the first domain (0.748), indicating weak internal consistency, though this may be due to the fact that the domain two scale contains a relatively smaller number of items ( $n = 8$ ) (Pallant, 2010).

**Table 1: Demographic data of survey respondents**

Age	20-24	13.95%
	25-29	46.51%
	30-39	34.88%
	40-49	4.65%
Race/ethnicity	White	84.09%
	Asian or Pacific Islander	6.82%
	Multiracial	6.82%
	A race or ethnicity not listed	2.27%
Sex	Female	75%
	Male	25%

Certification status (multi-select)	Certified Athletic Therapist	95.45%
	Certification Candidate	4.55%
	Other	2.27%
Practice setting (multi-select)	Private clinic	61.36%
	Sports Team	38.64%
	Fitness Facility	15.91%
	University/College Clinic	15.91%
	Hospital/Public Clinic	4.55%
	Other	25%
Years of experience (including practicum)	5+ years	47.73%
	4-5 years	15.91%
	3-4 years	20.45%
	2-3 years	13.64%
	1-2 years	2.27%
Province/territory of residence	Ontario	44.19%
	Manitoba	34.88%
	Alberta	6.98%
	British Columbia	6.98%
	Quebec	4.65%
	New Brunswick	2.33%

**Table 2: KNAP Questionnaire results**

	Domain 1 (126 points)	Domain 2 (54 points)	Total (180 points)
Mean	103.05 (81.79%)	34.27 (63.46%)	137.34 (76.30%)
Min	88.00	27.00	118.00
Max	121.00	47.00	161.00
Standard Deviation	8.05	4.84	11.53
Reliability (Cronbach's $\alpha$ )	0.748	0.581	0.801

## Interview Results

Of the 44 respondents to the initial survey, 23 participants agreed to be contacted for an interview. From this initial pool of survey respondents, 16 participants were contacted for an interview by selecting for maximum variation. I completed an interview with 10 participants, at which point I determined that data saturation had been reached by reviewing on my post-interview notes. I used a purposeful maximum variation sampling technique in order to identify common patterns across a diverse population (Patton, 2015). Demographic data of participants is represented in Table 3. I reached out to potential participants by email 2-3 at a time, based on the demographic information that they provided and the existing pool of interview data. Participants who responded to the email were asked to complete the interview consent form (Appendix G), which included specifically consent to being audio recorded.

**Table 3: Demographic data of interview participants**

Age	20-24	20%
	25-29	50%
	30-39	30%
Race/ethnicity	White	80%
	Asian or Pacific Islander	10%
	A race or ethnicity not listed	10%
Sex	Female	70%
	Male	30%
Certification status (multi-select)	Certified Athletic Therapist	100%
	Other	10%
Practice setting (multi-select)	Private clinic	80%
	Sports Team	30%
	Fitness Facility	10%
	University/College Clinic	10%
	Other	50%
Years of experience (including practicum)	5+ years	60%
	4-5 years	10%
	3-4 years	10%
	2-3 years	10%

	1-2 years	10%
Province/territory of residence	Manitoba	50%
	Ontario	40%
	British Columbia	10%

Recruitment and data collection continued until thematic saturation was reached (n= 10), at which point no new codes were generated from the data (Markula & Silk, 2011). I expected to reach this point at approximately 10-12 participants, which is consistent with similar qualitative studies of healthcare provider perspectives (Toye et al., 2017). Only two participants agreed to review their interview transcripts, while all but one participant agreed to review the initial themes. In response to the initial themes, I received positive feedback from two participants and no negative feedback or suggestions.

Six major themes and twenty-three subthemes were identified by the two coders, who met on a regular basis to combine their respective coding documents and discuss themes until a consensus was reached. The development of themes from the initial codes was led by myself. A general overview of themes and subthemes are described in Table 4 and detailed descriptions are provided below. Given that there is significant overlap between the concepts of knowledge, attitudes and beliefs, and barriers and facilitators, these inductively identified themes cut across my three research questions. Readers should keep in mind that within the TDF model, which was used to identify barriers and facilitators, are the domains of Knowledge, Skills, Beliefs about Capabilities, Beliefs about Consequences, Optimism and Emotion (Cane et al., 2012). Therefore, where these concepts appear I will be speaking about both the knowledge, attitudes or beliefs of athletic therapists regarding chronic pain, as well as potential barriers and facilitators to the biopsychosocial management of chronic pain. Several barriers which did not fit under these major themes or constitute themes on their own will be included in the discussion.

**Table 4: Themes and subthemes**

Theme	Subthemes
1. Therapist beliefs about pain	1.1 Appreciation for complex nature of chronic pain

	<p>1.2 Appreciation for psychosocial factors in chronic pain</p> <p>1.3 Entrenched biomedical beliefs versus biopsychosocial beliefs</p> <p>1.4 Stigmatizing beliefs</p>
2. Common approaches to chronic pain management	<p>2.1 Positive attitude towards exercise</p> <p>2.2 Short-term benefit of passive therapies</p> <p>2.3 Patient-centred care</p> <p>2.4 Negative attitude towards pain medication</p>
3. Athletic therapy in the community	<p>3.1 Importance of a professional support network</p> <p>3.2 Athletic therapy as a last-resort strategy</p> <p>3.3 Lack of recognition for athletic therapy as a profession</p> <p>3.4 Lack of supports from professional associations</p> <p>3.5 Openness to referring patients within their network</p>
4. Training or experience in chronic pain management	<p>4.1 Lack of preparation in chronic pain management</p> <p>4.2 Learning occurred outside of institutions</p> <p>4.3 Relevant gaps in scope of practice</p>
5. Communication	<p>5.1 Need for communication skills</p> <p>5.2 Boundaries around psychosocial assessment and/or engagement</p> <p>5.3 Managing patient expectations and beliefs</p> <p>5.4 Importance of patient rapport</p> <p>5.5 Preference for informal measures</p>
6. Affective side of treating chronic pain	<p>6.1 Emotional highs and lows</p> <p>6.2 Environmental or social stressors</p>

## 1. Therapist beliefs about pain

This theme describes athletic therapists' knowledge, attitudes and beliefs about chronic pain and the people who experience it.

### *1.1 Appreciation for complex nature of chronic pain*

Many therapists expressed an appreciation for the complex and individual experience of chronic pain.

(Participant 5) I mean, because pain, again, is subjective, obviously. Um, and like I was saying before, everybody's experience with pain is going to change their relationship with pain and I mean, that could be good and bad. I mean, someone who's in a lot of pain... you know, I don't want to say could be sensitive, but could, you know, maybe they feel pain more than the next person. [...] So it kind of goes both ways. It's like, it's one indicator. It's one sort of box, but it's like, it's, you know, I found anyways, not necessarily the most important one, just what us as individuals tend to be most focused on.

(Participant 23) We know that pain is very complex [...] So there's, there's lots that go into play with it, as you, as you know, so that's why, like with chronic pain, if someone ever is like, "I know the exact fix that's gonna get you better," that's... (laughing) I would love to see that.

### *1.2 Appreciation for psychosocial factors in chronic pain*

While most therapists were not familiar with the biopsychosocial model or able to provide a definition, most were able to describe at least some psychological or social factors related to chronic pain. Therapists tended to be more familiar with theories or factors related to the treatment of pain such as the gate-control theory, rather than theories about the development of chronic pain.

(Participant 22) So for me, in the patients that I've seen with chronic pain, it, I view it as a more holistic experience for the patient. So usually, it starts off with a bit of pain in one area and then... things happen in the person's life, whether they don't take care of it, whether they're beginning to not be able to do things that they enjoy, all that kind of stuff, they're not able to sleep, they're not able to see take their dog for a walk. And the pain starts to progress to other areas of their body, whether it be through compensatory movements because of the pain, or whether it be exacerbation of the pain from a psychological standpoint, rather than an actual physical standpoint. And it kind of just progresses till it gets to a point that they go see someone and then you're kind of trying to unwind the little net of issues

that have occurred. That's kind of how I see chronic pain, like as more of a holistic whole person issue rather than the pain itself.

Some therapists view chronic pain as a "cycle" where one event precipitates another or recreates the problem. One part of this cycle may be the patient coming to "identify" with the pain or making their pain a major focus of their life.

(Participant 8) I think there's a larger psychological aspect to chronic pain than to like acute or subacute pain. And so I would say like psychological factors would be a big one, people's understanding of their own body or their injury and how it relates to their abilities in terms of movement, function, participation and things. I would say that that's a pretty big one, because I do think that it turns into a bit of a cycle where people feel like their injury or their condition, or whatever's causing the discomfort limits areas of their life. And then there's different like, emotions or feelings of like isolation or depression or anxiety or apprehension about doing things. Or even feeling like other people are judging or criticizing based on what they can and cannot do. And I think those psychological factors play a big part in pain, or pain management or their own understanding of pain, right[...] Yeah, like different social, how other people interact with them about their injury or their pain would make a big difference, right?

(Participant 5) For me, chronic pain I feel is when a physical pain is progressing and manifesting in ways like, far beyond the physical. So when it's sort of, you know, entrenched in people's sort of everyday life, that it's become a part of how they identify themselves. I've always, that's kind of like a red flag for me when someone is starting to define themselves by their pain. And, like, define their, even each day by the amount of pain that they're in. That's really when I know somebody's, you know, legitimately managing, like chronic pain. [...] And, you know, just even when somebody starts to not be able to sort of separate themselves from their pain, like they are their pain, and every thing, every action, every... everything they're trying to accomplish, it all comes, it always comes back to the pain that they're in.

### *1.3 Entrenched biomedical beliefs versus biopsychosocial beliefs*

Around half of the therapists expressed a belief in a biomechanical "root cause" of chronic pain, even when provided with a definition of chronic pain in which there is no "identifiable underlying cause." Biomedical beliefs may have been influenced by the therapists' education in athletic therapy programs.

(Participant 3) So we learned a lot from that vantage point. And everything comes back to a root cause and that sort of the way that we talked about pain, so it's like



there's always there's always a catalyst, there's always a root cause to something and with people, you start to compensate.

(Participant 7) Chronic pain to me is... usually stems from either an injury or something or a history of a problem. And it's pain that doesn't necessarily go away and is repetitive, repeats itself, has a trending problem with it where it's... usually you're able to isolate where it came from, or you have a good understanding of where it comes from.

In contrast to the view that pain has a root cause, other therapists expressed a belief that pain did not necessarily correspond to a structural or physical cause.

(Participant 18) ...and that their pain may not be solely due to a muscular, muscular, ligamentous, whatever issue that there are these contributing factors. So, it's just acknowledging that just because you are in pain does not mean that your body is broken, or damaged or injured, just that these are contributors to pain to be aware of.

(Participant 1) But I think the easiest way is kind of, you know, acknowledging that, yeah, the pain is there, whether or not it's actually related to like tissue damage or not, some like, I like to frame it as like, the brain is kind of playing tricks on you, it's gone... It's kind of for whatever reason, it's hypersensitive is getting the signals mixed up, something's... wires are crossed somewhere in the brain, just kind of giving the joint, the muscle, whatever, just a weird signal and telling you ow there's pain when really, there's, I mean, there could be, and it always depends on the person and their situation, but whether or not there actually is damage or like a lot of damage, or very minimal, it's just kind of a mixed signal that somewhere down the line, the brain, body's just gotten used to that state, and it's decided, okay, we're gonna see this as normal.

#### *1.4 Stigmatizing beliefs*

Some therapists expressed stigmatizing beliefs, such as the belief that “good” patients do not seek medical treatment or complain about their injuries, whereas there exists a second “bad” type of patient who may want to “abuse the system.”

(Participant 3) There was an associate, I think a freak accident, but he sat down in a vehicle to do a process and I'm 99% sure he tore his meniscus [...] guy's been there for [number of] years, never once gone to medical for anything. I spoke with him before, he's got integrity, like he really doesn't want to show that he's injured, really not that kind of person, doesn't want to abuse the system.

(Participant 1) And it always seems to happen to the patients like it, the patients that always got screwed were always the good ones. Never the ones who are trying to screw the system.

Some therapists expressed a belief that certain patients may be beyond their abilities to repair or may never fully recover.

(Participant 7) And it's just trying to see where, where, if any, if this is just something that again, one of those uncontrollable factors, that's something maybe we can't do, like I said, maybe you can't fix everyone. But maybe there is something there that we're missing or that we're not, that we're not able to find and then you're able to find that and make a change. But like I said, sometimes it's a case where you can't fix everyone.

## **2. Common approaches to chronic pain management**

This theme describes shared treatment preferences in the management of chronic pain, as well as attitudes toward and beliefs about various treatment styles.

### *2.1 Positive attitude towards exercise*

When asked about how they typically approach the management of chronic pain, most ATs expressed a strong treatment preference and positive attitude towards exercise.

(Participant 8) I think that getting people exercising and active, whether it's like gym exercise or things like, you know, just going for a walk or, you know, moving around more... has such a huge effect on chronic pain.

Some ATs expressed a belief in the positive impact of exercise on psychological and social wellbeing for people experiencing chronic pain.

(Participant 22) That's how I think about it, even though the chronic pain isn't necessarily a physical condition. It can be, but it isn't always [...] there is always some sort of psychological part to it that you can always improve. Whether the person wants to admit it or not too, is a big one. But there are ways where you can like, slide in... things that will help them psychologically get better, even if they don't know that it is. Like taking a walk outside once a day or engaging with their spouse, like having their spouse do their exercises with them. [...] Or if they are very keen on kind of helping themselves as a whole, just saying, like, here are the benefits of taking a walk outside or here are the benefits of going to a group fitness class versus working out by yourself. And then helping them find what fitness class would work best for them... kind of thing. So it depends on the

person, but just helping to give suggestions that will help them both physically and mentally.

## *2.2 Short-term benefits of passive therapies*

In addition to seeing the value in active treatments such as exercise, some therapists believe that patients will not improve with passive modalities alone or are concerned that they do not provide a long-term benefit.

(Participant 18) More so with the patients who just want manual work, or just want massage. Because in my head, I'm thinking, "Hey, like, this isn't... Yes, it's gonna make you feel better, temporarily, but it's not really addressing the issue, per se," but then, again, I kind of go back to well, the person knows that it makes them feel better. And that's going to help them, you know, feel more relaxed and enjoy the rest of the day. Is that so bad?

However, many therapists believe there is a benefit to overall patient wellbeing in using pain relief and relaxation techniques such as manual therapy, heat or electrical stimulation, and accept that for some patients short-term pain relief may be the primary goal. One therapist uses manual therapy exclusively, while most prefer to use passive modalities alongside exercise.

(Participant 3) Like people go to massage therapists all the time for just a nice treatment and pain relief. Why can't they come to athletic therapists for that? Like, why do we have to pigeonhole ourselves into specifically getting patients better? Like, why can't we... why can't we be what they need us to be?

(Participant 5) And maybe you passed the point where you think that necessarily has like, the therapeutic value, but like, the value to them of doing something they enjoy or, you know, I... something like, you know, an electric stim or something like that, where, you know, it's not necessarily what you need to do, but for them they really feel much better after then, you know, that's the best way I think you can kind of address that. By you know, always trying to incorporate something where, you know, you're going to get that like sort of endorphin happy release as well... beyond what you're trying to accomplish through the treatments.

(Participant 12) And then, um, one thing I learned from the owner is sometimes patient just, patient wants the unusual time. So it's away from the reality, sometimes because it's not the usual, like lay down on the bed and then just somebody touching your body and then... and then small talk, right? So that's sometimes they need the time like, they're like, if you're raising a kid, stay away from kids and taking care of your body and then talking to adults is an unusual or the not reality.

### *2.3 Patient-centred care*

Many ATs believe in the benefits of setting small goals related to activities of daily living or functional abilities, and tailoring larger therapy goals to patient preferences.

(Participant 22) Like behavior modification is a big one. So setting goals and goal setting is a big one to manage chronic pain, specifically, like setting SMART goals. So just making the small steps and understanding how even like coming to you as a therapist is a big step for someone and then working with them to make small adjustments or small improvements over time. [...] So making sure that they're not setting super big goals that they're not going to accomplish, not giving them 18 different exercises to correct the 18 different things going wrong with their movements. Giving them exercises that are progressively going to work towards the thing that they need to get back to...

This respect for patient preferences was also evident in some therapists' recognition of the importance of being flexible in their treatment approach and providing individualized, patient-centred care, rather than following a "cookie cutter" approach.

(Participant 21) And also, like, using that term, like the holistic, like we're treating the whole body, you're not just focusing on the pain, let's say, you're kind of focusing on the person, their lifestyle, what they can and can't do find out like, their goals, because like as a practitioner, the goal is normally to get them better. But maybe for this client, rather than thinking about getting them better, smaller goals, like maybe having an hour into their day where they're not focused on their pain is a more realistic starting goal. [...] Like, I feel the one thing that's like unfortunate with what I learned at school to real life is I feel like in school, it was very cookie cutter, it was kind of like, if you see this, this is the method you use. Thinking outside the box was just kind of like, I felt like it was not encouraged as much. And yet, now that I'm in the field, there's been very few times where a cookie cutter method is like successful, like, I feel like I've had to be more creative, which is like, fine, because I'm a creative person, in my opinion, but like, I feel there's been more times where I've had to think outside of the box, then they led on to be for the profession.

### *2.4 Negative attitudes towards pain medication*

A common concern about chronic pain management that most therapist mentioned was their belief that pain medication is over-prescribed for chronic pain and that other strategies are needed to improve pain in the long-term.

(Participant 23) Treating things with only medication, not that medication is a bad thing, because medication can definitely be beneficial, and definitely has a place,

but if that's your only strategy for pain relief, then that's a problem. And if that's the only thing you've been exposed to, which is quite common, then that's the only thing that people have been given as a strategy, then it can also influence just everything else, and then there's, then they tend to move less anyway, it's just like a domino effect.

### **3. Athletic therapy in the community**

This theme encompasses the unique barriers athletic therapists as members of the healthcare community, as well as community factors which facilitate chronic pain management. In addition, I describe how athletic therapists relate to other professionals, insurers, professional associations, and the general public.

#### *3.1 Importance of a professional support network*

Many ATs work closely alongside other healthcare professionals (HCP) such as physical or occupational therapists and physicians in clinical settings, however ATs may be isolated from one another due to relatively fewer numbers in the community or competitiveness in the field.

(Participant 3) But I think as a profession, we're very divided, really, like we're unlike, you know, when I look at, I've worked in big physiotherapy clinics and I've been like, there's me the only AT and like 10 physical therapists, like, just by sheer numbers, they have more support with one another, because they're just with each other. Right? Like, you can turn around and talk to your colleague, right? And of course, I can talk to my physiotherapy colleagues, but as myself, I constantly felt like I was trying to prove myself being the only one. So that also creates barriers in discussing those cases with one another.

Several ATs described a stigma around asking for help from other practitioners, however a solid support network of other ATs or HCPs was frequently mentioned as a major facilitator in chronic pain management.

(Participant 5) In my case management work, I mean there's like a massive team of people and I can draw on people with lots of experience and nurses and doctors and I just have like basically unlimited resources. So what's fun about that is that I can come up with an idea and then I can access what I need to like put it into action, which is pretty special actually and... empowering, really. [...] So that's obviously different than like, when you're sole practitioner, like I was on my own. I mean, I would say the resources are extremely limited and that can be really difficult. I mean, you can, I mean, what I would do is I'd reach out to like friends and colleagues and discuss cases and what had other people seen and, you know,

you've got forums that you can sort of say, "Here's kind of my weird symptoms and diagnosis. Anyone seen this before? Has anyone tried this before?"

(Participant 23) - So it definitely can be overwhelming. But I just try and take a step back and like, it's nice being in a team setting that we all support each other. So we're not in it alone, which I think is really nice.

In addition, athletic therapists felt that chronic pain management was facilitated by working in environments where their colleagues are supportive and like-minded.

(Participant 23) At the hand clinic, when I'm there, I noticed some of the therapists are more biomedical model focused. And they're also rushed, like the appointments aren't long and like, it's a... definitely a little bit more of a quicker environment. So some of the time when I work with some people I have, I just take more time to go through that stuff. So it's, it can be a barrier if other people in your facility are saying one thing to someone, and then having to like try and answer their questions as well at the same time. So that's hard.

(Participant 7) I feel like at our clinic, we all have a pretty similar mindset. We all believe in a lot, we're trying to keep people as active as possible. [...] A lot of us as therapists are all on that same page to get people back to or stronger than they were before. [...] We do have a lot of shared values that are in our clinic there.

### *3.2 Athletic therapy as a last-resort strategy*

Athletic therapists are often the HCP of last resort for patients and referrals from other HCPs.

This may result in additional barriers to effective patient care such as entrenched pain beliefs or pain-related habits.

(Participant 12) I'm prepared sometimes mentally because three years he has the low back pain and then for example, he's seen chiro, he's seen physio, he's seen massage therapist and it didn't get better. And then he came to me and then... yeah, so they're expecting I make something different. But for me it's, it's a little bit overwhelming... for that situation like... what? You've been like a lot of you know, therapists and then you know, not short term, it's kind of long term, but didn't feel the progress. Can I make a difference?

(Participant 5) And then also just where you tend to not be the first practitioner that someone's come to see, you tend to be you know, after the person's tried chiro and physio and any other number of things and then they end up seeing you and the kind of hoping that you have a different answer for some of the chronic stuff that they're dealing with.

### *3.3 Lack of recognition for athletic therapy as a profession*

The lack of recognition for athletic therapy as a profession by other healthcare professionals, insurance providers and the general public was described as a barrier by many therapists.

(Participant 1) In terms of like government again, not really, because they don't know who we are in [province]. Apparently, we're considered healthcare to get a vaccine, but we're not considered health care to work during the [COVID-19] lockdown.

(Participant 5) I mean, just, I mean, because people don't know what athletic therapy is, right? So it's just one, not that people... I mean, this drives me crazy, people don't know what a physiotherapist does, either. But no one's gonna walk, this always drove me crazy, but no one's gonna walk into a PT's office and be like, what do you do? But for some reason, they're gonna sit down with an AT, they're seeing a professional, medical professional, and they're gonna sit down and they're gonna ask you what's an athletic therapist? And it's this really uniquely frustrating thing. You know, people don't know what a chiropractor does, people don't really understand necessarily their background or education or what they're even doing to them, but they're not going to walk into their office and say... and be questioning what the value they're going to bring to the table is and I find as an AT, for whatever reason, that will be, you will be challenged.

(Participant 3) I noticed that he had accepted AT. Problem is as soon as you go to your doctor and you have to go, you have to go the [worker's compensation] route and go to physio. [...] You're banned from going AT, once you're [worker's compensation] you can't go AT. [...] It's because of like insurance and stuff like that, like physio's covered [worker's compensation] and we don't.

### *3.4 Lack of supports from professional associations*

Many therapists felt that there was room for improvement in supports provided by their national association (CATA) and from some provincial associations.

(Participant 12) That's why, what I can say is, it's okay webinar. It's okay any, like a mentorship group, but at least you need to make something group for the younger generation. Otherwise, this profession is going to be die.

(Participant 5) Maybe because the CATA's been a gong show [...] I would say just like, on that subject, like the turmoil and the uncertainty around that makes it really hard to seek support from your associations when it comes to anything. What I would say is the [provincial association] is you know, we have such limited availability of courses here in [location] and... compared to [province], like it is hard to access courses and do continuing education that isn't online. And

I would say they do everything they can to try to bring that to us at a like reasonable rate and you know, they do their best to try to make this stuff accessible to us. [...] I'm just not sure that like, I would think to reach out to like, or participate with the associations because... I don't know, it just feels like... strained, it just feels like things are constantly strained. And you don't necessarily want to go over there and like, tip it over the edge. It's not a great, it's not great. I think that I think the conferences are good. I haven't been, which is too bad. But like, I think that's maybe an opportunity to like, actually come together or listen to research actually published by athletic therapists and celebrate AT and meet with colleagues and talk to colleagues and stuff like that. [...] . So yeah, I just I think like... it saddens me, because I think we could probably lift each other up more and be there for each other more and support... the associations could support ATs out, like we've got the mentorship program, but it's just not enough. It's really not enough.

In particular, therapists felt that additional education or guidelines around chronic pain management and supports for new therapists would be a facilitator.

(Participant 1) Yeah, in terms of like, AT associations... [Province] is a mess, that's all I'm gonna say. [...] I don't know that we have any resources, like maybe I'll look to like what the Americans are doing because they seem to have position statements.

Some therapists expressed a desire for more research conducted by or with athletic therapists, and more sharing of research by the CATA.

(Participant 23) Yeah, no, I think I think it it'd be good to have just more research on ATs in general. [...] "You guys [CATA] have a spot for research papers. Why don't we have that like an information thing for the public or something here? Hey, this is all the active research that's going on in the AT community, here's all the published papers that already exist," or whatever, like, I just feel like, because most other associations have credible evidence and research to support the profession. And I feel like it would just give us so much more of an edge.

### *3.5 Openness to referring patients within their network*

Athletic therapists generally are open to referring patients when they feel there is a lack of patient rapport, significant mental health concerns or a lack of progress.

(Participant 1) And sometimes you have to realize you're not the therapist to do it. Like, it's like, you know, what, this partnership ain't gonna work. I know someone else who can be good. Maybe go see them, right? Because I think it's also making sure you're protecting yourself as a therapist too, right? Like your sanity and what you can realistically do, right? That kind of stuff.



Athletic therapists prefer to refer within their own support network if possible and generally prefer not to refer to unknown or general practitioners. This is largely due to their negative experiences with other HCPs as a patient or a provider.

(Participant 3) I don't know the people here that well and I know of the people here and I know they are very prominent athletic therapists in the [location] area. However, I don't know if they are, have full patient loads. I don't know. I don't know what their situation is. I don't know how much they charge

(Participant 21) I don't like general practitioner doctors. I feel sometimes people... or my athletes have gone to them, they explain what's going on and like the doctor won't hear anything that the athletes actually said. That's a general complaint about these general practitioners is they don't hear what the athlete's saying.

(Participant 12) Yeah, everything musculoskeletal otherwise, I refer those to different concepts of therapists, but the one thing I would say that I tends to less refer to the chiropractor because of my experience so yeah. [...] I'm very young therapist but I have been like a more than fourth patient come after they receive, they got the treatment from chiro. And then they... so the patient said it was like, it's not good, actually. [...] Some patient and get worse, get worse and then that get worse patient went to the doctor, so medical family physician, and their family physician referred me, that's why.

#### **4. Training or experience in chronic pain management**

The fourth theme describes how and when athletic therapists acquire knowledge about chronic pain, what that training included and their overall readiness to manage chronic pain.

##### *4.1 Lack of preparation in chronic pain management*

Nearly all ATs described a lack of coursework on chronic pain management in their formal education prior to certification and in some cases also a lack of confidence in chronic pain management.

(Participant 23) When I got out of, when I graduated, I did not feel very prepared at all. Our degree focuses a lot on acute management, right? And there's not a lot on chronic pain management, even though like I want to argue that like 90% of your patients in a private practice are going to be a chronic issue or like chronic pain or acute stemming from a chronic movement dysfunction, right? So I definitely didn't feel super prepared out of school. I definitely feel more prepared now. But there's always something to learn. So there's no way I can say that I'm

100% confident all the time because there's always something to learn something I probably haven't read yet.

(Participant 7) And as far as management and longevity, I think it becomes... I feel a little bit ill-prepared just for, because of the lack of knowledge. I mean, there's so many courses, there's so many opportunities and as a new therapist, I think it'd be very naive of me to say that I'm equipped to handle all types of injuries, I'm equipped to handle everything. I definitely don't have a focus as of right now and the experiences that I've had aren't necessarily as strong in chronic pain as compared to a lot of other people. So I would say I'm not as fully prepared as I'd like to be, but it would definitely be something I can still handle.

Education that was received was largely biomedical-focused, with little or no discussion of psychological or social components.

(Participant 18) I was thinking back, I don't remember if we really, if even the words biopsychosocial model of pain were uttered? Or if they were it was in passing. Or again, it was just a sign of like, here's one, here's something to be aware of type thing, or, you know, I'm sure we, we mentioned, you know, psychological and social aspects of pain. But again, it was just kind of, in passing, or, you know, here are things that could contribute to pain without really diving into, like, we could probably spend a whole course semester on chronic pain and the biopsychosocial model, right, but for us, it was very bioanatomical, very pathoanatomical approach to pain and injury.

Some instruction stigmatized people with chronic pain or focused on “weeding out” people without an identifiable injury.

(Participant 21) With school, unfortunately, I felt like it was more... like the training was more about how to weed people out to determine if they're chronic pain or actually injured. Which like, I don't know, that always kind of bothered me cause it's one thing being like able to identify like, oh, this person's not actually hurt... they're like, faking the injury. But to the person if that chronic pain is real, then like, to me, it doesn't matter if they're injured or not. If that's what they're experiencing that's, like, that's what like, that's what they're dealing with. So I feel like it has to be treated the same way... as if they actually were hurt. [...] I don't think it's discussed enough at school, or it's not discussed efficiently enough.

(Participant 22) And then it was kind of just discussions off of that about psychological factors that can contribute to that, so if somebody doesn't want to return to the job that they were doing, or they're much more enjoying the time, to be able to spend time with their families or take walks during the day when they would be going to work, but then they're still being paid for work... [...] Like,

obviously, there were there were discussions between chronic versus acute pain. And in those like, in that learning, chronic pain was more attributed to chronic conditions. So somebody with SI joint dysfunction or someone with plantar fasciitis, so there was always like, a direct cause of their pain, it was just a prolonged condition.

#### *4.2 Learning occurred outside of institutions*

The majority of skill development and learning about chronic pain management came through experience (personal and/or professional) or mentorship. These experiences may be facilitators to chronic pain management and conversely a lack of personal or professional experience or mentorship may be a barrier to developing these skills. This largely occurred during practicums or post-graduation.

(Participant 8) One therapist in particular who I did most of my clinic hours were, actually both field and clinic [...] She's probably where I learned the most of those skills, partially because of how she communicated with people and how she let me practice my communication skills. And then when I maybe didn't ask a follow-up question, she would jump in a way that didn't feel like it was cutting me off, but in a way that just like made it a conversation between her and I and the patient. That basically, without like singling it out that I missed something, showed me what I could have done better, or where I could have asked another question... in a way that I learned a lot. And so I think that, yeah, that was really beneficial for me personally in terms of learning, and that's where I, I would say I learned the most.

(Participant 3) I've personally have dealt with chronic back pain since I was 15. So I'm pretty passionate about chronic pain and pain management. And it's, it's something that like people can't always understand. Like, I think that there's a number of individuals, including myself, who have gone to multiple practitioners who don't really understand, like, the pain that I'm dealing with. And so I've tried to go on more of like that management approach, because how many people need to be told the same exercises 15 times, they know the exercises.

(Participant #5) I would say most of the development of my understanding of chronic pain probably happened, you know, post-school, and just getting into clinical practice and meeting a lot of people with chronic pain and then from there you start to have a good understanding of it. You know, I also have a parent who had chronic pain my whole life. So I think that probably shaped my understanding of chronic pain as well.

Some therapists sought out research literature to help them with more complex patients. Research literature may be a facilitator or a barrier depending on the level of access to literature, skill and training of the therapist in research, and availability of relevant research.

(Participant 22) And then, like, research articles are a big one. So again, if there's a specific issue that I have with someone, I don't necessarily like, research chronic pain as its own issue, I kind of research the issues that come up along with it. So if there's a specific physical issue or if I'm having trouble addressing something, then I'll look it up.

#### *4.3 Relevant gaps in scope of practice*

Several therapists expressed a desire for more education around pain medication or medical imaging, as patients often wish to discuss these topics with their athletic therapist and therapists do not feel prepared to handle these conversations.

(Participant 21) I feel like medication and stuff was not a big focus of ours, where it's kind of like, "Oh, if it's anything, like medication wise, send them elsewhere, talk to a pharmacist," this or that. So when I have dealt with some people where they do have the chronic pain are like, "Oh, I'm taking this medication. Do you think it's good for me?" I'm kind of like, "Well, I can't tell you if I think it's good or not, because that's not within my scope of practice." So like, I feel like when it's medication-wise, that's that, that roadblock I come to where I'm like, "Hmm, I can't tell you if it's good, or bad." Like, because I don't, I don't have that training to do that

(Participant 5) You know, I would say that a weakness that could potentially be there is just... and I mean, maybe you find this different with your schooling, but with my schooling, I don't feel like we necessarily spoke a lot about imagery. So like CT, MRI, x-ray, and a lot of people with chronic pain have had do loads of imaging or they've had a doctor sit them down and be like, "Oh, well, here's your arthritis and the world is ending" and like, then that feeds into the whole psychological approach with their injury, etc. But like, I don't feel that that was well covered. And at times found myself at a disadvantage, because I'd be faced with this, you know, these reports, or maybe the images themselves that I'm reviewing, and I'm thinking, "Okay, well, that doesn't look great and you know, this doesn't sound very good." But then, you know, it took work experience, mentorship, etc, to realize that that doesn't hold as much weight.

## 5. Communication

This theme encompasses the experiences, attitudes and preferences of athletic therapists in communicating with patients with chronic pain, their willingness to broach certain topics with their patients and the importance of relationship-building in chronic pain management.

### *5.1 Need for communication skills*

Every athletic therapist spoke about how communication skills such as listening, empathizing and asking good questions are an essential skill for their profession.

(Participant 7) I think the biggest thing for sure is to be able to understand that pain is subjective, but also be able to maybe empathize a little bit with the client, because the last thing that they want to feel like is that it's work to come in to see someone. You want to make sure that they have very good patient care, you're very good communication, and that there's a little bit more of an understanding or just a general care, like obviously you care about your client, but that may be a little bit of a deeper because when... to use your definition there of chronic pain, when there's something that it's hard to understand, there is no clear cut reason as to why they have pain, trying to find ways and be helpful and more or less show a little bit of empathy and, and added care to it is a big thing, I think as a therapist... that we need to have for sure. [...] I think the better your bedside manner, almost a little bit more care that you show, the more receptive your client is to telling you things, to being open and honest and giving you all the information you need to know.

(Participant 5) But the same time you're working on somebody, and they are going to, you know, trust you and open up with you about problems they're having, or things that they're upset about, like, I've had multiple clients crying on my table... telling me about a cancer diagnosis or trouble they're having with a, you know, a parent or a child, or whatever it might be. And, you know, you're that sounding board to listen to them. So, I really think the only thing you can do in, from an athletic therapy perspective is just be supportive and just actively listen to people and make them feel heard. And, you know, already, I think, for most people, that's probably more than people feel like they have outside of... even in their day to day lives, unfortunately.

However, several therapists described low confidence in their own communication skills, which presented a barrier to chronic pain management, and/or a desire for more education or training in this area.

(Participant 8) I think also more, I think if you're educating ATs, more education about how to have conversations about the psychosocial side of things, right?

Like, once you've asked those good questions and they've told you all these things about themselves, how do you respond to that? Because that's not always easy. And so some of that more like... because I'm not their counselor, I'm not their therapist, like, psych therapist. But I do have a voice. And when they tell you things about their lives, you can't just say nothing. So like, how do you engage that in a way that's beneficial for them... and doesn't leave you taking it home every night?

(Participant 18) So I've definitely shifted from, again, doing some of those practical, physical skill courses, to learning more about communication-based skill. So I am probably still not something that I'm completely confident in, not something I want to be in, but, or still not where I want to be with the skills.

### *5.2 Boundaries around psychosocial assessment and/or engagement*

In addition, many therapists stated that they avoid directly asking questions or offering advice related to psychological or social wellbeing for fear of damaging the patients' trust in them or because they felt it was outside of their scope.

(Participant 22) Because the person is coming me to because they trust me to help them with their physical condition and when you start asking questions that are outside, well that can't be tied back to the physical... then you kind of get into that gray area of asking too much information than is necessary. But never would I stopped somebody from sharing that information with me. [...] And, "oh, that's a bit personal, I don't want to answer that question," or like... and it gets kind of on the verge of like people thinking you're creepy, or you're asking, like you're asking inappropriate... creepy or inappropriate is kind of where that can go.

(Participant 3) Like, if they're like, "Oh, I'm really stressed about my kids." I'm just like, yeah yeah yeah, and like I do try to divert the conversation, if it's something that feels too personal. But like, if they want to sit there and rant about their life, I'll be like, "yeah yeah yeah yeah yeah," like, I'm not gonna do anything to address it because that's not my place. It's not my place to say you need to get another employee for your work. It's not, that's not my place.

(Participant 8) But sometimes, it's also saying like, "Hey, have you thought about like, are their, do you have close friends? Or have you thought about therapy?" Right? Like, it's... psychology, like, it's like talking to psych shouldn't, I don't think it should be... like, there's always a fine line about recommending somebody talk to a psychologist, because you don't want to be pushing them into that if they're uncomfortable with it.

Several therapists described a need to emotionally detach themselves from patients or set boundaries in order to protect themselves emotionally. Fear of negative consequences or negative reinforcement may be barriers to a biopsychosocial management approach.

(Participant 22) Because naturally, when people come at you, the reaction is get that back up, you get in defensive mode. But like, if they're being just dragged along by this pain and really hurting, that's not who they are. They're not that pain. So I do find having that separation does help with like, the client care.

### *5.3 Managing patient expectations and beliefs*

An important communication challenge that every AT spoke about was patient expectations of treatment or beliefs about pain as a potential barrier or facilitator to their management of chronic pain.

(Participant 1) ...they'd always be like, "Oh, just put WD-40 on it." Yeah, they actually would do it. Stuff like that. And then, you know, oh if you crack your knuckles, you're gonna get arthritis or whatever, stuff like that. Right? Stuff that was done in the past, even with like... pregnant people, if you do this baby's gonna end up cross-eyed or something, right? Like, just stuff like that, that isn't really backed in science or evidence.

(Participant 23) Some people are pretty straightforward, a lot, like easier and more, if people are more open to having the conversations, and more ready to kind of dive into those things, the process is typically easier and a little bit quicker to get to the end. Whereas some people are just very stuck in their beliefs and their ways.

Many therapists described how they incorporated patient education into their sessions in order to change patient expectations, beliefs or behaviours.

(Participant 22) A big thing that I also use is like patient education, so explaining to them that like their chronic issue, no matter how long it's been, whether it's been a month or whether it's been six months that they've been dealing with it... It's all happened over time, so it's going to have like an opposite timeline to go back to what they would consider normal. So we're just helping them to understand that setting goals and making those little goals is eventually going to accumulate to the end goal.

Several therapists believe it is important to acknowledge or normalize the pain when communicating with patients.

(Participant 12) So because some patient like when they come to the clinic, and then they they misunderstood maybe, oh, we're gonna pain-free when we, you know, we leave this door. Like no, it's not going to happen. Pain is still there, but it's also up and down. Especially my experience with the shoulder. Yeah, it's up and down always. So.. yeah, this week good, but last week was terrible and then this week also, next week is going to be more bad. Sometimes happen. Yeah, that's... they need to know because before like, some, the rehab key concepts, key for success is consistency. So if they didn't know, like, this is, I would say, normal, acceptable thing, but they sometimes thinking or maybe it's therapist is not good, that's why we need to switch to another, you know, health practitioner health care professional there.

(Participant 23) Unfortunately with rehab flare-ups are just a reality... flare-ups are scary, but they are a reality of it. So some people can get really frustrated when that happens. But then it's a great time to discuss and have a conversation about it. And then just like try and help desensitize that, and it's not as scary.

#### *5.4 Importance of patient rapport*

Every AT expressed their belief that the success of their chronic pain treatment was largely dependent on the ability to develop a positive rapport or trust with the patient.

(Participant 8) I think asking good questions also builds a level of trust. If they feel like you have, like you're not just going through a checklist, like you've actually listened to them and thought about them and their injury and them as a person, they're more likely to actually tell you things. And then they're also more likely to buy-in to whatever treatment or rehab you implement, right? Because they feel like you've actually listened to their needs and have tailored your response and your treatment and your injury management to their specific needs and people are more likely to follow through that way. They're more likely to feel like whatever exercise program you give them, is specifically addressing their issue and if they feel like... it gives them more, yeah, more buy-in, I guess.

(Participant 5) With chronic pain in particular, if the person hasn't bought in to you helping them you won't be able to. You really need them to believe that you can make a difference for them or it's not gonna work, like you won't be able to do anything. Even if you're doing all the right techniques and doing all the right things, you can't help them if they don't want you to help them and they haven't bought in to what you're trying to do.

Therapists were likely to refer a patient to another practitioner if that rapport was not established, as they believed they would not be able to make progress with that patient without it.

(Participant 18) Sometimes my personality, the way I explain things doesn't gel with someone else and realizing that that is okay, is something that I've improved



on and still need to improve on. But in also recognizing that, yeah, I'm not going to gel with every patient. And that's going to affect my ability to communicate and effectively treat this person.

### *5.5 Preference for informal measures*

Most athletic therapists preferred to assess psychosocial factors passively through casual conversation or observation, if at all, rather than through formal assessment.

(Participant 18) You know, if I don't, I don't tend to objectively measure kinesiphobia or self-efficacy. I know, there are objective measures that do measure that and certainly, that can be something I can integrate a little bit more, but more from just, you know, talking with the patient, and, and, you know, seeing how they approach exercise and what we do in the gym.

(Participant 7) So if I were to use [questionnaires] on my own, I think that would be potentially a better use, because I know my intentions I have, I know what I want to do with them, or why I would be using them. Whereas sometimes I feel with the [worker's compensation], or the [automotive insurance], like the long-term clients with that chronic pain that, you know, can't be identified and things like that... it's almost like treating them like they're a piece of paper, that all of them is right there. And I think that and that's one of the things that I actually describe it is that when I have to fill out, you know, those sheets of paper and I have them do it, say this is you writing on a piece of paper. Now tell me how you really feel, because there's only so much, it's such a subjective thing and it only asks very specific questions and I think there's a lot more to it.

## **6. Affective side of treating chronic pain**

The final theme illustrates the positive and negative emotions athletic therapists feel in working with people experiencing chronic pain.

### *6.1 Emotional highs and lows*

Athletic therapists described how working with patients with chronic pain can be more rewarding than working with other patients when they feel they have been successful.

(Participant 23) So, yeah, it's definitely more complex, working with people with chronic pain, but I also find it more rewarding. And you definitely have to be on your toes always. Like, it's almost like you're a detective is kind of how I describe it... getting different pieces of the puzzle.

(Participant 8) I would say it's kind of equal parts rewarding and frustrating. When it goes well, it's so good. Because yeah, when it goes well, like it makes

such a big difference in people's lives and like, I know that firsthand. Like, I know the difference things like that can make.

However, therapists also described many negative emotions associated with chronic pain management such as guilt, confusion, frustration, fatigue, failure, and feeling overwhelmed or useless.

(Participant 5) You know, treating people with chronic pain is, [...], it can be really exhausting, it can be really, really, really exhausting. Because... people, these people do often have a lot going on and then the more you invest... and the potential for like, not being successful is so much more. Right? So you're investing more and you're potentially getting less, less reward, so to speak

(Participant 12) Overwhelmed and I feel like the useless if didn't work well. Yeah, that's definitely sure, yeah, useless.

## *6.2 Environmental or social stressors*

Some therapists described the pressure to return a patient to work and/or sport as stressful or unpleasant. One therapists experienced this pressure as a barrier to creating a positive rapport or trust with patients.

(Participant 1) Definitely pressure to like, get people back to work or play. It's like, okay, shit, like, it's stressful. But I think also, that's where you have to be realistic and kind of put on your bitchy voice and be like, "actually, no, this person can't lift their arm over their head. So no, it's not happening."

(Participant 5) As a case manager, people think my sole goal is always to get them off claim. [...] So like, the attitude someone might have towards me like getting them help are getting them treatment might be not as positive as if I were, you know, their athletic therapist in a clinical setting.

## Discussion

This convergent mixed-methods study of athletic therapy new graduates provides insight into the knowledge, attitudes and beliefs of these emerging professionals around the critical discipline of chronic pain management, as well as barriers and facilitators that they experience in this area of practice. Survey scores revealed areas where athletic therapists may lack in knowledge and where improvements can be made, in particular around best practices for treatment of pain. Six themes were identified from the qualitative portion; common approaches to chronic pain management, athletic therapy in the community, therapist beliefs about pain, training or experience in chronic pain management, communication, and affective side of treating chronic pain.

### **Knowledge, Attitudes and Beliefs**

In this study I sought to identify what knowledge CATCs have of current pain neuroscience literature and the role of psychosocial factors in the management of chronic primary pain, as well as their related attitudes and beliefs. The Knowledge and Attitudes of Pain Questionnaire was the primary measure of athletic therapist knowledge. While I did not reach the number of participants I had targeted for survey recruitment, the results of this survey may still be of interest to policy-makers, athletic therapists and their patients. Follow-up interviews with select participants helped to clarify specific knowledge gaps and areas for improvement in educational and organizational supports.

Athletic therapists who responded to our survey performed reasonably well on the “pain physiology and influential factors” scale (81.79% correct). Scores on the “treatment of pain” scale were relatively lower (63.46% correct). This may indicate that while AT new graduates are generally familiar with pain science, they are less comfortable with the actual guidelines and standards for treatment of pain. However, the standard deviation of Domain 1 was also significantly higher than Domain 2, which may indicate that athletic therapists may be more split in their knowledge and beliefs about chronic pain, whereas they tend to adhere to their common training and scope of practice in treatment. These findings are consistent with a systematic review of physiotherapist knowledge and attitudes towards using psychosocial interventions in practice, which found that while physiotherapists may have positive attitudes towards these

interventions, lack of knowledge and training in implementing these strategies was a barrier in practice (Dwyer et al., 2017). This finding is significant given that chronic pain management is not explicitly mentioned in the athletic therapy core competencies or scope of practice (Lafave et al., 2021). Therefore it is unclear what, if any, education future graduates will receive in chronic pain management, despite therapists in this study reporting that such cases make up a large portion of their clinical caseload.

Athletic therapists that I spoke to in the interview portion also identified both knowledge gaps and areas of familiarity. Therapists described how they felt ill-prepared to manage chronic pain in their practice following graduation and that the majority of their own learning and skill-building in chronic pain management occurred outside of educational institutions. Notably, the majority of therapists that I spoke to were not familiar with the biopsychosocial model or could not provide a definition, however many were familiar with related concepts such as patient-centred care, the importance of communication, and how psychological, social, and/or behavioural factors influence the experience of chronic pain. This recognition of the importance of individualized, patient-centred care and communication is especially significant given that individualized care and communication have been found to be key tenants of the BPSM in a concept analysis of current BPSM literature, in addition to biological, psychological and social factors (Daluiso-King & Hebron, 2022).

Conversely, many athletic therapists demonstrated entrenched biomedical beliefs; these therapists considered psychosocial explanations for pain only when a biomechanical “root cause” could not be identified, if at all. The abrupt shift from a biomedical to a biopsychosocial approach when there is no clear diagnosis for chronic pain has been theorized to contribute to patients’ sense of loss of credibility and may be damaging to the patient-provider relationship (Toye et al., 2013, 2017). As in studies with physiotherapists (PT), some athletic therapists may stigmatize patients who present with psychological and social factors, in particular when therapists are unable to identify a biomechanical cause for their pain (Synnott et al., 2015). The finding that some new-graduate ATs remain biomedically-oriented is consistent with previous research which has found that ATs with less experience in the management of chronic pain tend to be more biomedically-oriented than those with more experience (MacDougall et al., 2019).

In addition, therapists expressed a desire for more training in communication skills, as this knowledge gap presented a barrier when working with people with chronic pain. A

systematic review of physiotherapist knowledge, attitudes and beliefs towards the use of psychological techniques found that while PTs are aware of and have positive attitudes towards the use of these interventions in their practice, they face barriers to implementing these strategies in their practice, including lack of knowledge and role clarity (Driver et al., 2017). In my study, athletic therapists expressed that while they felt it was important to treat patients with chronic pain empathetically and to acknowledge their pain, they were concerned about the possibility of damaging their relationship with the patient, their professional reputation or their own mental wellbeing if the conversation veered too much into the psychological or social factors affecting pain. Most athletic therapists were uncomfortable with the use of formal measures of psychosocial variables, preferring to allow these topics to come up organically in conversation with the patient than to enquire directly. Once again, this sentiment is echoed in the physiotherapy literature; a systematic review of PTs found that there is limited willingness among practitioners to discuss cognitive, social or psychological factors which may be influencing their pain, and PTs express concern about exceeding their scope of practice or training in dealing with these factors (Synnott et al., 2015). Although athletic therapists have a general knowledge of psychosocial factors such as communication, like other health professionals they lack comfort and confidence in using these skills in practice.

Athletic therapists expressed strong treatment preferences towards exercise, however many acknowledged the potential short-term benefit of passive modalities as well. This preference towards exercise is a positive sign given that exercise is consistently recommended for chronic pain management (Foster et al., 2018; Hauser et al., 2017; Korownyk et al., 2022). Athletic therapists may be uniquely positioned among healthcare providers to deliver this type of care given their specialized training, especially because research shows that many physiotherapists lack the confidence, knowledge or skills to prescribe exercise, despite feeling that it is part of their professional role (Barton et al., 2021; West et al., 2021). Exercise is also often underutilized for chronic pain management; previous surveys from the US, Sweden and Australia have found high usage of ineffective electrical modalities by PTs in the management of chronic pain, and in emergency departments in Canada the most common treatment for musculoskeletal pain is prescribed medication (Foster et al., 2018).

## Barriers and Facilitators

As outlined in the Theoretical Domains Framework (TDF), which summarizes determinants of behaviour across psychological and health services research theories, knowledge, attitudes and beliefs may also serve as barriers or facilitators to behaviour change (Cane et al., 2012). In fact, the first domain of the TDF is *Knowledge*, including knowledge of the condition (i.e. chronic pain) and of the scientific rationale behind the behaviour. This domain appears twice in the thematic analysis; within the first theme, Therapist Beliefs about Pain, and the second theme, Training or Experience in Chronic Pain Management. The former outlines athletic therapists' understanding of pain as a complex condition influenced by psychological and social factors, while in some cases still upholding entrenched biomedical or stigmatizing beliefs about chronic pain. The latter theme describes how a lack of training in chronic pain management presents a barrier to practice for many new graduate ATs, as well as other relevant areas where a lack of knowledge is a barrier. This lack of knowledge and training can also be tied to the second domain of the TDF, *Skills*. Athletic therapists described a lack of opportunities for skill development in their formal education; most of this development occurred outside of educational institutions. This lack of skill development appears to be a real barrier for athletic therapists who, for example, are unsure about how to incorporate psychosocial approaches to pain management into their practice. This led to barriers in the fourth domain, *Beliefs about Capabilities*; graduates expressed low perceived competence and self-efficacy in chronic pain management, in particular immediately following graduation. In our first theme, some therapists even went so far as to express the belief that some patients may be completely beyond their ability to help, which echoes the TDF domain of *Optimism*, or the confidence that desired goals will be attained.

Multiple therapists expressed a desire for further training or preparation in chronic pain management, a sentiment which is echoed across the physiotherapy literature; in a recent study of PT new graduates readiness for managing chronic pain, the experience of beginning their practice and facing the complex nature of chronic pain led some PTs to doubt their own skills (Forbes & Ingram, 2021). Further, PT new graduates found that direct experience in clinical settings, as well as observational learning opportunities were both extremely helpful to their sense of preparedness, as well as lacking in their curriculum (Forbes & Ingram, 2021). A review of HCP experiences in chronic pain management describes similar accounts of feeling under-

skilled in this area following graduation and gradually learning the necessary skills through experience rather than formal education (Toye et al., 2017); a sentiment echoed by athletic therapists in the interviews I conducted. Health Canada's report to address the issue of chronic pain in Canada specifically mentions the lack of chronic pain education across multiple healthcare professions and recommends dedicated pre-licensure pain curricula and continuing education be introduced, as well as experiential learning opportunities in chronic pain (Health Canada, 2019). While athletic therapy new graduates prior to 2018 would have had to demonstrate at least 600 hours of supervised experience in a clinical setting, this requirement has been removed with the move to a competency-based framework (Lafave et al., 2021), which again does not specifically require chronic pain competency. Thus it is unclear what, if any, contact new graduates under this framework will have with people experiencing chronic pain or what education they will receive in chronic pain. The introduction of a biopsychosocial education would provide a useful framework in which programs could foster AT pain knowledge, attitudes and beliefs more in line with current evidence. Such an orientation could also improve on clinicians' clinical judgements and advice when working with people with chronic pain (Christe et al., 2021; Dwyer et al., 2020). However, this education must be accompanied by adequate practical training and individualized mentorship, as the present and previous research has found that education alone does not provide healthcare professionals with the confidence to fully execute a BPSM of care (Cowell et al., 2018; Forbes & Ingram, 2021; França et al., 2019; Holopainen et al., 2020).

In addition to formal training, our third theme "Athletic Therapy in the Community" describes numerous barriers and facilitators in how athletic therapists relate to and are supported by the healthcare community and the broader public. These barriers and facilitators include the importance of a professional support network, recognition for athletic therapy as a profession from physicians, insurers and patients, as well as support from professional associations. These subthemes overlap with TDF domains *Social/Professional Role and Identity*, including group identity and leadership and *Environmental Context and Resources*, including organisational culture/climate. Athletic therapists rely heavily on their professional networks and peer mentorship to help them navigate the complexity of chronic pain and to make treatment decisions, and as a source for referrals when they feel they will not make progress with a patient. Similarly, a recent study found that formal and informal supports from their clinical team or

mentors in their workplace were perceived as integral to new graduate physiotherapists' ability to manage complex chronic pain cases (Hunter et al., 2018). Therapists who are more isolated, for example self-employed or rural practitioners (Barlow & Stevens, 2014), may require additional supports to effectively manage chronic pain in their practice. In addition, athletic therapists felt that they would benefit from more formal supports from their governing bodies (national and provincial) to provide mentorship, training, clear guidelines for chronic pain management, and increased recognition for the profession. Lack of insurance coverage was cited by several therapists as a barrier to care and they disliked having to argue with insurers or other practitioners for coverage or patient referrals. Some therapists felt they could not reach out to their organizations due to organizational tensions between the provincial and national bodies.

Encompassed in the *Environmental Context and Resources* domain are several codes which were recognized in the thematic analysis as barriers or facilitators, but which did not rise to the level of a theme or subtheme; these include the availability of equipment or facilities, the stress and closures of the COVID-19 pandemic, and the economic position of the therapist. In particular, a lack of disposable income may be a challenge for therapists who cannot afford to take time off work, open a clinic or hire staff. The *Social Influences* domain also overlaps with several themes and subthemes, including the uncategorized code of gender/sex of the practitioner; female athletic therapists described increased challenges in their clinical practice with a lack of maternity leave, lack of respect from patients or other practitioners. Conversely, one female therapist saw her female socialization as an asset in her ability to communicate about emotional topics with her chronic pain patients. Overall, athletic therapists in our study found that the expectations and beliefs that patients bring to their practice can act either as a barrier or facilitator, depending on how well they adhere with the therapists' beliefs and treatment preferences. As in this study, unhelpful patient expectations have been discussed as a factor influencing chronic pain outcomes across the physiotherapy literature (Synnott et al., 2015; Toye et al., 2017). A high degree of communication skill is required to navigate conversations where patient and provider expectations or beliefs do not align, as well as to build and maintain a positive rapport and trust in the therapy approach. We also found that certain environmental and social stressors such as a pressure to return patients to work or sport may pose a threat to the patient-provider relationship (subtheme 6.2).



Similarly, the biopsychosocial nature of chronic pain may heighten the emotional involvement of the athletic therapist. Athletic therapists in our study spoke about the rewarding feeling of making progress with a complex case, but also about negative emotions associated with chronic pain management such as guilt, overwhelm, confusion, frustration, fatigue, failure and uselessness. In some cases, these feelings followed therapists outside of their working hours, and some therapists expressed a need to set boundaries around emotionally engaging with their patients in order to protect their own mental health (subtheme 5.2). *Emotion* is the 13<sup>th</sup> domain of the TDF and describes “a complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event” (Cane et al., 2012). Athletic therapists are not alone in experiencing complex and volatile emotions in working with patients with chronic pain; Toye’s 2017 meta-ethnography of HCP experiences in treating chronic pain described a failure at not being able to “fix” their pain and, in the case of a more biopsychosocial approach, a sense of personal loss. Similar to my study findings, HCPs in Toye’s review also struggled to navigate their tendency to empathize with their patient without allowing themselves to become too personally involved. These emotional responses to people with chronic pain may even impact practice through avoidance of engagement with patients, something which is particularly common in less experienced therapists (Barlow & Stevens, 2014).

Given the broad scope of my research questions, it is perhaps unsurprising that I was able to find connections between the six identified inductive themes and every domain of the TDF. This is likely due to the complex, multi-faceted nature of chronic pain management and of the biopsychosocial model, as well as the fact that I chose to structure our interview guide around the 14 domains to ensure thorough coverage of all potential barriers or facilitators. While I have highlighted some of the relevant TDF domains in this discussion, it may be useful in future studies with this population to isolate more specific behaviours or outcome variables for evaluation using this framework (Atkins et al., 2017).

### **Limitations**

There are several limitations to the present study; first, the relatively small sample size (n = 44) in the quantitative section may limit the generalizability of survey findings as this smaller sample size may have not been as representative as a larger sample may have been. I did not

receive a response from several provincial associations and from all but two university programs; this may at least partially account for the lack of representation from Eastern provinces. The survey was also only offered in English, which may explain the low response rate from Quebec. All of these factors likely influenced the representativeness and generalizability of the survey findings. One of the interview participants spoke English as an additional language, which may have resulted in some miscommunication between myself and the interviewee. In addition, due to a recent change to CATA policies our survey was not shared in a stand-alone email, but was included in the text of the monthly newsletter where it may have had less visibility than previous surveys of the membership which were shared individually. Both in the survey and interview components, there was a lack of representation of certain ethnic groups, for example black or indigenous therapists, though it is unknown whether this is representative of wider racial inequities within the athletic therapist population as demographic data is not publicly available. I also did not have an established relationship with all but one of the interview participants prior to the interviews and these participants had limited knowledge about my own experiences or beliefs, other than the fact that I am an athletic therapist. In addition, I had initially planned to exclude people with additional training (e.g. PT) from our sample, however I neglected to include this information on the consent page and it is possible that an unknown number of athletic therapy graduates who have obtained additional professional training may have completed the survey. In the interview portion, one participant had previously worked as a health care aid and another participant also practiced as a registered massage therapist. Therefore, it is possible that their knowledge, attitudes and/or beliefs may be influenced by these experiences.

As in all voluntary research, there is a chance that our research might reflect a self-selection bias, as those therapists who are more interested in or experienced with chronic pain management may have been more likely to respond to our survey or volunteer for an interview. Participant feedback on the transcripts and initial themes was also voluntary, and I received little feedback on either of these steps. However, the feedback that was received was positive or neutral, indicating general support for our thematic analysis. Finally, many of the interviews went over the 90-minute estimate; this was largely due to the enthusiasm and thoroughness of participants' responses, however it limited my ability as an interviewer to ask follow-up questions for fear of neglecting certain topics entirely. As an exploratory study, this approach was appropriate, however for a more specific, focused analysis of barriers and facilitators the

interview guide should be shortened significantly. Alternately, this area may benefit from a partnered research approach, such as an advisory panel of knowledge users who meet on a regular basis to co-create the research (Centre for Healthcare Innovation, 2020).

### **Conclusion**

This research has illuminated gaps in chronic primary pain knowledge, attitudes and beliefs among Canadian athletic therapy graduates, which has the potential to significantly impact the type and quality of care that patients with chronic primary pain patients receive from these therapists. Health Canada's Chronic Pain Task Force identified pain research as one of six key goals to address the national pain crisis, including evaluation of health services in the areas of pain and knowledge mobilization research (Health Canada, 2021). This research is the first step in the process of knowledge mobilization, from identifying the knowledge gap in a novel group of pain-related health care practitioners, to identifying barriers and facilitators to best practices in chronic primary pain management (Straus et al., 2013).

I found that athletic therapists face a wide variety of barriers to the application of the biopsychosocial model in chronic pain management and further research is needed to select, tailor and implement knowledge translation interventions to address these barriers. Participants suggested a number of strategies to facilitate or improve athletic therapists' management of chronic pain in Canada, though it is beyond the scope of this study to measure the effectiveness of these strategies. One suggestion was to increase evidence-based education prior to graduation on chronic pain and effective management strategies, including topics such as the biopsychosocial model, patient-centred care, pain medication, medical imaging, communication skill building and assessment, practical experience with chronic pain and dismissing unhelpful myths about chronic pain. Participants expressed a desire for increased supports from their national and/or provincial associations, in particular mentorship and networking opportunities, being more approachable and accessible as an organization, increased opportunities for chronic pain continuing education, sharing of research conducted by or with athletic therapists, position statements or guidelines around chronic pain management and targeted support for younger or new athletic therapists. Finally, interventions which increase awareness of the function and utility of athletic therapy in the community in insurers, other healthcare professionals and the general public may assist athletic therapists with chronic pain management, Our use of

established knowledge translation frameworks such as the TDF in the design of the interview guide and secondary analysis, as well as our broad mixed-methods approach has provided a foundation from which future knowledge translation interventions may be adapted, constructed and studied. Future research which utilizes the TDF in data analysis may benefit from a deductive approach to better identify specific domains of focus.

This research also marks the first use of the Knowledge and Attitudes in Pain questionnaire in this population. This study has demonstrated the utility and reliability of this measure in Canadian athletic therapists and may be useful for future comparisons between different demographics or other allied health professionals. In addition, future studies may benefit from our experiences with recruitment among this population in the design of their recruitment strategies.

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## Appendix A: Survey Consent Form (Survey Monkey)

Research Project Title: Barriers and facilitators to biopsychosocial management of chronic primary pain: an exploration of athletic therapists' perspectives

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Sponsor: Research Manitoba

**This consent form, which you may print or download for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.**

The purpose of this survey is to assess the knowledge, attitudes and beliefs of Canadian athletic therapists towards chronic pain management. It is important to understand the perspectives of athletic therapists as they are frequently in contact with people experiencing chronic pain and because these attitudes and beliefs may affect the way that they assess patients and make treatment decisions.

This survey should take approximately 15 minutes to complete. You will be asked to answer a 30-item questionnaire. Each question will ask you to respond to what extent you agree or disagree with a statement, on a 6-point scale from “completely agree” to “completely disagree.” Following this questionnaire, you will be asked seven additional demographic questions about your personal characteristics and athletic therapy practice. Finally, you will be given the option to provide an email address to be contacted about a second follow-up study that will be conducted by our team.

While your participation in this study will not benefit you directly in the form of monetary compensation or other rewards, the information gained from this study will provide information which may be used for future research with athletic therapists. The goal of conducting research with this population is to ultimately improve chronic pain patient care and to advance the profession of athletic therapy. As a means to advance the profession and to secure the cooperation of the Canadian Athletic Therapy Association (CATA), we will be providing them with a 1-page summary of results that will include anonymized demographic data and overall study findings. No identifiable participation will be shared with the CATA at any point.

Participation in this survey presents no greater risk to you than what one might experience in everyday life. Your survey responses will be anonymized (separated from potentially personally identifiable information such as your province of residence). Your email address, should you provide one, will be disassociated from your survey responses following data collection (estimated March, 2022). All personally identifiable information will be kept confidential and only the Principal Investigator and Research Supervisor will have access to that information. Data will be stored on a password-protected computer, as well as in a private folder on UM OneDrive, a secure online project management tool. Following data analysis (estimated April, 2022), personally identifiable information will be destroyed and the anonymized data will be stored indefinitely.

This survey is presented using the American website “Survey Monkey”. As such, responses are subject to American laws. Risks associated with participation are minimal and are similar to those associated with many email and social media websites such as Hotmail and Facebook

You are free to withdraw from the survey at any point prior to submission. If you choose to withdraw, your responses will not be recorded and there will be no negative consequences.

Participants who indicate they would like to be contacted with survey results will receive a brief (1-3) summary report by email (estimated August, 2022). Study results will also be shared within academic venues such as conference presentations, posters or publication within an academic journal. Results may also be presented at the Canadian Athletic Therapists Association national annual conference.

**Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.**

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Officer at 204-474-7122 or HumanEthics@umanitoba.ca. A copy of this consent form has been given to you to keep for your records and reference.

I confirm that I meet the eligibility criteria to participate in this study (graduation from an accredited athletic therapy program within the past 5 years): Yes/No

Do you agree to participate in this study? Please select your response: Yes/No



## **Appendix B: Interview Guide**

Thank you for agreeing to meet with me today! As a reminder, this interview will be audio recorded for the purpose of transcription. You are free to choose whether you would like to have your camera on or off for this interview and can change this setting by clicking the camera icon in the lower left corner.

For the rest of the interview, I will ask you a few questions about how you manage patients with chronic pain. Some questions may seem repetitive, but please bear with me as we want to give you every opportunity to discuss your experiences in detail. I may occasionally offer prompts to some questions such as “would you explain that a bit more?” If there are any questions you would rather not answer, that is completely fine. Please feel free to ask for clarification or to move on at any point. If you need a break at any point during the interview or would like to end the interview entirely, please let me know. As a reminder, some of my questions might prompt you to speak about experiences with your patients; please refrain from sharing directly or indirectly identifiable information about your patients, as per the Personal Health Identification Act. Any questions?

Before we begin, please tell me about the current setting(s) in which you practice? What would your typical day at work look like? Your typical patient?

### **Knowledge**

1. First, can you explain how you understand chronic pain?
  - a. Prompt: ...how you might explain it to a friend or family member?
  - b. Prompt: ...different types of chronic pain?
2. What factors influence the development of chronic pain?
  - a. Prompt: Are these different or similar to those that influence duration or severity?
  - b. Prompt: Are there any other factors that might influence pain?
3. Which, if any, theories, frameworks or guidelines do you use in your management of chronic pain?
  - a. If yes: How do you use them? What appeals to you about that theory/framework/guideline?
  - b. If no: Are you aware of any such theories, frameworks or guidelines?
4. How familiar are you, if at all, with the biopsychosocial model of disease (BPSM)?

- a. If familiar: how would you explain the model, in your own words?

*Interviewer:* For the remainder of the interview, when I refer to chronic pain I will be speaking specifically about pain for which there is no identifiable, underlying cause and which has persisted for at least three months. For example, this would not include cancer pain or pain following a surgery. Do you have any questions about this definition or anything else before we go on?

### **Skills**

5. In your opinion, what skills are important for a health care practitioner who manages patients with chronic pain?
  - a. How important do you feel that these skills are to your role as an athletic therapist?
6. What, if any, training have you received in chronic pain management?
  - a. How was this training delivered? By whom? When?
  - b. What did the training include?

### **Memory, Attention and Decision Processes**

7. How do you/would you assess and decide on a treatment plan for patients with chronic pain?
  - a. How easy or difficult do you find this decision in the moment?
8. Is there anything you use to help you make these decisions (preferences, training, guidelines, etc.)?

### **Behavioural regulation**

9. How do you/would you monitor patient progress when treating chronic pain?
10. How do you measure your own success or progress as a practitioner when managing patients with chronic pain?

### **Goals**

11. What is your primary goal in the management of chronic pain?
  - a. How do you/would you know when you've achieved this goal?
  - b. How do you feel your goals align with the patients' goals (different or similar)?

12. What is the importance (i.e. priority) of addressing psychological or social factors in the context of other tasks you have to complete as an athletic therapist (such as manual therapy, activity modification) in achieving the desired patient outcome?

**Beliefs about capabilities (Self-Efficacy)**

13. How prepared do you feel to assess and treat patients with chronic pain?
- How easy or difficult do you find this task?
  - Prompt: has this changed over time?
  - How prepared do you feel to address the needs of patients with chronic pain who present with psychological factors such mental distress, or social factors such as poverty?

**Intention**

14. To what extent, if at all, do you intend to assess psychological or social factors in caring for patients with chronic pain?
- Why or why not?
  - If so, how?
15. To what extent, if at all, do you intend to address psychological or social factors in your treatment of a patient with chronic pain?
- Why or why not?
  - If so, how?
16. How likely are you to refer a patient who presents with chronic pain to another practitioner?
- If so, what would be the reason for referral? If not, why not?
  - To whom would you refer?

**Social/professional role and identity (self-standards)**

17. How do you feel managing patients with chronic pain fits with your role and scope of practice as an athletic therapist?
- Are there aspects that do not fit within this scope?

**Beliefs about consequences (Anticipated Outcome/Attitude)**

18. What are the benefits or potential disadvantages of your usual treatment protocol for the management of chronic pain?

- a. How effective do you feel your preferred treatment protocol is/would be in managing chronic pain?
- b. Are there other approaches that you believe are more or less effective than your current approach? Is there an approach you see as “best practice” or aspire to?
- c. If there is a difference between current protocol and idea: Can you identify any barriers that prevent you from achieving “best practice?”

### **Reinforcement**

19. In your practice as an athletic therapist, how likely are you to be rewarded for incorporating psychological or social factors into your chronic pain management strategy?
  - a. In other words, how much of a potential benefit to yourself?
  - a. In what way? By whom?
20. In your practice as an athletic therapist, how likely are you to face negative consequences for incorporating psychological or social factors into your chronic pain management strategy?
  - a. In other words, how much of a potential risk to you?
  - b. In what way? By whom?
  - c. In your opinion, do you believe the potential risk or potential reward is greater? Based on what factors?

### **Environmental context and resources (environmental constraints)**

21. What, if any, supports are available to you in your practice or **professional community** to help you manage patients with chronic pain?
  - a. Have you utilized any of these supports? Why or why not?
  - b. What supports do you feel you need to effectively manage patients with chronic pain?
22. Are there any other factors in your practice environment(s) that make managing patient with chronic pain easier or more difficult (for example lack of time, funding, equipment, etc.)?

### **Social influences (Norms)**

23. How, if at all, do the views of your colleagues influence your treatment decisions when managing a patient with chronic pain?

24. How, if at all, do the views of your professional associations or governmental institutions (example: insurers) influence your treatment decisions when managing a patient with chronic pain?
25. How, if at all, do the views or preferences of your patient influence your treatment decisions when managing a patient with chronic pain?
26. From your experience, how do you think the healthcare community views incorporating psychological or social factors into practice?

### **Emotion (Stress/Concerns)**

27. How do you communicate with distressed patients? For example, patients expressing frustration, low mood or grief.
  - a. Prompt: can you provide an example?
  - b. How does apparent patient distress or psychological presentation influence your decisions when managing chronic pain?
28. With regard to your own emotions, how do you feel about managing patients with chronic pain in your practice? What word or words would you use to describe this feeling?

### **Optimism**

29. How hopeful are you that your treatment will lead to positive outcomes for patients with chronic pain?

### **Mapping to Intervention Strategies**

30. Over the course of this interview, you've shared some of the challenges or successes that you've experienced in managing chronic pain in your practice. What strategies, if any, would you suggest to address the difficulties or barriers you have identified today?
  - a. Prompt: examples of specific barriers mentioned by participant in the interview
  - b. Prompt: encourage to consider other intervention levels (individual, organizational, national, etc.) \*if you were designing an intervention

### **Conclusion**

Those are all of the questions I have for you today. Do you have any other thoughts on this topic that we haven't asked about? Do you have any final comments or questions?

Would you be interested in reviewing your interview transcript for accuracy once it has been transcribed to text, or in reviewing the initial themes that we come up with after reviewing multiple interview transcripts? Participation is completely optional and once you have reviewed the text you may choose whether or not to offer any comments or feedback.

### Appendix C: Interview Re-Consent (Email)

Hello!

Thank you again for participating in an interview for the study *Barriers and facilitators to biopsychosocial management of chronic primary pain; an exploration of athletic therapists' perspectives* (Protocol HE2021-0116). Prior to the interview, you consented to your interview being audio recorded and manually transcribed into text. We are emailing today to request your permission to utilize an artificial intelligence software to assist with the transcription of your interview. The reason for this change is to increase the speed at which interviews can be transcribed and analyzed, as well as to relieve some of the physical strain of manual transcription. This paid online service is called Otter.ai and enables users to automatically transcribe audio recordings uploaded to their accounts. Once the interview audio has been transcribed with Otter.ai, the transcript will be reviewed by the principal investigator (PI) in order to correct any errors and to remove any identifying information shared during the interview such as names or locations. Once the transcripts have been corrected, the transcripts and audio recordings will be deleted from the Otter.ai website and a copy will be stored on UM Onedrive. If you have opted to receive your transcript for review, the corrected transcript would then be sent to you via email to offer corrections or comments. The risk associated with this change is that Otter.ai is a privately-owned company who may collect data on those who use their software. You may review Otter.ai's full privacy policy here: <https://otter.ai/privacy> .

Consenting to this change is entirely optional. If you do not consent, your interview will be transcribed manually as per the original agreement. If you have any questions about this change or would like to consent to this change, please notify the PI by email.

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**Appendix D: 30-item KNAP English version**

Domain 1: Pain physiology and influential factors

On a scale from 1 to 6, to what extent do you *agree or disagree* with this statement

1. If the tissue damage or inflammation has fully healed, the pain disappears.

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

2. The pain system can adapt; therefore the pain system can become hypersensitive

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

3. Pain sensitivity can persist, even if there is no longer an injury or tissue damage

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

4. In persistent pain, the pain can be caused by adaptation of the pain system itself

1. completely disagree

2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

5. The brain releases chemicals, which can make the pain system less sensitive.

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

6. Hypersensitivity of the pain system can sometimes be beneficial

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

7. Pain is always an output of the brain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

8. The brain has an internal pain reduction system for different signals, to relieve pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

9. Brain activity is influenced by psychological and social processes (such as stress) which in turn influences the sensitivity of the pain system

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

10. The brain has a mechanism that can amplify nerve signals throughout the body

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

11. If the nerve signals from the body are interpreted as dangerous, this probably leads to the experience of pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree

5. to a large extent agree
6. completely agree

12. Negative thoughts about the cause of pain, can amplify the pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

13. In persistent pain, it is important to know that the pain isn't dangerous

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

14. In persistent pain, it is important to know why the pain persists

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

15. If pain is influenced by psychological factors, this probably means the pain is not real or has been partially made up

1. completely disagree
2. to a large extent disagree

3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

16. The physical pain that a person feels, is influenced by the thoughts about the cause of the pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

17. Persistent pain is often the result of nerve compression

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

18. Unexplained pain is not real pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

19. When in pain, it is dangerous to move or exercise

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

20. As long as tissue damage is visible on an X-ray or MRI, there will be pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

21. Pain indicates that you should reduce your activity level

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

Domain 2: Treatment of Pain

22. Treatment for persistent pain is aimed at reducing the sensitivity of the pain system

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree

6. completely agree

23. Treatment of pain is always the most effective when focussing on the tissue damage (or inflammation) and solving this problem

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

24. Exercise is a good treatment option in persistent pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

25. Pain medication is effective in persistent pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

26. Correcting poor posture reduces persistent pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree

4. somewhat agree
5. to a large extent agree
6. completely agree

27. The athletic therapist can reduce persistent pain by correcting a malaligned spine

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

28. During a athletic therapy treatment, pain-provoking exercises should be avoided

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

29. Learning more about pain “due to explaining pain” by the athletic therapist reduces persistent pain

1. completely disagree
2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

30. In persistent pain, the level of activity should be increased depending on the pain experienced

1. completely disagree



2. to a large extent disagree
3. somewhat disagree
4. somewhat agree
5. to a large extent agree
6. completely agree

## Appendix E

### **A tool for evaluating thematic analysis (TA) manuscripts for publication: Twenty questions to guide assessment of TA research quality.** (Braun & Clarke, 2020)

1. Do the authors explain why they are using TA, even if only briefly?
2. Do the authors clearly specify and justify which type of TA they are using?
3. Is the use and justification of the specific type of TA consistent with the research questions or aims?
4. Is there a good ‘fit’ between the theoretical and conceptual underpinnings of the research and the specific type of TA (i.e. is there conceptual coherence)?
5. Is there a good ‘fit’ between the methods of data collection and the specific type of TA?
6. Is the specified type of TA consistently enacted throughout the paper?
7. Is there evidence of problematic assumptions about, and practices around, TA? These commonly include:
  - Treating TA as one, homogenous, entity, with one set of – widely agreed on – procedures.
  - Combining philosophically and procedurally incompatible approaches to TA without any acknowledgement or explanation.
  - Confusing summaries of data topics with thematic patterns of shared meaning, underpinned by a core concept.
  - Assuming grounded theory concepts and procedures (e.g. saturation, constant comparative analysis, line-by-line coding) apply to TA without any explanation or justification.
  - Assuming TA is essentialist or realist, or atheoretical.
  - Assuming TA is only a data reduction or descriptive approach and therefore must be supplemented with other methods and procedures to achieve other ends.
8. Are any supplementary procedures or methods justified, and necessary, or could the same results have been achieved simply by using TA more effectively?
9. Are the theoretical underpinnings of the use of TA clearly specified (e.g. ontological, epistemological assumptions, guiding theoretical framework(s)), even when using TA inductively (inductive TA does not equate to analysis in a theoretical vacuum)?
10. Do the researchers strive to ‘own their perspectives’ (even if only very briefly), their personal and social standpoint and positioning? (This is especially important when the researchers are engaged in social justice- oriented research and when representing the ‘voices’ of marginal and

vulnerable groups, and groups to which the researcher does not belong.)

11. Are the analytic procedures used clearly outlined, and described in terms of what the authors actually did, rather than generic procedures?

12. Is there evidence of conceptual and procedural confusion? For example, reflexive TA (e.g. Braun and Clarke 2006) is the claimed approach but different procedures are outlined such as the use of a codebook or coding frame, multiple independent coders and consensus coding, inter-rater reliability measures, and/or themes are conceptualised as analytic inputs rather than outputs and therefore the analysis progresses from theme identification to coding (rather than coding to theme development).

13. Do the authors demonstrate full and coherent understanding of their claimed approach to TA? A well-developed and justified analysis

14. Is it clear what and where the themes are in the report? Would the manuscript benefit from some kind of overview of the analysis: listing of themes, narrative overview, table of themes, thematic map?

15. Are the reported themes topic summaries, rather than ‘fully realised themes’ – patterns of shared meaning underpinned by a central organising concept?

- If so, are topic summaries appropriate to the purpose of the research?
  - If the authors are using reflexive TA, is this modification in the conceptualisation of themes explained and justified?
- Have the data collection questions been used as themes?
- Would the manuscript benefit from further analysis being undertaken, with the reporting of fully realised themes?
- Or, if the authors are claiming to use reflexive TA, would the manuscript benefit from claiming to use a different type of TA (e.g. coding reliability or codebook)?

16. Is non-thematic contextualising information presented as a theme? (e.g. the first 'theme' is a topic summary providing contextualising information, but the rest of the themes reported are fully realised themes). If so, would the manuscript benefit from this being presented as non-thematic contextualising information?

17. In applied research, do the reported themes have the potential to give rise to actionable outcomes?

18. Are there conceptual clashes and confusion in the paper? (e.g. claiming a social

constructionist approach while also expressing concern for positivist notions of coding reliability, or claiming a constructionist approach while treating participants' language as a transparent reflection of their experiences and behaviours)

19. Is there evidence of weak or unconvincing analysis, such as:

- Too many or too few themes? Too many theme levels?
- Confusion between codes and themes?
- Mismatch between data extracts and analytic claims?
- Too few or too many data extracts?
- Overlap between themes?

20. Do authors make problematic statements about the lack of generalisability of their results, and or implicitly conceptualise generalisability as statistical probabilistic generalisability?

## Appendix F

### Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist (Tong et al., 2007)

#### **Domain 1:** Research team and reflexivity

##### *Personal Characteristics*

1. Interviewer/facilitator

Which author/s conducted the interview or focus group?

2. Credentials

What were the researcher's credentials? E.g. PhD, MD

3. Occupation

What was their occupation at the time of the study?

4. Gender

Was the researcher male or female?

5. Experience and training

What experience or training did the researcher have?

##### *Relationship with participants*

6. Relationship established

Was a relationship established prior to study commencement?

7. Participant knowledge of the interviewer

What did the participants know about the researcher? e.g. personal goals, reasons for doing the research

8. Interviewer characteristics

What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic

#### **Domain 2:** study design

##### *Theoretical framework*

9. Methodological orientation and Theory

What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis

##### *Participant selection*

10. Sampling

How were participants selected? e.g. purposive, convenience, consecutive, snowball

11. Method of approach

How were participants approached? e.g. face-to-face, telephone, mail, email

12. Sample size

How many participants were in the study?

13. Non-participation

How many people refused to participate or dropped out? Reasons?

*Setting*

14. Setting of data collection

Where was the data collected? e.g. home, clinic, workplace

15. Presence of non-participants

Was anyone else present besides the participants and researchers?

16. Description of sample

What are the important characteristics of the sample? e.g. demographic data, date

*Data collection*

17. Interview guide

Were questions, prompts, guides provided by the authors? Was it pilot tested?

18. Repeat interviews

Were repeat interviews carried out? If yes, how many?

19. Audio/visual recording

Did the research use audio or visual recording to collect the data?

20. Field notes

Were field notes made during and/or after the interview or focus group?

21. Duration

What was the duration of the interviews or focus group?

22. Data saturation

Was data saturation discussed?

23. Transcripts returned

Were transcripts returned to participants for comment and/or correction?

**Domain 3: analysis and findings**

*Data analysis*

## 24. Number of data coders

How many data coders coded the data?

## 25. Description of the coding tree

Did authors provide a description of the coding tree?

## 26. Derivation of themes

Were themes identified in advance or derived from the data?

## 27. Software

What software, if applicable, was used to manage the data?

## 28. Participant checking

Did participants provide feedback on the findings?

*Reporting*

## 29. Quotations presented

Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number

## 30. Data and findings consistent

Was there consistency between the data presented and the findings?

## 31. Clarity of major themes

Were major themes clearly presented in the findings?

## 32. Clarity of minor themes

Is there a description of diverse cases or discussion of minor themes?

### **Appendix G: Interview Consent Form (Survey Monkey)**

Research Project Title: Barriers and facilitators to biopsychosocial management of chronic primary pain: an exploration of athletic therapists' perspectives

Principal Investigator (PI): Olivia Tefft, B.Kin, CAT(C), CSEP-CPT

PI email: tefft@myumanitoba.ca

PI phone number: [redacted]

Research Supervisor: Dr. Shaelyn Strachan, Associate Professor at the University of Manitoba

Research Supervisor email: shaelyn.strachan@umanitoba.ca

Sponsor: Research Manitoba

This consent form, which you may print or download for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

#### **Study Objectives and Requirements**

The first objective of this study is to assess the knowledge, attitudes and beliefs of Canadian athletic therapists towards chronic pain management. It is important to understand the perspectives of athletic therapists as they are frequently in contact with people experiencing chronic pain and because these attitudes and beliefs may affect the way that they assess patients and make treatment decisions.

As a participant, you have already completed an online survey that assessed your knowledge, attitudes and beliefs, however the interviews will provide an opportunity for you to explain in more detail your perspective. The second objective of this study is to explore the factors which may prevent or facilitate chronic pain management and the reason(s) why an athletic therapist might choose one approach over another.

Participation in the interview will take approximately 90 minutes of your time over the course of one meeting. You will be prompted to respond honestly to a series of open-ended questions regarding your experiences and point of view on chronic pain management. You may



decline to answer any question(s) for any reason and may choose to end the interview at any point. You may also withdraw your interview recording or transcript from the study at any point prior to data analysis (approximately 2-weeks following your interview) by contacting the principal investigator.

Interviews will take place on the Zoom video conferencing software and will be conducted by the principal investigator (PI). The interviewer will have both audio and video enabled for the interview, however participant use of a video camera is optional. The interviews will be audio recorded and then transcribed by myself. No personally identifiable information will be included in the interview transcripts and transcripts will be identified only by a random numerical code associated with each participant. Direct quotes from these interviews will appear in the final document and these will be associated only with the participant numerical code (for example: "Participant #10"). Interview audio recordings and transcripts will be stored on UM OneDrive. Audio recordings will be destroyed following data analysis (approximately April 2022), anonymized transcripts will be stored indefinitely.

Interview audio recordings will be transcribed using the paid artificial intelligence software Otter.ai. Once the interview audio has been transcribed with Otter.ai, the transcript will be reviewed by the principal investigator (PI) in order to correct any errors and to remove any identifying information shared during the interview such as names or locations. Once the transcripts have been corrected, the transcripts and audio recordings will be deleted from the Otter.ai website and a copy will be stored on UM Onedrive. Once your interview has been transcribed and corrected (approximately one week following your interview) you will be given the opportunity to review the anonymized transcript of their interview for accuracy and to provide comment or corrections. These transcripts will be sent to the email address that you have provided. Participants will be given 10 days following when the transcript is sent to review and provide feedback. If at that time we receive no response, no further action will be taken. You will also be given the opportunity to view the tentative results of our analysis and to offer comment. The tentative results will be sent via email and participants will have 10 days to provide feedback.

Risk and Benefits

While your participation in this study will not benefit you directly in the form of monetary compensation or other rewards, the information gained from this study will provide information which may be used for future research with athletic therapists. The goal of conducting research with this population is to ultimately improve chronic pain patient care and to advance the profession of athletic therapy. As a means to advance the profession and to secure the cooperation of the Canadian Athletic Therapy Association (CATA), we will be providing them with a 1-page summary of results that will include anonymized demographic data and overall study findings. No identifiable participant information will be shared with the CATA at any point.

While this study poses no greater risk of physical harm to the participants than daily life, there are some risks. There is a possibility that one or more topics discussed may cause emotional distress for some participants. In addition, Zoom and Otter.ai are privately-owned companies who may collect data on those who use their free software.

Participants who indicate they would like to be contacted with study results will receive a brief (1-3) summary report by email (estimated August, 2022). Study results will also be shared within academic venues such as conference presentations, posters or publication within an academic journal. Results may also be presented at the CATA national annual conference. Notice Regarding Collection, Use, and Disclosure of Personal Information by the University

Your personal information is being collected under the authority of The University of Manitoba Act. The information you provide will be used by the University for the purpose of this research project, and for appropriate communication as required. Your personal information may also be used to contact you in the event that a draw is associated with the research project and you win the prize and/or you request other offers associated with the research project. Your personal information may also be disclosed to any co-investigators from other educational institutions (if applicable to this research project). Your personal information will not be used or disclosed for other purposes, unless permitted by The Freedom of Information and Protection of Privacy Act (FIPPA). If you have any questions about the collection of your personal information, contact the Access & Privacy Office (tel. 204-474-9462), 233 Elizabeth Dafoe Library, University of Manitoba, Winnipeg, MB, R3T 2N2.

Your signature on this form indicates that you have understood to your satisfaction the

information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Research Ethics Board at the University of Manitoba, Fort Garry campus. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Officer at 204-474-7122 or [HumanEthics@umanitoba.ca](mailto:HumanEthics@umanitoba.ca). A copy of this consent form has been given to you to keep for your records and reference.

1. Do you agree to participate in this study? Please select your response: Yes/No
2. Do you consent to your interview being audio recorded for the purpose of transcription and data analysis? Please select your response: Yes/No
3. What is your email address? [Open text box]

## Appendix H: Demographic Questionnaire

Demographic questions:

1. What is your age?
  - a. 18-19
  - b. 20-24
  - c. 25-29
  - d. 30-39
  - e. 40-49
  - f. 50-59
  - g. 60+
2. Which of the following best describes you?
  - a. Asian or Pacific Islander
  - b. Black or African
  - c. Hispanic or Latino
  - d. Indigenous or Native American
  - e. White or Caucasian
  - f. Multiracial
  - g. A race or ethnicity not listed here
3. Which of the following best describes you?
  - a. Male
  - b. Female
  - c. Intersex/Other
4. Which of the following best describes you?
  - a. Certified Athletic Therapist
  - b. Certification Candidate
  - c. Graduate (do not intend to certify)
  - d. Other (please specify) \_\_\_\_\_
5. In a typical week, describe your practice setting (check all that apply)
  - a. Sports team
  - b. Private clinic
  - c. Hospital/public clinic

- d. Fitness facility
  - e. University/college clinic
  - f. Other (please specify) \_\_\_\_\_
6. How many years have you been practicing athletic therapy (including volunteer/practicum)?
- a. <1 year
  - b. 1-2 years
  - c. 2-3 years
  - d. 3-4 years
  - e. 4-5 years
  - f. 5+ years
7. What is your province/territory of residence?
- a. British Columbia
  - b. Alberta
  - c. Saskatchewan
  - d. Manitoba
  - e. Ontario
  - f. Quebec
  - g. Nova Scotia
  - h. New Brunswick
  - i. Newfoundland and Labrador
  - j. Prince Edward Island
  - k. Yukon
  - l. Nunavut
  - m. Northwest Territories

Contact information (optional):

1. For the second component of our study, we are looking to schedule follow-up interviews via Zoom online conferencing software with some eligible participants. If you are interested in being contacted with more information about the interview component of our study, please provide your email address in the box below. [Open text box]

2. Are you interested in being contacted with a summary of the results from this survey? Contact information provided for this question will not be used for any purpose other than to share the results. If so, please provide your email address in the box below. [Open text box]