Ainsley Augusta MacIntyre, candidate for the degree of Master of Science in Gerontology, has presented a thesis titled, *A Pain Self-Management Program for Older Adults: Online vs. Workbook Delivery*, in an oral examination held on August 23, 2019. The following committee members have found the thesis acceptable in form and content, and that the candidate demonstrated satisfactory knowledge of the subject material.

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Abstract

The treatment for chronic pain continues to be a challenge, for clinicians and those suffering, because the complete exclusion of pain is seldom attainable for any considerable period of time. If treated ineffectively, the emotional consequences of pain, including psychological comorbidities, can increase considerably. It is well documented that severe pain is more common in older adults than it is younger persons. Of concern, older adults may not have access to traditional face-to-face self-management programs, which are recognized to be valuable in chronic pain management. Access to effective self-management approaches is particularly challenging for older adults who have mobility limitations or reside in rural and/or remote areas where access to health care services is limited. Internet self-management programs have the potential to address pain undermanagement, especially as the digital divide between the older and younger demographic continues to grow. Given the known difficulties with treatment access, the purpose of this study was to explore the efficacy and acceptability of a remotely delivered chronic pain management program tailored to older adults, the Pain Course, when delivered in online and workbook formats. Using a patient preference randomized controlled trial (RCT) design, four participants were not willing to be randomized to the online group. They were then offered the workbook, but not included in the analyses. These participants cited inconsistent internet access and difficulties navigating the internet as the reasons for selecting a preference. Therefore, the final sample included 117 participants. Participants were randomized to an intervention group (online or workbook) or wait list control group. The content of both formats was identical and
contained 5 core lessons that participants were encouraged to work through over an 8-week period. Primary, secondary and tertiary measures evaluated depression, anxiety, disability, chronic pain severity, pain beliefs, functional status, fear of movement and quality of life at pre-treatment, post-treatment, and follow-up. The wait list control group had the highest completion rates (85%) in comparison to workbook (83%) and online (76%) groups. Participants, in online and workbook groups, expressed a great deal of satisfaction with the program despite the absence of significant differences across groups with respect to any of the primary, secondary, and tertiary measures. By exploring the efficacy of an online group vs. workbook group, we expanded valuable methodological considerations for testing these programs in older adults. For example, future studies need to ensure recruited participants are experiencing distress and disability and furthermore, longer term follow-up would be beneficial.
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Dedication

I would like to dedicate this thesis to my late grandparents. Thank you for your encouragement, unconditional love and insightful words of wisdom. All four of you were a source of inspiration for my interest in the field of gerontology and for this reason, this project is dedicated to you.
Table of Contents

Abstract ................................................................................................................................ i
Acknowledgement ............................................................................................................. iii
Dedication .......................................................................................................................... iv
Table of Contents .................................................................................................................v
List of Tables ..................................................................................................................... ix
List of Appendices ...............................................................................................................x

1. INTRODUCTION ...........................................................................................................1
   1.1 Overview ............................................................................................................1
   1.2 Chronic Pain .........................................................................................................2
      1.2.1 Pain in older adults ..............................................................................3
      1.2.2 Nature of pain .....................................................................................6
      1.2.3 Biopsychosocial model of pain .........................................................11
      1.2.4 Treatment barriers .............................................................................15
         1.2.4.1 Health-care provider barriers .............................................15
         1.2.4.2 Patient barriers ...................................................................15
         1.2.4.3 Health-care system barriers ................................................16
         1.2.4.4 Undertreatment of pain ......................................................16
   1.3 Treatment .........................................................................................................18
      1.3.1 Pharmacological treatment .................................................................18
      1.3.2 Surgical treatment .............................................................................19
      1.3.3 Interdisciplinary treatment ................................................................19
1.3.4 Psychological interventions ..............................................................21
  1.3.4.1 Cognitive-behavioral therapy (CBT) ..............................................21
  1.3.4.2 Pain self-management .................................................................23

1.3.5 Psychological interventions in the management of pain in older adults ..........................................................................................................28

1.4 Online vs. Workbook .......................................................................................30

1.5 Computer Usage .........................................................................................32

1.6 Purpose .............................................................................................................32

2. METHODOLOGY ........................................................................................................33

2.1 Participants .......................................................................................................33

2.2 Design and Measures ......................................................................................36

  2.2.1 Primary measures ..................................................................................37
    2.2.1.1 Pain Disability Index (PDI) ..........................................................37
    2.2.1.2 Geriatric Depression Scale (GDS-30) .......................................37
    2.2.1.3 Generalized Anxiety Disorder 7-Item (GAD-7) ........................38

  2.2.2 Secondary measures ..............................................................................38
    2.2.2.1 The Brief Pain Inventory Short Form (BPI-SF) .......................38

  2.2.3 Tertiary measures ....................................................................................39
    2.2.3.1 Pain Self-Efficacy Questionnaire (PSEQ) ..................................39
    2.2.3.2 TAMPA Scale of Kinesiophobia (TSK) ....................................39
    2.2.3.3 Chronic Pain Acceptance Questionnaire (CPAQ-8) ...............40
    2.2.3.4 Pain Catastrophizing Scale (PCS) ..............................................41
2.2.4 Acceptability and satisfaction ...........................................................41
2.3 Treatment Program ........................................................................................................43
2.4 Online vs. Workbook Groups .................................................................44
2.5 Guide Contact ...................................................................................................45
2.6 Analysis............................................................................................................46
   2.6.1 Mixed models....................................................................................47
   2.6.2 Sub analysis ......................................................................................48
   2.6.3 Acceptability and satisfaction questions ...........................................49
3. RESULTS ......................................................................................................................49
   3.1 Data Checking.............................................................................................49
      3.1.1 Accuracy of data entry ......................................................................49
      3.1.2 Missing data..........................................................................................50
   3.2 Patient preference .............................................................................................50
   3.3 Demographic characteristics ............................................................................50
   3.4 Pain conditions and treatment or medications for pain ....................................58
   3.5 Analyses ...........................................................................................................62
      3.5.1 Pain beliefs and functional status......................................................62
      3.5.2 Chronic pain severity ........................................................................66
      3.5.3 Fear of movement and quality of life ..................................................69
   3.6 Sub analysis .....................................................................................................73
      3.6.1 Pain beliefs and functional status sub analysis .................................73
      3.6.2 Chronic pain severity sub analysis ....................................................76
3.6.3 Fear of movement and quality of life sub analysis .......................78
3.6 Treatment satisfaction ......................................................................................81
3.7.1 Quantitative treatment satisfaction data ..............................................81
3.7.2 Qualitative treatment satisfaction data ..............................................85
  3.7.2.1 Organization .................................................................87
  3.7.2.2 Content .................................................................90
  3.7.2.3 Outcomes .................................................................94
4. DISCUSSION ................................................................................................................99
  4.1 Participant satisfaction with the self-management program ...............101
  4.2 Directions for future research .................................................................108
  4.3 Conclusion .....................................................................................................114
List of Tables

Table 1: Participant demographic characteristics ..............................................................54
Table 2: Participant demographic characteristics by group ...............................................56
Table 3: Participant pain conditions ..................................................................................59
Table 4: Participant treatments or medications for pain ....................................................61
Table 5: Descriptive statistics for pain beliefs and functional status.................................65
Table 6: Descriptive statistics for chronic pain severity ....................................................68
Table 7: Descriptive statistics for fear of movement and quality of life ..............................72
Table 8: Descriptive statistics for sub analysis of pain beliefs and functional status ......75
Table 9: Descriptive statistics for sub analysis of chronic pain severity .........................77
Table 10: Descriptive statistics for sub analysis of fear of movement and quality of life .80
Table 11: Descriptive statistics for quantitative treatment satisfaction comments.............83
Table 12: Descriptive statistics for sub qualitative treatment satisfaction comments ......86
Table 13: Treatment satisfaction comments addressing course organization .................88
Table 14: Treatment satisfaction comments addressing course content ...........................92
Table 15: Treatment satisfaction comments addressing course outcomes .....................96
List of Appendices

Appendix A: Research Ethics Board Certificate of Approval .............................................. 145
Appendix B: Online Screening Consent Form .................................................................. 146
Appendix C: Preliminary Screening Questionnaire .............................................................. 151
Appendix D: Telephone Screening Protocol ..................................................................... 164
Appendix E: Pain Course Consent Form ........................................................................... 172
Appendix F: Treatment Satisfaction Questionnaire ......................................................... 183
1. INTRODUCTION

1.1 Overview

Pain is recognized as the one of the strongest predictors of poor quality of life (Mason, Skevington, & Osborn, 2009). It is associated with substantial disability and linked to decreased mobility, falls, depression, anxiety, avoidance of activity, sleep disruptions and social isolation (Abdulla et al., 2013a; Institute of Medicine, 2011). Chronic pain is recognized as a major public health problem, yielding substantial economic and social burden (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006; Leadley, Armstrong, Lee, Allen, & Kleijnen, 2012). Previous research has indicated that pain-related fear acts as a risk factor for the development and continuity of chronic pain following an acute pain episode (Boersma & Linton, 2005).

While chronic pain is recognized to be common, population prevalence estimates have been variable (Schopflocher, Taenzer, & Jovey, 2011). Prevalence estimates of persistent pain range from 18% to 57%, depending on survey methodology and population of interest (Institute of Medicine, 2011). In Canada, prevalence estimates of chronic pain can vary considerably across studies. The variability among Canadian estimates, between 16% and 41%, was found to be slightly smaller in comparison to the reported international data ranges (Ospina & Harstall, 2002; Verhaak, Kerssens, Dekker, Sorbi, & Bensing, 1998). Differences in populations, samples, methods of data collection and definitions of chronic pain were most likely due to the inconsistency found between studies (Schopflocher et al., 2011).
Prevalence rates for pain are expected to increase as populations continue to age thereby increasing the public health impact of pain (Reid, Eccleston, & Pillemer, 2015). Pain is a very common problem for the aging demographic, with persistent or chronic pain affecting between 27% and 86% of older adults living in a community setting or nursing home (Docking et al., 2011; Jakobsson, 2010; Patel, Guralnik, Dansie, & Turk, 2013; Yu, Tang, Kuo, & Yu, 2006). Despite the high prevalence of pain in old age, many researchers have emphasized that pain is often undertreated in the aging demographic (e.g., Reid et al., 2015).

This thesis is focused on efficacy and acceptability of a remotely delivered chronic pain management program for older adults, the Pain Course, when delivered in online and workbook formats. In the literature that follows, chronic pain, treatments for chronic pain, and treatment barriers will be reviewed followed by the two modes of delivery (online and workbook) and computer usage in the aging demographic.

1.2 Chronic pain

Pain is a universal form of human distress, with acute and chronic pain representing substantial public health issues (Hadjistavropoulos et al., 2011). Acute pain is generally triggered by a specific disease or injury, serves a useful biological purpose, tends to be related to tissue damage or skeletal muscle spasm and/or sympathetic nervous system activation, and is self-limited. In contrast, chronic pain typically outlasts normal healing time and is often defined as pain that lasts longer than three months. Chronic pain does not serve a biological purpose and has no distinguishable end-point (Borsook, 2012; Grichnik & Ferrante, 1991). The majority of acute pain does not progress to chronic pain.
However, there is evidence to suggest that numerous factors associated with the transition from acute to chronic, and potentially generalized, pain. These include high levels of anxiety and depression, perceived stress, substance abuse, lack of coping resources, poor social support and perceptions of health and current symptoms (Turk, 1997). All of these risk factors are potentially modifiable through effective psychosocial intervention.

Patients with chronic pain normally report other comorbidities such as increased levels of fatigue, sleep disturbances and other somatic symptoms (i.e., bowel or urinary symptoms). In the United States, the relationship between psychological and psychiatric factors in relation to pain was examined in the National Health and Nutrition Survey I. Results revealed that depressive symptoms predicted musculoskeletal chronic pain (defined as pain present on most days during at least one of the past 12 months) among participants who were pain free at the beginning of the survey. Conversely, chronic pain was the most powerful predictor for depression at follow-up among participants who did not have depression to begin with (Magni, Moreschi, Rigarri-Luchini, & Merskey, 1994).

1.2.1 Pain in older adults

Canadians over the age of 65 represent our fastest growing age group, a trend projected to accelerate over the coming years (Statistics Canada, 2014). Aging is often associated with an increased need for assistance. Previous research has outlined the relationship between increasing pain prevalence with increasing age, while highlighting pain as a persistent problem for the aging demographic (Docking et al., 2011; Tsang et al., 2008).
Pain is not a normal part of aging, though it is true that the prevalence of pain increases in old age (Institute of Medicine, 2011). In other words, pain results from pathologies that are more common in older adults but is not the result of aging per se. Older adults often underreport pain, however, because they believe it is part of the normal aging process (O’Malley, 2005). The pathophysiology, presentation and outcomes of persistent pain in older adults differ from other demographics and management of pain can be difficult as a result (Hall, 2016).

The undertreatment of pain in older adults is rapidly emerging as a major public health concern in North America (Census Bureau, 2002; Coggins, 2014; Health Canada, 2002; Herr, 2010). According to the American Pain Foundation (2008), the aging demographic is at the highest risk of the undertreatment of pain. The reasons that might contribute to the undertreatment of pain in the aging population include misconceptions regarding the process of aging, barriers to accessing care, lack of education regarding pain assessment and management, lack of ability to evaluate pain in the cognitively impaired, and the stigma that can be associated with admitting that one is suffering from pain (American Pain Foundation, 2008; Coggins 2014).

The presence of age-related comorbidities and functional decline often exist independently of pain and therefore, the exclusive influence of persistent pain can be difficult to identify in older adults (Rudy, Weiner, Lieber, Slaboda, & Boston, 2007). The increased frequency of persistent pain in old age is associated with an array of diseases (e.g., cancer, osteoarthritis) and conditions (e.g., decreased mobility, fall-related injuries) that disproportionately affect the aging demographic (Hadjistavropoulos, 2016b; Kaye,
Baluch, & Scott, 2010). Consequently, changes in quality of life and reduced self-care can result in older adults being unable to live independently. This can increase their likelihood of admission to a long-term care facility (Hall, 2016).

There are many age-associated psychosocial phenomena that older adults may experience alongside their personal experience of pain. The loss of family and friends, the loss of independence/institutionalization, bereavement, retirement from the workforce, and social isolation are psychosocial issues that can contribute to pain and suffering in older adults experiencing persistent or chronic pain (Krauss Whitbourne, Whitbourne, & Konnert, 2015; Nicholson, 2009; Roy, 2001).

Aging is associated with physiological changes that can have an influence on the perception of pain in addition to the pharmacodynamics and pharmacokinetics of analgesic medications. With increasing age, there seems to be a significant reduction in the number and function of peripheral nociceptive neurons (Kenshalo, 1986; Miller et al., 2016). Sensory thresholds for thermal and vibrational stimuli increase whereas thresholds decrease for particular mechanoreceptors and free nerve endings (Hall, 2016). Aging is also associated with changes that can influence the pharmacokinetics of analgesic medications. Pharmacodynamic and pharmacokinetic effects are difficult to quantify but might increase sensitivity to pharmacological interventions thereby elevating an older adult’s risk of side effects (Abdulla et al., 2013b).

Several experimental studies have been conducted over the years, in which age changes in pain perception have been studied using cross-sectional designs (Edwards, 2005; Gibson & Farrell, 2004; Lautenbacher, 2012). For older adults, the pain threshold
is assumed to increase with age although there also appears to be a decrease in pain threshold. Conversely, older adults might tolerate strong pain intensities less well, likely due to ineffective pain inhibitory processes (Lautenbacher, 2012). This explanation is in accordance with clinical findings of high prevalence of pain in old age (Gagliese, 2009) although there is no evidence that clinically significant suffering is reduced as a function of age (e.g., Cole, Farrell, Gibson, & Egan, 2010; Edwards and Fillingim, 2001).

Pain in older adults can be complicated, with an increase in chronic health conditions, psychosocial experiences and complex physiological changes, which may affect quality of life and impair function. For the aging demographic, the combination of multiple acute and chronic conditions increases their vulnerability to having their pain underassessed and inadequately treated. As a result, the assessment of pain type and severity is of significant importance (Hall, 2016). More research is needed in this area.

1.2.2 Nature of pain

Pain is recognized as a complex psychological experience. According to the International Association for the Study of Pain (IASP), pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (IASP, 2005). This definition, as outlined by the IASP, clearly outlines the psychological elements as being integral to the pain experience.

Melzack and Wall’s (1965) gate control theory of pain is the most inclusive and widely recognized conceptualization of pain. The original theory explored the role of psychological, cognitive, social, cultural, and environmental factors associated with pain (Melzack & Wall, 1965). The latter premise of the Gate Control Theory was described
using accessible physiological observations to justify particular behavioural and psychophysical observations in relation to pain. The theory has produced the foundation of more comprehensive biopsychological perceptions (Asmundson & Wright, 2004; Merskey, 1998). 

There is no simple relationship between nociception and pain. Pain is viewed as a complex experience with inputs from biological nociceptive and hypothalamic-pituitary-adrenal axis activity, in addition to psychosocial and socioeconomic factors (Gatchel et al., 2014). A key premise of the gate control theory is the presence of a gating mechanism, within the dorsal horn of the spinal cord, which permits or inhibits ascending nociceptive information from the periphery of the brain. The transmission of pain, from the peripheral nerve via the spinal cord, is subject to modulation by both intrinsic neurons and controls originating from the brain (Melzack & Wall, 1965).

According to Melzack (1996), the gate control theory of pain is based on several major premises. Firstly, the transmission of nerve impulses from afferent fibers to the spinal cord transmission cells is controlled by a spinal gating mechanism in the dorsal horn. The spinal gating mechanism is influenced by the relative amount of activity in the large-fibers (A-beta) and small-diameter fibers, with activity throughout the large fibers inhibiting transmission and small-fiber (C-fiber) activity facilitating transmission (Dickenson, 2002; Melzack, 1996). More simply, large-fiber activity closes the gate and small-fiber activity opens the gate. The spinal gating mechanism is influenced by descending nerve impulses from the brain. A specialized system of large-diameter, rapidly conducting fibers serves as the central control trigger. By way of descending
fibers, this specialized system selectively activates cognitive processes that, in turn, have an impact on the controlling properties of the spinal gating mechanism. In the event that the spinal cord transmission cells exceed threshold, the action potential is triggered thereby activating the underlying neural mechanisms throughout the dorsal horn of the spinal cord (Melzack & Wall, 1965).

The gate control theory has served as the foundation in pain research although there is a set of observations on pain in people with phantom limb pain and people with paraplegia that did not fit the theory (Melzack, 1996). Peripheral and spinal processes are a central part of pain, however further investigation on the mechanisms of peripheral inflammation, spinal modulation, and midbrain descending control is necessary. The data on phantom limbs below the level of total spinal section (Melzack & Loeser, 1978) suggest that research must go beyond the foramen magnum and into the brain (Melzack, 1989; Melzack, 1991).

The spinal projection systems to the thalamus and cortex are significant, though they simply represent the foundation of the psychological process that underlies perception (Melzack, 1996). The areas of the brain involved in the pain experience are extensive and extend beyond the cortex and thalamus. Both visual and vestibular mechanisms are included in our cognitive processes and consequently, widespread areas of the brain must be involved in pain. These areas include but are not limited to somatosensory projections and the limbic system (Melzack, 1996).

Melzack’s (1989; 1991) analysis of phantom limb phenomena (i.e., amputees experiencing pain in a limb that is no longer there) has led to four main assumptions that
have shaped a new conception of the nervous system. Firstly, the same neural processes that occur in the brain also take place in the body. Input from the body typically activate and modulate processes in the brain, though these processes can act in the absence of neural input. Secondly, sensations that we feel throughout the body, including pain, can be felt in the absence of neural input from the body. The origins of the patterns that underlie the qualities of experience arise from neural networks within the brain. Ultimately, stimuli might trigger the patterns, but they do not produce them. Thirdly, the body is perceived as a unit and is recognized as the “self,” which is distinct from other people and one’s surroundings. Lastly, the brain processes that underlie the body-self are genetically programmed though this built-in substrate is modified by experience (Melzack, 1996).

The premises outlined above formed the basis of the new conceptual model (the neuromatrix model) that was designed to supplement the gate control theory (Melzack, 1996). The anatomical substrate of the body-self is a widespread network of neurons that includes loops between the thalamus and cortex as well as the cortex and limbic system. Melzack (1996) labeled the large network as a neuromatrix whose spatial distribution and synaptic connections are primarily programmed genetically and are later moulded by sensory inputs.

The neuromatrix casts its distinctive signature on all nerve impulse patterns that flow through via the “neurosignature”. More simply, the neurosignature originates and takes form within the neuromatrix (Melzack, 1996). The neuromatrix model of pain describes how pain can be experienced in the absence of external stimulation.
Widespread networks of neurons throughout the brain are representative of the body. This neural network, defined as the neuromatrix, is described as being both genetically determined and shaped by inputs from the body (Melzack, 1996). Under some circumstances (e.g., phantom limb pain), the neuromatrix might have a genetically determined substrate that is altered by sensory experience (Melzack, 1990).

With the publication of the gate control theory, the emphasis moved from the periphery to central neural mechanisms when recounting an individual’s pain experience (Melzack, 1999). The brain is now seen as the central processor that derived inputs from several peripheral and central sources. It also incorporated the influence of affective, motivational and cognitive, evaluative processes transmitted from distinct subsystems of cortical activity enclosed within the brain (Apkarian, Bushnell, Treede, & Zubieta, 2005).

The Gate Control Theory has been supported through numerous experimental and clinical investigations and led to some of the most beneficial research in the study of pain (Moayedi & Davis, 2013). Measures of its progress are some of the predictions that have led to development of and support for clinically effective intervention. The context of the theory connected pain to several interacting circuits, described later by Melzack using the neuromatrix concept, has led to developments in the fields of pain genetics, affective components of pain and environmental factors that play a role in the pain experience (Mendell, 2014).

Psychophysical studies have established that pain sensation and pain affect exemplify two separate dimensions of pain with reliably different relationships to neural pain signaling (Price, 2000; Rainville, 2002; Rainville, Duncan, Price, Carrier, &
Bushnell, 1997). In other words, the sensory and affective dimensions of pain originate in distinct but overlapping neural circuits and are directed by separate neural pathways of cortical processing (Price, 2000). The somatosensory cortex primarily modulates the sensory properties of pain while the anterior cingulate cortex (ACC) and prefrontal cortex are fundamental to the affective, motivational and cognitive dimensions of pain processing. The psychological dimensions of pain emerge from distinct cortical pathways separate from the intensity characteristics of pain, but they are no less reliant on neural properties (Apkarian et al., 2005; Hofbauer, Rainville, Duncan, & Bushnell, 2001; Jensen, 2010; Rainville, 2002; Rainville et al., 1997).

1.2.3 Biopsychosocial model of pain

The biopsychosocial model is an alternative to the biomedical disease model, which generally attributes health problems to simply biological factors, such as genes, viruses or somatic abnormalities (Engel, 1977). In contrast to the biomedical model, Turk, Meichenbaum and Genest, (1983) suggested that both chronic and acute pain are the outcome of interactions among biological, behavioural, cognitive, and social features of pain. Recognition of the interplay of these factors is articulated within biopsychosocial models (e.g., Gatchel, Peng, Peters, Fuchs, & Turk, 2007; Robinson & Riley, 1999). In the past, the role of biological phenomena has been the focus of research though considerable evidence supports the interplay among biological, psychological and social determinants and their contribution to wellbeing (Gatchel et al., 2007; Turk & Okifuji, 2002). It is important to note that biopsychosocial formulations are consistent with the
gate control theory of pain and elaborate on the manner in which psychosocial factors may affect the pain experience.

The way in which pain is defined has progressed due to the increasing understanding of psychological and social influences. As a result, the biopsychosocial model of pain is viewed as the most comprehensive theoretical perspective of pain (Turk & Monarch, 2002). Despite strong empirical evidence supporting the biopsychosocial model, psychosocial factors are frequently given secondary status and mainly regarded as reactions to pain (Edwards, Dworkin, Sullivan, Turk, & Wasan, 2016).

Research has mainly focused on intrapersonal processes, both biological and psychological, which has left the social dimensions of the biopsychosocial model somewhat unexplored (Hadjistavropoulos et al., 2011). To understand the intrapersonal features of pain, it is important to recognize that people frequently experience pain in complex social environments and the individual’s distress is noticeably evident. Pain not only involves the attention of the sufferer, but it is often based upon the social setting and reactions of others (Cano, Barterian, & Heller, 2008; Craig, 2004; Hadjistavropoulos & Craig, 2002). It is important to note that the responses of others have a large influence upon the pain experience and wellbeing of the person in pain (Chambers, Craig, & Bennett, 2002). For instance, the presence of social support can modulate responses to pain (Gagnon, Hadjistavropoulos & MacNab, in press). This model explores the method that pain is encoded by expressive behaviour and the interpretation of expressive behaviour by observers (Prkachin & Craig, 1995).
An inclusive understanding of pain as a social phenomenon requires investigation of both social and communicative features. The dynamic interaction between the individual and the social environment in which pain develops establishes exposure to pain, the experience of pain and suffering, pain expression, and related disability (Hadjistavropoulos et al., 2011). For example, studies exploring social environments involving parents or spouses (Palermo & Holley, 2013; Palermo, Valrie, & Karlson, 2014) and individuals with acquired amputation (Hanley et al., 2004) have shown that social supports exert a sizeable influence on pain-related outcomes. The biopsychosocial model identifies biological mechanisms as fundamental to the psychological processes involved throughout pain experience. Furthermore, it focuses on social processes as both causes and consequences of an individual’s pain experience and the manner in which pain is expressed (Hadjistavropoulos et al., 2011).

Social forces play an influential role in shaping a variety of health-related outcomes, and pain is no exception. There are several psychosocial factors, such as depression, anxiety and general signs of emotional distress that seem to be associated with the development of persistent pain. Furthermore, they have been found to be the most commonly assessed psychological factors (Edwards et al., 2016). Premorbid psychological dysfunction serves as a risk factor for the future onset of several chronic pain conditions (Diatchenko, Fillingim, Smith, & Maixner, 2013; Fillingim et al., 2013; Linton et al., 2011). Similar psychosocial constructs and processes predict the probability of transition from acute to chronic musculoskeletal pain. More specifically, for example,
higher distress levels are associated with an increased likelihood of transitioning to chronic pain (Diatchenko et al., 2013; Pincus et al., 2013).

There is also a strong link between early traumatic experiences and the subsequent development of chronic pain (Afari et al., 2012; Brennstuhl, Tarquinio, & Montel, 2014; Jones, Power, & Macfarlane, 2009). The majority of these traumatic experiences are both social and interpersonal in nature (Edwards et al., 2016). Currently, it is unclear as to whether the link between trauma and the onset of chronic pain later in life is a direct consequence of exposure to the trauma or shaped mainly by individual affective, cognitive, and behavioural responses to the traumatic event (Brennstuhl et al., 2014).

A variety of the psychosocial determinants such as injustice perceptions, social exclusion, stigmatization, pain catastrophizing, depressed mood, behaviours, motivation, anxiety, and fear all can affect responses to pain (Darnall, Carr, & Schatman, 2017). The causal role of social determinants provides essential information regarding the prevention of pain across the life span, the impact of opportunities to learn about pain and perspectives on treatment. The focus on social processes seems to be especially important in understanding the human pain experience (Craig & Fashler, 2014).

The biopsychosocial model has been extremely valuable in forming the knowledge concerning individual differences in pain, and in managing the growth of efficacious and effective psychosocial and behavioural interventions to decrease the suffering associated with chronic pain (Gatchel, McGeary, McGeary, & Lippe, 2014; Jensen & Turk, 2011; Williams, 2013). The increased application of this model is the
result of extensive findings supporting the major role of social factors, including social support, in altering the pain experience in both clinical and experimental settings. By exploring the role of social determinants, the narrow emphasis on biological processes is shifting towards a multidisciplinary approach (Lincoln, 2017).

1.2.4 Treatment barriers

There is limited scientific literature with regards to the inequities in pain care (American Pain Foundation, 2008), but three categories of barriers to effective treatment of pain in older adults have been recognized. The three categories include patient, health-care provider, and health-care system barriers (Denny & Guido, 2012).

1.2.4.1 Health-care provider barriers. Inadequate assessment skills, knowledge gaps, negative attitudes, and timidity in prescribing are barriers that health-care providers can unknowingly bring to clinical encounters with patients (Von Roenn, Cleeland, Gonin, Hatfield, & Pandya, 1993). Pain management and physical rehabilitation are given low priority in both medical schools and residency training programs (Glajchen, 2001). More specifically, some physicians have been described as having “pain apathy” that reduces their likelihood of delivering active treatment (Notcutt & Gibbs, 2010).

1.2.4.2 Patient barriers. For those experiencing chronic pain, treatment is often delayed, inaccessible or ineffective. Communication, psychological, and attitudinal issues are examples of patient-related barriers. It is not uncommon for older adults experiencing chronic pain to encounter barriers to treatment, such as mobility or travel limitations, and have difficulty accessing health care services (Carlbring et al., 2006).
1.2.4.3 **Health-care system barriers.** The health-care system itself can pose barriers to effective treatment options for older adults experiencing chronic pain. Practical constraints might include the lack of a neighbourhood pharmacy, lack of transportation to the physician or pharmacy, or mobility limitations that can prevent older adults from leaving their homes. These limitations can serve as major obstacles in the pursuit of obtaining effective pain relief (Glajchen, Blum, & Calder, 1995).

1.2.4.4 **Undertreatment of pain.** The inconsistency between patient and physician when evaluating the severity of the patient’s pain is foretelling of inadequate pain management. Patients often have more than one concern per consultation (Heritage, Robinson, Elliot, Beckett, & Wilkes, 2007). It is well documented that many people experiencing chronic pain interact with physicians who “are poor listeners”. Time constraints are a major issue in today’s patient-physician relationship and patients are feeling the time crunch (Abbo, Zhang, Zelder, & Huang, 2008; Østbye et al., 2005). For example, physicians frequently interrupt patients after the expression of the patient’s first concern and follow their own agenda for the remainder of the visit (Beckman & Frankel, 1984; Marvel, Epstein, Flowers, & Beckman, 1999). In a recent study, it was reported that more than 50% of participants suffering from chronic pain found it necessary to change physicians in their pursuit of pain relief. More specifically, patients outlined their reasoning for changing physicians as lack of physicians’ willingness to treat the pain adequately, failure to take their request for treatment seriously, and lack of knowledge regarding pain management (American Academy of Pain Medicine & Janssen Pharmaceutica, 2000).
With regards to pharmacological treatment for chronic pain, there is an ongoing debate concerning the use of opioids (Andersen & Leikersfeldt, 1996; Portenoy, 1996). Moreover, evidence-based psychological interventions are underutilized as a form of non-pharmacological treatment. This is especially true in older adults that experience chronic pain. It will be necessary for health professionals to communicate with the aging demographic, particularly those who are skeptical about behavioural or cognitive techniques, that using psychological interventions can be quite useful. Remote therapies, CBT or pain self-management programs, that make use of technology may help overcome this barrier (Eccleston et al., 2014).

1.3 Treatment

For pain management, treatment protocols and treatment goals might need to be modified in order to accommodate the needs of older adults. Older adults’ chronic pain often occurs in the context of several comorbidities, which limits treatment options. The cause of a patient’s pain should be the determining factor when choosing the method of treatment. There are several of treatment options available for individuals experiencing chronic pain. Ultimately, the main goal of pain management is to provide symptom relief and improve an individual’s ability to complete daily activities (Whitten, Donovan, & Cristobal, 2005).

1.3.1 Pharmacological treatment

There are several pharmacological options, both oral and topical therapies, for the treatment of chronic pain. There are several categories of medications that are used for the treatment of chronic pain. Oral medications include non-steroidal anti-inflammatory
drugs (NSAIDs), aspirin, opioids, and acetaminophen (paracetamol). Topical medications, which are applied to the skin, are usually administered in the form of an ointment, cream or patch that is placed directly on the skin (American Society of Regional Anesthesia and Pain Medicine [ASRA], 2017). The most commonly used categories of medications are divided into the following broad categories: NSAIDs and acetaminophen, and opioids.

Acetaminophen is considered to be the preferred treatment for older adults experiencing mild to moderate pain because of its promising safety profile (Towheed et al., 2006). There are several different types of NSAIDs. For example, ibuprofen is a member of this class of drugs and it can be obtained over the counter. NSAIDs are effective for acute muscular and bone pain in addition to some types of chronic pain syndromes (ARSA, 2017). Oral NSAIDs have been shown to be successful in some patients but are safest when used for pain flares. However, oral NSAIDs have shown gastrointestinal, cardiovascular, and renal risks, which can increase with age (Trelle et al., 2011). Topical NSAIDs are typically well tolerated, and should be considered, particularly for older adults experiencing localized pain.

Opioids can be effective in the treatment of particular types of chronic pain when used properly. This class of drugs has been shown to treat nociceptive pain effectively in the absence coexisting nervous system pathologies. Conversely, opioids are less effective for treatment of neuropathic pain due to decreasing opioid efficacy. Some patients have coexisting nociceptive and neuropathic pain that could involve a combination of medications, which includes opioids (Woolf & American College of Physicians, 2004).
Long-term use of opioid drugs is not considered the ideal approach for treating pain syndromes. Given the recognized risks associated with opioid use, they may be considered when an older adult’s pain is unresponsive to other treatment options or when significant functional impairment continues despite active treatment. The possible negative side effects must be assessed alongside the consequences of untreated or undertreated pain prior to undertaking an opioid trial (Chou et al., 2015).

1.3.2 Surgical treatment

Surgery is not often used to treat chronic pain, though recent studies show that the use of surgical interventions for chronic pain has increased. For example, Rajaee and colleagues (2012) found a 137% increase in spinal fusion surgery for low back pain between 1998 and 2008 with an 11.8% increase in laminectomy procedures. It is difficult to treat chronic pain with surgery because often, there is no specific known physiological mechanism causing the pain. Moreover, there are concerns about high disability rates after these invasive procedures (Tarnanen et al., 2012).

1.3.3 Interdisciplinary treatment

It is well documented that the superior approach to the management of chronic pain is interdisciplinary (e.g., Gatchel et al., 2014; Okifuji, Turk, & Kalauokalani, 1999). The first year of chronic pain experience is often the costliest and for this reason, referral for interdisciplinary pain management is suggested (Kronborg, Handberg, & Axelsen, 2009). The treatment methods outlined above are only moderately successful, though the most promising methods are interdisciplinary. The success of treatment and cost-effectiveness of interdisciplinary pain management programs has been investigated.
considerably in the scientific literature (e.g., Gatchel & Okifuji, 2006; Turk & Swanson, 2007).

In recent years, there has been extensive clinical research that supports the efficacy of an interdisciplinary approach to chronic pain management. For example, Oslund et al. (2009) investigated the treatment- and cost-effectiveness of a comprehensive pain management program in the long-term. Results showed that patients reported improved outcomes across several measures (pain severity, interference of pain with function, etc.) over time and these improvements were sustained at a one-year follow-up.

Biomedical treatments for chronic pain (e.g., opioid medication, surgical interventions) might lack long-term benefit or subject the patient to risks that can result in the need for an alternative approach in the future (Gatchel et al., 2014). Non-pharmacological treatments for chronic pain include acupuncture, biofeedback, psychological interventions, electrical stimulation, exercise, physical therapy, and self-management programs. There is promising evidence for the efficacy of interventions for the treatment of chronic pain in older adults (McGuire, Nicholas, Asghari, Wood, & Main, 2014).

Research suggests that interdisciplinary approaches involving physical, pharmacological and other components are especially valuable for older adults (Morrison, Flanagan, Fischberg, Cintron, & Siu, 2008). For older adults experiencing chronic pain, psychological interventions are seldom offered as the only treatment approach and are commonly a part of a larger multimodal treatment modality. Older
adults are more likely to have physical comorbidities that can complicate treatment and for this reason, a multimodal strategy to intervention is particularly important in the aging demographic (McGuire et al., 2014). The interdisciplinary combination of medical, psychosocial, and physical therapy results in an inclusive pain management approach that produce superior outcomes compared to traditional medical treatment alone (Gatchel et al., 2014).

1.3.4 Psychological interventions

Cognitive therapy is a well-established psychological intervention that can assist with the management of chronic pain (Ehde, Dillworth, & Turner, 2014). Moreover, treatments that incorporate mindfulness, including acceptance and commitment therapies, are starting to show particular promise (e.g., Wetherell et al., 2016). There is an increasing awareness of the necessity to define self-management and its incorporation into clinical practice (Grady & Gough, 2014). Chronic illness, including its prevention, treatment and management, represents not only as public health issue but also a clinical issue (Starfield, Hyde, Gervas, & Heath, 2008; Sox, 2013). Health-care providers are recognising the importance of methods used to manage chronic symptoms in order to sustain patient independence and quality of life for the future (Grady & Gough, 2014). The results of previous studies delivering online pain self-management programs have been promising (Bender et al., 2011; Eccleston et al., 2014; Macea et al., 2010).

1.3.4.1 Cognitive-behavioral therapy (CBT). CBT is an evidence-based psychological intervention for the treatment of pain in older adults (Hadjistavropoulos, 2016b). For pain patients, CBT acknowledges the relationship among behaviours,
thoughts, and feelings (Flor & Turk, 2011). The main goal of CBT is to improve patient control over pain, based on the idea than an individual’s attitudes, behaviours, and beliefs play a major part in the pain experience (Lunde, Nordhus, & Pallesen, 2009). Standard CBT protocols include behavioural and cognitive techniques, focus on ways in which attitudes, beliefs, thoughts, and emotions can influence the perception of pain, and emphasize the patient’s own role in controlling and adjusting to chronic pain (Ehde et al., 2014). For example, catastrophic thinking related to pain is associated with poorer outcomes and can be altered with effective psychological intervention (Roditi & Robinson, 2011).

The aim of CBT is to disrupt the cycle of negative thinking by helping patients develop skills to improve their sense of control over pain, decrease associated negative emotions, and facilitate problem solving. These goals can be accomplished through numerous techniques that are generally organized into four broad categories (Skinner, Wilson, & Turk, 2012). These four categories include: (1) cognitive techniques that include cognitive restructuring and problem solving; (2) behavioural techniques that include behavioural activation, pacing, and relaxation skills; (3) supportive and educational techniques; and (4) numerous adjunctive methods such as biofeedback, hypnosis, and relapse prevention strategies (Hadjistavropoulos, 2016b).

For older adults, CBT approaches are similar to treatments focused on younger persons, however the context of therapy might be different. Aging has its challenges, such as chronic illness, disability, and grief. These challenges, combined with social context and generational differences, are important when adapting suitable cognitive-
behavioral strategies for older adults (Satre, Knight, & David, 2006). Despite encouraging results, older adults are less likely to be referred to CBT when compared to younger individuals (MacFarlane et al., 2012).

1.3.4.2 Pain self-management. Similar to CBT, self-management programs provide patients with strategies to decrease pain by adjusting their behavioural, cognitive, and emotional responses to pain. They focus on helping with the emotional consequences of painful conditions, simplifying adherence to prescribed medical or physical protocols, and producing meaningful life roles despite pain (Corbin & Strauss, 1988; Hadjistavropoulos, 2012; Lorig & Holman, 2003). These programs include skills for building self-efficacy, education about pain and its consequences, and training in coping, relaxation and communication skills (Hadjistavropoulos, 2013; Lorig & Holman, 2003). Procedures, based on cognitive and behavioural principles, are frequently included in self-management programs (e.g., Hadjistavropoulos & Hadjistavropoulos, 2008).

When compared to traditional health promotion programs, characteristics such as self-tailoring or the application of self-management skills give self-management programs superiority (Lorig & Holman, 2003). Self-management programs addressing pain involve meetings with a facilitator or guide whereas other approaches generally include the use of self-help manuals. Participants can gain social support offered through self-management groups, better knowledge about available treatments, mood management skills (e.g., problem solving), and coping strategies (Hadjistavropoulos, 2016b).
For the aging demographic, the literature on the effectiveness of self-management is mixed. Ersek and colleagues (2008) assessed a facilitator-assisted self-management program for older adults and determined that there were improvements in coping skills in the intervention group. However, there were no effects on pain and functional outcomes when compared to a bibliotherapy control group. Du et al (2011) performed a meta-analysis of self-management programs for people with musculoskeletal conditions. Their findings were inconclusive with respect to low back pain, however arthritis self-management programs that typically include older adults indicated small to moderate effects of improving disability in the long term (i.e., over a period of 26 weeks).

Advances in technology have been followed by a push to utilize technology in order to increase the success of chronic pain interventions (Keogh, Rosser, & Eccleston, 2010). The development of effective pain self-management programs is particularly important for older adults that face mobility limitations and/or live in remote rural areas and therefore, have difficulty accessing proper health-care services (Hadjistavropoulos, 2016b). However, online intervention research for older adults with persistent pain is relatively limited and further research is needed in this area. Online self-management programs have much better outcomes than other self-management programs (Hadjistavropoulos, 2016b).

For adults experiencing chronic pain, psychological treatments have been deemed efficient for improving quality of life (Eccleston, Morley, & Williams, 2013). More specifically, there is growing evidence that supports the use of internet cognitive behavioral therapy (ICBT) for numerous mental health conditions (Andersson, Cuijpers,
Carlbring, Riper, & Hedman, 2014). Low-cost interventions, such as online self-management programs, have the potential to eliminate the treatment barriers that face-to-face treatment can pose.

Internet self-management programs have the potential to address pain undermanagement (Andersson & Carlbring, 2003; Andersson et al., 2014). Such treatments include elements such as relaxation exercises and coping skills training (Alberts, Hadjistavropoulos, Dear, & Titov, 2017). These programs deliver comparable information and teach similar skills as face-to-face programs, except that they are delivered via the Internet, typically in the form of a series of lessons made up of text and images. The results of self-management programs for chronic pain condition management have been particularly encouraging (e.g., Beatty & Lambert, 2013; Eccleston et al., 2014).

Recent research found that internet-delivered cognitive behavioral therapy provided small effects on improving anxiety and depression (Mehta, Peynenburg, & Hadjistavropoulos, 2018). However, Mehta and colleagues (2018) stated that future long-term research is necessary in this area because it is difficult to determine the exact effectiveness that internet delivered courses have on chronic health conditions. While this may be true, current research provides reason to believe that ICBT has an effect on improving chronic health conditions.

Internet cognitive behavior therapy programs have greater efficacy compared to interventions without any professional support (Richards & Richardson, 2012). When compared to programs without support, interventions with therapist support have been
shown to have greater efficacy (Mehta et al., 2018). One such program that has shown particular promise is the *Pain Course* (Dear et al., 2015). The *Pain Course* is a self-management intervention for pain, which is delivered online for an eight-week period (Dear et al., 2013). It is a transdiagnostic pain management program, which is based on the principles of CBT (Dear et al., 2015; Dear et al., 2013, Dear et al., 2016; Friesen et al., 2017; Gandy et al., 2016). The *Pain Course* was designed based on the principles of transdiagnostic psychological interventions (e.g., Titov, Dear, Johnston, & Terides, 2012) and for that reason, it presents therapeutic information and relevant self-management skills for numerous pain conditions and psychological difficulties. This practical model of treatment is intended to provide participants with: (a) information to help them understand and decrease their pain-related symptoms and difficulties; (b) instruction on self-management skills; and (c) skills to reduce pain-related disability and improve emotional wellbeing by encouraging practice and use of practical skills in everyday life.

Randomized controlled trials (RCTs) of the *Pain Course* have focused on individuals with a diverse scope of pain-related conditions. With minimal clinician contact, Internet-administered treatments have proven useful for treating anxiety and depression (Dear et al., 2015; Dear et al., 2013). Trials show that the course results in a decrease in symptoms of pain, depression, and anxiety in addition to high levels of acceptability among participants (Dear et al., 2015; Dear et al., 2013). To date, only one study has examined the potential of remotely-delivered pain management programs, when delivered in online or workbook formats, as ways of increasing access to adequate pain management (Dear et al., 2017).
Dear and colleagues (2017) explored the effectiveness of the Pain Course when delivered in online and workbook formats. Results suggest that the workbook format was no less effective or acceptable than the validated online format. The main limitation of this study was the absence of a control group, which limited the ability to control for general time effects, spontaneous remission and the impacts of other treatments. Further research exploring the efficacy of Internet-delivered pain management programs specifically tailored to older adults is of considerable interest.

Newby, Mewton, Williams, and Andrews (2014) explored adherence rates, treatment gains and enrolment patterns for an ICBT program targeting mixed anxiety and depression in older and younger adults. Enrolment was more common for younger adults, but older adults \( t(705) = -6.51, p < 0.001 \) were more likely to complete all six lessons of the intervention program once enrolled. The results from this study support the effectiveness of ICBT in the aging demographic, though they are less likely to seek treatment (Newby et al., 2014). More recently, Staples, Fogliati, Dear, Nielsen, and Titov (2016) evaluated the effectiveness of the Wellbeing Plus Course, which is an ICBT intervention tailored to older adults with symptoms of anxiety and depression. The course was not only effective and acceptable, but deterioration rates were found to be low (<1.5%).

The increasing availability of remotely delivered self-management interventions, combined with advancing technology, highlights the need for further research in the remote delivery of pain self-management programs for older adults (Staples et al., 2016). Internet-delivered interventions have the potential to extend access to those that might
have mobility limitations and/or reside in rural areas. For this reason, the comparison of outcomes for workbook vs. ICBT of a pain self-management program is of great interest. By increasing the accessibility and evidence for remotely delivered self-management programs, the usage might grow among older adults.

1.3.5 Psychological interventions in the management of pain in older adults

Gatchel and Turk (1999) emphasize that the goal of interdisciplinary pain treatment programs is to maximize function and minimize pain, while assuming responsibility for the progress and management of pain. Interdisciplinary pain management programs represent the treatment of choice for chronic pain with psychological intervention being a key component in chronic pain management (Ehde et al., 2014). The remote delivery of pain self-management programs via the Internet is receiving substantial interest (Bender, Radhakrishnan, Diorio, Englesakis, & Jadad, 2011; Buhrman, Gordh, & Andersson, 2016; Eccleston et al., 2014; Macea, Gajos, Daglia Calil, & Fregni, 2010).

For the aging demographic, the role of psychological variables in the management of chronic pain is well-researched. With increasing age, the prevalence of chronic pain increases (Moulin, Clark, Speechley, & Morley-Forster, 2002). It is well documented that severity of chronic pain is associated with severity and frequency of depression, as well as a greater use of mental health services (Braden et al., 2008). Consequently, the development of effective pain self-management programs for those who cannot access traditional psychological interventions is of great importance.
Online self-management programs have the potential to overcome some of the limitations of face-to-face management programs. The effectiveness of an online “mind-body intervention” was examined for individuals over 55 years of age in comparison to a wait list control group. The sample (n = 41) had an average age of 65.8 years, and elements of CBT were included such as problem solving, relaxation training, and psycho-education. When compared to the control group, participants in the intervention group were shown to acquire increased confidence through the use of self-care techniques for their pain management. Study limitations were considered, including the recognition that there was not sufficient statistical power to reveal group differences (Berman, Iris, Bode, & Drengenberg, 2009). Further investigation is necessary as online intervention research is quite limited in older adults experiencing chronic pain.

Although the results of the study by Dear et al. (2017) were promising, the Pain Course has not been specifically tailored to special populations with chronic pain, such as older adults. As technology advances, the digital divide between younger and older adults continues to expand (Wu, Damnée, Kerhervé, Ware, & Rigaud, 2015). The digital divide can ultimately be a source of social exclusion, and, thus, worsen existing inequalities. With increasing age and decreasing socioeconomic status, a number of older adults may not have reliable access to the Internet and therefore, cannot access emerging Internet-delivered programs. This is especially true for people living outside of major cities in rural areas (e.g., Ennis, Rose, Denis, Pandit, & Wykes, 2012, Wang, Bennet, & Probst, 2011). For older adults, mobility and/or travel limitations can impede their ability to access proper treatment (Carlbring et al., 2006).
The remote delivery of pain management programs in a ‘low tech’ format might serve as an approach for overcoming barriers associated with unreliable Internet access (Dear et al., 2017). In Australia, a large online mental health service offers access to its treatment programs in both online and workbook formats based on patient needs, preferences and access to technology (Titov et al., 2015b).

Disease self-management is becoming very important as demands on the health care system continue to increase (Wheeler, 2003). The majority of chronic conditions are linked to lifestyle and therefore, self-management can be used as a direct intervention method at the patient level. This approach ultimately has the potential to have a positive impact on patient health and future health behaviours (Grady & Gough, 2014).

1.4 Online vs. workbook

The scientific literature has explored the remote delivery of pain-self management programs via the Internet. However, there is also extensive literature outlining the effectiveness of psychological interventions delivered in workbook format that has been available for almost two decades for numerous mental health conditions (Cuijpers, 1997). Several studies have investigated the delivery of pain management interventions via workbook formats. These results provide evidence of good clinical outcomes among participants completing the programs (e.g., Johnston, Foster, Shennan, Starkey, & Johnson, 2010; Spence & Sharpe, 1993; Thorsell et al., 2011). However, few studies have explored the delivery of pain management programs via workbooks with researcher support via email, mail and telephone (Dear et al., 2017).
Given that the *Pain Course* has been shown to be effective, it was worth exploring the effectiveness of workbook delivery. Barefoot et al. (2012) evaluated a pain self-management program that involved the use of a comprehensive self-help pain management book for older adults. Findings revealed that participants were satisfied with the self-management manual although their satisfaction did not result in improved outcomes (i.e., pain intensity, pain beliefs, and coping strategies) for the self-help group in comparison to the control group (Barefoot, Hadjistavropoulos, Carleton & Henry, 2012).

Dear et al. (2017) explored the effectiveness of the *Pain Course* when delivered in online and workbook formats. However, their sample had an average age of 47.84 (SD = 13.72), and the intervention included 5 core online lessons and lesson summaries, which provided homework assignments to help participants learn and apply the skills. The overall findings showed that the workbook format was no less effective or acceptable than the online format (Dear et al., 2017).

The findings from Dear et al. (2017) highlight the potential of using evidence-based hardcopy workbooks as a ‘low tech’ strategy for increasing access to pain management programs alongside quickly evolving ‘high tech’ pain management programs delivered online. There is a common assumption that older adults are reluctant to use new technology and thereby be less likely to participate in a remotely-delivered pain management program. For this reason, the workbook format would be expected to be more acceptable among the aging demographic. This is why it was necessary for the online delivery of the *Pain Course* to be compared to a workbook format in samples of
older adults. As technology rapidly evolves, remotely-delivered therapy offers an opportunity to eliminate treatment barriers and reach older adults.

1.5 Computer usage

There has been an abundance of research with regards to computer usage in older adults (Wagner, Hassanein, & Head, 2010). It is well documented that this demographic uses the computer to a much smaller extent when compared to the rest of society (Zickuhr, 2010). Conversely, Internet access among older adults is growing (Zickuhr & Madden, 2012) and with the decreasing cost of electronic devices (e.g., tablet computers), the number of older adults with Internet access is projected to increase in the near future (Choi, An, & Garcia, 2014). The Pew Research Center also found that 59% of American older adults use the Internet and 47% had access to a high-speed connection at home (Smith, 2014). Research suggests that once this demographic considers the computer to be valuable then they might become more motivated to use it (Nagle & Schmidt, 2012).

1.6 Purpose

The present study sought to explore the efficacy and acceptability of a previously developed pain self-management course, the Pain Course, for older adults with chronic pain after its content was optimized for older persons when delivered in online and workbook formats. Font size was increased to control for legibility and patient stories were tailored to reflect stories of older adults experiencing chronic pain and comorbid depression and/or anxiety. Using a patient preference RCT design, it was hypothesized that: (1) participants in the intervention groups would exhibit significant improvements on primary measures of pain beliefs and functional status relative to a wait list control
group; (2) participants in the intervention groups would exhibit significant improvements on secondary measures of chronic pain severity; and, (3) participants in the intervention groups would exhibit significant improvements on tertiary measures of fear of movement and quality of life relative to a wait list control group. We also examined the possibility of differences in the two modes of delivery (online group vs. workbook group) and, through qualitative procedures, we studied the acceptability of each approach.

2. METHODOLOGY

2.1 Participants

This study received University of Regina research ethics approval and was registered with the Current Controlled Trials Register (NCT03512522) prior to commencement. A sample size of 40 participants per group was calculated as sufficient (one-tailed test, power at 80%, and alpha at 0.05) to detect a medium within-between groups effect. The online Pain Course format was implemented in the current study as a benchmark with which to compare the efficacy and acceptability of the workbook Pain Course format. Based on previously reported dropout rates in the Pain Course (Dear et al., 2013; Dear et al., 2015), 120 participants were recruited in order to ensure adequate power in the event of participant attrition. Several studies have evaluated the delivery of pain management programs via workbook (e.g., Johnston et al., 2010; Spence & Sharpe, 1993; Thorsell et al., 2011), though these studies have experienced high dropout rates (e.g., > 50%). However, none of these studies compared the workbook format with remotely delivered pain management interventions, such as internet-delivered programs.
Participant recruitment took place across the 10 provinces of Canada through newspaper advertisements, social media outlets, word-of-mouth, group announcements about the study (e.g., senior gatherings), and newsletters (e.g., churches or senior living facilities). Consistent with previous research (Dear et al., 2015; Dear et al., 2013), participants were eligible for the study if they: (1) were a resident of Canada; (2) were 65 years of age or older; (3) reported experiencing pain for more than three months; (4) were not experiencing very severe symptoms of depression (i.e., Geriatric Depression Scale (GDS-30) Score > 19; Yesavage et al., 1982) or anxiety (i.e., Generalized Anxiety Disorder (GAD) Score > 10; Spitzer, Kroenke, Williams, & Lowe, 2006); (5) had regular access to a computer and the Internet (online group); and, (6) were proficient in speaking and writing in the English language. See Figure 1.

All participants applied for the remotely delivered pain self-management program by completing the preliminary online screening via Qualtrics. A brief description of the study was provided for participants on the study website or orally if they were recruited through advertisements and announcements. Participants provided informed consent (see Appendix B) prior to the online screening, and eligibility was then assessed using a preliminary online screening questionnaire (see Appendix C). The questionnaire evaluated basic study eligibility, such as symptoms of depression and anxiety, accumulated background information, and evaluated their preference toward online or workbook delivery of the Pain Course.

Following completion of the preliminary online screening questionnaire, a guide completed a detailed telephone screening (see Appendix D). The guide was the primary
investigator of the current study. The telephone screening was conducted to ensure that participants satisfied inclusion criteria, assessed suicide risk, and provided responses to questions participants had about the study. Exclusion criteria included participants assessed as high suicide risk. Seven participants were screened out via telephone. The guide explained that potential participants were screened out due to their GDS-30 or GAD-7 scores. Then, an email was sent with information regarding the Chronic Conditions Course (Canadian residents) or Pain Course (Saskatchewan residents) where Clinical Psychologists facilitated all clinical contact.

After the telephone screening, participants who satisfied the inclusion criteria were enrolled in the online group, workbook group or wait list control group using a patient preference RCT design (Howard & Thornicroft, 2006). There were two RCT groups with treatment (online group or workbook group) vs. wait list control group. In this study design, participants that were willing/able were randomized, but participants that had a very strong preference (e.g., workbook) or no internet access were not randomized to the online group. The goal was to have the majority of participants accept the randomization by emphasizing they are equally acceptable and effective, so only those with a very strong preference or no access to internet weren’t randomized. Participants with no preference for mode of delivery were randomized into the online group, workbook group, or wait list control condition. After completion of the full screening process, randomization results were provided via email to the participants. All participants provided informed consent (see Appendix E) prior to participation in the Pain Course for Older Adults. After treatment (online group or workbook group), participants
who were randomly allocated to the wait list control group were provided access to the course, in their preferred format, after the twelve-week period had passed.

2.2 Design and measures

Consistent with the IMMPACT (Initiative on Methods Measurement and Pain Assessment in Clinical Trials) recommendations (Dworkin et al., 2005), this study followed the core outcome measures for clinical trials of chronic pain treatment efficacy. The CONSORT (CONsolidated Standards of Reporting Trials) guideline (Schulz, 1997) was employed in the present study using a remotely delivered pain management program.

Eligible participants that were allocated to the online group, workbook group or wait list control group completed questionnaires at pre-treatment, post-treatment and four-week follow-up. For the online group, all measures were completed online whereas the workbook group received self-addressed/stamped envelopes to return. The primary end-points of the study were immediately 8-week post-treatment and four-week follow-up. The primary and secondary measures included measures of chronic pain severity, pain beliefs and functional status while the tertiary measures evaluated fear of movement and quality of life. The primary and secondary measures were administered at pre-treatment, 8 week- post-treatment, and four-week follow-up. Pain was evaluated as a secondary outcome because the Pain Course for older Adults encompasses the management of pain-related disability and emotional wellbeing. The tertiary measures were administered at pre-treatment, 8-week post-treatment, and four-week follow-up.

Post-treatment questionnaires, acceptability and satisfaction questions, were administered after completion of the eight-week course. Participants enrolled in the
online group and workbook group received a follow-up questionnaire four weeks after completing the *Pain Course for Older Adults*. The wait list control group also received a follow-up questionnaire at this time prior to beginning the course. Participants were sent email reminders in order to facilitate questionnaire completion.

### 2.2.1 Primary measures

#### 2.2.1.1 Pain Disability Index (PDI).
The PDI is a 7-item self-report questionnaire designed to measure the impact of pain in several areas of life: (1) family and home responsibilities; (2) recreation; (3) social activity; (4) occupation; (5) sexual behaviour; (6) self-care; and, (7) life support activities. Each item is rated from 0 (*no disability*) to 10 (*worst disability*) with total scores ranging from 0 to 70. Higher scores are associated with greater levels of disability (Pollard, 1984). The PDI is widely used and has yielded good psychometric properties with high levels of internal consistency ($\alpha = .85$), test-retest reliability, and construct validity (Tait, Pollard, Marglois, Duckro, & Krause, 1987). This questionnaire has been normed and validated for older adults (e.g., Ersek, Turner, Cain, & Kemp, 2008; Gauthier & Gagliese, 2011). Cronbach’s $\alpha$ for the study was found to be 0.80.

#### 2.2.1.2 Geriatric Depression Scale-30 (GDS-30).
The GDS is a 30-item assessment tool that was specifically developed for older adults. It is used to measure the main symptoms of geriatric depression and has the clear advantage of being the only depression scale tailored to older adults (Yesavage et al., 1982). The measure includes items that encompass an extensive spectrum of depressive symptoms and uses a *yes* or *no* format. This scale was designed with few somatic symptoms as they might otherwise
create difficulty for diagnoses in older adults. The GDS shows excellent levels of internal consistency ($\alpha = 0.94$), test-retest reliability, and construct validity based on the original sample of participants (Yesavage et al., 1982). Cronbach’s $\alpha$ for the study was found to be 0.83.

2.2.1.3 Generalized Anxiety Disorder 7-Item (GAD-7). The GAD-7 is a self-reported questionnaire that measures the symptoms of GAD using seven items (Spitzer et al., 2006). Each item is rated from 0 (not at all) to 3 (nearly every day), with total scores ranging from 0 to 21. During the preliminary screening, a maximum total score of 10 will serve as an inclusion criterion because it functions as the cut-off that distinguishes mild and moderate anxiety. A score of 10 or greater has been used to identify individuals likely to meet the diagnostic criteria for GAD (Spitzer et al., 2006). Further evaluation is recommended when the score is 10 or greater and, in this study, we do not have the capacity to provide treatment to participants experiencing moderate to severe anxiety. According to Wild et al. (2014), the GAD-7 exhibits excellent internal consistency ($\alpha = 0.82$) and strong construct validity. The questionnaire has been normed and validated for older adults (Wild et al., 2014). Cronbach’s $\alpha$ for the study was found to be 0.79.

2.2.2 Secondary measures

2.2.2.1 The Brief Pain Inventory Short Form (BPI-SF). The BPI-SF is a brief, self-administered questionnaire used to assess pain severity with four items and interference with seven items (Cleeland & Ryan, 1994). Pain severity items are rated on a scale ranging from 0 (no pain) to 10 (pain as bad as you can imagine). Pain interference items are rated on a scale ranging from 0 (does not interfere) to 10 (completely
interferes). Psychometric studies have established the two-factor structure of the BPI-SF and revealed suitable internal consistency (α = 0.70) in addition to acceptable test-retest reliability (Williams, Smith & Fehnel, 2006). The BPI-SF has been normed and validated for older adults (e.g., Ersek, Turner, Cain, & Kemp, 2008; Gauthier & Gagliese, 2011; Williams et al., 2006). Cronbach’s α for the study was found to be 0.78 and .79 for severity and inference subscales, respectively.

2.2.3 Tertiary measures

2.2.3.1 Pain Self-Efficacy Questionnaire (PSEQ). The PSEQ is a 10-item measure that includes statements regarding a patient’s beliefs about his or her ability to perform daily tasks regardless of chronic pain (Nicholas, 2007). Each item is rated using a 7-point scale from 0 (not at all confident) to 6 (completely confident), with total scores ranging from 0 to 60. Higher scores are reflective of stronger self-efficacy beliefs. Effective pain management programs view pain self-efficacy as an essential psychological target. The PSEQ has been shown to demonstrate excellent psychometric properties, including internal consistency (α = .88), test-retest reliability and construct validity (Nicholas, 2007; Nicholas et al., 2013). The questionnaire is highly correlated with measures of pain-related disability, coping strategies, and self-efficacy beliefs (Nicholas, 2007). The PSEQ has been normed and validated for older adults (e.g., Nicholas et al., 2013). Cronbach’s α for the study was found to be 0.86.

2.2.3.2 TAMPA Scale of Kinesiophobia (TSK). The TSK is a 17-item scale that measures the fear of movement and re-injury (Kori, Miller, & Todd, 1990). Each item is rated using a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores
suggest higher fears of movement and re-injury. The TSK has been reported to have good levels of internal consistency and reliability across items (Swinkels-Meewisse, Swinkles, Verbeek, Vlaeyen, & Oostendorp, 2003), and predict behavioural performance on movement tasks (Vlaeyen, Kole-Snijders, Boeren, & van Eek, 1995). The TSK demonstrates acceptable internal consistency ($\alpha = .76$), test-retest reliability, and construct validity (Larsson, Hansson, Sundquist, & Jakobsson, 2014; Nicholas et al., 2013). The questionnaire has been normed and validated for older adults (e.g., Ersek, Turner, Cain, & Kemp, 2004; Kori et al., 1990; Larsson et al., 2014). Cronbach’s $\alpha$ for the study was found to be 0.84.

2.2.3.3 Chronic Pain Acceptance Questionnaire (CPAQ-8). The CPAQ-8 is a short-form version of the CPAQ-20, which is designed to measure acceptance in the context of chronic pain (Fish, McGuire, Hogan, Morrison, & Stewart, 2010). The instrument consists of two subscales that measure the engagement in meaningful activities in the presence of chronic pain (i.e., Activity Engagement Subscale) and willingness to experience pain without trying to control or avoid pain (i.e., Pain Willingness Subscale). Each item is rated on a 7-point scale from 0 (never true) to 6 (always true). Higher scores suggest increased willingness to experience and acceptance of pain. The two subscales can be examined separately or in combination, and the CPAQ-8 has been found to possess good psychometric properties (Fish et al., 2010). The CPAQ-8 has high predictive validity and findings provide further evidence regarding the benefits of the Activity Engagement and Pain Willingness subscales for pain adjustment. The internal consistency of the total and subscales was found to be 0.84 to 0.87 (Bernini,
Rivas, & Berrocal, 2014). The CPAQ-8 has not been normed and validated for older adults. Cronbach’s α for the study was found to be 0.80.

2.2.3.4 Pain Catastrophizing Scale (PCS). The PCS is a 13-item scale that is designed to measure the tendency to amplify the threat value of constant pain (Sullivan, Bishop, & Pivik, 1995). Each item is rated on a 5-point scale from 0 (not at all) to 4 (all the time). The total score is calculated by summing responses to all 13 items. A total score ranges from 0 to 52, along with three subscale scores measuring rumination, magnification and helplessness (Sullivan et al., 1995). Higher scores indicate a greater tendency to amplify the threat and significance of ongoing pain. According to Nicholas et al. (2013), the PCS has been shown to possess acceptable internal consistency (α = .76) and construct validity. The PCS has been normed and validated for older adults (e.g., Nicholas et al., 2013; Vincent et al., 2013). Cronbach’s α for the study was found to be 0.86.

2.2.4 Acceptability and satisfaction

Treatment acceptability and satisfaction were assessed at post-treatment using questions (see Appendix F) used in previous research that examined the acceptability of other internet-delivered treatments (Dear et al., 2015b; Johnston, Titov, Spence, Andrews, & Dear, 2011; Titov et al., 2015a; Titov et al., 2015b). The following questions were also used in the first trial of the Pain Course (Dear et al., 2013): (1) “Overall, how satisfied were you with the course?” (2) “Would you feel confident in recommending the course to others?” and (3) “Was the course worth your time?” A 5-point Likert scale was
used to respond to the first question, which ranged from 0 (very dissatisfied) to 5 (very satisfied). The latter two questions were answered using a “yes” or “no” response.

Then, participants were asked to assess their confidence upon completing the Pain Course for Older Adults. The questions included: (4) “How has participating in the course affected your confidence that you can learn to manage symptoms of stress and worry?” (5) “How has participating in the course affected your confidence that you can learn to manage symptoms of low mood?” and (6) “How has participating in the course affected your confidence that you can learn to manage your day-to-day activities despite pain?” Similarly, a 5-point Likert scale was used to respond to the above three questions, which ranged from 0 (very dissatisfied) to 5 (very satisfied), or participants could specify that they had no previous difficulties with stress and worry, low mood, or day-to-day activities.

Lastly, participants were asked to respond to three-open ended questions in order to assess treatment efficacy and acceptability, which were also adopted from prior internet treatment studies (Dear et al., 2013; Dear et al., 2015b; Johnston et al., 2011; Titov et al., 2015a). These questions evaluated participant satisfaction: (7) “What did you not like about this course? How would you suggest that we change or modify this for future participants?” (8) “What did you most like about this course?” and (9) “Please feel free to write a couple of sentences that summarizes what you have learned or a message to future participants.”
2.3 Treatment program

The treatment program was adapted for older adults from the *Pain Course* that was initially developed by the eCentreClinic ([www.ecentreclinic.org](http://www.ecentreclinic.org)). For the present study, minor adjustments were made to the *Pain Course*, which included: (1) preliminary online screening assessment eligibility; (2) increasing font size to control for legibility; and, (3) patient stories to reflect the stories of older individuals with chronic pain struggling with anxiety and/or depression.

The *Pain Course* consists of five lessons (images and text displayed in slideshow format), five lesson summaries (images and text similar to self-help books), homework assignments (exercises and practice questions to learn and apply the skills described in the lessons), and additional supplementary resources that were offered to participants sequentially over the course of 8 weeks (Dear et al., 2013; Dear et al., 2015). Participants were encouraged to utilize the skills taught throughout the course and to steadily incorporate them into their daily lives. Additional resources were available in order to introduce supplementary topics and skills that might be relevant to several participants but are not described within the core lessons. Supplementary topics included working with health professionals and chronic pain treatments, sleep management, problem solving, controlling attention and assertive communication, all with the older adult in mind. Participants had access to comprehensive patient stories, which demonstrated how to apply skills that will be taught throughout the course, in addition to challenges that they may face when applying the course skills. All materials were presented on the intervention website for the online group or workbook for the workbook group.
Each lesson was presented in the form of a slide show, which took approximately 10 to 20 minutes to read (when done online). The lessons were presented in a didactic format and include real-life examples of skills practice and symptom management, which were tactically incorporated throughout in order to help learning objectives. Each lesson began with a summary of the content from the previous lesson. Key points and skills outlined in previous lessons were integrated with novel information introduced in later lessons.

2.4 Online vs. workbook groups

The online group received the *Pain Course* in its modified online format tailored to older adults and was provided with a personal, password-protected, login to the Online Therapy Unit system and to access the course. Consistent with previous versions of the *Pain Course* (Dear et al., 2013; Dear et al., 2015; Friesen et al., 2017; Gandy et al., 2016), participants were sent automated emails throughout the course. Emails were administered in accordance with the course timeline. More specifically, emails were sent at the beginning of each week to remind participants about new materials that will be made available that week and to suggest tasks that participants should focus on for the week. Participants were encouraged to complete one lesson every 7 to 10 days and to practice the skills outlined within the lesson summaries frequently. All materials were systematically released over the 8-week period. Participants were unable to access materials in later weeks without reading the materials from previous weeks. The online group were able to access and re-review course materials as much as they wanted after they became available.
The workbook group received the *Pain Course* in a spiral bound, hardcopy, workbook that was sent to participants via Canada Post registered mail. The workbook format was printed in color and the content was identical to the online format, modified and tailored to older adults, of the *Pain Course*. A timetable was provided to participants in the workbook group, which matched the systematic release of materials for the online group. Participants were instructed to refrain from accessing materials prior to the indicated date. Consistent with the online group, participants in the workbook group were encouraged to complete one lesson every 7 to 10 days and to practice the skills outlined within the lesson summaries frequently. No automated emails were sent to the workbook group, though contact was maintained via regular email. In an attempt to maintain similarity, the automated emails that were sent to participants in the online group were included as brief messages throughout the workbook (in the form of lesson introductions). Participants in the workbook group were instructed to contact the guide once their materials arrived via Canada Post. Then, a start date was determined, and they were instructed to begin the 8-week course.

### 2.5 Guide contact

Consistent with the procedure used in the first trial of the *Pain Course* (Dear et al., 2013a), contact with participants took place via secure messaging and telephone. A researcher acted as a guide who provided general support and encouragement, as opposed to a clinician who would offer guided discovery. Previous research has revealed that the use of non-clinicians to provide guidance (e.g., students) does not reduce the quality of clinical results or program efficacy (Titov et al., 2010).
The guide aimed to contact participants weekly via telephone for approximately 5 to 10 minutes. The purpose of the phone call was to summarize course content, answer participants’ questions, reinforce progress and encourage skills practice, discuss treatment challenges, and acquire feedback about participants’ experiences with the course and the use of the skills (Dear et al., 2013a; Johnston et al., 2011). The guide did not provide any therapeutic advice during the weekly phone calls. If a participant could not be reached via telephone, the guide left a voicemail and sent a written message as well – via our online platform for the online group and via email (of which did not include personal information) for the workbook group. All participant contact was documented.

2.6 Analysis

SPSS version 21 was used to conduct all statistical analyses. Descriptive statistics were calculated for all participants including the means, standard deviations, and range of all scores for outcome measures. Post hoc power calculations were conducted to confirm the magnitude of absolute differences in the primary and secondary outcomes the study was powered to detect. The power analyses were used to identify the smallest differences between the online and workbook groups that the present study could detect under two assumptions: (1) the workbook group condition was at least 50% as effective as the online group condition; (2) with power set to 0.80 with an alpha significance level of 0.05. Non-inferiority margins were calculated using the power estimates and resultant differences. These margins were used to separate out legitimate and clinically meaningful differences from non-legitimate and clinically non-meaningful differences. For all
dependent variables, missing values were replaced by the series mean upon examination of descriptive statistics.

2.6.1 Mixed models

To test hypothesis I (i.e., the effect of the *Pain Course for Older Adults* on primary measures of pain beliefs and functional status), a 3 x 3 within-subjects multivariate analyses of variance (MANOVA) was conducted. The within-subjects factors was the three conditions (i.e., workbook, group, online group, and wait list control) by time (i.e., pre-treatment, post-treatment, and four-week follow-up) and the dependent variables included: (1) GDS-30 scores; (2) GAD-7 scores; and, (3) PDI scores.

Multivariate significance was followed by univariate tests. A group (3) x time (3) mixed model analyses of variance (ANOVA) was conducted on each of the dependent variables as follow-up tests to the MANOVA. Then, univariate significance was followed by a series of pairwise comparisons. A conservative alpha level of .01 was used to minimize the probability of Type I errors as several univariate tests and post-hoc analyses were conducted.

To test hypothesis II (i.e., the effect of the *Pain Course for Older Adults* on secondary measures of chronic pain severity), a 3 x 3 within-subjects MANOVA was conducted. The within-subjects factors was the three conditions (i.e., workbook, group, online group, and wait list control) by time (i.e., pre-treatment, post-treatment, and four-week follow-up) and the dependent variables included: (1) BPI-SF Severity scores; and, (2) BPI-SF Inference scores.
Multivariate significance was followed by univariate tests. A group (3) x time (3) mixed model ANOVA was conducted on each of the dependent variables as follow-up tests to the MANOVA. Then, univariate significance was followed by a series of pairwise comparisons. A conservative alpha level of .01 was used to minimize the probability of Type I errors as several univariate tests and post-hoc analyses were conducted.

To test hypothesis III (i.e., the effect of the Pain Course on tertiary measures of fear of movement and quality of life), 3 x 3 within-subjects MANOVA was conducted. The within-subjects factors was the three conditions (i.e., workbook, group, online group, and wait list control) by time (i.e., pre-treatment, post-treatment, and four-week follow-up) and the dependent variables included: (1) PSEQ scores; (2) TSK scores; (3) CPAQ-8 scores; and, (4) PCS scores.

Multivariate significance was followed by univariate tests. A group (3) x time (3) mixed model ANOVA was conducted on each of the dependent variables as follow-up tests to the MANOVA. Then, univariate significance was followed by a series of pairwise comparisons. Several pairwise comparisons were conducted in order to examine mean differences between the three experimental conditions for each significant ANOVA. A conservative alpha level of .01 was used to minimize the probability of Type I errors as several univariate tests and post-hoc analyses were conducted.

2.6.2 Sub analysis

A sub analysis, including those with elevated scores (i.e., containing the median for each respective measure), was conducted in order to determine if floor effects were
responsible for the absence of significant findings. In lieu of a MANOVA, only ANOVAs were carried out in the sub analysis due to reduced statistical power.

2.6.3 Acceptability and satisfaction questions

Treatment satisfaction were assessed using both qualitative and quantitative approaches. Descriptive statistics were used to report the responses to the Treatment Satisfaction Questionnaire (TSQ). Thematic content analysis was employed to examine the narrative data comparing the online vs. workbook course participants’ response about their satisfaction with the *Pain Course* using NVivo qualitative software (Sandelowski, 2000). Researchers met to discuss potential themes and created a coding guide using key words. Two coders worked independently although they met frequently to discuss potential differences in order to reach a general agreement on coding. Furthermore, the qualitative analysis gathered feedback on the tailoring of the *Pain Course* to older adults. The content was analyzed by examining the TSQ and then, identifying themes within those data.

3. RESULTS

3.1 Data checking

3.1.1 Accuracy of data entry

All dependent variables were screened for accuracy of data entry through the examination of descriptive statistics. Values for each variable were found to be within range. Means and standard deviations for each variable were acceptable. Non-inferiority margins were calculated using the power estimates and resultant differences. However, these margins were not reported because findings were found to be insignificant.
3.1.2 Missing data

All dependent variables were screened for missing values through the examination of descriptive statistics. 12 missing values were identified for primary, secondary and tertiary measures with the exception of the PCS which had 13 missing values. 21 missing values were identified for primary, secondary and tertiary measures with the exception of the PCS which had 22 missing values. Therefore, missing values were replaced using mean substitution. For all variables, missing values were replaced by the series mean.

3.2 Patient preference

Following the patient preference RCT design, four participants did not agree to randomization. Two participants stated that they did not want to be randomized to the online group because they did not have consistent internet access. The remaining two participants cited that they had difficulties navigating their computers and would prefer to have a hardcopy. These four participants were given the workbook, but they were not included in the analyses below.

3.3 Demographic characteristics

Recruitment took place from February 2018 to November 2018. Participant recruitment took place across the 10 provinces of Canada through newspaper advertisements, newsletters, social media outlets, word-of-mouth, and group announcements about the study (e.g., senior gatherings). During this time, 192 individuals completed the preliminary online screening. A total 143 individuals applied for the *Pain Course for Older Adults*, of which, 26 were excluded from all analyses. 15
participants were screened out at or before the preliminary screening (e.g., 7 due to exclusion criteria, 4 were no longer interested, and 4 did not agree to randomization). Of the 128 participants that met all inclusion criteria, 11 participants were excluded from all analyses (e.g., 1 due to dyslexia, 1 due to inability to complete course, 6 were no longer interested, and 1 due to death). The final sample consisted of 117 participants. Details regarding participant flow are displayed in Figure 1.
Figure 1. Participant flow from enrollment to 4-week follow-up. NR, Non-response.
Results summarizing the demographic characteristics are displayed in Table 1. The final sample included 117 participants (65.0% female) ranging in age from 65-90 years ($M = 72.1; SD = 5.61$. In terms of the participant highest level of education, 5.1% completed less than high school, 12.8% completed high school, 23.1% held a college certificate or diploma, 16.2% completed some university, 17.1% held a university undergraduate degree, 6.8% held a university professional degree, and 18.8% held a university graduate degree. For employment status, 84.6% of participants were retired, 8.5% were employed or self-employed part-time, 6.0% were employed or self-employed full time, and 0.9% identified as a student. Geographical location showed that 40.2% of participants lived in a large city (population over 200,000), 35.0% resided in a small to medium city (population of 10,000 to 20,000), 21.4% lived in a town or village, and 3.4% lived on a farm.

In Table 2, participant demographic characteristics were analyzed by group. Females outnumbered males in the workbook group ($n = 21/35; 60.0\%$), online group ($n = 29/42; 69.0\%$) and wait list control ($n = 26/40; 65.0\%$). For highest level of education, 61.9% of participants in the online group ($n = 26/42$) had a university undergraduate degree or higher compared to that of the workbook ($n = 11/35; 31.5\%$) and wait list control group ($n = 13/40$) at 30.8% and 32.5%, respectively. The vast majority of participants cited retirement as their employment status in the workbook ($n = 33/45; 94.3\%$), online ($n = 33/42; 78.6\%$) and wait list control ($n = 33/40; 82.5\%$) groups. Lastly, large cities ($n = 47/117; 40.2\%$) and small to medium cities ($n = 41/117; 35.0\%$) were the most common places that participants resided.
Table 1

Participant demographic characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M of age in years (SD)</td>
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<td></td>
</tr>
<tr>
<td>Age</td>
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<td>65 – 69 years</td>
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<td>(35.0%)</td>
</tr>
<tr>
<td>70 – 79 years</td>
<td>59</td>
<td>(50.4%)</td>
</tr>
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<td>80 – 90 years</td>
<td>17</td>
<td>(14.6%)</td>
</tr>
<tr>
<td>Sex</td>
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<td></td>
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<tr>
<td>Male</td>
<td>41</td>
<td>(35.0%)</td>
</tr>
<tr>
<td>Female</td>
<td>76</td>
<td>(65.0%)</td>
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<td>High school diploma</td>
<td>15</td>
<td>(12.8%)</td>
</tr>
<tr>
<td>College certificate or diploma</td>
<td>27</td>
<td>(23.1%)</td>
</tr>
<tr>
<td>Some university</td>
<td>19</td>
<td>(16.2%)</td>
</tr>
<tr>
<td>University undergraduate degree</td>
<td>20</td>
<td>(17.1%)</td>
</tr>
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<td>University professional degree</td>
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<td>(6.8%)</td>
</tr>
<tr>
<td>University graduate degree</td>
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<td>(18.8%)</td>
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<td>Employment status</td>
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<tr>
<td>Employed or self-employed full-time (FT)</td>
<td>7</td>
<td>(6.0%)</td>
</tr>
<tr>
<td>Employed or self-employed part-time (PT)</td>
<td>10</td>
<td>(8.5%)</td>
</tr>
</tbody>
</table>
Retired 99 (84.6%)
Student 1 (0.9%)

Geographical location

Large city 47 (40.2%)
Small to medium city 41 (35.0%)
Town or village 25 (21.4%)
Farm 4 (3.4%)

*Note. N = 117.*
### Table 2

*Participant demographic characteristics by group*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Workbook ((n = 35))</th>
<th>Online ((n = 42))</th>
<th>Wait List ((n = 40))</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M</em> of age in years ((SD))</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 – 69 years</td>
<td>10 (28.6%)</td>
<td>16 (38.1%)</td>
<td>15 (37.5%)</td>
</tr>
<tr>
<td>70 – 79 years</td>
<td>18 (51.4%)</td>
<td>25 (59.5%)</td>
<td>16 (40.0%)</td>
</tr>
<tr>
<td>80 – 89 years</td>
<td>7 (20.0%)</td>
<td>1 (2.38%)</td>
<td>9 (22.5%)</td>
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<tr>
<td>Sex</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>14 (40.0%)</td>
<td>13 (31.0%)</td>
<td>14 (35.0%)</td>
</tr>
<tr>
<td>Female</td>
<td>21 (60.0%)</td>
<td>29 (69.0%)</td>
<td>26 (65.0%)</td>
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<td>Education</td>
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</tr>
<tr>
<td>Less than high school</td>
<td>1 (2.9%)</td>
<td>2 (4.8%)</td>
<td>3 (7.5%)</td>
</tr>
<tr>
<td>High school diploma</td>
<td>3 (8.6%)</td>
<td>6 (14.3%)</td>
<td>6 (15.0%)</td>
</tr>
<tr>
<td>College certificate or diploma</td>
<td>11 (31.4%)</td>
<td>5 (11.9%)</td>
<td>11 (27.5%)</td>
</tr>
<tr>
<td>Some university</td>
<td>9 (25.7%)</td>
<td>3 (7.1%)</td>
<td>7 (17.5%)</td>
</tr>
<tr>
<td>University undergraduate degree</td>
<td>1 (2.9%)</td>
<td>14 (33.3%)</td>
<td>5 (12.5%)</td>
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<td>University professional degree</td>
<td>3 (8.6%)</td>
<td>2 (4.8%)</td>
<td>3 (7.5%)</td>
</tr>
<tr>
<td>University graduate degree</td>
<td>7 (20.0%)</td>
<td>10 (23.8%)</td>
<td>5 (12.5%)</td>
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<tr>
<td>Employment status</td>
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<td>1 (2.4%)</td>
<td>6 (15.0%)</td>
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<tr>
<td>---------------------------------</td>
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<td>-----------</td>
</tr>
<tr>
<td>Employed or self-employed FT</td>
<td>1 (2.9%)</td>
<td>8 (19.0%)</td>
<td>1 (2.5%)</td>
</tr>
<tr>
<td>Retired</td>
<td>33 (94.3%)</td>
<td>33 (78.6%)</td>
<td>33 (82.5%)</td>
</tr>
<tr>
<td>Student</td>
<td>1 (2.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Geographical location</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Large city</td>
<td>17 (48.6%)</td>
<td>11 (26.2%)</td>
<td>19 (47.5%)</td>
</tr>
<tr>
<td>Small to medium city</td>
<td>9 (25.7%)</td>
<td>17 (40.5%)</td>
<td>15 (37.5%)</td>
</tr>
<tr>
<td>Town or village</td>
<td>8 (22.9%)</td>
<td>12 (28.6%)</td>
<td>5 (12.5%)</td>
</tr>
<tr>
<td>Farm</td>
<td>1 (2.9%)</td>
<td>2 (4.8%)</td>
<td>1 (2.5%)</td>
</tr>
</tbody>
</table>

*Note. N = 117.*
3.4 Pain conditions and treatments or medications for pain

In Table 3, 3.4% of participants \((n = 4/117)\) specified that their pain was a result of an accident and/or injury. Post-medical treatment \((n = 17/117; 14.5\%)\) was also cited as a leading cause of participant pain. Fibromyalgia \((n = 11/117; 9.4\%)\), neuropathic or neurological conditions \((n = 8/117; 6.8\%)\), and rheumatic or autoimmune conditions \((n = 13/117; 11.1\%)\) were categorized as other sources of pain for participants. Over 28\% \((n = 33/117)\) of participants identified osteoarthritis as a leading cause of their pain. Lastly, 72.6\% \((n = 85/117)\) of participants reported other sources as the result of their pain.
Table 3

**Participant pain conditions**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Workbook (n = 35)</th>
<th>Online (n = 42)</th>
<th>Wait List (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident/injury</td>
<td>1 (2.9%)</td>
<td>2 (4.8%)</td>
<td>1 (2.5%)</td>
</tr>
<tr>
<td>Post-medical treatment</td>
<td>1 (2.9%)</td>
<td>3 (7.1%)</td>
<td>13 (32.5%)</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>5 (14.3%)</td>
<td>4 (9.5%)</td>
<td>2 (5.0%)</td>
</tr>
<tr>
<td>Neuropathic/neurological conditions</td>
<td>3 (8.6%)</td>
<td>4 (9.5%)</td>
<td>1 (2.5%)</td>
</tr>
<tr>
<td>Rheumatic/autoimmune conditions</td>
<td>3 (8.6%)</td>
<td>6 (14.3%)</td>
<td>4 (10.0%)</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>11 (31.4%)</td>
<td>14 (33.3%)</td>
<td>8 (20.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>25 (71.4%)</td>
<td>29 (69.0%)</td>
<td>31 (77.5%)</td>
</tr>
</tbody>
</table>

*Note.* N = 117.
In Table 4, nearly half of participants \((n = 53/117; 45.3\%)\) reported using Tylenol (or acetaminophen) as medication for their pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) \((n = 40/117; 34.2\%)\) and opioid agonists, partial agonists, and antagonists \((n = 21/117; 17.9\%)\) were also widely used amongst participants. Cyclooxgenase-2-selective NSAIDs \((n = 5/117; 4.27\%)\), skeletal muscle relaxants \((n = 5/117; 4.27\%)\), and synthetic cannabinoids \((n = 8/117; 6.84\%)\) were sparsely used. 6.84% of participants \((n = 8/117)\) reported the use of antidepressants. Lastly, 26.5% \((n = 31/117)\) of participants outlined other daily medications that they were required to take for their pain or related comorbidities.

As opposed to medication, 35.9% of participants reported the use of nutritional supplements and/or alternative remedies \((n = 42/117)\). Chiropractors, physiotherapists and registered massage therapists (RMT) were cited as a form of treatment for 21.4% \((n = 25/117)\) of participants. Finally, only 8.55% \((n = 10/117)\) of participants reported the use of physical activity as a form of treatment.
Table 4

**Participant treatments or medications for pain**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Workbook (n = 35)</th>
<th>Online (n = 42)</th>
<th>Wait List (n = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tylenol</td>
<td>21 (60.0%)</td>
<td>19 (45.2%)</td>
<td>13 (32.5%)</td>
</tr>
<tr>
<td>Nonspecific NSAIDs</td>
<td>14 (40.0%)</td>
<td>14 (33.3%)</td>
<td>12 (30.0%)</td>
</tr>
<tr>
<td>COX-2-selective NSAIDs</td>
<td>0 (0.0%)</td>
<td>1 (2.4%)</td>
<td>4 (10.0%)</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>1 (2.9%)</td>
<td>5 (11.9%)</td>
<td>2 (5.0%)</td>
</tr>
<tr>
<td>Skeletal muscle relaxants</td>
<td>1 (2.9%)</td>
<td>1 (2.4%)</td>
<td>3 (7.5%)</td>
</tr>
<tr>
<td>Synthetic cannabinoids</td>
<td>4 (11.4%)</td>
<td>0 (0.0%)</td>
<td>4 (10.0%)</td>
</tr>
<tr>
<td>Opioid agonists, partial agonists and antagonists</td>
<td>5 (14.3%)</td>
<td>9 (21.4%)</td>
<td>7 (17.5%)</td>
</tr>
<tr>
<td>Other medication</td>
<td>10 (28.6%)</td>
<td>11 (26.2%)</td>
<td>10 (25.0%)</td>
</tr>
<tr>
<td>Chiropractor, physiotherapy or RMT</td>
<td>6 (17.1%)</td>
<td>12 (28.6%)</td>
<td>7 (17.5%)</td>
</tr>
<tr>
<td>Nutritional supplements or alternative remedies</td>
<td>12 (34.3%)</td>
<td>16 (38.1%)</td>
<td>14 (35.0%)</td>
</tr>
<tr>
<td>Physical activity</td>
<td>3 (8.6%)</td>
<td>3 (7.1%)</td>
<td>4 (10.0%)</td>
</tr>
</tbody>
</table>

*Note.* N = 117.
3.5 Analyses

3.5.1 Pain beliefs and functional status

According to Hypothesis I, participants in the intervention groups were expected to show significant improvements on primary measures of pain beliefs and functional status compared to a wait list control. Relevant means and standard deviations for the primary measures, at each time of measurement, for each group are reported in Table 5. By observing Table 5, the trends for pain beliefs and functional status appear to be the same for both the intervention groups and wait list control group and therefore, are inconsistent with Hypothesis I.

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model MANOVA was conducted in order to test the significance of the dependent variables as outlined by Hypothesis I. Using Wilks’ lambda, there was a significant main effect of time, \( \lambda = 0.628, F(6, 109) = 10.744, p = .000, \) partial \( \eta^2 = .372, \) with all groups showing a reduction in scores over time. Neither the main effect of group, \( \lambda = 0.982, F(6, 224) = .349, p > .050, \) partial \( \eta^2 = .009, \) nor the interaction effect between group and time, \( \lambda = 0.900, F(12, 218) = .981, p > .050, \) partial \( \eta^2 = .051, \) were found to be significant for pain beliefs and functional status.

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model ANOVA was conducted on each of the individual dependent variables as follow-up tests to the MANOVA. The first ANOVA examined effects on the GDS-30. The main effect of time, \( F(1.551, 176.833) = 11.799, p = .000, \) partial \( \eta^2 = .094, \) and the interaction effect between group and time, \( F(3.102, 176.833) = 2.986, p = .031, \)
partial $\eta^2 = .050$, were found to be significant for the GDS-30. The second ANOVA examined effects on the GAD-7. The main effect of time was significant, $F(1.797, 204.880) = 11.228, p = .000$, partial $\eta^2 = .090$, but the interaction effect between group and time, $F(3.594, 204.880) = .827, p > .050$, partial $\eta^2 = .014$, was not significant for the GAD-7. The third ANOVA examined effects on the PDI. The main effect of time was significant, $F(1.981, 225.809) = 13.873, p = .000$, partial $\eta^2 = .108$, and the interaction effect between group and time, $F(3.962, 225.809) = 1.012, p > .050$, partial $\eta^2 = .017$, was not significant for the PDI.

Follow-up pairwise comparisons showed that the difference in scores from pre-treatment to follow-up for the GDS-30, $F(1, 114) = 14.707, p = .000$, partial $\eta^2 = .114$, the GAD-7, $F(1, 114) = 16.793, p = .000$, partial $\eta^2 = .128$, and PDI, $F(1, 114) = 25.731, p = .000$, partial $\eta^2 = .184$, contributed to the significance of the univariate effect for the significant main effect of time. Furthermore, the difference in GDS-30 scores from post-treatment to follow-up, $F(1, 114) = 37.935, p = .000$, partial $\eta^2 = .250$ also contributed to the significant main effect of time. For the GDS-30, there was also a significant main effect between group and time from pre-treatment to follow-up, $F(2, 114) = 3.840, p = .024$, partial $\eta^2 = .063$.

Consistent with Hypothesis I, examination of the means and standard deviations showed that participants displayed a decrease in measures of depression, anxiety and disability over time. Contrary to Hypothesis I, workbook and online groups did not show significant improvements on primary measures of pain beliefs and functional status compared to the wait list control group. At pre-treatment, participants started with mild
depression (e.g., total scores of 5 to 8), little to no anxiety (e.g., total scores < 5), and levels of disability between levels of mild and moderate (e.g., total scores of 14 to 35). As shown in Table 4, participant scores decreased across all primary measures. Though the differences were not significant, participants ended with mild depression, little to no anxiety and mild levels of disability at follow-up.
Table 5

*Descriptive statistics (N = 117) for pain beliefs and functional status*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>GDS-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>7.63 (7.07)</td>
<td>6.77 (4.11)</td>
<td>5.64 (4.29)</td>
</tr>
<tr>
<td>Online</td>
<td>8.14 (5.68)</td>
<td>7.57 (3.70)</td>
<td>5.49 (3.74)</td>
</tr>
<tr>
<td>Wait List</td>
<td>6.50 (4.74)</td>
<td>7.93 (3.95)</td>
<td>6.45 (4.36)</td>
</tr>
<tr>
<td>GAD-7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>3.49 (3.21)</td>
<td>2.18 (2.78)</td>
<td>2.01 (2.77)</td>
</tr>
<tr>
<td>Online</td>
<td>3.21 (3.25)</td>
<td>2.23 (1.91)</td>
<td>2.13 (2.61)</td>
</tr>
<tr>
<td>Wait List</td>
<td>2.63 (2.57)</td>
<td>2.24 (2.82)</td>
<td>2.06 (2.34)</td>
</tr>
<tr>
<td>PDI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>27.5 (15.0)</td>
<td>23.3 (15.2)</td>
<td>21.6 (11.5)</td>
</tr>
<tr>
<td>Online</td>
<td>30.6 (13.9)</td>
<td>24.1 (11.4)</td>
<td>22.6 (11.1)</td>
</tr>
<tr>
<td>Wait List</td>
<td>25.7 (13.2)</td>
<td>23.4 (14.7)</td>
<td>22.7 (11.9)</td>
</tr>
</tbody>
</table>

*Note.* GDS-30 = Geriatric Depression Scale-30, GAD-7 = Generalized Anxiety Disorder-7, PDI = Pain Disability Index. N = 117.
3.5.2 Chronic pain severity

According to Hypothesis II, participants in the intervention groups were expected to show significant improvements on secondary measures of chronic pain severity compared to a wait list control. Relevant means and standard deviations for the secondary measures, at each time of measurement, for each group are reported in Table 6. By observing Table 6, the trend for chronic pain severity appears to be the same for both the intervention groups and wait list control group and therefore, are inconsistent with Hypothesis II.

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed-design MANOVA was conducted in order to test the significance of the dependent variables as outlined by Hypothesis II. Using Wilks’ lambda, there was a significant main effect of time, $\lambda = 0.735$, $F(4, 111) = 10.017$, $p = .000$, partial $\eta^2 = .225$. Neither the main effect of group, $\lambda = 0.979$, $F(4, 226) = .590$, $p > .050$, partial $\eta^2 = .010$, nor the interaction effect between group and time, $\lambda = 0.912$, $F(8, 222) = 1.307$, $p > .050$, partial $\eta^2 = .045$, were found to be significant for chronic pain severity.

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model ANOVA was conducted on each of the individual dependent variables as follow-up tests to the MANOVA. The first ANOVA examined effects on BPI-SF Severity. The main effect of time was significant, $F(1.853, 211.292) = 13.269$, $p = .000$, partial $\eta^2 = .104$, but the interaction effect between group and time, $F(3.707, 211.292) = .990$, $p > .050$, partial $\eta^2 = .017$, was not found to be significant for BPI-SF Severity. The second ANOVA examined effects on BPI-SF Inference. The main effect of
time was significant, $F(1.869, 213.085) = 20.832, p = .000$, partial $\eta^2 = .155$, whereas the interaction effect between group and time, $F(3.738, 213.085) = 2.352, p > .050$, partial $\eta^2 = .040$, was not significant for BPI Inference.

Follow-up pairwise comparisons showed that the difference in scores from pre-treatment to follow-up for the BPI-SF Severity, $F(1, 114) = 23.693, p = .000$, partial $\eta^2 = .172$, and the BPI-SF Inference, $F(1, 114) = 26.071, p = .000$, partial $\eta^2 = .186$, contributed to the significance of the univariate effect for the significant main effect of time. For the significant main effect of time, examination of the means and standard deviations showed that the secondary measures (BPI-SF Severity and BPI-SF Inference) decreased over time.

Consistent with Hypothesis II, examination of the means and standard deviations showed that participants displayed a decrease in measures of chronic pain severity over time. Contrary to Hypothesis II, workbook and online groups did not show significant improvements on secondary measures of chronic pain severity compared to the wait list control. For all groups, participants started with moderate scores of chronic pain severity on both subscales, severity and inference at pre-treatment. Follow-up scores showed a slight reduction and thereby, participant scores of chronic pain severity were classified as mild.
Table 6

Descriptive statistics (N = 117) for chronic pain severity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>BPI-SF Severity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>4.29 (1.82)</td>
<td>3.76 (1.86)</td>
<td>3.26 (1.60)</td>
</tr>
<tr>
<td>Online</td>
<td>4.75 (1.89)</td>
<td>4.09 (1.63)</td>
<td>3.81 (1.58)</td>
</tr>
<tr>
<td>Wait List</td>
<td>4.16 (1.83)</td>
<td>3.90 (1.69)</td>
<td>3.79 (1.69)</td>
</tr>
<tr>
<td>BPI-SF Inference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>4.19 (2.02)</td>
<td>3.00 (1.88)</td>
<td>3.06 (1.93)</td>
</tr>
<tr>
<td>Online</td>
<td>4.64 (2.12)</td>
<td>3.42 (1.43)</td>
<td>3.37 (1.62)</td>
</tr>
<tr>
<td>Wait List</td>
<td>3.64 (2.14)</td>
<td>3.37 (1.84)</td>
<td>3.29 (1.80)</td>
</tr>
</tbody>
</table>

Note. BPI-SF = Brief Pain Inventory Short Form. N = 117.
3.5.3 Fear of movement and quality of life

According to Hypothesis III, participants in the intervention groups were expected to show significant improvements on tertiary measures of fear of movement and quality of life when compared to a wait list control. Relevant means and standard deviations for the tertiary measures, at each time of measurement, for each group are reported in Table 7. By observing Table 7, the intervention groups show visible improvements on measures of movement and quality of life the same for the intervention groups relative to a wait list control group and therefore, are somewhat consistent with Hypothesis III.

In order to test the significance of the dependent variables as described by Hypothesis III, 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed-design MANOVA was conducted. Using Wilks’ lambda, there was a significant main effect of time, $\lambda = 0.732, F(8, 107) = 4.899, p = .000$, partial $\eta^2 = .268$. Neither the main effect of group, $\lambda = 0.941, F(8, 222) = .850, p > .050$, partial $\eta^2 = .030$, nor the interaction effect between group and time, $\lambda = 0.830, F(16, 214) = 1.303, p > .050$, partial $\eta^2 = .089$, were found to be significant for fear of movement and quality of life.

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model ANOVA was conducted on each of the individual dependent variables as follow-up tests to the MANOVA. The first ANOVA examined effects on PSEQ. The main effect of time was significant, $F(1.869, 213.115) = 14.303, p = .000$, partial $\eta^2 = .111$, but the interaction effect between group and time, $F(3.739, 213.115) = 1.530, p > .050$, partial $\eta^2 = .026$, was not found to be significant for PSEQ. The second
ANOVA examined effects on TSK. The main effect of time was significant, $F(1.794, 204.471) = 8.846, p = .000$, partial $\eta^2 = .072$, but the interaction effect between group and time, $F(3.587, 204.471) = .937, p > .050$, partial $\eta^2 = .016$, was not found to be significant for TSK. The third ANOVA examined effects on CPAQ-8. The main effect of time, $F(1.981, 225.778) = 2.921, p > .050$, partial $\eta^2 = .025$, and the interaction effect between group and time, $F(3.961, 225.778) = 1.090, p > .050$, partial $\eta^2 = .019$, were not found to be significant for CPAQ-8. The fourth ANOVA examined effects on PCS. The main effect of time was significant, $F(1.729, 197.100) = 13.197, p = .000$, partial $\eta^2 = .104$, whereas the interaction effect between group and time, $F(3.458, 197.100) = .276, p > .050$, partial $\eta^2 = .005$, was not significant for PCS.

Follow-up pairwise comparisons showed that the difference in scores from pre-treatment to follow-up for the PSEQ, $F(1, 114) = 16.359, p = .000$, partial $\eta^2 = .125$, TSK, $F(1, 114) = 12.496, p = .001$, partial $\eta^2 = .099$, and PCS, $F(1, 114) = 12.099, p = .001$, partial $\eta^2 = .096$, contributed to the significance of the univariate effect for the significant main effect of time.

Consistent with Hypothesis III, examination of the means and standard deviations showed that participants displayed a decrease in measures of fear of movement and quality of life throughout the course. Contrary to Hypothesis III, workbook and online groups did not show significant improvements on tertiary measures compared to the wait list control. For pain self-efficacy, participants in the workbook and wait list group showed an increase in total PSEQ scores from pre-treatment to follow-up. Conversely, the online group showed a decrease in PSEQ scores. For all groups, pain self-efficacy
would be classified as moderate. For the TSK, the fear of movement scores were found to be moderate at pre-treatment and reduced to mild at follow-up. The CPAQ-8 scores were moderate at pre-treatment and remained moderate upon follow-up. Thus, participants moderately accepted their chronic pain. At pre-treatment, participant scores of pain catastrophizing were moderate and were slightly reduced at follow-up for the PCS.
Table 7

*Descriptive statistics (N = 117) for fear of movement and quality of life*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>PSEQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>35.5 (13.9)</td>
<td>40.6 (12.7)</td>
<td>42.2 (10.9)</td>
</tr>
<tr>
<td>Online</td>
<td>32.2 (14.1)</td>
<td>39.1 (11.1)</td>
<td>36.4 (13.7)</td>
</tr>
<tr>
<td>Wait List</td>
<td>37.2 (14.8)</td>
<td>39.5 (14.4)</td>
<td>40.0 (13.8)</td>
</tr>
<tr>
<td>TSK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>36.4 (6.94)</td>
<td>34.4 (5.75)</td>
<td>35.3 (6.40)</td>
</tr>
<tr>
<td>Online</td>
<td>36.9 (7.40)</td>
<td>34.5 (6.75)</td>
<td>33.6 (6.74)</td>
</tr>
<tr>
<td>Wait List</td>
<td>35.2 (6.06)</td>
<td>34.1 (6.79)</td>
<td>33.4 (7.47)</td>
</tr>
<tr>
<td>CPAQ-8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>31.3 (5.37)</td>
<td>31.1 (4.71)</td>
<td>31.5 (4.75)</td>
</tr>
<tr>
<td>Online</td>
<td>28.8 (5.37)</td>
<td>30.5 (5.38)</td>
<td>31.0 (4.79)</td>
</tr>
<tr>
<td>Wait List</td>
<td>31.5 (6.34)</td>
<td>31.7 (5.76)</td>
<td>32.5 (5.22)</td>
</tr>
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<td>PCS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>13.6 (9.52)</td>
<td>10.4 (7.91)</td>
<td>11.0 (7.23)</td>
</tr>
<tr>
<td>Online</td>
<td>13.7 (8.97)</td>
<td>10.5 (8.29)</td>
<td>10.6 (7.61)</td>
</tr>
<tr>
<td>Wait List</td>
<td>12.1 (8.36)</td>
<td>9.44 (8.03)</td>
<td>10.5 (8.62)</td>
</tr>
</tbody>
</table>

*Note.* PSEQ = Pain Self-Efficacy Questionnaire, TSK = TAMPA Scale of Kinesiophobia, CPAQ-8 = Chronic Pain Acceptance Questionnaire, PCS = Pain Catastrophizing Scale. \(N = 117\).
3.6 Sub analysis

A sub analysis was carried out in order to determine if floor effects were responsible for the absence of clinically significant findings. With reduced statistical power, an ANOVA was conducted on each of the dependent variables. Participant scores, of which were greater than or equal to the median for each respective measure, were included in the following analysis.

3.6.1 Pain beliefs and functional status sub analysis

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model ANOVA was conducted on each of the individual dependent variables. The first ANOVA examined effects on the GDS-30. The main effect of time, $F(1.813, 105.150) = 27.032, p = .000$, partial $\eta^2 = .318$, and the interaction effect between group and time, $F(3.626, 105.150) = 3.096, p = .022$, partial $\eta^2 = .096$, were found to be significant for the GDS-30. The second ANOVA examined effects on the GAD-7. The main effect of time was significant, $F(1.882, 131.760) = 18.606, p = .000$, partial $\eta^2 = .210$, and the interaction effect between group and time, $F(3.765, 131.760) = .733, p > .050$, partial $\eta^2 = .021$, was not found to be significant for the GAD-7. The third ANOVA examined effects on the PDI. The main effect of time was significant, $F(1.951, 113.179) = 34.170, p = .000$, partial $\eta^2 = .371$, and the interaction effect between group and time, $F(3.903, 113.179) = 1.446, p > .050$, partial $\eta^2 = .047$, was not significant for the PDI.

Follow-up pairwise comparisons showed that the difference in scores from pre-treatment to follow-up for the GDS-30, $F(1, 58) = 47.022, p = .000$, partial $\eta^2 = .448$, the GAD-7, $F(1, 70) = 28.960, p = .000$, partial $\eta^2 = .293$, and PDI, $F(1, 58) = 53.475, p =$
.000, partial $\eta^2 = .480$, contributed to the significance of the univariate effect for the significant main effect of time. Furthermore, the difference in GDS-30 scores from post-treatment to follow-up, $F(1, 58) = 8.133, p = .006$, partial $\eta^2 = .123$ also contributed to the significant main effect of time. For the GDS-30, the main effect between group and time from pre-treatment to follow-up was approaching significance.

Following the sub analysis, trends for measures of depression, anxiety and disability are shown in Table 8. Participants were mildly depressed at pre-treatment and GDS-30 scores decreased slightly to be within normal range at follow-up. GAD-7 scores were non-severe at pre-treatment and follow-up and therefore, participants had very little to no anxiety throughout the course. Lastly, disability scores remained moderate at both pre-treatment and follow-up.
Table 8

*Descriptive statistics for sub analysis of pain beliefs and functional status*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>GDS-30 (N = 61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>13.8 (5.82)</td>
<td>9.40 (4.00)</td>
<td>8.60 (3.90)</td>
</tr>
<tr>
<td>Online</td>
<td>11.7 (4.17)</td>
<td>8.63 (3.93)</td>
<td>6.58 (4.04)</td>
</tr>
<tr>
<td>Wait List</td>
<td>10.4 (3.79)</td>
<td>9.89 (4.38)</td>
<td>8.87 (4.66)</td>
</tr>
<tr>
<td>GAD-7 (N = 73)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>5.00 (2.75)</td>
<td>2.89 (3.05)</td>
<td>2.72 (3.05)</td>
</tr>
<tr>
<td>Online</td>
<td>4.92 (3.03)</td>
<td>2.83 (2.09)</td>
<td>2.86 (3.05)</td>
</tr>
<tr>
<td>Wait List</td>
<td>4.35 (2.06)</td>
<td>3.49 (3.13)</td>
<td>2.92 (2.46)</td>
</tr>
<tr>
<td>PDI (N = 61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>40.3 (8.75)</td>
<td>30.1 (9.82)</td>
<td>27.2 (8.57)</td>
</tr>
<tr>
<td>Online</td>
<td>40.0 (9.43)</td>
<td>28.4 (11.9)</td>
<td>27.3 (11.3)</td>
</tr>
<tr>
<td>Wait List</td>
<td>37.1 (6.08)</td>
<td>32.8 (12.3)</td>
<td>29.4 (10.7)</td>
</tr>
</tbody>
</table>

*Note.* GDS-30 = Geriatric Depression Scale-30, GAD-7 = Generalized Anxiety Disorder-7, PDI = Pain Disability Index.
3.6.2 Chronic pain severity sub analysis

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model ANOVA was conducted on each of the individual dependent variables. The first ANOVA examined effects on the BPI-SF Severity. The main effect of time was significant, $F(1.837, 117.003) = 33.018, p = .000$, partial $\eta^2 = .347$, but the interaction effect between group and time, $F(3.774, 117.003) = .929, p > .050$, partial $\eta^2 = .029$, was not found to be significant for the BPI-SF Severity. The second ANOVA examined effects on the BPI-SF Inference. The main effect of time was significant, $F(1.965, 110.017) = 34.129, p = .000$, partial $\eta^2 = .379$, and the interaction effect between group and time, $F(3.929, 110.017) = 1.262, p > .050$, partial $\eta^2 = .043$, was insignificant for the BPI-SF Inference.

Follow-up pairwise comparisons showed that the difference in scores from pre-treatment to follow-up for the BPI-SF Severity, $F(1, 62) = 53.128, p = .000$, partial $\eta^2 = .461$, and BPI-SF Inference, $F(1, 56) = 58.097, p = .000$, partial $\eta^2 = .509$, contributed to the significance of the univariate effect for the significant main effect of time. As shown in Table 9, participant scores of chronic pain severity were found to be moderate at pre-treatment across groups. Similarly, scores ranged from mild to moderate pain at follow-up.
Table 9

*Descriptive statistics for sub analysis of chronic pain severity*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>M (SD)</em></td>
<td><em>M (SD)</em></td>
<td><em>M (SD)</em></td>
</tr>
<tr>
<td><strong>BPI-SF Severity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(N = 65)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>5.56 (1.35)</td>
<td>4.46 (1.62)</td>
<td>3.77 (1.40)</td>
</tr>
<tr>
<td>Online</td>
<td>6.04 (1.20)</td>
<td>4.67 (1.73)</td>
<td>4.40 (1.63)</td>
</tr>
<tr>
<td>Wait List</td>
<td>5.56 (1.31)</td>
<td>4.49 (1.66)</td>
<td>4.53 (1.64)</td>
</tr>
<tr>
<td><strong>BPI-SF Inference</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(N = 59)</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>5.63 (1.09)</td>
<td>3.85 (1.48)</td>
<td>3.65 (1.98)</td>
</tr>
<tr>
<td>Online</td>
<td>6.25 (1.34)</td>
<td>4.09 (1.36)</td>
<td>4.00 (1.56)</td>
</tr>
<tr>
<td>Wait List</td>
<td>5.78 (1.29)</td>
<td>4.87 (1.51)</td>
<td>4.54 (1.37)</td>
</tr>
</tbody>
</table>

*Note.* BPI-SF = Brief Pain Inventory Short Form.
3.6.3 Fear of movement and quality of life sub analysis

A 3 (group: workbook, online, wait list) x 3 (time: pre-treatment, post-treatment, follow-up) mixed model ANOVA was conducted on each of the individual dependent variables. The first ANOVA examined effects on the PSEQ. The main effect of time, $F(1.907, 108.708) = .643, p > .050$, partial $\eta^2 = .011$, and the interaction effect between group and time, $F(3.814, 108.708) = 1.130, p > .050$, partial $\eta^2 = .038$, were not found to be significant for the PSEQ. The second ANOVA examined effects on the TSK. The main effect of time was significant, $F(1.787, 108.983) = 22.470, p = .000$, partial $\eta^2 = .269$, but the interaction effect between group and time, $F(3.573, 108.983) = .543, p > .050$, partial $\eta^2 = .017$, was not found to be significant for the TSK. The third ANOVA examined effects on the CPAQ-8. The main effect of time was significant, $F(1.941, 106.749) = 3.916, p = .024$, partial $\eta^2 = .066$, and the interaction effect between group and time, $F(3.882, 106.749) = .376, p > .050$, partial $\eta^2 = .013$, was not significant for the CPAQ-8. The fourth ANOVA examined effects on the PCS. The main effect of time was significant, $F(1.858, 105.928) = 25.863, p = .000$, partial $\eta^2 = .312$, but the interaction effect between group and time, $F(3.717, 105.928) = .200, p > .050$, partial $\eta^2 = .007$, was not found to be significant for the PCS.

Follow-up pairwise comparisons showed that the difference in scores from pre-treatment to follow-up for the TSK, $F(1, 61) = 25.115, p = .000$, partial $\eta^2 = .292$, and PCS, $F(1, 57) = 28.467, p = .000$, partial $\eta^2 = .333$, contributed to the significance of the univariate effect for the significant main effect of time.
As shown in Table 10, participants in the workbook group showed a deterioration in pain self-efficacy scores from pre-treatment to follow-up. Furthermore, the online group showed an improvement and the wait list group showed no change in pain self-efficacy scores from pre-treatment to follow-up. Conversely, the online group showed a decrease in PSEQ scores. For all groups, PSEQ scores would be classified as high. Fear of movement scores were high at pre-treatment and follow-up across all groups. For chronic pain acceptance, CPAQ-8 scores were high at pre-treatment and follow-up. Lastly, pain catastrophizing scores were high at pre-treatment across all groups. At follow-up, PCS scores decreased slightly with the online group being moderate and workbook and wait list control group being high.
Table 10

Descriptive statistics for sub analysis of fear of movement and quality of life

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td><strong>PSEQ (N = 60)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>48.4 (7.40)</td>
<td>49.8 (9.41)</td>
<td>50.3 (6.54)</td>
</tr>
<tr>
<td>Online</td>
<td>45.1 (6.20)</td>
<td>46.5 (6.18)</td>
<td>41.5 (13.0)</td>
</tr>
<tr>
<td>Wait List</td>
<td>47.3 (7.66)</td>
<td>47.4 (9.07)</td>
<td>47.4 (8.14)</td>
</tr>
<tr>
<td><strong>TSK (N = 64)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>41.1 (3.29)</td>
<td>37.1 (4.78)</td>
<td>38.3 (5.38)</td>
</tr>
<tr>
<td>Online</td>
<td>42.0 (4.57)</td>
<td>37.1 (7.13)</td>
<td>36.8 (6.38)</td>
</tr>
<tr>
<td>Wait List</td>
<td>40.5 (3.45)</td>
<td>36.7 (7.08)</td>
<td>36.9 (6.23)</td>
</tr>
<tr>
<td><strong>CPAQ-8 (N = 58)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>34.8 (3.73)</td>
<td>32.0 (5.07)</td>
<td>33.0 (5.37)</td>
</tr>
<tr>
<td>Online</td>
<td>34.6 (3.71)</td>
<td>33.7 (6.89)</td>
<td>34.3 (4.82)</td>
</tr>
<tr>
<td>Wait List</td>
<td>35.6 (4.71)</td>
<td>33.8 (6.07)</td>
<td>34.8 (4.32)</td>
</tr>
<tr>
<td><strong>PCS (N = 60)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workbook</td>
<td>21.9 (6.39)</td>
<td>15.6 (7.76)</td>
<td>15.6 (6.95)</td>
</tr>
<tr>
<td>Online</td>
<td>19.6 (6.28)</td>
<td>12.9 (8.68)</td>
<td>13.3 (7.48)</td>
</tr>
<tr>
<td>Wait List</td>
<td>19.6 (6.28)</td>
<td>13.8 (8.80)</td>
<td>15.1 (9.82)</td>
</tr>
</tbody>
</table>

*Note.* PSEQ = Pain Self-Efficacy Questionnaire, TSK = TAMPA Scale of Kinesiophobia, CPAQ-8 = Chronic Pain Acceptance Questionnaire, PCS = Pain Catastrophizing Scale.
3.7 Treatment satisfaction

Treatment satisfaction was evaluated using both quantitative and qualitative analyses. SPSS was used to analyze quantitative treatment satisfaction data and NVivo was used to analyze qualitative treatment satisfaction data.

3.7.1 Quantitative treatment satisfaction data

Using SPSS, quantitative treatment satisfaction data was analyzed as shown in Table 11. For the workbook group, 85.3% of participants were satisfied or very satisfied with the course, 11.8% of participants were neutral and only 2.9% of participants were dissatisfied. 88.2% of participants felt confident in recommending the course to others while 11.8% did not feel confident. Over 88% of participants stated that the course was worth their time while nearly 12% cited that it was not worth their time.

Over 67% of participants indicated that participation in the course has greatly increased or increased their confidence to manage symptoms of stress and worry. Conversely, nearly 27% of participants cited no change and just under 6% of participants indicated that they never had any difficulties with symptoms of stress and worry. Completion of the program has greatly increased or increased the confidence of participants to manage day-to-day activities despite pain at 82.3%. 11.8% of participants indicated no change and almost 6% stated that they never had any difficulties with managing their daily activities due to their pain. Lastly, 41.1% of participants cited elevated confidence in their ability to manage symptoms of low mood whereas 35.3% indicated no change. 23.5% of participants did not have prior difficulties managing symptoms of low mood.
For the online group, over 94% of participants expressed satisfaction with the course. 2.9% were dissatisfied and the remaining 2.9% were neutral. 91.4% of participants felt confident in recommending the course to others while nearly 8.6% did not feel confident in doing so. Over 94% of participants felt that the course was worth their time and almost 6% felt that it was not worth their time.

82.8% of participants felt that their participation in the course increased their confidence when faced with symptoms of stress and worry. 11.4% cited no change, 2.9% had a decrease in confidence and the remaining 2.9% never had any previous difficulties with managing stress and worry. Over 85% of participants felt that the course had greatly increased or increased their confidence of managing their daily activities despite pain. 11.4% cited no change whereas 2.9% of participants felt a decrease in their confidence to carry out their everyday lives with pain. Lastly, 65.7% of participants felt that completion of the course has greatly increased or increased their ability to manage symptoms of low mood. 25.7% stated no change, 2.9% had a decrease in confidence, and 5.7% never had any previous difficulties when managing symptoms of low mood.
Table 11

*Descriptive statistics for quantitative treatment satisfaction comments*

<table>
<thead>
<tr>
<th></th>
<th>Workbook</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall, how satisfied were you with the course?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>1 (2.9%)</td>
<td>1 (2.9%)</td>
</tr>
<tr>
<td>Neutral</td>
<td>4 (11.8%)</td>
<td>1 (2.9%)</td>
</tr>
<tr>
<td>Satisfied</td>
<td>14 (41.2%)</td>
<td>15 (42.9%)</td>
</tr>
<tr>
<td>Very satisfied</td>
<td>15 (44.1%)</td>
<td>18 (51.4%)</td>
</tr>
<tr>
<td><strong>Would you feel confident in recommending the course to others?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30 (88.2%)</td>
<td>32 (94.3%)</td>
</tr>
<tr>
<td>No</td>
<td>4 (11.8%)</td>
<td>3 (5.7%)</td>
</tr>
<tr>
<td><strong>Was the course worth your time?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30 (88.2%)</td>
<td>33 (94.3%)</td>
</tr>
<tr>
<td>No</td>
<td>4 (11.8%)</td>
<td>2 (5.7%)</td>
</tr>
<tr>
<td><strong>How has participating in the course affected your confidence that you can learn to manage symptoms of stress and worry?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatly increased</td>
<td>4 (11.8%)</td>
<td>6 (11.8%)</td>
</tr>
<tr>
<td>Increased</td>
<td>19 (59.4%)</td>
<td>23 (65.7%)</td>
</tr>
<tr>
<td>No change</td>
<td>9 (26.5%)</td>
<td>4 (11.4%)</td>
</tr>
<tr>
<td>Decreased</td>
<td>0 (0.0%)</td>
<td>1 (2.9%)</td>
</tr>
<tr>
<td>Never had any difficulties</td>
<td>2 (5.9%)</td>
<td>1 (2.9%)</td>
</tr>
<tr>
<td>Question</td>
<td>Response</td>
<td>count</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
</tr>
<tr>
<td>manage symptoms of low mood?</td>
<td>Never had any difficulties</td>
<td>8 (23.5%)</td>
</tr>
<tr>
<td>How has participating in the course affected your confidence that you can learn to manage your day-to-day activities despite pain?</td>
<td>Greatly increased</td>
<td>3 (8.8%)</td>
</tr>
<tr>
<td></td>
<td>Increased</td>
<td>25 (73.5%)</td>
</tr>
<tr>
<td></td>
<td>No change</td>
<td>4 (11.8%)</td>
</tr>
<tr>
<td></td>
<td>Decreased</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>Never had any difficulties</td>
<td>2 (5.9%)</td>
</tr>
</tbody>
</table>

*Note. N = 69.*
3.6.2 Qualitative treatment satisfaction data

Using NVivo qualitative software, 230 comments were coded based on the 71 survey respondent in Table 12. Of the 230 comments, 15.7% ($n = 36/230$) were about the organization of the *Pain Course for Older Adults*; 43.5% ($n = 100/230$) addressed course content; and 40.9% ($n = 94/230$) discussed the outcomes associated with completion of the course. 109 comments were made by participants from the workbook group and 121 from the online group. Each theme is explained in greater detail below.
Table 12

*Descriptive statistics for qualitative treatment satisfaction comments*

<table>
<thead>
<tr>
<th></th>
<th>Workbook</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( (n = 109) )</td>
</tr>
<tr>
<td></td>
<td>( (n = 121) )</td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3 (2.8%)</td>
</tr>
<tr>
<td>Improvements</td>
<td></td>
</tr>
<tr>
<td>Timeline</td>
<td>4 (3.7%)</td>
</tr>
<tr>
<td>Format</td>
<td>16 (14.7%)</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>29 (26.6%)</td>
</tr>
<tr>
<td>Improvements</td>
<td></td>
</tr>
<tr>
<td>Unhelpful</td>
<td>10 (9.2%)</td>
</tr>
<tr>
<td>Future course</td>
<td>6 (5.5%)</td>
</tr>
<tr>
<td>Repetition</td>
<td>7 (6.4%)</td>
</tr>
<tr>
<td>Delivery</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td></td>
</tr>
<tr>
<td>Encouragement</td>
<td>10 (9.2%)</td>
</tr>
<tr>
<td>Supported</td>
<td>1 (0.9%)</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>7 (6.4%)</td>
</tr>
<tr>
<td>Control</td>
<td>4 (3.7%)</td>
</tr>
<tr>
<td>Future plans</td>
<td>2 (1.8%)</td>
</tr>
<tr>
<td>Optimism</td>
<td>2 (1.8%)</td>
</tr>
<tr>
<td>Informative</td>
<td>4 (3.7%)</td>
</tr>
<tr>
<td>Goal setting</td>
<td>1 (0.9%)</td>
</tr>
<tr>
<td>Gaining knowledge</td>
<td>3 (2.8%)</td>
</tr>
</tbody>
</table>

*Note. N = 230.*
3.7.2.1 Organization. In Table 13, comments describing the organization of the Pain Course for Older Adults were classified as organization comments and accounted for 15% \((n = 35/230)\) of all coded comments. 33% of participants \((n = 12/36)\) expressed satisfaction with the course organization whereas 67% \((n = 24/36)\) cited potential improvements. For satisfaction, 50% \((n = 6/12)\) of participants enjoyed the structure and presentation of the course, some \((n = 3/12; 25\%)\) cited both the online and workbook formats as very accessible and reported that the content was presented in a succinct and user-friendly fashion \((n = 3/12; 25\%)\).

67% \((n = 24/36)\) provided comments to improve the organization of the course. Potential improvements were further divided into timeline \((n = 5/24; 21\%)\) and format \((n = 19/24; 79\%)\). With regards to timeline, 60% \((n = 3/5)\) of participants felt rushed to remain on schedule over the 8-week period and mentioned that more time would be beneficial. The other 40% \((n = 2/5)\) felt that the workbook was too large in size, and this was intimidating for some whereas this became painful to hold when reading the materials. For the workbook group, some participants were aware that the font had been increased in size but 37% \((n = 7/19)\) recommended that the font be even larger. Other areas identified as needing improvement included numbering of the pages \((n = 4/19; 21\%)\).
Table 13

*Treatment satisfaction comments addressing course organization*

<table>
<thead>
<tr>
<th></th>
<th>Workbook</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Satisfaction</strong></td>
<td>“I liked having the workbook – knowing I can refresh at any time.”</td>
<td>“I liked the step by step way the course was set out.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I liked the care that was taken to make each stage clear and how one step led easily to the next.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“The structure and clarity of the lessons were very accessible.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Easy to read with power point presentation – material highlighted and a reasonable amount to absorb on each page.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“The course was put together in a people friendly way that is easy to follow yet covers very difficult situations for older adults with chronic pain.”</td>
</tr>
<tr>
<td><strong>Improvements</strong></td>
<td>“A bit overwhelming in terms of size of book. I would suggest better arrangement of lessons, separate them (5 books as opposed to large book).”</td>
<td>“I found it a little fast. A little more time might have been nice.”</td>
</tr>
<tr>
<td><strong>Timeline</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“The feeling of being rushed to stay on schedule and not be able to have more time to practice where I found new concepts/ideas/tips challenging.”</td>
<td></td>
</tr>
<tr>
<td>Format</td>
<td>“Number the pages front to back. One can then make an index to refer back to when looking up or referring to a strategy.”</td>
<td>“I would have liked the power point slides to be printable.”</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>“Font size of print a challenge.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“The coloured print was hard to read.”</td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 36.*
3.7.2.2 Content. Of the 100 comments regarding course content, 57% \((n = 57/100)\) exhibited satisfaction, while 41% \((n = 43/100)\) revealed opportunities for improvements as shown in Table 14. Several comments in this domain \((n = 62/100; 62\%)\) were about the stories of John and Anne that were shared with participants to demonstrate how the skills presented throughout the program can be applied. Most comments about the stories \((n = 15/57; 27\%)\), suggested that the stories were of benefit: “Reading about other people’s struggles with pain and depression made me feel less alone.” A handful of comments addressed the easy-to-read material \((n = 5/100; 5\%)\) and 9% \((n = 9/100)\) of participants praised the practicality of useful skills.

Overall, 43\% \((n = 43/100)\) outlined the opportunity to improve the course content. Participants cited what they found to be unhelpful \((n = 18/43; 42\%)\) and thereby, provided the opportunity for future improvements. For example, one participant stated that “I feel the course is outdated. Explain that medication can help greatly with chronic pain.” Other future changes included reducing the repetition of fundamental information \((n = 10/43; 23\%)\) and felt unable to relate to the stories of John and Anne \((n = 3/43; 7\%)\). This is demonstrated in the following comment “Chosen hypotheticals (John + Anne) were too extreme for my pain. Need suggestions for people like me who have pain but drive through and never quit!” A handful of participants \((n = 3/43)\) suggested the use of a chart and overall synopsis of the course. Some participants felt the program would have been more effective if there were a group component \((n = 3/43)\) and suggested incorporating a platform where participants could converse throughout the course in the
future. Lastly, 5% ($n = 2/43$) of participants addressed future revisions for the online delivery of the course.
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<tr>
<th></th>
<th>Workbook</th>
<th>Online</th>
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<tbody>
<tr>
<td><strong>Satisfaction</strong></td>
<td>“New ideas to add to my already practices.”</td>
<td>“I liked the extra reading that expanded on the materials of the course.”</td>
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<td></td>
<td>“The attempts to make me think and rethink about stressors.”</td>
<td>“The focus on practical possibilities.”</td>
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<td></td>
<td>“The experiences + insights of “Anne” and “John.” I found it very useful to read about the application of the principles by previous participants.”</td>
<td>“The clarity of concepts and things to work on.”</td>
<td></td>
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<tr>
<td><strong>Improvements</strong></td>
<td>“I would have liked more information about physical activities to alleviate pain.”</td>
<td>“A little too simplified and too many examples.”</td>
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<tr>
<td><strong>Unhelpful</strong></td>
<td>“Parameters for course were too broad and ill defined – scope of conditions were too wide.”</td>
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<td></td>
<td>“I don’t really feel that the weekly telephone contact was necessary or useful.”</td>
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<tr>
<td><strong>Repetition</strong></td>
<td>“The course seems somewhat repetitive – a lot of print!”</td>
<td>“Too much repetition of material.”</td>
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<tr>
<td></td>
<td>“Very repetitive. Try to make it more interesting.”</td>
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<tr>
<td>Future course</td>
<td>“A chart supporting document to track existing and analyze potential connections to pain. Information and resources re: healthy activity and nutrition related to pain.”</td>
<td>“I would have to say that it would be nice to be able to meet as a group, but you can’t have it all… Right?”</td>
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<td>“Course would be more effective if there were a group component. A real meeting would be best, but even an internet chat-type site would be better than nothing.”</td>
<td>“I would have to say that it would be nice to be able to meet as a group, but you can’t have it all… Right?”</td>
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<tr>
<td>Delivery</td>
<td>“Have an option to pause and save in the midst of a lesson; with the option to return to that point when I log in again. Stuff happens and sometimes you can’t complete the entire lesson in one go.”</td>
<td>“Course would be more effective if there were a group component. A real meeting would be best, but even an internet chat-type site would be better than nothing.”</td>
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*Note. N = 100.*
3.7.2.3 Outcomes. The final question of the TSQ asked participants to draw upon their experiences after completing the program. The following question stated, “Please feel free to write a couple of sentences that summarizes what you have learned or a message to future participants.” Overall, 19% of all participant comments included words of advice \(n = 18/94\) for future participants in Table 15. Mostly, participants expressed words of encouragement: “You’re not alone in your struggles with pain. Also, there are things you can do to feel better about yourself and hopefully decrease the impact that pain has on your life,” “I would like to tell participants that thoughts really can be challenged. It can be a life-long process, but eventually helps!”

Approximately 10% \(n = 9/94\) of participants commented that they felt supported and motivated while completing the course. The majority of comments \(n = 7/9\) highlighted their appreciation for their weekly contact with the guide. This is shown in the following comments: “Ainsley was helpful, easy to talk to, and very encouraging,” “The human connection was very helpful to answer questions and for encouragement.”

Most of the comments with regards to helpfulness \(n = 24/94; 26\%\) described using the course as a refresher, practicality of the tools, useful resources that can be referenced in the future and constant reminders. This is illustrated by comments such as “The best part of the course was the guidance and tools given to help you help yourself,” “Many of the recommendations were areas I have tried or am trying so it was good to see/hear that I was not off base. I found that very encouraging.” Similarly, 11% \(n = 10/94\) cited gaining a degree of control over their pain. This is shown in the subsequent
comment “I was letting it control me and now I feel like I am a little bit more in control of the pain.”

Finally, participants stated several other benefits following their participation in the *Pain Course for Older Adults*. These positive outcomes included making future plans with the tools provided (*n* = 4/94; 4%), feelings of optimism (*n* = 9/94; 10%), informative material (*n* = 9/94; 10%), gaining the skills for goal setting (*n* = 5/94; 5%), and gaining knowledge regarding chronic pain (*n* = 6/94; 6%).
Table 15

*Treatment satisfaction comments addressing course outcomes*

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<th>Workbook</th>
<th>Online</th>
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<tr>
<td><strong>Encouragement</strong></td>
<td>“Do not hesitate if offered this course. Don’t skim through it – it is well worth the time and effort.”</td>
<td>“This course enriched my training on pain control. Even if you have taken a course on pain management, please do this course… You will be surprised!”</td>
</tr>
<tr>
<td><strong>Supported</strong></td>
<td>“Your emphasis on giving yourself time to improve was appreciated.”</td>
<td>“The accountability of having Ainsley phone me weekly. Her upbeat interactions and ‘permissions’ allowed me to be less negative at times.”</td>
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<tr>
<td><strong>Helpfulness</strong></td>
<td>“Many of the recommendations were areas I have tried or am trying so it was good to see/hear that I was not off base. I found that very encouraging.”</td>
<td>“The discussion of relapse was most helpful.”</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>“Knowing that I will never be pain free, but”</td>
<td>“I was letting it control me and now I feel like I am a”</td>
</tr>
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</table>
the course left me far more positive that if I put in the work, I do have a degree of control of my pain experience.”

Future plans “While I practice some of the tools, the structure of the course provided me with a plan.” “I learned so much about my habits and patterns of pain, so that I can better anticipate, reduce and mitigate the symptoms.”

Optimism “I have felt a small difference since starting the course, and I know I can continue to improve.” “Learning about chronic pain, the ways to manage it and be successful in getting on with a good life has been empowering.”

Informative “Practical – Easy to follow. Common sense.” “The participant stories enhanced the progress of adapting to the suggestions given by them.”

Goal setting “I can now set goals for progress with the belief I can follow through.” “The goal setting in Lesson 5 was helpful, especially the recommendations to set more realistic and achievable goals.”
Gaining knowledge

“I have learned that graded exposure or pacing works for me.”

“It helped me to accept the chronic pain and how I can take steps to make life easier, not to overdo things.”

Note. N = 94.
4. DISCUSSION

The aim of the present study was to assess the efficacy and acceptability of a remotely delivered pain self-management program tailored to older adults, the *Pain Course*, using online and workbook formats. For the aging population, online self-management research is limited for those experiencing chronic pain. The present study is the first to examine the delivery (online vs. workbook) of a pain self-management program specifically tailored to older adults experiencing chronic pain. The inclusion of a wait list control group extended previous research in this area. Dear and colleagues (Dear et al., 2015a; Dear et al., 2013) found that the *Pain Course* resulted in significant improvements in anxiety, depression, disability, and pain immediately posttreatment in younger adults with mixed chronic pain conditions for the treatment groups in comparison to a wait list control group. These improvements were sustained or further improved at the 3-month follow-up.

In this study, examination of the outcome measures indicated that the workbook delivery was no less effective or acceptable than the previously validated online delivery of the *Pain Course*. This finding is consistent with literature in the field of education as Russell (1999, as cited in Manning-Ouellette & Black, 2017) found no significant differences between online and traditional classroom learning. Namely, the mode of delivery does not make a difference but the method of instruction (i.e., interactive) is what makes the difference.

Neither of the intervention groups demonstrated significant differences from a waitlist control group as participants, irrespective of group assignment, improved with
respect to depression and anxiety scores (primary outcome measures). Depression scores improved by 26% for the workbook group, 33% for the online group, and 1% for the wait list control group. Anxiety scores increased by 42% for the workbook group, 34% for the online group, and, 22% for the wait list control. Similarly, the intervention groups did not show significant improvements on secondary measures of chronic pain severity in comparison to the wait list control group. Lastly, the tertiary measures of fear of movement and quality of life were found to be statistically insignificant, when compared to the wait list control, for both online and workbook groups. However, measures of pain self-efficacy and pain catastrophizing improved significantly for all participants irrespective of group membership.

Following the absence of statistically significant differences among the experimental and control groups, it was determined that a portion of the sample did not present with clinically elevated levels of pain and psychological distress. This portion varied as a function of outcome measure which ranged from 65.8% (\( n = 77/117 \)) for GDS-30 and 70.1% (\( n = 82/117 \)) for GAD-7. As such, an exploratory sub analyses were carried out to evaluate for possible changes in the participants with the highest scores on each variable using a median split. The sub-analysis did not yield statistically significant differences between groups. Given that the majority of participants had mild to no symptoms, these findings are not surprising. Dear et al. (2017) had a large portion of participants score in the clinically significant range on at least one measure [i.e., depression, anxiety, disability or pain] at baseline. They found superiority in the online and workbook interventions in their study of younger persons. Findings suggested that
there were no differences between the online and workbook formats, which is consistent with this investigation.

4.1 Participant Satisfaction with the Self-Management Programs

Treatment satisfaction was evaluated using both quantitative and qualitative analyses. For the intervention groups, 90% of participants \((n = 62/69)\) were satisfied or very satisfied with the course, 7% of participants \((n = 5/69)\) were neutral and only 3% of participants \((n = 2/69)\) were dissatisfied. With regards to course recommendations, 90% \((n = 62/69)\) felt confident in recommending it to others while 10% \((n = 7/69)\) did not feel confident. Over 91% \((n = 63/69)\) of participants stated that the course was worth their time while almost 9% \((n = 6/69)\) cited that it was not worth their time.

Nearly 75% \((n = 52/69)\) indicated that participation in the course has greatly increased or increased their confidence to manage symptoms of stress and worry. Conversely, 19% of participants \((n = 13/69)\) cited no change, 1% \((n = 1/69)\) indicated a decrease and 4% of participants \((n = 3/69)\) indicated that they never had any difficulties with symptoms of stress and worry. Completion of the program has greatly increased or increased 84% of participants \((n = 58/69)\) confidence to manage day-to-day activities despite pain. 13% of participants \((n = 8/69)\) indicated no change, 1% cited \((n = 1/69)\) a decrease, and 3% \((n = 2/69)\) stated that they never had any difficulties with managing their daily activities despite pain. Lastly, 54% of participants \((n = 37/69)\) cited elevated confidence in their ability to manage symptoms of low mood whereas 30% \((n = 21/69)\) indicated no change. 1% \((n = 1/69)\) stated a decrease in their confidence to manage low
mood whereas 14% of participants \((n = 10/69)\) did not have prior difficulties managing symptoms of low mood.

When comparing the intervention groups, quantitative treatment satisfaction data showed that they had both similar and dissimilar results. The online group was more satisfied with the course at 94% \((n = 33/35)\) while 85% \((n = 29/34)\) of participants in the workbook group cited satisfaction. 3% of participants were dissatisfied with the course in both the online and workbook groups. Overall, online participants felt more confident in recommending the course to others \((n = 32/35; 91\%)\). A larger number of participants from the online group \((n = 33/35; 94\%)\) also felt that the course was worth their time.

Interestingly, participants in the workbook group \((n = 0/34; 0\%)\) did not cite any decreases in their confidence to manage symptoms of stress and worry, feelings of low mood or daily activities despite their pain. Conversely, 3% of participants \((n = 1/35; 3\%)\) in the online group cited a decrease in their confidence to manage. Online participants cited greater satisfaction, when compared to the workbook group, for managing symptoms of stress and worry \((n = 29/35; 83\%)\), and low mood \((n = 23/35; 66\%)\). The workbook group had greater satisfaction for managing day-to-day activities despite their pain \((n = 28/34; 82\%)\).

Following qualitative analysis, two coders identified three major themes. Organization of the program, course content, and the outcomes associated with completion of the course were identified as the three main domains. Comments addressing the organization of the *Pain Course for Older Adults* expressed either satisfaction or provided suggestions for future improvements. Satisfaction-related
comments described course structure and presentation, accessibility and as suitable. Of
the comments concerning course content, nearly 60% expressed satisfaction whereas just
over 40% recommended future revisions. However, it is important to note that there were
participants that were both satisfied and recommended future revisions. Some
participants were dissatisfied with the course. Lastly, comments addressing the outcomes
associated with course completion were predominantly positive. All in all, participant
satisfaction was relatively high as the majority of participants being either very satisfied
or satisfied with the program.

Qualitative analysis of participant feedback revealed very little dissatisfaction
with regards to the online delivery, though there were some dissatisfaction with the
workbook delivery such as the font size and size of the workbook. Participants expressed
personal barriers to completing the program, such as difficulties scheduling time to
complete the program and increased pain levels or fatigue that decreased their
productivity with the course materials. Further development, for future course delivery,
could enhance program delivery by separating the course into smaller components to
reduce fatigue and help participants allot their time effectively throughout the course. The
results of the qualitative analysis were found to be fairly consistent with those reported in
previous research on the *Pain Course* (Dear et al., 2015; Dear et al., 2013).

The acceptability of each intervention (online group vs. workbook group) for the
*Pain Course for Older Adults* was examined through qualitative analyses in an attempt to
extend previous research. Identified themes included course organization, course content
and outcomes of the course. The high acceptability of both the online and workbook
interventions aligns with the findings of Barefoot et al. (2012) which showed high satisfaction ratings for bibliotherapy focusing on pain self-management for older adults. Furthermore, high levels of acceptability of course content and positive outcomes, as cited by participants in the current study, aligns with the findings of Dear et al. (2017).

Participant opinions from the present study could shape development of a pain self-management program, workbook and online formats, for older adults experiencing chronic pain. Comments expressing satisfaction addressing organization cited as both formats, online and workbook, as user-friendly and rated the structure and presentation positively. With regards to possible improvements, the majority of comments addressed the workbook delivery of the course and more specifically, the formatting of the workbook. Participants, in the workbook group, were aware that the font size had been increased while constructing the course but emphasized that it could be further increased in addition to improving the font color scheme. By increasing the font, the size of the workbook was not prioritized and as a result, a handful of participants felt that it was not only intimidating, but it was painful for participants with arthritic hands. The size, and weight, of the workbook was not taken into account when printing the workbook format of the *Pain Course for Older Adults*. The possibility of dividing the workbook up into five separate books, one for each lesson, would be indeed be more costly and difficult when mailing.

Course content was rated as satisfactory and related suggestions included that patient stories be added to reflect the individuals with chronic pain struggling with anxiety and/or depression. Participants that rated the existing stories as agreeable were
likely able to relate to the patient stories. The relatability of these stories could potentially explain the reasons participants rated them to be beneficial. More specifically, the feeling of knowing that one is not alone in experiencing chronic pain was reassuring for some participants. Easy-to-read material and useful skills were also rated high amongst participants. Conversely, the patient stories were rated as too extreme for a handful of participants. Participants, with very mild to no symptoms, likely provided this feedback regarding the patient stories. Describing one’s pain varies across individuals and ultimately, it would be difficult to satisfy every participant due to the enormous variability. Lastly, comments addressing a platform that facilitates participant communication might help increase satisfaction associated with course content.

With regards to benefits, several participants offered positive words of encouragement for future participants that might be hesitant when enrolling in the course. Notably, the feeling of not being alone with one’s battle with pain was echoed in aforementioned words of advice. Feelings of support and guide contact were valued as participants cited feelings of motivation and appreciation for human connection throughout the 8-week period. Over 26% of the comments regarding course strengths addressed helpfulness. Participants revealed that course content was comprehensive, helpful, relatable and straightforward. Agreement was also conveyed through the 10% of comments that addressed feelings control over their pain. Lastly, participants cited positive outcomes such as feelings of optimism, informative course content, tools for goal setting, and gaining knowledge in the area of chronic pain.
Perhaps the most significant finding of this study is that participants expressed a great deal of satisfaction with both the online and workbook formats and the intervention group experiences some changes, but these were the same changes that the wait list control group also experienced. It is possible that participants may have attributed change to completion of the course materials. Participants with very mild to no symptoms enrolled in the *Pain Course for Older Adults*. There are many potential reasons as to why participants were willing to volunteer despite the absence of clinically significant symptoms. It is possible that participants wished to gain knowledge on ways of combating future pain given the high prevalence of chronic pain in older adults. More specifically, they may have had conditions that could result in future pain. Over 70% \((n = 85/117)\) of participants reported other sources (e.g., previous heart attack or stroke, cancer, or diabetes) as causes for their pain. A small number of participants \((n = 21/117; 17.9\%)\) stated that their pain was a result of an accident and/or injury or post-medical treatment. Of interest, less than half of participants \((n = 57/117; 49\%)\) cited osteoarthritis, rheumatic or autoimmune conditions, and fibromyalgia as the causes of their underlying pain.

A recent study explored the prevalence and incidence of chronic pain and possible risk factors. Researchers found that despite pain being highly prevalent and persistent, their findings highlighted the importance of early pain management in the prevention of future pain (Larsson, Hansson, Sundquist, & Jakobsson, 2017). Ultimately, participants were likely interested in completing the program due to the educational aspect. The anticipation of reduced risk factors and enhancement of preventative strategies to better
manage and prevent chronic pain could have been the main attraction for participants with very mild to no symptoms.

Next, participants were eligible for the study if they reported experiencing pain for more than three months. For this reason, chronic pain was defined as having pain for three months or more in the present study based on self-report. Participants might have been inaccurate in reporting their pain duration. Furthermore, motivation for enrollment in this program might have been viewed as a means of escaping one’s own troubles and negative feelings such as boredom. Clary and Snyder (1999) cited volunteering as a protective function and thereby, outlined this reason as one of the motivations to volunteer. This might indeed be the case as the majority of participants established their employment status as retired \((n = 99/117; 84.6\%)\). Older retirees for example, might have used the course as an opportunity not only educate themselves, but to keep themselves busy.

All things considered, community participants were asked to volunteer for the *Pain Course for Older Adults* and therefore, this might be the underlying cause for the absence of significance across groups. Participants with the absence of clinically significant symptoms might have been interested in gaining preventative strategies regarding chronic pain, wanting to volunteer to give back, or reduced the severity of their personal experience with chronic pain due to the variability of interpretation and rating of scales. A key difference between this study and other research studies involves the individuals who volunteer. In other research studies, potential participants do so because they feel they can benefit. In this research study, they may have chronic pain, but may
have volunteered for other reasons such as spare time and the desire to give back rather than because they might actually require assistance.

4.2 Directions for Future Research

There are several limitations that offer directions for future research. Firstly, 65.8% and 70.1% of participants, for the GDS-30 and GAD-7 scores respectively, with very mild to no symptoms volunteered to participate in this study. Therefore, with little to no symptoms, the absence of significant group differences may be the result of floor effects. Further investigation should place an emphasis on including participants with clinically significant symptoms in terms of distress and disability. Similarly, the sub analysis including participants with higher scores was underpowered and therefore, significant differences could not be detected. It is possible that significant differences might have been found with a much larger sample size. The present study administered the final questionnaire at a four-week follow-up. Future research should consider a longer follow-up period (e.g., 6 months or greater) as this might help in demonstrating the long-term effect of the program.

Furthermore, the majority of participants in this study were women, which is common in previous studies of the Pain Course (Dear et al., 2017; Dear et al., 2015a; Dear et al., 2013). By looking at aging populations, there is often a larger uneven split in women and men because women live longer than men (Austad, 2006). The greater number of women could account for notable differences that were found when comparing the present findings to previous findings of the Pain Course (Dear et al., 2013), and this might limit the generalizability of the findings. Secondly, potential participants were
required to volunteer and therefore, they might have been more likely to complete the pain self-management program due to intrinsic motivation. Consequently, the findings from this study may not generalize to those seeking treatment from family physicians and/or pain specialists. It was necessary for the present study to rely on self-report of chronic pain (i.e., experiencing pain for more than three months) due to the privacy constraints of medical information. In the future, recruitment of participants from treatment settings, such as family physicians and pain specialists, with confirmed chronic pain diagnosis would be beneficial.

Furthermore, incorporating a greater number of questions to ensure that there is in fact distress and disability would be valuable in future studies. Selecting older participants for distress and disability is important because chronic pain is known to be more common in older adults (Docking et al., 2011; Jakobsson, 2010). In fact, nearly 50% of community-dwelling older adults cited pain that interferes with everyday life (American Geriatrics Society, 2002). Nakai and colleagues (2019) recently explored the association between chronic pain and physical frailty in community-dwelling older adults. Their findings suggested that interventions in chronic pain in the early stages of physical frailty may play a role in decreasing the risk of disability.

Qualitative analysis yielded the potential for improvement in the organization and content of the Pain Course for Older Adults. The 8-week period to complete the course materials might be increased to a 10-week period. Participants would have two weeks to work through each lesson. With more time allotted, they might feel less rushed and have the opportunity to spend additional time on difficult and/or important concepts. The
majority of comments regarding organizational improvements addressed the font size in
the workbook. When formatting the workbooks, greater attention to increasing font size
would increase the quality and satisfaction amongst participants. The organizational
comments regarding font size are significant given the demographic of participants that
enroll in this pain self-management program. Conversely, some participants found that
the workbook was too large in size. The increase in font size would result in increased
page numbers and therefore, increasing the size of the workbook. It would be difficult to
decrease the workbook size, but future studies might involve increases in font size
without increases in the page count. Lastly, including page numbers would increase the
organization of the workbook format.

With regards to content comments, participants stated that it would be beneficial
to update the program material as some felt that the materials were outdated. The
growing field of pain research, specifically remotely-delivered pain self-management
programs, offers the opportunity for incorporating updated information in the *Pain
Course for Older Adults*. This might be beneficial in future course revisions given that
some participants felt that there was something out of date in the materials. A handful of
participants cited dissatisfaction due to their inability to relate to the stories of John and
Anne that were introduced throughout the course of the program. Moreover, it would be
useful to provide case examples reflecting three levels of pain (e.g., mild, moderate and
extreme). The introduction of three different levels of pain, as shown in the three
examples, would increase the likelihood of participants relating to the stories provided
throughout the program. Furthermore, future modifications might involve a synopsis of
fundamental material at the end of each lesson and refrain from reintroducing it in future lessons, for example, in the form of sidebars.

In the future, it might be worth creating a secure platform where participants can communicate with each other and with a facilitator throughout the course of the program. Though it is clear that a platform would pose some ethical issues (e.g., revealing participant identity to fellow participants), communication amongst participants could reinforce the idea that they are not alone in their struggle with chronic pain. This might increase accountability, combined with guide contact, and thereby increase the likelihood of program completion. For example, Ruehlman, Karoly, and Enders (2012) explored the efficacy of an online Chronic Pain Management Program, of which was a fully self-directed and self-paced system. Findings yielded significant decreases in pain severity, pain-related inference and emotional burden, perceived disability, catastrophizing, and pain-induced fear. When compared to the wait list control group, the experimental group showed a significant increase in knowledge regarding chronic pain and its management. Given these favorable results, the implementation of a secure platform could be beneficial. Lastly, some comments cited future revisions to the online delivery of the Pain Course for Older Adults. Potential adjustments might include the ability to bookmark the page and thereby, allowing participants to return to the previous page where they had finished reading during their previous login. This modification would increase the organization of the course considerably and as a result, this could improve participant feedback.
Participant feedback could also yield greater satisfaction if a therapist and/or clinical psychologist was in constant contact with participants throughout the course. In previous studies (e.g., Dear et al., 2017; Dear et al., 2015), registered clinical psychologists with doctoral degrees in Clinical Psychology facilitated all clinical contact with participants. Findings showed clinically significant improvements in anxiety, depression, disability, and pain with minimal clinician contact (Dear et al., 2015; Dear et al., 2013). In the present study, it is possible that participants might have needed a more experienced therapist while completing the Pain Course for Older Adults.

It is important to note that the use of an established program was a key strength in the present study. Given the minor adjustments, the Pain Course for Older Adults is not identical to that of the previously developed Pain Course by the eCentreClinic. As a result, findings from the present study are not generalizable to other online self-management programs and self-help workbooks. Given the variability of remotely delivered programs, it is compelling that there is sufficient evidence to suggest that there are substantial similarities in findings regarding acceptability and efficacy (e.g., Dear et al., 2015; Dear et al., 2013). Participants, in the two previous studies, showed significant improvements in levels of disability, anxiety, depression and average pain at post-treatment, which was maintained at 3-month follow-up. In the future, a longer follow-up period might be beneficial in order yield similar findings. However, it would be helpful for the field to develop a consensus evidence-based self-management program that would be used consistently in studies of various investigations in this area.
Lastly, the final limitation that must be considered in the present study includes quantifying the amount of guide contact via email. More specifically, the number of emails exchanged between the guide and workbook group should be quantified in future studies. This was not a concern for the online group as the online platform recorded the number of messages that were sent. This is inconsistent with standard practice (e.g., Dear et al., 2017; Dear et al., 2015). In the future, the average number of telephone calls that are made and received in addition to the average number of emails sent and received, for both intervention groups, should be recorded in an attempt to maintain similarities to comparable studies.

Despite the aforementioned limitations, the present study has several strengths. Firstly, a wait list control group was used in addition to two alternatives modes of treatment delivery. With this design, researchers were able to control for general time effects in addition to the potential impacts of other treatments. Wait list participants were ultimately given the opportunity to complete in the Pain Course for Older Adults at the end of the study period. Secondly, primary, secondary and tertiary measures with strong psychometric properties, high reliability and validity, were utilized. Thirdly, qualitative analysis of participant feedback was used in addition to satisfaction scores. Of the 230 comments, organization, course content and outcomes associated with course completion were identified as the three main thematic comment categories. With regards to feedback concerning course outcomes, 40% of participants \( n = 38/94 \) had feelings of optimism, felt supported, valued the informative course materials and expressed gaining control of their chronic pain. Lastly, the development of a pain self-management program specific
to older adults was carried out by modifying the previously established Pain Course. Modifications included tailoring course content for older adults and producing stories to reflect those struggling with chronic pain in addition to anxiety and/or depression.

4.3 Conclusion

These results address an important topic, namely improved access to pain self-management programs for older adults who do not have access to traditional psychological interventions. The present study extends previous findings of a remotely delivered chronic pain management program to that of older adults. There were no significant improvements in pain beliefs, functional status, chronic pain severity, fear of movement and quality of life in the intervention groups (online or workbook) when compared to the wait list control group among seniors who reported chronic pain, but participants ultimately had low levels of distress. Nevertheless, the findings suggested that participants still were satisfied and felt they benefitted in terms of gaining further knowledge regarding chronic pain, goal setting, gaining control over their pain to some degree, and reassurance that they are not alone in their daily struggle with pain. Methodologically, the results identified the importance especially among further study of the course with seniors who not only report chronic pain but also distress and disability as well as longer term follow-up of outcomes.
References


delivered pain management program when provided with different levels of clinician support. *Pain, 156*(10), 1920-1935.


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Print.

Appendix A: Research Ethics Board Certificate of Approval

University of Regina

Research Ethics Board Certificate of Approval

PRINCIPAL INVESTIGATOR: Ainsley MacIntyre
DEPARTMENT: Gerontology
REB#: 2018-004

SUPERVISOR: Dr. Thomas Hadjistavropoulos

TITLE: A pain self-management program for older adults; Online vs. workbook delivery.

APPROVED ON: February 7, 2018
RENEWAL DATE: February 7, 2019

APPROVAL OF:
Application for Behavioural Research Ethics Review, Recruitment Materials, Online Screening Consent Form, Pain Course Consent Form, Preliminary Screening Questionnaire, Telephone Screening Protocol, and Specific Questions, Geriatric Depression Scale, Pain Disability Index, Brief Pain Inventory, TAMPA Scale of Kinesiophobia, Pain Catastrophizing Scale.

Full Board Meeting □ Delegated Review □

The University of Regina Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol, consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: http://www.uregina.ca/research/for-faculty-staff/ethics-compliance/human/forms1/ethics-forms.html.

Raven Sinclair, BA, CISW, BISW, MSW, PhD
REB Chair

Please send all correspondence to:
Research Office
University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 585-4775
Fax: (306) 585-4893
research.ethics@uregina.ca
Appendix B: Online Screening Consent Form

Online Therapy Unit Information Page

Please take the time to carefully read the following information. If any information is unclear, please email the primary researcher at aam549@uregina.ca for clarification. You may also phone 306-585-4428.

Please note: The Pain Course for older adults is not therapy. It is a psychoeducational self-management program. Educational materials and prevention strategies will be provided to those experiencing chronic pain.

**Purpose of the Screening:** The purpose of the screening is to assess your present concerns and determine whether you are eligible for one of the Online Therapy courses and one of the associated research studies.

**Overview of Online Self-Management:** Our Online Therapy Courses are designed to assist clients with managing symptoms of depression and/or anxiety. The courses provide education on depression and anxiety and also discuss cognitive, behavioural and physical strategies for managing symptoms. The courses are short-term and typically require clients to review the materials presented online on a weekly basis as well as to practice skills that are taught in the courses. During the Online Therapy courses, clients have brief contact with a guide. The purpose of the guide is to provide support, assist with understanding materials presented and encourage the process of making changes. All clients who receive Online Therapy from us are asked to complete brief questionnaires before, during and after participating in the courses in order to help us evaluate Online Therapy. Online Therapy sessions take approximately 1-2 hours of participant’s time a week, with additional self-learning assignments that can take another 1 hour. The screening takes approximately 30 minutes.

**Format of the Screening**

**Pre-Online Screening:** Once you consent to the screening, you will be asked some basic eligibility questions. If you are not eligible for Online Therapy, the Online Screening will terminate and you will be given information about why you are not eligible. You can contact the primary researcher to discuss your eligibility further if you wish. This first part of the Online Screening will likely take 5 minutes.

**Full Online Screening:** If you meet the basic eligibility for Online Therapy you will be asked to provide basic personal information such as name, address, telephone number, and email address before continuing. This information is necessary for the research staff to contact you to discuss the results of the Online Screening. In the screening you will be presented with questions about your background, symptoms of anxiety and depression,
other mental health concerns, health, relationships, occupation, and treatment history. Additionally, at this time we request the name and contact information for a medical contact, such as your physician. Additional contact may occur between the research staff and your medical contact as needed in the case of an emergency, and for the purpose of continuity of care. Lastly, you will also be asked some questions about your perceptions of the Online Screening process. We anticipate that this Online Screening will likely take 15-35 minutes to complete, depending on the responses you provide.

**Telephone Screening:** Following the completion of the Online Screening, a member of the research staff will contact you by phone to discuss the results of the Online Screening with you and let you know if you are eligible for Online Therapy and one of our studies. It typically takes 2 to 3 business days to arrange this phone call. We anticipate that this Telephone Screening will likely take 20 minutes to complete, depending on the responses you provide. The primary researcher may ask you some brief clarifying questions if more information is needed regarding your responses to the Online Screening. You may also use this time to ask any questions you may have. **Please note: Online Therapy is not for everyone. Participation in the Online Screening does not guarantee participation in Online Therapy. Even if you are eligible for Online Therapy, it may not be possible to offer you the self-management program.**

**Volunteer Participation & Ability to Withdraw:**

Participation in the screening is entirely voluntary. Should you choose not to participate, or if you wish to stop the screening at any time after starting, you may do so without any consequences to your present or future health care. However, once the data has been pooled for analysis after the course has been completed, withdrawal from the study will no longer be possible. Researchers will retain the information you have provided.

**Limits of Confidentiality:**

The responses you provide are confidential although there are certain limits to confidentiality that every participant must be aware of.

- If you pose an immediate threat to your life, or another individual’s life, confidentiality may be broken in order to prevent harm
- If you disclose information suggesting that any child is at risk of abuse, the appropriate authorities will have to be notified
- If you become involved in a legal case, the judge has the right to subpoena any information relevant to the legal problem
- There are unique risks that may compromise your privacy that exist with any Internet-based service. A description of these risks follows:

1. Any computer connected to the Internet will store information about visited websites on the Internet in the browser’s history list and the browser’s cache. The
responses to the questionnaires are only temporarily stored on your computer until you close down your browser window. In other words, after you complete and submit your responses, your computer will discard this information, although some of this information may remain in your browser’s cache. You may delete this information by clearing your history list and browser’s cache.

2. After you complete the Online Screening, the information you provide will be sent directly to the survey software website over a secure connection. The information will then be encrypted and securely stored in the database at which point it is only accessible by the research staff.

**Methods Used to Protect Your Information:**

The primary researcher has taken precautions to protect the security of your information. Both the University of Regina server and Qualtrics.com servers are protected with generally available security technologies, including firewalls and data encryption. In addition, information transmitted from your machine to the server is encrypted using secure socket layer technology (SSL).

In addition to these security precautions, it is important for all users of internet-delivered services to take additional security precautions when submitting sensitive information electronically to ensure the safety of their information.

**There are various things that you can do to protect your information:**

1. Use your home computer or when you are done working with the web application ensure you have exited the Online Screening.

2. When you leave your computer or are done working with the web application ensure you have exited the Online Screening.

3. Since your Internet browser stores information in its memory, or disk cache, you can clean the cache after you use the computer. Certain browsers have “Privacy” modes that can be enabled. Once in this mode, the user’s interactions are not saved to browser history and no data is stored in browser cache. Once the browser is closed or this mode is exited, there are no browser records of any of the interactions that occurred while in the “Privacy” mode. Firefox has this feature, and is, therefore, highly recommended when completing the Online Screening. Browsers that do not have this mode, or users that do not use this feature, must manually purge their browser history and cache to prevent others from seeing their web interactions.

4. Enable either the firewall software that came with your operating system (e.g. Windows firewall), or install a reputable 3rd party software, such as ZoneAlarm.
Firewalls protect your computer and information from network attacks and threats.

5. Use anti-virus software to both prevent and recover from virus programs. While most anti-virus software is for purchase, there are free software options available to download. However, one must still be cautious in order to avoid downloading and installing malicious software that appears to be legitimate.

6. Malware-detection software (such as Spybot: Search and Destroy, Microsoft Security Essentials) can be used to scan your computer for software and files that may be leaking your personal information to 3rd parties.

**Use of Information Collected through Screening:**

Information gathered through the screening will be used for three purposes.

1. To determine eligibility for participation in Online Therapy:
   - If in the process of the follow-up telephone discussion of your screening with the primary researcher it is determined that participation in Online Therapy would be appropriate, your screening will become part of your file. This file will be provided to the guide who will work with you.
   - If in the process of the follow up telephone discussion of your online screening with primary researcher it is determined that you do not meet criteria for Online Therapy, the primary researcher will attempt to provide you with options available to you in your community.

2. To better assist with the pain self-management program you will be offered through the Online Therapy Unit.

3. To be used in de-identified form (identifying information removed) by researchers to evaluate the Online Screening and Online Therapy Courses and to help guide the development of future screening tools and courses offered by the Online Therapy Unit. Any publications stemming from the evaluation of this information will examine all respondents as a whole and you will not be personally identified.

**Storage of Online Screening Information:**

1. Your responses to the online screening will be collected by Qualtrics and then stored on their secure server until we retrieve this information. This server is located in Canada and information on that server is covered by the Canadian Privacy Act.
2. Responses from the online screening will be retrieved from Qualtrics weekly by research staff and will be stored on the Online Therapy Unit secure server, located at the University of Regina.

3. All information (whether paper or online) is kept securely at the University of Regina for a period of seven years.

**Ethics Approval:** This research project has been approved on ethical grounds by the Research Ethics Board (REB) of the University of Regina. Any questions regarding your rights as a participant may be addressed to that committee through the University of Regina Ethics Board at 306-585-4775 or email: research.ethics@uregina.ca. Out of town participants may call collect.

**Project Title:** A pain self-management program for older adults: Online vs. workbook delivery

The Pain Course for Older Adults project has been approved on ethical grounds by the Research Ethics Board (REB) of the University of Regina. Any questions regarding your rights as a participant may be addressed to that committee through the University of Regina Ethics Board at 306-585-4775 or email: research.ethics@uregina.ca. Out of town participants may call collect.

Ainsley MacIntyre  
Department of Gerontology  
University of Regina  
Regina, SK S4S 0A2  
Ph: 306-585-4428

**Technical Questions:** If you have any technical difficulty with screening, contact the primary researcher at 306-585-4428. You can also email her at aam549@uregina.ca.
Appendix C: Preliminary Screening Questionnaire

Consent Comprehension

We recommend that you download a copy of this consent form for your records by pressing the button below.
Attachment: Online Screening Consent Form All Studies.pdf

I have read the study information above and have had any questions answered to my satisfaction.
Yes | No

I am aware that I can contact the primary researcher at aam549@uregina.ca or call 306-585-4428.
Yes | No

I am aware that any questions regarding my right as a participant may be addressed to the committee through the University of Regina Ethics Board at 306-337-4775 or email: research.ethics@uregina.ca. Out of town participants may call collect.
Yes | No

I understand that the information I give through the online screening will only be shared with appropriate research staff and will be kept confidential unless I pose an immediate threat to my life, or another individual’s life, or if I disclose information suggesting that any child is at risk of abuse.
Yes | No

I understand that my participation is voluntary and that I am free to withdraw at any time.
Yes | No

I understand that when the results of the study are published, I will not be personally identifiable.
Yes | No

I understand that Online Therapy Unit courses are not right for everyone. After I complete the online screening, I will be contacted at the phone number I provide by the primary researcher or one of the research staff to discuss the results.
Yes | No

Do you freely and voluntarily consent to take part in this Online Screening? That is, do you consent to completing the Online Screening to the best of your ability, providing your contact information, and being contacted by the primary researcher or one of the research staff to discuss the results.
Yes | No
Part One Message

Part One – Basic Eligibility Questions

Thank you for consenting to take part in the Online Screening. As mentioned in the consent form, in this part of the screening, you will be asked some basic eligibility questions. If your responses indicate that you do not meet basic eligibility requirements to take part in one of our courses, you will receive an immediate computer generated response informing you that you are not eligible and you will not be asked any further questions.

Basic Eligibility Questions

Are you currently experiencing any of the following symptoms? Anxiety, worry, difficulties with depression, loss of pleasure in activities, and/or pain.
Yes | No

At this time, the Online Therapy Unit can only offer services to individuals who are experiencing some symptoms of anxiety, depression, and/or pain.

In the future, we hope to be able to offer an Online Therapy for a wider range of mental health concerns.

If you have questions about this requirement for our courses please feel free to contact the Online Therapy Unit by phoning 306-337-3331 or emailing Online.Therapy.User@uregina.ca

Are you a resident of Canada?
Yes | No

Are you older than 65 years of age?
Yes | No

Have you been experiencing pain for more than three months?
Yes | No

Do you have regular access to a computer and the internet?
Yes | No

Do you have a basic understanding of the English language?
Yes | No
Part Two Message

Part Two – Full Screening

Thank you for completing the basic eligibility questions. It appears that you meet the basic requirements for the Pain Course. The next section of the screening will ask you to provide more detailed information about yourself and your current situation to help the research team understand your current needs. The information collected in this part of the screening will be discussed with you in the follow up telephone conversation with the primary researcher or one of the research staff. You will not receive any automated computer responses as you answer these questions.

REMINDER

The Online Therapy Unit does not provide an emergency or crisis response service. If you are feeling suicidal or in a crisis please exit this screening and seek help immediately: Call emergency services by dialling 911 (Ambulance/Police/Fire Service) OR present at your local hospital emergency department.

Full Screen Questionnaire

Demographic and Contact Information

First Name: ___________________

Last Name: ___________________

Street Address: ________________________________

City/Town: ______________________

Province: ________________________

Postal Code: ___________________

How would you describe the location that you live?

- Large City (population over 200,000)
- Small to Medium City (population of 10,000 to 200,000)
- Town or Village
- Farm
- Reserve
Please enter your 10-digit phone number (e.g., 5555555555): ________________

Do you feel comfortable with us leaving a message for you at this phone number?
- Yes
- No, please explain

Please enter your email address:
Email: _____________________________

Please retype your email address: _________________________

**Age, education and employment**

Age: ______

Sex:
- Male  |  Female

What is your date of birth? (yyyy/mm/dd): ________________

What is your highest level of education?
- Less than high school
- High school diploma
- College certificate or diploma
- Some university
- University undergraduate degree
- University professional degree (e.g., MD)
- University graduate degree (e.g., MA, PhD)

What category best represents your employment status?
- Employed or self-employed full-time
- Unemployed
- On short-term disability
- On long-term disability
- Employed or self-employed part-time
- Homemaker
- Retired
- Student

How long have you been off work?
- Not at all
• Less than 4 weeks
• More than 4 weeks
  o Last date of full-time duties/hours: [yyyy/mm/dd]
  o If applicable, last date of modified work: [yyyy/mm/dd]
  o If applicable, expected return to work date: [yyyy/mm/dd]

Reason for disability leave? Please select the best answer:
• Due to sickness
  o Please describe your symptoms
  o What, if anything, do you believe caused the symptoms?
  o When did the symptoms first appear? [yyyy/mm/dd]
• Due to injury
  o Describe how the injury occurred
  o Date of injury: [yyyy/mm/dd]

What is your occupation?
• Service/Retail, please specify…
• Trades/Labour, please specify…
• Health/Medical, please specify…
• Education/Research, please specify…
• Business/Finance/Administration, please specify…
• Farming/Mining/Oil, please specify…
• Entertainment/Arts, please specify…
• Science/Technology, please specify…
• Law Enforcement/Security/Military, please specify…
• Other, please specify…

How long have you been in your current position with your employer?
• Less than 6 months
• 6 months to 1 year
• 1 to 2 years
• 2 to 5 years
• 5 to 10 years
• 10 or more years

How would you describe your ethnicity?
• White/Caucasian
• Spanish/Hispanic/Latino
• Black/African American
• Asian
• Southeast Asian
• Pacific Islander
• First Nations
How did you hear about the Online Therapy Unit?
- Printed poster or card
- Media (e.g., newspaper, radio, TV)
- Online Source (e.g., website or email)
- Friend/family member/employer
- Physician or other medical health professional
- Mental health professional or health region intake
- Bariatric clinic referral
- Insurance provider
- Other, please specify

Why are you interested in using pain self-management at this time? Please select all that apply.
- There are no face-to-face treatment options available to me right now
- My depression and anxiety symptoms make it difficult to attend face-to-face treatment
- I don’t have time for face-to-face treatment
- I have mobility issues or a medical condition which makes it hard to attend face-to-face treatment
- I can’t afford face-to-face treatment
- I don’t have transportation to attend face-to-face treatment
- I really want to try to manage my symptoms myself
- I don’t want to go see a counsellor/therapist in person
- I saw a counsellor/therapist before and had a bad experience
- I am currently on a waiting-list for face-to-face services and want to do this in the mean time
- Pain self-management was recommended by my insurance/health provider
- I heard about pain self-management and wanted to try it
- Pain self-management seems convenient
- Other

We would like you to indicate below how much you believe, right now that pain self-management will help to improve your lifestyle/functioning.

At this point, how logical does pain self-management seem to you?
- 1 – not at all logical
- 2
- 3
• 4
• 5 – somewhat logical
• 6
• 7
• 8
• 9 – very logical

At this point, how successfully do you think pain self-management will be in raising the quality of your functioning?
  • 1 – not at all useful
  • 2
  • 3
  • 4
  • 5 – somewhat useful
  • 6
  • 7
  • 8
  • 9 – very useful

How confident would you be in recommending pain self-management to a friend who experiences similar problems?
  • 1 – not at all confident
  • 2
  • 3
  • 4
  • 5 – somewhat confident
  • 6
  • 7
  • 8
  • 9 – very confident

By the end of this pain self-management course, how much improvement in your functioning do you think will occur?
  • 0%
  • 10%
  • 20%
  • 30%
  • 40%
  • 50%
  • 60%
  • 70%
  • 80%
Pain Questions

Are you currently experiencing symptoms of physical pain?
Yes | No

Please indicate where you are currently experiencing pain. Please select all that apply:
- Upper back
- Middle back
- Lower back
- Hip
- Leg
- Foot
- Shoulder
- Arm
- Hand
- Head
- Face
- Pelvis
- Other

You have indicated that you experience pain in an area other than the locations provided above. Please describe the other area where you experience pain:

__________________________________________

For how long have you been experiencing pain?
- Less 3 months
- More than 3 months
- Please specify how many months you have been experiencing this pain: ____

Have you had your pain assessed by your general practitioner or specialist?
Yes | No

If yes, when was the last time you had a medical appointment with your general practitioner or a specialist where you discussed your pain?
- Less than a month
- More than month
- Please specify how many months ago: ____
Are you taking any prescription medication for your pain?

Yes | No

If yes, what prescription medication(s) are you taking for pain?

________________________________________________________________________

When did you last have a change in your prescription medication dosage for your pain?
- Less than month
- More than a month
- Please specify how many months ago: ___

**Social Relationships**

What is your relationship status?
- Single, never married
- Married
- Living with partner
- Separated
- Divorced
- Widowed

If you are in a relationship, will your partner know that you are receiving services from us?
- Yes
- No, please explain

If you are in a relationship, do you have any concerns regarding your relationship at this time?

Yes | No

If yes, please explain your difficulties you are experiencing in your relationship.

________________________________________________________________________

Do you have children?
- Yes, how many?
- No

What ages are your children? ____________________________

Do you have any concerns regarding your children at this time?

Yes | No
If yes, please explain.

________

What are your current living arrangements?
- Living alone
- Living with spouse or partner
- Living with spouse or partner and children
- Living with children
- Living with extended family
- Living with roommates
- Other

Medical History
Do you have any current or past medical problems?
Yes | No

If yes, please describe.

________

Do you think these medical problems will interfere with your ability to take part in the course?
Yes | No

Are you receiving any treatment for your medical problems?
Yes | No

If yes, what kind of medical treatment are you receiving?

________

Symptoms of Anxiety

Over the last 2 weeks, how often have you been bothered by any of the following problems?

<table>
<thead>
<tr>
<th></th>
<th>Not at all sure</th>
<th>Several days</th>
<th>Over half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Feeling nervous, anxious, or on edge | 0 | 1 | 2 | 3
2. Not being able to stop or control worrying | 0 | 1 | 2 | 3
3. Worrying too much about different things | 0 | 1 | 2 | 3
4. Trouble relaxing | 0 | 1 | 2 | 3
5. Being so restless that it’s hard to sit still | 0 | 1 | 2 | 3
6. Becoming easily annoyed or irritable | 0 | 1 | 2 | 3
7. Feeling afraid as if something awful might happen | 0 | 1 | 2 | 3

Roughly when did you first start having the difficulties asked about above?
- Never
- Less than a month
- 1-6 months
- 7-12 months
- 1-2 years
- More than 2 years ago

Roughly how many distinct episodes of anxiety do you feel you have had in your lifetime? Please respond using a number.

Symptoms of Depression

Choose the best answer for how you felt over the past week.

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Are you basically satisfied with your life?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>2.</td>
<td>Have you dropped many of your activities and interests?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>3.</td>
<td>Do you feel that your life is empty?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>4.</td>
<td>Do you often get bored?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>5.</td>
<td>Are you hopeful about the future?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>6.</td>
<td>Are you bothered by thoughts you can’t get out of your head?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>7.</td>
<td>Are you in good spirits most of the time?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>8.</td>
<td>Are you afraid that something bad is going to happen to you?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>9.</td>
<td>Do you feel happy most of the time?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>10.</td>
<td>Do you often feel helpless?</td>
<td>YES / NO</td>
</tr>
<tr>
<td>11.</td>
<td>Do you often get restless and fidgety?</td>
<td>YES / NO</td>
</tr>
</tbody>
</table>
12. Do you prefer to stay at home, rather than going out and doing new things?  YES / NO
13. Do you frequently worry about the future?  YES / NO
14. Do you feel you have more problems with memory than most?  YES / NO
15. Do you think it is wonderful to be alive now?  YES / NO
16. Do you often feel downhearted and blue?  YES / NO
17. Do you feel pretty worthless the way you are now?  YES / NO
18. Do you worry a lot about the past?  YES / NO
19. Do you find life very exciting?  YES / NO
20. Is it hard for you to get started on new projects?  YES / NO
21. Do you feel full of energy?  YES / NO
22. Do you feel that your situation is hopeless?  YES / NO
23. Do you think that most people are better off than you are?  YES / NO
24. Do you frequently get upset over little things?  YES / NO
25. Do you frequently feel like crying?  YES / NO
26. Do you have trouble concentrating?  YES / NO
27. Do you enjoy getting up in the morning?  YES / NO
28. Do you prefer to avoid social gatherings?  YES / NO
29. Is it easy for you to make decisions?  YES / NO
30. Is your mind as clear as it used to be?  YES / NO

Roughly when did you first start having the difficulties asked about above?
  • Never
  • Less than a month
  • 1-6 months
  • 7-12 months
  • 1-2 years
  • More than 2 years ago

Roughly how many distinct episodes of depression do you feel you have had in your lifetime? Please respond using a number.

________________________

**Program Concerns**

Do you have concerns participating in the pain self-management course? If yes, please explain.
Yes  |  No

Do you have any concerns about having the time to complete the course? If yes, please explain.
Yes  |  No
Do you have any concerns about sending messages to the primary researcher or research staff? If yes, please explain.
Yes | No

Do you have any concerns about talking on the phone with the primary researcher or research staff? If yes, please explain.
Yes | No

From time to time, researchers are interested in conducting additional research studies. If you have provided a response on the online screen that would indicate that you may be eligible for a future study, would you like to receive an email invite?
- Yes, I give permission for the Online Therapy team to send me an invite to future research projects
- No
Appendix D: Telephone Screening Protocol

ID Number ___________________________
Reviewing Staff ___________________________

Script:

a) Hi, could I please speak to XXXX?

b) XXXX, this is _______ calling from the XXXX. Have I called at a good time?

c) I wanted to thank you for your interest in the Pain Course. I am one of the XXXX at the XXXX and I’m working on the Course.

d) I am calling to complete the application process with a brief and basic telephone discussion. The purpose of the call is to:

   1. Make sure the Course is suitable and likely to be helpful for you.
   2. Share a little about others’ experiences and their suggestions for getting the most out of the Course
   3. Answer any questions you might have and, if the course is going to be helpful, discuss what the Course consists of and when you might start.

e) This call will probably take about 15 to 20 minutes. Do you have time right now?

I’ll probably do a fair bit of talking for this call. But, I want you to feel comfortable to stop me if you have any questions or anything doesn’t make sense. Is that okay?

Confidentiality:
Before we begin, I would like to let you know that although this phone call is confidential there are some limits to confidentiality and these include:

- If you pose a threat to your life or another individual’s life or
- If a child is at risk of abuse, we are required to break confidentiality in order to prevent harm.

Do you agree?

- No ... Cannot participate.
- Yes

Contact Information:

Participant Name: _________________________________
Address: _______________________________________________________

Phone: _________________________

Permission to leave a message:  
Yes | No

Email: _____________________________________

Date of birth (yyyy-mm-dd): _________________

Sex: ________

Is the client information correct?  
Yes | No

What corrections need to be made to client information?

Land location/physical address: __________________________________________

Also, can you confirm that you are comfortable with me mailing and emailing you (if no, then cannot participate)?  
Yes | No

Medical Contact:  
Name of Medical Contact: __________________________
Type on contact: ________________________________
Medical Clinic Name: ____________________________
Address: _______________________________________________
Clinic Phone Number: ____________________________

Is the medical information correct?  
(Please ensure that the address provided by the client is correct and that they understand that a letter will be mailed to the contact they have provided).  
Yes | No

What needs to be corrected?  
________________________________________________________________________

The medical contact you have provided will receive a letter indicating you are taking part in the program. They will serve as an emergency contact and will be asked to contact the
unit if there are any concerns about your participation in the program to facilitate continuity of care.

Confirmed permission to contact?
(Please ensure that the address provided by the client is correct and that they understand that a letter will be mailed to the contact they have provided).
Yes | No

**Symptom Inclusion:**
Depression Details:
*Start of depression:* _______
*How many episodes:* ______

Anxiety Details:
*Start of anxiety:* _______
*How many episodes:* ______

Which symptoms do you find most troubling for you?
________________________________________________________________________

________________________________________________________________________

Has anything happened to cause problems with anxiety and depression to get worse?
________________________________________________________________________

________________________________________________________________________

Symptoms worse notes: ______________

Severe symptoms – Refer out?
- Symptoms are too severe to take part in the study
- Accept

**Medical Conditions:**
Do you have any current or past medical problems?
________________________________________________________________________

Do you think these medical problems will interfere with your ability to take part in one of our courses?
________________________________________________________________________

Medical problem – Refer out?
- Response reveals medical problems that would inhibit active participation in the online course as delivered
• Accept

**Pain Inclusion:**
*Are you currently experiencing symptoms of physical pain? __________*

*For how long have you been experiencing pain? __________*

*Have you had pain assessed by your general practitioner or a specialist?*

________________________________________________________________________

*When was the last time you had a medical appointment with your general practitioner or a specialist where you discussed your pain?*

________________________________________________________________________

*Exclude from pain course if:*
  • Pain has not been present for 3 months or longer

**Other Problems:**
*Do you have any other problems that you would like to share that you have not been asked about in this screening?*
  • Yes
  • No

**Notes:** ______________________________________

**Other problems – Refer out?**
  • *Client reports another problem that is significant and would interfere in their success with pain self-management*
  • *Accept*

**Wait List:**
*Are you currently on a waiting list to receive mental health treatment (e.g. from a social worker, psychologist, psychiatrist? __________*

**Provider type:**
  • Psychiatrist
  • Psychologist
  • Social Worker
  • Nurse
- Family Doctor
- Nurse Practitioner
- Clergy or Spiritual Leader
- Other

Waitlisted for another service and will drop self-management program – Refer out?
- Response reveals that will drop pain self-management once obtain desired service
- Accept

**Current Treatment:**
Are you currently receiving treatment for mental health concerns?
- Provider type
- Psychiatrist
- Psychologist
- Social Worker
- Nurse
- Family Doctor
- Nurse Practitioner
- Clergy or Spiritual Leader
- Other

Receiving other treatment – Refer out?
- Currently receiving significant treatment (more than twice a month) that would interfere with participation
- Accept

Have you taken psychotropic medications in your lifetime? _____________

Have you taken any medications for your mental health concerns in the last three months?
__________________________________________________________________________

When did you last have a change in your medication dosage for mental health concerns?
__________________________________________________________________________

- Pain Self-Management Program:
Which statement best describes your current thoughts about working on your symptoms?

What is motivating you to seek pain self-management at this time?
Things to consider:
What is your motivation for doing our program?
What do you hope to gain through your participation in this specific program?

Concerns about motivation – Refer out?
• Response suggests low motivation for pain self-management
• Accept

Concerns Matrix:
Concerns about the Online Therapy in general:
• Refer out
• Accept

Concerns about time to do the course:
• Refer out
• Accept

Concerns about sending messages:
• Refer out
• Accept

Concerns about using the phone:
• Refer out
• Accept

Any other notes: __________________________________________________

Inclusion/Exclusion Summary:
• Suicide risk
• Low motivation for self-management program
• Significant concerns with the format of the program (messages/phone/online treatment in general)
• Significant concerns about having the time to commit to the program
• Client did not agree to the terms of confidentiality
• Will not give permission for email contact during the program

• Basic eligibility not met

• Inclusion criteria not met – Refer out?
  
  ○ Client not eligible for the Pain Course

**Decision:**
*Based on this screening, I think the Pain Course would be a good fit for you. The way the course is set up, you will work on five core lessons over 8 weeks. A new lesson will be released in week 1, 2, 4, 5, and 7. Clients work on the first lesson and third lesson for 1 week and the other lessons for 2 weeks. In addition to the core materials, there are additional resources available to you as well, such as materials related to sleep, problem solving or assertiveness.*

*Would you like to go ahead with signing up?*

Final decision (select the anticipated decision to view course descriptions):

• Accepted to Pain Course
• Refer out

Receive confirmation from the client that they will complete outcome measures (if no, then cannot participate).

*We are able to offer this course free of charge because it is part of a research project that is looking at evaluating the long-term outcome of the course. In order to accomplish this, we require that participants complete questionnaires before starting the program, at the end of the eight weeks, and at 4 weeks after completing the course. These measures take about 10-15 minutes to complete, but the information is essential for us to assess how helpful this course is and how it can be improved. Even if you do not complete the course, we will still request this information because it helps us understand what changes need to be made. I know three months is a long period of time however, you don’t need to remember your self. We will send you an email when it comes time to complete the measures.*

*Is that something you are willing to do?*

*Yes | No*

Client responses indicate they no longer meet basic eligibility for:

• Residency
• Age
• Access to a computer/internet
- Comfort writing or using internet
  (The above field is not required. If client provides information suggesting that they should have endorse basic eligibility exclusion and didn’t please complete.)

Exclusion Reason:
- GAD-7 and GDS-30 greater than 10 and 19
- Suicide risk
- Medical condition interference
- Wants primary help with another condition
- Mental health treatment more than 2 times/month
- Wait for mental health treatment and will drop
- Concerns about pain self-management and format of program (low motivation, not available, no computer)
- Concerns about medical contact
- Will not be in country during program
- Client will not be 65 years of age at start of course
- Not a resident of one of the 10 provinces in Canada
- Have not been experiencing pain for more than 3 months

Referral:
- Referral not wanted
- Referral made to: ___________________________
Appendix E: Pain Course Consent Form

Pain Course for Older Adults
Self-Management Information

Please take the time to carefully read the following information. This information includes a description of the Online Therapy Unit, the associated research project, as well as the terms and conditions of participation. If any of the presented information is unclear, please e-mail the primary researcher, Ainsley MacIntyre, at aam549@uregina.ca, for clarification. You may also phone the Health Psychology Lab at 306-585-4428. If you understand and accept the terms and conditions presented, your informed consent will be required before you can participate. The consent form is located at the end of this document.

Please note: The Pain Course for older adults is not therapy. It is a psychoeducational self-management program. Educational materials and prevention strategies will be provided to those experiencing chronic pain.

Project Title: A pain self-management program for older adults: Online vs. workbook delivery

Background: Guided internet self-management has been shown to effectively treat various problems, such as anxiety, depression, and chronic pain. To date, however, this service has not been widely available in Canada. The Online Therapy Unit has since adapted pain self-management programs that were developed and tested by a team in Australia, and this program has been tailored to older adults. We are now accepting patients aged 65 years and older to receive a remotely-delivered Pain Course for older adults.

As you complete the course, information will be collected from you for a research project aimed at understanding how many people complete the Pain Course, who is satisfied with the Pain Course, and how effective the Pain Course is at relieving symptoms of pain, anxiety, and depression in the short- and long-term. Additionally, we will examine patient characteristics that predict the effectiveness of the Pain Course.

In this study, the primary researcher will be examining the overall effectiveness of remotely-delivered pain self-management compared to prospective participants who are first placed on a twelve-week waiting list. Some participants in the trial will receive the Pain Course for Older Adults immediately, while others will be placed on a twelve-week wait list control before being eligible to enrol in the Pain Course for Older Adults. Participants who take part in this study will be randomized to one of three groups immediately after completion of the preliminary screening. Assignment to these conditions (Online or Workbook, or Wait List) is determined randomly by chance.
In the **Intervention** condition, participants will be offered to begin the Pain Course for Older Adults immediately. As you complete the course, information will be collected from you for the present research project, which is aimed at understanding how many people complete the Pain Course for Older Adults, who is satisfied with the Pain Course for Older Adults, and how effective the Pain Course for Older Adults is at relieving symptoms of. Additionally, we will examine patient and guide characteristics that predict the effectiveness of the Pain Course for Older Adults.

In the **Wait List** condition, participants will be placed on a twelve-week waiting list and will be asked to complete questionnaires at initial enrolment on the waiting list, eight weeks after enrolment on the waiting list, and at the end of the twelve-week waiting period. Participants will be contacted at the end of the twelve-week waiting period and will be given the opportunity to enrol in the Pain Course for Older Adults, regardless of questionnaire completion.

**Assessment Results:** Based on your responses to the preliminary screening, you are experiencing chronic pain, and therefore are eligible to take part in this Pain Course. You should be aware that the Online Therapy Unit screening is not meant to take the place of best practice, traditional, and clinically-based assessments. If the information you were provided in the screening was upsetting, or if you disagree with this information, you can call us to discuss these concerns.

**Procedure:** After you read this Information Page, you will be asked to provide your informed consent to participate in the Pain Course and complete questionnaires.

1. **Remotely-delivered pain self-management:** The Pain Course, which is delivered in online and workbook formats, is composed of **5 lessons**. Lessons consist of psychoeducational materials that help you apply the skills you are learning in daily life. This is a **short-term support program**, and you should be able to complete the course in **8 weeks**. It is important to note that the Pain Course is not intended for long-term support.

During the Pain Course you will have support from a guide. The guide is a graduate student in gerontology. The guide will be checking in with you by phone each week to see if you have any questions or concerns and to offer encouragement and support in trying different strategies from managing chronic pain. If your guide is unable to reach you, they will also follow up with a message on the secure message system on the website (Online Group) or via telephone (Workbook Group). If a participant cannot be researched via telephone, the guide will leave a voicemail. Using the message system that exists on this website, you may message your guide to receive assistance with the lessons and exercises. For the participants without internet, the guide will contact participants via the telephone. You are free to contact your guide when it is convenient for you, and
she will respond to your messages once a week. Your guide will let you know which day of the week she will be checking in with you.

2. Questionnaire: At pre-treatment, post-treatment, and four-week follow-up you will complete questionnaires about your pain, depression, and anxiety symptoms to help your guide track changes in your symptoms. All participants with internet access will be encouraged to complete the questionnaires online. If participants don’t have access to the internet, they will complete the questionnaires on paper and return them using self-addressed stamped envelopes that we will provide. These questionnaires are brief and will take roughly 10 minutes to complete. Your guide will receive a summary of the results of these questionnaires.

To evaluate whether this program is effective, you will be asked to complete additional questionnaires about your symptoms and quality of life. These questionnaires will be completed at pre-treatment, post-treatment, and four-week follow-up. They will take approximately 30 minutes to complete. You will also answer questions regarding your relationship with your guide and your satisfaction with the service at the end of the course. Because these questionnaires pertain directly to your guide, your guide will not have access to your responses, but instead they will be reviewed by researchers.

To help us evaluate the long-term effectiveness of the Pain Course, you will be contacted by e-mail (Online Group) or via telephone (Workbook Group) four weeks after you complete the program. You will be asked to complete the questionnaire on paper and return them using provided self-addressed stamped envelopes (Workbook Group) or return to the website (Online Group), which will take approximately 30 minutes to complete. At this point, your responses to the questionnaires will be examined by researchers and not your guide. The researchers will not be looking at your responses individually, so they will not be aware of your identity.

You are not obliged to answer any question that you find objectionable or which makes you uncomfortable. In the event you are uncomfortable answering a question please contact the primary researcher at 306-585-4428.

In summary, you will be asked to complete questionnaires on 3 occasions:
- When you begin the Course
- After completing the Course
- Four weeks after you complete the Course

Your program will cover the following information:

<table>
<thead>
<tr>
<th>Lesson 1:</th>
<th>Introduction to the purpose and content of the course; education about chronic pain, anxiety, and depression; information about pain</th>
</tr>
</thead>
</table>

perception; learning about the cycle of symptoms; and instructions for identifying symptom interactions. (Week 1)

Lesson 2: Education about unhelpful thoughts; and practical strategies to learn how to manage thoughts and pain. (Weeks 2 & 3)

Lesson 3: Education about the physical symptoms associated with anxiety and depression, as well as their impact on pain; and skills for managing these symptoms. (Week 4)

Lesson 4: Education about problematic behaviours associated with anxiety, depression, and pain; address the issues of fear and avoidance behaviours; and practical skills for overcoming these symptoms. (Weeks 5 & 6)

Lesson 5: Information on lapses of symptoms; preparation to end the program; planning for after the program; and instructions on how to create a relapse prevention plan. (Weeks 7 & 8)

Possible Benefits & Challenges: There are potential benefits and challenges associated with receiving remotely-delivered support.

<table>
<thead>
<tr>
<th>Potential Benefits</th>
<th>Potential Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You do not need to schedule an appointment for the Pain Course.</td>
<td>• The Pain Course may require more self-motivation than other forms of services</td>
</tr>
<tr>
<td>• You avoid having to visit an office, which can be convenient if you have concerns like transportation, stigma, limited time.</td>
<td>• Without non-verbal cues, there is a greater potential for misinterpretation of e-mail messages or telephone conversations between you and your guide.</td>
</tr>
<tr>
<td>• You can have more control when you work on therapeutic activities.</td>
<td>• There is a risk for breaches of confidentiality (see below).</td>
</tr>
<tr>
<td>• You can access the online or workbook material from the location of your choice at your convenience. If you would like to continue referencing materials after the course, you can print off the pages.</td>
<td>• There is potential for technology failures that may result in messages not being received by either you or your guide.</td>
</tr>
<tr>
<td>• You can e-mail your guide through our secure website or reach them via telephone.</td>
<td>• The remotely-delivered Pain Course is a newer form of self-management, so there has been less research conducted when compared to face-to-face treatment.</td>
</tr>
<tr>
<td>• You may feel more comfortable disclosing personal information online or via telephone than in person.</td>
<td>• This service is provided free of charge.</td>
</tr>
</tbody>
</table>
Limitations of Self-Management for Pain: There is growing evidence that pain self-management is an effective and beneficial program for a range of problems; however, it is still in the early development phases, and as a result, there is currently less research available on its effectiveness when compared to established treatments, such as face-to-face treatment. It is acknowledged that there are limitations to the services provided on the Online Therapy Unit website, and this form of self-management is not intended to replace face-to-face treatment. This form of self-management is also not intended for emergency services or as a form of long-term support. If, during the course of this program, you feel that the Online Therapy Unit website does not meet or address your needs, you are advised to consult with your closest health or mental health professional.

Alternatives to the Remotely-Delivered Pain Course: Before consenting to this type of self-management program, you should consider the alternatives to the remotely-delivered Pain Course, including in-person treatment, confiding in friends or family, taking part in community programs that may be available to you, written self-help resources, visiting a family physician, or not seeking treatment at all. It is also possible that during the Pain Course, your guide may determine that in-person treatment would be more suitable for you. Situations where the Pain Course is not appropriate include if you were to become involved in a crisis situation, if there are risks to personal safety present, if you require specialized medical treatment, and if you need support that is more long-term, interactive, or intensive. The Pain Course may also not be suitable for you if you are unable to keep up with the suggested timeline of one to two weeks per lesson. If in-person treatment is more suitable for you, your guide will assist you in finding appropriate in-person services in your area, with your consent.

Pace of Course: The program is made up of 5 lessons. It is recommended that you spend 1 week on lessons 1 and 3, and 2 weeks on lessons 2, 4, and 5. If you require more than the recommended time, your guide may speak with you about alternatives to the Pain Course. If you do not log onto the website for over a week, your guide will contact you by phone to check in with you. You will have 8 weeks to complete the Pain Course. At the end of the 8-week program, you will continue to have access to the course material on your account for 3 months. Unless you make prior arrangements with the unit coordinator and guide, you will no longer have access to your assigned guide at the end of the 8-week time period; however, you are able to contact the primary researcher at 306-585-4428 with any questions during that time.

Guidance: Your guide will be logging into the website at least once a week. When your guide logs in, she will be able to review your progress, the pages you have viewed, and any messages you have sent over the last seven days. By reviewing this information, your guide is able to provide you with feedback and support and answer any questions you may have. If your guide notices that there has been a large increase in depressive
symptoms and/or you are having frequent thoughts about death or hurting yourself, then she will contact you by telephone to gain more information and to provide support.

Throughout the Pain Course, you will receive periodic notification emails to the email address you provide during your screening interview or telephone calls. These emails or telephone calls provide brief but important reminders from the unit. In order to facilitate the delivery of these notification emails to your off-system email, it is necessary to store your email address on our secure server.

Copyright and Intellectual Property Material contained on the Pain Course is copyright © University of Regina (except where otherwise indicated) or is used with permission or under license. You may download, print and reproduce this information in an unaltered form for your own personal use. All other rights are reserved. Requests from further permission to use this material should be directed to: Ainsley MacIntyre, the primary researcher for this project.

**Voluntary Participation and Ability to Withdraw:** Participation in the Pain Course is voluntary. Should you choose not to participate, or if you wish to withdraw from the study at any time after starting, you may do so without any consequences to your present or future health care. If you decide to discontinue the Pain Course, please inform your guide. If you do not communicate your withdrawal to your guide, the guide will be required to contact you weekly until the end of the eight-week program.

Once your guide has communicated to the unit that you wish to withdraw from the Pain Course, you will receive an email to the email account or telephone number you provided confirming your requested withdrawal from the program. In this email or telephone call, you will also be given the option to return to the site and provide your feedback on your experience and answer the same questionnaires that you would have answered if you had completed the course. These questionnaires will take approximately 30 minutes to complete. If you do not want to receive this email or telephone call please notify your guide at the time of withdrawal.

**Limits of Confidentiality:** Although these circumstances are rare, there are certain limits to confidentiality that every participant must be aware of:

- If you pose an immediate threat to your life, or another individual’s life, confidentiality may be broken in order to prevent harm.
- If you disclose information suggesting that any child is at risk of abuse, the Ministry of Social Services will have to be notified.
- If you become involved in a legal case, the judge has the right to subpoena any information relevant to the legal problem.
- If you are concerned about your guide’s professional conduct (or his/her supervisor’s), it may be necessary to release information from your file to evaluate and address this concern.
• If you request that information be released to another provider or your insurer, this request will be carried through.

**Supervision:** Students who are under supervision need to discuss their cases with their supervisor. By signing up for the Pain Course, it is necessary for you to accept and consent to the disclosures about your case that occur between the guide and their supervisor. In addition, your emails may be downloaded and printed by the guide for these purposes. Any document used for these purposes will mask your identifying data and will be shredded when no longer needed.

**Storage of Research Information:** For the purpose of evaluation the Pain Course, your responses to questionnaires will be pulled and kept in a computer file or securely locked in the Health Psychology Lab that will be available to the research team. This file will not contain any of your identifying information.

- For research purposes, scores from any questionnaires you respond to will be summarized across all participants, so that individual responses will not be linked to a specific person in any publication of our results. Therefore, you as an individual will be excluded from discussions, study reports, and presentations.
- Any details that could potentially reveal your identity will be excluded from discussions, study reports, and presentations.
- All information collected for this study will be kept in a locked office at the University of Regina and held for a minimum of 7 years following publication after which time they will be destroyed.

**Communications from your guide:** As a client, you agree not to share your guide’s communications with anyone else unless your guide provides written and informed consent. You also agree not to give advice based on the communications, or show communications to others, out of context.

For the purposes of understanding the nature of the Pain Course, email exchanges between the guide and the client may be examined. If email exchanges are examined we will ensure that identifying information is not revealed.

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**Possible Risks for Breaches of Confidentiality:** As an internet-based study, there are unique risks that may compromise your privacy that exist with any internet-based service. A description of these risks follows:
1. When submitting information to your guide through the internet, including questionnaires and e-mail messages, there is a possibility your information will be intercepted by unauthorized third parties using sophisticated tools. It should be noted that this rarely occurs, although it is a risk about which you should be advised. In order to limit this risk, the Online Therapy Unit system utilizes encryption in the form of HTTPS to transmit the data both to and from yourself and your guide. The data that is stored within the Online Therapy system, such as messages to your guide and responses to questionnaires, are encrypted with AES encryption. Furthermore, the system itself uses strict access controls whereby users of this system are only able to access their own information.

Any computer connected to the Internet will store information about visited websites on the Internet in the browser’s history list and browser’s cache. The responses to the questionnaires are only temporarily stored on your computer until you close down your browser window. In other words, after you complete and submit your responses, your computer will discard this information. However, some of this information may remain in your browser’s cache. You may also delete this information, as well as information about visiting the Online Therapy Unit website, by clearing your history list and browser’s cache.

2. Your messages are stored in the database, and on the server, that hosts the Online Therapy Unit website. This server is located in secure facilities at the University of Regina. The content of the messages are encrypted using AES encryption with 256bit key length (double industry standard). The Online Therapy system enforces strict access controls, and only your assigned guide (and supervisor) can contact you and see your process throughout the Pain Course.

3. After your questionnaires are completed, the information you provide will be sent directly to the survey software website over a secure connection. The information will then be encrypted and securely stored in the database at which point it is only accessible by your guide and researchers. However, your guide will not have access to any questionnaires related to how you rate them or the therapeutic process. All responses will be periodically retrieved for research purposes. This data will be kept in a secure location by the researchers until completion of the study. The results will be stored on a secure file, and the information will not be linked to your Internet address.

Methods Used to Protect Your Information

In order to protect the privacy of your information while you are a user of the Pain Course, we have several precautions in place. However, you should be aware that it is not possible to safeguard against every possible risk. The precautions we use are as follows:

1. To make certain features of the web application possible, you have been asked to provide the unit with a personal email which will be associated with your
therapeutic account for the purposes of email notifications from the system. This address is not released to any third parties.

2. Your login user name and password are specific to you.

3. Messages exchanged within the Online Therapy program are encrypted. This reduces the likelihood of unauthorized access to your communications.

4. The University of Regina, which hosts the Online Therapy Unit website, has firewall protection to protect from external threats.

5. The access to the Online Therapy server is strictly controlled, and the server is housed in a secure environment within the University of Regina. This means that limits are in place for who has access to the server. The only people with access are the primary project developers, the server administrators, and the service administrator.

There are also various things that you can do to protect your information:

1. Use your home computer instead of a computer in a shared space, such as a library or office.

2. Make sure the computer you are sending emails from is secure.

3. Do not share your login information with anyone, and do not use a password that is easily guessed by others. The research staff will never ask for your password. In the event you were contacted and asked for your password please contact the unit directly to report it.

4. When you leave your computer or are done working with the web application ensure you have logged out.

5. Since your internet browser stores information in its memory, or disk cache, you can clean the cache after you use the computer. Certain browsers have “Privacy” modes that can be enabled. Once in this mode, the user’s interactions are not saved to browser history and no data is stored in browser cache. Once the browser is closed or this mode is exited, there are no browser records of any of the interactions that occurred while in the “Privacy” mode. Firefox has this feature, and is, therefore, highly recommended for use with Online Therapy USER system. Browser that do not have this mode, or users that do not use this feature, must mutually purge their browser history and cache to prevent others from seeing their web interactions.

6. Enable either the firewall software that came with your operating system (e.g., Windows firewall), or install a reputable 3rd party software, such as ZoneAlarm. Firewalls protect your computer and information from network attacks and threats.
7. Use anti-virus software to both prevent and recover virus programs. While most anti-virus software is for purchase, there are free software options available to download. However, one must be cautious in order to avoid downloading and installing malicious software that appears to be legitimate.

8. Malware-detection software (such as Spybot: Search and Destroy, Microsoft Security Essentials) can be used to scan your computer for software and files that may be leaking your personal information to 3rd parties.

For Your Safety:

1. In event of high suicide risk, we will contact your family physician or medical clinic whose information you provided to use in the screening interview in order to discuss treatment options.
2. Please inform us of any changes in your physical or mental health status that may have an impact on your ability to participate in the Online Therapy Unit program.

Emergency Situations: In the event that your guide suspects you are at risk for harming yourself or others, they will contact you by telephone.

The Online Therapy Unit is not a crisis service and may not be able to respond immediately. In the event that your circumstances change during your participation in the Pain Course and you become unsure of your ability to keep yourself safe we ask that you immediately contact your family physician or Emergency Services (911) to ensure that you receive the help you need without delay.

Multiple Roles: It is the responsibility of the guide to avoid holding multiple roles with clients (e.g., friend, business partner). This means that the guide is expected to establish and maintain a professional relationship with their client. Likewise, the client is expected to respect this obligation, as well as the guide’s ethical and professional boundaries. Due to the guide’s limited amount of time, you may not receive an immediate e-mail response or telephone call, or a response every e-mail/telephone call that you send or make. The guide will also be unable to meet requests through social networking websites (e.g., Facebook).

Potential Unavailability: In the event that your guide is unable to access their e-mail messages or respond to telephone calls due to unforeseeable circumstances (e.g., sickness, injury) then another researcher involved in the project will advise you of the situations and you will then be given options for how you would like to continue with the Pain Course. For example, depending upon your circumstances, your guide’s supervisor, or a replacement guide, may be assigned to you. If your guide has a planned temporary absence (e.g., holiday or work-related absence), you will be informed in advance by your guide and provided with options for how you would like to proceed during this time.
**Termination of the Pain Course:** You may withdraw from participation in the course at any time. Otherwise, the Pain Course will be complete when you have completed 5 lessons within the 8-week period. If you would like to refer to the lessons after the course, you may do so by printing off the desired materials prior to your account being deactivated (Online Group). If you need longer than 8 weeks to complete the course, please contact your guide to determine whether an allowance can be made (e.g., because of sickness or holidays).

**Ethics Approval:** This research project has been approved on ethical grounds by the Research Ethics Board (REB) of the University of Regina. Any questions regarding your rights as a participant may be addressed to that committee through the University of Regina Ethics Board at 306-585-4775 or email: research.ethics@uregina.ca. Out of town participants may call collect.

**Access to Study Results:** A summary of this study’s results will be posted on this website (www.onlinetherapyuser.ca) once all data have been collected and analyzed. If you have any further questions about the research findings, please feel free to contact the Online Therapy Unit using the information listed below:

**Ainsley MacIntyre**  
**Department of Gerontology**  
University of Regina,  
Regina, SK S4S 0A2  
Ph: 306-585-4428

**Technical Questions:** If you have any technical difficulty with the Online Therapy Unit program, contact the primary researcher, at 306-585-4428. You can also email at her at aam549@uregina.ca
Appendix F: Treatment Satisfaction Questionnaire

1) Overall, how satisfied were you with the Course?
   - Very satisfied
   - Satisfied
   - Neutral
   - Dissatisfied
   - Very dissatisfied

2) Would you feel confident in recommending the Course to others?
   - Yes
   - No

3) Was the Course worth your time?
   - Yes
   - No
4) **How has participating in the Course affected your confidence that you can learn to manage symptoms of stress and worry?**

- [ ] Greatly increased
- [ ] Increased
- [ ] No change
- [ ] Decreased
- [ ] Greatly decreased
- [ ] I've never had any difficulties with stress and worry
5) How has participating in the Course affected your confidence that you can learn to manage symptoms of low mood?

- Greatly increased
- Increased
- No change
- Decreased
- Greatly decreased
- I've never had any difficulties with low mood
6) How has participating in the Course affected your confidence that you can learn to manage your day-to-day activities despite pain?

- Greatly increased
- Increased
- No change
- Decreased
- Greatly decreased
- I've never had any difficulties with my day-to-day activities because of pain

7) What did you NOT LIKE about this Course? How would you suggest that we change or modify this for future participants?

__________________________________________________________________________
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8) What did you MOST LIKE about this Course?
9) Finally, it would be great for future participants to read about the experiences of someone who has completed the program. If you would like to, please feel free to write a couple of sentences that summarizes what you have learned or a message to future participants. Put 'N/A' if you have no specific feedback. Please note that to protect your privacy, your sentences will be anonymous as your name will be changed.