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Engagement in online pain self-management improves pain in adults on medication-assisted behavioral treatment for opioid use disorders

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HIGHLIGHTS

- Online pain programs can reduce symptoms for people with pain and opioid use disorders.
- Pain self-efficacy is inversely related to pain, depression and opioid misuse.
- Strategies to improve online program engagement are needed.

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ABSTRACT

Introduction: Persistent pain has been recognized as an important motivator that can lead individuals to misuse opioids. New approaches are needed to test pain treatments that can improve outcomes for people with persistent pain in medication-assisted behavioral treatment for opioid use disorder. This study piloted an online pain self-management program to explore acceptability and treatment effects.
Methods: A sample of 60 adults diagnosed with chronic non-cancer pain and receiving medication-assisted behavioral treatment at one of two clinics were randomized into either treatment group with access to an online pain management program or waitlist attention control. Participants received online surveys via email at baseline and post-treatment at week 8.
Results: The majority of participants (n = 44; 73%) reported that their first use of opioids was in response to a painful event. Those who engaged in the online program had significantly lower pain interference, pain severity, opioid misuse measures, and depressive symptoms after eight weeks while pain self-efficacy was increased.
Conclusion: Our results suggest the online pain self-management program content may be helpful for managing physical and emotional symptoms experienced by individuals with co-occurring pain and opioid use disorders. To improve online engagement, more support is necessary to assist with technology access and completion of online activities.

1. Introduction

Persistent pain has been recognized as an important motivator that can lead individuals to misuse opioids (Blanco et al., 2016). Failure to appreciate the influence of pain on the 2 million Americans in treatment for opioid use disorder (OUD) likely reduces the possibility of successful recovery (Volkow & McLellan, 2016). An estimated 62% of people in medication-assisted behavioral treatment (MAT) for OUD have co-existing persistent pain (Dunn, Brooner, & Clark, 2014; Dunn, Finan, Tompkins, Fingerhood, & Strain, 2015) compared to about 19% in the general population (Kennedy, Roll, Schraudner, Murphy, & McPherson, 2014). Poorly managed pain could be one contributor to the rise in opioid overdose rates as people often use substances to "self-medicate" pain and its related symptoms (Alford et al., 2016). Opioid overdose death rates have more than tripled in the past two decades and are now the second leading cause of accidental death in the U.S. (CDC, 2017). Although there is growing recognition that adequate pain care is lacking for people with OUD and that novel, nonopioid alternatives are needed (Blanco et al., 2016), no consensus exists regarding how to best treat persistent pain in adults receiving MAT for OUD

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(Eyler, 2013).

MAT combines behavioral health and opioid agonist (e.g. methadone), partial-agonist (e.g. buprenorphine), and antagonist (e.g. naltrexone) treatment to optimize recovery (Substance Abuse and Mental Health Services Administration [SAMHSA], 2015). Few studies have evaluated the effectiveness of adding various pain treatments to supplement usual care for MAT populations (Eyler, 2013). People in MAT face unique challenges related to pain care, including heightened sensitivity to pain (Brush, 2012; Zahari et al., 2016), high opioid tolerance (Athanasos et al., 2006), and more severe co-existing mental health and medical disorders (Dunn et al., 2014; Eyler, 2013). Many MAT participants do not have insurance plans that cover potentially helpful nonopioid pain therapies, such as acupuncture or cognitive behavioral therapy (Dunn et al., 2014). Importantly, many providers do not prioritize pain care for patients in MAT and on-site support for pain management is rarely available within OUD treatment centers (Berg, Arnsten, Sacajiu, & Karasz, 2009). Pain treatment is challenging, in part, due to dangerous synergistic consequences that can occur when methadone is prescribed in conjunction with other pain-relieving medicines, particularly other opioids (Berg et al., 2009; Chou et al., 2014). As a result, pain is frequently managed inadequately or inappropriately among MAT populations (Berg et al., 2009).

One potential solution to reduce demands for opioid medicines is to increase emphasis on psychosocial interventions and non-pharmacological pain treatments (Hallinan, Osborn, Cohen, Dobbin, & Wodak, 2011). Self-management programs have been well-established as a means to teach coping skills that promote greater control over chronic health symptoms, which in turn can affect long-term health outcomes (Foster, Taylor, Eldridge, Ramsay, & Griffiths, 2007). Rooted in Bandura's Social Cognitive Theory (1997), self-management programs are designed to boost self-efficacy and thereby improve one's confidence in regulating troubling symptoms. Such programs are increasingly being applied to mental health (Arensman et al., 2015; Wolf, 2011). National guidelines advocate pain self-management as a standard of care for people with persistent pain (U.S. Department of Health and Human Services, 2016). Pain self-efficacy is considered a key influence in pain self-management program outcomes and is linked to positive changes in pain coping, pain tolerance, emotional distress, and disability (Keefe, Rumble, Scipio, Giordano, & Perri, 2004). Pain self-efficacy is consistently found to be a protective factor for adaptive adjustment to persistent pain and is associated with reduced functional impairment, affective distress and pain severity (Jackson, Wang, Wang, & Fan, 2014). Further evidence links self-efficacy to improvements in substance abuse treatment (Kadden & Litt, 2011). Despite this promising evidence, little is known about how to engage people in MAT in pain self-management programs and whether doing so can affect their pain and other pertinent outcomes.

Our past research, along with a number of published studies, find online pain self-management programs to be an acceptable, cost-effective means of providing evidence-based pain management content that can decrease pain and improve affective symptoms and opioid misuse behaviors (Macea, Gajos, Daglia Calil, & Fregni, 2010; Ruehlman, Karoly, & Enders, 2011; Wilson, Roll, Corbett, & Barbosa-Leiker, 2015). To our knowledge, no online pain self-management interventions have been tested within MAT outpatient settings. However, computer-assisted psychosocial technologies have demonstrated greater rates of opioid abstinence than standard care when used in conjunction with MAT, providing rationale for the present study (Marsch et al., 2014). We piloted the online *Goalistics Chronic Pain Management Program* (CPMP) among adults enrolled in MAT who had OUD and a co-existing persistent pain diagnosis. As this was the first randomized controlled trial of the CPMP with a population in substance use treatment, we sought to determine whether engagement in CPMP would be possible and/or beneficial for adults in MAT. The specific study aims were: 1) characterize and examine relationships between baseline levels of pain intensity and interference, depression, anxiety, opioid withdrawal, opioid misuse and pain self-efficacy in a population of adults in MAT with persistent pain; 2) determine if an online pain self-management program could decrease self-report of pain intensity and interference, anxiety, opioid withdrawal, opioid misuse, and increase pain self-efficacy compared to a wait-list attention placebo control group; 3) explore changes in pain self-efficacy from pre-to post-treatment and determine if changes in self-efficacy relate to changes in study outcomes; and 4) determine program acceptability and engagement.

2. Materials and methods

2.1. Design

A randomized controlled study was conducted from September 2015 to July 2016 involving participants recruited from two outpatient opioid treatment clinics in Washington State. Assignment to immediate treatment or wait-list attention placebo control group was accomplished using a computer-generated randomization table. Sample size was based on statistical power calculations for the primary aim of increasing pain self-efficacy. Previous studies have demonstrated medium to large effect sizes on this measure ($d = 0.40$ or higher, in standard deviation units) for Internet-based pain self-management (Wilson et al., 2015). A target sample of 60 was selected for anticipated 20% attrition and the ability to detect a moderate effect ($d = 0.40$), presuming alpha set at 0.05 and 80% power.

2.2. Participants

After receiving ethical approval from the principal investigator's university institutional review board, participants were recruited via advertisements posted at the two participating MAT sites. The selected clinics had no specific persistent pain programming available at the time of the study. Research assistants screened interested participants for eligibility either in person or by phone. Eligibility criteria included ability to read and write English, ≥18 years of age, and a diagnosis of chronic non-cancer pain lasting > 3 months. Participants were ineligible if they were pregnant, currently enrolled in counseling specifically for pain management, or had a medical or psychiatric condition that the principal investigator or medical director determined would compromise safe study participation. Eligible individuals were scheduled for an initial in-person meeting to sign an informed consent. A total of 111 potential participants were screened. Of those, 7 declined to participate, 7 were found to be ineligible, and 37 did not follow through with the scheduled baseline assessment and consent meeting, leaving 60 who were randomized into treatment and attention control arms.

2.3. Study measures

2.3.1. Demographics and health history

Socio-demographic and health history variables collected at baseline included age, gender, education level, chronic disease diagnoses, medications, pain history, pain management strategies, and first use of opioids.

2.3.2. Pain self-efficacy

The Pain Self-Efficacy Questionnaire (PSEQ) is a 10-item instrument to measure the confidence one has to conduct activities while experiencing persisting pain (Tonkin, 2008). The PSEQ covers a range of functions with each item rated on a 7-point scale (0 = “not at all confident”, 6 = “completely confident”), for example, “I can cope with my pain in most situations.” Total scores ranging from 0 to 60 are determined by adding the scores for each item. Studies using the PSEQ determined that high internal consistency and construct validity were demonstrated by correlations with pain-related disability and coping