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Everybody Hurts: Intersecting and Colliding Epidemics and the Need for Integrated Behavioral Treatment of Chronic Pain and Substance Use

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Abstract

Chronic pain and substance use disorders are both common, debilitating, and often persist over the longer term. On their own, each represents a significant health problem, with estimates indicating a substantial proportion of the adult population has chronic pain or a substance use disorder (SUD), and their co-occurrence is increasing. Chronic pain and SUD are also both often invisible, stigmatized disorders and persons with both regularly have difficulty accessing evidence-based treatments, particularly those that offer coordinated and integrated treatment for both conditions. But there is hope. Research is unraveling the mechanisms of chronic pain and substance use, as well as their co-occurrence, integrated behavioral treatment options based on acceptance- and mindfulness-based approaches are increasingly being developed and tested, government agencies are devoting more funds and resources to increase research on chronic pain and SUD, and there have been growing efforts in training, dissemination, and implementation of evidence-based treatments. At the very heart of the matter, though, is to recognize that everybody hurts sometimes, and treatments must empower people to life effectively with these experiences of being human.

Keywords

chronic pain; opioid use; alcohol use; substance use disorder; acceptance and commitment therapy; mindfulness-based interventions

Chronic pain, defined as persistent and recurrent pain that lasts longer than 3 months, and substance use disorder (SUD), defined as substance use associated with harm or marked risk of harm, are two of the most common, debilitating, and costly conditions worldwide. Opioid prescribing practices and global increases in alcohol, opioid, and cannabis use in the past three decades have contributed to increases in harms, particularly among persons with chronic pain. Individually, each represents a healthcare epidemic; their increasing co-

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occurrence signals a clear need for evidence driven approaches to prevent needless human suffering and loss of life.

In this paper, we provide a scoping review on cutting-edge research across many disciplines that are working to reduce suffering related to chronic pain and substance use. We highlight emerging evidence on mechanisms by which chronic pain and substance use may intersect in biopsychosocial systems, and discuss the increasing evidence for integrated behavioral treatments which simultaneously address these two conditions.

Prevalence, Disability, and Economic Costs

It is estimated that at least 10% of the world population has chronic pain (Vos et al., 2017), with rates of 20.4% in the United States and 43.5% in the United Kingdom (Dahlhamer et al., 2019; Fayaz et al., 2016). Prevalence of current substance use disorder (SUD) is estimated at 2.2% worldwide, with rates of alcohol use disorder as high as 13.9% in the United States and 22.7% in Australia (Glantz et al., 2020). Global prevalence of other SUD is estimated to be lower with approximately 0.32% for cannabis use disorder and 0.29% for opioid use disorder (Castaldelli-Maia & Bhugra, 2022).

Existing evidence suggests many presenting for treatment of chronic pain are also engaging in potentially harmful substance use behaviors. For example, approximately 16% to 25% of those with chronic pain report a history of current or past alcohol use disorder and approximately 8% to 40% of persons with chronic pain may be using opioids in a harmful manner (Preux et al., 2022; Vowles, Witkiewitz et al., 2018). The rates of co-occurrence are even higher when examining those presenting for treatment for SUD, with 64% of those with opioid use disorder and up to 73% of those receiving treatment for alcohol use disorder reporting persistent pain (Hser et al., 2017).

Both chronic pain and SUD have tremendous adverse impacts and health care costs. For example, both are associated with significant disability and years of life lost. Estimated annual economic costs in the United States are at least $635 billion for chronic pain, $249 billion for alcohol-related problems, and $1.02 trillion for opioid use disorder and overdose deaths (Florence et al., 2016; Gaskin & Richard, 2012). Approximately 500,000 deaths globally occur each year are due to substance use, with 70% of these associated with opioids. In the United States, over 100,000 lives were lost in 2021 to drug overdose, a 28.5% increase from the prior year (Ahmad et al., 2022). The majority of these deaths (64% of all drug overdose deaths) involved synthetic opioids. Alcohol-related mortality is even higher, with 5.3% of all deaths, 300 million per year, globally due to alcohol.

Are Prescription Medications the Problem, the Solution, or Both? It's Complicated

The morbidity and mortality associated with chronic pain were significantly exacerbated by exponential increases in prescribed opioids from the late 1990s to 2010s. Further, efforts to reduce opioid prescribing has potentially exacerbated the public health crisis of drug poisoning deaths. Recent data shows more individuals with opioid use disorder transitioning

to illicit drugs (Volkow et al., 2018) and there have been significant increases in overdose deaths due to synthetic opioids and cocaine in states with policies explicitly designed to decrease opioid prescribing (Lee et al., 2021). Observational studies indicate a significant increase in risk of mortality due to overdose and mental health crises among those patients undergoing forced reductions in opioid dose (Agnoli et al., 2021). Opioid prescriptions, as well as other substances, may be effective in providing some relief from pain, but treating chronic pain by opioid medication alone is often not sufficient.

Certain medications, including methadone, buprenorphine, and naltrexone are effective for chronic pain and substance use, but there are many barriers to accessing medications and many persons suffer needlessly due to lack of access, stigma, and federal regulations (Jones & McCance-Katz, 2019; Lagisetty et al., 2019). Methadone has been used as an effective medication for pain and also for opioid use disorder since 1964, but is only available via federally certified and highly regulated opioid treatment programs. Buprenorphine is an office-based treatment of opioid use disorder and is increasingly prescribed for patients with chronic pain who have opioid use disorder. Buprenorphine has been shown to be as effective as methadone for opioid use disorder (Hser et al., 2016), and recent changes to how buprenorphine is regulated, including elimination of specialized training (the Drug Addiction Treatment Act “X-Waiver”) and removal of limits to prescribing, may increase access to the medication. Naltrexone is effective in the treatment of both alcohol use disorder and opioid use disorder, and low dose naltrexone has increasingly been used in the treatment of chronic pain (Kim & Fishman, 2020).

Medical cannabis is another strategy for relieving suffering among those with chronic pain, those with opioid or alcohol use disorder, and among persons with both chronic pain and opioid use disorder. There is a great deal of hope for medical cannabis in the treatment of pain. Yet, evidence of long-term effectiveness is lacking, and there is evidence that medical cannabis can increase pain and may not lead to improvements in health and functioning.

Overall, findings suggest that long-term opioid therapy is a risky method of treating chronic pain over the longer term. Methadone, buprenorphine, and naltrexone are important tools for targeting both pain and substance use. Challenges to access, regulatory burdens, and stigma have all limited the use of these medications (Green et al., 2020; Hirsh et al., 2020; Jones & McCance-Katz, 2019; Lagisetty et al., 2019). It is critically important for efforts to increase access to these life-saving medications, as well as to continue to develop strategies for integrating medications with other behavioral treatment strategies. Further, medications alone are unlikely to be sufficient for addressing the negative effects of chronic pain and substance use on quality of life, more broadly. Medications, alone, may not meet the needs of effectively allowing one to life successfully with a history of difficult or traumatic circumstances, or aid in the formation of effectively flexible behavioral responses to challenging events in one’s life. Said more simply, a biological agent is not likely to be sufficient in addressing the complex life circumstances experienced by individuals with chronic pain and/or SUD.

Potential solutions include increasing access to medications in primary care and other health care settings to address access issues, increasing awareness of how stigma and

systemic racism play a role in perpetuating disparities to address barriers to care, and conducting more research to develop models of care that specifically address the behavioral challenges faced by those with these conditions, as these are more likely to be adequate to the complexity in presentation and treatment needs. For example, treatments that integrate medications and behavioral treatments, may be adequate to address both chronic pain and substance use simultaneously. Predictive modeling and precision medicine approaches to identify who is most likely to experience benefits from particular medications are additional research areas that hold significant promise.

Biopsychosocial, Environmental, and Systemic Contributors to Pain and Substance Use

Historically, research on the mechanisms and treatments for chronic pain and the study of SUD were separated with very little overlap or consideration for how similar biopsychosocial and environmental processes may be operating for both conditions. Over the past decade there has been greater attention on the mechanisms by which chronic pain and substance use may intersect and how some individuals may be particularly vulnerable to experience suffering related to both pain and substance use. Figure 1 provides a conceptual model of how chronic pain and substance use may be driven by similar processes, with a specific focus on early-life stressful experiences, environmental context, cognition, neuroadaptation, and subsequent feedback loops that maintain and exacerbate pain and substance use.

As shown in the figure, there are early life stressors and biological vulnerability (Burke et al., 2017; Sinha, 2008), and these must be accompanied by acutely painful experience and/or substance use. Experiences of distress and psychosocial and environmental contexts exacerbate pain and substance use (Vowles, Bailey, et al., 2018; Witkiewitz & Marlatt, 2004), which leads to the very human reaction of wanting discomfort and distress to go away. Behavioral approaches to make the discomfort go away via avoidance or substance use are effective in the short-term, leading to negative reinforcement and more avoidance and more substance use (Crombez et al., 1999; Ferguson et al., 2021). Ultimately, the behavioral and environmental changes have correlated neurobiological activity, including increased sensitization to pain and substance cues, as well as less pain relief (hyperalgesia) when using substances in attempts to reduce pain (Edwards et al., 2020). These experiences all occur within socioecological contexts that maintain feedback loops between experiences of distress, avoidance of pain, and substance use (Maly & Vallerand, 2018; Tucker & Witkiewitz, 2022). In essence, the normal response to pain and distress is to try and minimize these experiences. Unfortunately, these avoidance efforts can be unsuccessful and paradoxically lead to worsening symptoms and, more importantly, worse mental health and quality of life (Rogers & Farris, 2022).

It is also important to note that the socioecological context can exacerbate these major public health problems (Earp et al., 2020; Morais et al., 2022). Persons from historically disadvantaged and marginalized groups experience disproportionate burden of diseases. For example, American Indian and Alaska Native peoples have higher rates of chronic pain

and are at higher risk for opioid overdose fatalities as compared to whites (Mack et al., 2017), Black patients are less likely to receive prescriptions for buprenorphine (Lagisetty et al., 2019), and chronic pain is underdiagnosed and undertreated in Hispanic populations (Ng et al., 2019). As evidence of systemic racism and stigma of opioid use disorder, Hirsh and colleagues (2020) conducted an experimental investigation of perceived risk for adverse events, misuse, and addiction among physician residents and fellows and found Black patients, as compared to White patients, were perceived to be at greater risk of adverse events, be perceived to be more likely to divert medications, and to be perceived as having greater risk for misuse of opioids and of developing opioid use disorder. Populations in minoritized racial and ethnic groups are also significantly understudied in health research, underserved in healthcare systems, and have experienced serious medical and research abuses (Pacheco et al., 2013).

Integrated Psychological and Behavioral Treatments to Target Pain and Substance Use

Given the combined prevalence, cost, and disruptive nature of both chronic pain and problematic substance use, a crucial healthcare objective at present involves the identification of coordinated and efficacious treatments for patients with both chronic pain and SUD. While there is evidence of effective interventions for both pain interference and substance use when treated in isolation, few evidence-based options are available that offer integrated treatment to target pain interference and SUD in a coordinated fashion. Such treatments will need to simultaneously reduce the problematic interference of chronic pain and substance use.

Attempts to minimize or avoid discomfort or pain (including physical, physiological, cognitive, emotional pain, etc.) often exacerbate problems, as shown in Figure 1, and these processes represent a potential target for both chronic pain and substance use. In short, approaches targeting these behavioral responses may highlight the enormous costs of attempts to minimize or avoid discomfort. The remainder of this paper will discuss a few exemplar interventions that may be particularly useful for chronic pain and SUD associated suffering. It is important to note that very few programs have been developed that explicitly target both chronic pain and substance use, and we discuss those recently developed interventions in this section.

The Improving Pain during Addiction Treatment (ImPAT) psychosocial pain management program, which includes eight, 1-hour group-based sessions delivered over the course of 4 weeks, has been examined as a cognitive-behavioral treatment delivered in specialty SUD treatment programs that targets pain management and substance use. ImPAT provides cognitive and behavioral skills for coping with chronic pain and education about substances being a maladaptive and often ineffective coping strategy for pain. In comparison to an active supportive education control condition, men in the ImPAT program had greater pain tolerance and women in the program had lower pain intensity, although there were no effects of ImPAT versus matched control on alcohol or drug use (Ilgen et al., 2020). Two separate trials have examined behavioral treatments administered to patients recruited

from primary care on long-term opioid therapy (DeBar et al., 2022; Garland et al., 2022). Mindfulness-Oriented Recovery Enhancement (MORE), delivered in 2 hour weekly group sessions over 8 weeks, focuses on mindfulness of pain and experiences of opioid craving, reappraisal of negative thoughts and emotions, and savoring of pleasant experience. MORE has demonstrated efficacy in comparison to a supportive psychotherapy control group in reducing pain severity, opioid dose, emotional distress, and craving (Garland et al., 2022). The Pain Program for Active Coping and Training (PPACT), delivered in 90-minute group sessions over 12 weeks, included a range of cognitive-behavioral skills, such as problem solving, emotion regulation, cognitive restructuring, and pleasant activity scheduling. PPACT produced significantly greater reductions in pain intensity and interference, as well as pain-related disability, as compared to usual care at a 12-month follow-up (DeBar et al., 2022). The PPACT condition did not result in reductions in opioid use. Finally, a recent trial integrated Acceptance and Commitment Therapy (ACT) for chronic pain and Mindfulness-Based Relapse Prevention (MBRP) for substance use with 12 weekly 90 minute group sessions that target acceptance of chronic pain and substance craving, as well as willingness and acceptance of chronic pain in pursuit of meaningful activities and to increase effective responding to pain without relying on substance use. A pilot efficacy study among United States Veterans with chronic pain and hazardous opioid use found significant reductions in the primary outcomes of pain interference and hazardous opioid use as compared to a treatment as usual condition (Vowles et al., 2020). In this same trial, pain intensity also reduced more in the intervention group than the control, even though it was not targeted for change.

Each of these trials incorporated aspects of effective treatments for chronic pain and SUD, emphasized intervening on the overlapping areas of concern, and sought to expand patient behavioral repertoires from one that was primarily avoidant in nature to one that was more flexible, adaptable, and ultimately focused on improved quality of living. For example, in ACT, there is evidence that increased willingness to experience chronic pain in the service of increased engagement in meaningful activities is related to improved pain-related physical and psychosocial functioning (Vowles et al., 2014). While the collective outcomes from these trials indicates that integrated behavioral treatments can be effective in reducing pain interference and disability, only those interventions with explicit present-focused awareness/mindfulness components (MORE and ACT+MBRP) also resulted in reductions in opioid use (MORE) or hazardous opioid use (ACT+MBRP). Prior research has found the efficacy of MBRP can be explained, in part, by altering the automatic tendency to use substances in response to craving or other triggers (e.g., pain, negative affect) (Witkiewitz & Bowen, 2010), which may be an important treatment target for those with a history of using substances in attempts to manage pain or negative affective symptoms.

It is particularly noteworthy that all of these interventions have been delivered in weekly or biweekly group sessions lasting at least 60 minutes over a 1–3 month period. The group aspect of the interventions provides an opportunity for clients to observe the commonalities and human quality of pain and substance use, which clinical experience indicates can have a powerful normalizing and validating effect. Further, participants can aid one another in identifying effective and meaningful ways of addressing the complexities involved in living well with ongoing pain and with a history of problematic substance use. Spacing sessions

across weeks provides clients the opportunity to implement intervention content in the real-world and receive feedback from their experiences, so that successes can be reinforced and challenges considered with a view towards establishing new, more successful, behavioral patterns.

Returning to Figure 1, we propose that integrated behavioral treatments, particularly those incorporating mindfulness- and acceptance-based strategies, can disrupt the disruptive cycle of avoidance responses that perpetuate pain and substance use related disruptions by: (1) increasing awareness of automatic pilot and the tendency for pain and distress to serve as triggers for avoidance; (2) providing values clarification and opportunities to engage in values-based action *with* willingness to have discomfort in the service of these values; and (3) supporting efforts to experience discomfort and distress without using substances or engaging in other pain avoidance behaviors to relieve physical or psychological pain. Importantly, the goal here is to foster more appropriate flexibility in responding to pain and distress, such that individuals can engage in meaningful living *while* experiencing pain and discomfort. This aspect of treatment is particularly important when pain and discomfort are likely to be continually experienced as one goes about the business of living.

Conclusions

Human existence is characterized by the experience of pain and discomfort. The experience of co-occurring chronic pain and SUD involve significant suffering that may not be amenable to relief in any kind of permanent way. Thus, treatments may need to address this challenge of targeting persistent aversive experiences that are likely to continue. One plausible method is to empower individuals to respond in a meaningful way when experiencing pain and discomfort. That is the core message of integrated behavioral treatments for chronic pain and SUD, everybody hurts, *and* the experience of hurt does not need to be relieved to live a meaningful life. Both the experience of hurt and engagement in meaningful living are possible to have, in the same moment.

Disclosure of Conflicts:

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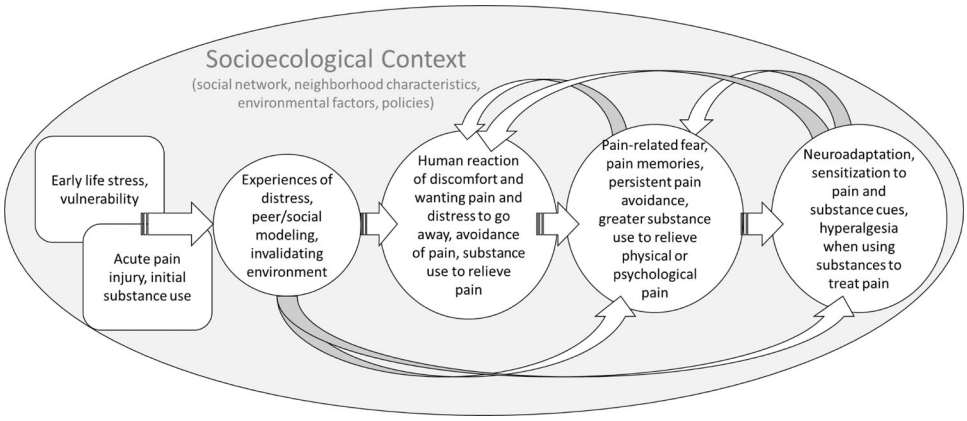

Figure 1.
Conceptual Model of Etiology and Maintenance of Pain and Substance Use