ACCSCIENCE PUBLISHING

Journal of Clinical and Basic Psychosomatics

REVIEW ARTICLE

Complementary and alternative medicine for chronic pain among individuals with high-risk opioid use: A scoping review

Dianah Hayati[1,2,3]*, Chanyoung Park[4], Yuejia Wang[4], Heather Wang[4], Simreen Guram[4], Jane Kim[1], Mohammadali Nikoo[1], Louise Penzenstadler[5], Gemy Kuriakose[6,7], and Michael Krausz[1,2]

[1]Department of Psychiatry, Faculty of Medicine, University of British Columbia (UBC), Vancouver, British Columbia, Canada

[2]Department of Psychiatry, Institute of Mental Health, University of British Columbia (UBC), Vancouver, British Columbia, Canada

[3]Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada

[4]Faculty of Science, University of British Columbia (UBC), Vancouver, British Columbia, Canada

[5]Addiction Division, Department of Psychiatry, Geneva University Hospital (HUG), Geneva, Switzerland

[6]Faculty of Medical Sciences, Private University in the Principality of Liechtenstein (UFL), Triesen, Principality of Liechtenstein, Germany

[7]Clinic for General and Geriatric Psychiatry, Klinikum Oberberg, Gummersbach, North Rhine-Westphalia, Germany

***Corresponding author:**
Dianah Hayati
(dianah.hayati@ucalgary.ca)

Citation: Hayati D, Park C, Wang Y, *et al*. Complementary and alternative medicine for chronic pain among individuals with high-risk opioid use: A scoping review. *J Clin Basic Psychosom*. doi: 10.36922/JCBP026270036

Received: June 30, 2026

Revised: September 10, 2026

Accepted: September 15, 2026

Published online: October 13, 2026

Copyright: © 2026 Author(s). This is an Open-Access article distributed under the terms of the Creative Commons Attribution License, permitting distribution, and reproduction in any medium, provided the original work is properly cited.

Publisher's Note: AccScience Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Abstract

The opioid overdose crisis continues, driven by synthetic opioids such as fentanyl and nitazines. Chronic pain is a major driver of opioid use, with many individuals turning to non-prescription opioids for untreated or undertreated pain. Complementary and alternative medicine (CAM) offers a potential non-pharmacologic approach, but its role among individuals with high-risk opioid use remains unclear. This scoping review aims to map the existing evidence on CAM for chronic pain in this population. This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines. Searches were conducted in Medical Literature Analysis and Retrieval System Online, Cumulative Index to Nursing and Allied Health Literature, Embase, and Google Scholar using keywords related to chronic pain, opioid use disorder, and CAM. Studies were screened using Covidence, and findings were synthesized descriptively. A total of 40 studies were included. Mindfulness- and meditation-based interventions were the most frequently reported modalities, followed by yoga, Tai Chi, and Qigong. CAM was associated with improvements in pain coping, emotional regulation, anxiety, depression, self-management, and quality of life, while evidence for reductions in opioid use, craving, and misuse was less consistent and strongest for mindfulness-based interventions (Mindfulness-Oriented Recovery Enhancement). Current evidence highlights the potential of utilizing CAM as an adjunct to opioid agonist therapy and overall addiction treatment, highlighting its potential to address the biopsychosocial dimensions of chronic pain and recovery that are often unmet by pharmacologic treatment alone. As chronic pain and opioid use disorder increasingly

require integrated approaches to care, CAM may represent a possible adjunctive strategy within addiction-treatment settings, although specific clinical research is needed to inform implementation and clinical practice.

Keywords: Chronic pain; Opioid use disorder; Complementary and alternative medicine; Integrative medicine; Addiction treatment.

1. Introduction

Chronic pain is a pervasive public health issue affecting nearly one in five adults worldwide and is associated with substantial physical, psychological, and social burden.[1] People living with chronic pain frequently experience reduced function, diminished quality of life, and increased rates of depression and anxiety.[2] Opioid medications have long been used as a foundation of chronic pain management, yet long-term opioid therapy poses well-documented risks including tolerance, dependence, and overdose.[3] These risks remain central to the ongoing opioid crisis, which continues to escalate morbidity, mortality, and strain on healthcare systems globally.[4]

Chronic pain and high-risk opioid use, including opioid use disorder (OUD), often intersect in complex ways. Chronic pain is highly prevalent among individuals receiving opioid agonist therapy (OAT), with a recent meta-analysis estimating a prevalence of 44% for chronic pain and 60% for current pain.[5] Many individuals initiate opioid use, prescribed or non-prescribed, in attempts to self-manage untreated or undertreated pain. Others develop chronic pain during or following opioid use and OUD, including during withdrawal or prolonged instability. Individuals with risky opioid use face significant barriers to effective pain care, including stigma, limited continuity of care, and restricted access to non-opioid pain treatment modalities.[6,7] Within addiction treatment settings such as OAT programs, harm-reduction environments, and recovery services, pain relief is often deprioritized or inconsistently addressed, despite being a major reason for opiate use in the first place, a determinant of quality of life, and critical for treatment retention.

In response to these challenges, there is substantial interest in complementary and alternative medicine (CAM) as a non-pharmacologic and integrative approach to managing chronic pain among individuals with risky opioid use or OUD. CAM modalities, including acupuncture, mindfulness-based therapies, yoga, massage, chiropractic care, and other non-pharmaceutical approaches, are increasingly recognized for their potential to reduce pain, improve function, and support holistic well-being. While CAM use in the population with chronic pain is well-documented, much less is known about how these modalities are being used, studied, or implemented within opioid-using populations or addiction-treatment contexts.[8,9] Where reviews have examined CAM alongside opioid use, they have concentrated on general or prescribed-opioid populations, often assessing whether integrative approaches can reduce prescribed opioid use, rather than on individuals with OUD or non-prescribed opioid use.[10]

The intersection of CAM, chronic pain, and opioid use is emerging, diffuse, and highly multidisciplinary, spanning addiction medicine, pain management, integrative health, rehabilitation, and community-based harm reduction. Research varies widely in study design, intervention type, outcome measures, and clinical context, making it unsuitable for a traditional systematic review focused on effectiveness. A scoping review is therefore the most appropriate approach to map this diverse body of literature, characterize existing evidence, and identify conceptual and methodological gaps.

This scoping review aims to map the available evidence on CAM for chronic pain among individuals with OUD, non-prescription opioid use, or in addiction-treatment settings. Specifically, it identifies CAM modalities studied, documented outcomes, implementation contexts, patient-reported experiences, and barriers or facilitators to integrating CAM into pain and addiction care.

Understanding how CAM has been applied across clinical, community, and harm-reduction settings has implications for improving integrated approaches to chronic pain and OUD. Synthesizing this evidence may support the development of more holistic and equitable care models, inform policy decisions related to insurance coverage and service delivery, and guide future research on both the feasibility and acceptability of CAM in addiction settings. Ultimately, this review aims to contribute to advancing patient-centered strategies that address chronic pain while minimizing reliance on opioids.

2. Methods

2.1. Developing research question

This scoping review was conducted according to Arksey and O'Malley's framework.[11] A preliminary search was conducted alongside team discussions to narrow the scope of the research question to the intersection of OUD, chronic pain, and CAM. Considering the purpose of our research, the research question was defined as: "What evidence exists on the use of CAM for chronic pain among individuals with high-risk opioid use?" This question addresses a gap in the literature related to holistic management of chronic pain in this vulnerable population. For this review, high-risk opioid use was defined as opioid use associated with an elevated risk of opioid-related harms, including OUD and non-prescribed opioid use among individuals with chronic pain. The working definition of CAM in this scoping review followed the operational definition of CAM established by Ng *et al.*,[12] in which CAM is defined as a list of 604 unique modalities including but not limited to acupuncture, chiropractic care, yoga, and cannabinoids. Music therapy, massage therapy, and tai chi were also included in this operational definition of CAM.

The eligibility criteria were developed using the Joanna Briggs Institute (JBI) population–concept–context framework for scoping reviews, as summarized in Table 1.

2.2. Identifying relevant studies

We searched the Medical Literature Analysis and Retrieval System Online (via Ovid), Cumulative Index to Nursing and Allied Health Literature (via EBSCO), and Embase (via Ovid) databases. The search strategy was organized around three conceptual blocks corresponding to the JBI population–concept–context framework: Chronic pain, CAM, and opioid use or OUD. Subject headings and free-text terms were combined using Boolean operators and adapted for each database interface. Searches were conducted with no time limit applied and restricted to English-language publications. Figure S1 shows the full Medical Literature Analysis and Retrieval System Online search strategy.

To enhance comprehensiveness, we conducted two supplementary searches. We searched Google Scholar (in November 2025) using the search string: "chronic pain" AND ("opioid use" OR "opioid use disorder" OR OUD) AND ("complementary medicine" OR "alternative medicine" OR "integrative medicine" OR acupuncture OR yoga OR mindfulness OR massage OR chiropractic OR "herbal medicine" OR meditation OR cannabis). The first 100 results were selected and screened. Additionally, a snowball search using a descendancy approach was conducted by examining the reference lists of all included sources and using Google Scholar to identify studies citing those sources. All results were imported into Covidence (Veritas Health Innovation, Australia) for deduplication and screening management.

2.3. Screening the articles

All studies and citations identified from the database searches were imported into Covidence for screening, where duplicate records were removed. A two-stage screening process was conducted. Title and abstract screening, followed by full-text screening, was conducted independently by at least two reviewers. Conflicts were resolved through team consensus. Studies were included if they included (i) individuals with chronic pain and high-risk opioid use (including OUD), and (ii) evaluated CAM interventions. Studies on acute pain, populations without high-risk opioid use, non-CAM interventions, reviews, commentaries, and conference proceedings were excluded.

Table 1. Eligibility criteria according to the Population–Concept–Context (PCC) framework

PCC component	Eligibility criteria
Population	Individuals with chronic pain (≥3 months) and high-risk opioid use, defined as opioid use associated with an elevated risk of opioid-related harms, including opioid use disorder and non-prescribed opioid use.
Concept	Complementary and alternative medicine (CAM) interventions used for chronic pain management, including mindfulness and meditation, yoga, Tai Chi/Qigong, acupuncture, massage, chiropractic care, and other nonpharmacological CAM modalities.
Context	Clinical, addiction-treatment, community, and other healthcare settings in which CAM interventions were used among individuals with chronic pain and high-risk opioid use.

2.4. Extracting the study data

After the screening, the data from the 33 published articles were extracted by the team and organized in the form of a table in Excel (Version 16.113.3 [26092714], Microsoft Corporation, USA). The study information, such as title, year of publication, location of the study, authors, and population demographics, was collected first. Thematic subcategories of the study details were developed through team consensus to chart the data into two main categories: characteristics of CAM modalities and reported effects of CAM interventions. Characteristics of CAM modalities included intervention type, delivery format, duration, and integration with addiction care. The primary outcomes examined were (i) pain-related outcomes, including pain intensity and pain-related functioning; (ii) opioid-related outcomes, including opioid consumption, craving, misuse, and return to drug use; and (iii) psychosocial outcomes, including psychological symptoms and quality of life. Treatment-related and patient-reported outcomes, including treatment retention and acceptability, were also examined where reported. The data extraction table is attached in Table S1.

2.5. Synthesizing and reporting the findings

Extracted data were collated and summarized descriptively and thematically in accordance with JBI guidance for scoping reviews.[13] Data were organized by CAM modality, study design, and clinical context to produce a narrative synthesis mapping the range and characteristics of available evidence across included studies. Quantitative data were summarized using descriptive statistics, including counts and frequencies of study designs, CAM modalities, settings, and population characteristics.

3. Results

3.1. Search summary

A total of 2,618 sources were identified through database searching and six sources through grey literature searching. Prior to screening, 669 duplicates were removed. Following title and abstract screening of 1,955 records, 1,732 were excluded. Of the 223 articles assessed for full-text eligibility, 183 were excluded for reasons including inappropriate study design, population, or intervention. In total, 40 studies met the inclusion criteria, of which seven ongoing, unpublished studies were not included in the formal results or further analysis but are summarized separately in Figure 1.

3.2. Characteristics of included studies

The 33 published studies represented a range of study designs and sample sizes. Overall, sample sizes varied substantially, ranging from 10 participants in a qualitative study to 13,441 participants in a national treatment-program survey; in the latter, 4,494 participants comprised the chronic-pain subgroup. Randomized controlled trials were the most common design (n = 17), followed by non-randomized pilot or feasibility studies (n = 4), qualitative studies (n = 3), cohort or observational studies (n = 3), cross-sectional studies (n = 2), mixed-methods studies (n = 2), and program evaluation or survey studies (n = 2) (Table S2).

Among the 33 published articles that were included for analysis. The majority of the studies were conducted across the United States (n = 31), alongside single studies in Canada and the Netherlands. Within the United States, the locations of the studies were focused in states such as Utah (n = 7), Massachusetts (n = 4), New Jersey (n = 3), and Florida (n = 4). The mean participant age ranged from 31 to 56 years, with the majority of studies (n = 23) featuring a middle-aged to senior population with the mean age over 45. Other studies (n = 8) also focused on younger adult populations, with the mean age of the participants ranging from 30 to 45. Gender distribution was relatively balanced across studies in the dataset, which included nine female-majority studies, 12 gender-balanced studies, and nine male-majority studies, as well as participants from specific focus groups such as the Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, and other communities (n = 1). Regarding racial demographics, four studies reported a majority of White participants, and four other studies were racially heterogeneous. Black, Indigenous, and People of Color participants are also represented in the review, with two studies focusing on American Indian/Alaska Native or Indigenous populations and one study with a majority of Black participants.

Ongoing and unpublished clinical trials identified during the search process were documented separately and are summarized in Table S3. Most included yoga, mindfulness, and artmaking interventions, often conducting larger-scale trials of previously investigated interventions included in the analysis.

3.3. Population characteristics

Psychiatric comorbidities were highly prevalent among the participants; 17 studies measured psychiatric conditions, and nine studies among the 17 studies reported the detailed percentage breakdown of psychiatric conditions. The most common psychiatric conditions in populations across the studies included depression, anxiety, post-traumatic stress disorder, and non-opioid substance use disorders. Clinically, the populations were largely engaged in outpatient care (n = 25) and receiving interventions as an

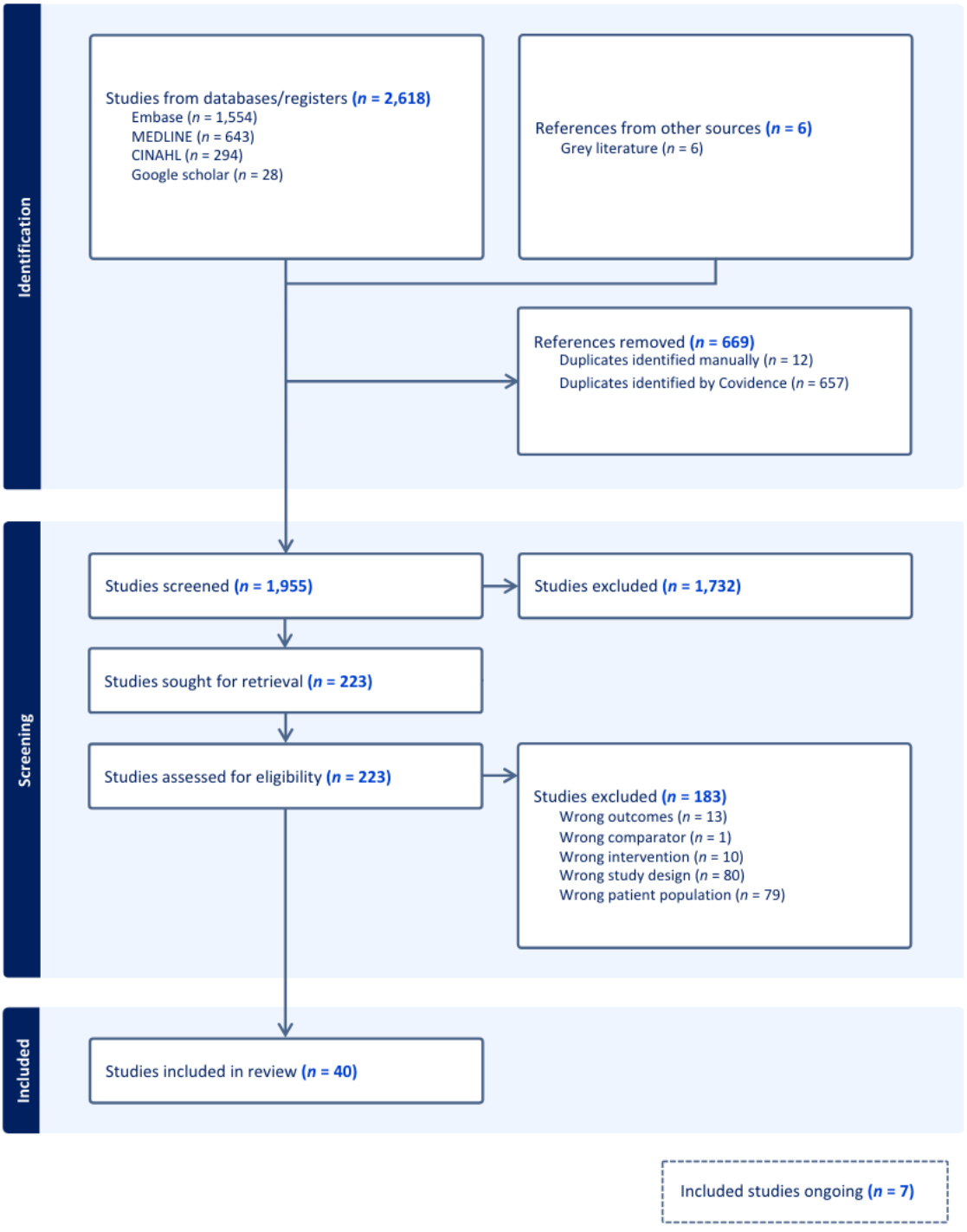

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews flow diagram of the study selection process

adjunct to OAT or other forms of addiction care (n = 26), primarily involving methadone maintenance treatment or buprenorphine. The most frequently discussed form of non-prescription opioid was heroin (n = 7). The Current Opioid Misuse Measure (COMM) was frequently conducted with other secondary forms of assessment such as the Mini-International Neuropsychiatric Interview, Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (DSM) Disorders, and Urine Drug Screening to diagnose OUD (n = 9).

3.4. Characteristics of complementary and alternative medicine modalities

3.4.1. Complementary and alternative medicine modalities

The included studies identified a wide range of CAM modalities (Figure 2). Mindfulness- and meditation-based interventions were the most frequently represented category (n = 16), with Mindfulness-Oriented Recovery Enhancement (MORE) being the predominant intervention. This was followed by movement-based mind–body therapies (n = 7), including yoga, Tai Chi, and Qigong, and manual and physical therapies (n = 6), including massage therapy, acupuncture, chiropractic care, and physical therapy. Other modalities included psychological and behavioral CAM-integrated therapies (n = 4), technology-assisted interventions (n = 2), cannabis-based interventions (n = 2), and music-, hypnosis-, and spirituality-based approaches (n = 1 each).

3.4.2. Delivery formats

The CAM interventions were delivered using group-based, individual, virtual, hybrid, and self-administered formats (Figure 3). Group in-person delivery was the most common format among mindfulness-based and movement-based interventions such as MORE, yoga, and Tai Chi. Many studies also had self-administered or home-based components, including mindfulness practice, journaling, breathing exercises, and guided movement activities completed outside formal sessions.

Manual and body-based therapies, such as massage therapy, chiropractic care, acupuncture, and osteopathic treatments, were more commonly delivered through in-person sessions.[14–17] In contrast, technology-assisted interventions including smartphone applications and virtual reality meditation and some Tai Chi were delivered through virtual and self-guided formats.[18–20] Overall, the findings suggest that CAM interventions were commonly structured around group-based participation accompanied by flexible at-home practices.

3.4.3. Duration

The duration of CAM interventions varied across studies. Many mindfulness-based and movement-based interventions followed structured eight-week programs with weekly sessions. Other interventions ranged from single-session exposures to longer programs lasting 12 weeks, 24 weeks, or up to 12 months.[15,20–23] Several studies also included follow-up assessments after the intervention period.

3.4.4. Integration with opioid agonist therapy/ addiction care

Most CAM interventions were delivered as adjunctive therapies alongside OAT, methadone maintenance treatment, buprenorphine treatment, or ongoing prescribed opioid therapy.[15–18,21–31] Many interventions were integrated within addiction care settings, including outpatient MOUD clinics and methadone treatment programs.[15–18,24,29,30] CAM modalities were primarily used as complementary approaches to support pain management, emotional well-being, coping, and treatment engagement rather than as standalone alternatives to conventional treatment.

3.5. Effects of complementary and alternative medicine interventions

3.5.1. Pain-related and psychosocial outcomes

Pain and psychosocial outcomes were reported more consistently across the included studies. Across a range of CAM modalities, participants reported improvements in pain-related functioning, coping, emotional regulation, mood, and overall well-being, although changes in pain intensity were not consistently observed across multiple studies. While findings varied across interventions and study types, several controlled trials demonstrated significant improvements in specific pain- and quality of life-related outcomes, supporting broader patterns observed across the evidence base. Notably, in a 2020 randomized controlled pilot trial study, Vowles *et al.*[21] found statistically significant between-group differences in pain outcomes from an intervention combining Acceptance and Commitment Therapy and Mindfulness-Based Relapse Prevention. The study reported statistically significant reductions in both pain interference and pain intensity ($p < 0.005$) in the intervention group, yielding large effect sizes for both pain interference and pain intensity. Regarding psychosocial outcomes, significant quantitative results were reported from more diverse modalities. Specifically, a 12-week randomized clinical trial of massage therapy reported significant between-group differences between the intervention and control



Figure 2. Distribution of complementary and alternative medicine (CAM) modalities across included studies (n = 33). Bubble size corresponds to the frequency of CAM modality representation across included studies (detailed category definitions and counts are provided in Table S4). Studies reporting multiple CAM modalities were counted in each relevant category.

groups. Within the study, the Patient Global Impression of Change score, which measures the participants' sense of improvement after the intervention, showed statistically significant differences at week 4 (p = 0.005) and week 8 (p < 0.001) follow-ups.[17] Table S5 shows the overview of the most frequently reported pain assessment tools and the corresponding pain-related findings.

3.5.2. Opioid-related outcomes

Opioid-related findings were mixed across studies. Mindfulness-based interventions, particularly MORE studied predominantly in randomized controlled trials, were most frequently associated with reductions in opioid craving, misuse, opioid dose, and return to drug use.[24,30–32] Acceptance and Commitment Therapy combined with Mindfulness-Based Relapse Prevention was also associated with reduced opioid misuse.[21] However, several feasibility, qualitative, and acceptability studies did not directly evaluate opioid-related outcomes or reported insufficient follow-up data.[18,33,34]

3.5.3. Treatment-related and patient-experience outcomes

Treatment retention varied by intervention type and setting, with higher retention generally reported in structured outpatient mindfulness-based programs than in inpatient or detox feasibility studies.[18,26,31,34] Participant experiences, reported predominantly in qualitative and mixed-methods studies with surveys, were largely positive, with CAM commonly described as supportive, acceptable,

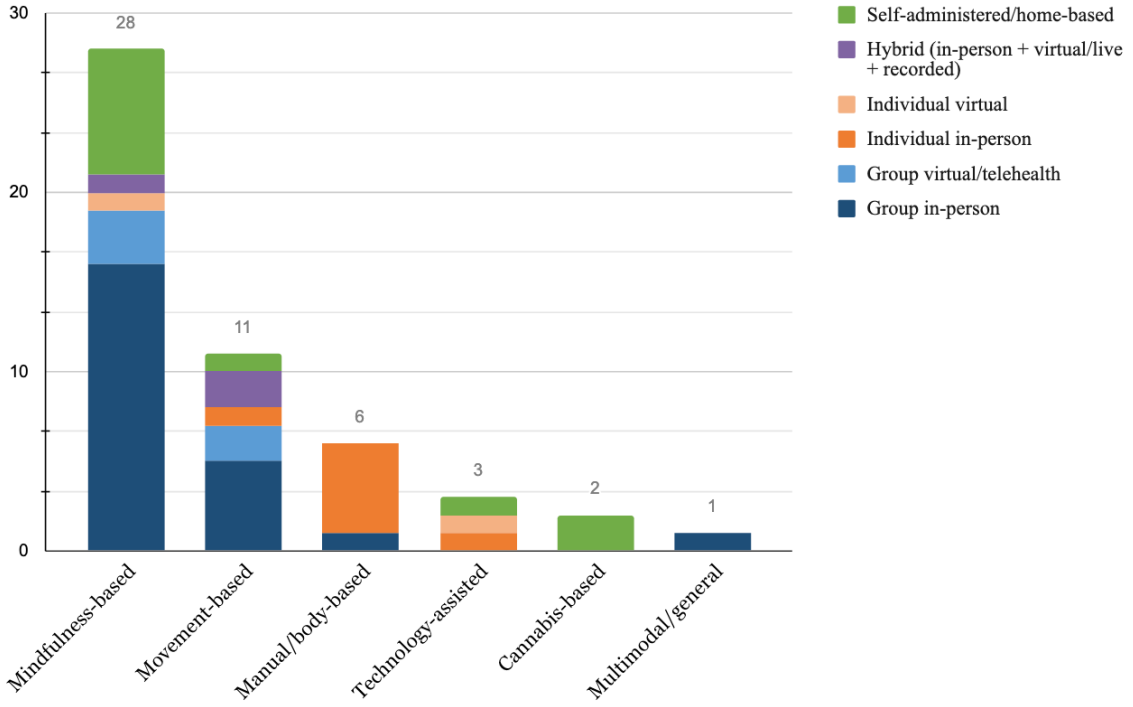

Figure 3. Distribution of delivery formats across complementary and alternative medicine (CAM) modalities among included studies. Stacked bars show the frequency of delivery formats within each CAM modality category. Studies reporting multiple CAM modalities and/or delivery formats were counted in each relevant category.

and complementary to existing pain, OAT, or addiction treatment services.[17,19,33,34]

3.5.4. Outcome measures used to evaluate complementary and alternative medicine interventions

Included studies varied largely in how they measured outcomes, which limits comparability across the evidence base. For pain, the Brief Pain Inventory was the most frequently used instrument (n = 17), followed by unstandardized self-report or single-item numeric and ordinal ratings (n = 11) and the Visual Analog Scale (n = 4); the Pain, Enjoyment of life, and General Activity Scale,[29] Patient-Reported Outcomes Measurement Information System Pain Interference,[21,22] Pain Catastrophizing Scale,[19] Pain Self-Efficacy Questionnaire,[29,35] Short-Form McGill Pain Questionnaire-2, and West Haven–Yale Multidimensional Pain Inventory each appeared in one or two studies.[16] Only two studies applied a formal chronic pain case definition (International Classification of Diseases, 11th Revision or International Association for the Study of Pain criteria).[19,33] An overview of the pain assessment tools used and the corresponding pain-related findings is provided in Table S6.

Opioid-related outcomes were measured less consistently. The COMM was the most frequently used instrument (n = 10), applied at varying cut-points (≥9 or ≥13) and usually alongside a diagnostic interview (Mini-International Neuropsychiatric Interview, Structured Clinical Interview for DSM Disorders, or DSM criteria; n = 9), the Drug Misuse Index, the Addiction Behaviors Checklist, or urine toxicology. A further 10 studies established opioid-related status only by enrolment in methadone or buprenorphine treatment, without an independent measure of misuse severity, and seven studies reported no opioid-related assessment at all.

3.6. Facilitators and barriers

The most reported facilitators of CAM implementation included structured group- or therapist-supported interventions (n = 12), improved accessibility and flexibility through telehealth, clinic integration, or home-based practice (n = 10), and participant interest in non-pharmacologic approaches for pain, cravings, stress, or sleep management (n = 9). Additional facilitators included peer support,[14,32,33] cultural safety,[14] and reduced-cost or subsidized interventions.[18,19,35]

The most frequently reported barriers included time commitment, scheduling, transportation, or attendance challenges (n = 9), financial and access-related limitations such as cost, insurance coverage, or device availability (n = 7), and instability related to relapse, medical comorbidities, homelessness, or psychiatric complexity (n = 4). Institutional barriers such as limited integration of pain management within OUD treatment settings were also reported.[35]

4. Discussion

Chronic pain is recognized as a major reason for opioid use, relapse, and overdose, particularly among individuals with high-risk opioid use.[36,37,38] Despite the complex bidirectional relationship between chronic pain and self-medication through street opioid use, this population remains substantially underserved. Many individuals experience persistent pain, psychiatric comorbidities, stigma, and fragmented care, with limited access to integrated treatment approaches.[39,40] In response to the limitations of pharmacologic management alone, CAM modalities have emerged in the literature displaying positive potential as adjuncts to traditional OAT models, with studies exploring interventions to address pain, cravings, psychological distress, and overall well-being.[10,41,42] Several conceptual and treatment models within the literature increasingly emphasize the importance of holistic, biopsychosocial, and integrated approaches to care, recognizing the influence of social and structural factors on chronic pain beyond substance use alone.[43] The biopsychosocial framework provides a framework for understanding chronic pain and OUD as emerging from interacting neurobiological, psychological, and social processes, and is being increasingly favored over purely pharmacological models.[44] Consistent with the Biopsychosocial Model, where chronic pain is viewed as a multidimensional condition,[45] CAM interventions may address multiple dimensions of well-being beyond pain alone, including emotional regulation, coping, quality of life, and social functioning.[46]

Although OAT such as methadone and buprenorphine are currently the pharmacological standard treatment for OUD in most countries, pain is not addressed specifically. A recent meta-analysis estimated a 44% prevalence of chronic pain and a 60% prevalence of current pain among individuals receiving OAT.[5] Consistent with this unmet need, most studies in this review evaluated CAM as an adjunct rather than a replacement for OAT, suggesting that integrated approaches are already being implemented across a range of clinical settings. Importantly, frequent CAM use or evidence of benefit does not support its use as a replacement for opioid therapy. At a policy level, the National Institute of Health Helping to End Addiction Long-term Initiative's Integrative Management of Chronic Pain and Opioid Use Disorder for Whole Recovery network funds combined pharmacological, behavioral, and complementary approaches across multiple sites, reflecting institutional recognition that fragmented, single-modality care is insufficient.[44,47] Cultural integration is an additional dimension of holistic care models. Rowan *et al.*[48] found that culturally based addiction treatment programs integrating Western and Indigenous practices were associated with reductions in substance use and may provide forms of relational, spiritual, and community support that complement standard biomedical care.

An important observation of this review is that CAM modalities may support dimensions of recovery that extend beyond opioid reduction alone. Although the included studies did not consistently demonstrate large or sustained reductions in opioid use, they repeatedly reported improvements in outcomes such as cravings, stress, emotional regulation, sleep, pain coping, pain interference, self-efficacy, and quality of life.[49] Given that chronic pain and OUD are influenced by biological, psychological, and social factors, improvements in functioning, well-being, and self-management may represent meaningful clinical progress.[50] This interpretation aligns with broader chronic pain literature showing that psychosocial and behavioral factors play a major role in the experience and maintenance of pain, and that self-management is a central goal of chronic pain care.[51] It is also consistent with current pain-management guidance, which emphasizes individualized, nonpharmacologic approaches that focus not only on pain reduction, but also on function and quality of life.[52]

These findings suggest that treatment success should not be defined solely by opioid discontinuation. While medications such as methadone and buprenorphine remain evidence-based treatments associated with reduced overdose risk and improved outcomes,[53] recovery is increasingly understood as a broader process encompassing health, wellness, self-direction, and meaningful participation in life.[49,54] Qualitative findings across included studies consistently describe participants feeling heard, supported, and more confident in their recovery, which is particularly significant given that individuals with OUD commonly experience stigma within healthcare settings, where expressions of pain may be interpreted as drug-seeking rather than as legitimate clinical need.[44] In this context, CAM may serve as a valuable adjunct to OAT by supporting patient-centered recovery goals and outcomes that take into account lived experiences of individuals living with chronic pain and high-risk opioid use.

The variation in outcome measurement across included studies highlights the need for more consistent criteria to evaluate CAM interventions in populations with chronic pain and high-risk opioid use. Based on the outcomes identified in this review, evaluation of CAM in populations with co-occurring chronic pain and OUD may benefit from combining standardized pain and functional outcomes with opioid-specific outcomes, while also assessing acceptability, retention, accessibility, cost, and integration within existing OUD treatment services. These criteria are consistent with existing standardized frameworks. The National Center for Complementary and Integrative Health Research Framework emphasizes feasibility, acceptability, adherence, appropriate outcome selection, and participant recruitment and retention prior to efficacy and effectiveness trials.[55] Similarly, the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials recommends core domains for chronic pain trials, including pain, physical and emotional functioning, treatment satisfaction, adverse events, and adherence,[56] while the NIDA Clinical Trials Network Core Outcome Set for OUD supports standardized evaluation of OUD treatment outcomes.[57] These established frameworks provide a foundation for evaluating CAM interventions while accounting for considerations specific to individuals with co-occurring chronic pain and high-risk opioid use.

Accessibility and peer support emerged as significant determinants of CAM feasibility across the literature. Virtual and telehealth-based models may help overcome common barriers to participation such as transportation, mobility, and cost, providing low-burden, scalable, and accessible options for underserved populations.[31,58,59] Additionally, group-based interventions may enhance social support and treatment engagement through peer interaction and shared recovery experiences. Peer support has been associated with improved engagement, retention, and linkage to addiction treatment services when compared to treatment-as-usual approaches.[60] Particularly within community settings, peer outreach and linkage programs also appeared to improve transitions into medication-assisted treatment and were supported through transportation, outreach, and ongoing follow-up services.[61] Together, these findings suggest that embedding CAM interventions within supportive and accessible addiction care settings may improve participation and continuity of care for patients.

Evidence suggests that CAM may be acceptable for people living with OUD and chronic pain. Acceptability was defined by measures in studies reflecting the extent to which participants considered the intervention appropriate based on their responses.[62] Through highly acceptable and patient-centered interventions, patients can form stronger relationships with healthcare providers and rebuild trust in the healthcare system, which substantially affects the intervention.[63–65] This is important because many people with high-risk opioid use have experienced structural and public stigma, undertreatment of pain, or mistrust from healthcare providers, which often discourages treatment seeking.[66–68] A focus on acceptability may help participants feel heard, valued, and supported, not only as patients with symptoms but as whole people with complex social, emotional, and healthcare experiences.[69,70] As the overdose crisis continues to evolve, there is an urgent need to better understand integrated and person-centered approaches that extend beyond opioid-focused treatment alone.[71]

5. Limitations

The limitations of this study included the considerable variety in design, sample size, population characteristics, CAM modalities examined, and outcome measures, making direct comparisons across studies difficult. Many studies also relied on self-reported outcomes and small sample sizes, which constrains the generalizability of individual findings. In addition, a substantial proportion of the included studies were pilot or feasibility studies, which are designed to assess feasibility of novel research rather than provide conclusions of efficacy. The concentration of included studies in higher-income countries, such as the United States, may limit the transferability of findings to other healthcare contexts with different addiction treatment infrastructures or cultural approaches to CAM.

6. Conclusion

While evidence for direct opioid reduction remains mixed, CAM interventions were perceived positively by patients and associated with improvements in well-being and quality of life. Translating these findings into clinical settings will require the integration of pain and addiction care, alongside culturally responsive CAM approaches within OAT, primary care, and harm reduction settings. Future research should prioritize adequately powered trials that move beyond the pilot and feasibility stage, standardized outcome measures, longer follow-up periods, and evaluations of implementation, acceptability, and equity. Additionally, future research should explore the effectiveness of CAM interventions in specific populations that may have unique needs, such as geriatric patients with high-risk opioid use. Overall, CAM may represent a valuable adjunct to current pain and addiction frameworks, as a patient-centered approach that may help address pain, psychosocial well-being, and recovery goals that work synergistically with existing treatments.

Acknowledgments

None.

Funding

None.

Conflict of interest

The authors declare they have no competing interests.

Author contributions

Conceptualization: Dianah Hayati, Chanyoung Park, Yuejia Wang, Heather Wang, Simreen Guram
Investigation: Dianah Hayati, Chanyoung Park, Yuejia Wang, Heather Wang, Simreen Guram
Supervision: Dianah Hayati, Michael Krausz
Visualization: Dianah Hayati, Yuejia Wang
Writing–original draft: Dianah Hayati, Chanyoung Park, Yuejia Wang, Heather Wang, Simreen Guram
Writing–review & editing: All authors

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data

Not applicable.

References

1. Dahlhamer J, Lucas J, Zelaya C, *et al.* Prevalence of chronic pain and high-impact chronic pain among adults — United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2018;67(36):1001-1006.

   doi: 10.15585/mmwr.mm6736a2

2. Tsang A, Von Korff M, Lee S, *et al.* Common chronic pain conditions in developed and developing countries: Gender and age differences and comorbidity with depression-anxiety disorders. *J Pain*. 2008;9(10):883-891.

   doi: 10.1016/j.jpain.2008.05.005

3. Vowles KE, McEntee ML, Julnes PS, Frohe T, Ney JP, Van Der Goes DN. Rates of opioid misuse, abuse, and addiction in chronic pain: A systematic review and data synthesis. *Pain*. 2015;156(4):569-576.

   doi: 10.1097/01.j.pain.0000460357.01998.f1

4. Volkow ND, Blanco C. The changing opioid crisis: development, challenges and opportunities. *Mol Psychiatry*. 2021;26(1):218-233.

   doi: 10.1038/s41380-020-0661-4

5. Yang J, Jung M, Picco L, *et al.* Pain in people seeking and receiving opioid agonist treatment: A systematic review and meta-analysis of prevalence and correlates. *Addiction*. 2024;119(11):1879-1901.

   doi: 10.1111/add.16574

6. Barry DT, Irwin KS, Jones ES, *et al.* Integrating buprenorphine treatment into office-based practice: A qualitative study. *J Gen Intern Med*. 2009;24(2):218-225.

   doi: 10.1007/s11606-008-0881-9

7. Livingston JD, Milne T, Fang ML, Amari E. The effectiveness of interventions for reducing stigma related to substance use disorders: A systematic review. *Addiction*. 2012;107(1):39-50.

   doi: 10.1111/j.1360-0443.2011.03601.x

8. Fogleman C, McKenna K. Integrative health strategies to manage chronic pain. *Prim Care Clin Off Pract*. 2022;49(3):469-483.

   doi: 10.1016/j.pop.2022.01.001

9. Gaul C, Schmidt T, Czaja E, Eismann R, Zierz S. Attitudes towards complementary and alternative medicine in chronic pain syndromes: A questionnaire-based comparison between primary headache and low back pain. *BMC Complement Altern Med*. 2011;11(1):89.

   doi: 10.1186/1472-6882-11-89

10. Hassan S, Zheng Q, Rizzolo E, Tezcanli E, Bhardwaj S, Cooley K. Does integrative medicine reduce prescribed opioid use for chronic pain? A systematic literature review. *Pain Med*. 2020;21(4):836-859.

    doi: 10.1093/pm/pnz291

11. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*. 2005;8(1):19-32.

    doi: 10.1080/1364557032000119616

12. Ng JY, Dhawan T, Dogadova E, *et al.* Operational definition of complementary, alternative, and integrative medicine derived from a systematic search. *BMC Complement Med Ther*. 2022;22(1):104.

    doi: 10.1186/s12906-022-03556-7

13. Peters MDJ, Marnie C, Tricco AC, *et al.* Updated methodological guidance for the conduct of scoping reviews. *JBI Evid Synth*. 2020;18(10):2119-2126.

    doi: 10.11124/JBIES-20-00167

14. Webb K, Kelley A, Restad D, *et al.* Complementary alternative medicine: A culturally centered approach to managing chronic pain from one american indian community. *Am Indian Alsk Native Ment Health Res*. 2023;30(2):55-69.

    doi: 10.5820/aian.3002.2023.55

15. Uebelacker LA, Van Noppen D, Tremont G, Bailey G,

Abrantes A, Stein M. A pilot study assessing acceptability and feasibility of hatha yoga for chronic pain in people receiving opioid agonist therapy for opioid use disorder. *J Subst Abuse Treat*. 2019;105:19-27.

doi: 10.1016/j.jsat.2019.07.015

16. Przekop P, Przekop A, Haviland MG, Oda K. Comprehensive treatment for patients with chronic pain in a 12-step based substance use disorder program. *J Bodyw Mov Ther*. 2018;22(3):685-692.

doi: 10.1016/j.jbmt.2017.08.009

17. Wiest KL, Asphaug VJ, Carr KE, Gowen EA, Hartnett TT. Massage impact on pain in opioid-dependent patients in substance use treatment. *Int J Ther Massage Bodyw*. 2015;8(1):12-24.

doi: 10.3822/ijtmb.v8i1.257

18. Coffee Z, Badger TA, Taylor-Piliae R, Vanderah TW, Yu CH, Gordon JS. Tai Chi easy for opioid use disorder: pilot feasibility outcomes and lessons learned. *J Integr Complement Med*. 2025;31(11):979-986.

doi: 10.1177/27683605251360930

19. Goodman GR, Overstreet DS, Wilson JM, *et al.* Acceptability of a smartphone-based music intervention for chronic pain and problematic opioid use among people with HIV: A mixed-methods pilot study. *AIDS Res Hum Retroviruses*. 2025;41(5):263-273.

doi: 10.1089/aid.2024.0072

20. Faraj MM, Lipanski NM, Morales A, *et al.* A virtual reality meditative intervention modulates pain and the pain neuromatrix in patients with opioid use disorder. *Pain Med*. 2021;22(11):2739-2753.

doi: 10.1093/pm/pnab162

21. Vowles KE, Witkiewitz K, Cusack KJ, *et al.* Integrated behavioral treatment for veterans with co-morbid chronic pain and hazardous opioid use: A randomized controlled pilot trial. *J Pain*. 2020;21(7):798-807.

doi: 10.1016/j.jpain.2019.11.007

22. Schuman-Olivier Z, Fatkin T, Creedon TB, *et al.* Effects of a trauma-informed mindful recovery program on comorbid pain, anxiety, and substance use during primary care buprenorphine treatment: A proof-of-concept study. *Am J Addict*. 2023;32(3):244-253.

doi: 10.1111/ajad.13364

23. Lent MR, Dugosh KL, Varsani K, Jonsson A, Kung T, Galluzzi KE. Motivation and experiences of individuals with opioid use disorder and chronic pain using medical cannabis for 12 months. *Harm Reduct J*. 2025;22(1):155.

doi: 10.1186/s12954-025-01306-9

24. Garland EL, Hanley AW, Kline A, Cooperman NA. Mindfulness-Oriented Recovery Enhancement reduces opioid craving among individuals with opioid use disorder and chronic pain in medication assisted treatment: Ecological momentary assessments from a stage 1 randomized controlled trial. *Drug Alcohol Depend*. 2019;203:61-65.

doi: 10.1016/j.drugalcdep.2019.07.007

25. Garland EL, Froeliger B, Howard MO. Neurophysiological evidence for remediation of reward processing deficits in chronic pain and opioid misuse following treatment with Mindfulness-Oriented Recovery Enhancement: exploratory ERP findings from a pilot RCT. *J Behav Med*. 2015;38(2):327-336.

doi: 10.1007/s10865-014-9607-0

26. Garland EL, Thomas E, Howard MO. Mindfulness-Oriented Recovery Enhancement ameliorates the impact of pain on self-reported psychological and physical function among opioid-using chronic pain patients. *J Pain Symptom Manag*. 2014;48(6):1091-1099.

doi: 10.1016/j.jpainsymman.2014.03.006

27. Garland EL, Froeliger B, Howard MO. Effects of Mindfulness-Oriented Recovery Enhancement on reward responsiveness and opioid cue-reactivity. *Psychopharmacology*. 2014;231(16):3229-3238.

doi: 10.1007/s00213-014-3504-7

28. Garland EL, Manusov EG, Froeliger B, Kelly A, Williams JM, Howard MO. Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *J Consult Clin Psychol*. 2014;82(3):448-459.

doi: 10.1037/a0035798

29. Nguyen L, Eddy BL, West N, Bone JN, Currie LM, Lauder G. The impact of a novel methodological process for needling scars, fascia, and muscles in the management of myofascial dysfunction and chronic pain in a population living with social and health inequities: Quantitative findings from a longitudinal observational pilot study. *Pain Res Manag*. 2025;2025(1):8567447.

doi: 10.1155/prm/8567447

30. Garland EL, Hanley AW, Nakamura Y, *et al.* Mindfulness-oriented recovery enhancement vs supportive group therapy for co-occurring opioid misuse and chronic pain in primary care: A randomized clinical trial. *JAMA Intern Med*. 2022;182(4):407.

doi: 10.1001/jamainternmed.2022.0033

31. Cooperman NA, Lu SE, Hanley AW, *et al.* Telehealth mindfulness-oriented recovery enhancement vs usual care in individuals with opioid use disorder and pain: A randomized clinical trial. *JAMA Psychiatry*. 2024;81(4):338-346.

doi: 10.1001/jamapsychiatry.2023.5138

32. Garland EL, Nakamura Y, Bryan CJ, *et al.* Mindfulness-

oriented recovery enhancement for veterans and military personnel on long-term opioid therapy for chronic pain: A randomized clinical trial. *Am J Psychiatry*. 2024;181(2):125-134.

doi: 10.1176/appi.ajp.20230272

33. Ellerbroek H, Hanssen I, Lathouwers K, *et al.* Mindfulness-based cognitive therapy for chronic noncancer pain and prescription opioid use disorder: A qualitative pilot study of its feasibility and the perceived process of change. *Brain Behav*. 2023;13(7):e3005.

doi: 10.1002/brb3.3005

34. Ahmadi E, Evans C, Agin-Liebes G, Tompkins DA. Assessing the acceptability of yoga among patients with and without chronic pain enrolled in a licensed opioid treatment program. *Int J Yoga Ther*. 2022;32(2022):Article 3.

doi: 10.17761/2022-D-21-00055

35. Lent MR, Keen R, Ruiz M, Callahan HR, Galluzzi KE, Dugosh KL. Clinical and psychosocial changes in adults with opioid use disorder and chronic pain using medical cannabis: A brief report. *J Cannabis Res*. 2025;7(1):36.

doi: 10.1186/s42238-025-00297-5

36. Ellis MS, Kasper Z, Cicero T. Assessment of chronic pain management in the treatment of opioid use disorder: Gaps in care and implications for treatment outcomes. *J Pain*. 2021;22(4):432-439.

doi: 10.1016/j.jpain.2020.10.005

37. Hayati D, Kim J, Choi F, Daswani R, Krausz RM. Chronic pain as a trigger for street opioid use: A systematic review. *J Clin Basic Psychosom*. 2025;4(2):025170032.

doi: 10.36922/JCBP025170032

38. Kim JJ, Hayati D, Zamany M, *et al.* Chronic pain among primary fentanyl users: The concept of self-medication. *Eur J Pain*. 2025;29(1):e4753.

doi: 10.1002/ejp.4753

39. Johnston KJA, Huckins LM. Chronic pain and psychiatric conditions. *Complex Psychiatry*. 2022;9(1-4):24-43.

doi: 10.1159/000527041

40. Vogel M, Choi F, Westenberg JN, *et al.* Chronic pain among individuals experiencing homelessness and its interdependence with opioid and other substance use and mental illness. *Int J Environ Res Public Health*. 2021;19(1):5.

doi: 10.3390/ijerph19010005

41. Coffee Z, Cheng K, Slebodnik M, *et al.* The impact of nonpharmacological interventions on opioid use for chronic noncancer pain: A scoping review. *Int J Environ Res Public Health*. 2024;21(6):794.

doi: 10.3390/ijerph21060794

42. DeBar L, Mayhew M, Benes L, *et al.* A primary care-based cognitive behavioral therapy intervention for long-term opioid users with chronic pain : A randomized pragmatic trial. *Ann Intern Med*. 2022;175(1):46-55.

doi: 10.7326/M21-1436

43. Kovačević I, Pavić J, Filipović B, Ozimec Vulinec Š, Ilić B, Petek D. Integrated approach to chronic pain—the role of psychosocial factors and multidisciplinary treatment: A narrative review. *Int J Environ Res Public Health*. 2024;21(9):1135.

doi: 10.3390/ijerph21091135

44. Archambault L, Bertrand K, Martel MO, Bérubé M, Belhouari S, Perreault M. The current state of knowledge on care for co-occurring chronic pain and opioid use disorder: A scoping review. *J Clin Nurs*. 2024;33(8):3056-3076.

doi: 10.1111/jocn.17139

45. Engel GL. The need for a new medical model: A challenge for biomedicine. *Science*. 1977;196(4286):129-136.

doi: 10.1126/science.847460

46. Wagner S, Ljungvall H, Zetterberg H, Karlsten R, Ekselius L, Åsenlöf P. Opioid use and prescription opioid use disorder: Biopsychosocial characterisation of a clinical chronic pain cohort. *Eur J Pain Lond Engl*. 2025;29(7):e70081.

doi: 10.1002/ejp.70081

47. Su ZI. Addressing the intersections of chronic pain and OUD: Integrative management of chronic pain and OUD for whole recovery (IMPOWR) research network. *Subst Use Addict J*. 2025;46(1):134-140.

doi: 10.1177/29767342241236592

48. Rowan M, Poole N, Shea B, *et al.* Cultural interventions to treat addictions in indigenous populations: Findings from a scoping study. *Subst Abuse Treat Prev Policy*. 2014;9(1):34.

doi: 10.1186/1747-597X-9-34

49. Black N, Chung S, Tisdale C, *et al.* An international, multidisciplinary consensus set of patient-centered outcome measures for substance-related and addictive disorders. *J Clin Med*. 2024;13(7):2154.

doi: 10.3390/jcm13072154

50. Turk DC, Fillingim RB, Ohrbach R, Patel KV. Assessment of psychosocial and functional impact of chronic pain. *J Pain*. 2016;17(9):T21-T49.

doi: 10.1016/j.jpain.2016.02.006

51. Meints S, Edwards R. Evaluating psychosocial contributions to chronic pain outcomes. *Prog Neuropsychopharmacol Biol Psychiatry*. 2018;87:168-182.

doi: 10.1016/j.pnpbp.2018.01.017

52. Dowell D, Ragan K, Jones C, Baldwin G, Chou R. CDC clinical practice guideline for prescribing opioids for pain. *MMWR Recomm Rep*. 2022;71(3):1-95.

doi: 10.15585/mmwr.rr7103a1

53. Wakeman SE, Larochelle MR, Ameli O, *et al.* Comparative effectiveness of different treatment pathways for opioid use disorder. *JAMA Netw Open*. 2020;3(2):e1920622.

doi: 10.1001/jamanetworkopen.2019.20622

54. Kelly JF, Greene MC, Bergman BG. Beyond abstinence: Changes in indices of quality of life with time in recovery in a nationally representative sample of U.S. adults. *Alcohol Clin Exp Res*. 2018;42(4):770-780.

doi: 10.1111/acer.13604

55. NCCIH Research Framework. NCCIH. Accessed September 8, 2026. https://www.nccih.nih.gov/grants/nccih-clinical-trials-funding-opportunities/research-framework

56. Turk DC, Dworkin RH, Allen RR, *et al.* Core outcome domains for chronic pain clinical: IMMPACT recommendations. *Ovid*. 2003;106(3):337-345.

doi: 10.1016/j.pain.2003.08.001

57. Karnik NS, Campbell CI, Curtis ME, *et al.* Core outcomes set for research on the treatment of opioid use disorder (COS-OUD): the National Institute on Drug Abuse Clinical Trials Network protocol for an e-Delphi consensus study. *Trials*. 2021;22:102.

doi: 10.1186/s13063-021-05051-9

58. Edwards KA, Dildine TC, You DS, *et al.* Zoom-delivered empowered relief for chronic pain: Observational longitudinal pilot study exploring feasibility and pain-related outcomes in patients on long-term opioids. *JMIR Form Res*. 2025;9(1):e68292.

doi: 10.2196/68292

59. Klein MR, Darnall BD, You DS. Feasibility of web-based single-session empowered relief in patients with chronic pain taking methadone or buprenorphine: Protocol for a single-arm trial. *JMIR Res Protoc*. 2024;13(1):e53784.

doi: 10.2196/53784

60. Zuccarini MM, Stiller C. The effect of peer support on treatment engagement for opioid use disorder. *J Am Psychiatr Nurses Assoc*. 2024;30(3):709-715.

doi: 10.1177/10783903221128062

61. Scott CK, Dennis ML, Grella CE, *et al.* A community outreach intervention to link individuals with opioid use disorders to medication-assisted treatment. *J Subst Abuse Treat*. 2020;108:75-81.

doi: 10.1016/j.jsat.2019.07.001

62. Sekhon M, Cartwright M, Francis JJ. Acceptability of healthcare interventions: An overview of reviews and development of a theoretical framework. *BMC Health Serv Res*. 2017;17(1):88.

doi: 10.1186/s12913-017-2031-8

63. Holt JM. Patient experience in primary care: A systematic review of CG-CAHPS surveys. *J Patient Exp*. 2019;6(2):93-102.

doi: 10.1177/2374373518793143

64. Lerch SP, Hänggi R, Bussmann Y, Lörwald A. A model of contributors to a trusting patient-physician relationship: A critical review using a systematic search strategy. *BMC Prim Care*. 2024;25(1):194.

doi: 10.1186/s12875-024-02435-z

65. Shukla M, Schilt-Solberg M, Gibson-Scipio W. Medical mistrust: A concept analysis. *Nurs Rep*. 2025;15(3):103.

doi: 10.3390/nursrep15030103

66. Bremer W, Plaisance K, Walker D, *et al.* Barriers to opioid use disorder treatment: A comparison of self-reported information from social media with barriers found in literature. *Front Public Health*. 2023;11:1141093.

doi: 10.3389/fpubh.2023.1141093

67. Cheetham A, Picco L, Barnett A, Lubman DI, Nielsen S. The impact of stigma on people with opioid use disorder, opioid treatment, and policy. *Subst Abuse Rehabil*. 2022;Volume 13:1-12.

doi: 10.2147/SAR.S304566

68. Hackworth JC, Schneider JE, Do Valle M, *et al.* The burden of acute pain in the U.S. in the wake of the opioid crisis. *Front Pain Res*. 2025;6:1642035.

doi: 10.3389/fpain.2025.1642035

69. Eldal K, Natvik E, Veseth M, *et al.* Being recognised as a whole person: A qualitative study of inpatient experience in mental health. *Issues Ment Health Nurs*. 2019;40(2):88-96.

doi: 10.1080/01612840.2018.1524532

70. Li E, Kealy D, Aafjes-van Doorn K, *et al.* "It felt like I was being tailored to the treatment rather than the treatment being tailored to me": Patient experiences of helpful and unhelpful psychotherapy. *Psychother Res*. 2025;35(5):695-709.

doi: 10.1080/10503307.2024.2360448

71. Blanco C, Wiley TRA, Lloyd JJ, Lopez MF, Volkow ND. America's opioid crisis: the need for an integrated public health approach. *Transl Psychiatry*. 2020;10(1):167.

doi: 10.1038/s41398-020-0847-1