SYSTEMATIC REVIEW

Cognitive behaviour therapy as an evidence-based intervention for opioid use disorder: A systematic review

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Abstract

Objective: To explore the effectiveness of cognitive behaviour therapy as an evidence-based intervention for patients with opioid use disorder and to estimate the effect of cognitive behaviour therapy in mental health care settings.

Method: The systematic review was conducted from January to April 2023, and comprised search on Web of Science, PsycINFO, Medline, Embase, Google Scholar, Science Direct, PubMed, ClinicalTrials and OvidSP databases for experimental studies and randomised controlled trials related to opioid use disorders published in peer-reviewed English-language journals between December 2022 and April 2023. The studies' quality was assessed using the Modified Cochrane Collaboration risk of the bias assessment criteria.

Results: Of the 314 studies initially identified, 42(13%) were subjected to full-text assessment, and 10(23.8%) were analysed. There were 5(50%) studies done in the United States, 2(20%) in Iran, and 1(10%) each in Germany, China and England. All 10(100%) studies were randomised controlled trials with intervention-based cognitive behaviour therapy, and reported significant results in patients diagnosed with opioid use disorders.

Conclusion: All the studies analysed were heterogeneous. Cognitive behaviour therapy had a short-term impact and remained influential in the long term as well in handling cognitive and behaviour setbacks among patients with opioid use disorders.

Keywords: Cognitive behaviour therapy, Opioid use disorders, Patients, Mental health, Randomised controlled trials.

(JPMA 74: 946; 2024) **DOI: https://doi.org/10.47391/JPMA.9940**

Introduction

Opioid use disorder (OUD) is a common mental health problem that causes mortality and morbidity.[1] Loss of control over opioid use, recurrent opioid use despite efforts to cut down, and despite having ongoing social, physical, psychological, interpersonal, tolerance and withdrawal issues are all signs of OUD.[2] Approximately 50% of patients with OUD have psychiatric comorbidities that enhance the addiction severity level and they experience double trouble in social and occupational functioning.[3] According to the Centres for Disease Control and Prevention (CDC), opioid-related overdose deaths increased in 2017, with an estimated 49,000 Americans dying as a result.[4] The report of the Substance Abuse and Mental Health Services Administration in 2019 showed that 9.5 million Americans misused opioids in the previous year. Another study reported that OUD affected 1.5 million Americans in one year.[5]

In Pakistan, the consumption of illegal opiates, such as heroin, and non-medical use of prescription opioid painkillers, like oxycodone, has reached epidemic levels, and the rates are still rising.[6] In the 1990s, there was increasing heroin usage, with the most common drugs used being cannabis and opiate.[7] According to estimates, 320,000 people (0.3%) and 860,000 people (0.8%) regularly use opium and heroin, respectively. Besides, 1.06 million individuals (1% of the population aged 15-64 years) are using opiates.[8] Opioids disrupt brain activity and result in aberrant cell firing.[9] Excessive opioid usage damages the brain's reward system, emotional response system, physical response system and decision-making system.[10] OUD patients often experience cognitive dysfunction which affects the level of decision making.[11] On the other hand, opioids are commonly prescribed for pain management, including for chronic pain conditions. However, non-medical use of opioids and the use of illegal opioids, such as heroin, also occurs[12]

Research reported that people with OUD receive treatment as they need lifetime care and clinical services to maintain recovery.[13] On the other hand, people with early onset usually overcome internalizing problems more efficiently[14] because of their better resources and less impairment in social and occupational functioning.[14-16]

In this regard, cognitive behaviour therapy (CBT) is an effective behavioural intervention used to improve treatment outcomes among people with OUD.[17] CBT can be helpful to individuals with OUD, but it is typically used in combination with other evidence-based treatments, like

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Submission complete: 07-06-2023 **Review began:** 24-07-2023

Acceptance: 10-01-2024 **Review end:** 11-11-2023

medication-assisted treatment (MAT), which includes medications, like naltrexone, methadone and buprenorphine, along with psychosocial interventions.[18]

CBT effectively treats OUD[19] and effects significant improvement in positive appraisal than other therapies in psychological treatment.[20] CBT is regarded as an evidence-based strategy for treating a variety of psychiatric problems.[21] The widely used behavioural interventions for people with various mental health conditions for many years has been CBT which integrates cognitive and behavioural theories.[22] For the treatment of substance use disorders (SUDs), CBT has been utilised both alone and in conjunction with medication.[23] CBT for OUDs focuses on reconstructing patients' erroneous perceptions of themselves, others and their surroundings, developing coping skills, and re-establishing a healthy lifestyle for maintaining abstinence.[24] Positive associations have been seen between CBT sessions and the number of continuous weeks of opioid abstinence and the provision of opioid-negative urine.[25] CBT for OUD highlights effectiveness in reducing opioid use, improving coping skills, and preventing relapse.[26] A randomised clinical trial (RCT) investigated the use of computer-based CBT for OUD and found that it improved cognitive function and treatment outcomes, including reducing opioid use and increasing abstinence.[27] Compared to physician management alone, CBT also enhances the effectiveness of treatment for prescription opioid misuse.[28] Recent research has further demonstrated that CBT is a successful strategy for those with OUD[29] as well as helps individuals with OUD in reducing their opioid use, improving their coping skills, and achieving better outcomes in their recovery journey.[30]

The current systematic review was planned to investigate the effectiveness of CBT in treating OUD patients.

Materials and Methods

The systematic review was conducted from January to April 2023, and comprised search on Web of Science, PsycINFO, Medline, Embase, Google Scholar, Science Direct, PubMed, ClinicalTrials and OvidSP databases for experimental studies and RCTs related to opioid use disorders published in peer-reviewed English-language journals between December 2022 and April 2023.

The key words or search terms included "cognitive behaviour therapy" OR "CBT" OR "evidence-based practices" OR/AND “substance abuse” OR "opioid use disorder" OR “opioid” OR "OUD" OR" heroin" OR “addiction opioid opiate” OR "oxycodone”.

The review included experimental studies and RCTs related to OUDs in adolescents. The studies, either qualitative or quantitative, tested CBT interventions and provided data relating to individuals suffering from OUDs as defined by the fifth edition of the text version of the Diagnostic and Statistical Manual of Mental Disorders.[31]

The studies were excluded if access to full text was not available, if the participants had been involved in illegal activities or had human immunodeficiency virus (HIV) or acquired immunodeficiency syndrome (AIDS) or SUDs. Also excluded were studies involving minors, non-humans, gays or lesbians.

Text search was the first step in the selection process, after which EndNote and Excel were used to import the references. Titles and abstracts were eliminated, and eligibility of whole papers was assessed with respect to the inclusion and exclusion criteria.

Five reviewers accessed and screened the studies' titles and abstracts, and then full-text articles were reviewed to determine eligibility and acceptability. Differences among the reviewers were settled through roundtable discussions.

The modified Cochrane Collaboration risk of bias tool was used to gauge the manuscripts’ quality. Bias is assessed as a judgment (high, low, or unclear) for individual elements from five domains (selection, performance, attrition, reporting, and others).[46]

All studies were coded, and relevant data was retreived, where available, from each study, including gender, sample size/description, age of participants, country of study, assessment of patients, study type/design, CBT and OUDs.

Only evidence-based CBT treatments were coded, and CBT represented cognitive and behavioural strategy. Final analysis focussed solely on the efficacy of evidence-based motivational and CBT techniques in the treatment of OUD patients.

With respect to quality assessment, using a checklist of the published studies, methodological assessment of the studies was done. The validity of the studies was also evaluated using this checklist (internal and external). Specific criteria, including descriptive issues, study population, data collection, generalisability, completion of the study, data analysis, results from the interpretation, treatment conditions, and outcomes, were employed during this evaluation.

Information analysis was done only for CBT and OUDs based on clinical samples. The outcomes of each trial were examined separately. The studies were organised in chronological order based on the publication dates of each study's references, and the researchers looked for evidence of the efficacy of CBT for OUD patients.

Table: Studies describing the effectiveness of cognitive behaviour therapy (CBT) in the treatment of opioid use disorder (OUD).

Study	Title	Country	Study Design	Participants Age Range	Conclusion
Meyer et al., 2021[45]	A Personalized, Interactive, Cognitive Behavioural Therapy–Based Digital Therapeutic (MODIA) for Adjunctive Treatment of Opioid Use Disorder: Development Study	Germany	Experimental Study	18-30 years	As part of a clinician-supervised MAT programme, MODIA will allow more patients to begin psychotherapy concurrently with opioid maintenance treatment.
Mumba et al., 2020[30]	Development of a Novel Behavioural Intervention for Opioid Use Disorders	USA	Experimental Study	19–74 years	This study concluded that CBT improves adherence to medications for OUD, self-efficacy, and quality of life.
Barry et al., 2019[37]	An evaluation of the feasibility, acceptability, and preliminary efficacy of cognitive-Behavioural therapy for opioid use disorder and chronic pain	USA	Experimental Study	19–74 years	We found support for the feasibility, acceptability, and preliminary efficacy of cognitive-Behavioural therapy relative to standard drug counseling in promoting abstinence from nonmedical opioid use among patients with opioid use disorder and chronic pain. Overall, patients exhibited improved pain outcomes, but these improvements did not differ significantly by treatment condition.
McHugh et al., 2017[46]	Development of an Integrated Cognitive Behavioural Therapy for Anxiety and Opioid Use Disorder: Study Protocol and Methods	England	Experimental Study	18 years or older.	Manual-based CBT has a significant role in decreasing relapse among opioid dependent individuals.
Amini-Lari et al., 2017[33]	Cognitive-Behavioural Therapy for Opiate Users in Methadone Treatment: A Multicenter Randomized Controlled Trial	Iran	Experimental Study	20–45 years	CBT can be used as an effective intervention to reduce regular opiate use on a stable methadone dose. A larger study with more Persian participants and a six-month follow-up is suggested.
Moore et al., 2016[28]	Cognitive Behavioural Therapy Improves Treatment Outcomes for Prescription Opioid Users in Primary-Care Based Buprenorphine Treatment	USA	Experimental Study	23–52 years	Findings suggest that examination of other factors that may predict response to Behavioural interventions is warranted.
Pan et al., 2015[24]	Efficacy of Cognitive Behavioural Therapy on Opiate Use and Retention in Methadone Maintenance Treatment in China: A Randomized Trial	China	Experimental Study	30–64 years	CBT counselling is effective in reducing opiate use and improving employment function and in decreasing stress level for opiate-dependent patients in MMT in China.
Otto et al., 2014[35]	A Randomized, Controlled Trial of the Efficacy of an Interoceptive Exposure-Based CBT for Treatment-Refractory Outpatients with Opioid Dependence	USA	Experimental Study	19–74 years	Results concluded that Cognitive Behavioural treatment showed significant changes on self-report but not objective measures of illicit drug use.
Pashaei et al., 2013[36]	A Randomized, Controlled Trial of the Efficacy of an Interoceptive Exposure-Based CBT for Treatment-Refractory Outpatients with Opioid Dependence	Iran	Experimental Study	20- 64 years	The result showed that relapse prevention treatment (Cognitive Behavioural model) has a significant role in decreasing relapse among opioid dependent individuals.
Fiellin et al., 2013[34]	A Randomized Trial of Cognitive Behavioural Therapy in Primary Care–based Buprenorphine	USA	Experimental Study	18 years or older.	Among patients receiving buprenorphine/naloxone in primary care for opioid dependence, the effectiveness of physician management did not differ significantly from that of physician management plus cognitive Behavioural therapy.

Results

Of the 314 studies initially identified, 42(13%) were subjected to full-text assessment, and 10(23.8%)[24,28,30-36] were analysed (Figure). There were 5(50%) studies done in the United States, 2(20%) in Iran, and 1(10%) each in Germany, China and England. All 10(100%) studies were RCTs with intervention-based CBT, and reported significant results in patients diagnosed with OUDs (Table).

There were 2(20%) studies[30,31] which looked at the worth of manualised CBT for OUDs and concluded that as a stand-alone approach this intervention was useful. Particular skills were introduced throughout sessions of integrated CBT (I-CBT) to substitute risky and maladaptive behaviours, like opioid use, and incorporated rehearsal of learned skills both by themselves and in conjunction with fear exposure. One-hour sessions were held once a week for 12 weeks as part of a treatment programme meant to support OUD MAT. The findings showed that the manual-based treatment regimen enhanced self-efficacy, quality of life, and adherence to OUD.

CBT dramatically decreased opiate usage after 4 weeks of treatment and there was more willingness to decrease opiate use.

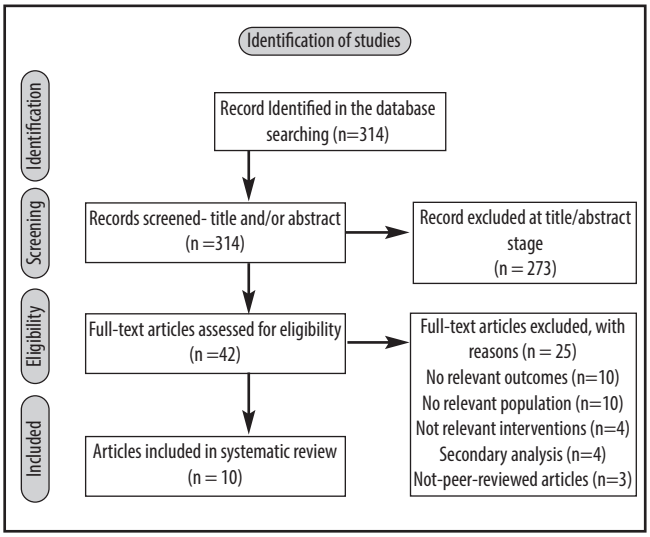

Figure: Preferred Reporting Items for Systematic Reviews (PRISMA) flowchart.

Further, 4(40%) experimental studies were based on RCT of two methadone clinics in which participants were randomly allocated (1:1) to experimental group and waitlist/control condition.[24,32-34] Research coordinators carried out randomisation and grouping. The CBT sessions were led by two psychologists, while control groups were not supposed to receive treatment.

For randomisation and allocation, the participants were blind. The baseline opiate treatment index (OTI) scores were similar between the groups. The OTI score in the treatment group considerably decreased after receiving CBT (z=3.73, *p*=0.01, d=0.89), while there was no difference in the control group. At the follow-up, the outcome in the treatment group was statistically stable (z=2.23, *p*=0.01, d=0.83), while there was no significant difference in the control group. Therefore, all the studies came to the same conclusion that CBT was an intervention that could decrease opiate usage while maintaining a constant methadone dosage.

Another research[36] assessed effectiveness of CBT intervention for adult OUD patients. Randomly, the participants were assigned to educational intervention group or control group. The study found that only 36.4% of experimental group subjects relapsed to opiate use, while 63.6% of the waitlist group relapsed. Hence, the study determined that CBT has a substantial role in reducing relapse among opioid-dependent individuals on methadone maintenance treatment (MMT), and its help clients remaining in retention longer.

A similar research[28] determined whether treatment outcomes varied for prescription opioid and heroin use disorder patients in the physician management (PM) group or the PM plus CBT group in primary care buprenorphine/naloxone treatment. The findings demonstrated that CBT reduced the use of opioid, and urine samples were also negative for all substances. Patients with opioid prescription in the PM-CBT group had more than twice as many mean weeks of drug-free time (7.6) as did those who were allocated to the PM alone group (3.6; *p*=0.02).

A study[37] assessed the acceptability and viability of CBT for chronic pain and OUD. In this trial, 40 methadone-maintained patients were randomly allocated to undergo either methadone drug counselling (MDC), which was standard drug counselling (n=19), or weekly manualised CBT (n=21). CBT was more likely to be feasible, acceptable and initially effective than traditional drug counselling in encouraging OUD individuals with chronic pain to stop using non-medical opioids. Additionally, another study[3] focusses on creating a comprehensive intervention that tailors its content to individual needs, incorporating elements such as real-time feedback and potential integration with wearable devices and introduces MODIA, a personalized, interactive, cognitive--behavioural therapy (CBT)-based digital therapeutic designed as an adjunctive treatment for opioid use disorder.

Discussion

The current systematic review assessed the effectiveness of evidence-based CBT practice in 10 studies. CBT was found to be an efficient treatment for individuals with OUDs. These results are supported by other researchers as well who concluded that CBT can also be useful in psychological disorders, such as people with OUD in reducing opioid use, improving coping skills, and addressing psychological factors that contribute to addiction..[38]

Another study concluded that by addressing cognitive and behavioural aspects, CBT was significantly able to focus on the elements that enhance long-term treatment outcomes and support lasting recovery.[39] Another study confirmed that CBT was an effective therapy for improving treatment outcomes, and played a vital role in helping individuals with OUD shift their focus from drug use to the things they value most in life[11] by practicing skills and help patients to strengthen these skills to avoid relapse of substance use disorder.[40] Similarly, another research supported that CBT always assisted patients with OUDs to recognise risk situations and develop strategies to cope with these high-risk situations.[41] CBT's effectiveness is well identified because of its concise and comprehensive quality. The intervention can be utilised in various situations because it is based on various skills and approaches.[42]

The current review found CBT to be associated with positive behavioural changes and adaptation skills in OUDs.[43] A more recent adaption model may be particularly useful in preventing substance misuse in young adolescents or treating concomitant psychiatric disorders such as depression, criminogenic cognition and relapses among substance use clients.[3] The positive outcomes observed in the review highlighted the value of CBT as a therapeutic approach for individuals with OUD, supporting their recovery journey and improving their overall wellbeing.

Limitations: The current systematic review has some limitations. Not many studies have been conducted in this specific area, and those that have been conducted are related to only a few countries. Also, most studies lacked follow-up information. Most studies analysed were conducted in advanced countries where people have orientation and opportunities. As such, it is not known how exactly these approaches can produce positive results in countries where the community is not well aware and practitioners are working with limited resources. Besides, data was on a broader level and did not deal with specific disorders. **Finally, the review was registered ex-post-facto on the protocols.io platform.**

Despite the limitations, however, the review provided information regarding psychological treatment for OUDs that may help clinicians and practitioners develop treatment models and technologies for their patients. However, it is essential to recognise that no single treatment approach is universally effective for all individuals, and a comprehensive treatment plan tailored to each person's specific needs is often the most successful approach.

Conclusion

CBT was found to be an evidence-based, effective and valuable treatment intervention for OUD patients. By addressing both cognitive and behavioural factors, it helped in reducing opioid use, managing cravings, improving psychological wellbeing, preventing relapse and promoting long-term recovery from OUD.

Acknowledgment: We are grateful to all the authors of the original studies that have been part of the current systematic review.

Disclaimer: All 10 studies in this systematic review are experimental studies and there is an "Unclear Risk of Bias" There may be a risk of bias, but there is either insufficient information to assess whether an important risk of bias exists or insufficient rationale or evidence that an identified problem will introduce bias. In all studies, the researchers fulfill the five domains (selection, performance, attrition, reporting, and other) in their experimental studies.

Conflict of Interest: None.

Source of Funding: None.

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Author Contribution:
MS: Conceived idea, data collection and writing.
KM: Review and submission process.