Non-pharmacological interventions for acute pain management in patients with opioid abuse or opioid tolerance: a scoping review protocol

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ABSTRACT

Objective: The objective of this scoping review is to identify and map the evidence on non-pharmacological interventions for acute pain management in patients with opioid tolerance and opioid abuse.

Introduction: The mainstay of pain management for adults experiencing moderate to severe acute pain is opioid therapy. However, in light of the known risks of opioid use and the growing number of patients with opioid tolerance or opioid abuse, non-pharmacological interventions are of increasing interest to healthcare providers. Non-pharmacological techniques have shown potential in reducing postoperative pain, opioid consumption, stress and anxiety.

Inclusion criteria: Eligible studies will include participants in a hospital or healthcare facility who are experiencing acute pain and have a tolerance to or dependence on opioids. Studies that examine non-pharmacological interventions for treating acute pain in these patients will be considered. Non-pharmacological interventions may include, but are not limited to, acupuncture, electroacupuncture, massage, mindfulness, electroanalgesia, laser therapy, low-level light therapy, meditation, biofeedback, hypnosis and relaxation techniques. Only studies published in English will be included, and there will be no limit on dates of publication.

Methods: PubMed, CINAHL, Scopus, Embase, Europe PubMed Central, PsycINFO, Cochrane Central Register of Controlled Trials and ClinicalTrials.gov will be searched, as well as sources of unpublished studies. After screening the titles and abstracts of identified citations, two independent reviewers will retrieve potentially relevant full-text studies, assess methodological quality and extract data. Data will be presented in diagrammatic or tabular form, and a qualitative thematic analysis will be undertaken. A narrative summary will accompany the tabulated results.

Keywords Acute pain; non-pharmacological; opioid abuse; opioid dependence; opioid tolerance

Introduction

The United States is currently experiencing an opioid crisis. Deaths involving opioids have continued to increase among people of all sexes, races, and nearly all ages.1 The number of deaths involving opioids was more than five times higher in 2016 than in 1999.2 Approximately 115 Americans die every day from opioid overdose.2

The opioid epidemic has been driven in part by a tremendous increase in the number of opioid prescriptions used in the treatment of chronic pain.3 In 2016, healthcare providers prescribed more than 214 million opioid prescriptions.3 More than 42,000 Americans were killed by opioid overdoses in 2016, and more than 40% of those deaths were from prescription opioids.4 Despite the fact that the United States has only a small fraction of the world’s total population, the U.S. population consumes an extremely high proportion of the world’s opioids.4 In 2015, approximately 12.4 million American adults misused prescription pain relievers and 828,000 used heroin.5 Morbidity and mortality statistics alone fail to fully capture the extent of the problem of substance use disorders in America because millions more Americans have misused prescription opioids.3

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Although the largest effects of the opioid epidemic are seen in America, problematic opioid use is not unique to the United States. From 1996 to 2016, global consumption of opioids more than tripled.\(^4\) Canada has the second highest level of prescription opioid use and experienced a 12.7% increase in daily opioid consumption between 2008 and 2012.\(^5\) Reports by the United Nations International Drug Control Program show a global increase in the production and consumption of opioid drugs. Heroin, specifically, has become increasingly common both in North American and in Europe.\(^6\) Additionally, Australia and New Zealand have experienced an increase in the number of patients prescribed opioids on a long-term basis.\(^7\) In 2010, approximately 1.5 million people in the European Union and Norway misused or abused opioids. Russia has a rate of problematic opioid users of 16.4 per 1,000 population.\(^8\) Reports by the United Nations show a global increase in the production and consumption of opioid drugs.\(^9\) In 2015, 29.5 million people worldwide suffered from drug use disorders, including drug dependence.\(^9\) Opioids were the most common and most harmful drug type misused, accounting for 70% of the negative health impact associated with drug use worldwide.\(^9\) The number of people globally who have used opiates or misused prescription opioids in the previous year is approximately 35.1 million.\(^9\)

Opioid medications are prescription analgesics that have risks for serious adverse outcomes including addiction, unintentional overdose and death.\(^10\) Chronic use, misuse and abuse of opioids have emerged as major public health problems.\(^10\) Management of pain in patients with opioid tolerance and opioid abuse presents unique challenges. It is more difficult to effectively manage acute pain in patients with opioid abuse or opioid tolerance, and these patients may require analgesia for longer periods of time and significant deviation from standard pain treatment protocols.\(^7\) Although pharmacologic approaches are the mainstay of treatment for pain, treatment should include non-pharmacological interventions as well.\(^11\) Although there is clear evidence regarding the risks of opioids, especially related to long-term opioid use, there is a paucity of documentation regarding treatment alternatives.

There are a variety of terms that may be used to describe opioid misuse: chronic opioid use, opioid misuse, tolerance, dependence and addiction. Opioid use disorder is defined as a problematic pattern of opioid use that leads to clinically significant impairment or distress.\(^12\) Physical dependence is defined as an adaptive state where a client would experience a specific withdrawal syndrome if there were a cessation or reduction in dosage of a drug or the administration of an antagonist medication.\(^13\) Tolerance is an adaptive state where there is a diminished effect of the drug due to chronic exposure over time.\(^13\) Opioid tolerance affects patients who have received for one week or longer at least 60 mg of oral morphine per day, 25 mcg of transdermal fentanyl per hour, 30 mg of oral oxycodone per day, 8 mg of oral hydromorphone per day, 25 mg of oral oxymorphone per day or an equianalgesic dose of another opioid medication.\(^10\) Addiction is a chronic neurobiological disease characterized by behaviors including impaired control over drug use, compulsive drug use, craving and continued use of a drug despite harm.\(^13\)

Many hospitalized patients, including those with tolerance to or dependence on opioids, will experience acute pain. Acute pain is a complex sensory experience that is unpleasant; includes emotional, cognitive and sensory components; and occurs in response to damage to the body tissues resulting from trauma, surgery, medical procedures and disease states.\(^11\) Under-estimation and under-treatment of pain in patients who are tolerant to or dependent on opioids is common.\(^14,15\) Problems in the management of pain in these patients often result in poor pain management and withdrawal phenomena.\(^14\) Patients with opioid use disorders who are experiencing pain have a right to treatment with respect, high-quality pain assessment and good pain management.\(^15\) There is an ethical imperative for healthcare professionals to provide safe and effective pain management for these patients.\(^15\) Poorly controlled pain may trigger a relapse or exacerbate existing substance addiction disorders.\(^15\)

The mainstay of pain management for adults experiencing moderate to severe acute pain is opioid therapy.\(^7,16\) However, in light of the growing number of patients with opioid tolerance or opioid abuse, non-pharmacological interventions may be of increasing interest to healthcare providers. Non-pharmacological techniques may include psychological interventions, attentional strategies,
cognitive-behavioral interventions and physical modalities.\textsuperscript{17} Non-pharmacological interventions are adjunctive to pharmacological interventions for the treatment of acute pain, and have shown potential in reducing postoperative pain, opioid consumption, stress and anxiety,\textsuperscript{9} patients.

The reason for undertaking the review is to identify an overview of what non-pharmacological interventions have been documented in the use of patients with opioid use disorders, including opioid tolerance, abuse and misuse. As a scoping review, the objective is to identify and map the available evidence regarding the use of non-pharmacological interventions in patients with opioid tolerance and opioid abuse. The intent is to identify the range of the available evidence in this potentially broad area and to inform evidence-based practice, advancing the state of knowledge for treatment of these patients.

The evidence available regarding acute pain management, including pharmacological and non-pharmacological interventions, in patients with opioid tolerance and opioid dependence is limited and is generally focused on case reports, case series and expert opinion.\textsuperscript{7} A preliminary search of the literature was conducted in February 2018 through PubMed, CINAHL, JBI Database of Systematic Reviews and Implementation Reports and Cochrane Database of Systematic Reviews. The authors discovered narrative reviews focusing on pharmacological management of acute pain in perioperative patients with opioid tolerance\textsuperscript{16} and pharmacological interventions for acute pain in patients with opioid tolerance.\textsuperscript{7} Another document discussed levels of evidence for various pharmacological interventions in the treatment of pain in patients with opioid tolerance or opioid addiction.\textsuperscript{17} The authors also discovered a systematic review of non-pharmacological intervention in orthopedic pain.\textsuperscript{18} However, this review did not consider underlying opioid use, abuse or tolerance. No systemic reviews were found detailing non-pharmacological interventions for patients with opioid tolerance or opioid dependence.

Review objective/question
The objectives of this review are to explore existing literature related to non-pharmacological interventions for acute pain management in patients with opioid tolerance and opioid abuse, to examine and conceptually map the evidence and to identify any gaps in the research literature. The question of this review is: what non-pharmacological interventions are used for the management of acute pain in patients who are tolerant to or dependent on opioids?

Inclusion criteria
Participants
The review will consider studies that include participants who are experiencing acute pain and who have a tolerance to or dependence on opioids.

Concept
The current scoping review will consider studies that examine non-pharmacological interventions used in the management of acute pain in patients with opioid tolerance or opioid abuse. These non-pharmacological interventions may include, but are not limited to, acupuncture, electroacupuncture, massage, mindfulness, electroanalgesia, laser therapy, low-level light therapy, meditation, biofeedback, hypnosis and relaxation techniques.

Acute pain experienced by the client may include nociceptive pain, such as somatic or visceral pain, or acute neuropathic pain. This may include postoperative pain, pain following a traumatic injury or acute pain associated with a disease process.

Context
The current scoping review will consider studies that have been conducted with patients in a hospital or healthcare facility who are experiencing acute pain.

Study types
This review will consider experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. This review will also consider descriptive observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion.

Studies published in English will be included. The review will consider all relevant published studies, with no limit on the dates of publication.
Methods

The Joanna Briggs Institute (JBI) methodology will be used to complete this scoping review.\(^1\)

Search strategy

The search strategy will aim to find published and unpublished studies. An initial limited search of PubMed and CINAHL has been undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe articles. This informed the development of a search strategy, which will be tailored for each information source. A full search strategy for PubMed is detailed in Appendix I. The reference list of all studies selected for inclusion will be screened for additional studies. The databases to be searched include PubMed, CINAHL, Scopus, Embase, Europe PubMed Central and PsycINFO. The trial registers to be searched include the Cochrane Central Register of Controlled Trials and ClinicalTrials.gov. The search for unpublished studies will include ProQuest Dissertations and Theses, PapersFirst and OpenGrey. Initial keywords to be used will be acute pain, non-pharmacological, opioid abuse, opioid dependence and opioid tolerance.

Study selection

Following the search, all identified citations will be collated and uploaded into EndNote V7.4 (Clarivate Analytics, PA, USA) and duplicates removed. Titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Studies that may meet the inclusion criteria will be retrieved in full and their details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; Joanna Briggs Institute, Adelaide, Australia). The full text of selected studies will be retrieved and assessed in detail against the inclusion criteria. Full-text studies that do not meet the inclusion criteria will be excluded, and reasons for exclusion will be provided in an appendix in the final systematic review report. The results of the search will be reported in full in the final report and presented in a PRISMA flow diagram.\(^2\) Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer.

Data extraction

Data will be extracted from papers included in the scoping review using the draft data extraction tool listed in Appendix II by two independent reviewers. The data extracted will include specific details about the populations, concept, context and study methods of significance to the scoping review question and specific objectives. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. Authors of papers will be contacted to request missing or additional data where required. The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included study. Modifications will be detailed in the full scoping review report.

Data presentation

The extracted data will be presented in diagrammatic or tabular form in a manner that aligns to the objective and scope of this scoping review. The tables and charts will report on distribution of studies by year or period of publication, countries of origin, intervention(s) and research methods. A qualitative thematic analysis will be undertaken to provide an overview of the literature. A narrative summary will accompany the tabulated and/or charted results and will describe how the results relate to the review objective and question. The findings will be discussed as they relate to practice and research.

References

Appendix I: Search strategy for PubMed


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Appendix II: Data extraction tool

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