

Management of spinal cord injury–related pain using complementary alternative medicine: a scoping review protocol

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ABSTRACT

Objective: This scoping review will identify complementary alternative medicine methods used to manage spinal cord injury–related pain.

Introduction: Spinal cord injury–related pain is common, with a third of individuals experiencing severe pain. Conventional interventions are well documented, however, pain relief remains elusive for people with spinal cord injuries. Although complementary alternative medicine is available to alleviate various health problems, little is known about the complementary alternative medicine methods used to manage pain in people with spinal cord injuries.

Inclusion criteria: This review will consider all studies on complementary alternative medicine treatment methods used by adults with spinal cord injury to treat their associated pain. The concept of interest in this study is complementary alternative medicine. Quantitative, qualitative, and mixed methods studies, text and opinion papers as well as systematic reviews will be included in this review.

Methods: A three-step search strategy, consisting of an initial limited search, a full search, and a screening of the reference lists of all included articles will be undertaken. Key information sources to be searched include CINAHL, Cochrane Library, *JBI Evidence Synthesis*, MEDLINE, Scopus, Web of Science, DynaMed, Natural Medicines, HerbMed, Open Dissertations, and OpenGrey. All titles and abstracts of identified citations will be screened and then uploaded to a reference management program. The full text of studies potentially meeting the inclusion criteria will be assessed in detail, and relevant data will be extracted and reported in tabular format, in line with the objectives and scope of the review.

Keywords: complementary alternative medicine; complementary therapies; pain management; scoping review; spinal cord injuries

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Introduction

Although a spinal cord injury (SCI) is an uncommon condition, its consequences are debilitating due to varying degrees of lifelong sensory and motor loss.¹ There is an estimated overall incidence of 23 cases per million people worldwide, with traumatic causes far outweighing non-traumatic

causes of damage to the spinal canal.² An SCI is either complete or incomplete, and depending on the level of injury, results in tetraplegia (partial or full loss of the trunk and all four limbs) or paraplegia (partial or full loss of the trunk and the lower limbs).³ The rising rates of SCI, especially in developing and middle- to low-income countries, are a cause of concern due to the associated costs, impact on well-being, community participation, and quality of life.⁴

Secondary health conditions (SHCs) in individuals with SCI are likely to worsen their primary

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disability across their lifespan.⁵ These SHCs are caused by the inability to control bodily functions and include respiratory complications, urinary and bowel complications, spasticity, depression, pressure ulcers, and pain, among others, with pain being among the most difficult to prevent and manage.^{2,4} Pain exceeds the consequences of the SCI at times and up to 94% of people with SCI (PWSCI) report the presence of pain.^{3,6} Pain in PWSCI interferes with activities of daily living, community participation, mood, and quality of life.^{6,7} The experience and perception of pain may be intense, and reported as severe to extreme, with the possibility of being aggravated over time and interfering with emotional and cognitive function, mobility, and independence.⁷ Various emotional, behavioral, and social factors affect the experience of pain,⁸ with different factors, such as genetics, comorbidities, current psychological state, prior experience of pain, and socioeconomic circumstances, influencing the severity of pain.⁹

Pain after SCI (also referred to as SCI-related pain) is multifactorial and could be nociceptive, neuropathic, or mixed; chronic or acute; and might even be experienced in one or more locations at the same time.^{3,9-11} Nociceptive pain is due to the activation of nociceptors, which occurs as a result of actual tissue damage.¹² Neuropathic pain is caused by a dysfunction in the nervous system (as is the case in SCI). It results from the hyperexcitability of the spinal neurons in close proximity to the level of injury, leading to the abnormal spontaneous neuronal activity in the dorsal horn neurons immediately above the level of injury.⁷ The spontaneous pain is often persistent, constant, and is often described as abnormal sensations (such as burning and electric shocks).⁹ “Mixed pain” is the accepted term when both nociceptive and neuropathic pain overlap.¹²

The different mechanisms of pain make the management of pain complex and challenging, particularly in PWSCI, and treatment is rarely aimed at all of the associated factors of pain.¹³ This is because pain after SCI is complicated by cognitive, emotional, behavioral, and social factors that negatively influence the experience of pain.⁸ For example, the general population with shoulder pain can rest the associated shoulder to relieve the pain; however, PWSCI with shoulder pain would not be able to successfully rest the painful shoulder because that

shoulder would be needed for wheelchair propulsion, transfers, and other activities of daily living.^{14,15} Despite these challenges, management of pain is essential, and without intervention, PWSCI may experience additional losses in function and community mobility.¹⁵

The biopsychosocial model is the most widely accepted and holistic perspective for the management of chronic pain. This model hypothesizes that individual pain experiences result from the interaction of psychological, social, cognitive, physiological, and behavioral factors.¹⁶ The biopsychosocial approach of pain management acknowledges that pain can be aggravated by emotional dimensions, social determinants, pain catastrophizing, perceptions of injustice, anxiety and fear, depressed moods and behavior, as well as social exclusion.¹⁷ There are various documented conventional management methods to manage SCI-related pain, including pharmacological, physiotherapeutic, and even surgical interventions.¹⁰ However, there are PWSCI who do not find relief for their pain, with SCI pain cited as the most difficult condition to manage.^{7,18}

People with SCI may be prescribed conventional management methods that are inappropriate for their type of pain or that do not target the other mediating factors that influence the experience of pain. The willingness to use one treatment method over the other may mediate the behavior of employing such a treatment,¹⁹ and as much as various pain management methods are made available to PWSCI, their attitude toward the treatment may play a role in attaining pain relief or not. For instance, a patient’s concerns, such as side effects or fear of addiction using pain medication, may influence whether a patient uses the pain medication or not.¹⁹ In order to manage SCI-related pain holistically and effectively, PWSCI need to be considered as a whole person. Psychosocial and environmental factors that might influence the way PWSCI would respond to pain management methods should also be considered. The experience of pain differs per individual; therefore, pain management should be patient-specific and should also reflect the individual’s attitudes, beliefs, and preferences.¹³

Pharmacological and non-pharmacological (such as electrical stimulation) treatment options are approaches traditionally used to manage SCI-related pain.²⁰ Unconventional treatment methods known as complementary alternative medicine (CAM) are

available and gaining popularity in pain management,²¹⁻²³ perhaps due to PWSCI not finding complete pain relief from conventional methods alone.^{6,20,21} CAM is defined as a “treatment and/or prevention which complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy or by diversifying the conceptual frameworks of medicine.”^{24(p.506)} It refers to a group of varying therapies (and products) that are not generally considered to be part of usual conventional medicine.^{22,25} A list of CAMs is provided in Appendix I.

Complementary alternative medicine is emerging as a strong unorthodox approach for treating pain. In the United States, the National Center for Complementary and Integrative Health has classified the different complementary approaches by how each therapy is delivered (primary therapeutic input). This may be nutritional (eg, dietary supplements), psychological (eg, meditation and hypnosis), physical (eg, chiropractic therapies), and combinations of the above.²⁶ Other complementary health approaches that do not fit into the above-mentioned groups include the use of traditional healers, Chinese medicine, and homeopathy.²⁶ People with disabilities use CAM more frequently than the general population^{11,21} given the numerous health complications caused by a disability.²² Pain is the most common reason for CAM use, with individuals reporting a high general satisfaction level with CAM.^{21,22} Choosing whether to use CAM or not involves numerous factors. These essentially revolve around an individual’s personal evaluation of the side effects and anticipated benefits of the treatment.²⁷ There is a scarcity of CAM scientific evidence for PWSCI, and some CAM methods have been researched more than others (eg, acupuncture compared with homeopathy).²¹ A review of all CAM methods used to relieve pain after SCI would be beneficial as there is a reported high rate of PWSCI seeking CAM methods for their chronic medical conditions.²¹

A preliminary search of MEDLINE (PubMed) and CINAHL was conducted on April 9, 2021, and no current or in-progress scoping or systematic reviews on this topic were identified. The proposed review will identify current CAM methods used in the management of pain in PWSCI. The outcome of this review will provide a concise overview of the existing evidence on the CAM methods used to

manage SCI-related pain, which could be explored as pain management measures based on the biopsychosocial approach.

Review question

What are the CAM methods used to manage pain in PWSCI?

Inclusion criteria

Participants

This scoping review will consider studies on CAM management methods (as specified in Appendix I) for treating SCI-related pain. The review will include studies with participants older than 18 years of age, irrespective of the participants’ demographic and injury profile (such as type or completeness of SCI). Furthermore, this review will consider studies where participants use a combination of CAM approaches or a combination of CAM and conventional approaches. Pain tends to co-exist with other SHCs, such as pressure ulcers, urinary tract infections, and spasms^{5,7}; consequently, studies that investigate CAM methods for pain in conjunction with other SHCs will be included.

Concept

The concept of interest in this study is the range of CAM management methods available that are used to treat SCI-related pain. These methods could include any of the constructs of the biopsychosocial model of care. They could also include any aspect of pain in PWSCI (eg, any type, cause, location, character and severity of pain).

Context

This review will consider CAM studies conducted on PWSCI in in-patient and out-patient rehabilitation settings or any other health care settings, irrespective of the country of origin, race, gender, or sociocultural context. Furthermore, the CAM methods may be self-administered or delivered by a skilled professional, and do not need to be prescribed by a health professional.

Types of sources

No limits will be imposed on this scoping review; as such, it will consider quantitative, qualitative, and mixed methods study designs as well as studies that seek to validate CAM outcome measures and methodological studies. In addition, systematic reviews

and text and opinion papers will be considered for inclusion.

Methods

The proposed scoping review will be conducted in accordance with the JBI methodology for scoping reviews^{28,29} and is registered with Figshare (<https://doi.org/10.6084/m9.figshare.15112947>).

Search strategy

The search strategy will aim to identify both published and unpublished studies, including reviews, texts, and opinion papers. A three-step search strategy will be used. The first step has already been completed, consisting of an initial limited search of the MEDLINE (PubMed) and CINAHL (EBSCO) databases to identify relevant articles on the topic. The initial search was followed by an analysis of the text words contained in the titles and abstracts of the relevant articles, and the index terms used to describe these retrieved articles. This step informed the development of a search strategy, including the identification of keywords and index terms, which will be adapted for each information source (see Appendix II). Potentially useful terms may be discovered during the development of the scoping review and incorporated into the search strategy. For the second step, all identified keywords and index terms will be searched across all of the included databases. In the third step, the reference lists of all included articles will be screened for additional papers to include in the review.

No restrictions on language or year of publication will be made. Should the need arise, the reviewers will contact the authors of primary studies or reviews for further information.

The databases to be searched will include CINAHL Complete (EBSCO); MEDLINE Complete (PubMed); ProQuest Health and Medicine (ProQuest); Cochrane Library; *JBI Evidence Synthesis*; Scopus; Web of Science; and specific CAM databases, including Natural Medicines, MICROMEDEX 2.0, DynaMed, and HerbMed. Open Access Theses and Dissertations; Open Dissertations (EBSCO); ProQuest Dissertations and Theses Global (ProQuest); and Digital Archives of Theses and Dissertations, including Research (DATAD-R), will be searched for theses on CAM. Furthermore, the World Health Organization, OpenGrey and Google Scholar will be searched for unpublished and gray studies.

Study selection

Following the search, all identified records will be collated and uploaded to the reference management program, EndNote v.X9 (Clarivate Analytics, PA, USA), and duplicates removed. Titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria. Potentially relevant papers will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia).³⁰ The full text of selected citations will be assessed in detail against the inclusion criteria by two independent reviewers. Studies that do not meet the inclusion criteria will be excluded and the reasons for the exclusion will be recorded and reported in the scoping review.

A pilot study of this screening process will be undertaken. A random sample of 25 titles and abstracts will be selected and screened by the entire team using the eligibility criteria. The team will discuss discrepancies and modify the eligibility criteria where necessary. We will ensure reliability between reviewers when there is an inter-rater agreement of 75% and above. All citations will be screened following this agreement.²⁸ Possible disagreements between the reviewers at any stage in the selection process will be resolved through discussion or with a third reviewer. The results of the search will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.³¹

Data extraction

Data will be extracted from the articles included in the scoping review by two independent reviewers using a self-developed data extraction table. The extracted data will include specific details about the study population, concept (pain and intervention information), context (setting of the intervention), methods (including the study design and aims), as well as the findings relevant to the topic. A draft data extraction tool is provided (see Appendix III). Two team members will pilot the data extraction form on a random sample of 10 included articles. The form will be modified as needed based on the feedback. Extensive data extraction will only commence once the reviewers involved in the pilot test have 90% agreement. One team member will extract the data, while the other will review the extracted data. A third

reviewer will then verify all changes made by the second reviewer to ensure that all the data are accurate.²⁸ Possible disagreements between the reviewers during the data extraction process will be resolved through discussion or with a third reviewer. Where required, the authors of the papers will be contacted to request missing or additional information.

Data analysis and presentation

The reviewers will categorize the intervention information according to each aspect of the biopsychosocial model. The presentation of the extracted data will be descriptive, in tabular format, and in line with the objective of this scoping review. Simple frequency counts of the concepts, populations, and other necessary fields (such as pain characteristics) will be presented. Information about each identified CAM method will also include the intervention name and prescription. A narrative summary will accompany the tabulated results and will describe how the results relate to the review objective.

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Appendix I: Complementary alternative medicine methods

The below list of CAM modalities is compiled by the authors as guided by the literature.^{23,25,26}

Primary therapeutic input	Description	Examples (not exhaustive)
Nutritional	Vitamins and minerals	Thiamin, calcium
	Non-vitamins and non-minerals	Fish oils, probiotics, prebiotics
	Botanicals (herbs)	Chamomile, aloe vera, cannabis
	Aromatherapy/aromatic oils	
Physical	Chiropractic manipulation	
	Acupuncture	
	Massage therapy	Swedish massage, reflexology, shiatsu, Rolfing, craniosacral therapy
Psychological	Meditation (including spiritual meditation)	
	Prayer	
	Hypnosis	
	Yoga	
	Biofeedback	
	Qi gong	
	Ayurveda	
	Guided imagery	
	Tai chi	
	Acupuncture	
Other	Naturopathy	
	Homeopathy	
	Therapeutic touch/healing touch	
	Reiki	
	Traditional Chinese medicine	
	Folk medicine	Curanderismo, Native American healing
	Traditional healing	Various practices based on indigenous theories and beliefs
	Devices	Light/electrical/magnetic stimulation

Appendix II: Search strategy

MEDLINE (PubMed)

Search conducted on September 24, 2021.

Search number	Query	Results retrieved
6	#5 AND Humans [species]	757
5	#3 AND #4	884
4	#1 AND #2	12,584
3	"Complementary Therapies"[Mesh] OR "complementary therapy" OR "complementary therapies" OR "complementary alternative medicine" OR "complementary medicine" OR "alternative medicine" OR "alternative therapy" OR "alternative therapies" OR biologically based medicine OR diet OR supplements OR vitamins OR minerals OR botanicals OR herbs OR aromatherapy OR "energy medicine" OR bio-electromagnetic field* OR "cranial electrotherapy stimulation" OR "therapeutic touch" OR "healing touch" OR reiki OR manipulative body-based medicine OR "chiropractic manipulation" OR "massage therapy" OR "mind body medicine" OR meditation OR prayer OR hypnosis OR yoga OR biofeedback OR "Qi gong" OR Ayurveda OR guided imagery OR "tai chi" OR "homeopathic medicine" OR acupuncture OR "folk medicine" OR naturopathy OR "traditional Chinese medicine" OR "traditional healing"	2,049,014
2	"Spinal Cord Injuries"[Mesh] OR "Spinal Injuries"[Mesh] OR "spinal cord injuries" OR "spinal cord injury" OR "spinal injury" OR "spinal injuries" OR sci[Text Word]	108,917
1	Pain management[MeSH Terms] OR pain OR "pain management" OR "pain intervention" OR "pain interventions" OR "pain treatment" OR "pain treatments"	907,710

Appendix III: Data extraction instrument

Study details	
Author (year), country of study	
Title	
Design	
Aims	
Participants	
Pain information	
Type of pain	
Location of pain (severity)	
Intervention information	
CAM intervention	
Description	
Frequency/duration	
Setting	
Facilitator	
Results	