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Review

Efficacy of craniosacral therapy in cervicogenic headache: a literature review

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Background
Neck discomfort is a frequent problem that can impair quality of life and make it difficult to perform daily tasks. Pain from neck strain is not limited to the cervical spine; it can also radiate into the skull and result in a headache of cervical origin, known as cervicogenic headache. Craniosacral can cure a wide array of musculoskeletal and neurological conditions, including headaches, but there is little evidence in the literature of its efficacy, particularly regarding cervicogenic headaches.

Objective
To determine the effectiveness of craniosacral therapy (CST) for cervicogenic headache and improve our understanding of cervicogenic headache.

Methods
A review of the literature was performed using the following electronic search bases: PubMed, Google Scholar, Scopus and The Cochrane library. To perform the search, these MeSH terms were used: "Cervicogenic headache" AND "Neck pain" AND "Craniosacral therapy" AND 'Headache' between the date 2020 to 2022.

Results
Eleven articles were included in the literature review. Overall, the results of published articles indicate 97.5–100% of the patients thought the treatment program was satisfactory. No adverse effects were reported. It has been demonstrated that CST is particularly safe and effective in lowering the intensity of neck pain. It may also enhance the quality of life and functional impairment for up to three months following the intervention. In addition to the conventional medical therapy, CST may be a beneficial therapeutic option for persistent and recurrent neck discomfort.

Conclusion
This review shows that CST is very effective for the treatment of cervicogenic headaches. CST evaluation is feasible in randomized controlled trials and may offer insightful results to enhance therapeutic decision-making.

Keywords:
Cervicogenic headache
Neck pain
Craniosacral therapy
Headache.

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Introduction

Neck discomfort is a frequent problem that can impair quality of life and make it difficult to perform daily tasks. Pain from neck strain is not limited to the cervical spine; it can also radiate into the skull and result in a headache of cervical origin, known as cervicogenic headache (1). According to research the incidence of cervicogenic headache, which accounts for 2.5–4.1% of all headache forms, is estimated to be over 46% worldwide (2,3). When contrasted to various types of headaches such tension or migraine, this incidence may seem low, but the accompanying impairment is considerable and concerning (4).

The definition of "cervicogenic headache" (CEH) came about via clinical observations of patients exhibiting indicators associated with the cervical spine and hemicrania, or strict unilateral headache (5). One of the primary symptoms of CEH is unilateral discomfort CEH is side-locked unilateral pain, which can be triggered with certain cervical region movements or external stress on the occipital or contralateral neck (5,6). According to Bogduk & Govind (7) CEH may originate from any tissue (such as facet joints, intervertebral discs, muscles, and ligaments) that can receive innervation from the segment neurons from C1 to C3 (8). Some research suggests the causes might include neurological processes, joint diseases, or abnormal posture (9).

A functional physiological system, the craniosacral system, is made up of the membranes and cerebrospinal fluid that surrounds the brain and spinal cord, the bones to which these membranes adhere, and the connective tissue that is associated with these membranes (10). Restrictions or imbalances in the craniosacral system may have a direct impact on any or all parts of the central nervous system's functioning because of its contents, which include the brain, spinal cord, and other connected tissues (11).

Originating from osteopathic manipulative therapy, Craniosacral Therapy (CST) employs very gentle and mindful fascial palpation techniques to promote the body's capacity to regulate itself by releasing the mental and physical structures and reducing sympathetic arousal by altering body (12). It is an alternative therapeutic method which aims to relieve constraints surrounding the brain and spinal cord and consequently improve bodily function (10).

The "primary respiratory mechanism" (PRM) or "craniosacral mechanism" is used to refer to the biological model of CST. This relies on the idea that cranial structures are intrinsically mobile and thus palpable with the hands. These structural linkages involve minute movements of membranous structures of the skull and their contents. The fundamental theory is that movement in the cranial structures results in certain alterations in the dural membranes, as well as in the cranial and sacral bones, and rhythmic motions of the cerebrospinal fluid from the skull to the sacrum (13).

Although there is still much to be found regarding the physical mechanisms behind CST, early randomized controlled studies have demonstrated the targeted therapy effects of CST on patient-reported outcomes (14,15). Research suggests the main way that craniosacral therapy prevents and treats headaches by relieving tension in meninges. The whole craniosacral system can open up when pressure from the neurological system releases the constraints on the meningeal and cranial bone structures (4).

CST is usually referred to as an alternative therapeutic strategy that treats somatic dysfunction in the skull and other parts of the body by using mild physical force. Headache specialists are beginning to acknowledge the possibility that cervical spine abnormalities may be the cause of headaches and that treating the neck might alleviate these symptoms (2). CST improves fluid flow throughout the body, desensitizes facilitated segments, and has psycho emotional benefits through its impact on autonomics (11). A prior systematic review that assessed the clinical effectiveness of CST showed that only a few trials display a reasonable level of effectiveness, which was partly explained by poor study design (16).

Pharmacological intervention is typically the first step in medical care; however, CGH patients frequently do not react to medicine (7). The literature has proposed more intrusive techniques, such as occipital nerve blocks, steroid and anesthetic blockades, and pulsed radiofrequency radiation therapy. More cautious treatments are usually recommended due to the dangers involved with these procedures and a lack of well-controlled outcome studies (10,17).

Although less research supports the effectiveness of craniosacral therapy in treating cervicogenic headaches, according to some studies craniosacral therapy can cure a variety of musculoskeletal and neurological conditions, including headaches. One crucial component of managing cervicogenic headaches effectively has been suggested to be the treatment of musculoskeletal abnormalities linked to the condition (1). Thus, the main objective of this study was to perform a literature review to assess the effectiveness of craniosacral therapy as a therapeutic strategy for managing cervicogenic headaches and to advance our knowledge of its effectiveness.

Methods

Search strategy and sources

A literature review was conducted using the following electronic search bases: PubMed Google Scholar, Scopus and The Cochrane library. To perform the search, the following MeSH terms were used: “Cervicogenic headache” AND “Neck pain” AND “Craniosacral therapy” AND ‘Headache’ between the date 2020 to 2022. Thirty articles were analyzed, of which 11 met the objective and

need for review. Of these, nine were randomized controlled trials and two were case–report studies. Additionally, the retrieved papers were checked for appropriate citations.

Studies were identified based on predetermined qualifying criteria. We included studies published between 2010 and 2022. No specific craniosacral therapy approach, study design, medical condition, patient demographics, or health results were included in the search. An additional citation search was conducted using the reference lists of the papers obtained.

Eligibility criteria

Inclusion criteria:

1) Research needs to be published as either observational studies or RCTs.
2) Research paper that was published from 2010 to 2022 and full English text
3) Human subjects must be used in studies; there is no age limit.
4) At least one primary or secondary result assessed at the end of the intervention period had to be included in the study.

Exclusion criteria:

1) Articles unrelated to CST, studies involving animals, and studies without clear evidence of CST use
2) Article only with the abstract without full text
3) Narrative, systematic and meta-analysis study

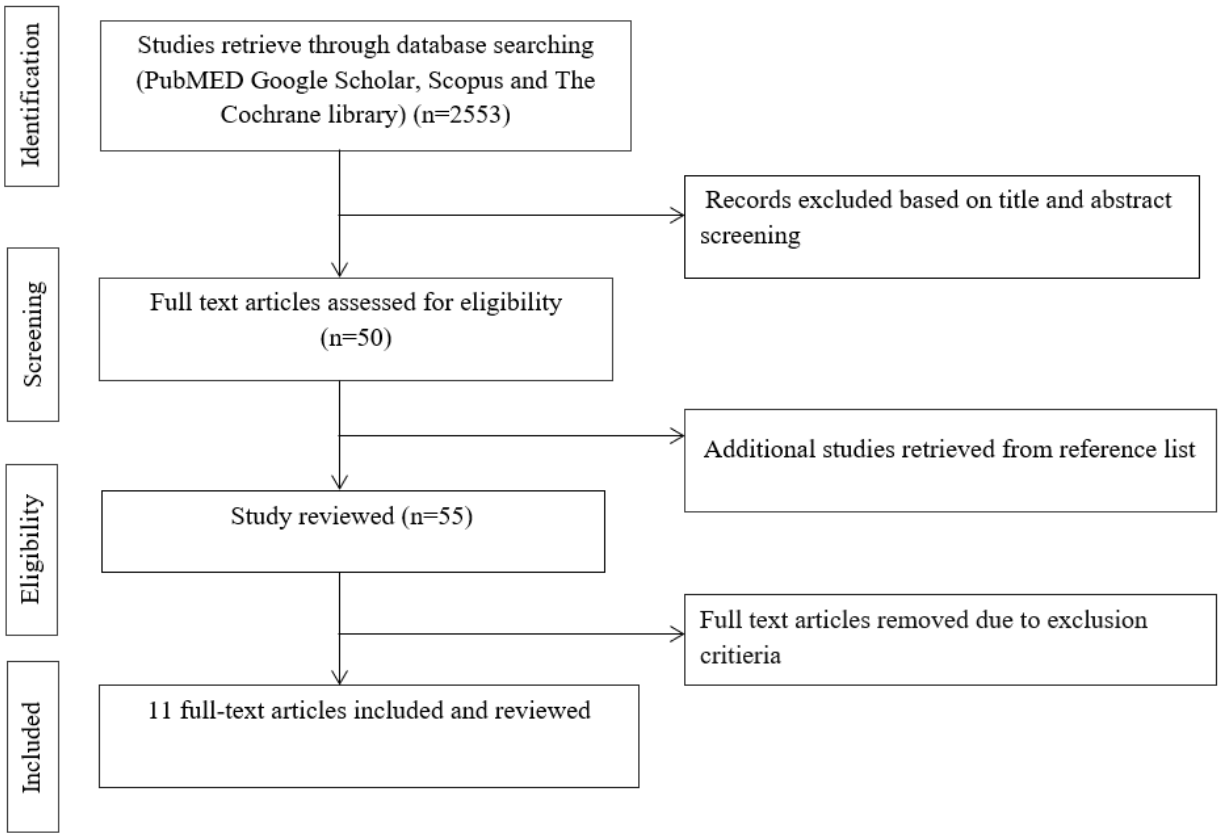

Figure 1. PRISMA flowchart of inclusion.

Result

The search yielded 11 studies included in the review after excluding number of articles for various reasons where most were randomized control studies, 2 of them are case studies, 1 is case report series which focuses the effects of craniosacral therapy in the treatment of headaches The sample size ranged from 36-75 in randomized controlled trials. Sociodemographic data were excluded from this study.

Outcome Measures

The outcome measures used in this study were the visual analog scale (VAS), neck disability index (NDI), and Glasgow Homeopathic Outcome Score (GHHOS). Headache diary for headache intensity, frequency, duration, Hettinger test, Wong Baker faces scale, Cohen-Williamson questionnaire, Headache Impact Test-6,8 weekly units of craniosacral therapy, light-touch sham treatment, Impact Neurocognitive Test, Dynavision Test, Short Form–36 Quality of Life Survey, and Numeric Pain Rating Scale.

Clinical Effectiveness

In the overall analysis, 7 out of 11 studies that evaluated pain intensity using various pain scales showed substantially significant changes in favor of craniosacral therapy. Average pain rating scale values fell substantially in those studies (9,11,18–21).

Three out of 11 studies that assessed neck disability index as an outcome measure reported enhancements in the upper back and neck regions of the right body. In the last session, headaches in the right posterior lateral skull and occipital area also decreased (9). Those surveyed in the studies reported a significant improvement in their overall or secondary health issues. Like anxiety depression, numbness in her hands, neck muscular strain (19,22) 2 out of 11 studies also reported participants having improved sleep quality (20,23). No negative impacts were reported by the participants (21).

Three out of 11 studies evaluated through headache impact test -6 The mean HIT-6 score was 67.6±7.8 points prior to therapy, and it was 42.7±3.6 points after treatment (4). In another comparative study, they also reported significant changes Headache-related impairment occurred on 2.7±2.5 days in the CST group and 3.9±4.4 in the MM group throughout a time of 3 weeks. In the CST group, the mean HIT-6 score was 63.9±8.8 points before therapy and 43.6±4.6 points after treatment, whereas in the contrary groups it was 61.3±8.1 and 58.1±7.6, respectively (24). Very high certainty of evidence suggested that CS therapy provides statistically significant change in the impact of the headache after intervention compared to a sham or control group.

In a case series, subjects reported that at discharge, the severity of their headache decreased from 6 to 9 to 2-4 cm on the VAS. The patient added that her symptoms of vertigo had also subsided (19). Research revealed patients' average frequency of general practitioner consultations reduced by 60%, and 70% of patients who were taking medication discontinued it (22).

Table 1. Outcome measure and effect of craniosacral therapy

Author, year	Number of participants	Outcome measure	Outcomes
Manning, 2010(8)	1	Visual analog scale (VAS) Neck disability index (NDI) Self-administered questionnaire	The individual experienced improvements in the neck and upper back portions of their right body. Headaches into the right posterior lateral skull and occipital region have also subsided on fifth session. She graded the VAS a 6/10 for pain. By the sixth session, the patient gave a score of 0/10 for all headache and neck discomfort symptoms.
Harrison et al., 2011(22)	75	Self-administered questionnaire Glasgow Homeopathic Outcome Score (GHHOS)	Those surveyed, seventy-four percent (74%) said their presenting issue had much improved. Additionally, 67% reported a significant improvement in their overall health or any secondary health issue. According to diagnostic groups' findings, individuals with headaches and migraines, neck and back discomfort, anxiety and depression may benefit most from UCST. In the six months after therapy, patients' average frequency of general practitioner consultations reduced by 60%, and 70% of patients who were taking medication discontinued it.
Youssef et al.,2013(18)	36	Visual analog scale (VAS) Neck Disability Index (NDI)	The paper findings demonstrated that each treatment group's assessed variables were substantially better. With the exception of the functional NDI, comparison between the two groups revealed substantial differences in all assessed variables following the intervention, all of which were in Favour of mobilization approaches.
Haller et al.,2015(19)	1	Visual analogue scale (VAS)	The patient stated her vertigo symptoms had subsided from 6–10 to 2 cm and her headache severity had reduced from 6–9 to 2-4 cm on the VAS upon discharge. There was an improvement in her general well-being, numbness in her hands, neck muscular strain, and movement.
Oltean et al., 2015(23)	50	Hettinger test Wong Baker faces scale Cohen-Williamson questionnaire	The outcomes demonstrate a decrease in pain, an increase in cervical spine mobility, an enhancement in patient well-being and sleep quality, and a decrease in tension, worry, and sorrow. During the six-week treatment, patients receiving physiotherapy and Craniosacral therapy reported experiencing profound relaxation and release, as well as pain alleviation and decreased muscular tension.

Table 1. Outcome measure and effect of craniosacral therapy

Haller et al.,2016(11)	54	8 weekly units of Craniosacral therapy and light-touch sham treatment Visual analog scale	At week eight (-21mm group difference; 95% confidence interval, -32.6 to-9.4; P=0.001; d=1.02) and week twenty (-16.8mm group difference; 95% confidence interval, -27.5 to-6.1; P=0.003; d=0.88), Compared to sham, CST patients reported significant and statistically substantial reductions in pain intensity. At week 20, 78% of the CST group reported at least somewhat substantial decreases in pain severity, and 48% even claimed meaningful therapeutic effects.
Rao et al., 2017(4)	49	Headache Impact Test-6 Cervicogenic Headache International Study Group diagnostic criteria	The mean HIT-6 score was 67.6±7.8 points prior to therapy, and it was 42.7±3.6 points after treatment. The degree of headache-related impairment at each attack was substantially in respect to the headache diary's stated statistical correlation between the occurrence of headache episodes and the length of impairment.
Rao et al., 2017(4)	69	Headache Impact Test- 6 (HIT-6)	Headache-related impairment occurred on 2.7±2.5 days in the CST group and 3.9±4.4 in the MM group throughout a time period of 3 weeks. In the CST group, the mean HIT-6 score was 63.9±8.8 points before therapy and 43.6±4.6 points after treatment., whereas in the contrary groups it was 61.3±8.1 and 58.1±7.6, respectively.
Wetzler et al., 2017(20)	11	Impact Neurocognitive Test; Dynavision Test Short Form–36 Quality of Life Survey Headache Impact Test Dizziness Handicap Inventory Numeric pain rating scale Range of motion tests (ROM) vestibular testing	Average pain rating scale values fell substantially (P = 0.0448), as did cervicogenic pain severity (P = 0.0486). Substantial improvements in Dynavision Average Reaction Time (P = 0.0332), Memory Test (P = 0.0156), and cervical Range of motion (P = 0.0377). Sleep hours averaged 2 hours on the first day of intervention, climbed to 4.0 hours at the conclusion of treatment, and still increasing at a 3-month follow-up.
Kratz et al., 2021(25)	67	Post-Concussion Symptom Checklist (PCSC) Patient-reported Treatment Outcome Survey (PTOS)	The retrospective record analysis's findings revealed that a significant proportion of patients with both persistent PCS (six months) and post-acute concussion symptoms (less than six months) credited CST for helping them accomplish the therapeutic aim of reducing concussion symptoms. Positive results about each participant's particular symptoms were observed among the twenty-nine who reported in the PTOS.
Rani et al.,2022(21)	80	Feasibility of participant recruitment, assessment procedure, retention, adherence, and acceptability. Headache impact test-6 for a headache disability Headache diary for headache intensity, frequency, duration. Neck disability index	The treatment procedure was deemed satisfactory by 97.5–100% of the subjects. The subjects did not report any negative effects.

Discussion

The purpose of this review was to collect and evaluate all relevant randomized controlled trial and case studies on the efficacy of craniosacral therapy on cervicogenic headache. Valid scientific evidence supporting the benefits of CST for patients has not been found in a previous systematic study. To ascertain the therapeutic utility of CST in the treatment of patients with a range of clinical disorders, this study aimed to identify and critically analyze the literature available on the subject. The primary conclusion drawn from this systematic review was the lack of research assessing CST's efficacy of CST in treating cervicogenic headaches.

However, research indicates craniosacral therapy is an effective therapeutic approach for individuals with cervical headaches throughout a three-week course of treatment based on the HIT-6 results (4). Some research results indicate 97.5–100% of the patients thought the treatment program was satisfactory. No adverse effects were reported (21). It has been demonstrated that CST is particularly safe and efficient in lowering the intensity of neck pain. It may also enhance the quality of life and functional impairment for up to three months following the intervention. In addition to the conventional medical therapy, CST may be a beneficial therapeutic option for persistent and recurrent neck discomfort (22). Some research also indicates CST had a better curative effect when combined with myofascial release and lymph node massage (8). Considering for the fact that there is lack of understanding in this field of manual treatment, it was determined that a study into the often-utilized CST was essential. The number of studies is still low compared to a prior systematic review, but the methodology that includes the use of RCTs has gotten a bit improved over time.

Limitations

A certain level of assurance regarding the effectiveness of these therapies is limited by methodological flaws in many currently accessible studies. These limitations include a limited number of patients, brief follow-up periods, and the relative absence of untreated controls. Few papers were included in this literature review because there are few published papers and clinical trials on the topic. Additional experiments should be conducted in the future to obtain more accurate results.

Conclusion

Based on review findings, Cervicogenic headaches have been found to respond significantly better to CST.CST evaluation is feasible in randomized controlled trials (RCTs) and may offer insightful results to enhance therapeutic decision-making. Although there are few clinical studies and those that do exist have poor methodological quality, patients' interest in osteopathic treatments supports their use. However, a therapy's level of popularity is not always a reliable predictor of its efficacy, and all therapies must be proven through useful scientific research. Long-term follow-up and further research using appropriate methodological approaches are required to validate the effectiveness of CST in treating cervicogenic headaches.

References

1. Dumas JP, Arsenault A, Boudreau G, Magnoux E, Lepage Y, Bellavance A, et al. Physical Impairments in Cervicogenic Headache: Traumatic Vs. Nontraumatic Onset. Cephalalgia. 2001 Nov 17;21(9):884–93. DOI: 10.1046/j.1468-2982.2001.00264.x
2. Haldeman S, Dagenais S. Cervicogenic headaches. The Spine Journal. 2001 Jan;1(1):31–46. DOI: 10.1016/S1529-9430(01)00024-9
3. Sjaastad O, Bakketeig LS. Prevalence of cervicogenic headache: Vågå study of headache epidemiology. Acta Neurol Scand. 2008 Mar;117(3):173–80. DOI: 10.1111/j.1600-0404.2007.00962.x
4. Rao K. Effectiveness of Craniosacral Therapy in Cervicogenic Headache. MOJ Yoga & Physical Therapy. 2017 Dec 14;2(4). DOI: 10.15406/mojypt.2017.02.00031
5. da Silva HM, Bordini CA. Cervicogenic headache. Curr Pain Headache Rep. 2006 Aug;10(4):306–11. DOI: 10.1007/s11916-006-0037-8
6. Sjaastad O, Fredriksen TA, Pfaffenrath V. Cervicogenic Headache: Diagnostic Criteria. Headache: The Journal of Head and Face Pain. 1990 Nov 20;30(11):725–6. DOI: 10.1111/j.1526-4610.1990.hed3011725.x
7. Bogduk N, Govind J. Cervicogenic headache: an assessment of the evidence on clinical diagnosis, invasive tests, and treatment. Lancet Neurol. 2009 Oct;8(10):959–68. DOI: 10.1016/S1474-4422(09)70209-1
8. van Suijlekom H, Van Zundert J, Narouze S, van Kleef M, Mekhail N. 6. Cervicogenic Headache. Pain Practice. 2010 Mar;10(2):124–30. DOI: 10.1111/j.1533-2500.2009.00354.x
9. Manning H. To Ascertain Outcomes of Craniosacral Therapy in Addition to Lymph Massage and Myofascial Release on Chronic Pain and Vertigo in a 46 Year Old Female. 2010;
10. Jäkel A, von Hauenschild P. A systematic review to evaluate the clinical benefits of craniosacral therapy. Complement Ther Med. 2012 Dec;20(6):456–65. DOI: 10.1016/j.ctim.2012.07.009
11. Upledger JE. CRANIOSACRAL THERAPY PART I: ITS ORIGINS AND DEVELOPMENT. Subtle Energies & Energy Medicine. 1995;6(1):1–53.
12. Haller H, Dobos G, Cramer H. The use and benefits of Craniosacral Therapy in primary health care: A prospective cohort study. Complement Ther Med. 2021 May;58:102702. DOI: 10.1016/j.ctim.2021.102702
13. Ceballos-Laita L, Ernst E, Carrasco-Uribarren A, Cabanillas-Barea S, Esteban-Pérez J, Jiménez-del-Barrio S. Is Craniosacral Therapy Effective? A Systematic Review and Meta-Analysis. Healthcare. 2024 Mar 18;12(6):679. DOI: 10.3390/healthcare12060679
14. Dossett ML, Davis RB, Lembo AJ, Yeh GY. Complementary and Alternative Medicine Use by US Adults With Gastrointestinal Conditions: Results from the 2012 National Health Interview Survey. American Journal of Gastroenterology. 2014 Nov;109(11):1705–11. DOI: 10.1038/ajg.2014.108
15. Ho D V., Nguyen J, Liu MA, Nguyen AL, Kilgore DB. Use of and Interests in Complementary and Alternative Medicine by Hispanic Patients of a Community Health Center. The Journal of the American Board of Family Medicine. 2015 Mar 1;28(2):175–83. DOI: 10.3122/jabfm.2015.02.140210
16. Green C, Martin CW, Bassett K, Kazanjian A. A systematic review of craniosacral therapy: Biological plausibility, assessment reliability and clinical effectiveness. Complement Ther Med. 1999 Dec;7(4):201–7. DOI: 10.1016/S0965-2299(99)80002-8
17. Page P. Cervicogenic headaches: an evidence-led approach to clinical management. Int J Sports Phys Ther. 2011;6(3):254–66.
18. Youssef EF, Shanb ASA. Mobilization versus massage therapy in the treatment of cervicogenic headache: A clinical study. J Back Musculoskelet Rehabil. 2013 Jan 28;26(1):17–24. DOI: 10.3233/BMR-2012-0344
19. Haller H, Cramer H, Werner M, Dobos G. Treating the Sequelae of Postoperative Meningioma and Traumatic Brain Injury: A Case of Implementation of Craniosacral Therapy in Integrative Inpatient Care. The Journal of Alternative and Complementary Medicine. 2015 Feb;21(2):110–2. DOI: 10.1089/acm.2013.0283
20. Wetzler G, Roland M, Fryer-Dietz S, Dettmann-Ahern D. CranioSacral Therapy and Visceral Manipulation: A New Treatment Intervention for Concussion Recovery. Med Acupunct. 2017 Aug;29(4):239–48. DOI: 10.1089/acu.2017.1222
21. Rani M, Kaur J. Effectiveness of different physiotherapy interventions in the management of cervicogenic headache: a pilot randomized controlled trial. Journal of Manual & Manipulative Therapy. 2022 Mar 4;30(2):96–104. DOI: 10.1080/10669817.2021.1962687
22. Harrison RE, Page JS. Multipractitioner Upledger CranioSacral Therapy: Descriptive Outcome Study 2007–2008. The Journal of Alternative and

Complementary Medicine. 2011 Jan;17(1):13–7. DOI: 10.1089/acm.2009.0644 DOI: 10.1089/acm.2009.0644
23. Oltean AM, Bughirica-Georgescu M. STUDY ON THE EFFICIENCY OF CRANIOSACRAL THERAPY IN PATIENTS WITH CERVICAL PAIN. Science, Movement and Health. 2021 Sep;XXI(2):403–9.
24. Rao K, Khatri S. Craniosacral therapy and Maitlands mobilisation in cervicogenic headache. International Journal of Applied Research. 2017;3(6):899–902.
25. Kratz SV, Kratz DJ. Effects of CranioSacral therapy upon symptoms of post-acute concussion and Post-Concussion Syndrome: A pilot study. J Bodyw Mov Ther. 2021 Jul;27:667–75. DOI: 10.1016/j.jbmt.2021.05.010

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