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POLISH JOURNAL OF PHYSIOTHERAPY

OFICJALNE PISMO POLSKIEGO TOWARZYSTWA FIZJOTERAPII

THE OFFICIAL JOURNAL OF THE POLISH SOCIETY OF PHYSIOTHERAPY

NR 5/2023 (23) KWARTALNIK ISSN 1642-0136



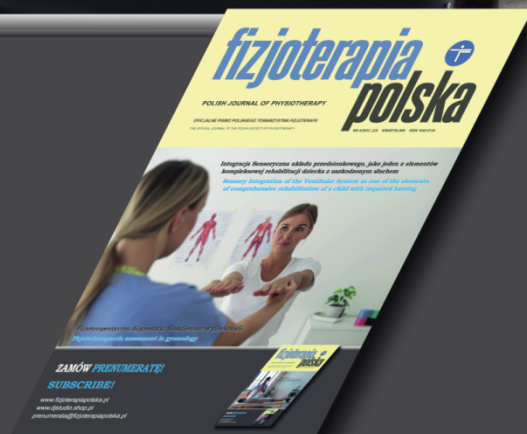
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# Application of craniosacral therapy in practice

*Zastosowanie terapii czaszkowo-krzyżowej w praktyce*

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## Abstract

Systematic evaluation of the evidence for the use of craniosacral therapy (CST) in practice. The following English-only electronic databases were searched: PubMed, Scopus, PEDro, Cochrane Library. The review of journal databases was conducted between March and June 2023. The databases were searched using MeSH (Medical Subject Headings) terms, keywords and logical operators. The results from the statistical analyses performed were taken into account. Only twenty-five studies met the inclusion criteria. Positive clinical results were reported for reduction of pain, reduction of crying in children, reduction of stress hormones, and improvement of patients' general well-being. The methodological quality of the PEDro scale ranged from 1 to 11 points. The review indicates a significant effect on patient outcomes/symptoms. There is a need for multi-center studies with common CST methodology in groups with large numbers.

Trial registration: PROSPERA registration number: CRD42023430923

## Keywords

craniosacral therapy, health, complementary alternative medicine, therapy, pain

## Streszczenie

Systematyczna ocena dowodów dotyczących stosowania terapii czaszkowo-krzyżowej (CST) w praktyce. Wyszukiwania przeprowadzono w następujących bazach danych dostępnych tylko w języku angielskim: PubMed, Scopus, PEDro, Biblioteka Cochrane'a. Przegląd baz danych czasopism przeprowadzono między marcem a czerwcem 2023 roku. Bazy danych przeszukiwano za pomocą terminów MeSH (Medical Subject Headings), słów kluczowych i operatorów logicznych. Wzięto pod uwagę wyniki przeprowadzonych analiz statystycznych. Tylko dwadzieścia pięć badań spełniło kryteria włączenia. Pozytywne wyniki kliniczne zgłoszono w przypadku zmniejszenia bólu, zmniejszenia płaczu u dzieci, zmniejszenia hormonów stresu oraz poprawy ogólnego samopoczucia pacjentów. Jakość metodologiczna skali PEDro wahała się od 1 do 11 punktów. Przegląd wskazuje na znaczący wpływ na wyniki/symptomy pacjentów. Istnieje potrzeba przeprowadzenia wieloośrodkowych badań z jednolitą metodologią CST w grupach o dużej liczbie uczestników. Rejestracja badania: numer rejestracji PROSPERA: CRD42023430923

## Słowa kluczowe

terapia czaszkowo-krzyżowa, zdrowie, medycyna komplementarna i alternatywna, terapia, ból



## Introduction

The founding of a school of osteopathy in 1892 by Andrew Taylor Still played a decisive role in the development of modern manual therapy. He specified three main principles that gave rise to osteopathy: 1. structure and function remain in reciprocal relations, 2. the body functions as a unity in health and illness, 3. the body is a self-healing mechanism. He also recognized the great importance of the free circulation of body fluids (blood, lymph and cerebrospinal fluid) and that it is necessary for the proper functioning of cells and clearing them of toxins [1]. He also observed that the relationship between structure and function is reciprocal. Many well-known osteopaths were educated at the school of osteopathy founded by Still. One of them was William Garner Sutherland, who contributed to the development of cranial therapy in the 1930s. In 1932 he presented his discovery to the American Osteopathic Association, stating that the central nervous system and its associated structures are subject to constant rhythmic movements and that this movement is an important feature for human health and life [1]. The development of craniosacral therapy was influenced by Frymann, Weaver, Cottam, Magoun, DeJarnette, Becker, Fulford, Handy, Arbuckle, Wales, Schooley, Upledger, Mitchell, Chila, Jealous, Blackman, Heede, Abehsera, McPartland and Pick [2]. Currently, craniosacral therapy is widely used in cases of various diseases, and it utilises the following approaches: structural, membranous and fluid fluctuations. It is used in dentistry in patients with degeneration and dysfunctions of the temporomandibular joint, bruxism and with patients using orthodontic splints and braces. Therapy is also used in patients with the following conditions: fibromyalgia, multiple sclerosis, children with cerebral palsy and variety of other disabilities, infant colic, myopia and hyperopia, asthma, migraine. A pilot study by Cutler et. al showed that the CV4 technique influences the change in sleep latency.

## Materials and Methods

This systematic review was organized according to PRISMA guidelines [3], the Cochrane Handbook for Systematic Re-

views of Interventions [4], and the PEDro checklist [5]. The protocol was registered with PROSPERO at the UK National Institute for Research, with registration no: CRD42023430923 (<http://www.crd.york.ac.uk/PROSPERO>).

## Selection criteria

Only observational studies (i.e., case reports, case series, two-group cross-sectional studies, case-control studies) were considered eligible for inclusion in the systematic review if they included the use of craniosacral therapy in clinical practice.

## Inclusion criteria

The inclusion criterion was an article published in a peer-reviewed journal, limited as to the scope of the publication year from 2013-2023. Another restriction was that it had to be an English-language publication. The inclusion criterion was articles on the effectiveness of craniosacral therapy/its effects in the context of patient functioning (improvement in functional status, reduction in pain, changes in measurable biomedical parameters) in relation to other methods of working with patients as well.

## Exclusion criteria

Failure to meet the inclusion criterion was treated as exclusion from the analysis.

## Outcome measures

The following outcome measure was studied: the impact of craniosacral therapy on health improvement supported by statistical analysis.

## Search strategy

The following electronic databases were searched, in English only: PubMed, Scopus, PEDro, Cochrane Library. The review of journal databases was conducted between March and June 2023. The databases were searched using MeSH (Medical Subject Headings) terms, keywords and logical operators. The search strategy used is detailed in Table 1.

**Table 1** Queries used to obtain data for analysis from the databases

Databases	Query	Numbers of results
PubMed	Craniosacral therapy[Title/Abstract]	140
	Cranial therapy[Title/Abstract]	
	(Craniosacral therapy[Title/Abstract] AND (health[Title/Abstract])	
	(Cranial therapy[Title/Abstract]) AND (health[Title/Abstract])	
	(Craniosacral therapy[Title/Abstract]) AND (treatment[Title/Abstract])	
Scopus	(Cranial therapy[Title/Abstract]) AND (treatment[Title/Abstract])	175
	(Title contains) craniosacral therapy article	
PEDro	(Title contains) cranial therapy article	15
	Title abstract keywords – craniosacral therapy	
Cochrane Library	Title abstract keywords – cranial therapy	158
	Title abstract keywords – craniosacral therapy	

### Study selection and data extraction

Two independent reviewers evaluated the titles, abstracts and full texts of the articles; any disagreement between the reviewers was resolved through discussion. Information from the articles was extracted and recorded with reference to the following data: study design, year of publication, subjects, and results obtained and conclusions.

### Data synthesis

The data were grouped into tables of evidence, and a descriptive summary was created to quantify the data and to examine differences in terms of characteristics and outcomes when

analyzing the relationship between the use of craniosacral therapy and its impact on health/quality of life.

### Results

A search of all databases found a total of 488 studies. Duplicate records and those that did not meet the inclusion criterion were excluded. The final sample consisted of 25 studies. The study selection process is shown in the PRISMA flow diagram (Figure 1). Table 2 shows the characteristics of the studies included in this review with respect to the objectives, sample, interventions, duration, evaluation tools used and outcomes of each clinical trial.

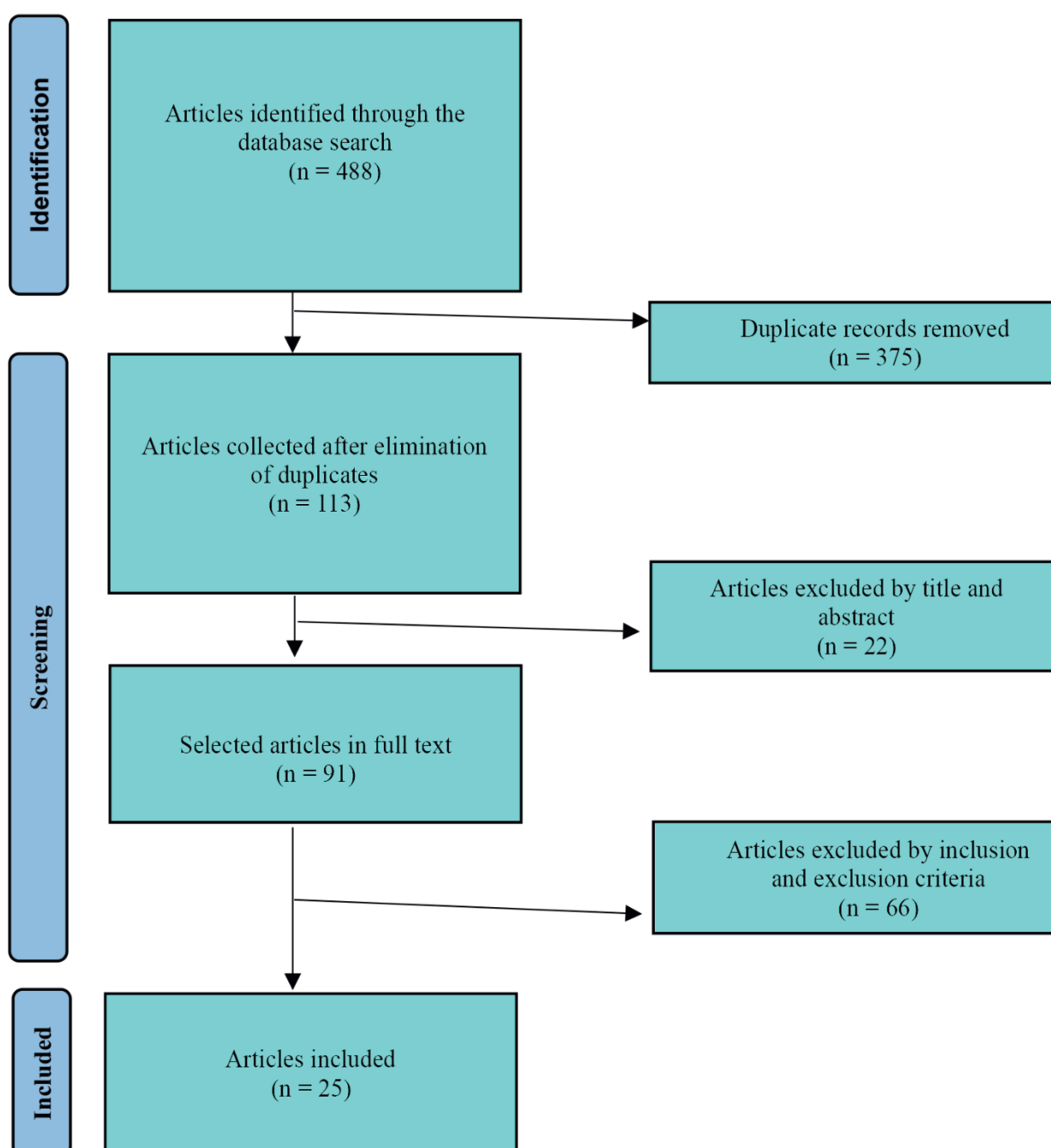


Fig. 1 Flowchart (PRISMA style)



**Table 2. Main results of the study**

Author, year	Type of study, population m/f	Disease/ Dysfunction	Intervention	Assessment	Results	Conclusion/ observations
Arnadottir et al., 2013 [6]	0 persons (18 f-female, 2 m-male), 20-50 years, 1 on week/4 weeks, A-group with CST, B group no interventions, randomization	Migraine	(CranioSacral Therapy)	IT-6 Questionnaire	Immediately after treatment and one month afterwards there was a significant reduction in HIT-6 scores compared with those prior to treatment. There was also a significant difference in HIT-6 scores between Times 1 and 4 ( $p = 0.004$ ). The effect size was $0.43 \pm 0.55$ .	cranosacral treatment can alleviate migraine symptoms
Elden et al., 2013 [7]	123 pregnant women, 30-31 years, 1st group n = 60 standard treatment (an elastic pelvic belt, a home training programme including exercises to strengthen and stretch the trunk, hip and shoulder muscles), 2nd group n = 63 standard treatment+CST, randomization	Pelvic girdle pain	CST+standard treatment	VAS, Oswestry Disability Index	Between-group differences for morning pain, symptom-free women and function in the last treatment week were in favor of the intervention group $p = 0.017$ and the function disability index was $p = 0.016$ .	treatment effects were small and clinically questionable. Conclusions should be drawn carefully.
Białoszewski et al., 2014 [8]	50 persons, 24-47 years, 1st group n = 27 CST, 2nd group n = 28 trigger points therapy	Non-specific lower back pain	CST	VAS Laitinen	The comparison of the subgroups at baseline showed significant statistical differences only with regard to pain intensity on the analogue VAS scale $p = 0.0470$ . The other study parameters were not statistically significantly different, confirming the homogeneity of the groups.	Both therapies are effective in treating non-specific LBP
Grisberger et al., 2014 [9]	31 persons - 16 f, 15 m, 19-60 years, 30 minutes' intervention	Heart rate variability in persons with subjective discomfort	CST	ECG	Parameters increased during the control period $P > 0.05$ , whereas during the test intervention period there was an increase in both $P < 0.05$ and $P < 0.01$ . Interactions between treatment and the increase were statistically not significant $P > 0.05$ . No changes were observed in the low frequency/high frequency ratio in the course of the control or the test intervention period $P > 0.05$ .	There was a favourable effect on autonomic nervous activity
Mishra et al., 2015 [10]	20 children, n = 10 experimental group, n = 10 control group	Autism	CST + Sensory Integration Therapy	Childhood Autism Rating Scale (CARS) Autism Treatment Evaluation Checklist (ATEC)	The experiment and control group were not significantly different statistically, as the $p$ value = 0.971. The results of $p = 0.005$ in the experimental group and $p = 0.01$ in the control group indicate a improvement.	A combined approach of CST and SI therapy (SIT) is more effective than SIT alone.
Haller et al., 2016 [11]	54 persons, 1 a week/ 8 weeks, treatment group and control group, randomization	Chronic neck pain	CST	VAS	CST patients reported significant and clinically relevant effects on pain intensity in week 8 $P = 0.001$ , and in week 20 $P = 0.003$ .	Therapy was both specifically effective and safe in reducing neck pain intensity and may improve functional disability and the quality of life up to 3 months after intervention.
Castro-Sánchez et al., 2016 [12]	64 persons, 18-65 years, 1 a week/ 10 weeks, CST group n = 32, massage group n = 32, a single-blinded randomized controlled trial	Chronic nonspecific low back pain	CST	Oswestry Low Back Pain Disability Index (ODI) Roland Morris Disability Questionnaire (RMDQ) numeric pain rating scale (NPRS) Tampa Scale of Kinesiophobia McQuade test Haemoglobin oxygen saturation, systolic blood pressure, diastolic blood pressure, hemodynamic measures (cardiac index), and interstitial fluid biochemical estimation (levels of sodium, serum potassium, chloride, phosphate, ionized or free calcium, magnesium, and lactic acid)	No statistically significant differences were seen between the groups for the main outcome of the study, the RMDQ $p = 0.060$ . However, patients receiving cranosacral therapy experienced greater improvement in pain intensity $p < 0.008$ , hemoglobin oxygen saturation $p \leq 0.028$ , and systolic blood pressure $p \leq 0.029$ in the immediate- and medium term and serum potassium $p = 0.023$ level and magnesium $p = 0.012$ in the short term than those receiving a classic massage.	Ten sessions of cranosacral therapy resulted in a statistically greater improvement in pain intensity, haemoglobin oxygen saturation, systolic blood pressure, serum potassium, and magnesium level than did 10 sessions of classic massage in patients with lower back pain.
Raith et al., 2016 [13]	30 pre-term infants, with a gestational age between 25 and 33 weeks, intervention group and control group, 3 weeks' therapy: to 20 min/treatment with a frequency of two intervention/ week over three weeks. Randomization.	Pre-term infants	CST	General Movement Assessment (GMA) General Movement Optimality Score (GMOS)	Between groups no difference in the global GMA could be observed. The GMOS did not change from session to session $p = 0.262$ in the IG or the CG. Furthermore, no differences between IG and CG $p = 0.361$ and no interaction of time and session could be observed $p = 0.658$ . Post hoc analysis showed a trend toward higher values before $p = 0.085$ and after $p = 0.075$ the first session in CG compared to IG. At all other time points, GMOS were not significantly different between the groups	"Healthy" pre-term infants undergoing an intervention with cranosacral therapy showed no significant changes in global and detailed GMA. The GMOS did not deteriorate, cranosacral therapy seems to be safe in pre-term infants.

Author, year	Type of study, population m/f	Disease/ Dysfunction	Intervention	Assessment	Results	Conclusion/ observations
Wetzler et al., 2017 [14]	11 male retired professional football players, morning and afternoon 2-hour sessions/ 10 sessions	traumatic brain injury (TBI)	CST+Visceral Manipulation (VM)+ Neural Manipulation (NM)	Impact Neurocognitive Test; Dynavision Test Short Form-36 Quality of Life Survey Headache Impact Test Dizziness Handicap Inventory numeric pain rating scale orthopaedic range of motion tests (ROM) vestibular testing. hours of sleep were checked	Statistically significant differences were seen with a decrease in overall pain rating scale scores $P = 0.0448$ , and cervicogenic pain levels decreased $P = 0.0486$ . There were statistically significant increases in Dynavision Average Reaction Time $P = 0.0332$ , Memory Test $P = 0.0156$ scores, and cervical ROM scores $P = 0.0377$ . Hours of sleep averaged 2 hours on the first day of treatment and increased to 4.0 hours at the end of treatment and were continuing to increase, as noted in a 3-month evaluation.	Ten sessions of specific CST/ VM/NM therapy resulted in statistically greater improvements in pain intensity, ROM, memory, cognition, and sleep in concussed patients.
Castejón-Castejón et al., 2019 [15]	58 infants, aged 0–84 days, diagnosed with infantile colic, the babies received a 30–40-minute CST session once a week (experimental group) or no treatment (control group). Babies in the CST group received either 1, 2 or 3 CST sessions over a 14-day period, randomized controlled trial was conducted on	infantile colic	CST	Crying and sleep were evaluated using a crying and sleep diary, and colic severity was measured using the Infant Colic Severity Questionnaire.	There was a statistically significant difference between groups in crying hours $p < 0.0005$ , sleep hours $p < 0.0005$ and colic severity $p < 0.0005$ across all the time points. In comparison with the control group, CST babies reported significant and clinically relevant effects in crying hours on day 7 $p < 0.0005$ , on day 14 $p < 0.0005$ and on day 24 $p < 0.0005$ ; in sleep hours on day 7 $p < 0.0005$ ; on day 14 $p < 0.0005$ ; and on day 24 $p < 0.0005$ .	Craniosacral therapy appears to be effective and safe for infantile colic by reducing the number of crying hours, the colic severity and increasing the total hours of sleep.
Wójcik et al., 2019 [16]	22 healthy male athletes, 21 years, were randomly allocated to either a craniosacral therapy $n = 11$ or placebo group $n = 11$ , 1 session/20 minutes, randomization	healthy	CST	correlates of stress reaction (skin conductance - SC, heart rate - HR and respiratory rate - RR) were measured	Stress induced from an arithmetic task resulted in a significant increase in physiological stress markers such as SC, HR and RR in both groups. Over the short term, craniosacral therapy was associated with a physiological relaxation response (a decrease in HR and SC) and an altered HR and SC response during the math task in comparison to the placebo group. Baseline mean (95%CI) for HR (beats/min) in CST group 65.29 (82.11–74.71) and placebo group 69.83 (47.75–82.99).	At least in the short term, the results of this study indicate that participating in 20-min exposure to craniosacral treatment may benefit participants by decreasing heart rate reactivity and skin conductance reactivity.
Ghasemi et al., 2020 [17]	45 patients with NCLBP (non-specific chronic low back pain), were randomly divided in three groups including CST, sensorimotor training (SMT), and MET (muscle energy technique), randomization energy technique). All groups received 10 sessions CST, SMT, and MET training/5 weeks.	Non-specific chronic lower back pain	CST+muscle energy technique (MET)+sensorimotor training (SMT)	Visual analogue scale (VAS) Oswestry functional disability questionnaire (ODQ) Beck depression inventory-II (BDI-II) 36-item short form health survey (SF-36)	The results showed that VAS, ODI, BDI, and SF-36 changes were significant in the groups SMT, CST and MET: $p < 0.001$ , $p < 0.001$ , $p < 0.001$ . The VAS, ODI, BDI, and SF-36 changes in post-treatment and follow-up times in the CST group were significantly different in comparison to SMT group, and the changes in VAS, ODI, BDI, and SF-36 at after treatment and follow-up times in the MET group compared with the CST group had a significant difference of $p < 0.001$ .	Craniosacral therapy, muscle energy technique, and sensorimotor training were all effective in improving pain, depression, functional disability, and quality of life in patients with non-specific chronic lower back pain. Craniosacral therapy is more effective than muscle energy technique, and sensorimotor training in posttreatment and follow up. The effect of craniosacral therapy was continuous after two months follow-up.
Strub et al., 2020 [18]	8 persons - 6 f and 2 m, 49-63 years,	post-traumatic stress	CST	none	The psychotherapists found that emotions and traumata were more accessible after CST. The ability to transform negative behaviors and develop positive alternatives were considered to be signs of improvement.	Craniosacral therapy for severely traumatized patients should only be provided in cooperation with psychotherapists, or other highly qualified health personnel working in specialized institutions.
Park et al., 2021 [19]	78-year-old male, sessions were conducted one week apart lasting 15 minutes, the remaining sessions were spaced two weeks apart until only monthly sessions were necessary to help alleviate symptoms concerning gait	normal pressure hydrocephalus (NPH)	CST	MRI	In the third session, the patient stated that his gait had significantly improved and turned 90 degrees quicker without significant hesitation. The patient continued to ambulate with a cane but was able to walk faster and felt more comfortable in crowded environments which he had not felt before. The patient also stated that his bladder urgency improved slightly over the previous three weeks.	Craniosacral therapy can be utilized in relieving a patient's NPH symptoms.
Atay et al., 2021 [20]	30 persons - 24 f and 6 m, 24-50 years, 2 groups: $n = 15$ patients the cranial osteopathy treatment group and control group $n = 15$ used dimenhydrinate, the craniosacral treatment session was applied once per week for 6 sessions, all of the individuals included in this study were evaluated 3 times, i.e., prior to treatment, on the third week of treatment, and on the sixth week of treatment.	peripheral vestibular pathology	CST	visual analog scale was used to evaluate dizziness Berg balance scale Activities-Specific Balance Confidence scale	A significant improvement was noted within each group in terms of dizziness and balance $p < 0.05$ ). When the groups were compared with each other, it was observed that craniosacral osteopathy was more effective than dimenhydrinate treatment for dizziness and balance $p < 0.05$ .	Craniosacral osteopathy is an effective treatment choice in individuals who have chronic peripheral vestibular pathology.
Haller et al., 2021 [21]	220 persons: infants $< 1$ year $n = 25$ , toddlers 1–3 years $n = 9$ ; children 4–12 years $n = 17$ ; adolescents 13–17 years $n = 3$ adults $\geq 18$ years $n = 166$ ). Patients received on average $7.0 \pm 7.3$ CST sessions to treat 114 different, acute and chronic conditions. cohort study	complementary treatments	CST	symptom intensity, functional disability, and quality of life before and after treatment using an adapted 11-point numerical rating scale (NRS) version of the Measure Yourself Medical Outcome Profile (MYMOP)	Patients received on average $7.0 \pm 7.3$ CST sessions to treat different, acute and chronic conditions. Symptom intensity significantly decreased by 95%CI = -4.69/-4.07, disability by 95%CI = -4.78/-4.05, and quality of life improved by 2.94 NRS 95%CI = 2.62/3.27. FCST enhanced personal resources by 3.10 NRS 95%CI = 1.99/4.21. Independent positive predictors of change in the adapted total MYMOP score included patients' expectations $p = .001$ and therapists' CST experience $p = .013$ , negative predictors were symptom duration $p < .002$ and patient age $p = .021$ ; a final categorical predictor was CST type $p = .023$ .	In primary care, patients and parents of underage children use CST for preventive and therapeutic purposes.



Author, year	Type of study, population m/f	Disease/ Dysfunction	Intervention	Assessment	Results	Conclusion/ observations
Mazreai et al., 2021 [22]	60 nurses, CST group n = 30, control group n = 30, CST was performed for eight sessions with 30-45 minutes for each session, randomization	chronic lower back pain	CST	McGill Pain Questionnaire	Results showed a significant difference between the two groups' mean scores of pain intensity and its subscales $P < 0.05$ . The mean scores of pain intensity and its subscales decreased over the three time points in the intervention group $P < 0.05$ .	Results showed a significant difference between the two groups' mean scores of pain intensity and its subscales, and that the mean scores of pain intensity and its subscales (sensory, affective, pain evaluation, and miscellaneous) decreased over the three time points in the intervention group.
Ghasemi et al., 2021 [23]	31 patients with NCLBP were randomly assigned to the CST group n = 16 and SMT n = 15, patients received 10 sessions of interventions over 5 weeks, One CST session lasts about 45 minutes, randomization	Non-specific chronic back pain	CST	The groups showed a significant improvement from baseline to after treatment $p < 0.05$ . In the CST group, this improvement continued during the follow-up period in all outcomes $p < 0.05$ , except the role emotional domain of SF-36. In the SMT group, VAS, ODI and BDI-II increased during follow-up. All domains of SF-36 decreased over this period. The results of group analysis indicate a significant difference between groups at the end of treatment phase $p < 0.05$ , except social functioning.	Both groups showed significant improvement from baseline to after treatment. In the CST group, this improvement continued during the follow-up period in all outcomes, except role emotional domain of SF-36. In the SMT group, VAS, ODI and BDI-II increased during follow-up. Also, all domains of SF-36 decreased over this period.	10 sessions of craniosacral therapy (CST) or sensorimotor training (SMT) can significantly control pain, disability, depression, and quality of life in patients with NCLBP.
Kratz et al., 2021 [24]	67 patients with a historical incidence of head trauma, CST session 60 minutes/1 week	Post-Concussion Syndrome (PCS)	CST	Post-Concussion Symptom Checklist (PCSC)	Utilization of CST revealed that most patients determined the treatment effect upon concussion symptoms within 1e3 sessions. A majority of patients met goals of reducing post-acute or PCS as reasons cited by self-determined change in status or discharge from service.	A significant proportion of patients in all groups reported a positive effect of CST on their symptoms.
Castejon-Castejon et al., 2022 [25]	58 infants with colic, CST group n = 29 – 24 days therapy, none intervention control group = 29, randomization	infantile colic	CST	Infantile Colic Severity Questionnaire (ICSQ)	Significant statistical differences were observed in favor of the experimental group compared to the control group on day 24 in crying hours $p < 0.001$ , and also in hours of sleep $p < 0.001$ and colic severity $p < 0.001$ .	Babies with infantile colic may obtain a complete resolution of symptoms on day 24 by receiving 2 or 3 CST sessions compared to the control group, which did not receive any treatment.
Wójcik et al., 2022 [26]	57 men, 18-24 years, intervention group n = 30/one week/5 weeks/20 minutes, control group n = 27, randomization	healthy	SCT	Cortisol level Postural stability Visual Analog Scale	The results show that craniosacral therapy can lead to lower levels of cortisol $p < 0.001$ . It is difficult to state unequivocally that craniosacral osteopathic therapy influenced the values of postural stability; it was noted for the ellipse area in the group subjected to craniosacral therapy for the lower limbs with eyes open $p = 0.0002$ .	Craniosacral therapy may have a beneficial effect in reducing high cortisol levels.
Muñoz-Gómez et al., 2022 [27]	50 persons, 18-50 years, intervention group n = 25 (20f,5m), no intervention n = 25 (20f,5m), session: one a week/four weeks/10 minutes, randomization	Migraine	CST	(VAS) Headache Disability Index (HDI)	After the intervention significantly reduced pain $p = 0.01$ , frequency of episodes $p = 0.001$ , functional $p = 0.001$ and overall disability $p = 0.02$ , and medication intake $p = 0.01$ , as well as led to a significantly higher self-reported perception of change $p = 0.01$ .	A protocol based on craniosacral therapy is effective in improving pain, frequency of episodes, functional and overall disability, and medication intake in migraineurs.
Ughreja et al., 2023 [28]	132 patients, 4 group: CST n = 33, Bowen therapy n = 33, static touch n = 33, standard exercise program n = 33, the participants in all the groups received once-a-week supervised sessions for 12 weeks, except those in the standard exercise group, who received once-a-week supervised sessions on the 1st, 2nd, 3rd, 5th, 9th, and 12th week, and twice-weekly home exercises for those 6 weeks. Then, they were asked to do thrice-weekly home exercises for the remaining weeks up to 12 weeks, randomization	fibromyalgia	CST	Pittsburgh sleep quality index Pressure pain threshold (PPT) Revised Fibromyalgia Impact Questionnaire Multidimensional Assessment of Fatigue Pain Catastrophizing Scale Tampa Scale for Kinesiophobia Positive and Negative Affect Schedule	ANOVA and appropriate post hoc tests will be applied to analyze the between-group differences.	This study will provide insights into the treatment options to manage sleep and fibromyalgia.
Wójcik et al., 2023 [29]	57 men, 18-24 years, intervention group n = 30/one week/5 weeks/20 minutes, control group n = 27, randomization	healthy	CST	Heart Rate Variability	Study showed that in the study group that received the therapy, it affected the values of HR (Heart Rate) and LF (Low Frequency) of heart rate variability, a statistically significant difference in the p-value $< 0.0001$ was obtained for these values. In the control group (without cranial techniques), there were statistically significant differences for the values of HR, LF and HF p-value $< 0.0001$ .	The cranial techniques and touch might exert a beneficial effect on HRV. Both factors can be used in stressful situations to lower HRV.
Tafler et al., 2023 [30]	39-year-old-man	post-viral neuropathic POTS	CST, CV4 technique	evaluation with an active standing test	In the supine position patient had a heart rate of 79 bpm, which increased by 30 bpm to 109 bpm within 10 minutes of standing. After the therapy, the supine heart rate was 70 bpm and the standing heart rate was 83 bpm.	Craniosacral technique CV4, will be beneficial for patients with POTS when performed as a main therapy or in adjunct to traditional therapy.

The review for this study is intended to provide a broad overview of the applicability of craniosacral therapy for various diseases/disorders in adult and paediatric patients. Arnadottir et al. and Muñoz-Gómez et al. present a practical application of CST therapy in migraine sufferers, demonstrating its positive effects on reducing migraine symptoms [6, 27]. Elden et al. performed this therapy in pregnant women with girdle pelvic pain, proving that the therapy is safe for pregnant women and results in a reduction in pain sensations among the subjects [7]. Białoszewski et al. and Mazreatai et al. [8, 22] showed a positive effect of CST therapy on reducing pain sensations in subjects with specific lumbar spine pain. The study by Castro-Sanchez et al. showed that CST therapy can be used in patients with non-specific low back pain while improving blood parameters [12]. Ghasemi et al. also presented a positive side of this therapy in non-specific low back pain, where in addition to CST therapy, the subjects in the study also had muscle energy technique and sensorimotor training performed [17]. On the other hand, Haller et al. applied this therapy to people with protect neck pain, also obtaining good pain reduction results [11]. In their studies, Grisberger et al. and Wojcik et al. showed a positive effect of CST therapy on lowering the excitability of the autonomic nervous system, using heart rate variability assessment [9, 15, 26]. Wetzler et al. reported on the use of CST therapy in people with traumatic brain injury, with study participants also having visceral manipulation and neuromodulation [14]. They obtained improvements in pain intensity, mobility, memory, cognitive function and sleep in patients with concussion. Strub et al. showed a positive effect of this therapy in post-traumatic syndrome patients, but they drew

great attention to the need for psychotherapists also to be involved in the treatment of patients when using this therapy [18]. Kratz et al. applied CST therapies to patients with post-concussion syndrome, achieving improvements in symptoms among the subjects. Park et al. attempted to apply CST therapies to a 78-year-old man with normal pressure hydrocephalus as a conservative treatment, since the patient did not want to undergo surgical intervention. In this case, a positive effect of this therapy was also obtained [19]. Atay et al. presented the results of a study of the use of the therapy in patients with peripheral vestibular pathology, achieving improvement in patients [27]. Ughreja et al. applied this therapy to patients with fibromyalgia [28]. In their study, the authors indicate a positive effect of CST therapy on reducing symptoms of the disease and improving sleep. This therapy may be effective in people at increased risk of stress, affecting the reduction in stress markers: CRH, corticoliberin and oxytocin [15 and own unpublished data]. Tafler et al. point to the positive effect of the CV4 technique, which is one of the techniques of this therapy in a patient with post-viral neuropathic POTS [30]. CST therapy has also found application in the youngest patients. Raith et al. showed a positive effect of the therapy in premature infants born between 25 and 33 weeks of gestation [13]. A positive effect of the therapy in the youngest patients has been reported in relieving symptoms as well as eliminating colic [15, 25]. Mishra et al. decided to test the effect of CST therapy and sensory integration therapy in children with autism, and obtained better results than the use of sensory integration therapy alone [10]. Haller et al. showed that this therapy is often used as complementary therapies in paediatric and adult patients [21].

**Table 3 Evaluation of the methodological quality of the articles included with the PEDro Scale**

Item PEDro scale	1	2	3	4	5	6	7	8	9	10	11	Total score
Arnadottir et al., 2013 [6]	x	x	x	x	no	no	no	x	x	x	x	8/11
Elden et al., 2013 [7]	x	x	x	x	no	no	no	x	x	x	x	8/11
Białoszewski et al., 2014 [8]	x	x	x	x	no	no	no	x	x	x	x	8/11
Grisberger et al., 2014 [9]	x	no	x	x	no	no	no	x	x	x	x	8/11
Mishra et al., 2015 [10]	x	x	no	x	no	no	no	x	x	x	x	7/11
Haller et al., 2016 [11]	x	x	x	x	no	no	no	x	x	x	x	8/11
Castro-Sánchez et al., 2016 [12]	x	x	x	x	no	no	no	x	x	x	x	8/11
Raith et al., 2016 [13]	x	x	x	x	no	no	no	x	x	x	x	8/11
Wetzler et al., 2017 [14]	x	x	x	x	no	no	no	x	x	x	x	8/11
Castejón-Castejón et al., 2019 [15]	x	x	x	x	no	no	x	x	x	x	x	9/11
Wójcik et al., 2019 [16]	x	x	x	x	x	no	no	x	x	x	x	9/11
Ghasemi et al., 2020 [17]	x	x	x	x	no	no	no	x	x	x	x	8/11
Strub et al., 2020 [18]	x	no	no	x	no	no	no	x	x	x	x	6/11
Park et al., 2021 [19]	no	no	no	no	no	no	no	no	no	no	x	1/11
Atay et al., 2021 [20]	x	no	no	x	no	no	no	x	x	x	x	6/11
Haller et al., 2021 [21]	x	no	no	no	no	no	no	x	x	x	x	6/11
Mazreatai et al., 2021 [22]	x	x	x	x	no	no	no	x	x	x	x	8/11
Ghasemi et al., 2021 [23]	x	x	x	x	no	no	no	x	x	x	x	8/11
Kratz et al., 2021 [24]	x	x	no	x	no	no	no	x	x	x	x	8/11
Castejón-Castejón et al., 2022 [25]	x	x	x	x	x	no	no	x	x	x	x	9/11
Wójcik et al., 2022 [26]	x	x	x	x	x	no	no	x	x	x	x	9/11
Muñoz-Gómez et al., 2022 [27]	x	x	x	x	x	no	no	x	x	x	x	9/11
Ughreja et al., 2023 [28]	x	x	x	x	x	no	no	x	x	no	x	8/11
Wójcik et al., 2023 [29]	x	x	x	x	x	no	no	x	x	x	x	9/11
Tafler et al., 2023 [30]	no	no	no	no	no	no	no	no	no	no	x	1/11

x = the criteria is satisfied; no = the criteria is not specified



### Methodological Quality Assessment

Based on the twenty-five articles included in this review, six show the highest scores with better methodological quality [15, 16, 25-27, 29]. Two of the twenty-five articles [19,30] show low quality, scoring 1 point. Thirteen of the twenty-five articles [6-9, 11-14, 17, 22-24, 28] show good quality. Unfortunately, no publication meets all 11 criteria and thus presents excellent methodological quality. The first criterion, relating to the description of participant selection methods in the articles, was met by all studies except [19, 30]. Six of the twenty-five articles [12, 25-29] met the fifth criterion regarding blinding of participants (see Table 3).

### Discussion

The main conclusion of this review is that there have been scientific studies evaluating the effectiveness of CST in various pathological conditions in children and adults. After applying the adopted screening and eligibility criterion, twenty-five studies were identified, which had been published between 2013 and 2023. The results of the analysis show that the evidence presented is diametrically heterogeneous in terms of techniques used and sample size, which in turn makes it difficult to draw general conclusions. What is more, the results of this review indicate that the use of CST influences patient-reported outcomes/symptoms, e.g., pain, crying babies due to colic, lowering stress hormones, which in turn improves quality of life/general well-being. This review aimed to provide solid evidence showing the positive effects of CST on the human body. The overall quality of the research methodology in the articles reviewed seems quite good, but one very significant limitation is the size of the CST intervention and control groups. Comparing the current review with the previous systematic review, research publications showing the impact of CST had appeared. In order to find as many relevant studies as possible, the search terminology was CST-related and major databases were searched. The valid and reliable critical appraisal tool used here provided a thorough assessment of the methodology of the research conducted. However, some limitations of this review must be considered. The authors of the original articles considered in this review were not asked to provide additional information to indicate data gaps in the research methodology.

Another limitation is that only articles in English were included, which may have excluded other relevant studies for this review. Also, a meta-analysis of the results obtained was not performed, which may also reduce their interpretation. However, despite these limitations, this review indicates that there is existing evidence for the use of CST and that assessing the effects of this therapy on human functioning in various pathological conditions is possible. However, despite the evidence provided, there is a need for multicentre studies using CST, with uniform methodology and larger study groups, as the mechanisms of CST's effects are still underrepresented in scientific research.

### Limitations

In addition to using the accepted methodology in this systematic review and conducting a comprehensive search, it is possible that our search did not identify all relevant studies, especially given the limitation of the search to English-language studies. Our knowledge of unpublished studies influenced our conclusions; unpublished studies are more likely to yield negative or inconclusive results. Although independent reviewers conducted this review, and despite the use of systematic strategies to assess the quality of included studies, there is still room for subjective interpretation. Each reviewer has varying degrees of familiarity with a priori assessment tools, which may have affected the inter-reviewer reliability of the original quality assessment and bias. Reviewers are osteopaths so this knowledge could also be considered a source of bias.

### Conclusion

The review indicates a significant effect on patient outcomes/symptoms. There is a need for multi-center studies with common CST methodology in groups with large numbers.

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### Piśmiennictwo/ References

1. Handy CL: History of Cranial Osteopathy: JAOA. 1948,47(1):269-272.
2. Andersen T, Bahr Ch, Ciranna-Raab C: Efficacy of osteopathy and other manual treatment approaches for malocclusion – a systematic review of evidence IJOM 2013,16(2):99-113.
3. Moher D, Liberati A, Tetzlaff J et al.: Preferred reporting items for systematic reviews and meta-analyses: the PRISMA Statement. PLoS Med 2009,6(7):e1000097.
4. Higgins J, Green S: Cochrane Handbook for Systematic Reviews of Interventions 2008.
5. [https://pedro.org.au/wp-content/uploads/PEDro\\_scale.pdf](https://pedro.org.au/wp-content/uploads/PEDro_scale.pdf) (Accessed 20/06/2023).
6. Arnadottir TS, Sigurdardottir AK: Is craniosacral therapy effective for migraine? Tested with HIT-6 Questionnaire. Complementary Therapies in Clinical Practice 2013,19:11-14. 10.1016/j.ctcp.2012.09.003
7. Elden H, Östgaard HCh, Glantz A et al.: Effects of craniosacral therapy as adjunct to standard treatment for pelvic girdle pain in pregnant women: a multicenter, single blind, randomized controlled trial. Acta Obstet Gynecol Scand 2013,92(7):775-82. 10.1111/aogs.12096

8. Białoszewski D, Bebelski M, Lewandowska M et al.: Utility of Craniosacral Therapy in Treatment of Patients with Non-specific Low Back Pain. Preliminary Report. *Ortopedia Traumatologia Rehabilitacja* 2014,6(6),16:605-615. 10.5604/15093492.1135120
9. Girsberger W, Bänziger U, Lingg G et al.: Heart rate variability and the influence of craniosacral therapy on autonomous nervous system regulation in persons with subjective discomforts: a pilot study. *Journal of Integrative Medicine* 2014,12(3):156-161. 10.1016/S2095-4964(14)60021-2
10. Mishra DP, Senapati A: Effectiveness of Combined approach of CraniosacralTherapy (CST) and Sensory-Integration Therapy (SIT) on reducing features in Children with Autism. *The Indian Journal of Occupational Therapy* 2015,47(1):3-8.
11. Haller H, Lauche R, Cramer H et al. Craniosacral Therapy for the Treatment of Chronic Neck Pain A Randomized Sham-controlled Trial. *Clin J Pain* 2016,32(5):441-449. 10.1097/AJP.0000000000000290
12. Castro-Sanchez AM, Lara-Palomo IC, Mataran-Penarrocha GA et al.: Benefits of Craniosacral Therapy in Patients with Chronic Low Back Pain: A Randomized Controlled Trial. *The Journal of Alternative and Complementary Medicine* 2016,22(8):650–657. 10.1089/acm.2016.0068
13. Raith W, Marschik PB, Sommer C et al.: General Movements in preterm infants undergoing craniosacral therapy: a randomised controlled pilot-trial. *BMC Complementary and Alternative Medicine* 2016,16:12. 10.1186/s12906-016-0984-5
14. Wetzler G, Roland M, Fryer-Dietz S et al.: CranioSacral Therapy and Visceral Manipulation: A New Treatment Intervention for Concussion Recovery. *Medical Acupuncture* 2017,29(4):239-248. 10.1089/acu.2017.1222
15. Castejón-Castejón M, Murcia-González MA, Martínez Gilc JL et al.: Effectiveness of craniosacral therapy in the treatment of infantile colic. A randomized controlled trial. *Complementary Therapies in Medicine* 2019,47:102164. 10.1016/j.ctim.2019.07.023
16. Wójcik M, Dziembowska I, Izdebski P et al.: Pilot randomized single-blind clinical trial, craniosacral therapy vs control on physiological reaction to math task in male athletes. *International Journal of Osteopathic Medicine* 2019,32:7–12. 10.1016/j.ijosm.2019.04.007
17. Ghasemi G, Amiri A, Sarrafzadeh J et al.: Comparison of the effects of craniosacral therapy, muscle energy technique, and sensorimotor training on non-specific chronic low back pain. *Anaesthesia, Pain & Intensive Care* 2020,24(5):532-543. 10.35975/apic.v24i5.1362
18. Stuba T, Kiilb MA, Liec B et al.: Combining psychotherapy with craniosacral therapy for severe traumatized patients: A qualitative study from an outpatient clinic in Norway. *Complementary Therapies in Medicine* 2020,49:102320. 10.1016/j.ctim.2020.102320
19. Park Y, Kabariti J, Tafler L: Craniosacral Therapy Use in Normal Pressure Hydrocephalus. *Cureus* 2021,13(5):e14886. 0.7759/cureus.14886
20. Ataya F, Bayramlara K, Saracb ET: Effects of Craniosacral Osteopathy in Patients with Peripheral Vestibular Pathology ORL 2021,83:7–13. 10.1159/000509486
21. Haller H, Dobos G, Cramer H: The use and benefits of Craniosacral Therapy in primary health care: A prospective cohort study. *Complementary Therapies in Medicine* 2021,58:102702. 10.1016/j.ctim.2021.102702
22. Mazreatai N, Rahemi Z, Aghajani M et al.: Effect of craniosacral therapy on the intensity of chronic back pain of nurses: A randomized controlled trial. *Nursing Practice Today* 2021,8(4),313-321. 10.18502/npt.v8i4.6707
23. Ghasemi C, Amiri A, Sarrafzadeh J et al.: Effects of craniosacral therapy and sensorimotor training on pain, disability, depression and quality of life of patients with nonspecific chronic low back pain: a randomized clinical trial. *Anaesthesia, Pain & Intensive Care* 2021,25(2):189-198. 10.35975/apic.v25i2.1458
24. Kratz SV, Kratz DJ: Effects of CranioSacral therapy upon symptoms of post-acute concussion and Post-Concussion Syndrome: A pilot study. *Journal of Bodywork & Movement Therapies* 2021,27:667e675. 10.1016/j.jbmt.2021.05.010
25. Castejon-Castejona M, Murcia-Gonzalez MA, Todri J et al.: Treatment of infant colic with craniosacral therapy. A randomized controlled trial. *Complementary Therapies in Medicine* 2022,71:102885. 10.1016/j.ctim.2022.102885
26. Wójcik M, Siatkowski I, Żekanowska E: A Proposal for the Use of Craniosacral Therapy in Firefighter Cadets to Decrease Cortisol Levels and Improve Postural Stability - A Randomized Trial. *J. Mens. Health* 2022,18(6):140. 10.31083/j.jomh1806140
27. Muñoz-Gómez E, Inglés M, Aguilar-Rodríguez M et al.: Effect of a Craniosacral Therapy Protocol in People with Migraine: A Randomized Controlled Trial. *J. Clin. Med* 2022,11:759. 10.3390/jcm11030759
28. Ughreja RA, Venkatesan P, Gopalakrishna DB et al.: Effectiveness of Craniosacral therapy, Bowen therapy, static touch, and standard exercise program on sleep quality in fibromyalgia syndrome: A protocol for a randomized controlled trial. *European Journal of Integrative Medicine* 2023,60:102254. 10.1016/j.eujim.2023.102254
29. Wójcik M, Siatkowski I: The effect of cranial techniques on the heart rate variability response to psychological stress test in firefighter cadets. *Scientific Reports* 2023, 13:7780. 10.1038/s41598-023-34093-z
30. Tafler L, Chaudry A, Cho H et al.: Management of Post-Viral Postural Orthostatic Tachycardia Syndrome With Craniosacral Therapy. *Cureus* 2023,15(2):e35009. 10.7759/cureus.35009