



## Review

# Physiotherapy in reducing migraine symptoms: literature review

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### Edited by

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### Keywords:

Physiotherapy  
Treatment  
Migraine

### Abstract

Migraine or megrim affects more than 31 million people in Brazil in all age groups, some with a higher prevalence. In the search for new forms of treatment, physiotherapy is on the rise, with promising results. In this context, this work aimed to investigate whether physical therapy adds effective results in the treatment of migraine symptoms. A literary review was carried out, using Scielo, PubMed, Virtual Health Library (VHL) and Google academic databases as review sources of the research, using the descriptors: Migraine, treatment, and physiotherapy. More than 500 articles were found, which were submitted to pre-established criteria for inclusion and exclusion, and, in the end, 5 articles were selected. The use of manual techniques, as stretching and mobilization in the skull bones was highlighted among the physiotherapy techniques used. The results obtained are encouraging, bringing benefits to patients and opening doors for further studies in the area.

Received: December 12, 2020  
Accepted: December 30, 2020



## Introduction

Currently, about 150 types of headaches are known. Among them, migraine or megrim appears amid the most frequent ones affecting the general population, according to studies conducted by the International Headache Society and the Brazilian Headache Society<sup>1</sup>. In Brazil, this pathology occurs in about 15% of the population, affecting 31 million people. It strikes the general population nevertheless its higher incidence happens in individuals aged 25 to 45 years old, with a greater prevalence in females. In children before puberty, both sexes are equally affected with about 5% of this age group. In people over 50, the incidence decreases, even in women.

The headache classification subcommittee of the International Headache Society<sup>2</sup> developed a questionnaire to assess the type of headache presented by patients. The criteria were established by the international headache society. The existence of more than five bouts of pain lasting between four and seventy-two hours, with criteria of location, pain intensity, and minimal presence of two factors such as nausea, vomiting, phonophobia, and photophobia are the prerequisites for the diagnosis of migraine.

According to Cabbaz<sup>3</sup>, the location of pain in migraine pain is always unilateral, sometimes on the left side and other times on the right side alternately, the patient feels pulsatile type pain from moderate to severe, which can be described as a throbbing pain reported by some people as if the heart were beating in the head.

For Vincent<sup>4</sup> Migraine is not characterized by the presence of headache, but by the state of constant susceptibility that makes the migraine sufferer permanently subject to an attack, by means of triggering factors. For a triggering factor to ignite a crisis (and it is not mandatory that it always does), the pre-existence of migraine susceptibility, common to all patients, is required.

NeuroAnchieta<sup>5</sup> says that, in most cases, the diagnosis is given quickly and simply clinically, from information collected by the professional, i.e., the neurological examination in the office and the symptomatology are sufficient, and there is no need for additional tests to close the diagnosis of migraine, but the physician may request additional tests to eliminate other possibilities.

The pathophysiology of migraine is still not fully elucidated, but several scholars follow lines of reasoning that end up finding themselves in hypotheses of what may be the cause of the problem. Among the possibilities, the one that has been

sustained is the trigemino-vascular system, with some factors that directly influence the triggering of pain.<sup>6</sup>

For Vincent<sup>4</sup>, there is a genetic alteration in specific calcium channels of the brain, causing hyper excitability, altering the homeostasis, making the CNS more vulnerable to luminous, sonorous stimuli (factors), and stress (intrinsic factor). The middle portion of the brainstem becomes particularly excitable, being the triggering center of the crises; this area also causes nausea and vomiting to occur (solitary tract). The trigeminal vascular system is activated through the spreading Depression (SD) caused by the hyperexcitability of the cerebral cortex, causing pain through the trigeminal nucleus (brainstem) and the peripheral vessels. In the meninges, it causes the release of vasodilator neurotransmitters, which interact with other substances released by vessels and nerve fibers, spreading the process and corroborating pain.

For Alves<sup>7</sup>, cerebral migraine has its origin linked to the limbic system, composed of several structures of the neurological system that are interconnected to the emotions and primitive life responsible for initiating the progress and bringing the crisis. This system belongs to the brainstem, in which are located important structures responsible for initiating migraine episodes, through medial proencephalic bundles.

According to Whalen et al.<sup>8</sup>, in terms of treatment, several drug protocols are known, but not all patients have satisfactory results. A more recent idea is surgery, but like any intervention of this type, it involves risks, and the cost is high, making it unfeasible for most of the population that suffers from migraine. On the other hand, physiotherapy comes as an alternative means, in great ascent, bringing satisfactory results. In this context, the following leading question arose: how can physiotherapy act to minimize migraine symptoms? The purpose of this paper was to investigate how physiotherapy adds effective results in the treatment of migraine symptoms.

## Methods

This is an integrative literature review, with the purpose of knowing in-depth what the scientific texts say about the theme. This methodological strategy consists of the systematic compilation of studies on a particular research problem, to allow a critical analysis of its objectives and methodological path, generating contributions to the integration of knowledge and its applicability, with a view to the development of the area in question.<sup>9</sup>



The integrative literature review is a distinct form of research that synthesizes published results and generates new knowledge about the reviewed topic.<sup>10</sup>

For database searching purposes, three keywords were used: Migraine, treatment, and physical therapy. The crossing of the descriptors was done electronically in the indexing databases Scielo, PubMed, Virtual Health Library (VHL), Google Scholar and in the journal Headache Medicine.

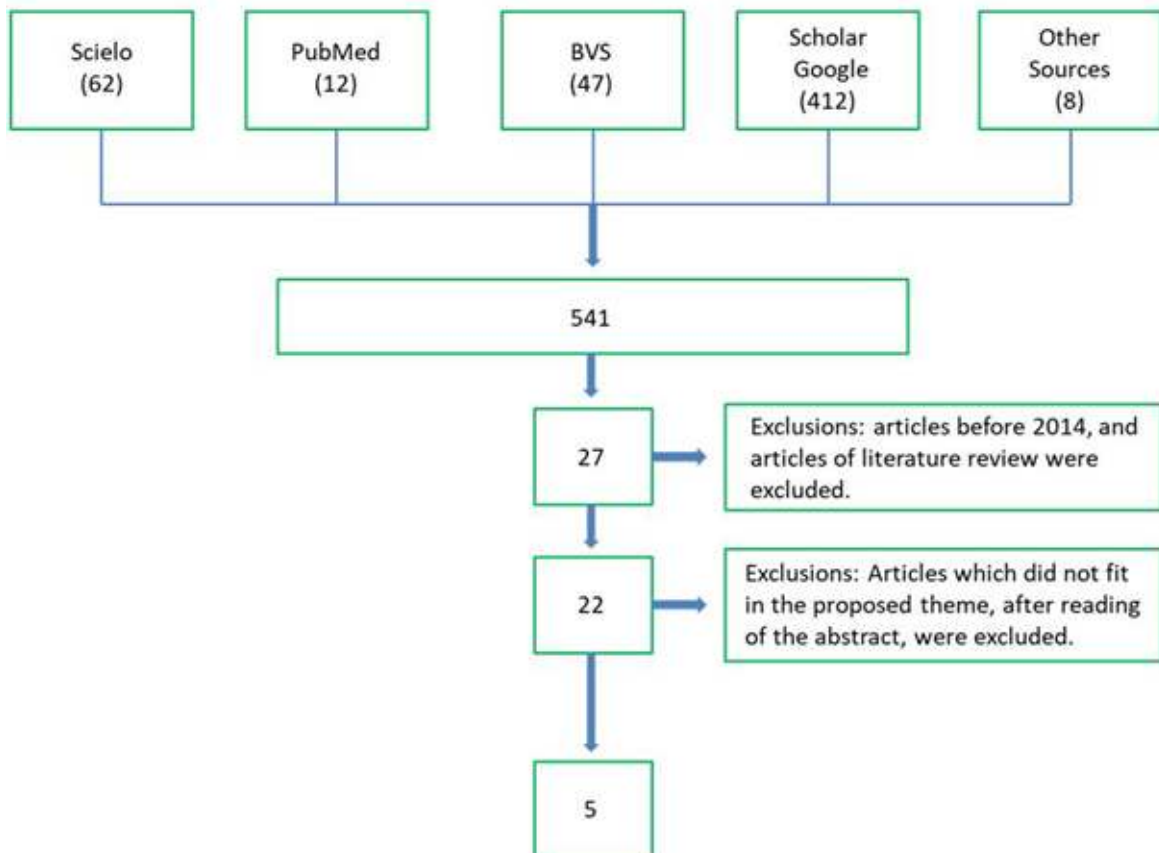
Some inclusion criteria were pre-established to delineate the search: (1) Year of publication from 2014 to 2020 (considering the year 2020 as atypical also in relation to research, 2014 was included to incorporate recent research from the last five years); (2) Language of publication, English, Portuguese, and Spanish; (3) Being an original publication, therefore, literature reviews were excluded.

## Results and Discussion

In the literature search, 62 studies were found and accessed in Scielo, 12 articles in PubMed, 47 publications in the Virtual Health Library (VHL), 412 articles in Google Scholar, and 8 publications from other sources. Then some exclusion and inclusion criteria were applied to obtain a direction to the final objective. In the end, 5 publications were left that qualified under the proposed criteria.

In the process of filtering the publications, one of the main reasons for exclusion was the central objective of the study, because many only cited physical therapy or manual therapy as a form of migraine treatment, but had not intensely explored the theme, showing in a more detailed way only treatments involving drugs or invasive processes, related to the area of medicine.

**Chart 1: Flowchart of the distribution of the articles located and selected in the literature review, according to the indexing databases consulted**



**Figure 1** presents an explanatory way about the main forms of inclusion and exclusion by the characteristics and results of the reviewed publications. The selected articles were published between 2014 and 2020. The articles were mostly Brazilian (80%) and Spanish (20%) originally. The languages of the publications were 40% in English, 40% in Portuguese and 20% in Spanish. All focused on the area of physical therapy and related areas.



**Table 1.** Title, authors, year of publication, objectives, method, main results, and conclusions of the studies reviewed

Title	Authors	Year	Objectives	Method	Results	Conclusion
Skull manual therapy as physiotherapy treatment conduct in chronic migraine	Alves PR	2018	Display the average age of the patients, gender prevalence, greater incidence in the professional category, type and local of the pain.	Descriptive exploratory quantitative qualitative research. Involving ten patients, who were applied 10 sessions (twice a week) of the manual therapy protocol.	The constant applicability of this protocol for chronic migraine sufferers collaborates for the reduction of the pain, increasing therefore the crises 'intervals, enhancing the quality of life of these patients and enabling the return to their daily activities and social interaction	This research observed the importance of the manual therapy as a rehabilitating preventive measure, pinpointing its beneficial effects in these people's lives. Highlighting the importance of the deepening of this study with a larger sample patient focused approach.
Physiotherapy Intervention in chronic migraine patients.	Cabbaz BEB	2016	Verify the efficacy of the Physiotherapy Intervention in chronic migraine patients.	Application of the protocol involving manual therapy techniques, stretching, and diaphragmatic breathing. Ten patients were served for four weeks.	The application of the proposed protocol has brought good results in improving the pain of volunteers diagnosed with migraine over four weeks. It is evident the improvement in the impact of social, family and work life, because the pain that often makes it impossible to perform tasks and social and family life has its degree decreased.	It can be said that the migraine sufferers who were part of the sample of this study presented an improvement in pain and in the score of the HIT-6 questionnaire, which suggests improvements in the social, physical, mental and psychological areas of the volunteers. Further studies with a larger number of volunteers are suggested.
Static ultrasound and manual therapy for treatment of refractory migraine. Case report	Gonçalves MC, Silva ERT, Chaves TC, Dach F, Speciali JG, Guirro RRJ, Bevilaqua-Grossi D.	2014	Reduced pressure pain thresholds (PPT) and the presence of migraine hotspots. Physiotherapy is often helpful for these patients. Muscle triggers are often seen in patients with migraine. Physical therapy is often helpful for these patients.	Case report: application of a manual therapy protocol and static ultrasound over a period of twenty sessions, with ultrasound being inserted from the 6th session on.	The association of the two types of therapies, static ultrasound, and manual therapy techniques, reduced the duration and frequency of migraine attacks and the number of active trigger points, and significantly increased pressure pain thresholds (PPT).	This case report demonstrated that the combination of manual therapy techniques and static ultrasound is an interesting non-pharmacological alternative for patients with migraine and myofascial involvement. Future studies, such as randomized clinical trials, should be performed to confirm the results on a large scale.
Clinical effectiveness of osteopathic treatment in chronic migraine: randomized controlled clinical trial:	Cerritelli F, Ginevri L, Messi G, Caprari E, Di Vincenzo M, Renzetti C, Cozzolino V, Barlafante G, Fochi N.	2016	To evaluate the effectiveness of OMT (osteopathic manipulative treatment) in patients with chronic migraine.	Randomized controlled trial, in a sample of 105 patients divided into three groups. The OMT group received 8 sessions over 24 weeks.	Based on this evidence, it may be possible to hypothesize a positive effect of the simulated procedure on adults with migraine, decreasing the incidence of crises in the medium term, thus improving the quality of life of migraineurs.	The present study showed significant differences between the OMT group compared to the other two groups, suggesting that OMT can be considered a clinically valid procedure for treating patients with migraine.
Additional effects of a physical therapy protocol on headache frequency, pressure pain threshold, and perceived improvement in patients with migraine and associated neck pain: a randomized clinical trial.	Bevilaqua-Grossi D, Gonçalves MC, Carvalho GF, Florencio LL, Dach F, Speciali JG, Bigal ME, Chaves TC.	2016	To evaluate the additional effect provided by physical therapy in the treatment of migraine.	Randomized controlled trial. 300 patients, 50 women (age range, 18 and 55 years) with a diagnosis of migraine were approached. They were randomized into 2 groups.	Physiotherapy plus medication patients showed an additional 18% improvement at post-treatment and 12% improvement at follow-up compared to control patients. The reduction observed in the physiotherapy plus medication patients was clinically relevant at post-treatment, while clinical relevance for the control patients was demonstrated only at follow-up. For pain intensity, the physiotherapy plus medication patients showed statistical evidence and clinical relevance with post-treatment reduction. In addition, they showed a better self-perception of overall change than the control patients.	The physical therapy protocol proposed in this study did not enhance the effects of conventional treatment for migraine frequency and intensity. However, the clinically relevant changes in migraine frequency and intensity observed were associated with better perceived change and satisfaction with the treatment received. Moreover, it was evidenced that physical therapy can be effective in reducing nociceptive afferences in the craniocervical region

Regarding the methodology of the selected articles, all of them are in-house studies, so the literature review articles were eliminated for a better analysis of the topic addressed, bringing more reliability to the study, therefore. Among the studies, manual therapy protocols were highlighted, such as stretching of the cervical region and myofascial release by Cabbaz<sup>3</sup>, mobilization of the cranium bones and compression of the fourth ventricle used by Alves.<sup>5</sup> Concepts of osteopathy seeking the balance of the body with joint mobilizations and manipulations as well as soft tissues, a method adopted by Bevilaqua-Grossi et al.<sup>11</sup>. In all protocols, the work of breathing (diaphragmatic pattern) was observed, associated with manual therapy in the treatment of migraine.

Alves<sup>5</sup> talks about the beneficial effects of manual therapy in relation to the decrease and strong intensity of migraine, due to the decay of nociceptive afferent flow within the trigemino-cervical nucleus, at the base of the brain and dura mater, reducing the somatic dysfunctions located throughout the cranial region, neck, upper back, and temporomandibular joint.

Bevilaqua-Grossi et al.<sup>11</sup> point out the additional benefits of a physiotherapy protocol concerning the frequency and intensity of migraine crises could not be confirmed. However, clinically relevant changes in headache frequency and intensity, associated with improved patient perception of change and satisfaction with treatment, were observed in the physiotherapy



plus medication group. In addition, significant increases in pain threshold to pressure in the temporalis muscle confirmed that the proposed therapy improved craniocervical sensitivity. They speculated two hypotheses for the mechanism of action of manual therapy: rebalancing of the trigeminal nucleus and reduction of pro-inflammatory substances.

Therefore, the application of manual therapy in patients with migraine could possibly reduce the release of pro-inflammatory substances, which in turn influence the function of the trigeminal nucleus. Consequently, a cascade of biological and neurological events, potentially based on a rebalancing of the abnormal activation of the habituation/sensitization mechanism, even between crises, may occur resulting in an overall improvement of clinical outcomes.

## Final considerations

Physical therapy through manual techniques clearly brings beneficial effects to individuals affected by migraine; however, through this review, it is evident that the idea is still little widespread, even though the physical therapy professional can act to reduce migraine symptoms. Due to the scarcity of studies, the discussion becomes limited to prompt more robust results to guide the physical therapy practice.

It also becomes a milder way, since the use of drugs brings within it adverse effects, which can be manifested in a more accentuated way in individuals who have aversion to drug treatments. There are also those who have allergies or sensitivity to the medication used.

This article opens doors for new studies, because this is still a poorly addressed area. There are still many aspects to be elucidated, such as what really causes migraines, because there are hypotheses and lines of reasoning, but nothing concrete. Therefore, this is the right way to follow, as there are positive results in patients subjected to the test. With more studies, new applications and techniques will emerge, which is good, because more solidness in the idea of treatment for each individual will be achieved.

**Financing source:** No

**Conflict of interests:** No

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