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Effectiveness of recent physiotherapy interventions on migraine headache: A literature review

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Abstract

Background of the study: Migraine is a common and often debilitating neurologic condition, which is associated with physical and emotional dysfunctions. The role of physical therapy in the management of migraine is largely unknown. female migraine incidence rises significantly faster than male migraine incidence beginning with puberty. Thus, women experience migraine three to four times more frequently than men do over the course of a lifetime. This study is based on reviewing the relevant literature and to improve the knowledge about the effectiveness of different treatment intervention on migraine patients.

Methodology: A comprehensive literature study was done using the specified search criteria ' In order to carry out a literature review, the search phrases "migraine," "physical therapy, and "manual therapy" "recent advances" were employed between the years 2015 and 2025. We have discovered 10 publications with complete text and methodologies for additional examination from diverse academic journals.

Results: The review of literature indicates that physiotherapy interventions have shown promising results in managing migraines. Studies consistently report a reduction in the frequency, duration, and severity of migraine attacks. Overall, the findings suggest that incorporating physiotherapy into migraine management can provide significant benefits for patients.

Conclusion: The review of literature analysed 10 studies exploring the effectiveness of recent physiotherapy interventions for migraine management. The interventions included manual therapy, dry needling, aerobic exercises, breathing techniques, Tai Chi, neurostimulation methods (e-TNS and REN), and chiropractic care combined with usual care (EUC). Across these studies, the results consistently showed significant improvements in reducing migraine frequency, intensity, and duration. Additionally, most interventions enhanced overall quality of life, reduced medication use, and alleviated associated symptoms. The positive outcomes observed across these diverse physiotherapy approaches underscore their potential as effective, non-pharmacological strategies for managing migraines.

Keywords: Migraine; Physical Therapy; Manual Therapy; Recent Advances

1. Introduction

Migraine is a neurological condition characterized by distinct episodes of headache accompanied by heightened sensory sensitivity. [1] It is the most prevalent type of primary headache encountered by healthcare professionals, representing 90% of cases, and is significantly more debilitating than tension-type headaches. Prevalence rates indicate that over a lifetime, 33% of women and 13% of men experience migraines. In terms of annual prevalence, 25% of women and 7.5% of men report having migraines. [1]

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Chronic migraine, affecting 1-2.2% of the population, predominantly women, is often resistant to treatment, with medications showing limited effectiveness and frequent side effects. [2] While there is some evidence indicating that manual therapy may serve as a treatment alternative for migraines, its effectiveness specifically for chronic migraine remains uncertain. [2]

Most patients experience migraine as episodic migraine (EM), which occurs regularly but not necessarily on a frequent basis. [2] It is estimated that around 65% of those affected have migraine episodes occurring every two weeks to once a month. However, when this episodic pattern becomes unmanageable, a process of chronicisation takes place, leading to an increase in the frequency and severity of the original episodic migraines. .[3] This condition is referred to as chronic migraine (CM) and is defined by the International Headache Society (IHS) as a headache that occurs on more than 15 days each month, with at least 8 of those days lasting for over three months.[3]

The drawbacks and adverse effects associated with pharmacological prophylaxis have sparked an increased interest in non-pharmacological methods for managing migraines. .[3] Although medications such as propranolol, topiramate, and amitriptyline can help decrease the frequency of migraines in certain individuals, their side effects—like fatigue and dizziness—often result in poor adherence or discontinuation of treatment. [4] Consequently, there is a rising demand for alternative therapies that can effectively prevent migraines without the complications linked to long-term medication use. [4] Physiotherapy techniques like manual and exercise therapy can help reduce migraine frequency and intensity. [4] These strategies provide a comprehensive, patient-focused approach that not only alleviates symptoms but also enhances overall well-being and quality of life. [4]

Hence, the purpose of this literature review is to provide an overview of the current evidence on physiotherapy interventions for migraine management. Additionally, this review will guide future research by identifying gaps in existing studies and highlighting areas for further investigation.

1.1. Need of the study

Migraine is a common and often debilitating neurologic condition, which is associated with physical and emotional dysfunctions. The role of physical therapy in the management of migraine is largely unknown. While pharmacological therapies are widely used, concerns about side effects, drug dependency, and limited long-term efficacy highlight the need for complementary non-pharmacological approaches. However, despite emerging evidence, there is still a lack of standardized protocols and conclusive data on their effectiveness of physiotherapy in management of migraine. A comprehensive literature review is essential to evaluate recent physiotherapy-based interventions, identify gaps in current research, and establish evidence-based guidelines for integrating physiotherapy into migraine management.

1.2. Objective of the study

This literature review will examine the existing evidence regarding the effectiveness of recent physiotherapy interventions in migraine management.

2. Materials and method

2.1. Study design

Literature search was conducted using the search engines Medline, Pedro, Google Schoolar, PubMed and more. The literature review was conducted for the time period from 2015 to 2025.

2.2. Search strategy

The key words used were: migraine, physical therapy, rehabilitation.

2.3. Sample size

Based on the inclusion and exclusion criteria and year of publication, ten appropriate articles were obtained for this review of literature.

2.4. Inclusion Criteria

- This study will include studies that specifically investigate the recent physiotherapy interventions in migraine management
- Only articles published in the English language will be considered.

- The study will include full-text articles, rather than abstracts or summaries.
- The articles were published between 2015 and 2025.
- Both genders are included

2.5. Exclusion Criteria

- Articles published in languages other than the regional language were omitted.
- Articles published prior to 2015 were excluded.
- Studies those are not relevant to the specified keywords Studies that have implemented suboccipital myofascial release as the intervention for migraine headache management.
- Studies used lifestyle modification for the management of migraine headache.
- Studies those are not relevant to the specified keywords.

3. Methodology

The evidence was gathered from online web publications obtained from different search engines, including Google Scholar, PubMed, and other journals. A tailored search was conducted using key words such as "migraine," "physical therapy," "rehabilitation" to retrieve relevant publications. The time period was designated as 2015 to 2025 in order to gather precise and current facts from throughout the globe over the course of the past decade. We have identified a total of 10 articles that meet our specific criteria for inclusion and exclusion. All 10 publications were obtained in their entirety to be analysed and continued with further analysis. The results received from all articles are displayed in a tabular format for enhanced comprehension.

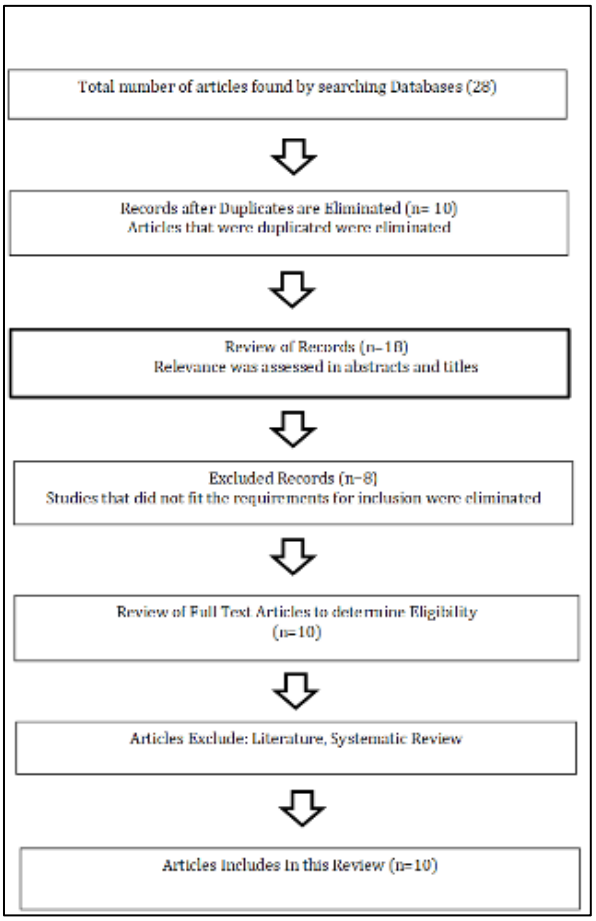

Figure 1 Flow Chart

The characteristics of extracted article have been listed in Table 1.

Table 1 Manual Therapy & Chiropractic Based Interventions

Sl.no.	Author	Year	Treatment intervention	conclusion
1.	Pamela M. Rist et.al	2022	chiropractic care along with ECU received up to 10 sessions of chiropractic care over a 14-week period. Chiropractic care include: posture correction and spinal stabilization exercises, soft tissue relaxation/release techniques, spinal manipulation and joint mobilization, relaxation techniques, education, stretches, and ergonomic modifications	The chiropractic care along with EUC group showed greater reductions in migraine days, severity, and medication use compared to the EUC-alone group, with effects persisting at final follow-up.
2.	Judit Mihaiu et.al	2023	Manual therapy sessions twice a week each lasting 45 minutes. The sessions comprised of craniocervical muscle exercises, suboccipital inhibition, cervical spine mobilization, trigger point treatment, soft tissue mobilization, elongation, muscle release, stretching, and head and neck massage. Additionally, patient performed a daily 10-minute at-home exercise session to improve posture and flexibility	The study showed that manual therapy led to significant improvements in chronic migraine and tension-type headache management. Also better sleep, reduced pain intensity, and decreased medication use.
3.	Sofía Monti-Ballano et.al	2024	The Dry needling technique for each AMTrP . bidirectional rotation technique was employed in muscles with a very flat muscular belly (such as the temporalis, occipitofrontalis posterior and anterior, and zygomaticus major muscles), and those with structures like blood vessels and nerves nearby (rectus capitis posterior major, obliquus capitis superior and inferior), in and out needling or needle winding in muscles with a large-diameter muscular belly and no nearby dangerous structures.	Adding chiropractic care to usual care (EUC) led to greater reductions in migraine days, severity, and medication use compared to EUC alone. Participants in the chiropractic care along with EUC group also reported greater improvements in migraine-related disability and quality of life.

Table 2 Breathing & Exercise-Based Interventions

1.	Mohammad Dawood Rahimi et.al	2022	The first intervention group practiced eye movement exercises, while the second group received diaphragmatic breathing instruction. The eye movement exercises involved horizontal and vertical eye movements. Participants performed these exercises for five minutes each morning and again for 30 minutes before bedtime. This routine was followed consistently for 12 weeks. The diaphragmatic breathing exercise consisted of a deep inhalation through the nose, followed by a two-second pause, and a slow exhalation through the mouth. Participants performed this practice three times a day at around 7:00 a.m., 2:00 p.m., and 9:00 p.m. Each session lasted for five minutes and was continued for 12 consecutive weeks	The study found that both eye movement exercises with jogging and diaphragmatic breathing with jogging significantly improved migraine symptoms. Participants in the intervention groups experienced a reduction in migraine frequency, duration, and intensity compared to the control group.

2.	Kiruthika Selvakumar et.al	2023	Aerobic exercise 40 minutes/ session, 18 sessions. (warm up exercise, neck exercise with resistance band, static bicycling, walking, cool down exercises) 3 times per week for 6 weeks. Biofeedback training group 30 minutes/session, 18 session (trapezius and frontalis for 30 minutes/ session for 3 times per week for 6 weeks)	The study suggests that aerobic training may reduce migraine frequency but has an unclear effect on severity. EEG analysis indicates potential brain activity changes. Further research is needed to confirm its effectiveness and long-term benefits.
3.	Ogulcan come at.el	2024	The intervention involved a 30-minute, one-on-one session at Family Health Centers (FHCs), where the researcher provided individualized instruction on Alternate Nostril Breathing (ANB). Participants received guided practice with real-time feedback to ensure correct technique. The researcher demonstrated the breathing exercise and corrected any errors. To support adherence, participants were given detailed written materials with step-by-step instructions.	This study found that Alternate Nostril Breathing (ANB) effectively reduced migraine attack frequency in the intervention group compared to the control group. While attack severity also decreased, the difference was not statistically significant. These findings suggest that ANB may be a beneficial non-pharmacological approach to migraine management.

Table 3 Mind-Body Practices

Sl.no.	Author	Year	Treatment intervention	conclusion
1.	Yao Jie Xie at.el	2022	The intervention consisted of a modified 33-short form Yang-style Tai Chi program. Participants in the Tai Chi group practiced for 1 hour per day, 5 days per week, for 12 weeks.. The program aimed to improve migraine symptoms through controlled movements, breathing, and mindfulness. A 12-week follow-up period assessed the long-term effects	The study concluded that Tai Chi program significantly reduced migraine frequency and duration in individuals with episodic migraines. The intervention demonstrated sustained benefits, with high participant satisfaction and continued practice post-study.

Table 4 Recent Advances in Neurostimulation

Sl.no.	Author	Year	Treatment intervention	conclusion
1.	Denise E Chou at.el	2019	The study examined the effectiveness of external trigeminal nerve stimulation (e-TNS) for treating acute migraines, comparing an active treatment group to a placebo group. The intervention involved is the neurostimulation using the e-TNS Cefaly device for a one-hour session. This device delivers rectangular biphasic symmetrical pulses at a frequency of 100 Hz and a pulse width of 250 ms. Electrical pulses are transmitted transcutaneously via a supraorbital self-adhesive electrode placed on the forehead The current gradually increases to a maximum of 16 mA within 14 minutes and remains stable for 46 minutes.	The active treatment group experienced significantly greater pain relief shortly after treatment and continued to show better results over time. More patients in the active group achieved complete pain relief and substantial pain reduction compared to the placebo group. The need for additional migraine medication was similar between both groups. The treatment was well-tolerated with no serious side effects, making e-

				TNS a promising non-invasive option for migraine relief.
2.	Daisuke Danno at.el	2019	Patients with migraines were treated using the Cefaly device, a neurostimulation tool, for 20 minutes daily over 12 weeks. The device delivered controlled electrical pulses to help reduce migraine frequency and severity. Patients recorded their headache patterns and device usage in an electronic diary throughout the treatment period. After 12 weeks, the effectiveness of the treatment was assessed by analyzing changes in migraine days, attack frequency, medication use, and headache severity.	The study found a significant reduction in migraine days and attacks after 12 weeks of external trigeminal nerve stimulation (e-TNS) therapy. The number of migraine days and migraine attacks also significantly declined .
3.	David Yarnitsky at.el	2019	The intervention involved a remote electrical neuromodulation (REN) device applied to the upper arm. The active device delivered modulated electrical stimulation through a smartphone-controlled application. Participants adjusted the stimulation intensity to a perceptible but non-painful level. Treatment was administered within one hour of migraine onset for 45 minutes per session. The study duration was 4-6 weeks, during which participants recorded migraine symptoms and responses in an electronic diary.	This study found that remote electrical neuromodulation (REN) effectively relieved acute migraine pain and associated symptoms compared to a sham treatment. REN proves to be a promising non-pharmacological option for acute migraine management.

4. Discussion

This literature review's main goal was to evaluate the effectiveness of recent physiotherapy interventions in managing migraine by analysing various studies and clinical trials. Physiotherapy techniques, such as manual therapy, aerobic exercise, and breathing techniques etc have been explored as adjuncts or alternatives to pharmacological treatments. This review aims to synthesize available evidence to provide clinicians with a comprehensive understanding of how physiotherapy can effectively complement conventional migraine management strategies.

In 2024, Ogulcan et al. conducted a study to assess the effectiveness of Alternate Nostril Breathing (ANB) in managing migraines through a 30-minute weekly session over three months. The study showed a significant reduction in migraine frequency in the intervention group. These findings suggest that ANB may be an effective non-pharmacological approach to reducing migraine frequency. [5]

In the year 2024, Sofía Monti-Ballano et al. conducted a study on the effectiveness of dry needling in treating migraines. The intervention targeted specific muscles, including the temporalis, occipitofrontalis (posterior and anterior), zygomaticus major, rectus capitis posterior major, obliquus capitis superior, and obliquus capitis inferior. The study demonstrated that adding chiropractic care to usual care (EUC) resulted in a greater reduction in migraine days, severity, and medication use compared to EUC alone.[6]

In 2023, Kiruthika Selvakumar et al. conducted a study on the effects of aerobic exercise and biofeedback training in migraine patients.. The results showed a reduction in migraine frequency, but the effect on severity was unclear. EEG analysis indicated possible brain activity changes. Further studies are needed to validate these findings and assess long-term benefits. [7]

In 2023, Judit Mihaiu et al. conducted a study on the effectiveness of manual therapy in managing chronic migraine and tension-type headaches. The intervention included 45-minute sessions twice a week, along with a 10-minute daily home exercise program. The results demonstrated significant improvements in pain reduction, better sleep quality, and decreased medication use, suggesting that manual therapy is a valuable non-pharmacological approach for migraine management. [8]

In 2022, Pamela M. Rist et al. conducted a study on the effectiveness of chiropractic care combined with Enhanced Usual Care (EUC) in managing migraines. The intervention lasted 14 weeks and demonstrated that participants receiving

chiropractic care along with EUC experienced greater reductions in migraine days, severity, and medication use compared to the EUC-alone group, with sustained benefits at follow-up. [9]

In 2022, Yao Jie Xie et al. conducted a 12-week study on a modified Yang-style Tai Chi program that significantly reduced migraine frequency and duration in individuals with episodic migraines. The intervention showed sustained benefits, with participants reporting high satisfaction and continued practice post-study. [10]

In 2022, Mohammad Dawood Rahimi et al. conducted a 12-week study comparing the effects of eye movement exercises and diaphragmatic breathing, both combined with jogging, on migraine management. The results demonstrated significant reductions in migraine frequency, duration, and intensity in both intervention groups, highlighting the potential effectiveness of these approaches compared to the control group. [11]

In 2019, Denise E. Chou et al. conducted a study to evaluate the effectiveness of external trigeminal nerve stimulation (e-TNS) using the Cefaly device for acute migraine treatment. The active treatment group showed significantly greater pain relief shortly after treatment, with continued improvements over time compared to the placebo group. More participants in the active group achieved complete pain relief, demonstrating the potential of e-TNS as a well-tolerated and non-invasive option for migraine management. [12]

In 2019, Daisuke Danno et al. conducted a study using the Cefaly device, a neurostimulation tool, for 12 weeks to manage migraines. The study observed a significant reduction in migraine days and attack frequency following 12 weeks of external trigeminal nerve stimulation (e-TNS) therapy. This intervention proved effective in decreasing both the frequency and severity of migraines, highlighting its potential as a beneficial non-pharmacological treatment. [13]

In 2019, David Yarnitsky et al. conducted a study evaluating the effectiveness of remote electrical neuromodulation (REN) for acute migraine management. The intervention lasted for 4–6 weeks and demonstrated significant relief in acute migraine pain and associated symptoms compared to a sham treatment, suggesting REN as a promising non-pharmacological option. [14]

This literature review highlights that recent physiotherapy interventions, including manual therapy, dry needling, aerobic exercise, breathing techniques, Tai Chi, neurostimulation (e-TNS and REN), and chiropractic care, have demonstrated promising outcomes in managing migraines. These interventions consistently led to significant reductions in migraine frequency, severity, and duration, along with improvements in quality of life and reduced medication dependency. The findings emphasize the importance of incorporating physiotherapy into migraine care protocols, offering patients safer and more sustainable treatment options.

5. Conclusion

This review of literature highlights the efficacy of various physiotherapy interventions in managing migraines by reducing their frequency, intensity, and duration while improving the overall quality of life for patients. Techniques such as manual therapy, dry needling, aerobic exercise, breathing exercises, Tai Chi, and neurostimulation have shown promising results, often decreasing the need for medication. These non-pharmacological approaches not only offer a safer alternative for migraine management but also empower patients to take an active role in their care. Integrating physiotherapy into migraine treatment protocols can enhance patient outcomes, providing a more holistic and sustainable approach to migraine management.

Limitations and recommendations

This review acknowledges certain limitations, including small sample sizes, short follow-up durations, and methodological inconsistencies across studies, which may affect the generalizability of findings. Additionally, the absence of standardized treatment protocols and outcome measures complicates direct comparisons between interventions. To address these limitations, future research should focus on conducting large-scale, randomized controlled trials with standardized protocols and extended follow-up periods. Further exploration of combined physiotherapy approaches and patient-specific responses is recommended to enhance the effectiveness and personalization of migraine management strategies.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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