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Original Article

Integrating Neck Massage and Progressive Muscle Relaxation: A Comprehensive Approach for Reducing Migraine Disability and Enhancing Quality of Life

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Abstract

Background : Migraine is a highly disruptive and common neurological disorder characterized by intense headache and transient somatosensory and motor disturbances that affects approximately 1 billion people worldwide with many common causative factors and often results in disability and reduced quality of life. This study aims to determine the effect of combined neck massage and progressive muscle relaxation therapy on disability and quality of life of migraine sufferers.
Methods : This quasi-experimental study used a pre-test-post-test control group design over eight weeks (May to July 2024), selecting 50 participants aged 18–60 years with migraines for over three months based on ICHD-3 criteria. The study utilized the Migraine Disability Assessment Questionnaire and the Migraine-Specific Quality of Life Questionnaire as instruments.
Results : The combination therapy of neck massage and progressive muscle relaxation both has a significant effect on reducing the severity, frequency, and duration of migraine attacks, as well as improving migraine-related disability (p =0.000) and quality of life (p-*value* = 0.001).
Conclusion : Combination therapy of neck massage and progressive muscle relaxation is effective in reducing migraine disability and improving the quality of life of migraine sufferers.

Keywords : Headache, Migraine, Neck Massage, Quality of Life

INTRODUCTION

Migraine is a highly disruptive and prevalent neurological condition that affects roughly 1 billion individuals globally,[1] with multiple common causative factors and often resulting in disability.[2] Migraine is characterized by repeated bouts of moderate to severe pulsating headache, which can occur on one or both sides of the head. These headaches are aggravated by regular physical activity and can last between 4 to 72 hours.[3] Pathophysiologically, migraine is a neurovascular disorder influenced by genes ,[4] and various genetic and environmental factors.[4-6] Migraine has clinical manifestations, namely severe headache and temporary somatosensory and motor disorders.[7] Additional migraine symptoms include a headache that can persist for 4 to 72 hours, vertigo, and a heightened sensitivity to external stimuli, including light and sound (photophobia and phonophobia).[8] Various aspects of life, including physical and mental health, social relationships, work, and financial conditions, can be affected and lead to a decline in quality of life when a person experiences disruptions due to migraine symptoms.[9]

According to the 2019 Global Burden of Disease (GBD) survey, headache problems were the second leading cause of years lived with disability (YLD), following back pain, with migraines contributing 88.2% of the total cases.[10] Migraine conditions can occur episodically or chronically, and are sometimes accompanied by or without aura.[5] Compared to the general population, people with a family history of migraines have a 1.9-fold increased chance of experiencing migraines.[11] Migraine affects at least 11% of men and 19% of women worldwide. Although this condition is not fatal, for individuals aged less than 50 years, frequent attacks with great intensity rank third in cause of handicap.[12] Migraine with aura, a type of migraine, can also be influenced by genes.[13] Monozygotic twins have a 34% chance, while dizygotic twins have a 12% chance.[14]

Based on how long they correlate with the headache, migraine episodes can be separated into four phases: the premonitory phase (before the headache), the aura phase (just before or accompanying the headache), the headache period, and the postdrome phase.[15] The phases of a migraine episode might overlap and vary, but this explanation is useful. During an attack, some migraine symptoms (sensory sensitivity and neck pain) may be present, while others (aura) may come and go. The various stages of a migraine episode allow the individual to describe and distinguish between the physiological changes that occur at the start of the attack, the changes that produce the headache, and the changes that occur during recovery.[16] During a migraine attack, the premonitory phase typically includes symptoms like yawning, frequent urination, mood swings, irritability, light sensitivity, neck pain, and trouble concentrating.[17]

Research into the possible mechanisms underlying migraine shows agreement that activation of the trigeminovascular system plays an important role,[18] often caused by circulating pro-inflammatory chemicals and oxidative conditions.[19] Although efforts continue to find safe and effective prevention and treatment strategies, currently available therapies, including non-pharmacological approaches,[20] only provide partial relief, so migraine management remains a challenge.[21] In a holistic approach to migraine management, physical therapy interventions are an important aspect. Physical therapy can improve the general health and quality of life for those who are coping with this complicated neurological condition in addition to helping to alleviate symptoms.[22] For a tailored and effective approach to managing and reducing migraine symptoms, physical therapy can be a helpful adjunct.[23,24] The disability referred to in this study refers to the level of limitation of daily activities caused by migraine attacks, both in the context of work, household tasks, and social activities. Migraine Disability Assessment (MIDAS) Questionnaire instrument to measure the number of missed days, the number of days with significant disruption (≥50% decrease in productivity), Total score reflects the level of disability: the higher the MIDAS score, the greater the disability due to migraine. Quality of life in the context of this study refers to an individual's perception of how much migraine affects their daily functioning and emotional well-being. Measurements were made using the Migraine-Specific Quality of Life Questionnaire (MSQOL), which assesses the impact of migraine in three main domains: Role Restriction (RR), Role Prevention (RP), and Emotional Function (ER).

Massage therapy has emerged as a promising alternative for migraine treatment. Massage has become increasingly popular due to its ability to reduce migraine symptoms and improve overall well-being.[25] Some evidence supports that massage may help migraines, but more in-depth scientific research is needed.[26] Research on the effectiveness of massage therapy in treating migraines could yield important information, evidence-based practice, and a deeper comprehension of supplementary migraine treatment modalities.[27] Progressive muscle relaxation (PMR), a muscle tension reduction technique[28] that aims to achieve deep relaxation and relieve anxiety and tension,[28,29] has grade-A evidence as an effective relaxation method for managing migraines.[30] Recent research shows that a multidisciplinary integrative approach to managing migraines, which includes medication therapy, and relaxation, is the most successful technique for lowering headache frequency and severity, enhancing patients' quality of life, and maximizing the efficacy of pharmaceutical treatment.[31,32] Despite the data supporting progressive muscle relaxation and neck massage to treat migraines, additional studies and

targeted analyses are still necessary to assess the impact on patients' quality of life and disability.[33] This study aims to examine the integrating effect of progressive muscle relaxation and neck massage therapy on migraine-related disability and the quality of life of migraine sufferers in the Surabaya area, using a pre-test-post-test treatment with an intervention group.

METHODS

Study Design

Design of this study is quasy-experimental, pre-post test with control group.The duration of the study is 8 weeks, from May to July 2024. Participants were selected through consecutive sampling, where individuals or groups were chosen based on specific criteria aligned with the research objectives, following the ICHD-3 guidelines and modified for inclusion and exclusion criteria. Migraine Disability Assessment (MIDAS) Questionnaire instrument to measure the number of missed days, the number of days with significant disruption (≥50% decrease in productivity), Total score reflects the level of disability: the higher the MIDAS score, the greater the disability due to migraine. Quality of life in the context of this study refers to an individual's perception of how much migraine affects their daily functioning and emotional well-being. Measurements were made using the Migraine-Specific Quality of Life Questionnaire (MSQOL), which assesses the impact of migraine in three main domains: Role Restriction (RR), Role Prevention (RP), and Emotional Function (ER).

Participants

A sample of 50 person who is in the Surabaya City area. Inclusion criteria: participants who have experienced migraines for over 3 months, aged between 18 and 60 years. The exclusion criteria include participants who are currently experiencing or recovering from neck or spinal disorders, have a diagnosis of psychological disorders, or have chronic illnesses. All participants had given their consent for the study research.

Intervention

The intervention group was given a protocol of neck massage therapy combined with progressive muscle relaxation tailored to alleviate migraines. The massage was performed by several certified nurses acting as complementary therapy professionals. To ensure the ability of the massage therapists was the same, all nurses involved had undergone the same intensive training and followed a standardized therapy protocol. In addition, regular monitoring and evaluation were carried out to ensure the consistency and quality of the therapy provided to the study participants. The pre-test phase includes the initial condition where participants have not yet received any intervention. The control group receives only standard care, and all participants undergo an initial assessment before starting the intervention. The implementation of the intervention includes the subject sitting and leaning against the chair's backrest in a relaxed position with their arms hanging at their sides. The backrest extends up to the upper chest. The therapist then stands behind the chair with their hands on the patient's shoulders. A maximum of 5 minutes is needed to complete the neck massage session.[34] Then it continues with progressive muscle relaxation therapy. The guidelines for progressive muscle relaxation, as well as the relaxation exercise steps for headache sufferers, are taken from the London Headache Centre.[28] The participants perform this exercise three times a week and record their progress. For the first four weeks, training sessions consist of weekly group meetings. The video program is used to demonstrate neck massage techniques and progressive muscle relaxation. During the registration session, participants received 20 minutes of therapy (5 minutes of neck massage and 15 minutes of progressive muscle relaxation). They were then told to follow the researchers' instructions for eight weeks to complete the exercises, with the goal of completing at least 60 sessions and recording their headache data every day. Instructional fliers, weekly phone calls, and a WhatsApp group that tracks the amount of time left to study between classes and the final assessment are all used to maximize compliance with the intervention group. The post-test phase occurs after participants have completed the intervention, which includes neck massage and progressive muscle relaxation therapy over eight weeks. The final assessment is conducted to evaluate changes in migraine-related disability and quality of life, using recorded headache data and compliance tracking.

Outcome Measures

Dissability Assesment

A quick self-assessment tool called the Migraine Disability Assessment (MIDAS) Questionnaire is used to gauge patients' headache-related disability over three months. Five questions covering three activity domains make up the MIDAS score: While questions 2 and 4 measure the number of extra days with significant activity limitations (defined as a productivity decrease of at least 50%) in the domains of paid work and household tasks, questions 1, 3, and 5 measure the number of days missed because of headaches at school or paid work, household tasks, as well as family, social, or recreational activities. The total of the responses to questions 1 through 5 is the MIDAS score. Healthcare professionals can obtain additional clinical information about the

frequency of headaches and the average level of pain during the previous three months by answering two supplementary questions (A and B).

Quality of Life (QoL) Assessment

The impact of migraines on participants' daily lives is evaluated using the Migraine-Specific Quality of Life Questionnaire (MSQOL). The survey was administered at the start of the intervention, at the conclusion of the intervention, and at the follow-up assessment. The 14 items on this particular migraine tool are intended to gauge the influence and/or restrictions that migraines have on day-to-day functioning. The questionnaire includes three domains: Role Restriction (RR) with 7 items that evaluate how migraines limit social and daily work activities; Role Prevention (RP) with 4 items that assess how migraines prevent the execution of activities; and Emotional Role (ER) with 3 items that evaluate the emotional impact of migraines. The total raw score is calculated and rescaled from 0 to 100, with higher scores indicating a better Quality of Life.

Data Collection

Baseline quality of life (QoL), medical history, migraine disability scores, and basic demographic data were gathered. Participants in the study learn how to keep a headache journal. Data on headache features, including how often and how long the attacks occur, what triggers them, the accompanying symptoms, the number of days affected by migraines, and the severity of the attacks, are gathered. After the three-month intervention period, a follow-up evaluation is carried out. This research was conducted after obtaining ethical approval from the STIKES Adi Husada Research Ethics Committee through Ethical Clearance letter No. 481.2/Ket/PPM/STIKES-AH/VIII/2024.

Statistical Analysis

Basic qualities are summarized using descriptive statistics. The Wilcoxon test, the proper statistical test, was used to examine the variations in pain intensity and QoL scores both within and between groups. A statistically significant *p-value* is one that is less than 0.05.

RESULTS

Features of the Demographics

Participants were split equally between The study included an experimental group (n=25) and a control group (n=25).

Migraine Disability

The participants in both the massage and control groups initially provided their MIDAS scores. Figure 1 and Table 2 illustrate the significant impact of the combined therapy of neck massage and progressive muscle relaxation regarding migraine-related disability (MIDAS Score), which is divided into five categories: (05) Little or No Disability, (610) Mild Disability, (1120) Moderate Disability, and (more than 21) Severe Disability. Figure 2 shows a decreased frequency of headaches before and after the intervention study. Figure 3 illustrates a reduction in pain intensity experienced before and after the research (Intervention).

Based on the normality test, the data was not normally distributed, so the next statistical test used the Wilcoxon Signed Rank Test. Initial assessment of the treatment group for migraine disability status showed a mean score of 2.36 ± 0.67, demonstrating the early influence of migraines on participants' overall disability status. An exceptional decline in migraine-related disability status was observed following the intervention; the average score increased to 3.84 ± 0.82, indicating a decreasing disability status. The findings of the Wilcoxon test analysis in the intervention group, as shown in Table 2, show that the combined therapy of progressive muscle relaxation and neck massage is beneficial in reducing migraine-related impairment (MIDAS score). In contrast, in the control group, participants started with an average disability score due to initial migraines of 2.52 ± 0.62, and experienced a non-significant decrease in migraine-related disability to 2.51 ± 0.58.

Quality of life

Based on the normality test, the data was not normally distributed, so the next statistical test used the Wilcoxon Signed Rank Test. The intervention group's initial quality

TABLE 1
Comparison of clinical and sociodemographic information

Sociodemographic information*	Intervention Group (n=25)	%	Control Group (n=25)	%
Gender				
Male	5	20	5	20
Female	20	80	20	80

TABLE 1. Continued.

Sociodemographic information*	Intervention Group (n=25)	%	Control Group (n=25)	%
Age (years)				
17–25	5	20	5	20
26–35	15	60	14	56
36–45	5	20	6	24
Marital Status				
Single	11	44	13	52
Married	14	56	12	48
Education				
Illiterate	0	0	0	0
Primary	0	0	0	0
Secondary	3	12	4	16
Intermediate	10	40	9	36
University	12	48	12	48
Occupation				
Student	1	4	1	4
Manual Work	5	20	6	24
Semi Professional/Professional	16	64	11	44
Housewife	3	12	7	28
Migraine headache Onset (years)*	0	0	0	0
Current Smoking				
Yes	3	12	4	16
No	22	88	21	84
Type of Migraine				
Low Frequent Episodic Migraine (LFEM)	14	26	16	64
High Frequency Episodic Migraine (HFEM)	11	44	9	36
Chronic Migraine (CM)	0	0	0	0
Presence of Aura				
With Aura	9	36	10	40
Without Aura	16	64	15	60

of life (QoL) examination revealed an average score of 34.6 ± 6.2, demonstrating the early effect of migraines on the patients' overall QoL. Following the intervention, the average QoL score increased to 72.1 ± 7.6, indicating an exceptional improvement. The Wilcoxon Test results showed a statistically significant rise from baseline to post-intervention (p<0.001). On the other hand, participants in the control group began with an average initial quality of life score of 36.2 ± 5.6. QoL improved slightly after the intervention, reaching 37.1 ± 5.2, suggesting some improvement, but this difference was not very noticeable. Nevertheless, Table 3 shows that this change in the control group is not statistically significant.

DISCUSSION

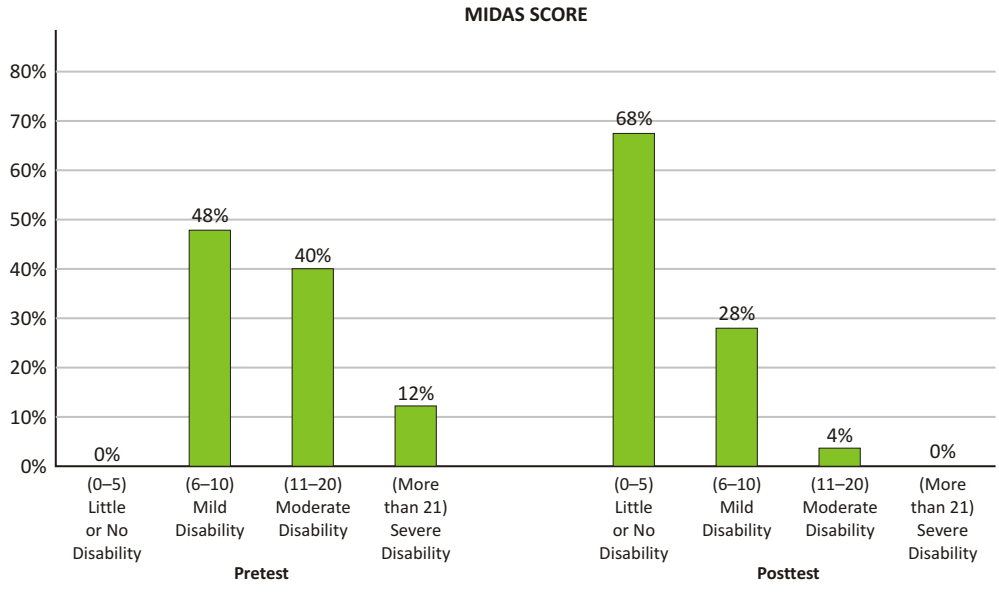

Figure 1. MIDAS Score score before and after the study performed (Intervention).

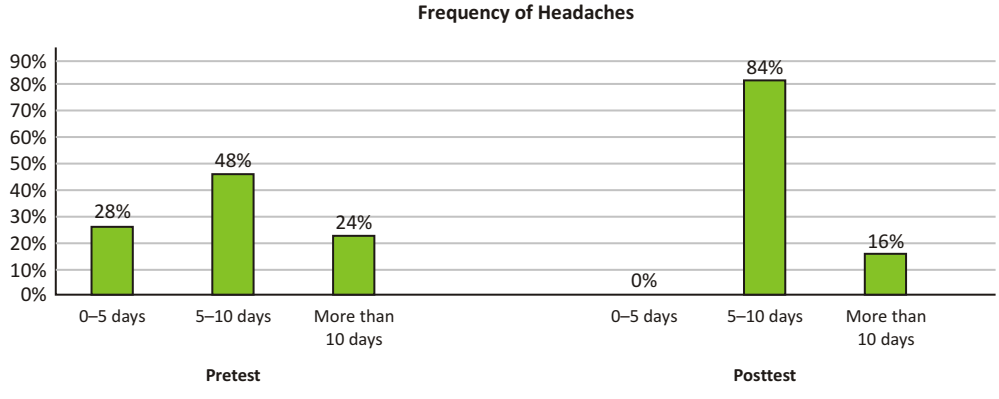

Figure 2. Frequency of headaches before and after the study performed (Intervention).

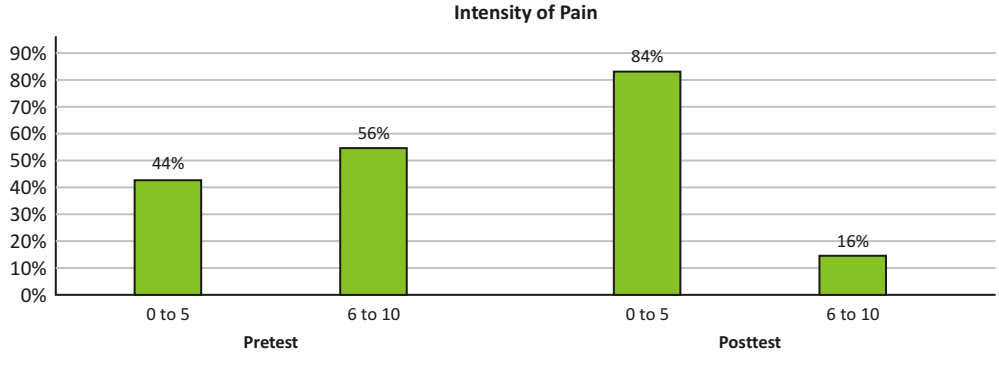

Figure 3. Intensity of pain experienced before and after study performed (Intervention)

The intervention program significantly decreased the severity, frequency, and duration of migraine episodes and enhanced the participants' overall quality of life. The majority of participants of this study are women. This result is consistent with a study conducted in India by Mehta and colleagues, in which a larger proportion of women than males participated in order to examine the impact of additional physical therapy on traditional pharmaceutical treatment for migraine sufferers. There

TABLE 2
Results of Migraine Disability (MIDAS Score)

Sociodemographic information*	Intervention Group (n=25)		Control group (n=25)	
	Pre-test	Post-test	Pre-test	Post-test
Mean	2.64	1.36	2.52	2.95
Standar Deviation	0.70	0.56	0.71	0.57
Normality (sig)	0.000	0.000	0.000	0.000
Homogenity (sig)	0.137		0.021	

TABLE 3
Wilcoxon Signed Rank Test Migraine Disability (MIDAS Score)

Sociodemographic information*	Intervention Group (n=25)		Control group (n=25)	
	Pre-test	Post-test	Pre-test	Post-test
Mean	2.36	3.84	2.52	2.51
Standar Deviation	0.67	0.82	0.60	0.58
P Value	0.000			

Description: *Significant (p <0.05); Wilcoxon Signed Rank Test

are two main forms of migraine, according to the International Headache Society: migraine without aura, which accounts for about 70% of attacks, and migraine with aura, which accounts for around 30% of incidents. This is consistent with the majority of patients in the current study experiencing migraine without aura.[35]

Common symptoms of migraines include neck pain. This symptom may lead to a number of migraine-related difficulties and can start in the premonitory period and last into the postdrome phase.[36] Neck massage therapy has been well studied as a prophylactic measure against migraines. Similarly, progressive muscle relaxation therapy has shown substantial effects on reducing migraines, with a notable decline in migraine occurrences.[37] Migraines are often associated with muscle tension around the neck and shoulders. Neck massage helps relieve this tension by manipulating the muscle tissue and reducing muscle spasms, which can alleviate pain and migraine symptoms. Neck massage can stimulate the parasympathetic nerves, which are responsible for the body's relaxation response. Activating this nervous system can help reduce stress and anxiety, which are often triggers for migraines. In addition, neck massage helps improve blood flow to the muscles around the neck and head. This increase in circulation can help reduce muscle tension and improve tissue oxygenation, which in turn can decrease the intensity and frequency of migraines.[38]

In progressive muscle relaxation therapy, it involves the gradual contraction and relaxation of various muscle groups.[28] The majority of participants in this study experienced significant functional disability due to their frequent episodic migraines. This disability was reflected in the disruption of daily activities, decreased quality of life, limitations in social interactions, and emotional impacts such as stress and fatigue. The most common complaints were neck pain and muscle tension, which contributed significantly to the level of disability. The developed therapy program, namely neck massage therapy and progressive muscle relaxation, directly addressed these main sources of complaints. Neck massage focused on relieving muscle tension and increasing circulation in areas that are often the focus of pain, while progressive muscle relaxation helped reduce stress and improve the body's response to chronic pain. Thus, both therapies were not only symptomatic, but also aimed to reduce the overall level of disability, so that participants could experience improvements in function, emotional well-being, and overall quality of life.

This technique can help reduce stress and anxiety by promoting a deep sense of relaxation,[39] which can prevent or lessen migraine attacks. PMR helps individuals increase their awareness of muscle tension in their bodies by focusing on muscle contraction and relaxation.[29] This awareness enables them to identify and address tension that can trigger migraines more quickly. Because PMR causes the sympathetic nervous system to become less active and the parasympathetic nervous

TABLE 4
Results of Quality of Life Assessment

Sociodemographic information*	Intervention Group (n=25)		Control group (n=25)	
	Pre-test	Post-test	Pre-test	Post-test
Mean	1.88	1.00	1.52	1.48
Standar Deviation	0.33	0.00	0.50	0.50
Normality (sig)	0.000	0.000	0.000	0.000
Homogenity (sig)	0.000		1.000	

TABLE 5
Wilcoxon Signed Rank Test Quality of Life Assessment

	Intervention Group (n=25)		Control group (n=25)	
	Pre-test	Post-test	Pre-test	Post-test
Mean	34.6	72.1	3.61	37.1
Standar Deviation	6.2	7.6	5.6	5.2
P Value	0.001			

Description: *Significant (p <0.05); Wilcoxon Signed Rank Test

system to become more active, which is linked to the stress response, it can help regulate the autonomic nervous system. Migraines may become less frequent and less severe as a result. Migraines can have a detrimental influence on social and professional lives, but they can also significantly increase emotional well-being when symptoms are reduced.[33]

The study's findings are consistent with randomized clinical trials that offer solid clinical proof that activities for the neck muscles, manual therapy, and pain neuroscience instruction can be used in conjunction as a non-pharmacological migraine treatment.[40] In addition, other research explains that a combination therapy program of neck massage and progressive muscle relaxation has a significant effect on reducing the severity, frequency, and duration of migraine attacks, enhancing patients' quality of life and migraine-related impairment.[24] The intervention program significantly reduces the intensity, frequency, and duration of migraine attacks, while also improving the quality of life for patients.[24] Along with lessening the negative effects of stress on the body and mind, progressive muscle relaxation improves circulation and cranio-cervical musculoskeletal function, as well as decreasing the frequency, intensity, and duration of pain.[23] According to the terms of time interaction and significant intervention for migraine attacks and days with migraines, migraine patients who receive regular relaxation treatment have a lower frequency of migraines compared to individuals who do not receive relaxation treatment. The findings of this study are consistent with previous research, indicating that an integrated education and relaxation program significantly reduces the frequency of migraine attacks in the intervention group compared to the control group. Moreover, participants receiving the intervention reported a significantly lower number of migraine days per month and shorter attack durations than those in the control group.[41] The integration of neck massage and progressive muscle relaxation offers a promising non-pharmacological strategy to reduce migraine-related disability and improve patients' quality of life. These findings underscore the relevance of holistic, patient-centered approaches in chronic pain management and support the implementation of such interventions as complementary therapies in clinical physiotherapy practice. Healthcare providers are encouraged to incorporate these techniques into individualized care plans, while future research with larger samples and extended follow-up is needed to confirm their long-term effectiveness and facilitate standardized clinical application.

CONCLUSION

Adult migraine sufferers' quality of life can be enhanced and migraine impairment can be decreased by combining progressive muscle relaxation with neck massage therapy.

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