ISSN: 2347-6567

International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

IJAMSCR |Vol. 14 | Issue 4| Oct - Dec 2026

www.ijamscr.com

DOI : https://doi.org/10.61096/ijamscr.v14.iss4.2026.1701-1710

Effectiveness of Myofascial Trigger Point Release Combined with Progressive Muscle Relaxation on Pain and Stress in Individuals with Tension-Type Headache

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Published on: 21-10-2026
Published by: Futuristic Publications
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Abstract:

Background: Tension-type headache (TTH) is the most prevalent primary headache disorder and is commonly associated with pericranial muscle tenderness, myofascial trigger points (MTrPs), and psychological stress. The interaction between musculoskeletal dysfunction and psychological stress may contribute to the persistence and severity of headache symptoms. Physiotherapy interventions addressing both components may therefore provide beneficial clinical outcomes. [1–4]

Objective: To evaluate the effect of myofascial trigger point (MTrP) release combined with progressive muscle relaxation (PMR) on pain and stress in individuals with TTH.

Methods: A pre-experimental one-group pre-test–post-test study was conducted among 30 participants with TTH. Participants received MTrP release and PMR twice weekly for six weeks. Pain and stress were assessed before and after intervention using the Visual Analogue Scale (VAS) and stress subscale of the Depression Anxiety Stress Scale-21 (DASS-21), respectively. Data were analysed using a paired t-test, with significance set at $p < 0.05$.

Results: Mean VAS score decreased from 7.70 ± 0.88 to 2.20 ± 0.76, showing a reduction in pain intensity ($t(29) = 34.98$, $p < 0.001$). Mean DASS-21 stress score decreased from 29.66 ± 6.28 to 17.00 ± 3.35 ($t(29) = 14.27$, $p <$

0.001), indicating reduced stress.

Conclusion: The combination of MTrP release and PMR was associated with significant reductions in pain intensity and stress scores in individuals with TTH.

Keywords: Tension-type headache, Myofascial trigger point release, Progressive muscle relaxation, VAS, DASS-21, Pain, Stress.

INTRODUCTION

Tension-type headache (TTH) is the most prevalent primary headache disorder and is a leading cause of disability worldwide. It is characterized by bilateral, non-pulsating pain with a pressing or tightening quality and is frequently associated with pericrania muscle tenderness and psychological stress. The condition can significantly impair daily activities, work productivity, and quality of life. [1–3] The pathophysiology of TTH is multifactorial and involves peripheral myofascial dysfunction, central sensitization, and altered pain modulation. Active myofascial trigger points (MTrPs) in the suboccipital, upper trapezius, sternocleidomastoid, temporalis, and masseter muscles may contribute to pain through referred pain patterns and increased muscle tenderness. Persistent psychological stress may further increase muscle tension and contribute to the sensitization of pain pathways, thereby increasing headache frequency and severity. [4–7]

MTrP release is a commonly used manual therapy technique that may decrease muscle tension, improve local circulation, and reduce nociceptive input from hyperirritable trigger points. Progressive muscle relaxation (PMR) complements this approach by promoting physical relaxation and reducing stress-related muscle activation. Previous studies have reported beneficial effects of these interventions on pain and related outcomes in individuals with TTH and other musculoskeletal conditions. [8–11] Despite growing evidence supporting MTrP release and PMR as individual interventions, evidence regarding their combined effectiveness in individuals with TTH remains limited. Therefore, the present study aimed to investigate the effectiveness of MTrP release combined with PMR in reducing pain and stress among individuals with TTH.

Aim of the study

To evaluate the effectiveness of myofascial trigger point release combined with progressive muscle relaxation in reducing pain and stress in individuals with tension-type headache.

Objectives of the study

To assess pain intensity using the Visual Analogue Scale (VAS) before and after the intervention among individuals with tension-type headache.

To assess stress levels using the stress subscale of the Depression Anxiety Stress Scale-21 (DASS-21) before and after the intervention among individuals with tension-type headache.

To determine the effectiveness of myofascial trigger point release combined with progressive muscle relaxation in reducing pain and stress among individuals with tension-type headache.

Methods and methodology

The study was approved by the institute ethics committee, IEC- RIPT/DT/21/4509.

Study design and participants

A pre-experimental one-group pre-test–post-test study was conducted at Revathi Medical Center, Tirupur, India, over a period of six months. Thirty participants diagnosed with tension-type headache were recruited using convenience sampling. Written informed consent was obtained from all participants before enrolment.

Inclusion and exclusion criteria

Inclusion criteria: Individuals were aged 18–30 years, had a clinical diagnosis of tension-type headache by neurologist, participants diagnosed with tension-type headache according to the International Classification of Headache Disorders, 3rd edition (ICHD-3) criteria were recruited, had experienced tension-type headache for at least 3 months, experienced headache on at least 2 days per week during the previous 1 month, reported bilateral headache, demonstrated increased pericranial or cervical muscle tenderness on manual palpation**.** Exclusion criteria: Individuals with migraine, secondary headache disorders, neurological or cardiovascular disorders, cervical pathologies, mental illness, or those receiving analgesics or steroids during the intervention period were excluded.

Intervention

Participants underwent MTrP release targeting the suboccipital, upper trapezius, sternocleidomastoid, levator scapulae, temporalis, and masseter muscles. Sustained manual pressure was applied for 20–60 seconds and repeated five times for each trigger point. This was followed by progressive muscle relaxation using a standardized sequence of muscle contraction and relaxation exercises. Each treatment session lasted approximately 30 minutes and was delivered twice weekly for six weeks.

Outcome measures

Visual analog scale (VAS):

The VAS was used to assess the intensity of headache pain before and after the intervention.

Depression Anxiety Stress Scale-21 (DASS-21):

DASS-21 was used to assess psychological symptoms, with the stress subscale used as a outcome measure for stress, before and after the intervention.

Statistical analysis

Data were analysed using SPSS version 24. The Shapiro–Wilk test was used to assess the normality of the data. As the data were normally distributed, pre-intervention and post – intervention scores were compared using the paired t-test. Statistical significance was set at $p<0.05$ with a 95% confidence interval.

Demographic variables

The study included 30 participants aged 18-30years, comprising both males and females diagnosed with TTH. Age and sex were recorded as baseline demographic characteristics before intervention.

VARIABLE	CATEGORY	FREQUENCY (n)	PERCENTAGE (%)
Age	20–22 years	11	36.7%
Age	23–25 years	18	60.0%
Age	26–27 years	1	3.3%
Gender	Female	20	66.7%
Gender	Male	10	33.3%

RESULTS

Participant characteristics

A total of 30 participants completed the study. The participants included both male and female individuals diagnosed with tension-type headache. All participants completed the intervention protocol and were included in the final statistical analysis. No dropouts or adverse events were reported during the study period.

Effect of the intervention on pain

Pain intensity was assessed using the Visual Analogue Scale (VAS) before and after the intervention. The mean pre-intervention VAS score was 7.70 ± 0.88, which decreased to 2.20 ± 0.76 following intervention. The reduction in pain intensity was statistically significant ($t = 34.98$, $p < 0.001$).

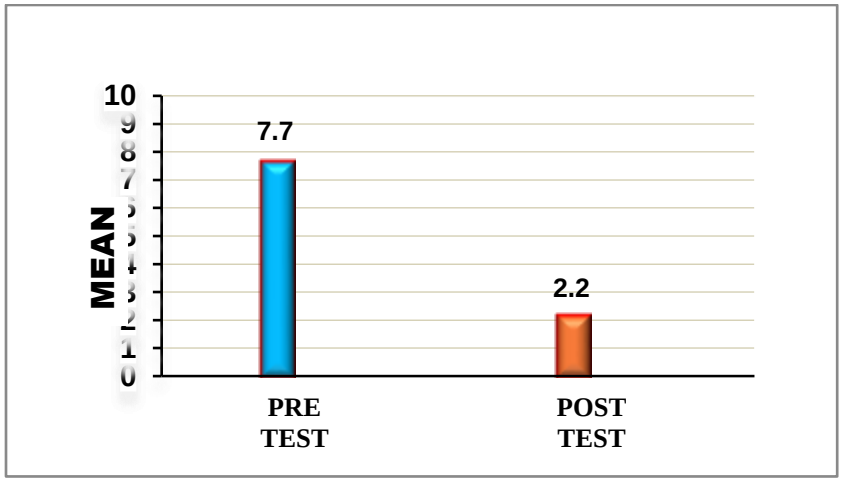
Effect of the intervention on stress

Stress levels were measured using the Depression Anxiety Stress Scale-21 (DASS-21). The mean pre-intervention DASS-21 stress score was 29.66 ± 6.28, whereas the mean post-intervention score decreased to 17.00 ± 3.35. Statistical analysis revealed a highly significant reduction in stress following treatment ($t = 14.27$, $p < 0.001$).

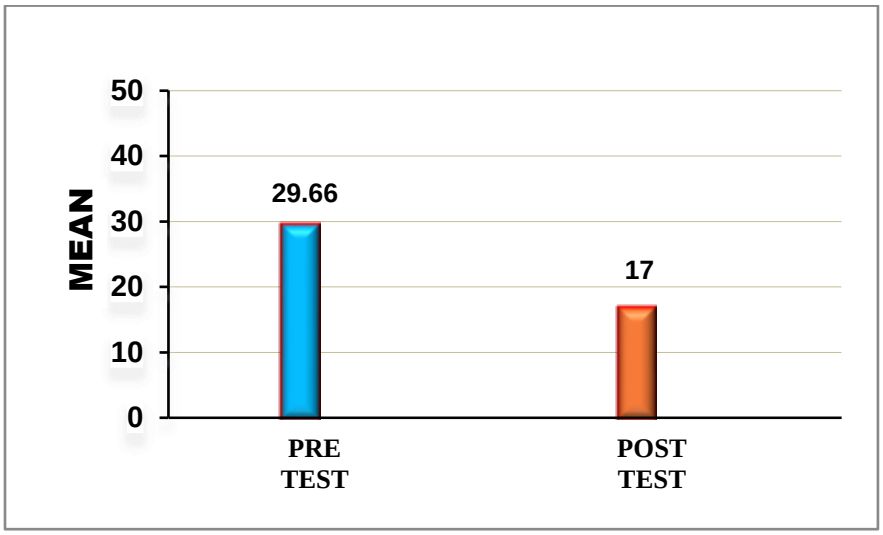
Comparison of VAS and DASS-21 scores

Outcome	Pre-test Mean ± SD	Post-test Mean ± SD	t value	p value
VAS	7.70 ± 0.876	2.20 ± 0.761	34.98	<0.001
DASS-21	29.66 ± 6.28	17.00 ± 3.35	14.27	<0.001

Comparison of VAS score within group between pre test and post test values



Comparison of DASS score within group between pre test and post test values



Overall finding

Both VAS and DASS-21 scores showed statistically significant improvement after the intervention.

Summary of findings

The findings of this study demonstrated that participants experienced significant improvements in both pain and stress following six weeks of myofascial trigger point release combined with progressive muscle relaxation. Pain intensity decreased by approximately 71%, while stress scores decreased by approximately 43% from baseline. These findings support the effectiveness of the combined physiotherapy intervention in the management of tension-type headache. The null hypothesis was rejected, and the alternative hypothesis was accepted, indicating that myofascial trigger point release combined with progressive muscle relaxation produced statistically significant improvements in pain intensity and stress levels among individuals with tension-type headache.

DISCUSSION

The present study evaluated the effectiveness of MTrP release combined with PMR in reducing pain and stress among individuals with TTH. The findings were associated with statistically significant improvements in both VAS and DASS-21 scores following six weeks of intervention, indicating that the combined approach effectively reduced pain intensity and psychological stress. The reduction in VAS scores may be attributed to the effects of MTrP release in decreasing muscle tension, improving local blood circulation, and reducing nociceptive input from active trigger points. These findings are consistent with

previous studies reporting that manual trigger point therapy effectively reduces pain and improves functional outcomes in individuals with TTH and other myofascial pain disorders. [1–3]

A significant reduction in DASS-21 scores suggests that PMR effectively alleviated stress by promoting muscle relaxation and reducing sympathetic nervous system activity. Relaxation-based interventions have been shown to improve emotional well-being, decrease headache frequency, and reduce headache-related disability in individuals with TTH. [4,5] The combined use of MTrP release and PMR may have produced synergistic effects by addressing both the peripheral musculoskeletal component and the psychological factors associated with TTH. This comprehensive approach is likely to contribute to sustained symptom relief and improved quality of life. Therefore, MTrP release combined with PMR may be considered a potentially effective non-pharmacological physiotherapy intervention for reducing pain and stress in individuals with TTH.

CONCLUSION

The findings suggest that myofascial trigger point release combined with progressive muscle relaxation was associated with reductions in pain and stress among individuals with tension-type headache. Following six weeks of treatment, participants showed significant improvements in both VAS and DASS-21 scores, indicating enhanced clinical outcomes. The combined intervention addresses both the musculoskeletal and psychological components of TTH and may represent a potentially useful non-pharmacological physiotherapy approach. However, controlled randomized studies with larger samples and longer follow-up are needed to establish the effectiveness of this combined intervention

Limitations

This study had several limitations. The sample size was relatively small, which may limit the generalizability of the findings. The intervention was conducted at a single centre, and the duration of follow-up was limited to the treatment period; therefore, the long-term effects of MTrP release combined with PMR could not be evaluated. The study used a relatively young sample (20–30 years. In addition, the absence of a control group prevented direct comparison with other treatment approaches.

Recommendations

Future studies should include larger sample sizes and multicentre recruitment to improve the external validity of the findings. Randomized controlled trials with longer follow-up periods are recommended to evaluate the long-term effectiveness of MTrP release combined with PMR. Further research may also compare this combined intervention with other physiotherapy techniques and investigate its effects on headache frequency, quality of life, functional disability, and recurrence of symptoms in individuals with TTH.

Informed consent

Written informed consent was obtained from all participants before enrolment in the study. Participants were informed about the study objectives, procedures, potential benefits, and their right to withdraw from the study at any time without affecting their treatment.

Conflict of interest

The authors declare that there are no conflicts of interest related to this study.

AUTHOR CONTRIBUTIONS

Dharsshana S: Conceptualization, data collection, intervention, data analysis, interpretation of results, and manuscript preparation. **Dr. Santhanalakshmi MPT:** Study supervision, methodology development, critical revision of the manuscript, and final approval. **Dr. P. Bright Alwin Victor MPT, PhD:** Research guidance, manuscript review, administrative supervision, and final approval of the manuscript. **Data availability statement** The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request.

ACKNOWLEDGEMENTS

The authors sincerely thank the management, Principal, faculty members, and staff of Revathi Institute of Physiotherapy, Tirupur, for their guidance and support throughout the study. The authors also express their gratitude to all participants for their valuable cooperation and willingness to participate in this research.

REFERENCES

1. Karakus A, Uzelpasaci E, Akyurek G. The comparative effectiveness of progressive relaxation training on pain characteristics, attack frequency, activity self-efficacy, and pain-related disability in women with episodic tension-type headache and migraine. PLoS One. 2025;20(4). doi:10.1371/journal.pone.0320575.
2. Jensen RH. Tension-type headache—the normal and most prevalent headache. Headache. 2017;57(2):339-345.
3. Corum M, Aydin T, Ceylan CM, Kesiktas FN. The comparative effects of spinal manipulation, myofascial release and exercise in tension-type headache patients with neck pain: a randomized controlled trial. Complement Ther Clin Pract. 2021;44:101319. doi:10.1016/j.ctcp.2021.101319.
4. World Health Organization. Tension-type headache [Internet]. Geneva: World Health Organization.
5. Chowdhury D. Tension type headache. Ann Indian Acad Neurol. 2012;15(Suppl 1).
6. World Health Organization. Stress [Internet]. Geneva: World Health Organization.

7. Leistad RB, Sand T, Stovner LJ. Stress-induced pain and muscle activity in patients with migraine and tension-type headache. Headache. 2006;46(1):10-19.
8. Cathcart S, Winefield AH, Rolan P. Stress and tension-type headache mechanisms. Cephalalgia. 2010;30(10):1250-1267. doi:10.1177/0333102410362997.
9. Grieve R, Barnett S, Coghill N, Cramp F. Myofascial trigger point therapy for triceps surae dysfunction: a case series. Man Ther. 2013;18(6):519-525. doi:10.1016/j.math.2013.04.004.
10. Pathan NM, Thakur S, Kadam K, Lohade S, Chandak N. Immediate effects of positional release therapy and manual trigger point release on neck pain and range of motion in computer users with upper trapezitis. J Family Med Prim Care. 2021;10:2839-2844.
11. Fernández-de-las-Peñas C, Alonso-Blanco C, Cuadrado ML, Gerwin RD, Pareja JA. Myofascial trigger points and their relationship to headache clinical parameters in chronic tension-type headache. Headache. 2006;46(8):1264-1272.
12. McCallie MS, Blum CM, Hood CJ. Progressive muscle relaxation. J Hum Behav Soc Environ. 2006;13(3):51-66.
13. Bendtsen L, Fernández-de-la-Peñas C. The role of muscles in tension-type headache. Curr Pain Headache Rep. 2010;14(6):451-458.
14. Angelopoulou E, Papadopoulos AN, Spantideas N, Bougea A. Migraine, tension-type headache and Parkinson's disease: a systematic review and meta-analysis. Medicina (Kaunas). 2022;58:1684. doi:10.3390/medicina58111684.
15. Burch R. Migraine and tension-type headache: diagnosis and treatment. Med Clin North Am. 2018;102(2):215-233. doi:10.1016/j.mcna.2018.10.003.
16. Jensen RH. Tension-type headache—the normal and most prevalent headache. Headache. 2017;57(6):933-939.
17. Nguyen KT, Hoang HTX, Bui QV, Chan DNS, Choi KC, Chan CWH. Effects of music intervention combined with progressive muscle relaxation on anxiety, depression, stress and quality of life among women with cancer receiving chemotherapy: a pilot randomized controlled trial. PLoS One. 2023;18(11). doi:10.1371/journal.pone.0293060.
18. Khan FM, Pathan MP, Pandian J, Shaikh AI, Ahsan M, Nuhmani S, et al. Effect of slow breathing exercise and progressive muscle relaxation technique in individuals with essential hypertension: a randomized controlled trial. Medicine (Baltimore). 2023;102(47). doi:10.1097/MD.0000000000035792.
19. Gallego-Gómez JI, Balanza S, Leal-Llopis J, García-Méndez JA, Oliva-Pérez J, Doménech-Tortosa J, et al. Effectiveness of music therapy and progressive muscle relaxation in reducing stress before exams and improving academic performance in nursing students: a randomized trial. Nurse Educ Today. 2019;84:104217. doi:10.1016/j.nedt.2019.104217.

20. Ozgundogdu B, Metin ZG. Effects of progressive muscle relaxation combined with music on stress, fatigue, and coping styles among intensive care nurses. Intensive Crit Care Nurs. 2019;52. doi:10.1016/j.iccn.2019.07.007.
21. Devereux F, O'Rourke B, Byrne PJ, Byrne D, Kinsella S. The effects of myofascial trigger point release on the power and force production in the lower limb kinetic chain. J Strength Cond Res. 2018.
22. Moraska AF, Schmiege SJ, Mann JD, Butryn N, Krutsch JP. Responsiveness of myofascial trigger points to single and multiple trigger point release massages—a randomized, placebo-controlled trial. Am J Phys Med Rehabil. 2017;96(9):639-645. doi:10.1097/PHM.0000000000000728.
23. Moraska AF, Stenerson L, Butryn N, Krutsch JP, Schmiege SJ, Mann JD. Myofascial trigger point-focused head and neck massage for recurrent tension-type headache: a randomized, placebo-controlled clinical trial. Clin J Pain. 2015;31(2):159-168. doi:10.1097/AJP.0000000000000091.
24. Svensson E, Lund I. Painful differences between different pain scale assessments: the outcome of assessed pain is a matter of the choices of scale and statistics. Clin Pain Res. 2024. doi:10.1515/sjpain-2023-0113.
25. Jollant F, Voegeli G, Kormannier NC, Cardon J, Richard-Devantoy S, Turcich G, et al. A visual analog scale to measure psychological and physical pain: a preliminary validation of the PPP-VAS in two independent samples of depressed patients. J Psychiatr Res. 2019;113:72-79. doi:10.1016/j.jpsychires.2019.03.010.
26. Thong ISK, Jensen MP, Miró J, Tan G. The validity of pain intensity measures: what do the NRS, VAS, VRS, and FPS-R measure? Scand J Pain. 2018;18(1):99-107. doi:10.1515/sjpain-2018-0012.
27. Dong T, Wang Y, Lin Y. Prevalence and determinants of depression, anxiety, and stress among secondary school students. PLoS One. 2025;20(9). doi:10.1371/journal.pone.0328785.
28. Zhang Z, Lin R, Qiu A, Wu H, Wu S, Zhang L, et al. Application of DASS-21 in Chinese students: invariance testing and network analysis. BMC Public Health. 2024;24:2934. doi:10.1186/s12889-024-20123-6.
29. Osman A, Wong JL, Bagge CL, Freedenthal S, Gutierrez PS, Lozano G. The Depression Anxiety Stress Scales-21 (DASS-21): further examination of dimensions, scale reliability, and correlates. J Clin Psychol. 2012;68(12):1322-1338. doi:10.1002/jclp.21908.