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Exploring The Impact Of Progressive Muscle Relaxation On Physical And Psychological Well-Being: A Focus On Sports Person Applications

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ABSTRACT

Progressive Muscle Relaxation (PMR) is a widely recognized method promoting physical and mental well-being. This study investigates the effects of PMR on athletes. By conducting a systematic review under PRISMA guidelines, this research draws on insights from multiple studies to evaluate the role of PMR in reducing stress, relaxing muscles, enhancing performance, and enhancing recovery. The findings indicate that PMR effectively lowers stress anxiety, reduces muscle stiffness, and improves sleep quality, cognitive abilities, and overall athletic performance. Additionally, PMR has proven helpful in pain management, regulating physiological stress responses, and supporting injury recovery. This study concludes that Progressive Muscle Relaxation (PMR) benefits athletes by reducing stress, anxiety, and muscle tension, while also enhancing performance, recovery, and mental resilience. PMR aids in improving sleep quality, managing stress responses, and facilitating injury recovery and pain management. It is recommended to integrate PMR into training and rehabilitation programs, and future research should focus on exploring personalized approaches.

Keywords: *PMR, Recovery, Rehabilitation, Injury recovery, PRISMA*

1. INTRODUCTION

Progressive muscle relaxation (PMR) is a well-established method to promote relaxation and reduce stress, anxiety, and pain by alternating between tensing and releasing specific muscle groups (Gopichandran et al., 2024). This technique focuses on increasing awareness of physical sensations and has proven beneficial for enhancing overall well-being in diverse populations (Chen et al., 2024). PMR has shown therapeutic potential in addressing various health challenges, such as chronic diseases, mental health conditions, cognitive difficulties, and recovery after surgery (Battaglini et al., 2022). For example, research indicates that PMR can effectively lower anxiety, stress, and discomfort while improving spinal function in patients recovering from lumbar disc herniation surgery. Similarly, it has been found to alleviate physical and emotional symptoms associated with premenstrual syndrome (PMS) (Ovgun & Tuzun, 2023).

Beyond its clinical use, PMR has gained recognition in contexts where physical and mental health intersect (Weschenfelder et al., 2024). In the field of sports, PMR has emerged as a valuable tool. Athletes face distinct physical and psychological challenges, making mental strength essential for their overall health and performance (Mashhadi-Naser et al., 2024). Studies suggest that PMR helps reduce stress, enhance sleep quality, and improve mental health outcomes for diverse groups, including individuals with long-term COVID-19 symptoms (Reisi et al., 2024), children with ADHD (Türkmen Noyan et al., 2024), and people with neurological issues like traumatic brain injuries (Baykal & Bilgic, 2024).

In addition to supporting mental health, PMR has significant benefits for managing chronic physical conditions. It has been shown to relieve pain and improve sleep quality in lung cancer patients undergoing chemotherapy (Turan et al., 2024) and reduce fatigue while stabilizing vital signs in kidney transplant recipients (Yagiz & Isik, 2024). These findings highlight the adaptability of PMR as a non-drug treatment in various health settings. Furthermore, PMR has contributed to better body

image and emotional well-being in women receiving cancer treatment (Arring et al., 2024) and has been more effective in reducing anger than other methods, such as distraction or rumination (Celenay et al., 2024).

This study aims to examine the role of PMR in Sports Person, focusing on its potential to support the overall well-being of the Human Body. By addressing the specific physical and psychological challenges they face, this research highlights the importance of PMR as a supplementary strategy for optimizing training, recovery, and performance. Through an analysis of current evidence, this paper adds to the growing understanding of sports science and healthcare, advocating for inclusive and evidence-based practices in athlete support.

Methodology

This research investigated the impact of Progressive Muscle Relaxation (PMR) on the physical and psychological well-being of sportspersons. A systematic literature review will be conducted to synthesize existing research on the application of PMR in various athletic contexts and its effects on physiological and mental health outcomes. While not pre-registered, the review process will adhere to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure a structured and transparent approach.

Search Strategy:

A comprehensive search was conducted across electronic databases including PubMed/Medline, Web of Science, Scopus, ResearchGate, and Taylor & Francis for broader coverage. Google Scholar will be used for supplementary searching to identify potentially relevant grey literature. The search utilised a combination of keywords:

- Progressive Muscle Relaxation: "Progressive Muscle Relaxation," "PMR," "Muscle Relaxation Techniques"
- Sports: "Sports," "Athletes," "Physical Activity," "Exercise," "Performance," "Competition"
- Physical Well-being: "Physical Health," "Physiological Health," "Muscle Strength," "Recovery," "Fatigue," "Pain," "Injury Prevention"
- Psychological Well-being: "Mental Health," "Psychological Health," "Stress," "Anxiety," "Depression," "Mood," "Sleep Quality," "Self-Confidence," "Focus," "Concentration," "Performance Anxiety"

Study Selection:

The search results were screened in a two-stage process:

- Title and Abstract Screening: Two independent reviewers screened titles and abstracts to identify potentially eligible studies. Discrepancies will be resolved through discussion or consultation with a third reviewer.
- Full-Text Review: Full texts of selected articles were retrieved and assessed against the inclusion and exclusion criteria by two independent reviewers. Disagreements will be resolved as described above.

Inclusion Criteria: Studies included those:

- Focus on the application of PMR interventions.
- Include sportspersons as participants.
- Investigate the impact of PMR on physical or psychological well-being outcomes.
- Are published in English.
- Are peer-reviewed journal articles, conference proceedings, or dissertations.
- Are published between 2020 and 2024 (adjusting the date range slightly for a more comprehensive search).

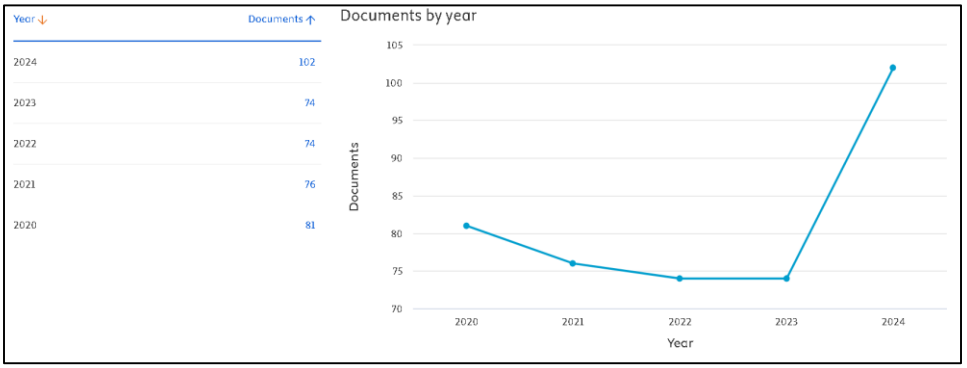


Figure 1: Presenting the papers or articles extracted from the sources

Exclusion Criteria:

Studies excluded if they:

- Are irrelevant to PMR interventions (e.g., studies focusing on other relaxation techniques).
- Do not include sportspersons as participants.
- Do not assess physical or psychological well-being outcomes.
- Are published in languages other than English.
- Are not peer-reviewed (e.g., editorials, letters to the editor without original data, blog posts, personal opinions).
- Use animal models without a clear and direct relevance to human athletic populations.
- Are duplicate publications or have overlapping data?

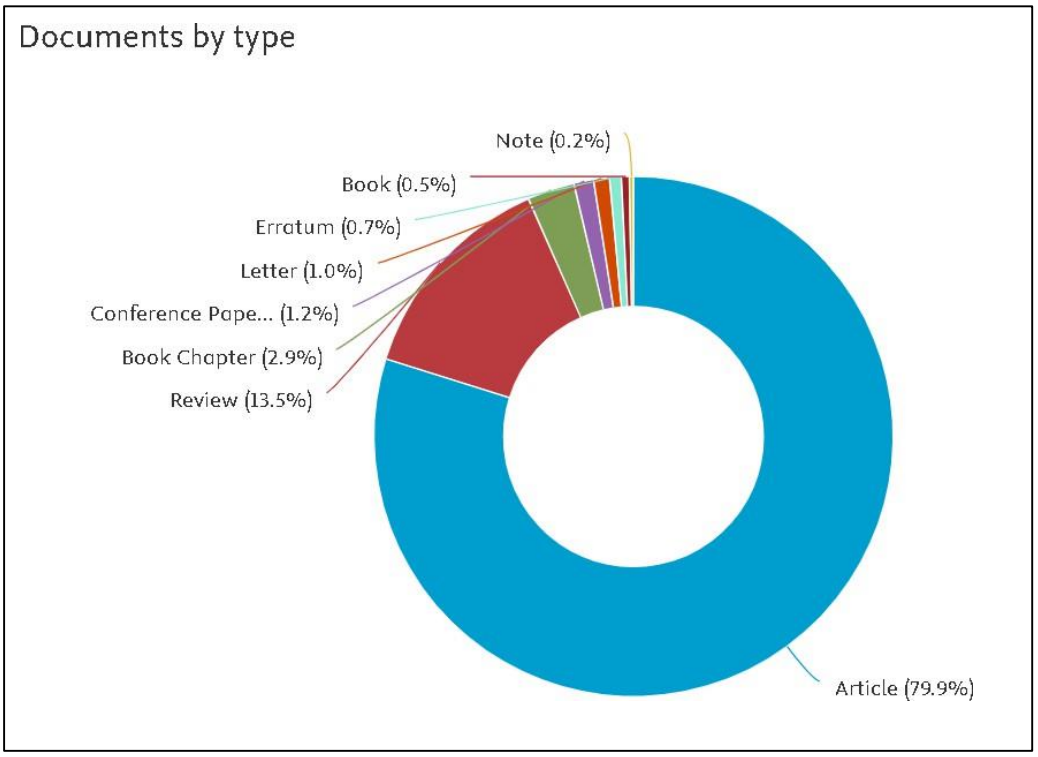


Figure 2: Presenting the types of documents extracted

Data Extraction:

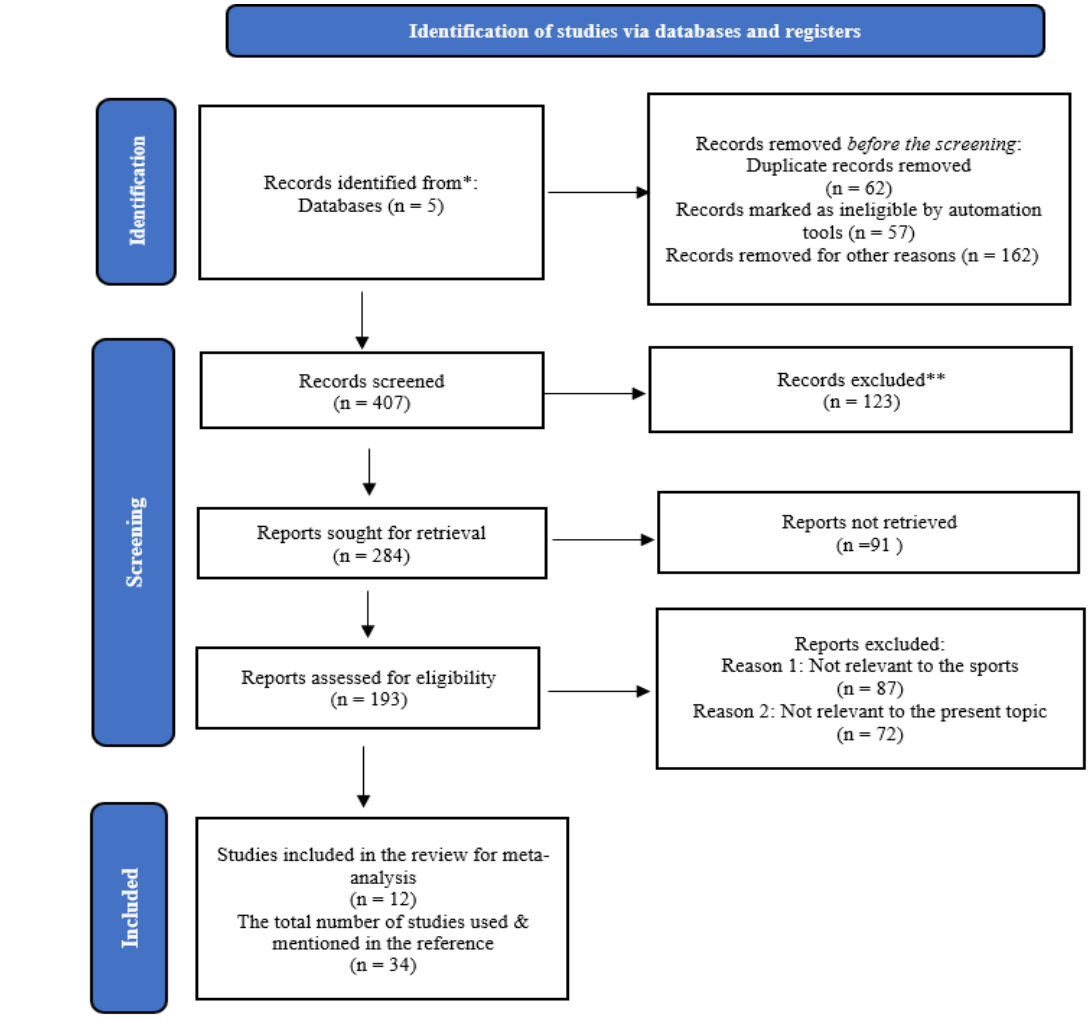
Data was extracted from included studies using a standardized data extraction form. Extracted information included:

- Study characteristics (e.g., author, year, study design, sample size).
- Participant characteristics (e.g., type of sport, competitive level, age, gender).
- Intervention details (e.g., PMR protocol, duration, frequency).
- Outcome measures (e.g., specific physical and psychological measures used).
- Key findings related to the impact of PMR.

Data Synthesis:

A narrative synthesis approach was used to synthesize the findings of the included studies. This involved thematically organizing and analysing the data to provide a comprehensive understanding of the current evidence regarding the effects of PMR on sportspersons' well-being. The synthesis considered the methodological quality of the studies, the consistency of the results across studies, and the potential mechanisms underlying the effects of PMR. The strength of the evidence for different outcomes was assessed.

Figure 3: PRISMA Flow Diagram (A PRISMA flow diagram will be included to visually represent the study selection process.)



2. RESULTS

Research findings indicate increasing support for the effectiveness of progressive muscle relaxation (PMR) in improving both physical and mental health among athletes, including those in sports. Various studies highlight PMR's benefits in lowering stress, anxiety, and muscle tension while also enhancing athletic performance and recovery.

One study involving elite athletes reported a noticeable decrease in stress levels, along with better sleep quality and mood improvement (Aksu & Erenel, 2022). Another study explored the impact of PMR on musicians, a group frequently affected by performance-related stress. The results revealed that incorporating yoga and meditation, including PMR techniques, helped reduce anxiety and emotional distress (Asalioglu & Sözbir 2024).

A systematic review of stress management methods for athletes further emphasized the adaptability of PMR, demonstrating its effectiveness in both solo and team sports at different levels of competition. Additionally, the review highlighted the roles of PMR in promoting physical and mental well-being by improving relaxation, pain management, and the ability to handle the pressures of competitive sports.

Table 1: Meta-analysis of the previously published research on application of PMR

Study	Population	Methodology	Key Findings	Implications for Sports Persons
Abdelkefi &	Female athletes (18-22 years)	8 sessions of 30-	Improved mood and reduced anxiety but	PMR can help manage psychological well-

Jarraya (2024)	during menstruation	min PMR	no significant effect on aggressive behaviour and cognitive variables	being during menstruation, which may aid athletic performance
Thorenz et al. (2023)	Sport science students (n=228)	45-minute PMR sessions, pre-test and post-test evaluations	Significant decrease in arousal and increase in pleasure	Supports PMR as an effective relaxation method in sports training
Krick & Felfe (2024)	Military personnel (n=118 MBI, n=55 PMR, n=156 control)	Comparison of Mindfulness-Based Interventions (MBI) and PMR	Both PMR and MBI reduced strain; MBI had additional benefits for mindfulness and physical complaints	PMR is a viable stress management tool for high-performance environments
(Corbett et al., 2020)	TBI patient with movement disorder	PMR, meditation, and mental practice interventions	Improved tremor, quality of life, and motor function	Potential for PMR in rehabilitation and injury recovery
Pathan et al. (2023)	Patients with essential hypertension (n=64)	PMR combined with slow breathing exercises	Significant reduction in blood pressure, heart rate, and anxiety	Useful for athletes in managing stress-induced hypertension
Di Blasi & Sinn (2024)	Participants undergoing anger management (n=157)	PMR vs. Rational Emotive Behavior Therapy and distraction techniques	PMR significantly reduced anger levels	PMR can be a strategy for managing pre-competition stress
Pardini et al. (2024)	University students (n=72)	PMR with Virtual Reality vs. PMR with guided imagery	Enhanced psychological well-being in VR group	VR-enhanced PMR can be integrated into mental preparation for sports
Nair et al. (2024)	Medical students under stress	2-hour PMR module in competency-based curricula	Increased resilience and stress management	PMR can be integrated into athlete mental training programs
Citil & Canbay (2024)	Women with premenstrual syndrome (n=79)	PMR for 8 weeks	Significant reduction in PMS symptoms	PMR can aid female athletes in managing cycle-related performance fluctuations
Sari et al. (2024)	Cancer patients undergoing chemotherapy (n=69)	PMR twice daily for 8 weeks	Improved sleep quality	PMR can enhance recovery and sleep in athletes
(Wu et al., 2024)	Sleep bruxism patients (n=66)	Comparison of PMR and occlusal splints over 1 year	PMR significantly reduced sleep bruxism episodes and stress levels	PMR could help address stress-related muscle tension in athletes
Luo et al. (2024)	Healthcare practitioners in high-stress environments	PMR intervention for 7 consecutive days	Reduced anxiety and improved sleep quality	PMR is useful for maintaining well-being in high-performance environments like

(n=94)	sports

This analysis reveals that Progressive Muscle Relaxation (PMR) is a helpful method for boosting the overall condition of athletes, including those with disabilities. Studies have consistently shown that PMR effectively diminishes tension, worry, and muscular tightness while promoting recuperation, sleep quality, and athletic capabilities. Growing scientific evidence supports the use of PMR to improve the physical and mental state of athletes across various sports. Numerous investigations demonstrate PMR's capacity to lessen stress, apprehension, and muscular strain, leading to improved performance and quicker recovery. A study with top-tier athletes demonstrated a substantial decrease in stress indicators, alongside enhanced sleep and improved disposition. Another investigation examined PMR's influence on musicians, a group often experiencing stress related to performances. The results indicated that incorporating yoga and mindfulness practices, including PMR, helped lessen anxiety and emotional suffering.

3. DISCUSSION

A review of stress management strategies for athletes further highlighted PMR's versatility, proving its usefulness in both individual and team sports at different competitive levels (Di Blasi & Sinn, 2024). Additionally, the review emphasized PMR's contribution to physical and mental wellness by fostering relaxation, pain management, and the capacity to handle the demands of competitive sports. Regarding psychological well-being, PMR has demonstrated considerable potential in managing psychological pressure, especially in demanding competitive settings (Noyan et al., 2024). Research suggests that athletes using PMR experience significant reductions in stress, anxiety, and emotional upset, leading to improved focus and concentration during competitions. A study involving military personnel, for example, found that PMR successfully lessened psychological burden and improved resilience (Nguyen et al., 2023). Moreover, a study with university students showed that PMR, combined with virtual reality, further enhanced psychological well-being, demonstrating its adaptability for mental training programs.

The psychological advantages of PMR extend to conditions brought on by stress. Research on medical students under considerable academic pressure showed that a structured PMR intervention improved stress management skills, indicating its applicability to athletes who experience performance-related nervousness (Sucu & Çitil 2024). Progressive Muscle Relaxation (PMR) has proven effective in anger management programs, helping to reduce aggressive tendencies, which can be particularly beneficial for athletes in competitive sports (Sharma et al., 2024). In terms of physical health and recovery, PMR plays a crucial role in overall well-being, especially in managing pain, promoting muscle relaxation, and enhancing recovery. Research indicates that PMR can improve motor function and regulate tremors in individuals with neurological conditions, suggesting its potential applications in rehabilitation and injury recovery for athletes (Butt et al., 2022). Research on individuals with hypertension showed that Progressive Muscle Relaxation (PMR), combined with slow breathing exercises, significantly reduced blood pressure and heart rate, highlighting its role in managing physiological stress for athletes.

The role of Progressive Muscle Relaxation (PMR) in enhancing sleep quality is a notable finding. A study involving cancer patients undergoing chemotherapy showed that regular practice of PMR improved their sleep patterns significantly (Nair et al., 2024). Given that sleep is essential for recovery and performance in athletes, integrating PMR into athletes' training routines could help promote better rest and recovery cycles. Moreover, PMR has been found effective in reducing sleep bruxism, a condition linked to stress-induced muscle tension, which is common among athletes dealing with pre-competition stress (Kiliçli & Gül, 2024). Regarding female athletes and hormonal effects, PMR also has implications for female athletes experiencing hormonal fluctuations. Research on women with premenstrual syndrome (PMS) showed that an eight-week PMR intervention significantly reduced PMS symptoms (Krick & Felfe, 2024). Similarly, another study on female athletes found that PMR was beneficial in reducing anxiety and mood disturbances during menstruation, suggesting its utility in managing psychological and physiological fluctuations associated with hormonal cycles.

This analysis highlights the versatility and effectiveness of PMR as a relaxation and recovery tool for athletes. The psychological benefits of PMR, particularly in reducing stress and anxiety, make it a valuable intervention for athletes in high-pressure environments. Its ability to enhance mood and cognitive function further supports its role in mental training programs. The physiological effects of PMR, such as improved muscle relaxation and recovery, highlight its potential in sports rehabilitation and injury prevention. Findings on its ability to reduce blood pressure and heart rate suggest that PMR can be integrated into training regimens to manage physiological stress responses effectively. The impact of PMR on sleep quality is particularly noteworthy. Given the critical role of sleep in athletic recovery, PMR’s effectiveness in enhancing sleep patterns makes it a valuable tool for optimizing performance. Additionally, its role in reducing premenstrual symptoms in female athletes underscores its relevance in addressing gender-specific challenges in sports. Beyond the athletic sphere, PMR’s benefits in high-stress environments, such as military and healthcare settings, indicate its broad applicability. The findings indicate that incorporating Progressive Muscle Relaxation (PMR) into training programs for athletes can boost both physical and mental resilience, leading to improved overall performance and well-being. Additionally, recent research has emphasized the effectiveness of PMR in preventing burnout among elite athletes, suggesting it plays a crucial role in sustaining long-term sports careers.

4. CONCLUSION

This study highlights the significant benefits of Progressive Muscle Relaxation (PMR) for both the physical and psychological well-being of athletes. Research from multiple studies shows that PMR is an effective strategy for reducing stress, anxiety, and muscle tension while simultaneously enhancing athletic performance, aiding recovery, and strengthening overall mental resilience. By promoting relaxation, improving sleep quality, and helping manage physiological stress responses, PMR proves to be a versatile method applicable across various athletic disciplines. The benefits of PMR extend beyond stress reduction to play crucial roles in injury recovery, pain management, and addressing gender-specific issues, such as menstrual-related anxiety in female athletes. Incorporating PMR into training and rehabilitation programs offers a non-pharmacological approach to optimizing performance and extending athletes' careers.

Given the growing empirical support for the effect of PMR, it is strongly recommended that it be integrated into sports psychology and athletic training programs. Future research should focus on developing personalized PMR interventions tailored to the specific needs of individual athletes, ensuring that all athletes, can fully achieve their physical and psychological potential. By weaving PMR into a comprehensive athlete care framework, sports professionals can enhance performance, prevent burnout, and promote overall well-being in the demanding world of competitive sports.

Conflict Statement

The corresponding author confirmed that there were no conflicts of interest among the authors.

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REFERENCES

[1] Arring, N. M., Lafferty, C. K., Clark, P. M., & Barton, D. L. (2024). The experience of women in a phase II trial of hypnosis and progressive muscle relaxation for body image: informing future research questions. JOURNAL OF PSYCHOSOCIAL ONCOLOGY, 42(1), 148–158. https://doi.org/10.1080/07347332.2023.2206406

[2] Abdelkefi, I., & Jarraya, S. (2024). The effectiveness of progressive muscle relaxation techniques in improving affective well-being among female athletes during menstruation: A randomized controlled study. Sport Psychologist. https://doi.org/10.1123/tsp.2024-0038

[3] Asalioglu, C. U., & Sözbir, S. Y. (2024). Effect of online health training/counselling and progressive muscle relaxation exercise on postpartum depression and maternal attachment: A randomized controlled trial. INTERNATIONAL JOURNAL OF GYNECOLOGY & OBSTETRICS, 165(3), 1218–1228. https://doi.org/10.1002/ijgo.15359

[4] Baykal, D., & Bilgic, B. (2024). The effects of progressive muscle relaxation exercise on dementia caregivers. GERIATRIC NURSING, 59, 491–497. https://doi.org/10.1016/j.gerinurse.2024.07.035

[5] Battaglini, M. P., Pessoa, D. M., Calais, S. L., Miyazaki, M., Neiva, C. M., Espada, M. C., de Moraes, M. G., & Verardi, C. E. L. (2022). Analysis of Progressive Muscle Relaxation on Psychophysiological Variables in Basketball Athletes. INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH, 19(24). https://doi.org/10.3390/ijerph192417065

[6] Butt, M. N., Maryum, M., Amjad, I., Khan, O. J., & Awan, L. (2022). Effects of aerobic exercise and progressive muscle relaxation on migraine. JOURNAL OF THE PAKISTAN MEDICAL ASSOCIATION, 72(6), 1153 – 1157. https://doi.org/10.47391/JPMA.0838

[7] Aksu, S. P., & Erenel, A. S. (2022). Effects of health education and progressive muscle relaxation on vasomotor symptoms and insomnia in perimenopausal women: A randomized controlled trial. PATIENT EDUCATION AND COUNSELING, 105(11), 3279–3286. https://doi.org/10.1016/j.pec.2022.07.015

[8] Campbell, A. H., Barta, K., Sawtelle, M., & Walters, A. (2024). Progressive muscle relaxation, meditation, and mental practice-based interventions for the treatment of tremor after traumatic brain injury. Physiotherapy Theory and Practice, 40(10), 2441–2457. https://doi.org/10.1080/09593985.2023.2243504

[9] Celenay, S. T., Ozcelikel, G., & Bayrakli, A. (2024). Efficacy of progressive muscle relaxation technique in primary dysmenorrhea: A randomized controlled trial. TAIWANESE JOURNAL OF OBSTETRICS & GYNECOLOGY, 63(3), 329–335. https://doi.org/10.1016/j.tjog.2023.10.016

[10] Chen, X. X., Chen, G. L., Zhao, Y. H., Chen, Q. Y., Huang, J. L., & Hu, G. Q. (2024). Evaluating the value of progressive muscle relaxation therapy for patients with lumbar disc herniation after surgery based on a difference-in-differences model. BIOTECHNOLOGY AND GENETIC ENGINEERING REVIEWS, 40(4), 3988–3999. https://doi.org/10.1080/02648725.2023.2204709\

[11] Citil, E. T., & Canbay, F. C. (2024). Effect of progressive muscle relaxation exercises on symptoms of premenstrual syndrome: A single-blind randomized controlled trial. Archives of Psychiatric Nursing, 51, 228–234. https://doi.org/10.1016/j.apnu.2024.07.005

[12] Corbett, C., Egan, J., & Pilch, M. (2020). A randomised comparison of two 'Stress Control' programs: Progressive Muscle Relaxation versus Mindfulness Body Scan. Mental Health & Prevention, 15, 200163. https://doi.org/https://doi.org/10.1016/j.mph.2019.200163

[13] Di Blasi, T., & Sinn, L. (2024). The effects of Rational Emotive Behavior Therapy, Progressive Muscle Relaxation, Distraction, and Rumination on state anger using the Autobiographical Essay Memory Task. Journal of Aggression Maltreatment & Trauma. https://doi.org/10.1080/10926771.2024.2388561

[14] Gopichandran, L., Srivastsava, A. K., Vanamail, P., Kanniammal, C., Valli, G., Mahendra, J., & Dhandapani, M. (2024). Effectiveness of Progressive Muscle Relaxation and Deep Breathing Exercise on Pain, Disability, and Sleep Among Patients With Chronic Tension-Type Headache. HOLISTIC NURSING PRACTICE, 38(5), 285–296. https://doi.org/10.1097/HNP.0000000000000460

[15] Kiliçli, A., & Gül, S. (2024). The effect of neurolinguistic programming and progressive muscle relaxation exercises on breastfeeding success and breastfeeding self-efficacy: A randomized controlled trial. EXPLORE-THE JOURNAL OF SCIENCE AND HEALING, 20(5). https://doi.org/10.1016/j.explore.2024.103027

[16] Krick, A., & Felfe, J. (2024). Comparing the effectiveness of a mindfulness-based intervention and progressive muscle relaxation in a military context. Mindfulness, 15(1), 80–99. https://doi.org/10.1007/s12671-023-02281-7

[17] Luo, Y. D., Du, J., Wang, J. Q., Liu, P. C., Shi, Z. L., He, Y., Che, G. Y., Huang, K., & Wang, J. (2024). Progressive muscle relaxation alleviates anxiety and improves sleep quality among healthcare practitioners in a mobile cabin hospital: a pre-post comparative study in China. FRONTIERS IN PSYCHOLOGY, 15. https://doi.org/10.3389/fpsyg.2024.1337318

[18] Mashhadi-Naser, S., Shirvani, S., & Vasli, P. (2024). A randomized controlled trial to evaluate the progressive muscle relaxation technique in hip fracture patients. SCIENTIFIC REPORTS, 14(1). https://doi.org/10.1038/s41598-024-64516-4

[19] Nair, B., Khan, S., Naidoo, N., Jannati, S., Shivani, B., & Banerjee, Y. (2024). Progressive muscle relaxation in pandemic times: Bolstering medical student resilience through IPRMP and Gagne's model. Frontiers in Psychology, 15. https://doi.org/10.3389/fpsyg.2024.1240791

[20] Nguyen, K. T., Hoang, H. T. X., Bui, Q. V, Chan, D. N. S., Choi, K. C., & Chan, C. W. H. (2023). 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, 18(11). https://doi.org/10.1371/journal.pone.0293060

[21] Noyan, G. T., Direk, G. B., & Örengul, A. C. (2024). A randomized controlled trial of effects of sleep hygiene training and progressive muscle relaxation training in children with ADHD. SLEEP MEDICINE, 117, 169–176. https://doi.org/10.1016/j.sleep.2024.03.001

[22] Ovgun, C. D., & Tuzun, E. H. (2023). The effect of progressive muscle relaxation technique and myofascial release technique on premenstrual symptoms, blood circulation, and quality of life in women with premenstrual syndrome: A single-blind randomized controlled study. MEDICINE, 102(27). https://doi.org/10.1097/MD.0000000000034223

[23] Pardini, S., Gabrielli, S., Olivetto, S., Fusina, F., Dianti, M., Forti, S., Lancini, C., & Novara, C. (2024). Personalized virtual reality compared with guided imagery for enhancing the impact of progressive muscle relaxation training: Pilot randomized controlled trial. JMIR Mental Health, 11. https://doi.org/10.2196/48649

[24] Pathan, F. K. M., Pandian, J. S., Shaikh, A. I., Ahsan, M., Nuhmani, S., Iqbal, A., & Alghadir, A. H. (2023). Effect of slow breathing exercise and progressive muscle relaxation technique in the individual with essential hypertension: A randomized controlled trial. Medicine, 102(47). https://doi.org/10.1097/MD.0000000000035792

[25] Reisi, S., Ahmadi, S. M., Foroughi, A., Bahrami, R., & Parvizifard, A. (2024). Transdiagnostic Therapy Compared to Progressive Muscle Relaxation on the Emotional Health of Mothers With Premature Infants: A Randomized Controlled Trial. INTERNATIONAL JOURNAL OF PSYCHIATRY IN MEDICINE, 59(1), 112–130. https://doi.org/10.1177/00912174231177629

[26] Sari, E., Gündogdu, F., & Semerci, R. (2024). The Effect of Progressive Muscle Relaxation Exercises on Sleep Quality in Cancer Patients Undergoing Chemotherapy: A Randomized Controlled Study. SEMINARS IN ONCOLOGY NURSING, 40(2). https://doi.org/10.1016/j.soncn.2024.151620

[27] Sharma, A., Sharma, N., & Chahal, A. (2024). Home care program and exercise prescription for improving quality of life in geriatric population with knee osteoarthritis: A systematic review and meta-analysis. Journal of Bodywork and Movement Therapies, 40, 1645–1656. https://doi.org/https://doi.org/10.1016/j.jbmt.2024.09.003

[28] Sucu, C., & Çitil, E. T. (2024). The effect of progressive muscle relaxation exercises on postmenopausal sleep quality and fatigue: a single-blind randomized controlled study. MENOPAUSE-THE JOURNAL OF THE MENOPAUSE SOCIETY, 31(8), 669–678. https://doi.org/10.1097/GME.0000000000002384

[29] Thorenz, K., Berwinkel, A., & Weigelt, M. (2023). A Validation Study for the German Versions of the Feeling Scale and the Felt Arousal Scale for a Progressive Muscle Relaxation Exercise. BEHAVIORAL SCIENCES, 13(7). https://doi.org/10.3390/bs13070523

[30] Turan, G. B., Özer, Z., & Sariköse, A. (2024). The effects of progressive muscle relaxation exercise applied to lung cancer patients receiving chemotherapy on dyspnea, pain and sleep quality: A randomized controlled trial. EUROPEAN JOURNAL OF ONCOLOGY NURSING, 70. https://doi.org/10.1016/j.ejon.2024.102580

[31] Türkmen Noyan, G., Direk, G. B., & Örengül, A. C. (2024). A randomized controlled trial of effects of sleep hygiene training and progressive muscle relaxation training in children with ADHD. Sleep Medicine, 117, 169–176. https://doi.org/https://doi.org/10.1016/j.sleep.2024.03.001

[32] Weschenfelder, F., Bulgay-Mörschel, M., Lütje, W., & Schleussner, E. (2024). Progressive Muscle Relaxation Training During Pregnancy: Effects on Mental State, Delivery and Labour Pain - a Prospective Study. GEBURTSHILFE UND FRAUENHEILKUNDE. https://doi.org/10.1055/a-2360-4380

[33] Wu, Y. Y., Gao, Y. Y., Wang, J. Q., Zhang, C., Xu, P. J., Liu, J., Yu, R. Z., & Zhang, H. J. (2024). The influence of mindfulness meditation combined with progressive muscle relaxation training on the clinical efficacy and quality of life of patients with sarcopenia receiving haemodialysis: a randomised controlled trial. BMC COMPLEMENTARY MEDICINE AND THERAPIES, 24(1). https://doi.org/10.1186/s12906-024-04485-3

[34] Yagiz, S. U., & Isik, S. A. (2024). Effects of progressive muscle relaxation exercises on the vital signs and fatigue in kidney transplant patients: a randomized controlled trial. INTERNATIONAL UROLOGY AND NEPHROLOGY, 56(9), 3111–3121. https://doi.org/10.1007/s11255-024-04061-1