

Article

Literature Review: The Effect of Progressive Muscle Relaxation Technique on Dysmenorrhea In Adolescent Girls

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A B S T R A C T

Dysmenorrhea is menstrual pain that can interfere with activities. Primary dysmenorrhea is a condition that occurs due to changes in prostaglandin hormone levels. In Indonesia, the prevalence of primary dysmenorrhea in 2019 was 54.89%. Dysmenorrhea can be alleviated through non-pharmacological methods, one of which is the progressive muscle relaxation technique, which has no side effects. This study aim to examine the effect of progressive muscle relaxation techniques in reducing primary dysmenorrhea. This study was a literature review using the scoping review method, conducted from April 2024 to February 2025. Data was collected from databases (PubMed, ScienceDirect, Google Scholar, and GARUDA) with publications from 2019 to 2024. The data analysis was carried out using thematic analysis. The selected articles were organized into a PRISMA-ScR (Preferred Reporting Items for Systematic Review and Meta-Analyses extension for Scoping reviews) flow diagram, resulting in 15 analyzed articles. The research results indicate that progressive muscle relaxation techniques have an effect on reducing primary dysmenorrhea. However, factors such as stress experienced by women during relaxation exercises and an uncondusive environment may affect the success of the technique.

I. INTRODUCTION

Adolescence, defined by the World Health Organization (WHO) as the period between ages 10 and 19, represents a crucial transition from childhood to adulthood.¹ This stage is significant for building the foundation of a healthy life and involves biological, psychological, and social development. One of the major events in female adolescence is the onset of

menstruation. During menstruation, many girls experience discomfort such as abdominal pain, backache, and cramps, which can interfere with daily activities. This condition, known as dysmenorrhea, is a common gynecological problem among women worldwide. WHO reports that more than 50% of women in every country experience menstrual pain, and about 90% of women in the United States suffer from dysmenorrhea, with 10–15% experiencing severe pain that disrupts daily life.⁷

In Asia, the prevalence of dysmenorrhea was approximately 84.2% in 2019, with regional variations 68.7% in Northeast Asia, 74.8% in the Middle East, and 54.0% in Northwest Asia. In Southeast Asia, prevalence rates were 69.4% in Malaysia, 84.2% in Thailand, and 64.25% in Indonesia, consisting of 54.89% primary and 9.36% secondary dysmenorrhea.⁸ In Indonesia, around 60-70% of women experience dysmenorrhea, and studies in West Sumatra reported that 57.3% of female adolescents experienced menstrual pain, with 9% suffering from severe pain.¹⁰

Dysmenorrhea occurs due to increased prostaglandin levels, leading to uterine contractions and hormonal changes involving estrogen and progesterone. When unmanaged, this condition can negatively affect daily activities, concentration, and school attendance, thus reducing quality of life. Although pharmacological treatments such as analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used, prolonged use can cause side effects including nausea, liver toxicity, and menstrual irregularities.¹⁷ Therefore, many women seek safe, non-pharmacological alternatives such as exercise, massage, herbal remedies, and relaxation therapy.¹⁹

One promising non-pharmacological approach is the progressive muscle relaxation (PMR) technique, which combines deep breathing with systematic tensing and relaxing of major muscle groups to induce physical and mental relaxation. This method is practical, inexpensive, and does not require special equipment. PMR reduces stress, muscle tension, and pain perception by stimulating parasympathetic activity and decreasing sympathetic nervous responses. Physiologically, relaxation improves blood circulation, increases oxygen supply, and triggers the release of positive hormones such as endorphins, serotonin, and melatonin, which promote comfort and emotional stability.²⁰

Previous studies have shown the effectiveness of PMR in reducing pain and stress in various conditions. For instance, research at K.R.M.T Wongsonegoro Hospital in Semarang demonstrated that PMR effectively reduced headache intensity among hypertensive patients.²⁰ Similarly, studies by Helena et al. (2020) and Puji et al. (2023) revealed that adolescent girls who performed PMR experienced significant decreases in menstrual pain intensity compared to those who did not. These findings suggest that PMR can relax the uterine and pelvic muscles, reduce contractions, and lower stress levels, all of which contribute to pain relief.^{19,22}

Based on this evidence, it is important to explore further the role of progressive muscle relaxation in managing dysmenorrhea among adolescent girls. This literature review aims to analyze the effect of PMR on reducing primary dysmenorrhea and to identify supporting and inhibiting factors that influence its success. The results are expected to provide useful insights for healthcare professionals, especially midwives and school nurses, in implementing non-pharmacological interventions to improve menstrual health and the quality of life of adolescent girls.

II. METHODS

The type of literature study used is a scoping review employing the PRISMA-ScR method (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews), which serves as a guideline for identifying the steps in developing a research protocol for a scoping review. A scoping review is an evidence synthesis approach that uses rigorous and transparent methods to answer research questions by analyzing similar research articles and

drawing conclusions from them. This study aims to examine various research findings regarding the effect of progressive muscle relaxation techniques on dysmenorrhea in adolescent girls. This literature study was conducted from Maret 2024 to Januari 2025. Data collection was carried out through four database; PubMed, Google Scholar, Science Direct, and Portal Garuda. The keywords used are “progressive muscle relaxation technique,” “Jacobson’s relaxation technique,” “deep muscle relaxation,” and “dysmenorrhea,” combined using two or more of these terms, in English and Bahasa.

The inclusion criteria for journal searches are full text journals that discuss the topic of the influence of progressive muscle relaxation technique on dysmenorrhea, primary research journals, English language international journals indexed by Scopus, Indonesian language national journals indexed by SINTA 1, 2, 3, 4 & 5 and year of publication 2019-2024. Meanwhile, the inclusion criteria for journal searches are secondary journals or tertiary research journals.

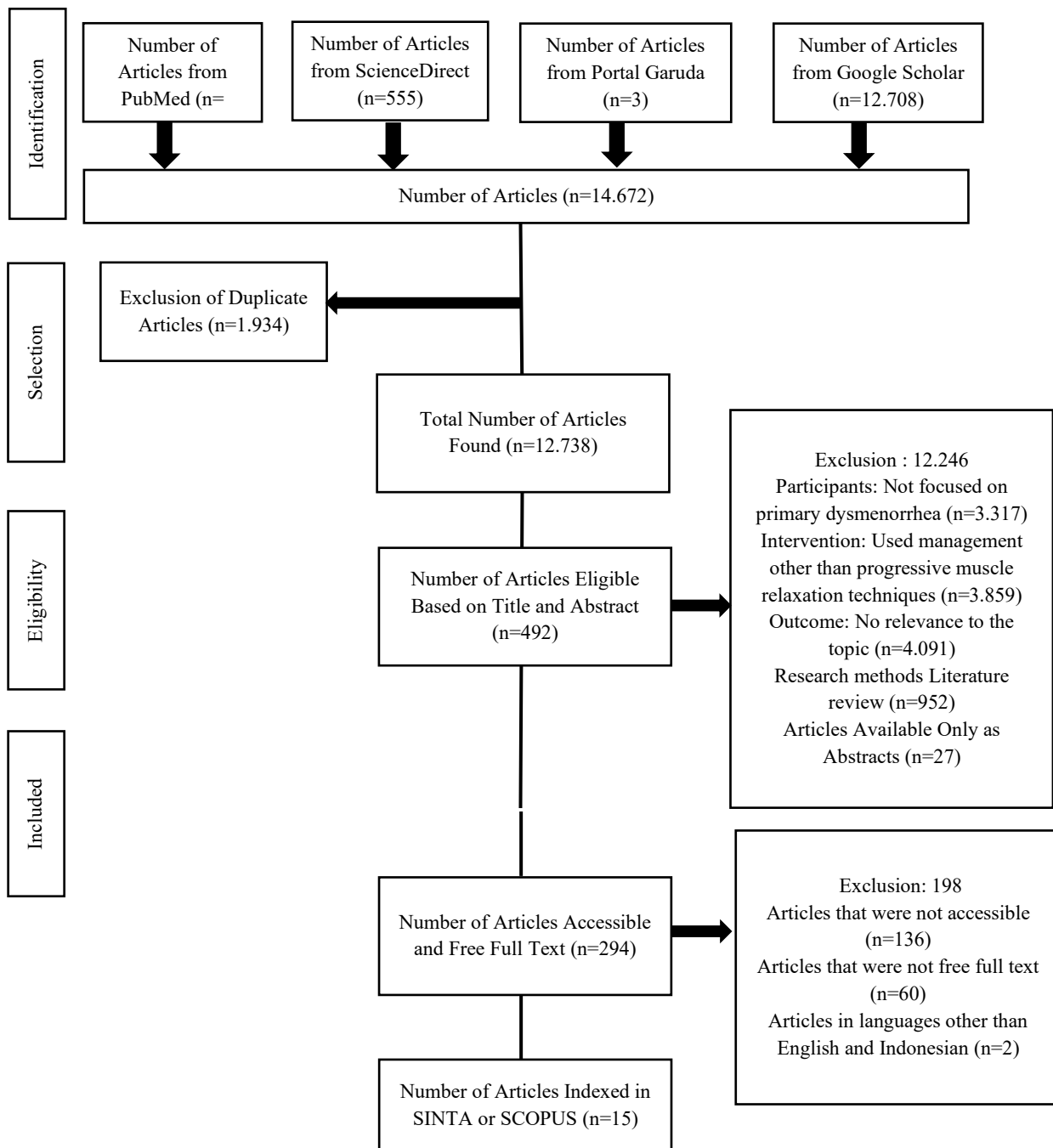


Figure 1. Flowchart PRISMA-ScR

III. RESULT

Journal searches are carried out through a database by selecting journals based on the criteria for inclusion and exclusion of established literature studies.

Relevant articles based on the inclusion criteria which was found in the four databases is 15 articles. In the analyzed articles, 11 articles discussed the effect of progressive muscle relaxation techniques on dysmenorrhea in adolescent girls. In addition, 3 articles analyzed the comparison between progressive muscle relaxation techniques and other relaxation techniques. Meanwhile, 1 article described the application of progressive muscle relaxation techniques combined with other methods, which demonstrated success in reducing pain intensity during menstruation.

Data Sources	Number of Journal Articles in the Initial Search	Number of Articles Analyzed
PubMed	1.406	1
<i>ScienceDirect</i>	555	1
Garuda	3	3
<i>Google Scholar</i>	12.708	10
Total	14.672	15

Table 1. Results of Articles Identified Based on Keywords and PICO

IV. DISCUSSION

Progressive muscle relaxation is a relaxation method that combines deep breathing with a sequence of tensing and relaxing specific muscle groups while focusing attention on the differences in sensation between tense and relaxed muscles.⁵⁶ Based on the analyzed articles, this technique is effective in reducing dysmenorrhea pain intensity through the stimulation of the sympathetic nervous system, which influences peripheral muscles, and by blocking pain perception toward the hypothalamus. This process induces relaxation, decreases muscle tension, and creates a sense of comfort through a conditioning mechanism. The technique is also easy to perform at home without special equipment, following the principle of tensing each muscle group for 5 seconds and then relaxing it for 10-20 seconds, and it may increase endorphin release through distraction from pain.

The effectiveness of progressive muscle relaxation is influenced by environmental conditions and individual factors. Research indicates that a non-conducive environment may hinder the success of this intervention and reduce its effectiveness.⁴² In addition, stress, anxiety, skipping breakfast, and low levels of physical activity can also affect the outcome of relaxation. Therefore, it is important to ensure a calm environment along with supportive physical and emotional conditions before performing this technique to achieve optimal benefits.

Progressive muscle relaxation for reducing primary dysmenorrhea is performed through 14 movements involving various muscle groups, such as the hands, feet, face, jaw, chest, and neck. This technique can be carried out in a sitting or lying position and begins with taking five deep breaths to relax the body. Each movement follows the principle of tensing the muscles for several seconds and then relaxing them, starting from the muscles of the feet, calves, thighs, hands, abdomen, chest, shoulders, lips, mouth, eyes, and eyebrows. The duration of implementation varies from 3 to 45 minutes, with a minimum frequency of once daily for three days. Several studies show that sessions lasting 5–15 minutes are effective in reducing pain intensity, with results indicating a decrease from severe to mild pain levels.

The effectiveness of progressive muscle relaxation can be enhanced when combined with other interventions, such as music. This combination works through a distraction mechanism, shifting the individual's focus away from pain toward relaxation movements and the accompanying music, thereby stimulating the release of endorphins that help reduce discomfort.⁴⁴ Each intervention has its own mechanism for alleviating pain, and combining two or three interventions at once may produce more optimal effects in reducing dysmenorrhea intensity.

Progressive muscle relaxation has been proven effective in reducing primary dysmenorrhea pain intensity. Various studies report a significant reduction in pain scores following the technique, supported by statistical results showing p-values < 0.05. This intervention works by decreasing muscle tension, promoting both physical and mental relaxation, improving blood circulation, and stimulating the release of endorphins, which act as the body's natural pain relievers. Additionally, the technique enhances parasympathetic nervous system activity, which helps lower blood pressure, reduce stress, relieve nausea and headaches, and improve overall comfort. Research consistently shows that individuals experiencing severe pain may experience a reduction to moderate or mild pain after practicing progressive muscle relaxation.

The effectiveness of progressive muscle relaxation has also been compared with other interventions, such as aromatherapy, deep breathing relaxation, acupressure, oil massage, and pelvic floor exercises. The results vary: progressive muscle relaxation is more effective than aromatherapy and deep breathing but less effective than acupressure and pelvic floor exercises, which produce greater pain reduction due to their simpler application and targeted focus on specific muscles or pressure points. Although progressive muscle relaxation involves 14 movements and is more complex, it can still be performed independently and provides significant benefits for adolescents experiencing dysmenorrhea. Overall, the literature indicates that progressive muscle relaxation is a safe, accessible, and effective intervention for reducing primary dysmenorrhea pain intensity.

V. CONCLUSION

Progressive muscle relaxation techniques have an influence in reducing primary dysmenorrhea; however, the effectiveness of this technique depends on the environmental conditions and the individual's emotional state during the relaxation process. An unconducive environment and feelings of anxiety or stress may lead to the failure of progressive muscle relaxation in alleviating dysmenorrhea. Various methods of progressive muscle relaxation can be applied in the management of dysmenorrhea. This technique can also be combined with other therapies, such as music therapy or warm compresses, to enhance its effectiveness.

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