

# The Effect of Relaxation Therapy on the Reduction of Menstrual Pain in Adolescents

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## ABSTRACT

Menstrual pain (dysmenorrhea) is one of the complaints experienced by adolescent girls and can interfere with daily activities and quality of life. Relaxation techniques are a nonpharmacological method believed to be able to reduce pain levels by reducing muscle tension and relieving stress. Purpose: This study aims to determine the effect of relaxation techniques on reducing the level of menstrual pain in adolescents. Methods: This study used a quasi-experimental design with pretest-posttest approach without a control group. Sample of 15 people who are adolescent girls experiencing dysmenorrhea and selected through purposive sampling technique. The intervention was given in the form of relaxation techniques for 5 days. The Data were analyzed using paired t-test with significance level  $p < 0.05$ . Results: The mean pain level before the intervention was  $6.80 \pm 1.01$  and decreased to  $3.93 \pm 1.28$  after the intervention. The t-test results showed a value of  $t = 9.264$  with  $p = 0.000$  ( $p < 0.05$ ), which means there is a significant difference between the pain levels before and after the intervention. Implications: The results of this study show that relaxation techniques are effective in reducing the level of menstrual pain in adolescents. This provides a non-pharmacological alternative used by health workers in providing care to adolescents with complaints of dysmenorrhea. Conclusion: By reducing menstrual pain through relaxation techniques, adolescents can undergo learning and social activities more optimally. This contributes to improved quality of life, self-confidence, decreased anxiety or stress that often accompanies the menstrual cycle.

**Keywords:** Dysmenorrhea, Relaxation Techniques, Nonpharmacological Therapy



## INTRODUCTION

Dysmenorrhea is one of the most common reproductive health problems experienced by adolescent girls and has a significant impact on their daily activities. Menstrual pain that is felt can be mild to severe, and is often accompanied by accompanying symptoms such as nausea, dizziness, fatigue, and mood disorders. Recent research has shown that more than 70% of adolescents with dysmenorrhea report difficulty concentrating in class, school absences, as well as decreased participation in social activities and sports (Bettendorf et al., 2023). This discomfort becomes a serious obstacle to the productivity and psychological well-being of adolescents, especially during puberty, which is a critical phase in the formation of self-identity and social involvement.

The impact of dysmenorrhea is not only limited to the physical aspect, but also has an impact on mental health and overall quality of life. Recurrent and untreated pain can cause stress, anxiety, and even mild to moderate depression in adolescents (Lopez & Kim, 2024). In addition, sleep disorders and decreased energy due to menstrual pain can worsen academic performance and social interactions. In the long term, dysmenorrhea that does not get proper intervention risks developing into chronic pain disorders that affect reproductive function in adulthood (Zhou et al., 2022). Therefore, it is important to give serious attention to the management of dysmenorrhea in adolescents through a holistic approach, ranging from education, psychological support, to nonpharmacological interventions that are easy to implement.

Menstrual pain or dysmenorrhea is a very common condition experienced by adolescent girls, especially at the onset of menarche. Dysmenorrhea is characterized by cramping pain in the lower abdomen that occurs before or during menstruation, and may be accompanied by other symptoms such as nausea, headache, diarrhea, or fatigue. According to the World Health Organization (WHO), dysmenorrhea is experienced by more than 50% of women of childbearing age in the world, and the prevalence is higher in adolescents. In Indonesia alone, various studies show that the prevalence of dysmenorrhea in adolescents is very high, ranging from 70-90%.

Although the prevalence of dysmenorrhea among adolescents is very high, there are still research gaps regarding the practical and accessible application of nonpharmacological interventions, especially in formal educational environments such as Junior High School. Most of the previous studies were conducted in urban areas or health institutions, while research in the school environment that represents the adolescent population directly is still limited. Therefore, this study is important to do that has a large number of adolescent girls but access to reproductive health education and non-medical treatment of menstrual pain is still minimal. The urgency of this study lies in the effort to provide an alternative treatment of menstrual pain that is effective, safe, and can be done independently by adolescents, namely through progressive Muscle Relaxation (PMR) techniques. The findings of this study are expected to be applied in school health programs or youth services in health centers, thus having a direct impact on improving the quality of life and learning achievement of adolescent girls. The purpose of this study was to determine the effect of progressive muscle relaxation techniques to reduce the level of menstrual pain (dysmenorrhea) in adolescent girls.



A study conducted by Silaen et al. (2020) in Denpasar found that 74.42% of adolescent girls experienced menstrual pain, with the age group 14-16 years being the most affected. Meanwhile, Adelta et al. (2021) in Central Lampung reported that 8 out of 10 female students experienced dysmenorrhea, especially on the first day of menstruation. This shows that dysmenorrhea is a serious health problem and requires appropriate treatment, especially in adolescents who are in the phase of physical and emotional development.

Physiologically, primary dysmenorrhea is caused by increased production of prostaglandins chemicals that trigger excessive contraction of the uterine muscles, causing pain. This process occurs without any organic abnormalities in the reproductive system. However, the perception of pain is highly subjective and influenced by psychological factors such as stress, anxiety, and pain tolerance levels. Some risk factors that increase the likelihood of dysmenorrhea include early menarche, irregular menstrual cycles, family history, and physical inactivity.

The impact of dysmenorrhea is not only physical, but also affects the emotional and social aspects of adolescents. Many girls are forced to miss school, unable to concentrate, or feel inferior because they have to deal with pain every month. If left without adequate treatment, this condition can affect academic performance, social relationships, and even the psychological condition of adolescents in the long run.

So far, the treatment of menstrual pain is generally done by consuming analgesic drugs, such as ibuprofen and paracetamol. Although effective, long-term use can cause side effects such as gastric disorders or dependence. Therefore, an alternative approach is needed that is safer and can be done independently by adolescents, such as relaxation techniques. Relaxation techniques are non-pharmacological methods that aim to reduce stress, muscle tension, and pain through the body's physiological mechanisms. One type of technique that is widely used is deep breath relaxation and progressive muscle relaxation. These methods are easy to teach, require no special tools, and can be done at any time.

Relaxation techniques are one of the nonpharmacological approaches that have been shown to be effective in reducing menstrual pain (dysmenorrhea) in adolescents. One technique that is widely used is Progressive Muscle Relaxation (PMR), which is a method that is performed by tensing and then systematically relaxing muscle groups, from head to toe. This process helps to reduce muscle tension, improve blood circulation, and shift the focus away from pain, resulting in an overall relaxing effect. Several studies have shown that PMR can decrease pain perception, stabilize emotions, and increase comfort during menstruation without harmful side effects (Moeenizadeh & Zarezadeh, 2022). Therefore, relaxation techniques such as PMR are highly recommended as an alternative to treating dysmenorrhea that is easily applied by adolescents independently and in the guidance of health workers in the school and community environment.

Various studies support the effectiveness of relaxation techniques in reducing the level of menstrual pain. Lumbantobing et al. (2022) showed that deep breath relaxation training significantly reduced the level of dysmenorrhea pain in junior high school students in Medan. Another study by Tyastuti et al. (2020) stated that progressive muscle relaxation decreased the pain scale clinically and



significantly in college students with dysmenorrhea. In fact, the combination of relaxation and cold compresses as studied by Kartinzahri et al. (2022) proved to reduce pain more effectively than a single method.

Considering the prevalence of dysmenorrhea, its impact on the quality of life of adolescents, and the potential of relaxation techniques as an effective, safe, and independent non-medical intervention, this study was conducted to assess the effect of relaxation techniques on reducing menstrual pain levels in adolescents. The main objective of this study was to evaluate the effectiveness of relaxation techniques in reducing the intensity of menstrual pain, as well as to know to what extent these interventions can improve the quality of life of adolescents with dysmenorrhea. This research is expected to contribute to the development of health interventions that can be applied, and form the basis of more effective reproductive health education in schools and communities.

## METHODS

This study used a quasi-experimental design with a pretest-posttest approach without a control group to measure changes in menstrual pain levels in adolescents after being given a relaxation technique intervention. Researchers selected adolescent girls who experienced dysmenorrhea as respondents using purposive sampling. The number of samples taken was 15 people. The variable measured in this study was the level of menstrual pain as the dependent variable, which was measured using the Numeric Rating Scale (NRS) before and after the intervention, namely relaxation techniques in the form of deep breathing exercises or progressive muscle relaxation. Respondents were asked to perform relaxation techniques for 15-20 minutes a day. Data collection was done by measuring the level of menstrual pain using NRS before and after the intervention. In addition, observation sheets were used to monitor the application of relaxation techniques, and questionnaires were used to evaluate the degree of compliance of respondents with instructions. The data obtained were analyzed using a paired t-test to see if there was a significant difference between the level of menstrual pain before and after the intervention. All respondents have been given an explanation of the objectives and procedures of the study and signed a consent sheet (informed consent) before participating.

## RESULTS

### 1. Univariate Analysis

The results obtained about the general picture of the level of pain felt by adolescent girls who experience dysmenorrhea before and after given relaxation therapy.

**Table 1. Mean Distribution of Pain Levels Before and After Relaxation Therapy**  
(n = 15)

Mean measurement time	Mean ± SD	Minimum	Maximum	Pain Category
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Before Relaxation	6,80 ± 1,01	5	8	Medium-heavy
After Relaxation	3,93 ± 1,28	2	6	Mild-moderate

The results before the relaxation intervention, the level of menstrual pain in respondents was in the moderate to severe category, with an average score of 6.80 (SD ±1.01). This shows that most of the respondents experienced dysmenorrhea with pain intensity that was enough to interfere with activity. After the relaxation therapy, there was a significant decrease in the pain score to 3.93 (SD ±1.28), which belongs to the mild to moderate category. This decrease indicates a positive response to the intervention of relaxation techniques, so it can be concluded that these techniques are effective in helping to reduce the level of menstrual pain in adolescents.

## 2. Bivariate Analysis

The results obtained to see the effectiveness of relaxation therapy to reduce the level of dysmenorrhea pain by using paired t-test (paired t-test).

**Table 2. Difference in Pain Level Before and After Relaxation Therapy**  
(n = 15)

Variable	Mean ± SD Before	Mean ± SD After	Value of t	p-value	Description
Degree of dysmenorrhea pain	6,80 ± 1,01	3,93 ± 1,28	9,264	0,000	Significant (p < 0,05)

Based on the test results paired t-test, obtained the value of  $t = 9.264$  with  $p = 0.000$ . Since the p value is  $< 0.05$ , it can be concluded that there is a statistically significant difference between the level of pain before and after relaxation therapy is given. Thus, relaxation therapy has been shown to be effective in reducing the level of dysmenorrhea pain in adolescent girls.

## DISCUSSION

### 1. Univariate Analysis

The results of this study provide a general overview of changes in the level of pain felt by adolescent girls who experience dysmenorrhea before and after the intervention in the form of relaxation therapy. Based on the data shown in Table 1, it was obtained that before the relaxation therapy was carried out, the average level of pain felt by the respondents was  $6.80 \pm 1.01$ , with a minimum score of 5 and a maximum of 8. Based on the pain classification, this score falls into the category of moderate to severe pain. After being given relaxation therapy, the average level of pain decreased to  $3.93 \pm 1.28$ , with a minimum value of 2 and a maximum of 6. This value belongs to the category of mild to moderate pain.

This decrease in pain levels indicates a positive response to relaxation therapy interventions. Relaxation therapy, particularly in the form of deep breathing techniques or progressive muscle relaxation, is known to decrease muscle tension, decrease sympathetic nervous system activity, and



increase comfort, which overall can decrease pain perception. The physiological effects of relaxation are also associated with a decrease in stress hormones (such as cortisol) and increased blood circulation to the uterine area, thereby reducing uterine muscle spasm, which is the main cause of pain in dysmenorrhea (Ushiroyama, 2007).

Theoretically, this finding can be explained through the Gate Control of Pain theory proposed by Melzack and Wall (1965), which states that pain signals sent to the brain can be modulated by other stimuli such as Touch, pressure, or relaxation. In other words, relaxation therapy can activate large non-painful nerve fibers that "close the pain gate", so that pain signals are not passed on to the pain perception Center in the brain.

This finding is also supported by a number of previous studies. Research by Aelik and Apay (2021) showed that progressive relaxation exercises significantly decreased the level of menstrual pain in adolescent girls after being performed for two menstrual cycles. So it was in an experimental study by Toprak Aelenay et al. (2024), it was found that the Progressive Muscle Relaxation (PMR) technique was not only effective in reducing menstrual pain but also improved quality of life, decreased anxiety, and improved the daily function of female students with dysmenorrhea.

From this descriptive analysis, it can be concluded that relaxation therapy has the potential to be a safe, inexpensive, and effective non-pharmacological intervention in treating dysmenorrhea pain. These interventions are particularly relevant to apply in the context of adolescent education and health, in particular for those who have not yet gained access to medical treatment or who want to avoid the use of drugs.

Nevertheless, the researcher is also aware that this interpretation of the univariate results only shows a general picture of changes in the level of pain, and has not been able to statistically prove the existence of a causal relationship. Therefore, further analysis is needed such as bivariate tests (for example, paired t-tests) to determine whether the difference is statistically significant and does not occur due to chance factors or other variables that are not controlled.

## **2. Bivariate Analysis**

This study aims to evaluate the effectiveness of relaxation therapy in reducing the level of dysmenorrhea pain in adolescent girls. Based on the results of bivariate analysis using paired t-test, it was found that there was a significant difference between the level of pain before and after relaxation therapy was given. The mean level of pain before therapy was  $6.80 \pm 1.01$ , belonging to the category of moderate to severe pain. After the therapy was given, the average level of pain decreased to  $3.93 \pm 1.28$ , which is classified into the category of mild to moderate pain. Statistical test results showed the value of  $t = 9.264$  with  $p = 0.000$ . A p value smaller than 0.05 indicates that the difference is statistically significant, so it can be concluded that relaxation therapy is effective in reducing dysmenorrhea pain.

The effectiveness of this relaxation therapy can be explained through the Gate Control Theory proposed by Melzack and Wall (1965). This theory explains that pain signals sent to the brain through the nerves can be inhibited by non-painful stimuli such as muscle movement, massage, or



relaxation techniques. In this case, when a person relaxes, non-painful nerve fibers are activated and pain signals are inhibited, so the perception of pain is reduced.

In addition, physiological mechanisms also explain how relaxation can reduce pain. Relaxation therapies, such as Progressive Muscle Relaxation (PMR), work by lowering muscle tension, slowing the heart rate, lowering blood pressure, and reducing stress hormones such as cortisol. All these effects contribute to a decrease in muscle contractions of the uterus and spasm of blood vessels, which is the main cause of pain during menstruation.

The results of this study are also reinforced by various previous studies. The study by Åelik and Apay (2021) showed that progressive relaxation exercises performed independently during two menstrual cycles were able to significantly reduce pain intensity compared to the control group ( $p < 0.001$ ). Another study by Toprak Åelenay et al. (2024) in a randomized experimental study found that relaxation therapy decreased menstrual pain, anxiety, and significantly improved the quality of life of young women ( $p < 0.05$ ). Similar findings were also presented by Nasr Abdelhalim et al. (2023) who stated that PMR is effective in decreasing pain severity and improving emotional comfort in adolescent girls who have dysmenorrhea.

From the perspective of the researcher, these results not only illustrate the statistical success of the intervention, but also provide practical value in the non-pharmacological treatment of dysmenorrhea. Relaxation therapy has a number of advantages, such as it is easy to learn, can be performed independently, does not require special tools, and does not cause side effects. Therefore, this therapy is very suitable to be applied in the context of adolescents, especially in school environments or communities with limited access to medical services.

However, the researchers are also aware of the limitations of this study, including the small sample size ( $n = 15$ ) and the absence of a control group, so the possibility of a placebo effect or other outside factors cannot be ignored. In addition, the short duration of monitoring only measures short-term effects, so it cannot describe the effectiveness of the therapy in the long term. Therefore, the researchers recommend further research with randomized controlled trial (RCT) design and a larger number of samples in order to produce stronger and generalizable conclusions.

Overall, these results indicate that relaxation therapy, especially in the form of PMR, is an effective intervention to reduce dysmenorrhea pain in adolescent girls, both from physiological, psychological, and practical aspects. These findings are expected to serve as a basis for the development of school-based or community-based menstrual pain management programs, as a safe and effective non-drug alternative.

## CONCLUSIONS

Based on the results found that relaxation therapy has a positive effect on reducing the level of dysmenorrhea pain in adolescent girls. Before the therapy was given, the mean pain level was in the moderate to severe category with a score of  $6.80 \pm 1.01$ , and after the intervention it decreased to  $3.93 \pm 1.28$  in the mild to moderate category. These findings suggest that relaxation therapies, such as deep breathing techniques or Progressive Muscle Relaxation (PMR), have the potential to reduce



muscle tension, activate the parasympathetic nervous system, and decrease pain perception through physiological and psychological mechanisms.

The paired t-test results reinforced the findings by showing a statistically significant difference between pain levels before and after therapy ( $t = 9.264$ ;  $p = 0.000$ ). This is in line with The Gate Control Theory Of Pain which explains that non-painful stimuli such as relaxation can block pain signals to the brain. This finding is also supported by a number of previous studies showing the effectiveness of Progressive Muscle Relaxation (PMR) in reducing menstrual pain. Thus, relaxation therapy proved to be a simple, safe and feasible non-pharmacological intervention in the treatment of dysmenorrhea pain, especially in adolescents in educational and community settings. As a practical implication, it is suggested that relaxation techniques such as PMR be integrated into reproductive health education programs in schools through cooperation with BK teachers or UKs officers. In addition, puskesmas can also develop educational sessions or relaxation training for young women as part of Adolescent Health Services, so that their application can reach the community more broadly and sustainably.

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