

Volume 8, No. 2
August, 2025

e-ISSN : 2685-1997
p-ISSN : 2685-9068

REAL in Nursing Journal (RNJ)

Research of Education and Art Link in Nursing Journal

<https://ojs.fdk.ac.id/index.php/Nursing/index>

Progressive Muscle Relaxation as a Non Pharmacological Intervention For Mild-Insomnia in Adolescents

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ABSTRACT

Background: Introduction: Sleep disorders in adolescents vary, but some studies suggest quite a high number. Around 39% of teenagers reported experiencing insomnia or difficulty sleeping. Another study stated that up to 73.4% of adolescents experience sleep disorders. Aim: evaluating the effects of progressive muscle relaxation training (PMRE) applied to patients in improving sleep quality in adolescents

Method: The design of this research is Pre-Eksperiment with Group Comparison. In this study there is one group but divided into two, namely half the group for the experiment (treated) and half for the control group. The sampling technique in this study was carried out by adolescents. Determination of the sample in this study was by purposive random sampling technique, which amounted to 20 people in this study. 10 people, namely 10 experimental people and 10 control people in adolescents who experience insomnia who have met the inclusion criteria and exclusion criteria. I use the instrument Progressive Relaxation Techniques

Findings: The average level of difficulty sleeping in female adolescents in the control group was (2.60), meaning the level of difficulty sleeping was mild (95% CI: 1.37-2.43), with a standard deviation of 0.516.

Conclusion and recommendation:

In line with these findings, it has been determined that PMRE improves sleep quality in adolescents. It is recommended that education about PMRE be provided and that the exercises be taught.

Keywords:

sleep quality, progressive muscle relaxation exercises, adolescents

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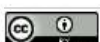
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Introduction

Children who experience sleep disturbances have higher levels of irritability, impulsivity, and behavior. and difficulty in regulating emotions, which can increase the likelihood of developing behavioral problems. Additionally, multiple studies have shown that insufficient sleep is associated with an increased risk of psychiatric disorders throughout childhood and adolescence, including anxiety, depression, and attention deficit hyperactivity disorder (ADHD). Sleep disturbances in children can manifest in a

variety of ways, each with specific implications for children's emotional and behavioral well-being. Among the most common is childhood insomnia, characterized by difficulty falling or staying asleep, which may be related to separation anxiety, night terrors, or inadequate sleep hygiene habits. Frequent nighttime awakenings also interfere with sleep continuity, which can lead to daytime sleepiness and chronic fatigue. Sleep disturbances can affect brain circuits associated with emotion control and stress regulation, increasing vulnerability to psychological problems and affecting the



quality of life of children and their families. Anxiety and sleep disturbances have been shown to have a bidirectional relationship, with high levels of anxiety leading to sleep disturbances, while sleep deprivation or poor quality sleep can lead to sleep disturbances. Sleep can increase vulnerability to anxiety and other emotional problems. In particular, anxiety is strongly associated with sleep problems and frequent nighttime awakenings. Similarly, children with anxiety have longer sleep latencies and lower sleep levels (Lipkin et al., 2020).

Sleep is believed to contribute to physiological and psychological recovery. Sleep has an anabolic recovery function and facilitates 'metabolic building'.¹ Experts also believe that sleep restores psychological functions. Furthermore, sleep may be necessary for optimal immune system function (Ferminaj & Gandhi, 2020). The percentage of sleep disturbance problems in adolescents varies, but some studies show a fairly high number. Around 39% of teenagers are reported to experience insomnia or difficulty sleeping. Another study found that up to 73.4% of adolescents experience sleep disorders. Psychological factors such as anxiety, stress, and smoking can affect the quality of sleep of patients. Sleep problems can directly affect the patient's ability to live a normal life, contribute to a sedentary lifestyle that leads to decreased health-related quality of life and the risk of mental health problems. Improving the quality of sleep of patients is an increasing number of non-pharmaceutical methods to improve the quality of life of patients. 'sleep quality. Among these methods is relaxation techniques. This technique is considered as one of the cost-effective and easy ways to overcome sleep disorders by controlling stress and anxiety levels, mood

disorders, autonomic nervous system function, and body discomfort. Common relaxation methods used to overcome sleep problems include Benson's relaxation (BR) and progressive muscle relaxation (PMR), yoga, guided imagery, meditation, and massage therapy (Bagheri et al., 2021).

Relaxation exercises such as Progressive Muscle Relaxation (PMR) and transcendental meditation can help reduce low blood pressure and create relaxation (Gupta, 2014). The main problem lies in the amount, quality, or timing of sleep; and Parasomnia, where the main problem is irregular sleep. The pattern and amount of sleep we get can change as humans age, but its occurrence and thus its significance does not diminish (Martin, 2024).

Many alternative and complementary therapies including meditation, progressive muscle relaxation, aromatherapy, hydrotherapy, humor therapy, imagery, massage, music, and relaxation can be used successfully as adjunct therapies to help reduce stress, sleep disturbances, and anxiety. audio-assisted progressive muscle relaxation techniques were older adults who used the same relaxation script for post-test. Measurements using the State Trait Anxiety Inventory scale showed that each treatment condition was equally effective in producing significant changes in the client's anxiety levels. The authors emphasize that a certain level of anxiety can cause many illnesses. It is beneficial if one learns how to control anxiety or at least reduce it with progressive muscle relaxation techniques. (Thomas, 2006).

PMRE is a type of relaxation exercise that involves individual contractions and relaxation of muscle groups from the face to the feet. Sleep latency is a subdimension of the PSQI that indicates

the time it takes for a patient to fall asleep. This has a negative impact on patients who have difficulty falling asleep (Bell, 2021; Çetinkaya & Karabulut, 2022). Knowing the effectiveness of Progressive Relaxation techniques in reducing sleep difficulties, where the focus of this research was carried out on adolescents in Islamic boarding schools which is different from previous research on the elderly

Methods

Design

The design of this research is *Pre-Experiment*. In this study there was one group but it was divided into two, namely half the group for the experiment (which was given treatment) and half for the control group.

Sample and setting

The sampling technique in this study was carried out by adolescents. The determination of the sample in this study was by purposive random sampling technique, which amounted to 20 people, namely 10 experimental people and 10 control people in adolescents who experience insomnia who have met the inclusion criteria and exclusion criteria. Sample criteria Inclusion criteria: adolescents aged 11-13 years, have complaints of insomnia, do not receive pharmacological therapy, do not experience significant psychological trauma, depression, withdraw, are not consuming alcohol. We used median test. This research was conducted on teenagers at the research location, namely the dormitory, where the children with insomnia were obtained from data from teachers who had previously conducted examinations on the students.

Data Collection

Teenagers were interviewed and observed to be categorized into levels of sleep difficulty. Teenagers who met the established criteria were used as samples after agreeing to the informed consent submitted by the researcher. Provide a comfortable room for the sample and prepare the research instruments to be used and ensure the tools work well. Divide the sample into several groups, adjust to the number of officers available. Arrange a schedule for providing relaxation technique therapy for each group. Ask the group whose turn it is to receive relaxation technique therapy to enter the room that has been provided for therapy. Teach the sample to do relaxation techniques and make sure the sample understands how the relaxation technique is taught. Relaxation techniques are carried out for approximately 20-30 minutes 3 times. Ask the sample to do the relaxation technique that has been taught by the researcher 1 time a day regularly for 1 week is quite effective in reducing difficulty sleeping

Data Analysis

Editing data, is intended to evaluate the completeness, consistency and suitability of the data needed to test the hypothesis or answer the research objectives. At this editing stage, the researcher checks the existing data. The data on the twenty observation sheets are completely filled in. Data was analyzed by using t-test dependent and t-test independent.

Ethical consideration

This research has undergone ethical testing with ethics number 855/KEPK.UFDK/XI/2024.

Results

Describes the quality of sleep in female adolescents at the Pasir Modern Islamic Boarding School, IV Angkek District, Agam Regency (Experimental Group), it was

found that 6 (60%) respondents experienced mild difficulty sleeping and 4 (40%) respondents experienced moderate difficulty sleeping.

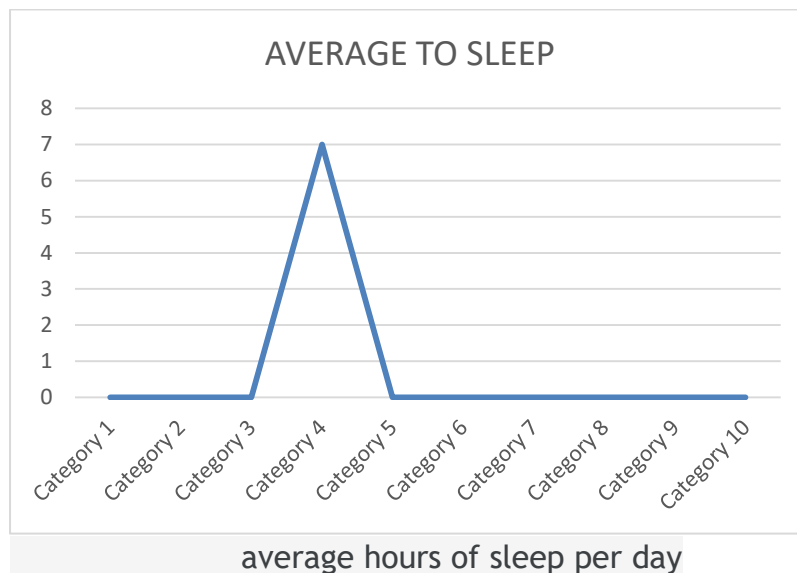


Figure 1. Average hours of sleep per day for teenagers

Average hours of sleep per day for teenagers. The graph above illustrates that the child is experiencing mild insomnia. with a range of categories 3 to 5, where children experience mild insomnia

Table 1. Distribution of the Effectiveness of Progressive Relaxation Techniques in Reducing Sleep Difficulty in Adolescents

Variable	Mean	SD	Minimum-Maksimum	95% CI
Eksperiment	2,60	0,516	2-3	1,90-2,43

The results of the analysis of table 1 obtained the average level of difficulty sleeping in adolescent girls in the control group is (2.60) meaning that the level of difficulty sleeping is mild difficulty (95% CI: 1.37-2.43), with a standard deviation of 0.516. The lowest level of difficulty sleeping is moderate difficulty and the highest is mild difficulty sleeping. From the results of the interval estimation, it can be concluded that 95% is believed that the average level of difficulty sleeping in adolescents in the experimental group is between almost approaching moderate difficulty sleeping to mild difficulty sleeping.

Table 2. Average Comparison of Sleep Difficulty Levels According to the Control Group and Experimental Group in Adolescents

Variable	Mean	SD	SE	p Value	N
Control	1,90	0,738	0,233	0,001	10
Eksperiment	2,60	0,516	0,163		

The average level of difficulty sleeping in the control group was (1.00) meaning that the level of difficulty sleeping was moderate anxiety with a standard deviation of 0.738. In the experimental group, the average level of difficulty sleeping was (2.60) meaning that the

level of difficulty sleeping was almost mild. Based on the results obtained from the study in table 5-5, the mean value of the difference in the average between the control group and the experimental group was 0.70 (mild) with a standard deviation of 0.483.

Discussion

Relaxation works more dominantly on the parasympathetic system, thereby relaxing tense nerves. The sympathetic nervous system controls breathing and heart rate to help the body relax. Progressive muscle relaxation can stimulate the body's response to relax and calm the mind, making one feel comfortable with the situation, which can increase the production of endorphins, serotonin, and melatonin. Endorphins are hormones that trigger feelings of happiness, serotonin triggers mood, desire, sleep, memory, and temperature regulation, while melatonin promotes deep sleep, which the body needs to produce natural healing, thereby relaxing the body. When the body is in a relaxed state, brain waves such as delta, theta, alpha, beta, and gamma function optimally, making it easier to achieve NREM and REM sleep. This means the elderly no longer have difficulty falling asleep or waking up at night, and they do not need a long time to fall asleep again. As sleep disturbances caused by biological or psychological factors gradually return to

normal, this can improve the quality of sleep for the teenager. (Borneo et al., 2017).

Each individual's sleep habits vary depending on the habits brought during development towards adulthood, activities, age, health conditions and so on. The need for sufficient sleep is determined not only by the number of hours of sleep (sleep quantity), but also by the depth of sleep (sleep quality). Therefore, sleep during adolescence needs to be improved for their growth and development. Based on the results obtained from. The lowest level of difficulty sleeping is moderate difficulty and the highest is mild difficulty sleeping. From the results of the interval estimation, it can be concluded that 95% is believed that the average level of difficulty sleeping in adolescents in the experimental group is between almost approaching moderate difficulty sleeping to mild difficulty sleeping.

One way to overcome sleep difficulties is through progressive relaxation techniques. Progressive relaxation provides a way to identify specific muscles and muscle groups and differentiate between feelings of

tension and deep relaxation. Relaxation is a self-management technique that is based on how the sympathetic and parasympathetic nervous systems work. Relaxation techniques are increasingly being used because they have been proven to be effective in reducing tension and anxiety. The intervention group improved significantly compared to the control group. In addition, the results of a recent study showed that the use of PMR techniques for 30 minutes per day for five days can improve sleep quality in COVID-19 patients. Furthermore, an evaluation study tested the effects of an 8-week PMR program on sleep quality in patients with chronic obstructive pulmonary disease and the results supported the efficacy of this intervention. A possible explanation for the improvement in overall sleep quality and some subscales in this study may be due to the effects of relaxation techniques applied in reducing anxiety and stress, pain, and fatigue among patients undergoing CABG, because these people experience varying degrees of the symptoms mentioned due to surgery that can result in poor sleep quality. In addition, relaxation can reduce anxiety and pain by increasing self-esteem and self-control. In addition, some chemical changes associated with relaxation training in the blood such as decreased levels of adrenal hormones can improve sleep quality. In addition, relaxation techniques help manage stress, reduce psychological stress, improve subjective well-being, and help ignore distracting thoughts, and as a result can improve sleep quality (Bagheri et al., 2021).

This progressive muscle relaxation itself is to overcome various problems in overcoming stress, anxiety, insomnia, and can also build positive emotions from negative emotions, improve work

performance, overcome fatigue. These problems can become a series of psychological disorders if not addressed and with progressive relaxation will reduce sleep difficulties in adolescents. Based on the results obtained from the research, it describes the difficulty sleeping in female adolescents (Experimental Group), and the difficulty sleeping in female adolescents (Control Group) at the Diniyah Modern Dormitory in Pasir, IV Angkek District, Agam Regency., it was found that there were 6 (60%) respondents experiencing mild sleep difficulties and 4 (40%) respondents experiencing moderate sleep difficulties and in the control group it was found that there were 5 (50%) respondents experiencing moderate sleep difficulties, 3 (30%) respondents experiencing severe sleep difficulties and 2 (20%) respondents experiencing mild sleep difficulties. In the adolescent group, the results of the study showed that there was a reaction to decreased sleep difficulties in adolescents who were given progressive relaxation therapy.

The main findings showed that the intervention had a significant impact on reducing anxiety, with improvements in most of the subscales evaluated except for the obsessive-compulsive disorder subscale. Significant improvements were also found in sleep quality, with decreased resistance to bedtime, nighttime awakenings, parasomnias, and sleep-disordered breathing, although no significant changes were seen in delayed sleep onset, sleep duration, anxiety during sleep, and daytime sleepiness. Gamification of physical exercise interventions showed positive effects in reducing anxiety and improving sleep quality in elementary school children, highlighting its potential as a strategy

intervention in elementary education classes (Carcelén-Fraile et al., 2025).

With statistical tests showing t-results greater than t-tables in both the control and experimental groups indicating that the null hypothesis is rejected and the working hypothesis is accepted, namely in adolescents at the Diniyah Modern Pasir Girls' Dormitory, IV Angkek District, Agam Regency. Sleep is indeed not a standard measure because each individual's sleep needs are different, but for people with difficulty sleeping, an increase in sleep duration is quite significant for respondents. Respondents feel that increasing sleep hours can at least overcome the problem. Likewise, easy sleep and reduced sleep duration can reduce respondents' anxiety about the unfamiliarity with starting sleep, because anxiety about not being able to sleep becomes a tension in itself for respondents which often causes them to be increasingly unable to sleep. A psychologist who developed a physiological method against tension is a technique for reducing muscle tension based on muscle contractions. Progressive relaxation of the muscles will lower the pulse rate and blood pressure, as well as reduce sweating and respiratory rate. Deep muscle relaxation, if mastered properly, can be used as an anti-anxiety drug. Thus, if teenagers with difficulty sleeping can do relaxation techniques for 20-30 minutes every day, it will reduce difficulty sleeping so that it can increase the totality and quality of a person in activities and functions (physical, emotional and intellectual) in daily life.

Conclusion

Based on the conclusion that progressive relaxation techniques can reduce the

incidence of insomnia by relaxing the muscles, it is hoped that nurses can apply progressive relaxation as a nursing intervention in overcoming sleep difficulties.

Disclosure

Authors declare no actual or conflict of interest associated with this study.

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