

THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION ON ANXIETY LEVELS IN 11th GRADE STUDENTS

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ABSTRACT

Background: Anxiety is a psychological condition characterized by vague worries, accompanied by feelings of uncertainty, helplessness, isolation, and insecurity. Adolescents are a vulnerable group to anxiety, particularly due to academic pressures such as assignments, exams, and the demands of determining future educational directions. This study aims to determine the effect of progressive muscle relaxation therapy (PMR) on reducing anxiety levels among 11th grade students at State Islamic Senior High School Cimahi.

Methods: The research used a pre-experimental method with a one-group pre-test and post-test design, involving 36 respondents who met the inclusion criteria. The instrument used to measure anxiety levels was the Hamilton Anxiety Rating Scale (HARS) questionnaire, administered before and after the intervention. The intervention consisted of PMR therapy conducted for three consecutive days. Data were analysed using the Shapiro-Wilk test for normality and the paired t-test to determine differences in anxiety scores before and after intervention.

Results: The results showed a significant decrease in anxiety levels after the intervention; the mean score before was 20,81, which decreased to 10,39 after the intervention. The paired t-test yielded a p-value of 0,001 ($< \alpha = 0.05$), indicating a significant effect of progressive muscle relaxation therapy in reducing anxiety.

Conclusion: Therefore, this therapy can be considered a non-pharmacological alternative intervention to manage anxiety in adolescents.

Keywords: anxiety, adolescents, HARS questionnaire, progressive muscle relaxation

INTRODUCTION

Adolescence is a crucial developmental phase marked by various physical, psychological, and social changes. According to the WHO, adolescents are individuals aged 10–19 years, who often face academic pressures, social demands, and uncertainty about the future. Such pressures can trigger anxiety disorders, which are characterized by symptoms such as excessive worry, concentration difficulties, physiological changes, and other emotional symptoms (Meikawati and Prajayanti 2020).

WHO data from 2019 reported that 301 million people worldwide experience anxiety disorders, making it the most common mental disorder globally (Organization 2023). In Indonesia, I-NAMHS (2022) revealed that approximately 34.9% of adolescents experience mental health problems, particularly anxiety (Kesehatan 2024). In Cimahi City, data from the 2024 Health Office recorded 307 cases of anxiety, most of which occurred in the productive age group.

Anxiety among students often has a negative impact on the learning process, such as reduced concentration, prolonged stress, and even deviant behavior as a form of escape (Chodavadia et al. 2023). Therefore, effective and efficient management is needed. One

proven non-pharmacological approach is progressive muscle relaxation therapy (Rustam et al. 2021). During progressive muscle relaxation, the parasympathetic nervous system is activated, playing a role in reducing the body's stress response. In this process, acetylcholine is released in the ganglion and interacts with nicotinic receptors on the muscle membrane at the postsynaptic area, stimulating muscarinic receptors. As a result, anxiety and muscle tension gradually decrease, replaced by a sense of comfort and muscle relaxation (Carisa and Wahyuni 2022).

This aligns with the findings from a previous study conducted in 2022, which reported a significant difference between the control and treatment groups. In the treatment group, anxiety scores decreased by 18.9 points, while in the control group, scores decreased by only 8.7 points (Carisa and Wahyuni 2022). Similar findings were reported by another study in 2024, which demonstrated a significant effect of progressive muscle relaxation in reducing anxiety among senior high school students (Nova, Damanik, and Wahyuni 2024). Further support comes from a 2022 study that found a significant reduction in anxiety levels ($p < 0.05$) following therapy (Nurfitriyani and Sugiyanto 2022). The other international study from 2022 also confirmed its effectiveness ($p < 0.05$) (Toqan et al. 2022). This study also refers to Dorothea Orem's self-care theory, which emphasises the nurse's role in helping adolescents meet their Therapeutic Self-Care Demand through a Supportive–Educative System approach. Nurses can provide education on the benefits of progressive muscle relaxation, demonstrate the technique, and guide adolescents in practising it until they are able to perform it independently. Additionally, nurses play a role in motivating and monitoring the therapy's effectiveness, as well as providing support so that adolescents can incorporate progressive muscle relaxation into their daily self-care strategies. Thus, the implementation of progressive muscle relaxation therapy not only helps reduce anxiety but also fosters adolescent independence in managing their mental and physical health, in line with Orem's self-care principles (Unique 2022).

This research was conducted at State Islamic Senior High School Cimahi, the only state Islamic senior high school in the city, which applies a dual curriculum (general and religious) (Agama 2023). The high academic workload, combined with spiritual demands, makes students, particularly those in grade 11th, vulnerable to anxiety. A preliminary study showed that 16 out of 20 surveyed students experienced anxiety, ranging from mild to moderate, although most of them were unaware of their condition.

This study aims to determine the effect of Progressive Muscle Relaxation Therapy on reducing anxiety levels in class XI students of Cimahi State Islamic Senior High School.

RESEARCH METHOD

This study employed a pre-experimental design with a one-group pretest–posttest approach. This design enabled the researchers to evaluate the effect of progressive muscle relaxation therapy on anxiety levels by comparing scores before and after the intervention within the same group (Notoatmodjo 2018). The sampling technique used was purposive sampling, involving respondents with mild to moderate anxiety levels based on initial assessment results (Donsu 2016). The study population consisted of all 11th grade students at MAN Kota Cimahi, totaling 323 students. Using purposive sampling, 36 students were selected as participants based on the criteria of having mild to moderate anxiety levels as measured during the initial assessment (Sugiyono 2022).

The intervention, in the form of progressive muscle relaxation therapy, was conducted over three consecutive days, from May 19 to May 21, 2025. Each session lasted approximately 35 minutes, delivered in groups under the guidance of an instructor. The

technique followed the standard procedure, involving systematic tensing and relaxing of muscle groups from head to toe.

Univariate analysis was used to describe the distribution of anxiety levels before and after the intervention. The Shapiro–Wilk normality test indicated that the data were normally distributed; therefore, bivariate analysis was carried out using a paired sample t-test to determine the difference in mean anxiety scores before and after the therapy.

Data analysis in this study employed a paired t-test. Hypothesis testing was performed using SPSS software, with decision-making based on the significance level p (Sig. 2-tailed). If $p > 0.05$, the null hypothesis (H_0) was accepted; if $p < 0.05$, H_0 was rejected (Sugiyono 2022). This study complied with research ethics principles, as evidenced by ethical clearance obtained from the Ethics Committee of STIKes Budi Luhur Cimahi, with approval number 132/D/KEPK-STIKes/V/2025.

RESULTS

After the entire series of research activities was carried out in accordance with the Standard Operating Procedures (SOP), the following section presents the research findings on the effect of progressive muscle relaxation therapy on reducing anxiety levels, as measured using the Hamilton Anxiety Rating Scale (HARS). The results cover the distribution of anxiety levels before and after the intervention, as well as the analysis of the therapy's effect using the dependent t-test on 11th-grade students at MAN Kota Cimahi. The detailed findings are presented as follows:

Table 1 Overview of Anxiety Levels Before Progressive Muscle Relaxation Therapy

Anxiety Levels	Frequency	Percentage (%)
No anxiety	0	0
Mild anxiety	23	63,9
Moderate anxiety	13	36,1
Severe anxiety	0	0
Very severe anxiety	0	0
Total	36	100

Based on Table 1, the anxiety level distribution of 11th-grade students at State Islamic Senior Highschool Cimahi prior to receiving progressive muscle relaxation therapy is as follows. Out of a total of 36 respondents over the three-day period, the majority 23 students (63.9%) were in the mild anxiety category, while a smaller portion 13 students (36.1%) were in the moderate anxiety category. These data indicate that all respondents experienced varying levels of anxiety before the intervention was conducted.

Table 2 Overview of Anxiety Levels After Progressive Muscle Relaxation Therapy

Anxiety Levels	Frequency	Percentage (%)
No anxiety	33	91,7
Mild anxiety	3	8,3
Moderate anxiety	0	0
Severe anxiety	0	0
Very severe anxiety	0	0
Total	36	100

Based on Table 2, the distribution of anxiety levels among 11th-grade students at State Islamic Senior Highschool Cimahi after receiving progressive muscle relaxation therapy for three consecutive days is as follows. The results show that the majority of students 33 individuals (91.7%) were in the no anxiety category, while only a small number 3 students (8.3%) remained in the mild anxiety category. These findings indicate a reduction in anxiety levels following the intervention in the form of progressive muscle relaxation therapy.

Table 3 Statistical Test Results on the Effect of Progressive Muscle Relaxation Therapy on Reducing Anxiety Levels among 11th Grade Students at State Islamic Senior Highschool Cimahi

		Anxiety levels after Progressive Muscle Relaxation Therapy			Total	p
		No anxiety	Mild anxiety	Moderate anxiety		
Anxiety levels before Progressive Muscle Relaxation Therapy	No anxiety	0	0	0	0	0,001
	Mild anxiety	23	0	0	23	
	Moderate anxiety	10	3	0	13	
	Total	33	3	0	36	

From Table 3, the data show that before the intervention, 23 respondents experienced mild anxiety and 13 respondents experienced moderate anxiety. After the progressive muscle relaxation therapy was administered, 33 students were in the no anxiety category, and 3 students remained in the mild anxiety category.

The results yielded a p-value = 0,001 < α 0.05. Therefore, it can be concluded that there is a significant difference in anxiety levels before and after the intervention, meaning that progressive muscle relaxation therapy has a significant effect on reducing anxiety levels among 11th-grade students at State Islamic Senior Highschool Cimahi.

DISCUSSION

This study examined the effectiveness of progressive muscle relaxation therapy (PMR) in reducing anxiety levels among grade XI students at MAN Kota Cimahi. The findings demonstrated a significant decline in anxiety after three consecutive days of PMR, supporting its use as a simple, non-pharmacological intervention for adolescent mental health.

Before the intervention, all respondents experienced some degree of anxiety, categorized as mild or moderate. Following PMR, the majority shifted to the no-anxiety category, with only a small proportion remaining mildly anxious. These results confirm that PMR can help adolescents manage psychological stressors linked to academic demands, consistent with definition of anxiety as an emotional response to vague threats and uncertainty (Agustina 2023; Stuart 2016).

The effectiveness of PMR is explained by its physiological basis: alternating muscle tension and relaxation activates the parasympathetic nervous system, promoting reductions in heart rate, blood pressure, and stress-related somatic symptoms (Chodavadia et al. 2023).

This mechanism helps students recognize bodily tension and develop greater control over stress responses, thereby reducing both physical and psychological anxiety symptoms.

These findings are consistent with prior studies that demonstrated the effectiveness of short-term PMR interventions reported reductions in somatic anxiety symptoms (Annisa and Ifdil 2016). While the other studies found significant decreases in anxiety levels after three days of therapy (Amalia and Kartika 2024), (Tiara Nurbaiti Nusa et al. 2023), and (Nekada* et al. 2023). A previous study documented an average reduction of 4.58 points in anxiety scores (Nova, Damanik, and Wahyuni 2024). The other study observed significant pre–posttest differences using the paired t-test. Together, these studies reinforce the conclusion that PMR is effective even when implemented over a short period (Toqan et al. 2022) .

The unique aspect of this study lies in its modification of the standard therapy position. Unlike the usual seated-on-chair protocol, PMR was delivered in a seated position on the floor with legs extended, adjusted to the available facilities. Despite this deviation from SOP, the intervention still produced significant improvements, suggesting that PMR remains effective in alternative positions. This finding broadens the applicability of PMR, particularly in educational settings with limited infrastructure.

From the perspective of Orem’s self-care deficit nursing theory, these results align with the supportive educative system, where nurses or facilitators provide guidance and training that empower individuals to care for themselves (Unique 2022). In this context, PMR not only reduced anxiety during the study but also equipped students with practical skills they can apply independently in future stressful situations, such as exams.

The practicality of PMR is a major strength. It is low-cost, requires no equipment, and can be taught to teachers, school health workers, or counselors. Implementing PMR in schools may enhance students’ emotional well-being, concentration, and resilience, contributing to both academic performance and long-term psychological health.

CONCLUSION

Based on the findings of this three-day study, which aimed to examine the effect of progressive muscle relaxation therapy on anxiety levels, it was found that prior to the intervention, 23 students (63.9%) were in the mild anxiety category and 13 students (36.1%) were in the moderate anxiety category. Following the intervention, 33 students (91.7%) were classified as having no anxiety, while only 3 students (8.3%) remained in the mild anxiety category. The results of the paired sample parametric test yielded a p-value of 0,001, which is less than the significance level of $\alpha = 0.05$, indicating a statistically significant difference in anxiety levels before and after the application of progressive muscle relaxation therapy among 11th grade students at the State Islamic Senior High School.

RECOMMENDATIONS

Future studies on progressive muscle relaxation therapy for reducing anxiety in adolescents should consider implementing longer intervention periods or follow-up assessments to evaluate the sustainability of its effects over time. Researchers are encouraged to expand the sample size and include participants from diverse educational settings to enhance the generalizability of the findings. It is also recommended to control for potential confounding factors, such as academic workload, personal stressors, and sleep quality, which may influence anxiety levels. Moreover, incorporating a control group or comparing progressive muscle relaxation with other non-pharmacological interventions could provide stronger evidence of its effectiveness. Finally, qualitative approaches, such

as interviews or focus group discussions, may be integrated to gain deeper insights into participants' experiences and perceptions of the therapy.

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