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Effect of combined guided imagery and lavender aromatherapy on anxiety levels among twelfth-grade students

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Abstract

Background: Adolescence is a transitional period characterized by physical, psychological, and social changes that can increase the risk of anxiety. Uncontrolled anxiety can affect mental health, learning concentration, and adolescents' ability to adapt. Guided imagery and lavender aromatherapy are non-pharmacological therapies that can provide a relaxing effect, thus helping to reduce anxiety levels.

Purpose: To determine the effect of the combination of guided imagery and lavender aromatherapy on the anxiety levels of twelfth-grade students.

Method: A pre-experimental design with a one-group pre-test and post-test approach. The sample consisted of 36 respondents selected using purposive sampling. Anxiety levels were assessed using a teenage anxiety questionnaire. Data were analysed using univariate and bivariate analysis with a paired t-test.

Results: Based on the research results, the average anxiety level before the intervention was 30.83 ± 2.823 and decreased to 17.25 ± 3.467 after the intervention. The Paired T-Test results showed a p-value < 0.001 , indicating that there is an effect of the combination of guided imagery and lavender aromatherapy on anxiety levels in adolescents.

Conclusion: The combination of guided imagery and lavender aromatherapy is effective in reducing anxiety levels in twelfth-grade students.

Keywords: Adolescents; Anxiety; Guided Imagery; Lavender Aromatherapy.

INTRODUCTION

Adolescent health has become a global issue because, at the ages of 10–19, teenagers face various physical, mental, and social changes that affect their quality of life. The World Health Organization reports that about 5.3% of adolescents aged 15–19 experience anxiety disorders, while globally, anxiety disorders affect 4.4% of the world population (World Health Organization, 2021). In Indonesia, around 20–30% of adolescents experience health problems, including mental disorders, influenced by the transition to adulthood as well as social and academic pressures (Kim, Jang, Lee, & Kim, 2022). Mental health problems among adolescents are increasingly evident, especially among 12th-grade high school students who face

academic demands, final evaluations, and preparation for the future. INAMHS indicates that almost one-third of adolescents experience mental health problems, with around 2.45 million diagnosed with anxiety or depression disorders. The 2023 Adolescent Mental Health Factsheet also reports that 3.7% of adolescents aged 10–17 show symptoms of anxiety (Febriana, Rochmawati, Setyowati, & Susanto, 2026). Most students experience moderate to high anxiety before exams, which affects academic performance (Zhou, Wang, Yang, Yang, Zhang, Guo, & Chen, 2020). In Tangerang Regency, the prevalence of emotional mental disorders reaches 9.8% among residents over 15 years old (Triwahyuni, Zukhra, & Jumaini, 2021).

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Excessive anxiety can disrupt physiological, social, and academic functions, thus requiring proper management. Anxiety management can be carried out through pharmacological or non-pharmacological approaches. For mild to moderate anxiety, a non-pharmacological approach is more recommended because it is relatively safe, has minimal side effects, and is easy to apply in the school environment. One effective non-pharmacological intervention is guided imagery and lavender aromatherapy. Guided imagery is a relaxation technique based on directed imagination that helps reduce physiological tension and anxiety symptoms through stimulation of the parasympathetic nervous system (Zemla, Sedek, Wróbel, Postepski, & Wojcik, 2023). That 15 minutes of guided imagery is effective in reducing stress and improving attention focus (Zhang, Dimitriou, & Halstead, 2021). Meanwhile, lavender aromatherapy through inhalation of *Lavandula angustifolia* essential oil containing linalool and linalyl acetate provides sedative and anxiolytic effects on the brain's limbic system (Amitani, Nishi, Sagiyama, Fukumoto, Funakoshi, Takayanagi, & Asakawa, 2023). That inhaling lavender for 10 minutes can significantly increase relaxation and reduce stress (Hu, Liu, Zhao, Bi, Cao, Liu, & Yang, 2023). Separately, guided imagery and lavender aromatherapy have been shown to be effective in reducing anxiety. However, research on the combination of the two among high school adolescents is still limited. The combination of cognitive relaxation through guided imagery and sensory stimulation through lavender aromatherapy is believed to provide a synergistic effect on the autonomic nervous system, thereby producing more optimal relaxation. The combination of the two interventions was effective in reducing anxiety in preoperative fracture patients (Bachtar, Marsaid, Hidayah, & Ciptaningtyas, 2025). Another study on nursing students also showed that the combination of deep breathing relaxation and lavender aromatherapy was effective in reducing anxiety when facing laboratory skills exams (Sreeraj, Parija, Uvais, Mohanty, & Kumar, 2017). The combination of guided imagery and lavender aromatherapy could improve sleep quality in adolescents, which was related to a decrease in anxiety and an increase in physiological relaxation (Ningsih & Rifai, 2024). Nevertheless, most research still focuses on adult and clinical populations, so empirical evidence regarding the

effectiveness of the combination of guided imagery and lavender aromatherapy in 12th-grade high school students is still limited. This condition indicates a research gap that needs to be further examined. Nurses play an important role as implementers, educators, and supervisors of interventions, including guiding the practice of guided imagery, lavender aromatherapy, and monitoring students' responses. In addition, nurses also play a role in stress management education, early detection of anxiety, and strengthening adolescents' emotional resilience to maintain students' mental health optimally.

Based on a preliminary study through an 18-question anxiety questionnaire and interviews with 14 twelfth-grade students, some students experience anxiety related to academic demands and future preparation. Symptoms that appear include restlessness, tension, difficulty concentrating, palpitations, and sleep disturbances. Students also show responses such as withdrawing, procrastinating, daydreaming, crying, as well as diverting attention by playing gadgets or sleeping excessively. The interview results indicate that there is not yet a specific program from the school to help overcome students' anxiety. These findings emphasize the need for easily applicable non-pharmacological interventions to reduce students' anxiety levels (Gruber, Gauthier-Gagne, Voutou, Somerville, Saha, & Boursier, 2021).

RESEARCH METHOD

A quantitative research design with a pre-experimental approach using a one-group pretest-posttest design was employed. The study was conducted at Senior High School 25 Tangerang Regency from March 9 to 12, 2026. The research procedure began with an explanation of the study objectives, obtaining written informed consent from participants, and screening respondents based on the predefined inclusion and exclusion criteria. The intervention, consisting of a combination of guided imagery and lavender aromatherapy, was administered for three consecutive days. The research sample consisted of 36 twelfth-grade students experiencing moderate anxiety, selected using a non-probability sampling technique, namely purposive sampling, with proportional sample allocation across each class. The study used an adolescent anxiety questionnaire adapted and modified by Ways AlQorny (2023). The instrument

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consists of 16 self-administered items measured on a five-point Likert scale ranging from 1 (never) to 5 (always). The questionnaire assesses the frequency of anxiety symptoms experienced by adolescents across physical, cognitive, emotional, and behavioral dimensions, with higher total scores indicating greater levels of anxiety. The total score is categorized into anxiety levels according to the established scoring guidelines. Prior to data collection, the instrument underwent psychometric testing. The validity test demonstrated that all 16 items were valid, with the lowest Pearson correlation coefficient of 0.392, exceeding the critical R-value of 0.361. Reliability testing showed excellent internal consistency, with a Cronbach's Alpha coefficient of 0.911, indicating that the instrument was highly reliable for measuring anxiety among adolescents.

The combination intervention of guided imagery and lavender aromatherapy was administered for 15

minutes per session over three consecutive sessions. Guided imagery was delivered through structured verbal instructions that encouraged participants to imagine peaceful and relaxing environments, while lavender aromatherapy was administered via inhalation to promote relaxation and alleviate anxiety symptoms. Univariate analysis was performed to describe the demographic characteristics of the respondents and the distribution of anxiety levels before and after the intervention. Data normality was assessed using the Shapiro-Wilk test. The results showed a pretest significance value of 0.185 and a posttest significance value of 0.383 ($p > 0.05$), indicating that the data were normally distributed. Therefore, bivariate analysis was conducted using the paired-samples t-test to examine the effect of the combined guided imagery and lavender aromatherapy intervention on anxiety levels among twelfth-grade students.

RESEARCH RESULTS

Table 1. Distribution of Respondent (N= 36)

Variable	Results
Age (Mean$\pm$SD)(Range)(Year)	(16.8 $\pm$ 0.9)(15–18)
Gender (n/%)	
Male	9/25.0
Female	27/75.0
Anxiety Levels Before Intervention (Pre-Test) (n/%)	
Not	0/0.0
Mild	0/0.0
Moderate	36/100.0
Anxiety Levels After Intervention (Post-Test) (n/%)	
Not	4/11.1
Mild	32/88.9
Moderate	0/0.0

Based on Table 1, the respondents had a mean age of 16.8 $\pm$ 0.9 years, with an age range of 15–18 years. Most respondents were female (27; 75.0%), while 9 respondents (25.0%) were male. Before the intervention (pre-test), all respondents (36; 100.0%) experienced moderate anxiety, with no respondents categorized as having no anxiety or mild anxiety. After the intervention (post-test), the respondents' anxiety levels improved, with 32 respondents (88.9%) experiencing mild anxiety and 4 respondents (11.1%) reporting no anxiety. No respondents remained in the moderate anxiety category after the intervention.

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Table 2. Average Anxiety Levels Before and After Intervention (n=36)

Variable	Min- Max	SD	Mean	Mean Difference
Pre-Test	26-36	2.823	30.83	13.58
Post- Test	10-23	3.467	17.25	

Based on Table, it is known that the average anxiety level before the intervention was 30.83 with a standard deviation of 2.823 and minimum and maximum values of 26–36. After the intervention, the average anxiety level decreased to 17.25 with a standard deviation of 3.467 and minimum and maximum values of 10–23. The difference in average anxiety levels before and after the intervention was 13.58. These results indicate a decrease in the average anxiety level after being given a combination of guided imagery and lavender aromatherapy interventions.

Table 3. Shapiro-Wilk Normality Test for Anxiety Before Intervention.

Variable	Statistic	Sig
Pre-test	0.958	0.185
Post-test	0.958	0.383

Based on Table, which shows the results of the normality test using Shapiro-Wilk, the pre-test significance value was 0.185 ($p > 0.05$) and the post-test significance value was 0.383 ($p > 0.05$). These results indicate that the pre-test and post-test data are normally distributed, so bivariate analysis was conducted using the parametric test, namely the Paired Sample t-test.

Table 4. Paired T Test Anxiety Before and After Intervention

Variable	Mean	SD	Sig
Pretest-Posttest	13.583	3.960	<0.001

Based on Table 2 of the Paired T-Test results, the mean difference between pretest and posttest anxiety scores was 13.583 with a standard deviation of 3.960. The significance value (Sig. 2-tailed) obtained was <0.001, which is less than 0.05 ($p < 0.05$). This indicates that there is a significant difference in students' anxiety levels before and after the intervention. Therefore, it can be concluded that the intervention provided has an effect on reducing anxiety levels in twelfth-grade students.

DISCUSSION

The research results showed that the majority of respondents were female, totaling 27 respondents (75%), while male respondents totalled 9 respondents (25%). Anxiety in adolescents can be influenced by various factors such as academic pressure, social environment, emotional regulation ability, and individual coping mechanisms. Females tend to have higher levels of anxiety compared to males because

females are more likely to express emotions and the psychological pressures they experience. In addition, hormonal changes and emotional sensitivity can also affect the emergence of anxiety in adolescent females. The results of this study are in line with previous research which states that women are more vulnerable to experiencing anxiety compared to men due to differences in emotional and psychological responses to stressors. However, the level of anxiety in adolescents can also be influenced by environmental factors, social support, and an individual's ability to cope with academic and social pressures (Farhane-Medina, Luque, Tabernero, & Castillo-Mayén, 2022).

The study results showed that before being given the combined intervention of guided imagery and lavender aromatherapy, all respondents experienced moderate anxiety, totalling 36 respondents (100%) with a mean score of 30.83. This condition indicates that twelfth-grade students are vulnerable to

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experiencing anxiety due to academic demands, graduation preparation, and future planning. In addition, the pressure of facing exams, academic targets, and expectations from the surrounding environment can trigger feelings of anxiety in adolescents. Anxiety in adolescents can also be influenced by negative thinking patterns, fear of failure, and inability to manage stress well. If anxiety is not addressed, the condition can affect students' learning concentration, academic motivation, and psychological health. The results of this study are in line with previous research which states that high school adolescents are a group vulnerable to experiencing anxiety due to academic pressure and psychological developmental changes (Zhao, Xu, He, & Xiang, 2022).

The research results show that after being given a combination intervention of guided imagery and lavender aromatherapy, most respondents experienced mild anxiety, amounting to 32 respondents (88.89%), while 4 respondents (11.11%) did not experience anxiety. The mean anxiety level after the intervention decreased to 17.25. These results indicate a decrease in anxiety levels after being given a combination intervention of guided imagery and lavender aromatherapy. Guided imagery helps respondents create a calming mental image, thereby increasing comfort and helping reduce psychological tension. Meanwhile, lavender aromatherapy provides a relaxation effect through stimulation of the brain's limbic system, which plays a role in regulating emotions and stress responses. The combination of these two interventions helps respondents feel more relaxed, calm, and able to control the anxiety they experience (Li, Zhou, Ru, Niu, He, & Zhou, 2021).

The results of this study are in line with previous research which shows that guided imagery and lavender aromatherapy are effective in reducing anxiety levels (Bi, Lin, Zhang, & Zhao, 2022). These non-pharmacological interventions can be a safe and easy-to-implement alternative to help reduce anxiety in school adolescents. (Pumamasari, 2018). The research results showed a decrease in anxiety levels after administering a combination intervention of guided imagery and lavender aromatherapy. The average anxiety level decreased from 30.83 in the pretest to 17.25 in the posttest, with a reduction difference of 13.58 points. The results of the Paired

Sample t-test showed a p-value of <0.001 ($p < 0.05$), which means that there is an effect of the combination of guided imagery and lavender aromatherapy on anxiety levels in the twelfth-grade students (Wang, Zhao, Zhai, Huang, Yang, Pan, & Fan, 2022).

The reduction in anxiety levels occurs because guided imagery helps respondents shift negative thoughts into more positive and calming images, thereby enhancing psychological relaxation. In addition, lavender aromatherapy provides a calming effect through stimulation of the olfactory senses, which is transmitted to the brain's limbic system, thus helping to reduce stress and anxiety responses. The combination of these two interventions works synergistically in helping respondents control emotions and reduce psychological tension. The results of this study are in line with previous research stating that guided imagery and lavender aromatherapy are effective in reducing anxiety levels in both adolescents and adults. Therefore, the combination of guided imagery and lavender aromatherapy can be one of the effective non-pharmacological interventions to help reduce anxiety in high school students (Wang, Guo, Du, Li, Wu, Guo, & Lu, 2022).

CONCLUSION

Based on the results of the study on the effect of the combination of guided imagery and lavender aromatherapy on anxiety levels in 12th-grade students, it was found that before the intervention, all respondents experienced moderate anxiety, with 36 respondents (100%) having an average anxiety score of 30.83. After the intervention, there was a decrease in anxiety levels, where 4 respondents (11.1%) were in the no anxiety category and 32 respondents (88.9%) were in the mild anxiety category, with the average anxiety score decreasing to 17.25. The Paired Sample t-test results showed a p-value of <0.001 ($p < 0.05$), thus it can be concluded that the combination of guided imagery and lavender aromatherapy has a significant effect in reducing anxiety levels in 12th-grade students.

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