

## Effectiveness of Group Counseling with Mindful Breathing Technique in Reducing Student Anxiety

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### ABSTRACT

Adolescent anxiety is a growing mental health concern, with prevalence reaching 3.7% in Indonesia, yet practical and effective school-based interventions remain limited. This study aims to examine the effectiveness of group counseling with the mindful breathing technique in reducing anxiety among students at SMA Model Terpadu Madani Palu. An experimental method with a Pretest-Posttest Control Group Design was employed, involving 20 students selected through purposive sampling, divided into an experimental group (n=10) and a control group (n=10). Anxiety levels were measured using the Social Anxiety Scale for Adolescents (SAS-A), comprising 18 valid items ( $\alpha=0.731$ ). Data were analyzed using Paired Sample t-tests and Mann-Whitney U tests in SPSS. Results showed a significant reduction in anxiety in the experimental group ( $t=6.444$ ,  $p=0.000$ , Cohen's  $d=2.04$ ), with 60% of students reaching the low-anxiety category after six intervention sessions, compared to none prior to the intervention. The Mann-Whitney U test confirmed a significant difference between groups ( $p=0.000$ ). These findings demonstrate that group counseling integrated with the mindful breathing technique is an effective, accessible, and practical strategy for reducing student anxiety in school settings.

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## 1. INTRODUCTION

Anxiety has become one of the most common mental health problems experienced by adolescents in Indonesia. Data shows that anxiety disorders, including generalized anxiety disorder, social anxiety disorder, and panic disorder, occur in 3.7% of adolescents, with 1 in 3 adolescents aged 10–17 years recorded as having mental health problems, equivalent to 15.5 million people [1]. This trend is increasingly worrying among the younger generation today; Anderson et al. [2] note that the prevalence of anxiety among

Generation Z is approaching 30%, driven by academic pressure, exposure to social media, family and global instability, and the impact of the COVID-19 pandemic. These statistics indicate that adolescent anxiety is not merely an individual psychological issue but a growing public health concern that requires systematic and evidence-based intervention, particularly within educational settings where adolescents spend most of their time.

Adolescent anxiety is an emotional response in the form of worry and fear that arises due to psychological, social, and environmental changes in the process of transitioning to adulthood [3]. When left unaddressed, anxiety can erode an individual's ability to face new challenges [1]. Nevid (2005) identified three domains of anxiety symptoms: physical (such as heart palpitations, shortness of breath, and excessive sweating), behavioral (avoidance and dependence), and cognitive (repetitive thoughts about threats that have not yet occurred) [4]. Specifically for social anxiety, its impact not only affects an individual's psychological health but also hinders their ability to build and maintain social relationships [5], which is a crucial aspect of adolescent life in school. Therefore, social anxiety in adolescents may significantly interfere with academic participation, peer interaction, and overall developmental tasks that are central to secondary school experiences.

Initial observations at the Madani Palu Integrated Model High School revealed several anxiety symptoms in students, including concerns about peer evaluation, a tendency to avoid new social situations, and physical symptoms such as increased heart rate and difficulty breathing. This condition reflects a real need for targeted interventions that can be implemented in the school environment. These observations confirm that broader statistical trends are also evident at the local institutional level, underscoring the urgency of designing structured counseling strategies tailored to students' specific needs.

One promising approach is mindfulness, particularly mindful breathing techniques. Mindfulness is defined as the ability to be fully present in the moment without judgment (Kabat-Zinn, 1994) [6], while dispositional mindfulness is a psychological resource that helps individuals cope with stressful situations [7]. In practice, breathing functions as an anchor of awareness that unifies the body and mind [8]. The application of this technique in group counseling is increasingly relevant, as it allows simultaneous support for several students through therapeutic group dynamics [9] and has been shown to strengthen emotional regulation and the quality of social relationships [10]. Integrating mindful breathing into group counseling may therefore provide both intrapersonal regulation benefits and interpersonal support mechanisms within a structured school-based intervention framework.

Several previous studies support the effectiveness of this approach. Sari et al. [11], through a systematic literature review, found that mindfulness meditation can reduce anxiety and depression while improving cognitive function. Ameliana et al. [12] empirically demonstrated a decrease in academic anxiety scores from 70.06 to 65.7 following a mindful breathing intervention among high school students. Puswiartika et al. [7] showed the role of mindfulness as a psychological protector amid conditions of uncertainty. Furthermore, deep breathing techniques have been shown to reduce anxiety responses by stimulating the parasympathetic nervous system [10], andun et al. [13]

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confirmed that brief mindful breathing training is effective in reducing situational anxiety and improving students' emotional regulation. Collectively, these findings suggest that mindfulness-based strategies hold significant potential as preventive and curative approaches to adolescent anxiety.

However, these studies still leave gaps. Sari et al. did not produce direct intervention data; Ameliana et al. did not use a control group, thus limiting causal inference; and Puswiartika et al. focused on university students, not high school students. More importantly, there have been no studies that specifically integrate the 4-7-8 breathing technique into structured group counseling sessions for adolescent social anxiety in schools, especially in areas such as Palu, Central Sulawesi, which are still underrepresented in the national guidance and counseling literature. This gap highlights the need for a rigorously designed experimental study that combines a specific breathing protocol with a structured group counseling model in a secondary school context.

This study was designed to address this gap by using a Pre-test-Post-test Control Group design, applying the 4-7-8 mindful breathing technique in six group counseling sessions [17], [18], and specifically targeting high school students' social anxiety. Three research objectives were established: (1) to map students' anxiety levels before the intervention; (2) to analyze changes after the intervention; and (3) to test the overall effectiveness of the mindful breathing-based group counseling program at Madani Palu Integrated Model High School. By employing an experimental design with a control group, this study seeks to strengthen causal inference regarding the intervention's effectiveness.

Theoretically, the results of this study are expected to enrich the study of mindfulness-based interventions in Indonesian secondary schools, especially in contexts that have been underrepresented. In practice, these findings are expected to serve as a reference for guidance counselors in designing responsive counseling services that do not interfere with academic schedules, while equipping students with independent coping skills that they can use whenever they encounter situations that trigger anxiety [7], [6]. In a broader perspective, this study aims to contribute to the development of accessible, scalable, and culturally relevant mental health interventions within the Indonesian educational system.

## **2. METHOD**

This study used a quantitative approach with a Pre-test-Post-test Control Group Design to test the effectiveness of group counseling with mindful breathing techniques in reducing student anxiety. This design was chosen because it allows researchers to compare changes in anxiety levels between the group receiving treatment (experimental group) and the group not receiving special treatment (control group), thereby controlling for external variables that may influence the research results. The use of an experimental design with a control group strengthens internal validity and enables clearer causal interpretation of the intervention's impact.

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Table 1. Pretest-Posttest Control Group Design Research Design

Group	Pretest	Treatment	Posttest
Experimental (A)	O <sub>1</sub>	X	O <sub>2</sub>
Control (B)	O <sub>1</sub>	-	O <sub>2</sub>

**Notes:**

- A = Experimental group
- B = Control group
- O<sub>1</sub> = Initial measurement (pretest) of anxiety level using the SAS-A scale
- O<sub>2</sub> = Final measurement (posttest) of anxiety level using the SAS-A scale
- X = treatment in the form of group counseling with mindful breathing technique (6 sessions × 45-60 minutes)
- (-) = No special treatment (regular group counseling without mindful breathing technique)

**Population and Sample**

The population of this study comprised all 63 students in grades X and XI at Madani Palu Integrated Model High School, including 41 female and 22 male students. The research sample was determined using purposive sampling. Lenaini (2021) explains that purposive sampling allows researchers to select participants based on specific characteristics relevant to the study's focus, rather than selecting subjects randomly or based on certain strata, and that the selection is guided by the study's specific objectives[14]. This sampling strategy was selected to ensure that participants met predefined psychological criteria relevant to the intervention being tested.

The sample selection criteria included: (1) students identified as experiencing social anxiety based on the results of initial interviews and psychological scale completion; (2) students willing to participate in the entire series of group counseling activities; and (3) students in grades X and XI. Based on these criteria, 20 students were selected and randomly divided into two groups: 10 students in the experimental group and 10 in the control group. Random assignment after purposive selection was conducted to reduce selection bias between groups and to increase comparability of baseline characteristics.

Table 2. Distribution of Population and Research Sample

Class	Population (F/M)	Total Population	Sample	Group
XI – 6	21/12	33	10	5 Experimental, 5 Control
XII – 7	20/10	30	10	5 Experimental, 5 Control
Total	41/22	63	20	10 Experimental, 10 Control

**Research Instruments**

La Greca and Lopez (1998) explain that social anxiety is a form of fear or psychological pressure that arises when individuals are in social interactions, mainly due to

concerns about negative judgments from others [15]. This form of anxiety is divided into three main aspects, namely fear of negative evaluation, a tendency to avoid and feel uncomfortable in new social situations, and general social avoidance in daily life [16]. Based on this theoretical framework, the Social Anxiety Scale for Adolescents (SAS-A) was selected as the primary instrument because it comprehensively measures these three dimensions.

This study used a quantitative, Pretest-Posttest Control Group Design to test the effectiveness of group counseling with mindful breathing techniques in reducing student anxiety. This design was chosen because it allows researchers to compare changes in anxiety levels between the group receiving treatment (experimental group) and the group not receiving special treatment (control group), thereby controlling for external variables that may influence the research results. The SAS-A instrument was administered consistently at both measurement points to ensure comparability of pretest and posttest data.

Table 3. SAS-A Instrument Blueprint

Dimension	Item Numbers	Total Items
Fear of Negative Evaluation (FNE)	2, 5, 8, 9, 12, 14, 15, 17	8
Social Avoidance and Distress - New (SAD-New)	1, 3, 4, 6, 10, 13	6
Social Avoidance and Distress - General (SAD-General)	7, 11, 16, 18	4
Total		18

Validity and Reliability Testing of Instruments: Validity testing was conducted using Pearson's Product-Moment correlation analysis in SPSS version 25. Items were considered valid if the calculated r value was greater than the table r value (0.312) at a significance level of 0.05 with a sample size of 40 students. The validity test results showed that of the 22 items tested, 18 were valid, with correlation values ranging from 0.313 to 0.639, while 4 were invalid and were removed from the instrument. Reliability testing was conducted using Cronbach's alpha in SPSS version 25. Nunnally and Bernstein (1994) stated that Cronbach's Alpha is an appropriate method for measuring the internal consistency of instruments, especially for interval score data [16]. The instrument was considered reliable if Cronbach's Alpha was  $\geq 0.70$ . The reliability test results showed a Cronbach's Alpha of 0.731, indicating that the instrument has high reliability and can be relied upon to consistently measure students' anxiety levels. These results indicate that the instrument met acceptable psychometric standards for research purposes.

Group Counseling with Mindful Breathing Techniques. Group counseling is a service in individual guidance and counseling facilitated in a small group, where the dynamics between members are used to accelerate the process of change. Prayitno & Erman (2004) explain that group counseling is an effort by counselors to help individuals who need assistance in solving their problems in a group environment [17]. Corey (2016) adds that group counseling is an effective method for overcoming emotional and social problems through a process of mutual learning and support among group members [18].

The group format in this study consisted of structured sessions designed to encourage participation, emotional expression, and peer feedback.

In the context of this study, group counseling was combined with mindful breathing techniques to provide a more comprehensive intervention in reducing student anxiety. Data Collection Procedure Data collection was carried out in three stages. First, a pretest using the SAS-A scale was administered to the entire sample on September 18, 2025, to measure the initial anxiety levels of both groups. Second, a group counseling intervention with mindful breathing techniques was conducted for the experimental group over 6 sessions (45-60 minutes) from September 25 to October 30, 2025. The mindful breathing technique applied was the 4-7-8 technique, with the following procedure: (1) participants sat upright in a relaxed position; (2) took a deep breath through the nose for 4 seconds; (3) held their breath for 7 seconds; (4) exhaled slowly through the mouth for 8 seconds; (5) the cycle is repeated according to the session stages. Each session integrated psychoeducation, guided breathing practice, group reflection, and evaluation to ensure progressive skill acquisition.

Thich Nhat Hanh (2018), a Zen Master and leading mindfulness practitioner, emphasizes that breathing serves as a bridge connecting life with awareness, uniting body and mind. According to him, awareness of the breath is the key to achieving harmony between body and mind, so mindful breathing exercises can help individuals refocus on the present moment and reduce anxiety [8]. The exercises were conducted under the guidance of researchers to ensure that the techniques were performed correctly. Meanwhile, the control group underwent regular group counseling with the same stages but without the application of mindful breathing techniques. Third, a posttest was administered using the same scale on November 1, 2025, to measure the final anxiety levels of both groups. The identical measurement procedures at pretest and posttest ensured consistency and minimized measurement bias.

#### Data Analysis Techniques

Descriptive analysis was used to describe the students' anxiety levels before and after the intervention. The pretest and posttest data were processed using a percentage formula:

$$NP = \frac{R}{SM} \times 100 \quad 1)$$

Where:

NP = Percentage Value

R = Score obtained by students

SM = Maximum Score

In addition to descriptive statistics, inferential statistical analyses were conducted to test the significance of differences within and between groups. Assumption testing, including normality tests, was performed prior to hypothesis testing to ensure the appropriateness of parametric procedures.

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### 3. RESULTS AND DISCUSSION

#### 3.1. Results

The initial measurements (pretest) showed differences in anxiety levels between the experimental group and the control group. In the experimental group (n=10), which consisted of 10th and 11th-grade students, there was 1 student (10%) who experienced high anxiety and 9 students (90%) who experienced moderate anxiety, with an average score of 70.80 (SD = 7.82). Meanwhile, in the control group (n=10), there was 1 student (10%) experiencing moderate anxiety and 9 students (90%) experiencing low anxiety with an average score of 44.90 (SD = 8.12). This baseline difference indicates that the experimental group had higher initial anxiety levels, thus requiring more intervention. These descriptive findings provide an overview of participants' initial psychological condition before treatment implementation and serve as a reference point for evaluating intervention effectiveness.

Tabel 4. Statistik Deskriptif Skor Kecemasan Pretest dan Posttest

Group	Measurement	N	Mean	SD	Min	Max	Category Distribution
Experimental	Pretest	10	70.80	7.82	62	82	High: 10%, Moderate: 90%
Experimental	Posttest	10	48.40	9.15	40	74	Moderate: 40%, Low: 60%
Control	Pretest	10	44.90	8.12	31	60	Moderate: 10%, Low: 90%
Control	Posttest	10	28.30	6.45	22	49	Low: 100%

Post-intervention measurements showed significant changes in students' anxiety levels, as shown in Figures 1 and 2. In the experimental group, the distribution of anxiety shifted to 4 students (40%) in the moderate category and 6 students (60%) in the low category, with an average score of 48.40, indicating an average decrease of 22.40 points. In the control group, all students (100%) were in the low category with an average score of 28.30. The magnitude of change in the experimental group was substantially greater for the categorical transition from moderate to low anxiety, suggesting a clinically meaningful improvement following the intervention.

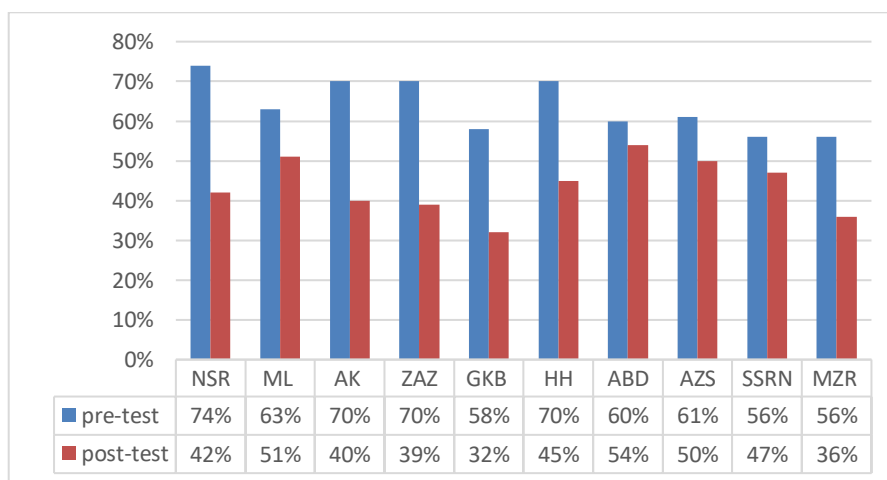


Figure 1. Comparison of pretest and posttest anxiety levels in the experimental group

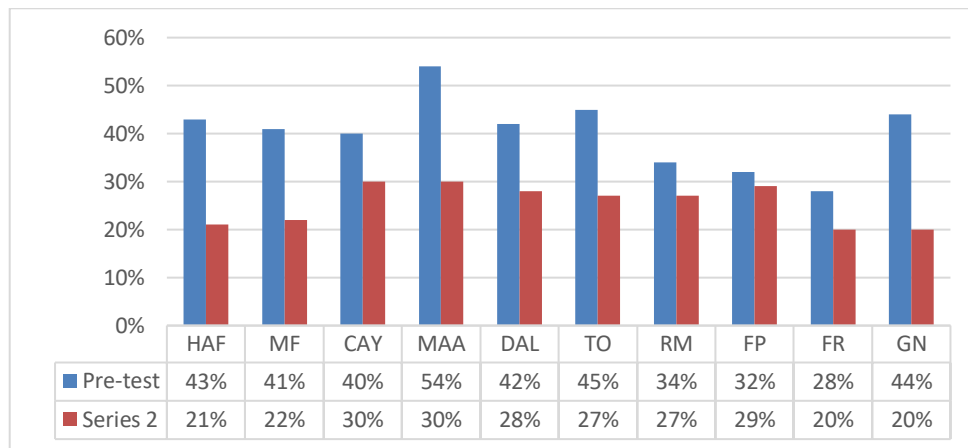


Figure 2. Comparison of pretest and posttest anxiety levels in the control group

Individual case analysis shows substantial improvement in the experimental group. For example, NSR students decreased from 82 points (74%) to 52 points (42%), while GKB students decreased from 71 points (58%) to 40 points (32%). These changes illustrate the intervention's effectiveness at the individual level. The Shapiro-Wilk normality test results show significance values for the pretest of the experimental group (0.154), posttest of the experimental group (0.947), pretest of the control group (0.904), and posttest of the control group (0.093). All significance values were greater than 0.05, confirming the normal distribution of the data and meeting the assumptions for parametric testing, as shown in Table 5. The fulfillment of normality assumptions indicates that parametric statistical procedures could be appropriately applied to test the research hypotheses.

Table 5. Shapiro-Wilk Normality Test Results

Group	Measurement	Statistic	Df	Sig.	Interpretation
Experimental	Pretest	0.886	10	0.154	Normal
Experimental	Posttest	0.977	10	0.947	Normal
Control	Pretest	0.971	10	0.904	Normal
Control	Posttest	0.867	10	0.093	Normal

The results of the Paired Sample t-test for the experimental group showed a t value of 6.444 with a significance of 0.000 ( $p < 0.05$ ), indicating a very significant difference between the pretest and posttest scores. The Mean Difference value of 24.700 shows the magnitude of the decrease in anxiety scores. The effect size calculation using Cohen's d produced a value of 2.04, indicating a very large practical significance (large effect) of the intervention. This effect size exceeds the conventional benchmark for a large effect ( $d \geq 0.80$ ), demonstrating that the intervention produced not only statistical significance but also a strong practical impact.

Table 6. Paired Sample t-test Results for Experimental Group

Comparison	Mean Difference	SD	SE	95% CI	T	df	p	Cohen's d
Pre-Post	24.700	12.120	3.833	[16.030, 33.370]	6.444	9	0.000	2.04

The Mann-Whitney U test showed a p-value of 0.000 ( $p < 0.05$ ), indicating a significant difference between the experimental and control groups after treatment. The experimental group experienced a greater reduction in anxiety than the control group, with mean ranks of 15.50 and 5.50, respectively, as shown in Table 7. These findings confirm that the anxiety reduction observed in the experimental group cannot be attributed solely to general counseling effects, but rather to the additional mindful breathing component integrated into the intervention.

Table 7. Mann-Whitney U Test Results

Variable	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Mean Rank Experiment	Mean Rank Control
Posttest Anxiety	0,000	55,000	-3,787	0,000	15,50	5,50

### 3.2. Discussion

The significant decrease in anxiety levels in the experimental group shows that mindful breathing techniques in a group counseling setting can effectively facilitate the process of regulating students' emotions. Research [19] explains that breathing techniques help individuals become calmer, more focused, and better able to manage negative emotions. These findings are consistent with research [12], which found that students who received a mindful breathing intervention showed lower anxiety scores than those who did not. [20]. It also reinforces this explanation by showing that four weeks of mindfulness-breathing meditation significantly reduced students' stress and anxiety levels. Thus, the present findings empirically strengthen previous evidence by demonstrating that even a relatively brief and structured breathing intervention can generate substantial reductions in adolescent anxiety within a school context.

The proportion of students who achieved the low anxiety category in the experimental group indicates that this intervention not only reduced scores statistically but also produced clinically meaningful changes. The change in anxiety category from moderate to low shows that students experienced a real improvement in quality of life, where they were better able to manage situations that previously triggered excessive anxiety [13]. explains that group counseling services that provide mindful breathing techniques and emotional support to students can reduce the likelihood of higher anxiety [11]. found a significant relationship between effective mindfulness practices and lower student anxiety levels, with students who practiced mindful breathing techniques regularly reporting less anxiety. These categorical shifts suggest that the intervention did not merely affect numerical outcomes but also altered students' functional emotional responses in everyday academic and social situations.

The difference in the pattern of decline between the experimental and control groups, even though both declined in scores, indicates a specific effect of the mindful breathing technique. The decline experienced by the control group was likely due to the general therapeutic effects of the group counseling process itself, such as social support and emotional catharsis. However, the experimental group showed more substantial changes in the proportion of students who reached the low category, indicating that the addition of mindful breathing techniques provided significant added value [21]. mentions that needs-based interventions tailored to students' anxiety problems result in lower anxiety levels and higher psychological well-being compared to conventional approaches. Therefore, the integration of a structured breathing protocol appears to function as an active therapeutic component beyond the general benefits of group interaction alone.

The psychological mechanism behind the effectiveness of mindful breathing techniques can be explained through emotion regulation theory [22]. states that the inability to manage negative emotions exacerbates anxiety, and by providing practical and easy-to-apply mindful breathing skills, counselors help students manage these emotional responses. When students encounter anxiety-inducing situations such as exams or social interactions, they tend to experience automatic negative thoughts that trigger physiological stress responses. Mindful breathing techniques break this cycle by shifting attention to breathing sensations, providing a cognitive pause that allows students to respond to situations more adaptively [23]. adds that mindful breathing interventions have been shown to improve students' ability to adapt to academic and social pressures, which indirectly reduces the burden of anxiety. From a neurophysiological perspective, controlled breathing activates the parasympathetic nervous system, reducing physiological arousal and facilitating cognitive reappraisal, which supports adaptive coping.

This is in line with the findings [6], which show that structured mindfulness psychoeducation programs in a group format can improve participants' understanding and skills in applying mindfulness techniques to maintain mental health, with participants' satisfaction levels in the very green range regarding the program material and its implementation. The consistency between the present findings and previous psychoeducational mindfulness programs suggests that structured guidance and repeated practice are critical elements in achieving sustainable emotional regulation outcomes.

Group dynamics in the counseling process play an important role in strengthening the effectiveness of the techniques taught. The group setting provides an opportunity for students to observe how their peers handle similar anxieties, thereby reducing feelings of isolation and increasing motivation to apply the techniques they have learned. Corey (2016) adds that group counseling is an effective method for addressing emotional and social problems through a process of mutual learning and support among group members [18]. In the context of this study, group counseling is combined with mindful breathing techniques to provide a more comprehensive intervention in reducing student anxiety. The interaction between peer modeling and individual breathing practice may have enhanced participants' internalization of coping skills.

The similarity in effectiveness between the mindful breathing technique in this study and the self-instruction technique reported by [24] indicates that self-awareness-

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based interventions and cognitive regulation have complementary mechanisms of action in overcoming adolescent anxiety [24]. showed that individual counseling using self-instruction techniques was effective in reducing academic anxiety in gifted children at Golden Gate Palu Junior High School, with a significant decrease in anxiety scores. This similarity indicates that both breathing-based and self-instruction approaches train students to develop internal control over their anxiety responses. These parallels reinforce the theoretical assumption that strengthening internal cognitive and attentional control mechanisms is central to anxiety reduction interventions.

The simple nature of mindful breathing techniques and the lack of specialized equipment required contribute to the sustainability of the practice [25]. A literature review reinforces that mindfulness-based interventions, including breathing exercises, mindfulness meditation, and emotional regulation, help minimize student anxiety. Students who have mastered these techniques have coping tools that can be immediately accessed when faced with anxiety-provoking situations, without relying on the presence of a counselor or formal setting. This increases students' sense of control over their emotional state, which is an important protective factor against anxiety. Such accessibility makes the intervention particularly suitable for school environments with limited mental health resources.

The relatively short duration of the intervention, yet its resulting significant changes, demonstrate the efficiency of this technique in the context of school guidance and counseling services. The systematic implementation of a group counseling program using mindful breathing techniques by guidance counselors has the potential to be an effective strategy for mitigating the psychological impact of anxiety on students while holistically improving the quality of guidance and counseling services. This intervention can be integrated into responsive service programs without disrupting students' academic schedules, making it a practical and realistic option for implementation in schools. Accordingly, this model may serve as a scalable prototype for school-based mental health promotion initiatives.

The limited sample size in this study limits the ability to generalize the findings to a broader population of high school students. Variations in individual characteristics such as initial anxiety severity, history of mental health problems, and social support outside the research setting may influence the response to the intervention, but cannot be explored in depth with a limited sample. The relatively short duration of the intervention also did not allow for an evaluation of the long-term effects and the consistency of students' independent practice after the intervention ended, thus requiring further research with a follow-up design to confirm the sustainability of the benefits. Future studies employing larger samples, randomized controlled designs, and longitudinal follow-up assessments are necessary to strengthen the generalizability and durability of these findings.

#### **4. CONCLUSION**

This study demonstrates that group counseling integrated with the mindful breathing technique constitutes an effective, accessible, and practically applicable intervention for reducing social anxiety among high school students. The intervention succeeded in producing clinically meaningful reductions in student anxiety levels, with the

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majority of students in the experimental group transitioning from moderate to low anxiety categories after six structured sessions. The underlying mechanism of this effectiveness operates through emotion regulation: the 4-7-8 mindful breathing technique activates the parasympathetic nervous system, interrupts cycles of automatic negative thinking, and cultivates students' internal capacity to self-regulate their emotional responses. The group counseling format further amplified these effects by fostering peer social support, normalizing shared anxiety experiences, and creating a safe environment for interpersonal learning and mutual encouragement.

The findings of this study carry significant theoretical and practical implications. Theoretically, this study contributes to the growing body of evidence supporting mindfulness-based interventions as legitimate and effective approaches within the school guidance and counseling framework, particularly for adolescent populations in Indonesian educational contexts. It reinforces the theoretical proposition that emotion regulation capacity — when cultivated through structured, brief, and repeatable breathing exercises — can produce substantive improvements in psychological well-being even within a short intervention window. In practice, the results strongly recommend that school guidance and counseling teachers incorporate the mindful breathing technique as a core component of responsive counseling services. Because this technique requires no special equipment, can be conducted within the school schedule, and produces observable results within six sessions, it offers a cost-effective and scalable model for managing student anxiety at the institutional level. School administrators are similarly encouraged to create supportive policies and dedicated time allocations for mental health interventions of this nature as part of a holistic student welfare program.

This study is not without limitations that must be acknowledged. First, the relatively small sample of 20 students from a single school limits the generalizability of the findings to a broader, more diverse high school population. Second, the purposive sampling method, while appropriate for targeting students with identified anxiety characteristics, introduces the possibility of selection bias. Third, the study did not include a follow-up measurement after the intervention concluded, leaving the long-term durability of anxiety reduction unverified. Fourth, individual-level factors that may moderate intervention effectiveness — such as pre-existing mental health history, quality of social support outside the school environment, and student personality traits — could not be controlled or deeply explored given the current study design. These limitations reduce the degree to which causal conclusions can be drawn and highlight the importance of replication across varied contexts.

Future research should address these limitations by employing randomized controlled trial designs with larger, more diverse samples drawn from multiple schools and regions, thereby enabling stronger causal inferences and greater generalizability. Incorporating post-intervention follow-up assessments at 1, 3, and 6 months would allow researchers to evaluate the sustainability of the therapeutic gains. Future studies should also explore potential moderating variables, including student gender, baseline anxiety severity, academic pressure levels, and the quality of family and peer support systems, to determine which subpopulations benefit most from this type of intervention. The

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development of a standardized, documented mindful breathing group counseling protocol with detailed session guides, fidelity checklists, and facilitator training materials would further facilitate replication, quality assurance, and broader adoption across diverse school settings. For the general public — particularly parents, educators, and policymakers — this study highlights that adolescent anxiety is a pressing and growing mental health concern that demands proactive, evidence-based attention. It affirms that simple, non-pharmacological, and school-integrated strategies such as mindful breathing are not only scientifically supported but also humanly accessible to adolescents regardless of socioeconomic background, making them a valuable tool for building a generation with stronger emotional resilience and mental health literacy.

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