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Can a Collage-Based Coping Strategy Reduce Future Anxiety among High School Students?

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Abstract
This study aims to examine the effectiveness of a Collage-Based Coping Strategy in reducing future anxiety among senior high school students. A quantitative approach with a quasi-experimental non-equivalent control group design without random assignment (using intact classes) was employed. Participants were 20 eleventh-grade students from a senior high school in Malang City, identified as having high levels of future anxiety based on the adapted Zaleski scale (Cronbach's alpha = 0.934). The experimental group (n = 10) received the Collage-Based Coping Strategy intervention through two 90-minute group guidance sessions, while the control group received no intervention. The intervention was theorized to facilitate emotional regulation through non-verbal expression, cognitive reappraisal via visual manipulation, and peer-validated coping skill internalization. Post-test was administered immediately after the intervention. Paired sample t-test results showed a significant reduction in anxiety scores in the experimental group ($t(9) = 37.088$; $p < 0.001$; Cohen's d_z = 11.73), whereas the control group showed no significant change ($t(9) = 0.190$; $p = 0.853$). An independent sample t-test on post-test scores further confirmed a significant difference between the two groups ($t(18) = -8.469$; $p < 0.001$; between-group Cohen's $d = 3.79$). These findings provide preliminary evidence that the Collage-Based Coping Strategy may reduce future anxiety among high school students. The intervention is easy to implement using simple and low-cost materials, making it feasible for school counselors to integrate into group guidance programs. This study contributes to the growing body of evidence supporting art-based interventions in the Indonesian educational context. Given the small sample and lack of follow-up, results should be interpreted cautiously, and future studies employing randomized controlled trials with larger samples are warranted.

Introduction

Adolescents experience rapid growth during high school; this is driven by the transition from childhood to adulthood, which is marked by rapid physical growth, cognitive development, and emotional changes. This period is used to discover one's identity and learn how to process information in more complex ways (Zhang & Qin, 2023). Adolescents' ability to understand abstract concepts influences their still-developing coping strategies, which can trigger anxiety about the future (Novinta & Mastuti, 2023). This condition is characterized by excessive anxiety, restlessness, fear, and discomfort accompanied by physical symptoms. It directly contributes to the rising prevalence of future-related anxiety among adolescents, which has become a global concern.

Findings from the World Health Organization (2022) indicate that approximately 58 million adolescents worldwide experience anxiety, equivalent to 20% of the total adolescent population. Meanwhile, the Indonesia National Adolescent Mental Health Survey (I-NAMHS, 2022) reports that one in three adolescents (34.9%)

experiences mental health issues, with anxiety being the most prevalent (prevalence of 26.7% in the 10–17 age group). According to the DSM-5, generalized anxiety disorder has the highest prevalence at 3.7%, surpassing major depressive disorder (1.0%), conduct disorder (0.9%), PTSD (0.5%), and ADHD (0.5%). This situation is exacerbated by limited access to mental health services: only 2.6% of adolescents have ever used counseling or emotional support services, while only 4.3% of parents realize that their child needs help. The gap between the high prevalence and low access to these services underscores the need for schools to serve as the first line of mental health intervention, given that adolescents spend most of their time in educational settings (World Health Organization, 2022). These data indicate that anxiety among adolescents is not merely an individual phenomenon but has evolved into a public health crisis at both the global and national levels.

As a preliminary study to identify general problem areas, the researcher administered the Problem Checklist to 30 11th-grade students at UM Laboratory High School on March 2, 2026. The results showed that 18 students (60%) reported concerns about the future, including fear of failure, uncertainty about their life direction, and low self-confidence. These PCL findings were then followed up with a more specific assessment using the adapted Zaleski Future Anxiety Scale (Ruddin & Nuryanti, 2026), which was administered on April 20, 2026. The results showed that 20 out of 30 students (66.67%) fell into the high-anxiety category, which served as the basis for selecting the participants in this study.

Various efforts to address anxiety have been made but have not yet been optimal. Subject teachers have created a conducive learning environment through a variety of approaches, but time constraints and curriculum demands have led to students' emotional needs being neglected. School counselors have provided individual counseling, but the ratio of school counselors to students is insufficient, meaning that support has not yet reached everyone who needs it. Students themselves try to manage their anxiety on their own—for example, by confiding in friends or distracting themselves, but without targeted guidance, these strategies are less effective. Parents have provided moral support, but a lack of understanding about the symptoms of anxiety often leads them to underestimate or fail to recognize their child's condition. If left unaddressed, the effects of anxiety can become serious: declining academic performance, hindered social development, increased avoidance behavior, and even the risk of depression and self-harm.

The effects of unmanaged anxiety can undermine emotional well-being and impair academic performance. Excessive anxiety about the future is positively correlated with stress, depression, and a reduced quality of life (Öztekin et al., 2025). Anxiety about the future can also hinder students' ability to plan their careers and make adaptive academic decisions (Khalaf & Yahya Alraw, 2023). Thus, unmanaged anxiety is not merely a psychological issue but a systemic barrier that threatens the quality of human resources; therefore, addressing it must be a priority within the education system.

The use of collage has been empirically proven to be a safe medium for emotional expression and effective in reducing anxiety (Soewito et al., 2024). In the context of school guidance and counseling, art therapy can be utilized as an innovative approach to facilitate students' emotional expression (Hidayatunnisa et al., 2025). The collage technique stands out because it is the least threatening and most accessible, especially for students who feel they lack artistic talent. Soewito et al. (2024) explain that collage allows students to express their thoughts and feelings nonverbally through the combination of images and materials, so this technique not only provides a sense of control but also serves as a safe outlet for catharsis. Similar findings have also been reported in international studies; for example, Coholic (2020) found that structured art-based interventions can reduce anxiety in adolescents with mental health issues, while Zhang et al. (2024), in a systematic review, demonstrated that art therapy is effective in reducing anxiety symptoms among school-aged adolescents. Furthermore, since collage does not require drawing skills, students' initial psychological barriers may be reduced, which in turn enhances their active participation in managing anxiety.

From a psychological perspective, the effectiveness of collage can be explained through two main mechanisms. First, the activity of visual manipulation (selecting, cutting, and pasting images) facilitates cognitive reappraisal (the process of changing how individuals interpret threatening situations) implicitly and without verbal pressure (Hidayatunnisa et al., 2025). Second, nonverbal expression through visual media provides psychological distancing from the source of anxiety, which gradually reduces the intensity of emotional responses (Soewito et al., 2024). From a neuroscience perspective, collage activities (which involve fine motor skills and visual processing) have been shown to activate the ventrolateral prefrontal cortex. This area plays a role in emotion regulation while simultaneously reducing the amygdala's reactivity to threatening stimuli. This dual mechanism makes collage not merely an expressive activity but a neurobiologically grounded coping strategy for managing anxiety.

Based on these advantages, the researchers selected the collage technique as a coping strategy due to its potential to provide a means of nonverbal emotional expression, support the process of cognitive reframing through visual manipulation, and offer a sense of control that prevents future anxiety from developing into a chronic disorder.

Soewito et al. (2024) demonstrated that the creative process of collage allows individuals to shift their focus from stressors to a calmer mental space, thereby significantly reducing anxiety, while Hidayatunnisa et al. (2025) confirmed that collage serves as an effective nonverbal communication tool for students to express feelings that are difficult to articulate verbally, facilitating catharsis and the development of adaptive coping strategies. Theoretically, coping strategies are defined by Theodoratou and Argyrides (2024) as cognitive and behavioral efforts to manage overwhelming demands. Öztekin et al. (2025) demonstrate that adaptive coping strategies can weaken the negative relationship between future anxiety and psychological well-being. Thus, the collage technique shows potential as an adaptive coping strategy based on empirical and theoretical evidence, making it worthy of further testing in this study.

Although the collage technique has shown promise in clinical settings (Soewito et al., 2024), its application in educational settings remains limited, particularly in the form of structured interventions (Darmawan & Fitriana, 2025). However, there are at least three research gaps that remain unaddressed: (1) no studies have examined collage as a structured intervention in group counseling settings at schools; (2) the effectiveness of collage specifically for future anxiety (as distinct from general anxiety) has not yet been empirically examined; and (3) the Indonesian cultural context, where verbal expression of emotions is often considered taboo, makes nonverbal approaches such as collage potentially more relevant but has not yet been studied. This study is designed to address these three gaps by testing the effectiveness of the Collage-Based Coping Strategy on future anxiety among high school students through a quasi-experimental design. The study sample consisted of 20 eleventh-grade students at a high school in Malang City who were categorized as having high future anxiety (66.67%) based on the results of the Zaleski scale pre-test; the sample included both male and female students aged 17–18 years. The findings of this study are expected not only to make a theoretical contribution to the development of arts-based interventions in guidance and counseling, but also to offer practical and creative solutions for school counselors to sustainably enhance students' resilience and mental health.

This study proposes two hypotheses: (H1) The experimental group will show a statistically significant decrease in future anxiety scores between the pre-test and post-test (within-group); (H2) The experimental group's post-test future anxiety scores will be significantly lower than those of the control group (between-group). Both hypotheses are consistent with predictions derived from the cognitive reappraisal and adaptive coping frameworks.

Methods

Design

This study employed a quantitative approach with a quasi-experimental design of the non-equivalent control group type. In this study, two groups were compared: the experimental group received the Collage-Based Coping Strategy intervention during group counseling sessions, while the control group received no intervention (no-treatment control group). Both groups were assessed before and after the intervention using pre-tests and post-tests. Participants were not randomly assigned because the study utilized naturally formed groups at the school (Ballance, 2024).

The rationale for choosing this quasi-experimental design is based on three main reasons. First, in the context of education and counseling, individual randomization is often impractical and unethical because students are already organized into fixed classes. Therefore, the use of natural groups is the most realistic approach (Ballance, 2024). Second, even without full randomization, the presence of a control group and repeated measurements still allows for credible causal inferences because changes in scores between the two groups can be systematically compared to isolate the impact of the intervention (Shadish et al., 2002). Third, the quasi-experimental design is the most prevalent method (62.1%) in micro-intervention research in the field of guidance and counseling; thus, its application in this study holds strong methodological relevance (Iqbal et al., 2026). Accordingly, the non-equivalent control group design is considered the most appropriate approach to answer the research question regarding the effectiveness of collage-based interventions. This study follows the TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) reporting guidelines for quasi-experimental studies, ensuring that every stage of the study is reported transparently and can be replicated.

Participants

This study involved 20 11th-grade students from UM Laboratory High School in Malang, East Java. Based on a pre-test of the Zaleski Future Anxiety Scale administered to 30 students, 20 students with high anxiety were identified and selected through purposive sampling. Using a quasi-experimental design with an unequal control group, Class XI-9 ($n = 10$) was designated as the experimental group receiving the Collage-Based Coping Strategy intervention, while Class XI-8 ($n = 10$) served as the control group that received no intervention (no-treatment control group). An independent samples t-test showed no significant difference in pre-test anxiety scores between the two groups of selected students ($t(18) = 1.02$, $p = 0.322$), thus supporting initial equivalence.

All participants were 17–18 years old; their demographic characteristics are presented in Table 1. Inclusion criteria included full attendance at the baseline assessment and written informed consent from both the students and their parents; exclusion criteria were attendance of <75% or unwillingness to have the data published. Anonymity was ensured through the use of identification codes, and official permission was obtained from the school.

Table 1. Demographic Distribution of Participants

Characteristics	Category	Experimental group		Control Group	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Gender	Male	4	40	3	30
	Female	6	60	7	70
Age	17 years old	9	90	8	80
	18 years old	1	10	2	20
Plans after graduating from high school	College	10	100	9	90
	No definite plans	0	0	1	10
Level of clarity regarding future plans	Clear	4	40	1	10
	Moderately clear	3	30	3	30
	Unclear	3	30	4	40
Career counseling experience	Yes	4	40	3	30
	No	6	60	7	70

Note: The average age of the participants was 17.15 years (SD = 0.37)

Data Collection

The data collection procedures in this study were systematically designed to ensure a direct correlation between the instruments used and the objective of evaluating the effectiveness of the Collage-Based Coping Strategy. Data were collected via a structured questionnaire to objectively measure changes in future anxiety scores in the experimental and control groups (Iqbal et al., 2026). The use of questionnaires is a dominant technique in guidance and counseling research oriented toward micro-interventions due to their efficiency in capturing psychological data (Polit & Beck, 2021). The primary instrument was the Future Anxiety Scale, developed based on Zbigniew Zaleski's theoretical framework (1996). The construct of future anxiety is defined as a negative emotional state characterized by fear, uncertainty, and worry regarding potential adverse changes in the future. This scale measures three operational dimensions: Adversity, which encompasses perceptions of threat and failure; Social Existential, which encompasses social status and self-esteem; and Hope, which serves as an indicator of optimism or a cognitive counterbalance to fear.

This instrument consists of 21 items on a 1–6 Likert scale that has been culturally adapted by Ruddin & Nuryanti (2026) for a population of high school students in Indonesia, specifically in the city of Malang. Based on the distribution of total scores in the initial sample (N = 30), future anxiety was categorized as follows: low (score < 76), moderate (score 76–91), and high (score ≥ 92). The participants included in this study were 20 students in the high category. The use of instruments validated within the subjects' cultural context is crucial to minimize interpretive bias in school settings where individual randomization is often not feasible. This adaptation process ensures that the terminology in all items aligns with the local linguistic context and the developmental stage of adolescents aged 17–18 years (Desiningrum & Arywibowo, 2024). Methodological rigor is further supported by explicit validation procedures. First, content validity was evaluated through expert judgment from field supervisors and education practitioners to ensure the relevance of each item to the target indicators. Second, item validity was tested using corrected item-total correlations, with coefficients ranging from 0.417 to 0.767 ($p < 0.01$), indicating that all items consistently measure the same construct. Full construct validity will be further tested through factor analysis in subsequent research. Third, reliability was estimated using Cronbach's alpha. A value of $\alpha = 0.934$ was obtained for 21 items (N = 224). This value is well above 0.70, indicating very strong internal consistency that supports the study's analytical claims.

Data were collected in two phases in an intact classroom setting. The first phase was a pre-test conducted on April 20, 2026, to obtain baseline data on students' initial anxiety levels before the intervention was administered. The second phase was a post-test conducted after the experimental group completed all sessions of the collage-based coping strategy, to measure the impact of the intervention by comparing changes in scores between the experimental

and control groups. All procedures adhered to strict ethical protocols and ensured the confidentiality of participants' identities through the use of anonymous codes. This was done to maintain data integrity and ensure that participation was entirely voluntary.

Data Analysis

Data analysis in this study was conducted using descriptive and inferential statistical approaches. Descriptive statistics were used to describe the characteristics of future anxiety scores in both study groups, both at the pre-test and post-test stages, by calculating values such as the mean, standard deviation, frequency, and percentage. Prior to testing parametric hypotheses, a Shapiro-Wilk normality test was conducted on the pre-test and post-test scores for each group separately, given that the sample size was relatively small (n = 10 per group). The results of the normality test showed that all score distributions were normally distributed ($p > 0.05$): the pre-test scores of the experimental group ($W = 0.958$, $p = 0.762$), the post-test scores of the experimental group ($W = 0.949$, $p = 0.652$), the pre-test scores of the control group ($W = 0.946$, $p = 0.626$), and the post-test scores of the control group ($W = 0.963$, $p = 0.814$). Thus, the assumption of normality was met, and the parametric tests could proceed. All statistical calculations in this study were performed using IBM SPSS Statistics Version 29 for Mac OS X. The significance level for all analyses was set at 0.05 (alpha = 0.05) with a 95% confidence interval (Gray & Grove, 2020).

Hypothesis testing was conducted in two steps to answer the research question regarding the effectiveness of the intervention. The first step was a paired-sample t-test to evaluate whether there were significant differences between pre-test and post-test anxiety scores within each group. This test measures the changes that occurred in each group separately as a result of the treatment or the passage of time (Polit & Beck, 2021). The second step was an independent-samples t-test, which aimed to compare post-test scores between the experimental and control groups. This test was crucial for determining whether the difference in results between the two groups was truly caused by the intervention effect, rather than by other factors. The criteria for the intervention's success were established objectively, namely: (1) there was a significant decrease ($p < 0.05$) in anxiety scores in the experimental group between the pre-test and post-test based on the paired-sample t-test, and (2) the experimental group's post-test scores were significantly lower ($p < 0.05$) than those of the control group based on the independent-samples t-test. If both criteria are met, then the Collage-Based Coping Strategy intervention is deemed effective in reducing future anxiety among high school students.

Intervention Procedure

The intervention was conducted over two sessions, each lasting 90 minutes, on April 27, 2026, and May 4, 2026. The activities took place in an 11th-grade Class 9 high school classroom in Malang City. All students in the experimental group (n=10) participated in the series of sessions without any dropouts. All materials required for each stage of the intervention are presented in Table 2. Most of the materials were basic items easily obtained from stationery stores, craft stores, or even from used household items. Two main materials that require further explanation are heavy-weight craft paper (locally referred to as buffalo paper)—used as a collage surface strong enough to hold newspaper and magazine clippings as well as hand-drawn sketches—and water-based paper glue, which is safe, non-toxic, and readily available at stationery stores, bookstores, or school cooperatives. The materials for the collage—clippings from old newspapers and magazines—are collected from home, while students also add hand-drawn sketches using markers or colored pencils as a form of positive self-affirmation. The entire collage-making process serves as a visual expression and catharsis through the arrangement of images, colors, text, and direct sketches on the thick craft paper

In practice, school counselors act as facilitators with the following roles: (1) providing clear and non-threatening initial instructions, (2) maintaining the group's psychological safety by creating a supportive atmosphere, (3) guiding students' reflections after each step, and (4) helping students connect the visual symbols they create with adaptive coping strategies that can be applied in daily life. This Collage-Based Coping Strategy intervention is designed in stages to help students manage their anxiety about the future. An illustration of the Collage-Based Coping Strategy is presented in Figure 1. First, students map out their anxiety by identifying, acknowledging, and distinguishing the various sources of stress that trigger their worries, then visually representing them as reflections on thick craft paper. Second, students identify their personal strengths by pasting magazine and newspaper clippings that represent their hopes and the positive goals they wish to achieve. This activity helps students recognize the strengths they possess and wish to build to face the future. Third, students engage in coping behaviors where they learn to accept that anxiety does not completely disappear but can be managed through personal resilience by integrating these two layers. They realize that resilience can coexist with and overcome stress. Fourth, students share their experiences verbally in small groups, discussing their feelings, interpretations, and the challenges they faced during the creative process, so that adaptive coping strategies can take deeper root through social validation and peer support. Thus, this

intervention as a whole aims to reduce anxiety about the future, increase a sense of control, and build students' psychological resilience through safe visual and narrative expression.



Figure 1. Illustration of a Collage-Based Coping Strategy

Table 2. List of Collage Materials

The Materials Needed for Each Step	
Step 1: Mapping Anxiety	Heavy-weight craft paper as a visual medium; pencils or ballpoint pens, as a reflection of the source of anxiety
Step 2: Identifying Students' Personal Strengths	Magazine or newspaper clippings, featuring images, colors, and positive words
Step 3: Students' Coping Behaviors	Paper glue for bonding and a weight to press down on the collage so it dries completely
Step 4: Sharing Experiences	Markers or ballpoint pens for students to record their feelings after the creative process

Note: Data collected and modified by the authors.

Results

The Effectiveness of Collage-Based Intervention Strategies

The process scores for each step of the intervention were obtained from the student engagement evaluation forms, which were completed by the observer using a 1–4 Likert scale for five statements per stage. The score range for each stage was 5–20. Inter-rater reliability was not calculated because there was only one observer. A summary of the scores for each stage of the intervention is presented in Table 3, while a detailed description of each step is provided below.

A summary of the intervention in the experimental group shows that Step 1 had the lowest average score, namely 14.2, with a range of 12 to 15. In Step 2, the average score increased to 15.6, with a range of 14 to 16, indicating a relatively uniform response among students during the stage of identifying their personal strengths. Furthermore, in Step 3, the average score increased again to 17.0 with a range of 15 to 18, indicating that students began to be more adaptive in engaging in coping behaviors such as cutting, pasting, and expressing their feelings through collages. In Step 4, the average score was 18.3 with a range of 17 to 19; Step 4 achieved the highest average score. Overall, the greatest variation among students occurred in Step 2, while Steps 1, 3, and 4 showed relatively more stable performance.

Description of Mapping Anxiety

The initial stage of the intervention begins with students reflecting on the primary forms of anxiety they most frequently experience regarding the future, such as fears of failure (failing exams or not being accepted into college), uncertainty about their life path (being confused about career choices or not knowing what to do after graduating from high school), and low self-confidence (feelings of inadequacy, inferiority, or fear of not being accepted by their peers). Students then immediately express the results of this reflection on thick craft paper in the form of doodles, drawings, or visual symbols that best represent the anxiety they are currently experiencing (whether in the form of chaotic lines,

abstract shapes, or brief writings) according to each individual's creative freedom. This spontaneous process helps students channel their anxiety from within their minds onto a tangible visual medium. As a result, anxiety is no longer a formless burden but transforms into a map that can be recognized, understood, and begun to be addressed. The first step was to assess the students' ability to identify, acknowledge, and express anxiety about the future. The average total score was 14.2 out of a maximum of 20 (SD = 1.03), with a range of 12–15, and four students scored above the average (15). Most students (80%) reported feeling comfortable writing down their fear of failure, while 70% were able to identify the source of their anxiety. However, two students (20%) gave a score of 1 to the statement "writing down my worries makes me feel more relieved," indicating that catharsis does not occur automatically. On the other hand, 90% of students recognized that anxiety about the future is normal, and 80% were able to distinguish real threats from excessive worries.

Description of Identifying Students' Personal Strengths

Once the anxiety map was drawn, students were encouraged to shift their focus from anxiety to their inner strengths. Using clippings from old magazines and newspapers, students selected images, colors, or words that represented their hopes, dreams, and the positive things they wanted to achieve in the future. These clippings are then pasted onto the craft paper around or on top of the anxiety map they created earlier. Through this collage activity, students learn to recognize that even amid uncertainty and anxiety, there are still strengths, hopes, and personal assets that can serve as resources for facing the future. The second step assessed students' ability to paste magazine and newspaper clippings representing hope and to write positive affirmations. The average score was 15.6 (SD = 0.71, range 14–16), indicating little variation among students. A total of 80% of students were able to find images or words that represented hope. However, only 70% wrote positive affirmations. Additionally, no students (0%) selected a score of 1 or 2 for the statement "feel more confident after seeing positive things."

Description of Students' Coping Behaviors

In the third step, students learn to accept the reality that anxiety about the future will not disappear entirely. Nevertheless, they can overcome that anxiety with the inner strength they possess. The process of integrating the two layers—the anxiety map and the inner strength layer, is a pivotal moment. When these two layers are combined, students realize that anxiety and strength can coexist; inner strength does not eliminate anxiety, but it enables them to overcome the pressures that arise. This realization builds their confidence that they can continue moving forward even while still feeling anxious. The third step measured active coping behaviors, such as cutting, pasting, scribbling, and channeling anxiety. The average score increased to 17.0 (SD = 0.94, range 15–18). A total of 100% of students reported cutting carefully, pasting neatly, and adding expressive scribbles. Meanwhile, the statement "cutting and pasting activities make me more focused and calm" received a score of 4 from 30% of respondents. Additionally, 100% of students agreed that collages can channel anxiety into meaningful works of art.

Description of Sharing Experiences

In the final session, students engaged in a verbal sharing of experiences within their groups. Each student described the feelings that arose during the creative process, the insights they gained from each stage, and the challenges they faced while making the collage. This sharing activity not only provided a space to express emotions but also served as an opportunity to receive social validation from their groupmates. When students hear that their experiences are acknowledged and supported by others, the adaptive coping strategies they have practiced can become more deeply ingrained. It is this peer support that reinforces students' belief that they are not alone in dealing with anxiety, allowing these new ways of managing anxiety to truly become lasting habits. The fourth step measures students' ability to share experiences verbally. The average score was 18.3 (SD = 0.67, range 17–19). 100% of students felt confident sharing their collages and feelings, 100% listened attentively, and 100% received support from their peers. As for the statement "sharing experiences makes me feel less alone," responses varied, with no students selecting a score of 1. On the other hand, 100% of students felt more relieved and understood how to manage anxiety after the group discussion. Statistical summaries for each intervention step are presented in Table 3.

This study involved 20 11th-grade students classified as having high anxiety based on the Zaleski scale pre-test (score ≥92). The participants were divided into an experimental group (n=10) and a control group (n=10). The mean age of the experimental group was 17.2 years (SD = 0.42), and that of the control group was 17.1 years (SD = 0.32). A total of 7 male students (35%) and 13 female students (65%) participated. There were no significant differences in demographic characteristics between the two groups.

Table 3. Statistical Summary for Each Step

Step	Minimum Score	Maximum Score	Mean	Standard Deviation (SD)
Step 1: Mapping Anxiety	12	15	14.2	1.03
Step 2: Identifying Students' Personal Strengths	14	16	15.6	0.71
Step 3: Students' Coping Behaviors	15	18	17.0	0.94
Step 4: Sharing Experiences	17	19	18.3	0.67

From the table, it can be seen that Step 1 has the highest standard deviation (1.03), indicating the greatest variation in responses. Conversely, Step 4 has the lowest standard deviation (0.67), indicating consistency in responses during the experience-sharing stage. Prior to the intervention, an independent t-test was conducted on the pre-test scores to ensure that the two groups were equivalent at baseline. The results showed no significant difference between the experimental group (M = 108.7, SD = 7.2) and the control group (M = 104.9, SD = 9.3), t(18) = 1.02, p = 0.322. Table 4 presents the mean and standard deviation (SD) of future anxiety scores for the experimental and control groups, both at the pre-test and post-test stages.

Table 4. Mean and Standard Deviation of Future Anxiety Scores

Group	n	Pre-test (M ± SD)	Post-test (M ± SD)
Experiment	10	108.7 ± 7.2	77.4 ± 5.1
Control	10	104.9 ± 9.3	104.8 ± 8.9

To facilitate the visualization of changes in anxiety scores between the pre-test and post-test for both groups, Figure 2 is presented below.

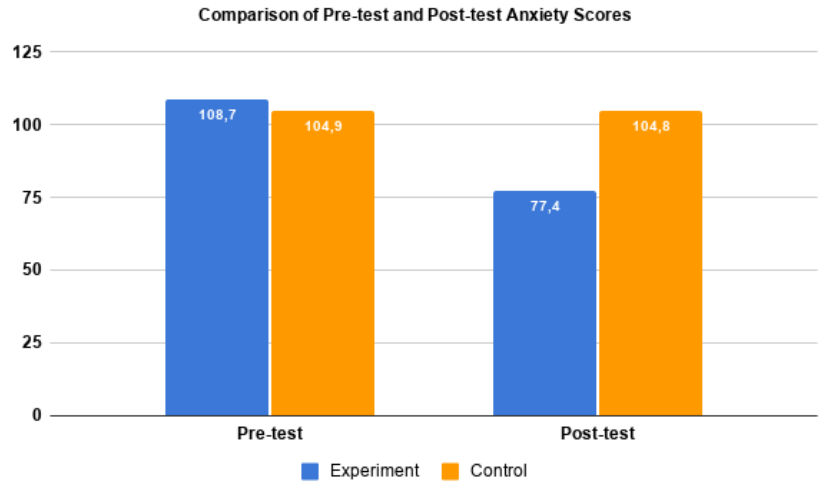


Figure 2. Comparison of Average Future Anxiety Scores

A paired-sample t-test was conducted to compare the pre-test and post-test scores within each group. A summary of the analysis results is presented in Table 5.

Table 5. Paired-Sample t-Test

Group	Mean Difference	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper	t	df	p (2-tailed)	Cohen's d	Hedges' g
Experiment	31.300	2.669	0.844	29.391	33.209	37.088	9	< 0.001	11.73	10.72
Control	0.100	1.663	0.526	-1.090	1.290	0.190	9	0.853	0.06	0.05

Note: Hedges' g is reported as a supplement to correct for potential overestimation of effect size in small samples.

The results of the analysis showed that the experimental group experienced a statistically significant decrease in anxiety scores ($p < 0.001$) with a very large effect size (Cohen's d_z = 11.73; Hedges' g = 10.72). Meanwhile, in the control group, the decrease in scores was not significant ($p = 0.853$) with a negligible effect size (Cohen's d_z = 0.06; Hedges' g = 0.05). These findings indicate that the reduction in anxiety was specifically caused by the intervention, rather than by other factors such as history or maturation.

Next, to compare the post-test scores between the experimental and control groups, an independent samples t-test was conducted. Levene's test indicated that the variances of the two groups were homogeneous ($F = 3.277$; $p = 0.087$), so the t-test was conducted under the assumption of equal variances. A summary of the results is presented in Table 6.

Table 6. Comparison of Post-test Scores Between Groups

Group	n	Post-test (M ± SD)	Mean Difference	t	df	p (2-tailed)	95% CI	Cohen's d
Experiment	10	77.4 ± 5.1	-27.40	-8.469	18	< 0.001	[-34.197; -20.603]	3.79
Control	10	104.8 ± 8.9	-	-	-	-	-	-

Note: Independent samples t-test; equal variances assumed (Levene's F = 3.277, p = .087). Mean difference = -27.40 (Experiment–Control).

Based on Table 6, the independent samples t-test showed that the post-test scores of the experimental group (M = 77.4; SD = 5.1) were significantly lower than those of the control group (M = 104.8; SD = 8.9), with a mean difference between groups of -27.40 points ($t(18) = -8.469$; $p < 0.001$; 95% CI = -34.197 to -20.603). The confidence interval, which lies entirely below zero, and the very large effect size (Cohen's d = 3.79) reinforce the evidence that the intervention's superiority is not due to chance but rather reflects an extraordinary magnitude of effect. Descriptively, the experimental group showed an average decrease of 31.3 points from the pre-test (M = 108.7) to the post-test (M = 77.4), representing a clinically meaningful shift from the "high" to the "moderate" anxiety category based on the instrument's norms; all 10 participants experienced a decrease in their individual scores, indicating a high consistency of response to the treatment. Thus, based on the established success criteria, both conditions were met: (1) statistically, the experimental group's post-test scores were significantly lower than those of the control group ($p < 0.001$) with a very large effect size, and (2) clinically, all participants showed individual improvement with a shift in anxiety category. In conclusion, the Collage-Based Coping Strategy intervention is effective in reducing future anxiety among high school students at UM Laboratory High School.

Discussion

The Collage-Based Coping Strategy intervention in this study was designed in four steps: Mapping Anxiety, Identifying Personal Strengths, Coping Behaviors, and Sharing Experiences. Process engagement scores increased progressively across the four intervention steps. The gradual increase in engagement scores from Step 1 (M = 14.2) to Step 4 (M = 18.3) is consistent with the model of gradual change in expressive therapy. Step 1, which recorded the lowest score, reflects students' initial resistance to open emotional expression—a phenomenon known as "art resistance" (Malchiodi, 2012)—and is not an indication of intervention failure but rather a natural starting point in the gradual change process. The first step helps students identify and visualize thoughts about the future as a cognitive prerequisite for anxiety management. Step 2 shifts the focus from threats to personal strengths; an increase in scores at this stage may indicate initial challenges in changing one's mindset, rather than negative resistance, as described in the self-regulated learning model (Zimmerman, 2023) as the orientation phase preceding meaningful change. The third step involves fine motor activities (cutting, pasting, scribbling) that facilitate emotional release and implicit cognitive reappraisal. Examples of students' collage works produced during the intervention are presented in Figure 3. The fourth step serves as a social reinforcer that stabilizes meaning and aids in the internalization of coping strategies, consistent with the principle of peer support. This pattern aligns with the transtheoretical model of change (Paiva et al., 2021), which states that behavioral change is not linear; however, this interpretation is speculative because this study did not directly measure the stages of change.



Figure 3. Results of the Collage-Based Coping Strategy

After completing these four steps, the experimental group showed a statistically significant decrease in future anxiety scores (paired t-test: $t(9) = 37.088$; $p < 0.001$; Cohen's $d_z = 11.73$) with a very large effect size. In contrast, the control group did not experience a significant change ($t(9) = 0.190$; $p = 0.853$). A comparison of post-test scores between the groups also confirmed the intervention's superiority: $t(18) = -8.469$; $p < 0.001$; Cohen's $d_z = 3.79$; 95% confidence interval [-34.197; -20.603]. The assumption of homogeneity of variances was met (Levene's test, $p = 0.087$) and the assumption of normality was confirmed (Shapiro-Wilk, $p > 0.05$), making the standard t-test valid.

These very large effect sizes ($d = 11.73$ and 3.79) should be interpreted with caution. Compared to similar arts intervention studies—such as Coholic (2020), which reported a moderate effect ($d = 0.55$), and the systematic review by Zhang et al. (2024), with an average d ranging from 0.45 to 0.80—the between-group effect in this study (Cohen's $d = 3.79$) appears significantly higher. This striking difference, as well as the overall effect size, are most likely due to a combination of methodological factors, namely: a very small sample size ($n = 10$ per group) that is prone to overestimation; participant selection based on high anxiety scores, which opens the possibility of a regression-to-the-mean effect; and post-test measurements conducted immediately after the intervention without a follow-up period, making long-term effects unmeasurable. Thus, these figures reflect encouraging effect sizes in the context of a preliminary study, rather than definitive evidence of superior effectiveness.

In the context of guidance and counseling services, a decrease in scores indicates a shift from the "high" to the "moderate" anxiety category (using the same cutoff as the pre-test). This means that most students who were initially highly anxious about the future reported more manageable anxiety levels after the intervention. These findings reinforce the evidence that collage provides a safe outlet for nonverbal expression (Soewito et al., 2024; Hidayatunnisa et al., 2025) and extend its application from clinical settings to school environments. These results also support the theoretical framework of adaptive coping strategies, demonstrating that visual manipulation of collage materials can facilitate cognitive reappraisal without the need for intensive verbal intervention.

Limitations of the study include: (1) a small sample size ($n = 20$), which limits generalizability; (2) a quasi-experimental design without randomization, which may introduce selection bias despite equivalent pre-test scores; (3) the researcher was not blinded to group assignment, so experimenter bias may have influenced the results; (4) a brief intervention (two sessions) without follow-up, making long-term effects unmeasurable; (5) a potential testing effect, in which repeated measurements increase students' awareness of their anxiety, as well as an expectancy effect due to greater attention paid to the experimental group, neither of which can be eliminated. Furthermore, the use of self-report instruments carries the potential for social desirability bias, even though participant anonymity was ensured; (6) this study did not directly measure mediator variables (cognitive reappraisal, self-efficacy, emotional regulation), so the psychological mechanisms explaining the reduction in anxiety remain inferential. Without measuring mediators, claims regarding "why" the intervention works cannot be empirically tested in this study. Follow-up studies using randomized controlled trials, larger samples, and follow-up assessments are needed to verify the sustainability of the effects and to test the mediating mechanisms.

Practical implications for school counselors: this intervention is easy to implement using simple, low-cost materials. However, school counselors need basic training in facilitating emotional expression through art, including how to provide instructions that do not trigger excessive distress, guide group reflection, and conduct debriefing after the collage activity to ensure students' psychological safety. With the right support, the Collage-Based Coping Strategy can be a creative approach in group guidance programs to reduce high school students' anxiety about the future.

Conclusions

This study examined the effectiveness of the Collage-Based Coping Strategy on future anxiety among 20 high school students using a quasi-experimental design. The results showed a significant decrease in anxiety scores in the experimental group ($t(9) = 37.088$; $p < 0.001$; Cohen's $d_z = 11.73$; Hedges' $g = 10.72$), which was not observed in the control group, as well as a significant post-test difference between the groups ($t(18) = -8.469$; $p < 0.001$; $d = 3.79$). Theoretically, this study extends the application of the cognitive reappraisal and adaptive coping frameworks from clinical settings to school environments in Indonesia, a context that has not previously been represented in the literature. Practically, this intervention offers an easily implementable, low-cost solution, making it a viable candidate for integration into routine group counseling programs. Further studies using randomized controlled trials, larger samples, a follow-up period of at least three months, and measurements of mediating variables (cognitive reappraisal, self-efficacy) are needed to verify these findings and uncover the underlying psychological mechanisms. Cross-cultural research is also recommended to test the transferability of this intervention to different educational contexts.

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Author Contributions

Ahmad Yusyrof Al Hakim: Conceptualization, Methodology, Data Curation, Writing Original Draft; **Gloria Diniy Hidayatur Rahman:** Formal Analysis, Writing review, Supervision, Validation. **Fitriana Naimatu Jannah:** Formal Analysis, Writing review, Validation.

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Conflicts of Interest

The authors declare that there are no financial, personal, or institutional conflicts of interest that could inappropriately influence or bias the findings of this research. While the study was conducted within the specific educational environment of MA Ummul Quro Putri, the researchers maintained complete independence in data collection, analysis, and the reporting of results, ensuring that no commercial affiliations or personal relationships with the institution's administration affected the objectivity of the manuscript.

Ethical Approval

This study did not obtain ethical approval.

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