




# Comparing the Effectiveness of Mindfulness and Positive Psychology Training on Reappraisal and Suppression in Students with Generalized Anxiety Disorder Symptoms

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## ABSTRACT

**Objective:** The aim of this study was to compare the effectiveness of mindfulness and positive psychology training on reappraisal and suppression in students with generalized anxiety disorder symptoms.

**Methods and Materials:** This was a quasi-experimental study with a pre-test, post-test, three-group design, and a three-month follow-up period. The population of this research consisted of female high school students in Tehran with generalized anxiety disorder symptoms. A total of 45 students with generalized anxiety disorder symptoms were selected through a multi-stage cluster sampling method and purposeful sampling based on the scores obtained from the Spitzer et al. (2006) scale and randomly assigned to three groups (two experimental groups and one control group). All three groups completed the Gross and John (2003) Emotion Regulation Questionnaire. The first group received mindfulness training, the second group received positive psychology training in eight sessions of 1.5 hours each, and the control group did not receive any treatment. The data were analyzed using repeated measures analysis of variance and follow-up LSD test.

**Findings:** The findings indicated that there was no significant difference between the effects of mindfulness and positive psychology training on reappraisal and suppression ( $p>0.5$ ).

**Conclusion:** Based on the results, in students with generalized anxiety disorder symptoms, both mindfulness and positive psychology training were beneficial.

**Keywords:** Mindfulness, Positive Psychology, Tolerance of Distress, Emotion Regulation, Reappraisal, Suppression.

## 1. Introduction

Adolescence is a particularly vulnerable period for mental health, such that almost half of all mental

disorders are established before the age of 18 (Chung et al., 2019). Among the most common psychological and emotional issues during adolescence is anxiety, which often

affects an individual's emotional reactions. Most adolescents experience anxiety when confronted with threatening situations or pressure (Madigan et al., 2018).

Individuals have reported experiencing mild, moderate, or severe anxiety in the past two weeks. Research has shown that individuals with generalized anxiety disorder have higher average scores for negative emotion regulation strategies and lower scores for positive emotion regulation strategies than normal individuals (Benjet et al., 2023; Mason et al., 2022). Childhood adversities are positively associated with emotion regulation problems and the habitual use of rumination and suppression, while the use of cognitive reappraisal for emotion regulation is negatively associated with childhood adversities and psychological pathology (Grey et al., 2020; Hayward et al., 2020).

Emotion regulation refers to any process or action by which an individual influences their feelings or emotional expression. An individual can regulate their emotions at several points, including the situations they seek or avoid and how they think about an experience and express their feelings (Kazemi Rezaei et al., 2023; Oussi et al., 2023). Some forms of emotion regulation are associated with greater well-being, such as cognitive reappraisal, mindfulness, and acceptance, while other strategies, such as suppression, are associated with poorer psychological outcomes (Aritzeta et al., 2022).

Given the greater emotional difficulties in individuals with generalized anxiety disorder (Strauss et al., 2019), the emotion dysregulation model by Mennin and Fresco (2005) seeks to explain the pathology of this disorder. In this integrative model, it is assumed that emotions can range from functional to disordered. Accordingly, the three main aspects of emotional functioning are: a) motivational mechanisms, b) regulatory mechanisms, and c) behavioral outcomes. Thus, in the motivational mechanisms section, the safety motivation system and high emotional intensity are dysfunctional, which are effective in the initial formation of anxiety symptoms (Mennin et al., 2005). In the regulatory mechanisms section, Mennin and Fresco (2005) introduced four emotion regulation strategies whose dysfunction leads to the formation of anxiety. These emotion regulation strategies include attention deployment, allowing, distancing, and cognitive reappraisal (Conway et al., 2021; Mennin et al., 2005). Therefore, dysfunction in emotion regulation and the presence of negative emotional intensity and safety motivation dysfunction lead to the formation of anxiety symptoms. Additionally, positive and negative emotion regulation strategies are related to anxiety and

depression, with positive emotion regulation strategies reducing anxiety and worry (Aritzeta et al., 2022).

Mindfulness training, as well as positivity, are two of the most important and widely used educational interventions recently introduced in the field of psychology and have been the focus of researchers in recent years to help adolescents with depression (Kroska et al., 2018). Mindfulness training is an effective treatment for symptoms of generalized anxiety disorder (Evans, 2016) that, through step-by-step non-judgmental moment-to-moment awareness, enhances patient's self-control, self-regulation, and self-monitoring, leading them towards recovery. Higher levels of non-judgment may lead to the acceptance of thoughts and feelings (Soleymani et al., 2023; Torfiamidpoor et al., 2022; Weng et al., 2022). This therapeutic method is an emerging concept in health care, confirmed as an effective tool for helping individuals control emotional and clinical symptoms, and meditation practice causes changes in brain areas responsible for cognitive and emotional functions, creating a process of self-regulation. This mechanism is responsible for psychological changes and physical and mental well-being, confirmed by effects such as increased attention, increased body awareness, emotion regulation, metacognitive development, and change in self-perspective (Bao, 2022; Chen et al., 2022; Mehraban et al., 2022; Riquelme-Marín et al., 2022; Saito & Kumano, 2022).

Positive psychotherapy, utilizing techniques such as recognizing personal strengths and focusing on positive emotions, can serve as an effective treatment for students with generalized anxiety disorder (Khalili et al., 2022). The main subject of positive psychology is the research on positive mental experiences. These experiences include well-being, contentment, satisfaction, pleasure, hope, psychological optimism, competence, and love (Parsakia & Darbani, 2022). Positive psychology aims to empower individuals and develop their talents, as well as foster positive experiences such as optimism, happiness, and humor in people. One of the effective methods in positive psychotherapy emphasizes individuals' abilities and strengths. In this type of psychotherapy, the goal is more than just improving the negative symptoms of a disorder; it aims at enhancing well-being and happiness in individuals (Roepke & Seligman, 2015; Seligman, 2015). Positive psychotherapy, by creating and expanding positive emotions, broadens the scope of positive thinking and simultaneously prepares the individual for positive actions. Positivity can enhance the alignment between expectations

and reality, belief in people's kindness, academic skills, and fairness in students (Parsakia & Darbani, 2022).

However, there is a research gap regarding the more effective impact of one of these two therapeutic methods in reducing symptoms and problems related to generalized anxiety disorder. Therefore, further investigations are needed to understand the more effective impact of one of the treatments, thereby reducing the financial costs for these individuals and the health costs to society, and providing a basis for reducing psychological and emotional problems. Accordingly, the research question is whether there is a difference in the effectiveness of mindfulness training and positivity on cognitive reappraisal and suppression in students with symptoms of generalized anxiety disorder?

## 2. Methods and Materials

### 2.1. Study Design and Participants

The current study was a quasi-experimental design with pre-test, post-test, and follow-up periods, including a control group. The population consisted of female high school students in Tehran exhibiting symptoms of generalized anxiety disorder. The sample included 45 students (based on a G\*Power calculation with an effect size of 0.25, an alpha error of 0.10, and a test power of 0.85) who were selected through a combination of multi-stage cluster and purposive sampling methods and randomly assigned to one of three groups of 15: mindfulness training, positivity training, and a control group. The sampling method was a combination of multi-stage cluster and purposive sampling.

Initially, after obtaining the necessary permissions from the Tehran Education Department, District 1 of Tehran was randomly selected from the 19 educational districts. Two schools, Bu Ali and Farast, were randomly chosen based on the codes of female high schools in District 1. From among the 19 classes in these schools, 7 classes totaling 200 students were randomly selected. Then, all these students completed the Spitzer et al. Generalized Anxiety Disorder questionnaire, and based on a score above 10 on this scale and other inclusion and exclusion criteria, 45 students were selected. After explaining the research design and considering ethical issues, with their cooperation, they were randomly assigned to one of three groups of 15: mindfulness training, positivity training, and a control group, and completed the relevant questionnaires. Mindfulness training sessions were held for the first experimental group over 8 weeks, with one 90-minute session per week, and positivity training sessions were held for the second experimental

group over 8 weeks, with one 90-minute session per week, both in a group format, while the control group waited. After the educational methods were implemented, participants from all three groups completed the questionnaires again, and three months later, during the follow-up period, the questionnaires were administered again.

### 2.2. Measures

#### 2.2.1. Generalized Anxiety Disorder

Spitzer and colleagues (2006) developed a 7-item Generalized Anxiety Disorder scale, which includes seven main questions and an additional question assessing the disorder's interference in individual, social, family, and occupational functions. The scale assesses the duration of feeling nervous and anxious in the past two weeks, duration of worry, the extent to which an individual has been unable to control worry, the ability to remain calm, the extent to which restlessness has prevented relaxation, irritability, and fear of adverse events. Respondents answer the questions on a scale from "never," "several days," "more than half the days," to "nearly every day," scored as 0, 1, 2, and 3, respectively, with the highest possible score being 21 (Spitzer et al., 2006). Results from Naeinian et al. (2011) indicated that the cutoff score for the questionnaire is 10, with a Cronbach's alpha coefficient of 0.85, and the scale's reliability was deemed appropriate based on test-retest administration. The validity of the scale showed significant correlation with Spielberger's State-Trait Anxiety Inventory, some subscales of the 36-item Short Form Health Survey, and the 12-item General Health Questionnaire, indicating suitable convergent validity (Naeinian et al., 2011).

#### 2.2.2. Reappraisal and Suppression

The Emotion Regulation Questionnaire, developed by Gross and John (2003), measures emotion regulation strategies and consists of two subscales: cognitive reappraisal with 6 items and suppression with 4 items. Participants respond on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). In Gross and John's (2003) research, internal consistency for reappraisal was 79% and for suppression 73%. Karim and Weingarden reported internal consistency of 83% for reappraisal and 79% for suppression (Gross & John, 2003). In Iran, researchers reported a Cronbach's alpha of 79% for reappraisal, and in the current study, Cronbach's alpha for

reappraisal was 83% and for suppression 79% (Bigdeli et al., 2013).

### 2.3. Interventions

#### 2.3.1. Mindfulness Training

The mindfulness training package was initially introduced based on the approach by Kabat-Zinn (2003). The summary of the training sessions is as follows:

The mindfulness sessions, adapted from Kabat-Zinn (2004), are designed to enhance awareness and alter thought patterns, starting with an initial assessment and introduction to mindfulness concepts. Subsequent sessions focus on developing moment-to-moment awareness through guided practices like mindful eating and body scans, gradually introducing seated meditation to cultivate present-moment awareness, including awareness of breath, sounds, and thoughts. The program progresses to accepting and observing thoughts without judgment, teaching the distinction between thoughts and reality, and employing mindfulness strategies to address anxiety. The final sessions emphasize ongoing mindfulness practice for maintaining emotional balance and integrating mindfulness into daily life for sustained well-being (Kabat-Zinn, 2003).

#### 2.3.2. Positivity Training

Positive thinking training sessions were introduced based on the approach by Seligman (2001). The summary of the training content is as follows:

The positivity training sessions, derived from Schrank et al. (2014), include an initial meeting to familiarize participants with the program and establish group norms. Subsequent sessions explore the concept and indicators of positive thinking, analyzing individual perspectives. Participants learn to identify positive aspects in school and interpersonal relationships, write about positive experiences related to school, and integrate positivity into daily life, even in the face of insoluble problems. The program progresses to cultivating positive living and thinking through continuous practice of positive thought strategies, aiming for a purposeful life and establishing positive relationships with others (Seligman, 2001).

### 2.4. Data analysis

In descriptive statistics, mean and standard deviation were used, and in inferential statistics, repeated measures ANOVA and the LSD post hoc test were utilized.

## 3. Findings and Results

The Table 1 shows the mean and standard deviation of the pre-test, post-test, and follow-up scores for the research variables, including the emotion regulation sub-scales (reappraisal and suppression), across the control, mindfulness, and positivity groups. Initially, the assumptions of the repeated measures analysis of variance (ANOVA) are tested, followed by an examination of the research hypotheses using the specified test.

**Table 1**

*Mean and Standard Deviation of Pre-test, Post-test, and Follow-up Scores for Research Variables*

Group	Variable	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Control	Reappraisal	21.47 (7.289)	21.13 (6.556)	20.87 (6.140)
	Suppression	17.60 (1.957)	17.20 (1.373)	17.13 (1.846)
Mindfulness	Reappraisal	22.73 (6.871)	30.60 (6.717)	31.80 (6.167)
	Suppression	17.07 (2.052)	13.27 (2.086)	12.67 (1.877)
Positivity	Reappraisal	23.27 (6.017)	29.67 (5.602)	31.73 (5.612)
	Suppression	16.53 (2.200)	14.67 (2.225)	14.00 (2.204)

Since the significance levels obtained from the Kolmogorov-Smirnov test are greater than the error level of the test (0.05), the claim of normal distribution of variables is accepted. The results of the Box's M test indicated that the significance levels obtained are greater than 0.05, confirming that the condition of homogeneity of covariances has been adequately met.

According to the results of the Mauchly's test of sphericity in the mindfulness group, since the significance level obtained from the Mauchly's test for the variables of distress tolerance and resilience is greater than 0.05, the Mauchly's sphericity assumption for these variables is met. However, the significance level obtained from the test for reappraisal, suppression, and interpretive bias is less than 0.05. Therefore, the results of the repeated measures

ANOVA for these variables are presented using the Greenhouse-Geisser correction.

Similarly, in the positivity group, since the significance level obtained from the Mauchly's test for distress tolerance is greater than 0.05, the Mauchly's sphericity assumption for these variables is met. However, the significance level obtained from the test for reappraisal, suppression, resilience, and interpretive bias is less than 0.05. Therefore,

the results of the repeated measures ANOVA for these variables are presented using the Greenhouse-Geisser correction.

Finally, the Levene's test for equality of variances showed that the significance levels are greater than the error level of the test (0.05). Therefore, the assumption of equal variances is met.

**Table 2**

*Summary of Repeated Measures ANOVA Results for the Effect of Mindfulness Training on Emotion Regulation Sub-scales*

Variable	Source	Sum of Squares	df	Mean Square	F	Significance	Eta Squared
Reappraisal	Phase	323.267	1.49	216.917	79.183	<0.0001	0.739
	Phase * Group	407.089	1.49	273.163	99.715	<0.0001	0.781
	Group	1173.611	1	1173.611	9.169	0.005	0.247
Suppression	Phase	104.422	1.31	79.478	31.567	<0.0001	0.530
	Phase * Group	68.289	1.31	51.976	20.644	<0.0001	0.424
	Group	199.511	1	199.511	27.342	<0.0001	0.494

According to Table 2, the significance level related to the phase for reappraisal and suppression is less than 0.05. Therefore, it can be accepted that there is a significant difference between the mean scores of these variables at the pre-test, post-test, and follow-up stages. Also, considering the significance of the interaction effect of phase \* group and the significance of the group effect, it is concluded that the changes in these variables over the pre-test, post-test, and follow-up stages were not the same in the control and

mindfulness groups, thus it can be concluded that mindfulness training was effective on the emotion regulation sub-scales (reappraisal and suppression) in students with symptoms of generalized anxiety disorder.

According to the eta squared value, 78.1% of the changes in the reappraisal scores during the pre-test, post-test, and follow-up stages were due to mindfulness training, and 42.4% of the changes in the suppression scores during these stages were due to mindfulness training.

**Table 3**

*Summary of Repeated Measures ANOVA Results for the Effect of Positivity Training on Emotion Regulation Sub-scales*

Variable	Source	Sum of Squares	df	Mean Square	F	Significance	Eta Squared
Reappraisal	Phase	254.822	1.56	163.381	48.633	<0.0001	0.635
	Phase * Group	332.467	1.56	213.163	63.452	<0.0001	0.694
	Group	1123.600	1	1123.600	10.104	0.004	0.265
Suppression	Phase	36.689	1.40	26.182	14.068	<0.0001	0.334
	Phase * Group	16.956	1.40	12.100	6.502	0.008	0.188
	Group	113.344	1	113.344	12.217	0.002	0.304

According to Table 3, the significance level related to the phase for reappraisal and suppression is less than 0.05. Therefore, it can be accepted that there is a significant difference between the mean scores of these variables at the pre-test, post-test, and follow-up stages. Also, considering the significance of the interaction effect of phase \* group and the significance of the group effect, it is concluded that the changes in these variables over the pre-test, post-test, and follow-up stages were not the same in the control and

positivity groups, thus it can be concluded that positivity training was effective on the emotion regulation sub-scales (reappraisal and suppression) in students with symptoms of generalized anxiety disorder.

According to the eta squared value, 69.4% of the changes in the reappraisal scores during the pre-test, post-test, and follow-up stages were due to positivity training, and 18.8% of the changes in the suppression scores during these stages were due to positivity training.



**Table 4**

*LSD Test for Comparing the Effect of Mindfulness and Positivity Training on Emotion Regulation Sub-scales*

Variable	Base Group - Comparison Group	Mean Difference	Error	Significance Level
Reappraisal	Control - Mindfulness	-9.47	2.304	<0.0001
	Control - Positivity	-8.53	2.304	0.001
	Mindfulness - Positivity	0.93	2.304	0.688
Suppression	Control - Mindfulness	3.93	0.705	<0.0001
	Control - Positivity	2.53	0.705	0.001
	Mindfulness - Positivity	-1.40	0.705	0.054

According to [Table 4](#), considering the significance of the difference in means, it can be said that both mindfulness and positivity training had a significant impact on the emotion regulation sub-scales (reappraisal and suppression). Furthermore, considering the non-significance of the mean difference, it can be said that there is no significant difference between the effects of mindfulness and positivity training on the emotion regulation sub-scales.

#### 4. Discussion and Conclusion

The aim of the present study was to compare the effectiveness of mindfulness and positivity training on suppression and reappraisal in students with anxiety disorders. According to statistical findings, it can be said that both mindfulness and positivity training have had a significant effect on the emotion regulation sub-scales (reappraisal and suppression). Also, considering the non-significant difference in mean scores, it can be said that there is no significant difference between the effects of mindfulness and positivity training on emotion regulation sub-scales. The results are consistent with part of the findings by previous studies ([Azizi et al., 2023](#); [Cavicchioli et al., 2019](#); [Kazemi Rezaei et al., 2023](#); [Khalili et al., 2022](#); [Nasiri Takami et al., 2020](#); [Pepping et al., 2018](#); [Shariat et al., 2021](#); [Soleymany & Sarifi, 2023](#); [Vigil, 2022](#)).

Explaining the lack of significant difference between the two treatments, it can be said that the effectiveness of both treatments emphasizes the way of interacting with thoughts and emotions.

Mindfulness training enhances the elements of attitudes, attention, and intention simultaneously in an individual. Strengthening these components allows the individual to develop a perspective in experiences that moves from a judgmental, objective, and explicit state of thoughts, feelings, and emotions as transient phenomena to a non-judgmental and accepting direction, feeling flexibility in their mental processes ([Kazemi Rezaei et al., 2023](#); [Vigil,](#)

[2022](#)). This change enables the person to identify and discontinue habitual patterns or mental states and initiate responses that are more reflective than reactive, thus leading to a full awareness of inefficient and defective mental processes and substituting them with healthy mental processes, consequently starting a positive transformation in their life and improving their emotion regulation.

On the other hand, individuals' perspective on life consists of emotions, thoughts, and beliefs they hold. To change a negative perspective to a positive one, the most fundamental step is identifying and differentiating between one's emotions, thoughts, and beliefs ([Khalili et al., 2022](#)). Emotions (and sentiments) are the primary indicators showing whether individuals have a positive or negative outlook on life. The more aware individuals become of their emotional and emotional signs, the more they can change their negative feelings to a positive state ([Nasiri Takami et al., 2020](#)). The main strategy for positive thinking emphasizes focusing on the positive aspects and disregarding the negative aspects of these thoughts and emotions. Once the thoughts change, emotions and sentiments automatically change, and actions take a different direction. Therefore, positive thinking can reduce negative emotions like anger and aggression by changing thoughts and feelings and regulating an individual's emotions ([Khalili et al., 2022](#); [Shariat et al., 2021](#)).

Therefore, both treatments teach an individual to regulate their emotions by recognizing emotions and being self-aware of them, and the outcome of both treatments does not significantly differ for participants in the study.

#### 5. Suggestions and Limitations

##### Research Limitations

1. The participants of this study were limited to students with symptoms of generalized anxiety disorder in District 1 of Tehran, so caution should

be exercised in generalizing the findings to other individuals.

2. Due to the COVID-19 pandemic, conducting sessions with maximum adherence to protocols was challenging.
3. Lack of cooperation from parents and school administrators prolonged the session execution time.
4. The inability to control family, social, and economic conditions was a limitation of the study.
5. The presence of some families during the tests could influence the results.

#### Research Suggestions

1. To increase the generalizability of the results, it is recommended that similar studies be conducted in other cities and cultures to examine potential differences in their findings with those of the current study.
2. Compare the impact of mindfulness and positivity training with other interventions like attribution retraining on the research variables.
3. Future research should investigate the effect of mindfulness and positivity training by gender.
4. Control for family, social, and economic conditions of the students.
5. Prevent families' presence and intervention during tests and training sessions.

#### Practical Suggestions

1. Considering the research findings, mindfulness training impacts emotion regulation components in students with symptoms of generalized anxiety disorder. Given the growing trend of anxiety disorders in the country, it is recommended that psychologists and specialists conduct training workshops on mindfulness to reduce problems in students with generalized anxiety disorder.
2. Given the research findings, positivity training impacts emotion regulation components in students with symptoms of generalized anxiety disorder. Therefore, educational authorities are advised to incorporate positivity training into the programs for students with generalized anxiety disorder.
3. Considering the research findings, there is no difference between the impact of mindfulness and positivity training on emotion regulation components in students with symptoms of generalized anxiety disorder. Therefore, counseling

centers can use both mindfulness and positivity training to improve students' emotion regulation.

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#### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

#### Declaration of Interest

The authors of this article declared no conflict of interest.

#### Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

#### Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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#### Authors' Contributions

All authors equally contributed in this article.

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