# Mindfulness Based Stress Reduction for Reducing Anxiety in College Students

**Puti Mourra Dikfried[1], Kondang Budiyani[2*], Martaria Rizky Rinaldi[3]**
[123]Faculty of Psychology, Universitas Mercu Buana Yogyakarta, Indonesia
*kondang@mercubuana-yogya.ac.id

## ABSTRACT

This study aims to evaluate the effectiveness of the Mindfulness-Based Stress Reduction (MBSR) intervention in reducing anxiety levels among college students. Using a pretest-posttest one-group design, five students with moderate to severe anxiety, selected through the anxiety scale of the Depression Anxiety Stress Scales (DASS), participated in an MBSR program consisting of four sessions. Anxiety levels were measured before and after the intervention. The analysis results showed a significant reduction in anxiety levels, with a pretest mean score of 24.2 (SD = 4.87) and a posttest mean score of 11.6 (SD = 3.10). Paired t-tests indicated a mean difference of 12.60 ($p < 0.05$), suggesting that MBSR has a positive impact on reducing anxiety. These findings support the existing literature on the effectiveness of MBSR in anxiety management and highlight the importance of this intervention in the higher education context. Further research with a larger and controlled design is needed to strengthen the generalizability of these results.

**Keywords :** anxiety, mindfulness-based stress reduction, college students

## Introduction

Currently, students are confronted with a myriad of complex and diverse demands. In an increasingly competitive academic environment, they are expected to meet high expectations from educational institutions, families, and themselves (Leung et al., 2021). These demands encompass optimal academic performance, engagement in various organizations and extracurricular activities, as well as the development of social and professional skills (Destin & Svaboda, 2018). Furthermore, with the advent of technology and social media, students face pressure to remain constantly connected and actively involved in the digital world. This situation often results in prolonged stress and mental fatigue, ultimately impacting their mental health (Pedrelli et al., 2015).

Among the various issues arising from these demands, anxiety has emerged as one of the most prevalent mental health concerns among students (Jones et al., 2018). Anxiety can manifest as uncertainty and excessive worry regarding examinations, assignments, or even future prospects post-graduation. The prevalence of anxiety among students is significant, with numerous studies reporting that 30% to 40% of students experience considerable anxiety, with an average prevalence rate of 39% (Li et al., 2022). This statistic indicates that anxiety is not merely an individual issue but rather a public health concern that requires greater attention in the context of higher education.

The ramifications of anxiety cannot be overlooked (Moskow et al., 2024). Students experiencing anxiety often struggle with concentration, experience decreased motivation, and face difficulties in social interactions. Additionally, they are more susceptible to various physical health problems, such as sleep disturbances, headaches, and gastrointestinal issues. If not adequately addressed, anxiety can lead to depression, reduced academic performance, and even an increased risk of withdrawal from higher education (Prevatt et al., 2015). Therefore, it is evident that addressing anxiety among students is of paramount importance.

To that end, effective and sustainable interventions are necessary to assist students in coping with the anxiety they face. Various types of interventions have been developed and implemented to reduce anxiety levels, including cognitive behavioral therapy (Oliveira et al., 2023), stress management skills training (Amanvermez et al., 2023), and relaxation techniques (Manansingh et al., 2019). One intervention that has garnered increasing attention is Mindfulness-Based Stress Reduction (MBSR) (Zhou et al., 2020). MBSR is a program that teaches individuals to practice mindfulness, which can help them remain present in the moment and improve their management of stress and anxiety responses (Li & Bressington, 2019). Research indicates that MBSR is not only effective in reducing anxiety levels but also enhances overall psychological well-being.

However, despite numerous studies demonstrating the effectiveness of MBSR across various populations, research specifically focusing on students as subjects remains relatively limited. Therefore, it is crucial to conduct further investigations examining the impact of MBSR on students' anxiety levels. This study aims to evaluate the effectiveness of the MBSR intervention in reducing anxiety among students, with the hope of providing deeper insights into effective mental health management strategies within higher education settings. The findings from this research are expected to enrich the existing literature and contribute positively to the development of mental health support policies and practices in educational institutions.

## Methods

This study employed a one-group pretest-posttest design, in which participants' anxiety levels were assessed before and after the intervention. This design allows researchers to evaluate the effectiveness of Mindfulness-Based Stress Reduction (MBSR) in reducing anxiety among college students.

Participants were recruited from the active student population at a university. A total of 35 students expressed their interest in participating in the study. Following the application of inclusion criteria, 10 students qualified for participation. Out of these 10 participants, 5 students provided informed consent and committed to completing all phases of the study.

The inclusion criteria for participants were as follows: (1) active students enrolled in higher education, and (2) having anxiety scores categorized as moderate to severe, as measured by the anxiety subscale of the Depression Anxiety Stress Scales (DASS). The exclusion criteria included: (1) students unable to attend all intervention sessions, and (2) students currently undergoing psychological or pharmacological treatment related to anxiety.

Participants' anxiety levels were measured using the anxiety subscale of the Depression Anxiety Stress Scales (DASS), which is a standardized and reliable instrument for assessing anxiety, depression, and stress in individuals (Widyana et al., 2020). Anxiety scores were assessed twice: before the intervention (pretest) and after the intervention (posttest).

The intervention utilized in this study was Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 2001), consisting of four sessions with a total duration of 200 minutes. Each session was facilitated by a licensed psychologist experienced in delivering MBSR interventions. These sessions included meditation, breathing exercises, and mindfulness practices aimed at assisting participants in managing their anxiety.

Data obtained from the pretest and posttest assessments were analyzed using a paired sample t-test. This statistical test was employed to compare the mean anxiety scores before and after the intervention, with the objective of determining whether a significant difference existed in participants' anxiety levels following the MBSR program. The significance level was set at $\alpha < 0.05$.

### Results

The characteristics of the participants are shown in Table 1. Of the five participants, 60% were male and 40% were female. Most participants (60%) were 20 years old, while 20% were 19 years old and 20% were 21 years old.

Table 1. Participant characteristic

| Characterictic | n | % |
|---|---|---|
| Sex | | |
| Male | 3 | 60 |
| Female | 2 | 40 |
| Age | | |
| 19 | 1 | 20 |
| 20 | 3 | 60 |
| 21 | 1 | 20 |

The descriptive statistics for anxiety levels are presented in Table 2. The mean pretest score was 23.4 (SD = 5.12), ranging from 17 to 29. Post-test scores showed a significant reduction, with a mean of 10 (SD = 2.91), ranging from 7 to 14.

Table 2. Descriptive Data (N=5)

| | N | Mean | Std. Deviation | Min | Max |
|---|---|---|---|---|---|
| *Pretest* | 5 | 23.4 | 5.12 | 17 | 29 |
| *Post-test* | 5 | 10 | 2.91 | 7 | 14 |

The findings presented in Figure 1 illustrate the pretest and posttest anxiety scores for five participants who underwent the Mindfulness-Based Stress Reduction (MBSR) intervention. The blue line represents the pretest scores, while the orange line reflects the posttest scores.
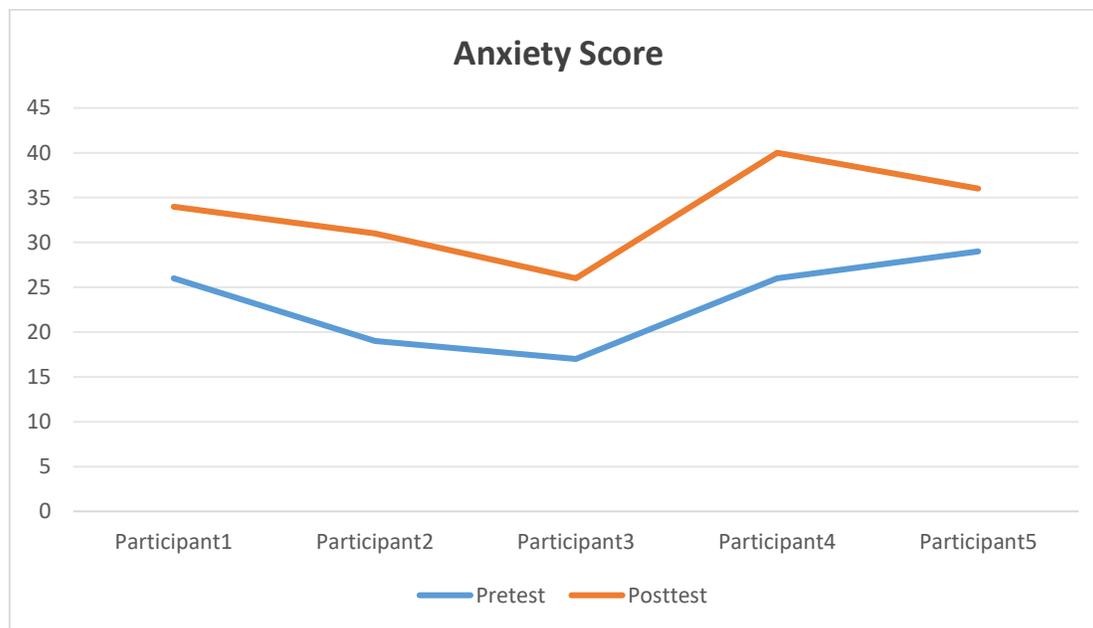


Figure 1. Anxiety Score

The normality test results for the pre-test DASS-A data yielded a significance value of 0.182, while the post-test DASS-A data yielded a significance value of 0.200. Since both values are greater than 0.05, it can be concluded that the pre-test and post-test data are normally distributed.

Subsequently, the hypothesis test results, which compare the pre-test and post-test scores of the DASS-A, are presented. The mean score for the pre-test was 23.4 with a standard deviation of 5.13, whereas the mean score for the post-test was 10.0 with a standard deviation of 2.92. The paired t-test revealed a mean difference of 13.40 with a standard deviation of 6.47 and a standard error of the mean of 2.89. The 95% confidence interval for the difference in scores ranged from 5.37 to 21.43. The t-value was calculated to be 4.634 with 4 degrees of freedom (df), and the significance (p-value) was 0.010, which is less than 0.05. Therefore, it can be concluded that there is a statistically significant difference between the pre-test and post-test DASS-A scores, indicating that the intervention has a significant impact on reducing participants' anxiety levels.

**Discussions**

The analysis results indicate that the Mindfulness-Based Stress Reduction (MBSR) intervention exerts a statistically significant effect on reducing participants' anxiety levels, as evidenced by the statistical analyses conducted. This substantial reduction in anxiety scores

is consistent with previous studies that affirm the efficacy of MBSR in managing stress and anxiety (Serpa et al., 2014). MBSR, which emphasizes cultivating present-moment awareness and fostering non-judgmental acceptance of experiences, plays a critical role in assisting participants in better managing their anxiety responses. The observed decrease in anxiety levels may be attributed to participants' enhanced ability to regulate their emotions and diminish automatic stress reactions through mindfulness practices (Santoso & Rinaldi, 2022; Zhou et al., 2020).

MBSR facilitates the development of heightened awareness regarding current thoughts and emotions without the inclination to resist or avoid them. In many instances of anxiety, excessive rumination concerning future uncertainties or past experiences can exacerbate anxiety symptoms (Hoge et al., 2014). By enhancing present-moment awareness, MBSR participants are equipped to avoid entrapment in cognitive patterns that exacerbate anxiety.

Anxiety frequently arises from the body's automatic stress responses, including increased heart rate and the sudden emergence of anxious feelings (Jeronimus, 2019). Through mindfulness practice, individuals cultivate the ability to recognize their physiological reactions to stress without engaging in immediate reactive behaviors. This mindfulness fosters a more measured and composed response to stress, thereby mitigating anxiety that may arise from disproportionate reactions (Hitchcock et al., 2016).

Moreover, MBSR not only facilitates participants' awareness of their emotional states but also encourages them to accept these emotions without judgment or avoidance (Kabat-Zinn, 2003). Rather than combating or repressing anxious feelings, MBSR participants learn to embrace anxiety as a normal aspect of human experience. Over time, such acceptance has the potential to diminish the intensity of anxiety and enhance individuals' coping capabilities (Nyklíček & Kuijpers, 2008).

Individuals suffering from anxiety often engage in persistent negative thought patterns or "rumination." MBSR instructs participants to concentrate their attention on simple, mindful activities—such as breath awareness or body scanning—thereby decreasing their propensity to ruminate on anxiety-inducing thoughts. This increased capacity to focus on external stimuli, rather than negative cognitions, may further alleviate anxiety (Gu et al., 2015).

Neuroscientific research underscores that mindfulness practices, such as those implemented in MBSR, can induce changes in brain structure and functionality (Van Der Celden & Roepstorff, 2015). For instance, mindfulness has been shown to enhance activity in the prefrontal cortex—an area of the brain associated with decision-making and emotional regulation—while concurrently reducing activity in the amygdala, which governs stress and anxiety responses. Such neural adaptations contribute to improved self-regulation and diminished anxiety (Gotlink et al., 2016).

Furthermore, mindfulness promotes a non-judgmental acceptance of all experiences, irrespective of their pleasantness or unpleasantness (Kral et al., 2019). This approach assists individuals in becoming less reactive to situations that typically elicit anxiety. For instance, instead of perceiving social situations or specific stressors as threatening, individuals learn to

approach these contexts with greater neutrality, thereby preventing the reinforcement of anxiety responses (Praissman, 2008).

It is essential to acknowledge that the sample size of this study is relatively small (N = 5), necessitating cautious interpretation of the findings. Subsequent research involving larger sample sizes is imperative to ascertain the generalizability of the results. Nonetheless, the present findings provide preliminary evidence that MBSR may serve as an effective intervention for mitigating anxiety in individuals facing stress or anxiety disorders. Future investigations should involve a greater number of participants to enhance the representativeness of the findings across broader populations. An increased sample size would facilitate the generalization of results and bolster the external validity of the research.

In conclusion, the results of this study indicate that MBSR holds promise as an effective intervention method for alleviating anxiety within student populations. Mindfulness-based interventions can be effectively utilized by psychologists, counselors, and mental health practitioners to support individuals experiencing anxiety symptoms. To enhance internal validity, future studies should consider implementing a control group or utilizing a randomized controlled trial (RCT) design. This methodological approach would permit direct comparisons between participants undergoing MBSR intervention and those either not receiving the intervention or receiving alternative treatments, thereby enabling a more objective evaluation of the efficacy of MBSR.Hasil analisis menunjukkan bahwa intervensi Mindfulness-Based Stress Reduction (MBSR) memiliki pengaruh signifikan dalam menurunkan tingkat kecemasan peserta, sebagaimana dibuktikan melalui hasil uji statistik yang disajikan.

## Conclusion

The aim of this study was to investigate the effectiveness of Mindfulness-Based Stress Reduction (MBSR) in reducing anxiety levels among participants. Based on the findings of this study, it can be concluded that the MBSR intervention has the potential to significantly reduce participants' anxiety levels. Although this research utilized a small sample, the results demonstrated a noticeable decrease in anxiety levels following participation in the MBSR program, suggesting that mindfulness may play a role in enhancing participants' ability to cope with anxiety. Therefore, MBSR can be considered an effective intervention for anxiety management, particularly among student populations.

However, the limitations of this study, such as the absence of a control group and the small sample size, restrict the generalizability of the findings. Consequently, further research with a more robust design and larger sample size is required to validate these results. Additionally, further exploration of the long-term effects and underlying mechanisms of anxiety reduction through MBSR is crucial to provide a deeper understanding and broader application of this intervention.

**Acknowledgement**

**References**

Adlina, N., Kaloeti, D., Ediati, A., & Martono, K. (2022). Psychometric Evaluation of the Generalized Problematic Internet Use Scale 2 in an Indonesian Adolescents' Sample. ICPsyche 2021, 283–291. https://doi.org/10.5220/0010811400003347

Amanvermez, Y., Rahmadiana, M., Karyotaki, E., de Wit, L., Ebert, D. D., Kessler, R. C., & Cuijpers, P. (2023). Stress management interventions for college students: A systematic review and meta-analysis. *Clinical Psychology: Science and Practice*, *30*(4), 423.

Destin, M., & Svoboda, R. C. (2018). Costs on the mind: The influence of the financial burden of college on academic performance and cognitive functioning. *Research in Higher Education*, *59*, 302-324.

Gotink, R. A., Meijboom, R., Vernooij, M. W., Smits, M., & Hunink, M. M. (2016). 8-week mindfulness based stress reduction induces brain changes similar to traditional long-term meditation practice–a systematic review. *Brain and cognition*, *108*, 32-41.

Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical psychology review*, *37*, 1-12.

Hitchcock, P. F., Martin, L. M., Fischer, L., Marando-Blanck, S., & Herbert, J. D. (2016). Popular conceptions of mindfulness: Awareness and emotional control. *Mindfulness*, *7*, 940-949.

Hoge, E. A., Bui, E., Goetter, E., Robinaugh, D. J., Ojserkis, R. A., Fresco, D. M., & Simon, N. M. (2015). Change in decentering mediates improvement in anxiety in mindfulness-based stress reduction for generalized anxiety disorder. *Cognitive therapy and research*, *39*, 228-235.

Jeronimus, B. F. (2019). Dynamic system perspectives on anxiety and depression. *Psychosocial Development in Adolescence*, 100-126.

Jones, P. J., Park, S. Y., & Lefevor, G. T. (2018). Contemporary college student anxiety: The role of academic distress, financial stress, and support. *Journal of College Counseling*, *21*(3), 252-264.

Kabat-Zinn, J. (2001). Mindfulness meditation for everyday life. *London, UK: Piatkus*.

Kabat-Zinn, J. (2003). Mindfulness-based stress reduction (MBSR). *Constructivism in the human sciences*, *8*(2), 73.

Kral, T. R., Imhoff-Smith, T., Dean III, D. C., Grupe, D., Adluru, N., Patsenko, E., ... & Davidson, R. J. (2019). Mindfulness-based stress reduction-related changes in posterior cingulate resting brain connectivity. *Social Cognitive and Affective*

*Neuroscience*, *14*(7), 777-787.

Leung, C. W., Farooqui, S., Wolfson, J. A., & Cohen, A. J. (2021). Understanding the cumulative burden of basic needs insecurities: associations with health and academic achievement among college students. *American Journal of Health Promotion*, *35*(2), 275-278.

Li, S. Y. H., & Bressington, D. (2019). The effects of mindfulness-based stress reduction on depression, anxiety, and stress in older adults: A systematic review and meta-analysis. *International journal of mental health nursing*, *28*(3), 635-656.

Li, W., Zhao, Z., Chen, D., Peng, Y., & Lu, Z. (2022). Prevalence and associated factors of depression and anxiety symptoms among college students: a systematic review and meta-analysis. *Journal of child psychology and psychiatry*, *63*(11), 1222-1230.

Manansingh, S., Tatum, S. L., & Morote, E. S. (2019). Effects of relaxation techniques on nursing students' academic stress and test anxiety. *Journal of Nursing Education*, *58*(9), 534-537.

Moskow, D. M., Lipson, S. K., & Tompson, M. C. (2024). Anxiety and suicidality in the college student population. *Journal of American college health*, *72*(3), 881-888.

Nyklíček, I., & Kuijpers, K. F. (2008). Effects of mindfulness-based stress reduction intervention on psychological well-being and quality of life: is increased mindfulness indeed the mechanism?. *Annals of behavioral medicine*, *35*(3), 331-340.

Oliveira, C., Pacheco, M., Borges, J., Meira, L., & Santos, A. (2023). Internet-delivered cognitive behavioral therapy for anxiety among university students: A systematic review and meta-analysis. *Internet interventions*, *31*, 100609.

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: mental health problems and treatment considerations. *Academic psychiatry*, *39*, 503-511.

Praissman, S. (2008). Mindfulness-based stress reduction: a literature review and clinician's guide. *Journal of the American Association of Nurse Practitioners*, *20*(4), 212-216.

Prevatt, F., Dehili, V., Taylor, N., & Marshall, D. (2015). Anxiety in college students with ADHD: Relationship to cognitive functioning. *Journal of Attention Disorders*, *19*(3), 222-230.

Santoso, B. A., & Rinaldi, M. R. (2022). Teknik Mindfulness Dan Kecemasan Perempuan Sebagai Aparat Sipil Negara. *JIP (Jurnal Intervensi Psikologi)*, 14(1), 21-30.

Serpa, J. G., Taylor, S. L., & Tillisch, K. (2014). Mindfulness-based stress reduction (MBSR) reduces anxiety, depression, and suicidal ideation in veterans. *Medical care*, *52*, S19-S24.

Van Der Velden, A. M., & Roepstorff, A. (2015). Neural mechanisms of mindfulness meditation: bridging clinical and neuroscience investigations. *Nature Reviews Neuroscience*, *16*(7), 439-439.

Widyana, R., & Sumiharso, S. R. (2020). Psychometric properties of internet-administered

version of depression, anxiety and stress scales (DASS-42) in sample Indonesian adult. *Talent Dev Excell*, *14*(2s), 1422-1434.

Zhou, X., Guo, J., Lu, G., Chen, C., Xie, Z., Liu, J., & Zhang, C. (2020). Effects of mindfulness-based stress reduction on anxiety symptoms in young people: A systematic review and meta-analysis. *Psychiatry Research*, *289*, 113002.