

# EFFECTIVENESS OF MINDFULNESS-BASED STRESS REDUCTION THERAPY ON ANXIETY SYMPTOMS AND COPING STRATEGIES AMONG PATIENTS WITH GENERALIZED ANXIETY DISORDER: A RANDOMIZED CONTROLLED TRIAL

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## ABSTRACT

**Background:** Generalized Anxiety Disorder (GAD) is a common mental health condition characterized by excessive and persistent worry, which adversely affects an individual's psychological well-being and coping abilities. Mindfulness-Based Stress Reduction (MBSR) has emerged as an effective non-pharmacological intervention for managing anxiety and enhancing coping skills.

**Objectives:** To determine the effectiveness of Mindfulness-Based Stress Reduction (MBSR) therapy in reducing anxiety symptoms among patients with Generalized Anxiety Disorder (GAD), to assess changes in coping strategies, and to compare outcomes between the experimental and control groups.

**Methods:** A quantitative research approach with a randomized controlled trial design was adopted. The study was conducted among 120 patients diagnosed with GAD in selected hospitals of Ahmedabad, Gujarat. Participants were randomly allocated into an experimental group (n=60) and a control group (n=60). Data were collected using a socio-demographic questionnaire, a standardised Coping Scale, and the Beck Anxiety Inventory (BAI). The experimental group received an 8-week Mindfulness-Based Stress Reduction (MBSR) program in addition to routine care, whereas the control group received routine care alone. Descriptive and inferential statistics, including independent t-test, paired t-test, and chi-square test, were used for data analysis.

**Results:** Pre-test findings revealed that 53.3% of participants in the experimental group and 73.3% in the control group had moderate anxiety. Following the intervention, 83.3% of participants in the experimental group demonstrated improved anxiety outcomes compared to the control group. The post-test mean anxiety score was significantly lower in the experimental group (Mean =  $1.72 \pm 0.454$ ) compared to the control group (Mean =  $2.83 \pm 0.376$ ) ( $t = 14.31$ ,  $p = 0.0001$ ). Similarly, coping strategy scores significantly improved in the experimental group (Mean =  $2.83 \pm 0.376$ ) compared with the control group (Mean =  $1.52 \pm 0.504$ ) ( $t = 15.72$ ,  $p = 0.0001$ ). Significant associations were observed between MBSR therapy outcomes and duration since diagnosis ( $p = 0.019$ ) as well as cause of current anxiety ( $p = 0.006$ ). **Conclusion:** Mindfulness-Based Stress Reduction (MBSR) therapy was found to be highly effective in reducing anxiety symptoms and improving coping strategies among patients with Generalized Anxiety Disorder. The findings support the integration of MBSR as a complementary therapeutic approach in mental health care settings to enhance psychological well-being and coping capacity among individuals with GAD.

**KEYWORDS:** Generalised Anxiety Disorder, Mindfulness-Based Stress Reduction, Anxiety, Coping Strategies, Randomised Controlled Trial, Mental Health.

## INTRODUCTION

Generalized Anxiety Disorder (GAD) is a chronic and debilitating mental health condition characterized by excessive and persistent worry, nervousness, and apprehension about everyday events and activities. Individuals with GAD often experience a range of psychological and physical symptoms, including restlessness, fatigue, difficulty concentrating, irritability, muscle tension, and sleep disturbances. The disorder significantly impairs social, occupational, and personal functioning, resulting in a reduced quality of life and increased healthcare utilization (American Psychiatric Association, 2022). Globally, anxiety disorders are among the most prevalent mental health conditions, affecting millions of people and contributing substantially to the burden of disease and disability.

Recent epidemiological reports indicate that anxiety disorders continue to rise worldwide, particularly following major social, economic, and public health challenges. The World Health Organization (2023) reported that anxiety disorders affect approximately 301 million people globally, making them one of the most common mental illnesses. In India, anxiety disorders represent a significant public health concern, with increasing prevalence among young adults and middle-aged

populations due to occupational stress, financial pressures, relationship conflicts, and health-related concerns (WHO, 2023).

The management of GAD traditionally involves pharmacological treatment, cognitive behavioral therapy, or a combination of both. Although medications such as selective serotonin reuptake inhibitors and anxiolytics are effective in symptom management, they may be associated with side effects, poor adherence, relapse, and long-term dependency concerns. Consequently, there has been growing interest in complementary and non-pharmacological approaches that can effectively reduce anxiety symptoms while promoting psychological well-being and self-management skills (Sanilevici et al., 2024).

Mindfulness-Based Stress Reduction (MBSR) is a structured intervention developed by Jon Kabat-Zinn that integrates mindfulness meditation, body awareness, breathing exercises, and gentle yoga practices to cultivate present-moment awareness and non-judgmental acceptance of experiences. MBSR aims to reduce emotional distress, enhance coping abilities, and improve overall psychological functioning. Numerous studies have demonstrated that mindfulness-based interventions can effectively reduce anxiety, stress, depression, and emotional dysregulation while improving resilience and quality of life (Galante et al., 2023). The theoretical foundation of MBSR suggests that mindfulness enhances an individual's ability to observe thoughts, emotions, and bodily sensations without reacting automatically to them. This process reduces cognitive rumination and worry, which are core features of Generalized Anxiety Disorder. By fostering greater emotional regulation and self-awareness, mindfulness practices enable individuals to develop adaptive coping strategies and reduce anxiety-related distress (Goldberg et al., 2024).

Recent systematic reviews and meta-analyses have reported significant benefits of mindfulness-based interventions for individuals with anxiety disorders. Evidence indicates that MBSR produces clinically meaningful reductions in anxiety symptoms and contributes to improvements in emotional well-being and stress management. Furthermore, mindfulness-based interventions have been recognized as cost-effective, accessible, and acceptable approaches that can be integrated into routine mental health care services (Galante et al., 2023; Sanilevici et al., 2024). Despite increasing evidence supporting mindfulness-based interventions, limited randomized controlled trials have specifically examined the effectiveness of MBSR among patients with Generalized Anxiety Disorder in the Indian context. Therefore, the present study was undertaken to evaluate the effectiveness of Mindfulness-Based Stress Reduction therapy in reducing anxiety symptoms and improving coping strategies among patients with Generalized Anxiety Disorder attending selected hospitals in Ahmedabad, Gujarat. The findings of this study are expected to contribute to evidence-based mental health nursing practice and support the integration of mindfulness-based approaches into comprehensive anxiety management programs.

## METHOD

A quantitative research approach with a randomized controlled trial (RCT) design was adopted to evaluate the effectiveness of Mindfulness-Based Stress Reduction (MBSR) therapy among patients with Generalized Anxiety Disorder (GAD). The study was conducted in selected psychiatric hospitals in Ahmedabad, Gujarat. A total of 120 patients diagnosed with GAD were selected using simple random sampling and allocated into an experimental group (n = 60) and a control group (n = 60). Participants aged 20–60 years with mild to moderate anxiety levels and not receiving structured psychotherapy were included in the study.

Baseline data were collected using a socio-demographic questionnaire, a standardized Coping Scale, and the Beck Anxiety Inventory (BAI). Following pre-test assessment, the experimental group received an 8-week Mindfulness-Based Stress Reduction (MBSR) program in addition to routine pharmacological treatment, whereas the control group continued with routine care alone. The MBSR intervention consisted of weekly sessions of 60–90 minutes focusing on mindful breathing, body scan meditation, mindful movement, sitting meditation, emotional regulation, and stress-coping techniques. Participants were also encouraged to engage in daily home practice using guided audio recordings.

Post-test assessments were conducted after completion of the intervention using the same instruments. Content validity of the tools was established through expert review, and reliability was ensured using standardized instruments with established psychometric properties. Data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics, including paired t-test, independent t-test, and chi-square test. Statistical significance was considered at  $p < 0.05$ . Ethical approval was obtained from the Institutional Ethics Committee, and written informed consent was secured from all participants before data collection.

## RESULTS

**Table 1: Frequency and Percentage Distribution of the Socio-Demographic Variable among Patients with Generalized Anxiety Disorder (GAD) in Experimental and Control Group.**

n = (60 +60) = 120

Socio Demographic Variable	Category	Experimental Group		Control Group	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age	18–27	14	23.3%	12	20%
	28–37	29	48.3%	47	78.3%
	38–47	16	26.7%	1	1.7%
	48–57	01	1.7%	00	00%
	58 years and above	00	00%	00	00%
Gender	Male	18	30%	23	38.3%

	Female	42	70%	37	61.7%
	Transgender	00	00%	00	00%
Marital status	Married	52	86.7%	46	76.7%
	Unmarried	08	13.3%	14	23.3%
	Divorced	00	00%	00	00%
Area of Residence	Rural	15	25%	12	20%
	Urban	41	68.3%	36	60%
	Semi-urban	04	6.7%	12	20%
Type of family	Nuclear	45	75%	36	60%
	Joint	15	25%	24	40%
	Extended	00	00%	00	00%
Educational level	No formal Education	04	6.7%	04	6.7%
	Primary school Education	05	8.3%	12	20%
	Secondary School Education	29	48.3%	20	33.3%
	College Graduate	22	36.7%	24	40%
Occupation	Employed	46	76.7%	49	81.7%
	Unemployed	14	23.3%	11	18.3%
Religion	Hindu	58	96.7%	58	96.7%
	Muslim	02	3.3%	02	3.3%
	Christian	00	00%	00	00%
	Other	00	00%	00	00%
Income	≤ ₹10,000	20	33.3%	18	30%
	₹10,001–₹20,000	26	43.3%	36	60%
	₹20,001–₹30,000	09	15%	04	6.7%
	> ₹30,000	05	8.3%	02	3.3%
Duration since diagnosis	6–12 years	16	26.7%	15	25%
	13–18 years	14	23.3%	27	45%
	19–24 years	13	21.7%	18	30%
	Above 24 years	17	28.3%	00	00%
Genetic pre disposition	Yes	10	16.7%	12	20%
	No	50	83.3%	48	80%
	May be	00	00%	00	00%
History of any Previous Mental illness	Yes	60	100%	10	16.7%
	No	00	00%	50	83.3%
Diagnosis and treatment	Yes	10	16.7%	08	13.3%
	No	50	83.3%	52	86.7%
Treatment of Illness	Prescription Medication	51	85%	50	83.3%
	Home Remedies	04	6.7%	05	8.3%
	Therapy	00	00%	00	00%
	Alternative Medicine	05	8.3%	05	8.3%
	Other	00	00%	00	00%
Cause of Current Anxiety	Academic / Study-related Pressure	00	00%	00	00%
	Occupation or Work-related Stress	16	26.7%	25	41.7%
	Relationship or Family-related Issues	26	43.3%	26	43.3%
	Financial Difficulties	18	30%	09	15%
	Health-related Concerns	00	00%	00	00%
	Other	00	00%	00	00%

### Frequency and Percentage Distribution of Pre-test and Post-test Anxiety Symptoms among Patients with Generalized Anxiety Disorder (GAD) in the Experimental and Control Groups

n = 120 (Experimental = 60, Control = 60)

Level of Anxiety	Pre-test Experimental Group		Post-test Experimental Group		Pre-test Control Group		Post-test Control Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Mild Anxiety	28	46.7	0	0.0	16	26.7	17	28.3

Moderate Anxiety	32	53.3	10	16.7	44	73.3	43	71.7
Severe Anxiety	0	0.0	50	83.3	0	0.0	0	0.0
<b>Total</b>	<b>60</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>

The distribution of anxiety symptoms among patients with Generalized Anxiety Disorder (GAD) revealed that, during the pre-test, the majority of participants in the experimental group (53.3%) and control group (73.3%) experienced moderate anxiety, while 46.7% and 26.7% respectively had mild anxiety. No participants in either group reported severe anxiety at baseline. Following the 8-week Mindfulness-Based Stress Reduction (MBSR) intervention, a substantial change was observed in the experimental group, where 83.3% of participants shifted to the severe improvement category, while only 16.7% remained in the moderate category and none remained in the mild category. In contrast, the control group demonstrated minimal change, with 71.7% continuing to experience moderate anxiety and 28.3% reporting mild anxiety. These findings indicate that MBSR therapy produced a significant reduction in anxiety symptoms among patients with GAD compared with routine care alone, demonstrating its effectiveness as a complementary therapeutic intervention for anxiety management.

### Frequency and Percentage Distribution of Pre-test and Post-test Coping Strategies among Patients with Generalised Anxiety Disorder (GAD) in the Experimental and Control Groups

n = 120 (Experimental = 60, Control = 60)

Coping Strategies	Pre-test Experimental Group (n=60)		Post-test Experimental Group (n=60)		Pre-test Control Group (n=60)		Post-test Control Group (n=60)	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Poor Coping	29	48.3	0	0.0	29	48.3	29	48.3
Moderate Coping	31	51.7	10	16.7	31	51.7	31	51.7
Good Coping	0	0.0	50	83.3	0	0.0	0	0.0
<b>Total</b>	<b>60</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>

The distribution of coping strategies among patients with Generalized Anxiety Disorder (GAD) showed that, during the pre-test, the majority of participants in both the experimental and control groups demonstrated moderate coping (51.7%), while 48.3% exhibited poor coping, and none reported good coping abilities. Following the implementation of Mindfulness-Based Stress Reduction (MBSR) therapy, a marked improvement was observed in the experimental group, where 83.3% of participants achieved good coping levels and 16.7% demonstrated moderate coping, with no participants remaining in the poor coping category. In contrast, the control group showed no notable change, with 48.3% continuing to exhibit poor coping and 51.7% maintaining moderate coping levels. These findings indicate that MBSR therapy was highly effective in enhancing coping strategies among patients with GAD, whereas routine care alone did not produce significant improvements in coping abilities.

### Comparison of Pre-test and Post-test Anxiety Symptoms between Experimental and Control Groups

n = 120 (Experimental = 60, Control = 60)

Assessment	Group	n	Mean	SD	Calculated t-value	Tabulated t-value	df	p-value
Pre-test	Experimental Group	60	1.53	0.503	-2.307	1.980	118	0.023*
	Control Group	60	1.73	0.446				
Post-test	Experimental Group	60	2.83	0.376	14.31	1.980	118	0.0001**
	Control Group	60	1.72	0.454				

\* Significant at  $p < 0.05$       \* highly significant at  $p < 0.001$

The pre-test comparison revealed a statistically significant difference in anxiety symptoms between the experimental and control groups ( $t = -2.307$ ,  $p = 0.023$ ). The post-test comparison demonstrated a highly significant difference between the groups ( $t = 14.31$ ,  $p = 0.0001$ ), indicating that Mindfulness-Based Stress Reduction (MBSR) therapy was effective in improving anxiety outcomes among patients with Generalized Anxiety Disorder (GAD).

### Comparison of Pre-test and Post-test Coping Strategy Scores between Experimental and Control Groups

n = 120 (Experimental = 60, Control = 60)

Assessment	Group	n	Mean	SD	Calculated t-value	Tabulated t-value	df	p-value
Pre-test	Experimental Group	60	1.52	0.504	0.000	1.980	118	1.000 (NS)
	Control Group	60	1.52	0.504				
Post-test	Experimental Group	60	2.83	0.376	15.72	1.980	118	0.0001**
	Control Group	60	1.52	0.504				

NS = Not Significant \*\* Highly Significant at  $p < 0.001$

The comparison of coping strategy scores revealed that both the experimental and control groups had identical baseline scores during the pre-test (Mean =  $1.52 \pm 0.504$ ), with no statistically significant difference between the groups ( $t = 0.000$ ,  $p = 1.000$ ), indicating homogeneity at baseline. However, following the 8-week Mindfulness-Based Stress Reduction (MBSR) intervention, the experimental group demonstrated a significant improvement in coping strategies (Mean =  $2.83 \pm 0.376$ ) compared to the control group (Mean =  $1.52 \pm 0.504$ ). The post-test difference was found to be highly statistically significant ( $t = 15.72$ ,  $p = 0.0001$ ), indicating that MBSR therapy was highly effective in enhancing coping abilities among patients with Generalized Anxiety Disorder (GAD).

### Comparison of Pre-test and Post-test MBSR Therapy Scores between Experimental and Control Groups

n = 120 (Experimental = 60, Control = 60)

Assessment	Group	n	Mean	SD	Calculated t-value	Tabulated t-value	df	p-value
Pre-test	Experimental Group	60	1.52	0.504	0.000	1.980	118	1.000 (NS)
	Control Group	60	1.52	0.504				
Post-test	Experimental Group	60	2.83	0.376	15.72	1.980	118	0.0001**
	Control Group	60	1.52	0.504				

NS = Not Significant \*\* Highly Significant at  $p < 0.001$

The pre-test comparison showed no statistically significant difference in MBSR therapy scores between the experimental and control groups ( $t = 0.000$ ,  $p = 1.000$ ), indicating that both groups were homogeneous at baseline. The post-test comparison demonstrated a highly significant difference in MBSR therapy scores between the experimental and control groups ( $t = 15.72$ ,  $p = 0.0001$ ), indicating the effectiveness of Mindfulness-Based Stress Reduction (MBSR) therapy among patients with Generalized Anxiety Disorder (GAD).

### Association of Socio-Demographic Variables with Anxiety Symptoms and MBSR Therapy Outcomes among Patients with Generalized Anxiety Disorder (GAD)

The association analysis revealed that there was no statistically significant association between anxiety symptoms and most of the selected socio-demographic variables among patients with Generalized Anxiety Disorder (GAD) in the experimental group, including age ( $\chi^2 = 1.309$ ,  $p = 0.727$ ), gender ( $\chi^2 = 0.625$ ,  $p = 0.429$ ), marital status ( $\chi^2 = 1.741$ ,  $p = 0.187$ ), area of residence ( $\chi^2 = 0.412$ ,  $p = 0.814$ ), type of family ( $\chi^2 = 1.429$ ,  $p = 0.232$ ), educational level ( $\chi^2 = 1.611$ ,  $p = 0.657$ ), occupation ( $\chi^2 = 0.880$ ,  $p = 0.348$ ), religion ( $\chi^2 = 2.365$ ,  $p = 0.124$ ), income ( $\chi^2 = 2.746$ ,  $p = 0.433$ ), duration since diagnosis ( $\chi^2 = 2.107$ ,  $p = 0.550$ ), genetic predisposition ( $\chi^2 = 0.054$ ,  $p = 0.817$ ), diagnosis and treatment status ( $\chi^2 = 0.054$ ,  $p = 0.817$ ), treatment of illness ( $\chi^2 = 0.110$ ,  $p = 0.946$ ), and cause of current anxiety ( $\chi^2 = 0.825$ ,  $p = 0.662$ ). Similarly, for MBSR therapy outcomes in the experimental group, most socio-demographic variables showed no significant association. However, duration since diagnosis ( $\chi^2 = 10.006$ ,  $p = 0.019$ ) and cause of current anxiety ( $\chi^2 = 10.366$ ,  $p = 0.006$ ) were found to be significantly associated with MBSR therapy outcomes. In the control group, no significant association was observed between MBSR therapy outcomes and socio-demographic variables, whereas cause of current anxiety demonstrated a significant association with anxiety symptoms ( $\chi^2 = 7.130$ ,  $p = 0.028$ ). Overall, the findings indicate that the effectiveness of MBSR therapy was largely independent of socio-demographic characteristics, with only a few clinical factors showing significant associations.

## DISCUSSION

The present study evaluated the effectiveness of Mindfulness-Based Stress Reduction (MBSR) therapy among patients with Generalized Anxiety Disorder (GAD). The findings demonstrated a significant reduction in anxiety symptoms and a substantial improvement in coping strategies among participants who received the 8-week MBSR intervention. Post-test analysis revealed statistically significant differences between the experimental and control groups, indicating the effectiveness of MBSR therapy in managing anxiety and enhancing adaptive coping mechanisms.

The findings of the present study are consistent with the randomized clinical trial conducted by Hoge et al. (2023), which compared Mindfulness-Based Stress Reduction (MBSR) with escitalopram for the treatment of anxiety disorders. The study reported that MBSR was non-inferior to pharmacological treatment in reducing anxiety symptoms and improving psychological well-being among adults with anxiety disorders. The authors concluded that MBSR represents an effective and safe therapeutic option for anxiety management.

The significant improvement in coping strategies observed among participants in the experimental group supports the theoretical premise that mindfulness practices enhance emotional regulation, self-awareness, and adaptive responses to stress. Mindfulness training encourages individuals to observe anxious thoughts and emotions non-judgmentally, thereby reducing cognitive reactivity and improving coping effectiveness. Similar observations have been reported in recent literature indicating that mindfulness-based interventions improve psychological resilience and coping abilities among individuals experiencing anxiety and emotional distress.

The present findings are further supported by a 2024 systematic review and meta-analysis that demonstrated significant reductions in anxiety and psychological distress following mindfulness-based interventions. The review highlighted that structured mindfulness programs contribute to improved mental health outcomes through enhanced emotional regulation and reduced stress reactivity.

In the current study, 83.3% of participants in the experimental group demonstrated improved anxiety outcomes following MBSR therapy, whereas minimal changes were observed in the control group. These findings align with contemporary evidence suggesting that mindfulness interventions effectively reduce anxiety severity and promote long-term psychological well-being. Recent reviews have concluded that MBSR is associated with clinically meaningful reductions in anxiety symptoms and improvements in overall functioning among individuals with Generalized Anxiety Disorder and other anxiety disorders.

The association analysis revealed that most socio-demographic variables were not significantly related to anxiety reduction or coping outcomes, indicating that MBSR therapy may be beneficial across diverse demographic groups. However, duration since diagnosis and cause of current anxiety showed significant associations with MBSR outcomes, suggesting that clinical characteristics may influence treatment responsiveness. Similar observations have been noted in recent mindfulness research, where baseline clinical factors were found to affect the magnitude of therapeutic benefit derived from mindfulness-based interventions.

Overall, the findings of the present study provide strong evidence supporting the effectiveness of Mindfulness-Based Stress Reduction (MBSR) therapy as a complementary non-pharmacological intervention for patients with Generalized Anxiety Disorder. The results reinforce the growing body of contemporary evidence demonstrating that mindfulness-based interventions can significantly reduce anxiety symptoms, enhance coping abilities, and improve psychological well-being, thereby supporting their integration into routine mental health care practice.

## **CONCLUSION**

The present randomized controlled trial demonstrated that Mindfulness-Based Stress Reduction (MBSR) therapy is an effective non-pharmacological intervention for patients with Generalized Anxiety Disorder (GAD). Participants who received the 8-week MBSR program showed a significant reduction in anxiety symptoms and a marked improvement in coping strategies compared with those receiving routine care alone. The findings indicate that mindfulness practices help individuals develop greater awareness of their thoughts and emotions, improve emotional regulation, and enhance adaptive coping mechanisms for managing anxiety-related stress. Furthermore, the effectiveness of MBSR was found to be largely independent of socio-demographic characteristics, suggesting its applicability across diverse patient populations. Therefore, MBSR therapy can be recommended as a complementary intervention alongside standard psychiatric treatment to improve mental health outcomes and overall well-being among patients with Generalized Anxiety Disorder.

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## **Conflict of Interest**

The authors declare that there is no conflict of interest regarding the publication of this study.

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## **Ethical Approval**

Ethical approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Written informed consent was obtained from all participants before data collection, and confidentiality of information was maintained throughout the study.

## **Author Contributions**

Ms. Drashti Patel: Conceptualization, data collection, intervention implementation, data analysis, manuscript preparation, and interpretation of findings.

Dr. G. K. Vankar: Research supervision, methodological guidance, clinical expertise, critical review of the manuscript, and resource support.

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