The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 13, Issue 2, April- June, 2025
DIP: 18.01.118.20251302, DOI: 10.25215/1302.118
https://www.ijip.in

Research Paper

Evaluating the Effectiveness of Mindfulness-Based Stress Reduction on Anxiety: A Controlled Trial

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ABSTRACT

Anxiety disorders are a prevalent and debilitating mental health concern, necessitating effective treatment strategies. Mindfulness-Based Stress Reduction (MBSR) has gained recognition as a promising intervention for managing anxiety symptoms by fostering present-moment awareness, emotional regulation, and cognitive restructuring. This study aimed to evaluate the efficacy of MBSR in reducing anxiety symptom severity compared to Treatment as Usual (TAU) in individuals diagnosed with anxiety disorders. A pre-and post-test between-group research design was employed, with 20 participants purposively sampled from the Institute of Mental Health and Neurosciences (IMHANS-K). Participants were divided into an experimental group (n=10), receiving eight weeks of MBSR therapy, and a control group (n=10), undergoing TAU. Anxiety severity was assessed using the Hamilton Anxiety Rating Scale (HAM-A), while mindfulness levels were measured via the Five Facet Mindfulness Questionnaire (FFMQ). Results demonstrated a significant reduction in anxiety symptoms post-intervention in both groups, with the MBSR group exhibiting greater improvements in mindfulness facets. The findings highlight the potential of MBSR as an effective complementary approach for anxiety management. Further research with larger sample sizes and long-term follow-up is recommended to validate these results.

Keywords: *Anxiety disorders, Mindfulness-Based Stress Reduction (MBSR), Treatment as Usual (TAU), Hamilton Anxiety Rating Scale, Five Facet Mindfulness Questionnaire, emotional regulation*

Anxiety disorders represent a significant and pervasive mental health challenge, affecting a substantial proportion of the global population. These disorders encompass a range of conditions, including generalized anxiety disorder (GAD), social anxiety disorder (SAD), panic disorder, and agoraphobia, each characterized by persistent and excessive worry, heightened physiological arousal, and maladaptive coping mechanisms. Given their chronic nature and resistance to treatment, researchers and clinicians continue to explore innovative interventions to alleviate the burden of anxiety-related symptoms.

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Received: March 27, 2025; Revision Received: May 01, 2025; Accepted: May 04, 2025

Among the various therapeutic approaches available, Mindfulness-Based Stress Reduction (MBSR) has gained increasing recognition as a promising intervention for anxiety disorders. Rooted in mindfulness practices derived from contemplative traditions, particularly Buddhism, MBSR aims to cultivate a state of present-moment awareness, non-judgmental acceptance, and conscious attention. These principles stand in contrast to habitual cognitive patterns of worry, avoidance, and rumination that characterize anxiety disorders. Mindfulness-based interventions have been integrated into clinical practice through structured programs such as MBSR, Mindfulness-Based Cognitive Therapy (MBCT), Dialectical Behavior Therapy (DBT), and Acceptance and Commitment Therapy (ACT). Scientific interest in mindfulness emerged in the 1970s following Herbert Benson's work on the "Relaxation Response," which underscored the physiological benefits of meditative practices. Ainslie Meares further introduced meditation into the medical and psychotherapy fields in Australia, particularly for its potential in managing anxiety, chronic pain, and cancer-related distress. More recently, Jon Kabat-Zinn's contributions have solidified MBSR as a structured, evidence-based approach widely utilized in both medical and community settings. Research has demonstrated its efficacy in reducing symptoms of stress, anxiety, and depression, suggesting that MBSR facilitates emotion regulation and cognitive restructuring.

Anxiety, derived from the Latin term "anxietas," refers to a psychological state encompassing cognitive, affective, and behavioral responses to perceived threats. Distinguished from fear, which is a reaction to an immediate and identifiable danger, anxiety is characterized by future-oriented apprehension and physiological activation. The theoretical underpinnings of anxiety have been extensively studied across psychodynamic, cognitive-behavioral, and neuroscience frameworks, with research emphasizing the interplay of genetic predisposition and environmental stressors in its etiology. Despite advancements in pharmacological and psychotherapeutic interventions, a significant proportion of individuals with anxiety disorders continue to experience persistent symptoms, necessitating the exploration of alternative and complementary treatments such as MBSR.

Several studies have investigated the impact of MBSR on anxiety disorders, yielding promising yet varied results. For instance, Koszycki (2007) compared MBSR to cognitive-behavioral group therapy (CBGT) for SAD, finding that while both interventions improved mood, functioning, and quality of life, CBGT exhibited superior outcomes in reducing social anxiety symptoms. Similarly, Lee et al. (2007) examined a meditation-based stress management program, demonstrating significant reductions in anxiety but mixed results for depression. Evans et al. (2008) reported reductions in anxiety and depressive symptoms among GAD patients following an MBCT intervention, while Philippe R. and Gross (2009) identified neurobiological changes associated with MBSR, including reduced amygdala activity and improved emotional regulation in SAD patients. Additional research, such as studies by Borah Kim et al. (2010) and Vollestad & Nielsen (2011), further supports the efficacy of MBSR in mitigating anxiety symptoms, though methodological limitations and variations in treatment outcomes warrant further investigation.

Given the growing body of evidence supporting MBSR as a viable intervention for anxiety disorders, this study aims to assess and compare symptom severity in patients with anxiety disorders following MBSR therapy versus treatment as usual (TAU). By evaluating the effectiveness of MBSR in real-world clinical settings, this research seeks to contribute to the ongoing discourse on mindfulness-based interventions and their role in anxiety management. Understanding the comparative efficacy of MBSR and TAU may provide valuable insights into optimizing treatment strategies for individuals suffering from anxiety disorders.

METHODOLOGY

To evaluate and contrast the severity of symptoms in individuals with anxiety disorders following Mindfulness-Based Stress Reduction (MBSR) therapy compared to standard treatment.

Hypotheses

Ho1: There will be no significant difference in symptom severity in patients with Anxiety Disorders post MBSR and Treament as usual (TAU)

Study Design

The present study employed a pre-and post-test between-group research design.

Sampling

Purposive sampling was utilized to examine the effects of Mindfulness-Based Stress Reduction (MBSR) therapy on anxiety disorders, involving both an experimental group and a control group.

Study Location

The research was conducted at the Institute of Mental Health and Neurosciences (IMHANS-K) and the community general hospital unit of IMHANS-K, which is affiliated with the Government Medical College. The study commenced following approval from the Institutional Ethical Committee.

Procedure

A total of 20 patients diagnosed with anxiety disorders were selected for the study after meeting the inclusion and exclusion criteria and providing written informed consent. The participants were divided into two groups: 10 patients were assigned to the experimental group, where they underwent eight sessions of Mindfulness-Based Stress Reduction (MBSR) therapy, delivered once a week. The remaining 10 patients were placed in the control group and received treatment as usual (TAU)

Inclusion criteria

- Patients who give consent to participate in the study.
- Patients who are primarily diagnosed with Anxiety disorders (i.e., a primary diagnosis of generalized anxiety disorder, panic disorder, agoraphobia, or social anxiety disorder) as per ICD-10.
- Both genders will be included in the study.
- Age range 20-45 years.
- Educational level at least up to tenth class.

Exclusion criteria

- Patients with History of head injury, epilepsy or organicity.
- Patients with History of substance use/dependence (except nicotine).
- Patients with the history of severe medical illness.

Tools used

- **Socio-demographic and clinical data sheet:** Socio-demographic and clinical data sheet to collect the information about the various socio-demographic and clinical variables of the patient. Socio-demographic variables included are age, gender, birth

order, marital status, area of residence, qualification, family type, and employment status while clinical variables are age of onset, duration of illness, family history of any diagnosed psychiatric illness in the first degree relatives.

- **Hamilton–Anxiety Rating Scale (HARS):** The HAM-A rating scale, created by M. Hamilton, was among the first to be created to assess the severity of anxiety symptoms. It is currently frequently used in both clinical and research contexts. The 14-item scale evaluates both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical ailments associated with anxiety). Each item is defined by a set of symptoms. Although the HAM-A is still often employed in clinical trials as an outcome measure, it doesn't offer any standardized probing questions. In spite of this, the scale's reported inter-rater reliability values seem to be satisfactory.
- **The Five Facet Mindfulness Questionnaire (FFMQ):** Baer and his associates created the multi-factorial Five Facet Mindfulness Questionnaire (FFMQ). It has received a lot of use because of its useful psychometric qualities. The FFMQ's five components are: watch, describe, act mindfully, refrain from evaluating inner experience, and refrain from reacting to inner experience. The FFMQ comprises of 39 items and has been proven to have strong construct validity and internal consistency (Baer et al., 2006). The mindfulness facets of the FFMQ exhibit both positive and negative associations with related dimensions.

Statistical Analysis

Table 1: Description of Socio-demographic Characteristics (categorical variables) of Experimental and Control Group of the Patients with Anxiety disorders

Variables	Experimental Group F(%)	Control Group F(%)	Chi square	df	Significance
Gender					
Female	4 (40.0%)	6 (60%)			
Male	6 (60.0%)	4 (40.0%)	.80	1	.37
Marital status					
Unmarried	7 (70%)	7 (70%)			
Married	3 (30.0%)	3 (30.0%)	.00	1	1.00
Religion					
Islam	10 10(100.0%)	10 10(100.0%)	-	-	-
Education					
Graduation	4 (40.0%)	3 (30.0%)			
Postgraduation	3 (30.0%)	6 (40.0%)	2.643		.450
Secondary	3 (30.0%)	1 (10.0%)		3	
Occupation					
Unemployed	8 (80.0%)	8 (80.0%)			
Employed	2 (20.0%)	2 (20.0%)	3.925	3	.267

Firstly, in terms of Gender, the table shows that there are more Females (60%) in the Control Group compared to Males (40%), while the Experimental Group has a slightly higher number of Males (60%) than Females (40%). Chi-square value for Gender is 0.80 with 1 degree of freedom and a significance level of 0.37, indicating a non-significant difference between the two groups concerning gender distribution. Moving on to Marital

Status, both the Control and Experimental Groups exhibit an equal distribution between Unmarried and Married individuals, with each category representing 70% and 30%, respectively. The Chi-square value for Marital Status is 0.00, indicating no significant difference between the groups in terms of marital status. Regarding Religion, all participants in both the Control and Experimental Groups belong to the Islam religion, resulting in a 100% distribution for this variable. However, Chi-square and degrees of freedom are not applicable since there is no variability in this factor. The Education variable demonstrates differences in distribution among the groups. In the Control Group, 40% of individuals have Graduation-level education, 30% have Post-Graduation, and 30% have Secondary education. In contrast, the Experimental Group consists of 30% Graduates, 40% Post-Graduates, and 10% with Secondary education. The Chi-square value for Education is 2.643 with 3 degrees of freedom and a significance level of 0.450, suggesting a non-significant difference in education levels between the two groups.

Finally, occupation shows an 80% distribution of Unemployed individuals in both the Control and Experimental Groups, while Employed individuals account for 20% in both groups. The Chi-square value for Occupation is 3.925 with 3 degrees of freedom and a significance level of 0.267, indicating no significant difference in occupation status between the groups

Table 2: Description of Facets of Mindfulness between Experimental & Control Group before Therapy Sessions

FFMQ	**Experimental Group Mean ±SD N=10**	**Control Group Mean ±SD N=10**	**Experimental Group Mean Rank**	**Control Group Mean Rank**	**U**	**Significance**
Observing	13.00± .816	12.70± .823	11.55	9.45	39.50	.397
Describing	17.10±2.23	15.30±2.11	12.85	10.50	26.50	.073
Non judging of inner Experience	16.30±3.56	17.20±1.54	10.55	10.45	49.50	.96
Acting with awareness	17.20±1.03	18.30±5.25	11.20	9.80	43.00	.58
Non reactivity to inner experience	13.30±.94	13.60±.51	9.40	11.60	39.00	.36
Total	76.90±4.65	77.30±4.73	11.05	9.95	44.50	.67

FFMQ Five Facet Mindfulness Scale

The table 2 presents a comparison of mindfulness scores between two distinct groups, labelled as the Experimental Group and the Control Group," using the Five Facet Mindfulness Questionnaire (FFMQ). Each group comprises ten participants, and several key statistical measures are provided for different facets of mindfulness as well as the total mindfulness score.

For the facet of "Observing, the Experimental Group yielded a mean score of 13.00 with a standard deviation of 0.816, while the Control Group had a slightly lower mean score of 12.70 with a standard deviation of 0.823. The mean ranks for these groups were 11.55 and 9.45, respectively. The Mann-Whitney U test yielded a p-value of 0.397, suggesting that there is no statistically significant difference between the two groups in terms of their scores for observing facet. In the "Describing" facet, the Experimental Group exhibited a mean score of 17.10 with a standard deviation of 2.23, while the Control Group had a lower mean score of 15.30 with a standard deviation of 2.11. The mean ranks for these groups were 12.85 and 10.50, respectively. The Mann-Whitney U test yielded a p-value of 0.073, indicating a borderline significant difference, with the Experimental Group tending to score higher on this facet. For "Non-Judging of Inner Experience," the "Ex Group" had a mean score of 16.30 with a standard deviation of 3.56, while the "C Group" scored slightly higher with a mean of 17.20 and a standard deviation of 1.54. The mean ranks were 10.55 for the "Experimental Group and 10.45 for the Control Group, with a nonsignificant p-value of 0.96. In terms of "Acting with Awareness," the Experimental Group scored an average of 17.20 with a standard deviation of 1.03, while the "Control Group had a mean score of 18.30 with a higher standard deviation of 5.25. The mean ranks were 11.20 for the Experimental Group and 9.80 for the Control Group, with a p-value of 0.58, indicating no significant difference between the two groups. Lastly, for "Non- Reactivity to Inner Experience," the Experimental Group and Control Group exhibited mean scores of 13.30 and 13.60, respectively, with standard deviations of 0.94 and 0.51. The mean ranks were 9.40 for the Experimental Group and 11.60 for the Control Group. The p-value was 0.36, indicating no significant difference between the groups on this facet. When considering the total FFMQ scores, the Experimental Group had a mean score of 76.90 with a standard deviation of 4.65, while the Control Group had a similar mean score of 77.30 with a standard deviation of 4.73. The mean ranks were 11.05 for the Experimental Group and 9.95 for the Control Group, with a p-value of 0.67, suggesting that there is no significant difference in the total mindfulness scores between the two groups.

Table 3: Description of Control Group on Severity of Anxiety before & after Treatment as Usual Therapy Sessions.

Variable	**Control Group (Pre Therapy) Mean ± SD N=10**	**Control Group (Post Therapy) Mean ± SD N=10**	**Z**	**Significance**
HAM-A	21.30±4.02	15.80±2.82	-2.81	.005**

***Significant at 0.01 level*
HAM-A Hamilton's Anxiety Rating Scale

The table 3 presents data from a study involving two groups: a pre-control group (N=10) and a post-control group (N=10). It displays the mean scores and standard deviations for anxiety levels, as assessed by the Hamilton Anxiety Rating Scale (HAM-A), both before and after a control intervention.

Before the intervention, the pre-control group had a mean anxiety score of 21.30±4.02, which notably decreased to 15.80±2.82 in the post-control group. This reduction in anxiety scores was statistically significant, as indicated by a Z score of -2.81 (p=0.005).
In summary, the table demonstrates that the control intervention had a significant and beneficial impact on reducing anxiety levels among participants in the post-control group compared to the pre-control group, as measured by the HAM-A scale. These findings

suggest that the control intervention effectively mitigated anxiety symptoms in the study participants.

DISCUSSION

Study Results: Impact of Mindfulness Scores

The findings of this study evaluated the effects of mindfulness on participants' scores. A comparison between the pre-experimental and post-experimental groups revealed significant changes across multiple facets, as well as an overall increase in total mindfulness scores. A notable rise in the **Observing** facet scores from pre- to post-experiment suggests that the intervention positively influenced participants' ability to notice and be aware of both internal and external experiences. This supports the idea that mindfulness practices enhance present-moment awareness and observational skills (Brown & Ryan, 2003). The study highlights how mindfulness, particularly the **Observing** facet, contributes to improved psychological well-being. Conversely, a decrease in scores within the **Describing** facet indicates that participants may have shifted away from labeling or verbalizing their experiences. This change could reflect a transition toward a more direct experiential awareness, a key element of mindfulness (Baer et al., 2006). The research explores different mindfulness facets, including **Describing** and **Acting with Awareness**, and their assessment through self-report measures. A significant increase in scores within the **Non-Judging of Inner Experience** facet suggests that participants developed a more accepting and non-judgmental approach toward their thoughts and emotions. This finding aligns with the fundamental principles of mindfulness, which emphasize cultivating non-judgmental awareness (Shapiro et al., 2006). The study discusses how the **Non-Judging** facet helps reduce self-criticism and enhances mental well-being. The improvement in the **Acting with Awareness** facet suggests that participants became more mindful and intentional in their actions. This supports the concept that mindfulness training fosters greater attentiveness and purposeful engagement in daily activities (Brown et al., 2007). The research explores the theoretical foundations of mindfulness and its positive impact on awareness and intentionality, particularly within the **Acting with Awareness** facet. Additionally, a significant increase in scores within the **Non-Reactivity to Inner Experience** facet suggests that participants became less emotionally reactive to their thoughts and feelings. This is a core component of mindfulness, as it promotes emotional regulation and equanimity in response to internal experiences (Hölzel et al., 2011). The study provides insights into how mindfulness training influences neural mechanisms and enhances emotional regulation.

Finally, the overall increase in total mindfulness scores indicates a comprehensive improvement across all mindfulness facets due to the intervention. These results demonstrate the effectiveness of the mindfulness-based approach in enhancing overall mindfulness skills
The results of our study assessed anxiety levels before and after an experimental intervention in two groups: the pre-experimental group and the post-experimental group. The findings indicate a significant reduction in anxiety scores in the post-experimental group compared to the pre-experimental group. The significant decrease in anxiety scores from the pre-experimental group to the post-experimental group suggests that the intervention had a substantial impact on reducing anxiety levels among participants. Anxiety is a common mental health concern, and effective interventions to alleviate symptoms are valuable. Bandelow, B., & Michaelis, S. (2015).

CONCLUSION

In summary, this study highlights the beneficial effects of Mindfulness-Based Stress Reduction (MBSR) on mindfulness, particularly in reducing anxiety and stress. The results emphasize the potential of MBSR as an effective therapeutic approach for individuals struggling with Anxiety Disorders.

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Acknowledgment
The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest
The author(s) declared no conflict of interest.

How to cite this article: Sadiya, A., Hayath, K., Singh, J. & Khan, Z. (2025). Evaluating the Effectiveness of Mindfulness-Based Stress Reduction on Anxiety: A Controlled Trial. *International Journal of Indian Psychology*, *13*(2), 1289-1297. DIP:18.01.118.20251302, DOI:10.25215/1302.118