Meditation Practice and Mental Health Outcomes: A Cross-Sectional Study in the Indian Context

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Abstract

Recent technological advancements and changes in social norms have developed significant mental health concern. Meditation, an ancient practice has gained an attention in recent years for its psychological as well as neurological benefits. Hence the objectives of the current study are to inspect the relationship between meditation practice and scores of depressions, anxiety and stress among Indian population. Based on the inclusion and exclusion criteria, a total of 200 meditation practitioners (mean age of 22.7 years) were finalized. All the participants were assessed for meditation, depression, anxiety and stress. All the variables were analyzed using SPSS version 29.0. In results, experience of meditation showed an inverse relationship with scores of depressions ($p<0.05$). Whereas, daily practice of meditation in a week showed a negative relation with anxiety ($p<0.01$) and with the total of DAS scores ($p<0.05$). The results concluded as meditation practices serves as an effective strategy to enhance mental health.

Keywords: Anxiety, Depression, Meditation, Stress

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Introduction

The rapid changes in globalization, technological development, and urbanization have changed human lifestyles immensely, both positively and negatively. While all these factors are considered to have helped in economic growth and interconnectedness, they have equally created an increase in psychological distress, containing a heightened degree of depression, anxiety, and stress across the globe (WHO, 2022). The competitive work environments, digital overload, and social isolation associated with modern life have developed mental health problems, and these have now become a crucial public health issue. In India, the mental load-related disorders are particularly at alarming stage. Approximately 56 million people individuals are characterized by depression, while 38 million reported anxiety disorders (Gururaj et al., 2016). Globally, according to reports published by the WHO, nearly 280 million individuals are facing depression, while anxiety disorders affect approximately 301 million individuals, which evidences the urgent requirement for effective interventions (WHO, 2023).

Depression, anxiety, and stress have an immense impact on different psychological aspects of health and functioning. It is reported that these conditions have a linked association and can lead to impaired executive functioning, reduced processing speed (Snyder, 2013), increased aggression (Fava & Rosenbaum,1998), negative affect (Sultson et al., 2024), mood disturbances (Lazarus & Folkman, 1984), interpersonal problems (Zheng et al., 2023), emotional disturbances (Gruber et al., 2011), emotional regulation (Visted et al.,2018), decreased happiness (Milić et al., 2024), reduced well-being, and

life satisfaction (Bukhari, Denovan & Macaskill, 2022). In the light of these associations, effective strategies are highly needed to bolster psychological resilience and overall functioning.

Meditation is considered as an ancient practice based on spiritual and philosophical traditions. Recently it has gathered significant scientific interest for its psychological and neurological positive outcomes (Telles & Gupta, 2020). Several research consistently indicates that mindfulness-based practices and interventions, are effective in alleviating depressive symptoms. For instance, a single time assessment study comparing meditation practitioners and non-meditators (sample size, 111 per group) revealed that individuals who practiced meditation reported a notable lower score on anxiety and stress ($p<0.001$ for both) in comparison to non-meditators (Duraimani, 2019). In similar investigation, 67 individuals who were practicing mindfulness meditation showed a notable reduction in anxiety and stress values at 0.05 level of significance for both. Similarly, Ranabhat et al. (2018) conducted a cross-sectional study involving 453 women and observed that those regularly engaging in meditation (OR = 2.56, 95% CI = 2.01–4.88), or worship (OR = 4.56, 95% CI = 3.91–8.26) were less likely to report illness. In addition, Snaith et al. (2018) conducted research among yoga practitioners in South Australia through a web-based survey which outlined a positive association between mindfulness and scores of self-compassions, also significant negative correlations between mindfulness and anxiety, stress, and depression scores ($p<0.05$ for all). Further, visualization meditation showcased a greater efficacy in diminishing anxiety and stress among students compared to non-meditative control groups, particularly in terms of motivational and emotional outcomes (Aksu & Ayar, 2023). Alvarado-García et al. (2025) conducted a longitudinal study in which 64 college students who practiced mindfulness meditation for 12 weeks exhibited decreased scores of stresses, anxiety and depression. In continuation with these findings, Morais et al., 2022 reported significant reductions in anxiety after participation in a mindfulness-based program, further confirming the effectiveness of meditation in anxiety management program.

In authors' knowledge, most of the above-mentioned studies have been conducted in Western populations, revealing that psychological aspects are influenced by cultural factors (Goodmann et al., 2021). The present study is conducted in India, where meditation has deep historical and spiritual significance (Bronkhorst, 2014). Additionally, while some research compares meditators and non-meditators (Duraimani, 2019), few studies examine how the duration and frequency of meditation practice influence mental health outcomes (Snaith et al., 2018). This study fills these gaps by exploring the association between the duration of meditation experience and psychological well-being. By bridging the existing research gap, the objectives of the present study are to explore the association across meditation practice and scores of depressions, anxiety and stress (DAS) among the Indian population.

Material and Methods

Participants

The details of the research study were circulated among various departments of the universities located in Uttarakhand. The data confidentiality was promised to all the participants. The consent was received from each participant in advance to the data collection. The Departmental Ethics Committee approved the study (HLA/2023/009). Prior to the study, total participants (N) = 210 was determined based on an alpha of 0.05, powered at 0.95, and an effect size of 0.5 (Erdfelder, Faul & Buchner, 1996; Komariah et al., 2022). The inclusion criteria were as follows: (i) intent to participate, (ii) a minimum of one year experience of practicing meditation and (iii) practicing meditation for a minimum of twice a week. The participants (i) with incomplete questionnaires, (ii) who are on medication, and (iii) suffering from any chronic diseases were eliminated from the study. After referring both inclusion and exclusion criteria, a total of 200 individuals with average age of 22.7 years were recruited for meditation group. According to the sociodemographic information, participants practiced meditation for 36.98±57.2 months, 5.12±2.2 days, and 67.75±48.4 minutes every day.

Research Design

This was one-time cross-sectional research design which had no control group or intervention group. Each participant was evaluated single time to examine the relationship of (i) depression, (ii) anxiety and (iii) stress with different dimensions of meditation practice (i.e., experience of meditation in months, number of days practice of meditation per week, and daily practice of meditation in minutes).

Psychological Tools

Depression, Anxiety, and Stress Scale-21 (DASS-21)

DASS-21 is a prominent self-rated measure to examine the degree of depression, anxiety, and stress experienced in the previous week (Osman et al., 2012). The tool consists of 21 questions, categorized into three subscales of 7 items each to assess DAS. Participants evaluate each item using a 4- point Likert scale which ranged from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”). The elevated scores signify increased symptom intensity. The Cronbach’s alpha coefficients of 0.900 for Anxiety, 0.923 for Stress, and an overall alpha of 0.961, signifying robust internal consistency of the tool. The DASS-21 has been standardized and tested in the Indian context, confirming its reliability and validity as a measure for detecting psychological distress in Indian populations (Sharma, Hallford & Anand, 2020).

Data Analyses

The product moment correlation (r) and regression analyses were performed to assess the correlation and to predict the effect of (i) experience of meditation (in months), (ii) number of days practice of meditation (per week), and (iii) daily practice of meditation (in minutes) with the psychological parameters such as depression, anxiety and stress using SPSS.

Results

Correlation

Experience of meditation in months indicated an inverse relation with scores of depressions ($p<0.05$). Whereas, number of days practice

of meditation in a week showed a negative relation with (i) anxiety ($p<0.01$) and (ii) total of depression, anxiety and stress scores (DAS; $p<0.05$). The details of correlation (r) values are mentioned in Table 1.

Table 1. Correlation of depression, anxiety and stress scores with experience of meditation in months, days in a week and daily practice (in minutes) among the group of meditation practitioner

S. No.	Variable			Experience (in months)	Number of days (per week)	Daily practice (in minutes)
1	**Depression, Anxiety and Stress**					
		Depression	r- value	-0.151*	-0.079	0.056
			p- value	0.030	0.258	0.424
		Anxiety	r- value	-0.109	-0.224**	-0.108
			p- value	0.118	0.001	0.123
		Stress	r- value	-0.096	-0.103	0.042
			p- value	0.172	0.139	0.547
		DAS Total	r- value	-0.136	-0.151*	<0.001
			p- value	0.052	0.030	0.998

*p<0.05; **p<0.01

Regression

The scores of depression, anxiety, stress and total scores of DAS were also predicted with meditation as follows: depression (R= 0.186, R^2= 0.034; 3.4 percent of variance of the predictors, F= 2.393, $p>0.05$), for anxiety (R= 0.263, R^2= 0.069; 6.9 percent of variance of the predictors, F= 4.994, $p<0.01$), for stress (R= 0.158, R^2= 0.025; 2.5 percent of variance of the predictors, F= 1.714, $p>0.05$), for total of all three (DAS) (R= 0.212, R^2= 0.045; 4.5 percent of variance of the predictors, F= 3.158, $p<0.05$). These values suggest a significant prediction of the predictors as a model on anxiety ($p<0.01$) and DAS scores ($p<0.05$). The details of the multiple regression values of predictors with DAS are mentioned in Table 2.

Table 2. Summary table of Regression Coefficient B, SE, t-value, p-value of depression, anxiety and stress

Model	Variable	Predictors	Unstandardized Coefficients		t-value	p-value	R	R square	F	p-value
			B	SE						
1	**Depression**	(Constant)	13.213	2.550	5.182	<0.001	0.186[a]	0.034	2.393	0.070[b]
		Experience (in months)	-0.025	0.011	-2.135	0.034				
		Number of days (per week)	-0.626	0.428	-1.460	0.146				
		Daily practice (in minutes)	0.012	0.014	0.894	0.372				
2	**Anxiety**	(Constant)	18.804	2.228	8.440	<0.001	0.263[a]	0.069	4.994	0.002[b]
		Experience (in months)	-0.018	0.010	-1.824	0.070				
		Number of days (per week)	-1.170	0.374	-3.126	0.002				
		Daily practice (in minutes)	-0.007	0.012	-0.598	0.551				
3	**Stress**	(Constant)	16.657	2.434	6.845	<0.001	0.158[a]	0.025	1.714	0.165[b]
		Experience (in months)	-0.015	0.011	-1.343	0.181				
		Number of days (per week)	-0.717	0.409	-1.754	0.081				
		Daily practice (in minutes)	0.012	0.013	0.914	0.362				

4	**DAS total**	(Constant)	48.673	6.348	7.667	<0.001	0.212[a]	0.045	3.158	0.026[b]
		Experience (in months)	-0.058	0.029	-2.012	0.046				
		Number of days (per week)	-2.513	1.067	-2.356	0.019				
		Daily practice (in minutes)	0.017	0.034	0.500	0.618				

Dependent Variables: depression, anxiety and stress

Discussion

This study evaluated the association between different aspects of meditation practice with the scores of depression, anxiety and stress. The findings from this research illustrate the psychological advantages of meditation, especially in reducing sadness, anxiety, and stress.

The outcomes demonstrated a significant inverse relation between duration of meditation practice (in months) and depression scores. Whereas number of days practice of meditation in a week showed a negative relation with anxiety and with the total of DAS scores. Above results are aligned with previous researches, when 67 individuals who were practicing mindfulness meditation showed a notable decline in their anxiety and stress scores (Duraimani, 2019). Similarly, Ranabhat et al. (2018) found that 453 women who were regularly engaged in yoga, meditation or worship were less likely to report illness. Another web-based survey, reporting a favourable association between mindfulness and self-love and significant negative correlations between mindfulness and anxiety, stress, and depression scores (Snaith et al., 2018). These findings indicate a potential dose-response relationship, where longer practice of meditation is associated against depressive symptoms. The finding supports neuroplasticity models of meditation, suggesting that long term practice elicits functional changes and even structural changes in those parts of the brain implicated in emotion regulation (Davidson & McEwen, 2012). Another research also explained that regular practice of meditation may help in maintaining a steady state of mindful awareness which prevents the buildup of anxious thoughts and ruminative patterns (Lutz et al., 2008).

The regression analyses highlighted that meditation predicted depression, anxiety, stress and overall, DAS scores ranges 2.5 to 6.9 percent of variance of the predictors respectively. Also, as an individual prediction experience of meditation in months significantly predicted depression and total scores at ($p<0.05$) respectively.

The findings can be explained based on a number of physiological and theoretical frameworks. Meditation practice enhances prefrontal cortex regulation of limbic system

activity, particularly amygdala responses to emotional stimuli (Tang, Hölzel & Posner, 2015) which reduces emotional reactivity and improves stress coping behaviors in meditators. Additionally, the practice modulates the default mode network which reduces mind-wandering and self-referential thinking that often characteristics of depressive and anxious states (Brewer et al., 2011). Also, the stress-reducing effects may be mediated through decreased hypothalamic-pituitary-adrenal axis activity and cortisol secretion (Vargas-Uricoechea et al., 2024) as well as enhanced parasympathetic nervous system (Ganguly et al., 2020). These biological changes reduce stress reactivity which facilitates more effective meditation practice, which in turn further strengthens emotional regulation capacities. Breathing practices also demonstrated a significant impact on parasympathetic activation via vagal activity. The vagal activity regulates the psycho-physiological control of both physical and mental health (Telles et al., 2017; Telles et al., 2019; Telles et al., 2017; Telles et al., 2016).

According to the polyvagal theory, a neural circuit may develop positive emotions (Porges, 2011). Another study conducted by Babu and his colleagues in 2020, Rajyoga meditation practitioners showed increased grey matter volume (GMV) in the different areas of the brain included prefrontal region and the anterior cingulate cortex which are considered as an element of reward center of the brain. Increased GMV in these brain areas was associated with subjective experience of happiness and reduced psychological distress (Babu et al., 2020; Ancelin et al., 2019). Additionally, persons who were engaged in regular meditation practice exhibit elevated secretion of GABA (a neurotransmitter) which may help in anxiety reduction simultaneously enhanced mood (Guglietti et al., 2013). Studies also suggests an elevated serotonin production with mindfulness. Serotonin serves to regulate an individual's mood and overall well-being (Stoffel et al., 2019; Young, 2011), enhanced cognitive functions and emotional resilience (Afonso et al., 2020).

According to the Attention Regulation Theory, meditation enhances the ability to disengage from negative thought patterns which reduces depression level (Lutz et al., 2008). The Mindfulness Stress Buffering Model suggests that meditation alters stress appraisal processes which help individuals to perceive challenges as more manageable (Creswell, 2017). Also, regular meditation may serve as an exposure technique where practitioners learn to observe distressing thoughts and sensations which may maintain anxiety disorders (Baer, 2003). Meditation practices, including mindfulness, are believed to improve emotional regulation by developing non-judgemental awareness of one's thoughts and feelings (Hölzel et al., 2011). This heightened awareness may allow individuals to react to stressors and interpersonal conflicts more effectively, resulting in enhanced happiness and reduced aggression.

The study has several limitations which are as: (i) The cross-sectional design limits the ability to establish causal relationships among meditation practice and scores of depression, anxiety and stress; therefore, longitudinal studies are needed to

examine directionality and temporal effects, (ii) the self-report measures may cause response biases, (iii) the sample was limited to urban Indian adults, so the results of this study may limit generalizability and (iv) the specific type of meditation practice was not documented in this study which may have differential effects on psychological outcomes.

Conclusion

In conclusion, this study manifests the correlation between meditation practice and reduced DAS in the Indian population. The findings support the potential of meditation as a preventive and therapeutic mental health intervention while highlighting the importance of both sustained engagement and regular practice.

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NOTE: The authors have sole responsibility for the originality of the contents of this manuscript.