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The relationship Mindfulness Based Self-Efficacy aspects with anxiety symptoms and demographic variables in a clinical sample with anxiety disorder

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ABSTRACT

Background: This study delves into the interplay between anxiety symptoms, mindfulness-based self-efficacy scales, and demographic characteristics. Given the prevalence of anxiety as a psychological disorder and the increasing adoption of mindfulness-centered frameworks, this research endeavors to elucidate the interplay among various anxiety symptoms, mindfulness-based self-efficacy scales, and demographic characteristics. *Method:* In a correlational study at Taleghani Hospital's psychological clinic in Tehran, participants with the willingness to join, moderate to high Beck Anxiety Inventory scores (x ≥16), and included individuals with at least a middle school-level literacy. Assessment scales had Beck Anxiety Inventory, Mindfulness Based Self-Efficacy Scale-Revised, as well as measures of State and Trait anxiety. Data analysis was conducted using SPSS version 20, and it involved T-tests, ANOVA, linear regression, and correlation analysis. *Results:* The study involved 114 anxiety disorder patients (age range: 18-53, M=31.6, SD=8.87) from Taleghani Hospital in Tehran. Significant associations were found between gender and trait anxiety (p = .008) and diagnosis and self-efficacy scores (p = .000). However, demographic variables did not show any meaningful relationships with study scales. Regression analysis identified State Anxiety as a meaningful predictor for MSES-R (R= .30; P= .001). *Conclusion:* The findings highlight gender differences in anxiety symptoms, particularly in state anxiety compared to trait symptoms or the Beck Anxiety Inventory. Moreover, the study suggests a connection between MSES-R scores and diagnosis, implying that distinct diagnoses may result in varying scores in MSES.

Keywords: Anxiety, Trait, State, Self-efficacy, Demographic variable

1. INTRODUCTION

Mindfulness is a concept that dominated across a range of recently growing treatment approaches Baer, (2015), such as MBSR Santorelli et al., (2017), ACT Levin and Hayes, (2011), DBT Eeles and Walker, (2022), MBCT Segal et al., (2004) and so on. Its efficacy was proven with different psychological conditions and disorders such as depression, anxiety, stress Hofmann and Gómez, (2017), Strohmaier et al., (2021), etc. Amongst them, anxiety is a well-researched topic with the highest prevalence worldwide (Baxter et al., 2013; Remes et al., 2016; Salari et al., 2020). This issue is a crucial important matter that asserts the effect of mindfulness-based concepts. Self-efficacy related mindfulness measures certain structures that constitute basic skills learned in a mindfulness meditation program (Cayoun, 2011; Cayoun et al., 2018). These aspects include equanimity, emotion regulation, distress tolerance, interpersonal efficacy, social skills, and responsibility (Cayoun et al., 2022).

There are clear connections between the effectiveness and importance of these factors, and they are related to different dimensions of mental health in general, and mindfulness skills in particular. There is some functional impairment in anxiety disorders, including global, social, occupational, and physical aspects McKnight et al., (2016), it has been revealed that patients with different types of anxiety disorders exhibit various forms of impairments. However, these impairments are closely interconnected, both in cross-sectional and longitudinal perspectives (Naragon-Gainey et al., 2014). While the level of impairment may be similar across the different disorders, the content of impairment might vary (Naragon-Gainey et al., 2014). Psychological treatments are particularly relevant to impairments, so identifying the impairment could help the therapist to have a more clear view of their clients, because reducing these impairments might be the primary goal of the treatment (Lam et al., 2011).

As the significance of mindfulness in treating various psychological conditions becomes increasingly evident Plank, (2010) it is crucial to understand the relationship of mindfulness with anxiety and its dimensions. There are many studies regarding the relationship between general self-efficacy and anxiety (Hebdon et al., 2021). Specifically, discerning how these aspects of mindfulness relate to state and trait anxiety is of great value. State anxiety symptoms are known for their variability and shorter duration, implying quicker potential for change. Conversely, trait anxiety symptoms tend to be more stable and require more time for alteration. Unraveling the connection between these aspects and state-trait anxiety provides valuable insights for therapists. In addition, previous studies showed that demographic variables were not related to anxiety and self-efficacy scores (Razavi et al., 2017).

However, it is still unclear what type of anxiety (state or trait) can be attributed to these findings. In addition to State and Trait Anxiety (STAT-Y), the Beck Anxiety Inventory stands as a well-established tool for anxiety assessment. Investigating its correlations with the mindfulness aspect of self-efficacy proves valuable and insightful. Thus, our primary objective in this study is to examine the relationships between the self-efficacy component of mindfulness and both state and trait anxiety. As a secondary aim, we aim to delve deeper into the relationship between Beck's anxiety symptoms and aspects of mindfulness-based self-efficacy. As a third objective of this study, we aimed to explore the correlation between diagnosis and various subscales of mindfulness-based self-efficacy scales.

2. MATERIALS AND METHODS

Study Design

This study was conducted as a descriptive cross-sectional study at Taleghani Hospital in Tehran from 2021 to 2022.

Study Population and Sampling

The study population consisted of Persian-speaking individuals who sought treatment for anxiety symptoms at the psychological clinic of Taleghani-Tehran Hospital between January and May 2022. Participants were selected through an inaccessible sampling method, and those who willingly completed the necessary questionnaires were included. Inclusion criteria encompassed proficiency in reading and writing in Farsi, providing informed consent for questionnaire completion, exhibiting anxiety-related complaints, and obtaining an average to high score on the Beck Anxiety Inventory. The diagnosis was concluded and recorded through a clinical interview with a registered clinical psychologist using the DSM-5-TR criteria and the SCID tool. Consequently, we selected individuals meeting these criteria as the study sample and administered the relevant questionnaires. A certified clinical psychologist conducted all clinical interviews and assessments.

Measures

Mindfulness based Self-Efficacy Scale- Revised (MSES-R)

The MSES-R is a 22-item self-report scale designed to measure aspects common to mindfulness and self-efficacy, utilizing a 5-point Likert scale. Initially developed by Cayoun and colleagues, it was tailored to gauge shifts in self-efficacy perception in clinical populations undergoing mindfulness-based therapy. The scale has demonstrated commendable psychometric properties, rendering it a valuable tool for evaluating the effectiveness and post-psychotherapy outcomes (Cayoun et al., 2022). In its Persian adaptation, the scale exhibited robust psychometric properties, featuring a factor structure encompassing six subscales, a Cronbach's alpha of 0.75, and a two-week test-retest reliability of 0.89 (Masjedi-Arani et al., 2023).

State-Trait Anxiety Inventory (STAI-Y)

The STAI-Y is a self-report questionnaire comprising 40 items rated on a 4-point Likert scale. It offers distinct assessments of both state and trait anxiety. State anxiety captures a temporary reaction to a perceived adverse event, characterized by sensations of tension, apprehension, nervousness, and worry. In contrast, trait anxiety denotes a more enduring predisposition to view stressful situations as threatening or perilous (Spielberger, 1983). It is widely recognized as one of the most frequently used self-reported anxiety measures in both research and clinical settings (Balsamo et al., 2018; Bergua et al., 2012). It has been translated and validated in Persian. The Persian version of the STAI-Y demonstrates strong internal consistency with a Cronbach's alpha of 0.846 for state anxiety and 0.88 for trait anxiety. Furthermore, reliability and internal consistency were acceptable (Abdoli et al., 2020).

Beck Anxiety Inventory (BAI)

The Beck Anxiety Inventory (BAI) is a 21-item instrument designed to assess anxiety symptoms experienced over the past week (Beck et al., 1988). Respondents rate items on a 4-point Likert scale, ranging from 0 to 3. The total score can range from 0 to 63. The validated Persian version interprets scores as follows: 0-7 indicate an average level of anxiety, 8-15 signify mild to moderate, 16-25 denote moderate to severe, and 26-63 represent severe anxiety (Kaviani and Mousavi, 2008). The BAI has demonstrated robust reliability and validity for measuring anxiety symptoms (Bardhoshi et al., 2016; Beck et al., 1988; Steer et al., 1993). As a results of a study in an Iranian sample, the Cronbach's alpha coefficient for the BAI was 0.92, and the test-retest reliability after one month was 0.83 (Kaviani and Mousavi, 2008; Toosi et al., 2017).

Data Analysis

We carefully encoded and stored the collected data with the utmost consideration for individual privacy, ensuring that no personal information was retained. Following this, the coded data underwent analysis using the 20th version of the SPSS software. The evaluation encompassed descriptive and inferential statistical variables, employing tests such as t-tests, means comparison, and ANOVA. To address possible biases related to questionnaire order and counteract any effects of participant fatigue, we administered questionnaires in varying sequences. To determine the appropriate sample size for this correlation study, we conducted a power analysis using G*Power software (Faul et al., 2007). Given our study design with seven diagnostic groups and three scales, and considering an anticipated small-to-medium effect size based on previous literature Cohen, (1988), we set the significance level at $\alpha = 0.05$. The analysis indicated that a sample size of 114 subjects would provide adequate statistical power to detect significant correlations. With this sample size, we have 80% power to detect correlations as low as r = 0.23. This level of power is considered acceptable for this study.

Ethical Considerations

To adhere to ethical standards, we securely coded individuals' personal information. Participants were also duly informed about the study's privacy measures and ethical considerations as part of their consent process. Furthermore, the study underwent honest review and received approval from the Ethics Committee of Shahid Beheshti University of Medical Sciences (IR.SBMU.MSP.REC.1400.238).

3. RESULTS

A total of 114 participants completed the study questionnaires. Table 1 presents the demographic characteristics of the participants. The participants' ages ranged from 18 to 53 years old, with a mean (M) of 31.6 and a standard deviation (SD) of 8.87.

Table 1 Demographic variables of the participants

Main factor	Sub-factor	N	%
Gender	Man	47	41.2
	Women	67	58.7
Literacy	Primary school	5	4.3
	Elementary school	18	15.78
	High school	44	38.59
	University or upper	47	41.22
Marital Status	Single	49	42.98
	Married	63	55.26
	Divorced	2	1.75
Diagnosis	GAD	23	20.17
	SAD	30	26.31
	Panic disorder	28	24.56
	Phobia	6	5.26
	OCD	7	6.14
	PTSD	7	6.14
	Other	13	11.4

In Table 2, the means and standard deviations of the variables, along with their maximum and minimum scores, are presented. To explore the correlation between demographic variables—such as gender, marital status, literacy, and diagnosis—we conducted ANOVAs. The outcomes are outlined in (Table 3). In general, there were no significant interactions between these variables and the study scales, except for two instances. At first, state anxiety exhibited a disparity between male and female participants (Mean Differences= 3), indicating that female participants demonstrated significantly higher anxiety symptoms compared to their male counterparts. Secondly, there was a noteworthy relationship between diagnosis and MSES-R scores, signifying that various diagnoses yielded very different scores on the MSES-R scale.

Table 2 Statistical Characteristics of the Study Variables

Study Scales	Max	Min	Mean	Standard Deviation
BAI	39	17	29.78	5.87
State Anxiety	55	29	38.9	6.4
Trait Anxiety	53	14	29.8	8.83
MSES-R	62	23	38.4	6.8

Apart from the significant relationships between gender and trait anxiety ($p = .008$) and diagnosis and self-efficacy scores ($p = .000$), we found no other meaningful relationships between study scales and demographic variables. Linear regression results ($R= 0.202$; $R2=0.041$; $p =0.032$) showed that 4% of self-efficacy changes can be explained by diagnosis. Table 4 presents a matrix of correlations between the scales used in the study. Unlike Beck anxiety and trait anxiety, state anxiety exhibited a robust negative correlation with self-efficacy ($r = -0.30$, $p < 0.001$). State anxiety showed a negative and strong correlation with social skills ($r = -0.30$, $p < 0.001$), and interpersonal efficacy ($r = -0.26$, $p < 0.001$) subscales of MSES-R.

Table 3 ANOVA for the relationship between demographic variables and Study scales

Variables	Scales	Sum Of Squares	df	F	Sig.
Gender	BAI	6.07	1	.175	.677
	State Anxiety	279.4	1	7.17	.008
	Trait Anxiety	177.8	1	2.3	.132
	MSES-R	128.3	1	2.78	.098
Age	BAI	784.2	29	.689	.871
	State Anxiety	1393.7	29	1.24	.22

	Trait Anxiety	1867.5	29	.778	.774
	MSES-R	1118.1	29	.775	.778
Marital S.	BAI	48.66	2	.702	.498
	State Anxiety	1.92	2	.023	.977
	Trait Anxiety	77.07	2	.498	.614
	MSES-R	141.5	2	1.52	.223
Literacy	BAI	205.7	3	2.04	.112
	State Anxiety	79.12	3	.636	.593
	Trait Anxiety	169.1	3	.717	.544
	MSES-R	249.07	3	1.81	.150
Diagnosis	BAI	125.9	6	.596	.733
	State Anxiety	481.1	6	2.06	.064
	Trait Anxiety	285.9	6	.598	.732
	MSES-R	1227.9	6	5.39	.000

The Correlation Matrix results indicate a robust negative correlation between state anxiety and social skills (r = -.30) as well as interpersonal efficiency (r = -.26), both of which are MSES-R subscales. This suggests that individuals in our study sample, diagnosed with anxiety disorders, experienced challenges in social domains. Furthermore, their anxiety symptoms had a discernible impact on both social performance and interpersonal efficacy.

Table 4 The correlation matrix of the study scales and MSES-R subscales

Scales/Subscale	BAI	State Anxiety	Trait Anxiety	MSES-R
BAI	-	-	-	-
State Anxiety	.25**	-	-	-
Trait Anxiety	.05	.07	-	-
MSES-R	-.13	-.30 **	.07	-
Emotion. regulation	-.07	-.09	.08	.41 **
Equanimity	-.03	-.13	.04	.34 **
Distress tolerance	-.06	-.06	-.007	.36 **
Social skills	-.08	-.30 **	-.05	.49 **
Responsibility	-.08	-.12	.15	.36 **
Interpersonal efficacy	-.02	-.26**	.012	.49 **

**. Correlation is significant at the 0.01 level (2- tailed)

Multivariate Predictive Analysis of mindfulness based self-efficacy and Anxiety: Regarding the multivariate regression analysis, the linear regression model determined significant differences (p <0:05) for self-efficacy and anxiety symptoms. Furthermore, Trait and Stat anxiety (predictors) showed a significant relationship with mindfulness based self-efficacy (R2=0.101; p =0:003). The results of linear regression for MSES-R and anxiety symptoms are presented in (Table 5). As observable, State anxiety can explain 10% of MSES symptoms alone; the other anxiety scores (Trait and Beck Anxiety) were not meaningful predictors for MSES-R scores.

Table 5 Regression analysis results between MSES scores with Anxiety

Dependent Variable	Predictors	R	R2	t	Sig.
MSES-R	Total	.325	.106	10.6	.007
	BAI	.133	.018	-1.409	.162
	State Anxiety	.30	.09	-3.309	.001
	Trait Anxiety	.077	.006	.809	.42

4. DISCUSSION

This study aimed to assess the relationships between the scores of three Anxiety scales within a population diagnosed with anxiety disorders. While, in general, women tended to exhibit higher average anxiety scores, in this study, only state anxiety showed a significantly higher score in women compared to men. These findings align with previous studies indicating that, on average, women tend to score higher in anxiety Gao et al., (2020), Hou et al., (2020), specifically for state anxiety. It is probably because women are more accessible to report anxiety symptoms than men and women are more likely than men to be diagnosed with anxiety disorders (Simonds and Whiffen, 2003). But there was no difference in the symptoms of trait anxiety reported by men and women. Therefore, the mentioned difference is probably related to the symptoms of state anxiety rather than trait anxiety.

Although this finding needs more research, it may clarify the contradictions in this line of research (Asher et al., 2017; Stoyanova and Hope, 2012). Although we didn't find any gender differences among the participants, the mentioned studies indicate that women tend to score higher in state anxiety compared to male participants. Furthermore, a notable correlation emerged between participants' diagnoses and their scores on the self-efficacy scale. Although previous studies did not reveal a relationship between demographic variables (gender and education) and efficacy Razavi et al., (2017), these findings suggest that individuals with different diagnoses obtain distinct scores on the self-efficacy scale based on MSES-R. Such outcomes are consistent with prior research indicating that impairments associated with different diagnoses may vary (Naragon-Gainey et al., 2014).

This also underscores the potential sensitivity of MSES-R to diagnosis, warranting further investigation. About other demographic variables, including gender, literacy, marital status, and age, no significant relationships were identified, not only for mindfulness-based self-efficacy but also for trait anxiety and the Beck Anxiety Inventory Moreover, a review study showed that some of the demographic variables were important not only in anxiety but also in self-efficacy (Cuadrado et al., 2022; Yeo et al., 2023). For example, females were more prone to anxiety and low levels of self-efficacy than males (Simonetti et al., 2021). Mindfulness-based self-efficacy demonstrated an overall negative association with anxiety symptoms. However, only state anxiety demonstrated a significant association with Mindfulness-Based Self-Efficacy Scale (MSES) scores.

This finding implies that state anxiety symptoms may have a major impact on MSES-R scores, even though the amount is not significant. This finding may a reasonable explanation for those studies which find relationship between anxiety and self-efficacy (Liu et al., 2023; Razavi et al., 2017; Simonetti et al., 2021). Mindfulness based self-efficacy scale is a multifaceted construct (Masjedi-Arani et al., 2023; Cayoun, 2011). Our study suggests that individuals experiencing anxiety symptoms may be mainly influenced by specific factors within this construct. Notably, we observed a significant negative correlation between state anxiety and social skills, as well as interpersonal efficacy. Recognizing these effects in clinical settings is crucial, and future research could explore variations in MSES-R subscales among different diagnoses.

Indeed, a deficiency in self-efficacy is not limited to anxiety; it can manifest in various behaviors, including but not limited to depression, diminished engagement in self-care activities, heightened stress levels, and even a decline in health factors such as sleep quality (Bassi et al., 2020; Simonetti et al., 2021). The small sample size of this study was one of its limitations, making it difficult to conduct thorough comparisons across all classes, especially given the many diagnostic characteristics associated with the scales. Subsequent research along these lines may provide important new understandings of various diagnoses and the pathogenic content of each one. The possible difference between the scales used in this study and those in other research is another important factor to take into account when assessing how generalizable the results are. Various self-efficacy scales have distinct self-efficacy symptoms, for example, depending on the MSES-R. Therefore, while comparing the outcomes, we need to be cautious.

5. CONCLUSION

The findings of this study indicate that state anxiety is a factor associated with gender. Women with an anxiety disorder tend to have higher scores in state anxiety compared to men diagnosed with anxiety. Moreover, distinct diagnoses demonstrated varying scores in mindfulness-based self-efficacy. In the relationship between anxiety and mindfulness-based self-efficacy, unlike Trait and Beck anxiety symptoms, State anxiety emerged as a significant and influential factor on Mindfulness-Based Self-Efficacy Scale (MSES) scores. These results shed light on connections between anxiety symptoms, mindfulness-based self-efficacy, and demographic variables. Considering the limitations, we recommended to replicate the study with larger populations and further investigate differences between various diagnoses based on different dimensions of self-efficacy and anxiety.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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Author contributions

We certify, as authors, that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor. All persons who have made substantial contributions to the work reported in the manuscript.

Ethical approval

The Research Ethics Committee of Shahid Beheshti University of Medical Sciences approved the ethical consideration of this study with this ethical code number (IR.SBMU.MSP.REC.1400.238) on 13/07/2021.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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