

Original Article

Mindfulness-based Practices Along with Mediating Role of Resilience Among Medical Students

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Abstract

Objectives: To explore the effects of mindfulness-based practice and the mediating role of resilience among medical students.

Methodology: A cross-sectional study was conducted among 200 students of Abwa Medical College from April 2024 to September 2024, using the purposive sampling technique. A self-administered questionnaire was designed, and a pilot study was conducted to validate the questionnaire. Participants were assessed using a 35-item questionnaire with a Cronbach's alpha score. The data were analyzed in SPSS 26 on Windows 11 platform using the correlational matrix and regression analysis.

Results: Out of the 200 participants in the study, 102 (51%) of the participants were females and 98 (49%) were males. The overall Cronbach's alpha score for the 35 items was 0.930, indicating high reliability. Female participants reported higher self-awareness, present-moment attention, and overall mindfulness practice than male participants, with statistical significance ($P = 0.005$). The correlational matrix between embracing the present, self-awareness, emotional regulation, and future orientation revealed statistically significant correlations among these variables. The Regression analysis revealed a linear relationship between mindfulness practice and resilience among the medical students.

Conclusion: The practice of mindfulness leaves a positive impact and refines the approach of medical students towards the prevailing stressful conditions during their medical career.

Keywords: mindfulness practice, self-regulation, future orientation, self-awareness.

Cite this article as: Kausar U, Hassan TU, Sohail MU, Ahmad A, Sohail A. Mindfulness-based Practices Along with Mediating Role of Resilience Among Medical Students. J Soc Obstet Gynaecol Pak. 2025; 15(3):218-223. DOI. 10.71104/jsogp.v15i3.941

Introduction

Medical students experience stress during their studies. Stress leads to negative outcomes, including poor academic performance and altered mental health. Medical students are faced with considerable stress during their tenure as a medical student. As compared to the general population students, the level of stress and depression among medical students is higher. ⁽¹⁾

The issues of mental health can cause a variety of personal and academic problems that can affect the performance the students including those who study medicine. Majority of them have an increased amount of stress and anxiety. ⁽²⁾ These mental health issues can be intertwined with their scholastic performance,

social contacts, and general well-being. ⁽³⁾ According to a study conducted on the university students of Sialkot, the frequency reported for stress and anxiety was 75% and 88.4% respectively. ⁽⁴⁾ Another study reported a higher incidence of anxiety scores among the medical students visiting a psychiatric clinic. ⁽⁵⁾

Mindfulness-based practices can be used to address the issues of stress and anxiety. In line with existing evidence, the mindfulness practices become a preferred choice for combating the prevailing stress and anxiety among the medical students. Mindfulness may help individuals manage, endure, and eventually resolve their stressors. ⁽⁶⁾ According to a literature

Authorship Contribution: ¹Substantial contributions to the conception or design of the work or the acquisition, Supervision, ²Active participation in active methodology, ⁴Drafting the work or revising it critically for important intellectual content. ^{3,5}Literature review,

Funding Source: none
Conflict of Interest: none

Received: April 07, 2025

Revised: July 08, 2025
Accepted: July 13, 2025

review, a number of studies have been done to approach and practice mindfulness and resilience among medical students. (7) To inculcate mindfulness with mediating role of resilience is a unique modality for addressing stress and anxiety. A narrative review of depression and anxiety in medical students identified a very high rate of mental health problems in this group which may involve decreased standards of patient satisfaction and professional behavior. At the same time, it must be predominantly highlighted that prophylaxis and therapy of psychological diseases must be given the first priority, followed by the search for the precise interventions which will justify the special demands faced by the medical students. (8)

Mindfulness-based interventions have been confirmed to facilitate the recovery of medical student from stress and anxiety. (9) With these applications, the findings reveal a great fall in stress and anxiety besides budding mindfulness, mood elevation, self-efficacy, and empathy. Moreover, fostering of resilience was identified as a crucial component in fighting stress and dealing with mental health problems among medical schools. (10)

According to a meta-analysis, the mindfulness meditation impacts on significant positive outcome on the ability to calculate and conduct daily life activities. It moreover refines the mechanism of self-regulation and contributes in a positive way for health-related behaviors.(11), (12) According to a theoretical model developed by Holzel BK et al, fundamentals were identified such as body awareness, attention, emotion regulation and perspective change on the self. Certain programs were conducted to inculcate meditation in the form of social, emotional learning responses and emotional arousal. (13)

There exists gap in literature regarding the development of training programs for mindfulness practices among the medical students. Additionally, some literature has reported moderate post intervention effect on the psychological stress and well-being in students.(14) Mindfulness practices help in maintaining self-regulation, metacognition and resilience. These traits foster a healthy mindset and healthy approach towards daily and professional activity. Several mindfulness trainings programs such as Cultivating Awareness and Resilience in Education (CARE) have been designed which demonstrate an effective outcome for both teacher and students in nurturing their physical and mental well-being, self-efficacy and

motivation.(15),(16) CARE model can be integrated into medical education by teaching compassion and empathy to medical students. Hence developing emotional intelligence and empathy. The current study aimed to explore the effects of mindfulness-based practices among the medical students for reducing stress and anxiety that help in developing resilience and sense of fulfillment, thus improving overall subjective wellbeing with a mediating role for improvement in the quality of personal and professional life.

Methodology

A cross-sectional study was carried out in the Abwa medical college, Khurrianwala, Faisalabad from April 2024 to September 2024. IRB was obtained from the institutional ethical committee ref no. ABWA/DME/MC/94. Purposive sampling technique was employed. The sample size was calculated by using the WHO sample size calculator. The calculated sample size was 206. Six participants were excluded from the study due to incomplete filling of the questionnaire. The participants enrolled were from 1st to 4th year of MBBS. The exclusion criteria were students with any preexisting psychiatric illness or those with a history of taking drugs. The participants were assessed on a 35-items scale that inquired about emotional regulation, future outcomes, mindfulness practice among the medical students and embracing the present and self-awareness. The overall Cronbach's alpha score for the 35 items was recorded. All the data were collected and then analyzed in SPSS 22 using the correlational and regression analysis.

Results

A total of 200 participants were enrolled in the study. Table I depicts the distribution of participants depending upon the age, gender, class, parent status, smoking, income and the existence of a hobby. 51% of the participants were females whereas 49% of the participants were males. Majority of the participants were from 1st year MBBS (n=85; 42.5%). 22 (11%) participants reported to be smokers.

The reliability analysis for embracing the present and self-awareness (7 items), emotional regulation (9 points), positive future orientation (5), mindfulness practice in medical students (14 points) resulted in Cronbach's alpha score of 0.930

Table I: Distribution of participants included in the study (n=200).

Category	Subcategory	(N)	(%)
Gender	Male	98	49.0%
	Female	102	51.0%
Age (years)	≤ 20 years	89	44.5%
	21-22 years	47	23.5%
	≥ 23 years	64	32.0%
Class	1 st	85	42.5%
	2 nd	33	16.5%
	3 rd	36	18.0%
	4 th	46	23.0%
Parent Status	Couple	176	88.0%
	Divorce	10	5.0%
	Widow	14	7.0%
Income per Month	< 200k	57	28.5%
	200-500k	73	36.5%
	> 500k	70	35.0%
Smoking	0	1	0.5%
	Yes	22	11.0%
	No	177	88.5%
Hobby	Yes	143	71.5%
	No	57	28.5%

Table II indicates the relationship between gender and different variables to assess the mindfulness practice among the medical students. Results indicate a significant relationship of gender with embracing the present and self-awareness as statistically significant with a P value of 0.022. The overall mindfulness practice in medical student was reported to be statistically significant with a P value of 0.005. Table III

indicates the correlation matrix

Table III: Overall variables and mindfulness practice among medical students. (correlational analysis)

Variables	EPS	ER	PFO	MPMS
EPS (Embracing the Present & Self-Awareness)	1	.701**	.517**	.640**
P-value		.000	.000	.000
ER (Emotional Regulation)	.701**	1	.464**	.631**
P-value	.000		.000	.000
PFO (Positive Future Orientation)	.517**	.464**	1	.593**
P-value	.000	.000		.000
MPMS (Mindfulness Practice in Med Students)	.640**	.631**	.593**	1
P-value	.000	.000	.000	

The correlation coefficient (R) is 0.739, indicating a strong positive relationship between the independent variables (PFO, ER, EPS) and the dependent variable (MPMS). The R² value of 0.547 means that approximately 54.7% of the variance in mindfulness practice among medical students can be explained by the three predictors. The adjusted R² value of 0.540, adjusted for the number of predictors, is slightly lower but still significant, showing that the model remains robust despite using multiple predictors. All predictors are statistically significant as their p-values are much less than 0.05. Figure 2 indicates the regression

Table II: Relationship between Gender and Different Factors Regarding Embracing the Present and Self-Awareness, Emotional Regulation, Positive Future Orientation, and Mindfulness Practice in Medical Students.

Factor	Response	Male (N %)	Female (N %)	Total (N %)	Chi-square (P-value)
Embracing the Present and Self-Awareness	Never	0 (0.0%)	0 (0.0%)	0 (0.0%)	7.61 (P = 0.022)*
	Rarely	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Sometimes	3 (3.1%)	11 (10.8%)	14 (7.0%)	
	Often	58 (59.2%)	44 (43.1%)	102 (51.0%)	
	Always	37 (37.8%)	47 (46.1%)	84 (42.0%)	
Emotional Regulation	Never	0 (0.0%)	0 (0.0%)	0 (0.0%)	3.21 NS (P = 0.361)
	Rarely	2 (2.0%)	0 (0.0%)	2 (1.0%)	
	Sometimes	14 (14.3%)	16 (15.7%)	30 (15.0%)	
	Often	54 (55.1%)	50 (49.0%)	104 (52.0%)	
	Always	28 (28.6%)	36 (35.3%)	64 (32.0%)	
Positive Future Orientation	Never	0 (0.0%)	0 (0.0%)	0 (0.0%)	3.88 NS (P = 0.144)
	Rarely	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Sometimes	9 (9.2%)	4 (3.9%)	13 (6.5%)	
	Often	19 (19.4%)	14 (13.7%)	33 (16.5%)	
	Always	70 (71.4%)	84 (82.4%)	154 (77.0%)	
Mindfulness Practice in Medical Students	Never	0 (0.0%)	0 (0.0%)	0 (0.0%)	10.69 (P = 0.005)**
	Rarely	0 (0.0%)	0 (0.0%)	0 (0.0%)	
	Sometimes	13 (13.3%)	4 (3.9%)	17 (8.5%)	
	Often	59 (60.2%)	52 (51.0%)	111 (55.5%)	
	Always	26 (26.5%)	46 (45.1%)	72 (36.0%)	

analysis. Linear regression indicating a positive relation between the development of resilience and mindfulness practice among the medical students.

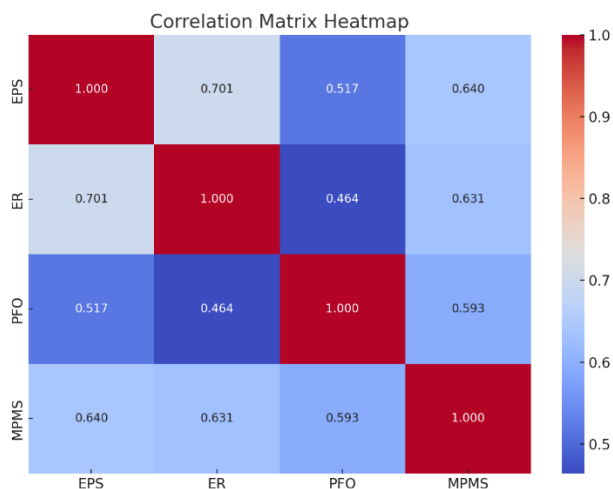
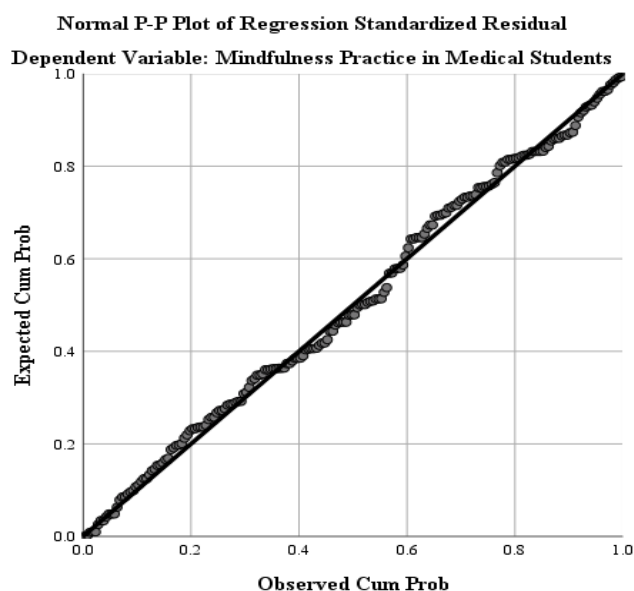


Figure 1. Indicates the correlational matrix heatmap.



The regression model summary indicates the R-squared value of 0.547 which indicates that approximately 54.7% of the variance in the dependent variables which can be explained by the predictors (Embracing the Present and Self-Awareness, Emotional Regulation, and Positive Future Orientation).

The F-statistic (78.739) and its significance level ($p < .001$) indicate that the overall regression model is statistically significant, meaning at least one of the predictors significantly explains variance in mindfulness practice. The ANOVA results ($F = 78.739$, $p < 0.001$) indicate that the model is statistically significant,

suggesting that the predictors collectively contribute to explaining variance in the dependent variable. The coefficients table shows that all predictors have a statistically significant positive influence on mindfulness practice, with Positive Future Orientation having the highest standardized coefficient (Beta = 0.318), indicating it's the strongest predictor among the three. Overall, the data suggest a robust relationship between the predictor variables and mindfulness practice in medical students.

Table 4: ANOVA Analysis for Mindfulness practice among medical students.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.559	3	13.186	78.739	.000 ^b
	Residual	32.824	196	.167		
	Total	72.383	199			

a. Dependent Variable: MPMS Mindfulness Practice in Medical Students

b. Predictors: (Constant), PFO Positive Future Orientation, ER Emotional Regulation, EPS Embracing the Present and Self-Awareness

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	.535	.221		2.42	.016
2					
EPS Embracing the Present and Self-Awareness	.260	.068	.269	3.80	.000
ER Emotional Regulation	.264	.061	.295	4.31	.000
PFO Positive Future Orientation	.291	.052	.318	5.57	.000
8					

a. Dependent Variable: MPMS Mindfulness Practice in Medical Students

Discussion

The current study explored the predictors of mindfulness practice in medical students with three main psychological factors including embracing the present and self awareness (EPS), emotional regulation (ER) and positive future orientation (PFO). Mindfulness practices among the medical students maintains well being and develops resilience. The finding aligns with the randomized control trial conducted by Julieta Galante et. Al (17). The mean score for the distress was reported to be significantly reduced when implying the mindfulness practice among the medical students. In the current study, the relationship between the female gender and embracing

the present and self-awareness was statistically significant with a P-value of 0.022. According to a study by Jasvir Kaur, female students scored higher on the act with awareness facet of mindfulness than the male students. (18) Another study advocated a significant higher score among the female than the males which aligns with the results of current study. (19)

In the current study, Organization of results into the ANOVA format showed that the overall model is highly significant with $F=78.739$, $p < 0.001$ that means the selected factors: EPS, ER, PFO describe a significant part of variance connected with the frequency of practicing mindfulness by the medical students. This conclusion is consistent with prior studies indicating enhanced self-regulation, affect regulation, and future perspective as crucial factors in practicing mindfulness behaviours in medical education. Another study by Adam Neufeld et al, (20) mindfulness and resilience were associated with lower perceived stress. Their findings were suggestive of mindfulness and resilience as important qualities for medical student's wellbeing.

In the current study, the findings of the regression analysis expands on the individual correlation of each predictor variable. In this case, the most significant predictor in relation to mindfulness practice was PFO, with a standardized coefficient [Beta] = 0.318, $t = 5.578$ ($p < 0.001$). This result supports the idea that students with a positive attitude to the future are more likely to practice mindfulness. This finding may be due to the idea that student with a positive future orientation might be able to better cope with stress and thus be more able to concentrate on mindfulness practices. Positive relationship was also found between Emotional regulation as well as embracing the present and self awareness with the mindfulness practice (Beta = 0.295, $p < 0.001$). In light of this, the result highlights the importance of effective emotional regulation in dealing with volatile emotional environment that comes with the course of finishing medical education. Those scholars, who manage with their feelings better in class may be oriented to the activity and directed attention needed for mindful learning. The final two predictors for mindfulness practice are acceptance subscale, which had a moderate correlation alfa coefficient equal to 0.544, and Embracing the Present Awareness (EPS), with standardized coefficient of 0.269, $p < 0.001$. This means that students who are apt to practice mindfulness, are those that have higher levels of self-awareness and presence. EPS promotes the development of readiness to both monitor current

emotional and psychological condition, which is a part of mindfulness. The study by Stephanie Bryan et al. (21) the mediators reported to be statistically significantly impacting the mindfulness practice among the medical students.

Another study by Aisha Zubair et al (22), multiple regression analysis shows the resilience has a moderate relationship between mindfulness and well-being. Literature review suggests a moderating role in developing resilience in predicting positive psychological outcomes. (23)

Conclusion

The development of mindfulness practice is a much needed tool and trait among the medical students to cope up with stress factors. The study contributed to the growing literature for medical student well being by providing an insight to the potential impacts of mindfulness practice and developing resilience among the medical students. Finding align with results of current study female participants have more mindfulness practice. In a nutshell the learning environment should foster the development of mindfulness practices among medical students for the physical and mental wellbeing.

Future Implications: The mindfulness practice specially among the medical students of 3rd year and 4th year carries immense significance as the students face a transition from basic subjects to clinical subjects. The stress factor increases as the students face problems with clinical subjects. Hence, policies regarding mindfulness should be introduced and integrated in the curriculum for better coping up with the physical and mental wellbeing of the students.

Limitations: The main limitation of the study is that it was carried out in a single centered. Some student didnot consent to participate in the study. Future well designs, multicentre studies should be carried out to overcome these limitatins. Mindfulness practices should become an integral part of the curriculum and newer methodologies should be integrated to gain positive outcomes

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