

Mindful Eating And Self-Compassion As Correlates Of Mental Well-Being Among Undergraduate Medical Students: A Cross-Sectional Study

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Abstract

Background: Medical students face high levels of psychological distress and identifying modifiable protective factors is essential. This cross-sectional study examined relationships among mindful eating, self-compassion, and mental well-being in first-year medical students.

Methods: A cross-sectional study was conducted at a medical college in Chennai, India, from March 2025 to June 2025, involving 72 first-year MBBS students using a simple random sampling method. Participants, after giving their informed consent, completed the Mindful Eating Questionnaire, Self-Compassion Scale-Short Form, and Warwick-Edinburgh Mental Well-being Scale. The correlation between mental well-being and other variables was assessed using the Pearson correlation test. Multiple regression analysis was performed to predict mental well-being based on the measured variables.

Results: The mean scores for mindful eating behavior, self-compassion, and mental well-being were 2.67 ± 0.26 , 2.82 ± 0.53 , and 43.18 ± 9.23 , respectively. Mindful eating behavior ($r = 0.24$, $p = 0.04$) and self-compassion ($r = 0.45$, $p < 0.001$) showed a significant moderate positive correlation with mental well-being. Multiple linear regression analysis revealed self-compassion as a significant positive predictor of mental well-being ($\beta = 7.68$, $p < 0.001$) in this population, while mindful eating did not ($\beta = 3.39$, $p = 0.37$).

Conclusions: Self-compassion shows a robust association with mental well-being in first-year medical students and independently predicts higher well-being, whereas mindful eating correlates with well-being but did not retain independent predictive value. These findings highlight the significance of fostering mindful eating practices and developing self-compassion as viable approaches to improving mental well-being.

Keywords: Medical students, Mental well-being, Mindfulness, Mindful eating, Self-compassion.

1. INTRODUCTION

The prevalence of mental-health challenges among undergraduate medical students is a pressing issue that demands urgent attention. Contemporary medical education imposes a demanding curriculum layered with high expectations and emotionally strenuous clinical experiences, thereby exposing students to a significant risk for psychological distress, anxiety, depression, and burnout [1]. The interplay between various unique stressors, including sustained sleep deprivation, a highly competitive culture, the need to master vast amounts of information within a limited period followed by frequent testing, and prolonged exposure to death and patient suffering, contributes to a higher prevalence of mental health issues in medical students compared to age-matched peers in the general population [2, 3, 4, 5]. Although a recent study revealed that increased self-perception of mental health disorders among medical students did not necessarily align with the actual rates of diagnosed mental health conditions in this group relative to non-medical students, it was nevertheless emphasized that medical students continue to face prolonged anxiety and stress and report lower quality of life during training [6]. Moreover, the academic and clinical demands are frequently exacerbated by underdeveloped coping mechanisms that further compound stress, undermine well-being, and increase the perception of diminished mental health status and resilience against challenges in this population [2, 7]. The scale of this crisis has recently been underscored by findings from the National Medical Commission (NMC) Task Force for Mental Health and Wellbeing. In one of the largest surveys of its kind in India, involving over 25,000 undergraduate and 5,000 postgraduate medical students, the report revealed that nearly 1 in 4 MBBS students had a diagnosed mental health disorder, while 1 in 3 postgraduate students reported suicidal thoughts, with over 10% planning suicide attempts and 4.4% attempting suicide in the past year. Alarming, 16.2% of undergraduates admitted to experiencing suicidal ideation in the past 12 months [8]. The NMC survey further dissected the role of various structural and systemic stressors, such as excessive working hours,

lack of adequate rest, poor hostel facilities, corruption in assessments, and limited faculty support in aggravating mental health disorders among this high-risk cohort of students and advocated for tailored interventions to curb these issues at the root [8].

Towards this end, there has been growing interest in identifying protective psychological factors and behavioral strategies that may buffer the adverse effects of chronic stress. Mindfulness, defined as the ability to attend to the present moment with non-judgmental awareness, has been shown to mitigate stress, enhance emotional regulation, and foster resilience [9, 10]. Randomized controlled trials (RCT) have demonstrated that mindfulness interventions can reduce symptoms of depression, anxiety, and burnout among medical students, while improving sleep quality and academic performance [11, 12]. A related subset of mindfulness involves mindful eating, which emphasizes non-judgmental awareness of physical hunger and satiety cues, emotional triggers of eating, and the sensory experience of food. While research on mindful eating among medical students is limited, studies in broader populations suggest that it improves dietary habits and enhances psychological well-being [13, 14]. More specifically, engaging in mindful eating practices has been correlated with healthier eating patterns [15] and is known to help lower fasting glucose levels, minimize sugar consumption [16], and facilitate weight loss [17]. Aside from these physiological manifestations, eating behavior has also been documented to exert a strong influence on an individual's mental health [18]. Considering that poor dietary practices, irregular eating schedules, and stress-induced eating are common among medical trainees, mindful eating may serve as a practical, everyday strategy for enhancing health and resilience.

Closely linked to mindfulness is the construct of self-compassion, which involves treating oneself with kindness and understanding in times of failure or distress rather than engaging in harsh self-criticism [19]. Self-compassion comprises of three interacting components: self-kindness vs self-judgment, a sense of common humanity vs isolation, and mindfulness vs over-identification [20]. Self-kindness refers to the act of treating oneself with compassion, warmth, and understanding in the face of adversity. The concept of common humanity pertains to the understanding that one's failures and suffering are elements of the larger human experience, rather than a source of isolation. The mindfulness element involves maintaining a balanced awareness of painful experiences, rather than over-identifying with distressing thoughts. Research suggests that self-compassionate individuals are likely to report greater overall happiness [21], improved life satisfaction, and fewer psychological distress symptoms [22]. Among healthcare professionals in particular, emerging evidence suggests that self-compassion is inversely correlated with stress, burnout, and suicidal ideation [23, 24]. Together, mindfulness, self-compassion, and mindful eating converge on the broader construct of mental well-being, encompassing positive affect, life satisfaction, resilience, and a sense of purpose that might translate to better outcomes for students as well as for the patients that they might care for. Indeed, there is compelling evidence to indicate that healthier, more resilient medical students often turn out to be more empathetic, compassionate, and effective physicians [24, 25].

Despite this growing recognition, several gaps remain. Much of the literature has examined mindfulness, self-compassion, or mindful eating in isolation, with relatively few studies investigating their combined influence on psychological outcomes in medical students. Moreover, existing studies largely originate from Western settings, limiting generalizability to the unique sociocultural and institutional contexts of South Asia. Importantly, there is limited evidence from India, where there is a disproportionately higher burden of mental distress among students, as highlighted by the NMC task force report [8]. To address these gaps, the present study sought to explore the interplay between self-compassion, mindful eating, and mental well-being among first year undergraduate medical students.

2. METHODS

2.1 Study Design and Setting

This cross-sectional study was conducted among first-year undergraduate medical (MBBS) students at Panimalar Medical College Hospital & Research Institute in Chennai, India, between March 2025 and June 2025. The study was approved by the Institutional Ethics Committee (Ref: PMCH&RI/IHEC/2025/245), and written informed consent was obtained from all participants prior to data collection. The study was conducted in accordance with the principles of the Declaration of Helsinki.

2.2 Sample Size and Study Population

The minimum required sample size was determined using a correlation coefficient of 0.33 between mindful eating behavior and self-compassion, as reported in a previous study [26]. To detect this relationship with a 95% confidence level and 80% power, a total sample size of 72 participants was calculated. The inclusion criteria were as follows: (a) enrollment in the first-year MBBS program, (b) age between 18 and 25 years, and (c) willingness to provide written informed consent. Students outside the specified age range or those unwilling to participate were excluded. Among 150 eligible first-year medical students, 120 expressed willingness to participate. Using simple random sampling, 75 students were selected; following data collection, three students were excluded due to incomplete questionnaires, yielding a final sample of 72 participants.

2.3 Study Procedure and Instruments

After obtaining written informed consent, participants (n=75) were provided with a link to a self-administered online survey hosted on Google Forms. The survey collected basic demographic data (age, gender) and contained three validated psychological scales outlined below.

2.3.1 Mindful eating behavior

Mindful eating was assessed using the Mindful Eating Questionnaire (MEQ) developed by Framson et al. [27]. The MEQ evaluates awareness of physical and emotional sensations during eating, as well as the ability to eat without external distraction or emotional reactivity. It comprises 28 items across five subscales – Awareness, Distraction, Disinhibition, Emotional Response, and External Cues – and each item is rated on a four-point Likert scale (where 0 = never to 4 = always). Subscale scores are computed as the mean of completed items, excluding “not applicable” responses. The overall MEQ score is the mean of all subscale scores, with higher values indicating greater mindful eating behavior.

2.3.2 Self-compassion

Self-compassion was measured using the Self-Compassion Scale-Short Form (SCS-SF), which is a 12-item tool to evaluate self-compassion, as evidenced by student responses to experiences of failure, inadequacy, or distress [28]. Each item was rated by participants on a 5-point Likert scale ranging from 1 (Almost never) to 5 (Almost always). Subscales include self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. A total score was calculated by averaging the mean scores of all subscales, with higher scores indicating greater self-compassion. Specifically, scores between 1.0-2.49 were categorized as low, 2.5-3.5 as moderate, and 3.51-5.0 as high in self-compassion.

2.3.3 Mental Well-Being

Mental well-being was evaluated using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) developed by Tennant et al. [29]. The WEMWBS includes 14 positively worded items reflecting psychological functioning over the preceding two weeks. Each item is rated on a five-point Likert scale (where 1 = none of the time to 5 = all of the time), yielding a total score range of 14-70, with higher scores indicating greater mental well-being. The scale showed good internal consistency in our study, as evidenced by a Cronbach's α value of 0.85.

2.4 Statistical Analysis

All analyses were performed using IBM SPSS for Windows (Version 29.0, IBM Corp., Armonk, NY, USA). Continuous variables were tested for normality using the Shapiro-Wilk test and are presented as mean \pm standard deviation (SD). Between-group differences in continuous variables were assessed with the independent t-test. Pearson's correlation coefficient was used to examine associations among mindful eating, self-compassion, and mental well-being. Multiple linear regression analysis was conducted to determine whether mindful eating and self-compassion independently predicted mental well-being. A two-tailed p-value < 0.05 was considered as statistically significant.

3. RESULTS

3.1 Mindful eating, self-compassion, and mental well-being characteristics among the overall and gender-stratified population

The final study sample consisted of 72 first-year medical students with a mean age of 18.82 ± 0.69 years. The cohort was predominantly female (n = 55, 76.4%). As highlighted in **Table 1**, the overall mean scores of the study population for mindful eating behavior, self-compassion, and mental well-being were 2.67 ± 0.26 , 2.82 ± 0.53 , and 43.18 ± 9.23 respectively. When stratified by gender, males and females reported comparable levels of mindful eating (2.64 ± 0.16 vs. 2.68 ± 0.16 , $p = 0.64$), self-compassion (2.91 ± 0.51 vs. 2.79 ± 0.53 , $p = 0.40$), and mental well-being (43.65 ± 12.2 vs. 43.04 ± 8.09 , $p = 0.81$), indicating that gender did not appear to influence the distribution of scores across the study variables.

Table 1: Gender differences in mindful eating, self-compassion, and mental well-being

Variables	Total Population (n=72)	Male (n=17) Mean ± SD	Female (n=55) Mean ± SD	t value	p-value
Mindful eating behavior	2.67 ± 0.26	2.64 ± 0.16	2.68 ± 0.16	-0.47	0.64
Self-compassion scale	2.82 ± 0.53	2.91 ± 0.51	2.79 ± 0.53	-0.83	0.40
Mental well-being	43.18 ± 9.23	43.65 ± 12.2	43.04 ± 8.09	-0.24	0.81

3.2 Bivariate correlations of study variables

Table 2 shows the Pearson's correlation coefficients that were calculated to examine the bivariate relationships between mindful eating, self-compassion, and mental well-being (**Table 2**). Mental well-being demonstrated a significant positive correlation with both mindful eating behavior ($r = 0.24$, $p = 0.04$) and self-compassion ($r = 0.45$, $p < 0.001$), indicating that higher levels of these traits were associated with greater mental well-being. In contrast, the correlation between mindful eating and self-compassion was weak and not statistically significant ($r = 0.15$, $p = 0.20$).

Variables	Mindful Eating	Self-Compassion	Mental Well-Being
Mindful Eating	-	-	-
Self-Compassion	0.15	-	-
Mental Well-Being	0.24*	0.45*	-

Note: * indicates significance at the level of p value ≤ 0.05 ; ** indicates significance at the level of p value ≤ 0.01 .

3.3 Multiple Regression Analysis

A multiple linear regression analysis model was constructed to further explore the predictors of mental well-being and the results are summarized in **Table 3**. The overall regression model accounted for 21.6% of the variance in mental well-being scores. Within this model, self-compassion was a significant positive predictor of mental well-being ($\beta = 7.68$, $p < 0.001$), with the β -coefficient indicating that each one-point increase in self-compassion score was associated with an increase in mental well-being score by 7.68 points. In contrast, mindful eating did not significantly predict mental well-being ($\beta = 3.39$, $p = 0.37$). Taken together, these findings highlight that while both mindful eating and self-compassion were positively correlated with mental well-being, only self-compassion independently predicted well-being scores in this cohort of medical students.

Table 3: Multiple regression analysis to identify the predictors of mental well-being

Model Variables	β	SE	t	p-value
Constant	12.45	10.82	1.15	0.25
Mindful eating	3.39	3.83	0.88	0.37
Self-compassion	7.68	1.88	4.07	<0.001**

4. DISCUSSION

In the present study, we sought to explore the impact of mindful eating and self-compassion on the mental well-being of first-year medical students. Our findings reveal two critical insights: (1) both mindful eating and self-compassion are positively correlated with mental well-being, and (2) self-compassion is an independent predictor of mental well-being, whereas mindful eating, though correlated, does not significantly predict well-being when both variables are considered together. Lastly, there were no significant gender differences among the studied variables in this cohort. These results both align with

and diverge from prior literature, and have important implications for medical education, student health, and preventive interventions.

4.1 Self-compassion positively modulates psychological well-being and may exert a protective influence against mental health challenges

The finding that self-compassion strongly predicts mental well-being aligns with evidence from a meta-analysis of over 16,000 participants from the general population, which showed moderate to large effect sizes for the relationship between self-compassion and various dimensions of mental well-being spanning psychological, emotional, and cognitive aspects [30]. When looking at university student populations in particular, studies have shown self-compassion to be inversely related to stress, anxiety, and depression, and positively predict good mental health, subjective happiness, and overall life satisfaction [31, 32]. To qualify how self-compassion confers beneficial effects among students, Cheraghian et al. demonstrated that self-compassion moderates the relationship between academic burnout and mental health in university students, and buffers the negative impact of the former on psychological functioning [33]. This moderator role maps closely onto the broader interpretations of the findings of the present study. In an environment such as early medical training where academic burnout is common and predictable, self-compassion may exert a stress-attenuating influence by reducing self-criticism and maladaptive comparison [33]. Within this context, it is important to appreciate that these trends are dynamic across diverse geographic populations, each of which are shaped by esoteric evaluations of students, different cultural perceptions of self-identity and self-compassion, and differing perspectives on the importance of identifying and resolving mental-health challenges. For instance, in a cross-cultural comparison of the relationship between self-compassion and mental well-being in Malaysian and United Kingdom (UK) students, researchers found that Malaysian students scored lower on self-compassion and resilience than UK peers and that self-compassion partially mediated the link between negative mental-health attitudes and mental health problems [34]. Although we did not compare students from different countries, these findings broadly reinforce the need to inculcate good coping practices among student populations. Another study also found that self-compassion mediated the relationship between sleep and mental health among UK nursing students and protected against the mental-health impacts of sleep deprivation and shame [35]. Together, these two studies, which provide important culture and profession-specific nuances highlight a couple of important considerations that build on top of the current study. First, self-compassion may be particularly salient in cultures or contexts where stigma and shame worsen help-seeking attitudes, as is often the case in South Asian countries such as India [36]. Second, the fact that self-compassion can mediate or explain how basic needs such as sleep and attitudes of mental well-being translate into better observed health outcomes begets the development and implementation of self-compassion training programs across institutes.

While some studies offer a simple and unidimensional interpretation of the positive role of self-compassion on mental well-being, others often unravel more complex relationships between these variables. In a large mixed sample of nurses, physicians, and medical students, greater self-compassion predicted lower burnout and better quality of life, but its moderating effects on the stress-burnout link varied by profession [37]. Notably, self-compassion moderated stress and burnout in nurses, but not in doctors or medical students. This heterogeneity suggests that the protective effect of self-compassion may interact with role-specific stressors, workplace cultures, or professional identity formation. For our cohort of first-year medical students, these findings caution against assuming uniform effects and argue for studies that explicitly test the aforementioned variables. They also imply that, while promoting self-compassion is broadly desirable, the design and target of interventions might need tailoring to the specific academic and sociocultural contexts of the chosen population. The consistent advocacy for implementation of mental health counselling programs is further bolstered by the observation that deteriorating mental health issues are often pervasive across the life of a medical student and extend well into their time as a practising physician. Indeed, among physicians who have been practising for many years, lower self-compassion was associated with higher compassion fatigue and worse mental health outcomes [38]. The observed negative correlation between self-compassion and compassion fatigue ($r = -0.596, p < 0.001$), when viewed in combination with the observation that physicians with existing mental health conditions such as depression or anxiety had greater levels of compassion fatigue, in this study [38] lends credence to the argument that early curricular or co-curricular self-compassion training may be a high-yield, preventive strategy in medical education. Not all studies, however, showcase a “buffering” capacity of self-compassion against mental health challenges. Pourramzani et al. reported that, among

medical students in different phases of training, those in the preliminary/basic science years had the greatest level of perceived stress, which was accompanied by a significantly higher burden of stress related somatic symptoms [39]. However, across the entire cohort of students, the relationship between self-compassion and perceived stress was not statistically significant and there was no evidence to suggest that self-compassion played a protective role in, or mediated the relationship between, stress levels and somatic symptoms [39]. These results support the need to minimize exclusive reliance on cross-sectional self-reported studies where measurement models are often simplified, and instead advocates for conducting longitudinal studies with multimethod approaches, whenever possible, to clarify causal and mediational pathways rather than inferring them from correlations alone. Collectively, the strong correlation between self-compassion and mental well-being ($r = 0.45$, $p < 0.001$) (Table 2) and the predictive power of the former in positively modulating outcomes of latter ($\beta = 7.68$, $p < 0.001$) (Table 3) suggests that medical students who approach their inevitable struggles, failures, and imperfections with kindness, a growth mindset, and positive cognitive restructuring are significantly better equipped to maintain a state of mental equilibrium that might insulate against disorders like depression, anxiety, and/or burnout.

4.2 Mindful eating exhibits complex relationship with overall perceived mental well-being

Mindful eating was positively correlated with mental well-being ($r = 0.24$, $p < 0.05$), albeit to a lesser extent than self-compassion (Table 2), and did not independently predict well-being in multivariate regression analysis ($\beta = 3.39$, $p = 0.37$) (Table 3). Similar to the interaction between self-compassion and mental well-being, this relationship also exhibited contrasting patterns with studies in the literature. Among university students from various health-related disciplines including sports science, pharmacology, and allied health sciences such as nursing and physiotherapy, higher mindful eating was associated with lower mood disturbances and was also a significant predictor of disordered eating [40]. Notably, this study also found significant gender differences in MEQ scores, with women scoring significantly higher across the total scale and in all but the emotional subscale of the questionnaire. This is of further importance given the finding that MEQ scores were noted to be a significant predictor of binge eating disorders in their study population [40]. However, in our study neither were there gender differences in MEQ scores nor was mindful eating a predictor of mental well-being. This might partially be explained by the fact that our study population exclusively comprised of medical students, all of whom are exposed to the same environment and stressors that might then dilute any within group differences. Further, some students stay on-campus in hostels, while others commute to and from their houses. In communal spaces, it is plausible that eating behaviors might be unknowingly passed on, especially during times of stress (such as an upcoming exam), which might render the population otherwise homogenous. The substantially smaller proportion of males might also contribute towards the observed results. Lastly, it may be that gender differences in stress or mental health emerge later in training or are moderated by unmeasured factors. Against this backdrop, it is also worth considering whether cultural factors in the broader Indian medical education paradigm reduce gender differences in various traits early during training, and should be explored further in larger, and ideally longitudinal, studies. While additional evidence from studies that specifically look at mindful eating behaviours among South Asian medical students are sparse, some broader comparisons merit consideration. Among Malaysian university students, it was noted that daily mindful eating was positively associated with everyday physical and psychological well-being, and that eating attitudes moderate these relationships [41]. By focussing on day level changes, the researchers showed that benefits of mindful eating are accrued by repeated practices over time that could then confer beneficial effects in student populations. Another interesting finding was that their sample had a notable proportion of Muslim students, whose religious values and dietary teachings mandated self-awareness while eating [41]. For our Indian cohort, this highlights the need to account for culturally mediated eating attitudes and to consider how locally meaningful dietary norms, as well as attitudes and practices towards eating could amplify effect sizes. Likewise, Khan & Zadeh found that, in a sample of 309 participants from the general population, there was a significant positive correlation between mindful eating and mental well-being ($r = 0.291$, $p < 0.05$) as measured by the MEQ and WEMWBS measures [42], which was in agreement with the findings of, and the methods underlying, our study. Overall, these studies suggest that mindful eating is a reliable correlate of well-being and has specific professional and cultural contexts that make it a ripe target for mindfulness-based intervention programs. Indeed, experimental evidence suggests that such interventional programs can lead to improved MEQ scores and heightened awareness while eating among medical students [43]. Our finding that mindful eating did not independently predict mental well-being once self-compassion was included, suggests that mindful eating may exert its effect via

broader self-care processes and affective regulatory capacities (including self-compassion), or alternatively may act additively but more weakly than traits like self-compassion. This further strengthens the need for multimodal interventions for medical students that simultaneously (a) promote self-compassion and emotion regulation, (b) teach mindful-eating skills with attention to culturally relevant eating attitudes, and (c) strengthen other complimentary self-care behaviors.

4.3 Limitations and Future Directions

There are several limitations to the present study. Since data was collected at one point in time, causality and evolution of traits and outcomes over time cannot be inferred. Specifically, mental well-being assessed over past 2 weeks via WEMWBS may not capture longer-term trends or fluctuation, especially under varying academic schedules, exam periods, or clinical rotations. This is particularly relevant in light of evidence that suggests that the emotional health of medical students is at the worst level during their first year, but gradually improves over time, perhaps due to the adoption of better coping strategies [44]. It is also not certain whether higher self-compassion leads to better well-being, or vice versa, or whether both are influenced by some confounding variable such as presence of social support systems or a more resilient baseline “mental reserve”. The sample only included first-year MBBS students in one medical college in Chennai, which limits generalizability to students in other years, other medical institutions, or other regions of India. There may be institutional, cultural, or curriculum differences that shape stressors and protective factors that are worth exploring in larger and more diverse studies. This is of particular importance when combined with the fact that, although the sample size met the minimum requirements for detecting correlations, it may have been underpowered to detect smaller or subgroup effects. Lastly, the study also suffers from all biases inherent to self-reported measures. A student might over-report self-compassion because they are aware it is a valued trait. Future research would benefit from multi-method assessments, including qualitative interviews to explore the lived experience of self-compassion or physiological measures of stress to triangulate the psychological data. In parallel, RCTs should be conducted to test the efficacy of specific self-compassion training programs against control conditions, using our identified outcome measures.

5. CONCLUSION

This study contributes to the growing body of evidence that psychological traits such as self-compassion have strong associations with mental well-being among medical students, and appear to act as a more powerful predictor than mindful eating when both are simultaneously considered. While mindful eating is positively associated with mental health, its independent predictive role may be lesser in early medical training contexts. Given the high burden of mental distress observed in Indian medical students and its far-reaching implications for student performance, patient care, and long-term physician well-being, integrating self-compassion trainings and promoting mindful eating may represent promising strategies for medical schools. Early, culturally appropriate, evidence-based interventions, supported by longitudinal and interventional research, are needed to safeguard the mental health of medical students as they transition into their roles as future physicians.

Author Contributions

Conceptualization, methodology and design of the study: VC; Data curation: MM and VC; Formal statistical analysis and interpretation of results: MM, VC, LS, and PP; Writing-Original Draft: VC, LS, and PP; Writing-Reviewing and Editing: VC, MM, LS, and PP. All authors revised the manuscript for critical intellectual content. All authors have read and approved the final manuscript.

Funding: The study received no external funding.

Institutional Ethics Approval: The study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Ethics Committee at Panimalar Medical College Hospital and Research Institute (Ref: PMCH&RI/IHEC/2025/245).

Informed Consent: Written informed consent was obtained from all participants of the study.

Data Availability Statement: The raw data underlying the manuscript are available from the corresponding author upon reasonable request.

Acknowledgements: The authors thank all the participants who took part in the study with gratitude.

Conflicts of Interest : The study authors do not have any conflicts of interest to disclose.

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