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Original Research Article

Perceived Stress Source and Coping Strategies among First and Final Year Undergraduate Medical Students

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Abstract: Medical education is highly demanding, with students facing intense academic, emotional, and professional challenges. First-year students face the pressures of adjusting to a rigorous curriculum and new social environments, while final-year students experience heightened stress related to career uncertainty and impending clinical responsibilities. Understanding the sources of stress and coping strategies at different stages of training is crucial for developing targeted interventions that promote student well-being and academic success. Hence, this study aimed to assess the differences in perceived stress sources and coping strategies among first and final-year undergraduate medical students using an online survey. Sociodemographic information was collected, and stress levels were measured using the Perceived Stress Scale, while sources of stress were identified with the Medical Student Stressor Questionnaire. Coping strategies were evaluated using the Brief-COPE. Statistical analysis was performed using SPSS, with Chi-square tests to compare groups. A total of 264 medical students (132 first-year, 132 final-year) participated in the study. First-year students reported higher levels of stress, with 84.8% experiencing moderate stress, while final-year students showed more balanced stress distribution. Academic, interpersonal, and teaching-related stressors were most significant. First-year students predominantly used problem-focused coping, whereas final-year students employed more emotion-focused and avoidant coping strategies, with significant differences observed between the cohorts. Our results highlight the evolving stress experiences and coping strategies across the medical curriculum, underscoring the need for targeted mental health support that promote student well-being.

Keywords: Perceived Stress, Stress Source, Coping Strategies, Undergraduate Medical Students.

INTRODUCTION

Medical education is widely recognized as one of the most demanding and stressful training paths, marked by high academic pressures, emotional strain, and intense workloads. As future healthcare professionals, medical students often face unique stressors that can adversely affect their mental health and well-being. The transition into medical school, especially for first-year students, can be particularly daunting. As they embark on this journey, students must navigate complex curricula, clinical responsibilities, and the emotional demands of patient care. Concurrently, final-year students face their own set of pressures as they prepare for internships and professional practice. Understanding the differences in perceived stress sources and coping strategies between these two cohorts is essential for developing effective interventions that can mitigate these stressors and enhance their educational experience.

Research has consistently shown that medical students experience elevated levels of stress compared to their peers in other disciplines. A study by Jafri SAM *et al*., (2017) reported that around 54% of medical students experience symptoms of stress, originating primarily from academic demands, compared to 20.6% of engineering and arts students, as well as 32% of commerce students. This stress can lead to significant mental health issues, including anxiety and depression, which are particularly prevalent among medical students. A study conducted in India found that 32.0% of medical students exhibited symptoms indicative of depression, while 40.1% showed signs of anxiety, and 43.8% reported symptoms consistent with stress (Taneja N *et al*, 2018). Garg K *et al*., (2017) found that stress among medical students is a dynamic phenomenon, with its sources differing based on the stage of the curriculum. First-year students often experience stress related to the transition into a demanding academic environment and the adjustment to new social dynamics. Conversely, final-year students tend to face stress primarily associated with anxiety about their future career prospects and the emotional burden of impending professional responsibilities (Garg K *et al.*, 2017).

Stressors in medical education can be categorized into several domains. Academic-related stressors, such as high-stakes examinations, heavy workloads, and the volume of material to be mastered, are often cited as the primary sources of stress (Jafri SAM *et al.*, 2017). Interpersonal stressors can arise from relationships with peers and faculty, which may be exacerbated by competitive environments. Personal factors, such as financial concerns and work-life balance, further complicate the landscape of stress for medical students (Garg K *et al.*, 2017).

Coping strategies are vital for managing stress effectively. Research indicates that medical students typically employ a mix of problem-focused, emotion-focused and avoidant coping strategies (Neufeld A *et al.*, 2021 and Sarah S *et al.*, 2023). Problem-focused coping, which involves actively addressing stressors, has been associated with better academic outcomes and mental health. In contrast, reliance on emotion-focused coping strategies, such as seeking emotional support or using denial, can lead to negative outcomes, including increased anxiety and decreased academic performance (Neufeld A *et al.*, 2021). Understanding the coping mechanisms utilized by first and final-year students can provide insight into their resilience and adaptability in the face of stress.

Recent studies have highlighted the importance of distinguishing between first and final-year students in terms of stress experiences and coping strategies (Melaku L *et al.*, 2021 and Patil SK *et al.*, 2016). For instance, final-year students often demonstrate greater proficiency in problem-solving and stress management, potentially due to accumulated experiences throughout their medical training. Conversely, first-year students may be more susceptible to severe stress, given their initial exposure to the rigors of medical education and clinical responsibilities (Melaku L *et al.*, 2021).

As medical education continues to evolve, there is a pressing need to address the mental health and well-being of medical students. Understanding the dynamics of stress and coping strategies will be instrumental in fostering a supportive educational environment, ultimately enhancing both student well-being and patient care in the future. Given the unique challenges faced by medical students, particularly during pivotal transitions such as the first and final years, this study aimed to study the differences in perceived stress sources and coping strategies among first and final-year undergraduate medical students.

MATERIAL AND METHODS

The present study was a cross-sectional observational study conducted among first and final year undergraduate medical college students after obtaining approval from the Institutional Ethics Committee. An online survey was used to minimize one-on-one encounters and facilitate the participation of medical undergraduates in the study. The survey was sent as a WEBSMS and also shared on various social network groups of first and final year undergraduate medical college students. All the respondents provided informed consent at the beginning of the survey with a yes-no question after being introduced to the nature and purpose of the research, assuring confidentiality and personal data protection. Data were collected between 1 October 2021 and 31 December 2021. Students above 18 years of age were included while those with a history of diagnosed medical conditions and psychiatric illnesses were excluded from the study.

Sociodemographic data was obtained including age, gender, living status (day scholar/hostler), hobbies (active/passive), and socioeconomic status (based on modified Kuppuswamy scale). A question was also included to determine whether the respondent was in their first or final year of study. Perceived Stress Scale was applied to measure levels of stress, the Medical Student Stressor Questionnaire to identify sources of stress, and Brief-COPE to assess coping strategies.

Perceived Stress Scale (PSS) is a 10-item questionnaire designed to measure the self-reported level of stress by assessing feelings and thoughts during the last month. Each item of the scale is scored from 0 (never) to 5 (very often) with a range of 0–40 for the total score of the scale. A higher level of stress is indicated by higher scores on this scale (Cohen S *et al.*, 1983).

The Medical Student Stressor Questionnaire (MSSQ) is a self-report instrument with 40 items that identifies sources of medical student stressors and measures the intensity of stress caused by each item on a

5-point Likert-type scale of 0-4 (0 = causing no stress, 4 = causing extreme stress). It addresses stressors under six domains - Academic related stressors, Interpersonal and intrapersonal related stressors, teaching and learning related stressors, Social related stressors, Drive and desire related stressors, and Group activities related stressors. The Cronbach's alpha was 0.95, indicating a high internal consistency (Yusoff MSB, 2010).

The Brief-COPE is a 28-item self-report questionnaire developed as a short version of the original 60-item COPE scale. It was designed to assess individuals' varying coping strategies in response to stress. It comprises 14 subscales, each of which evaluates the degree to which a respondent utilizes a specific coping strategy. These scales include active coping, planning, positive reframing, acceptance, humor, religion, emotional support, instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement, and self-blame. Each of the 14 subscales comprises two items; total scores on each scale range from 2 (minimum) to 8 (maximum). Respondents rate items on a 4 point Likert scale, ranging from 1 (I haven't been doing this at all) to 4 (I've been doing this a lot). Higher scores indicate increased use of that specific coping strategy (Carver CS, 1997).

Statistical analysis was done using Statistical package for social sciences (SPSS), version 25.0, released in 2017 by (IBM corp, Armonk, New York, United States of America). Chi-square test was used to study the association of year of study (first year/final year) with levels of stress, and coping strategies. A probability value of ≤0.05 was taken as statistically significant.

RESULTS

The total sample comprised 264 undergraduate medical college students above 18 years of age, of which 132 students were from the first year and 132 from the final year. The mean age of first-year students was 18.61 ± 0.82 years, while for final-year students, it was 21.60 ± 0.96 years. The gender composition was consistent across both years, with females making up the majority, 62.9% in the first year and 65.2% in the final year. A higher proportion of first-year students lived in hostels (60.6%) compared to final-year students (50.8%). Conversely, more final-year students were day scholars (49.2%) compared to first-year students (39.4%). Both groups showed a similar distribution of hobbies, with approximately 34% engaging in active hobbies and 65% in passive hobbies. The majority of students in both years belonged to the upper-middle class, followed by the lower-middle class. There was a small representation of students from the upper-lower and lower socio-economic statuses, as summarized in Table 1.

Table 1: Descriptive statistics for sociodemographic variables

Parameters	**Year**	
	First year (n = 132)	**Final year (n = 132)**
Age (Years)	18.61 ± 0.82	21.60 ± 0.96
Gender		
Male	49 (37.1%)	46 (34.8%)
Female	83 (62.9%)	86 (65.2%)
Living status		
Day scholar	52 (39.4%)	65 (49.2%)
Hostler	80 (60.6%)	67 (50.8%)
Hobbies		
Active	45 (34.1%)	46 (34.8%)
Passive	87 (65.9%)	86 (65.2%)
Socio-economic status		
Upper	27 (20.5%)	27 (20.5%)
Upper middle	63 (47.7%)	68 (51.5%)
Lower middle	32 (24.2%)	27 (20.5%)
Upper lower	9 (6.8%)	8 (6.1%)
Lower	1 (0.8%)	2 (1.5%)

Mild, moderate, and severe stress levels were prevalent in 13.6%, 73.5%, and 12.9% of students, respectively, on assessment with Perceived Stress Scale. Among first-year undergraduate medical students, the distribution of stress levels revealed that 4.5% experienced mild stress, while the majority, 84.8%, reported moderate stress, and 10.6% faced severe stress. In contrast, stress levels among final-year students shifted, with 22.7% reporting mild stress, 62.1% experiencing moderate stress, and 15.2% enduring severe stress, as depicted in Figure 1.

The assessment of stressors among undergraduate medical students was conducted using the Medical Student Stressor Questionnaire (MSSQ), as depicted in Figure 2. The findings indicate varying levels of stress across different domains. Academic related stressors (ARS) emerged as the most significant concern, with over half of the students (50.4%) reporting moderate stress. The interpersonal and intrapersonal domains (IRS) highlighted a concerning prevalence of severe stress, affecting 28.8% of participants. Teaching and learning related stressors (TLRS) accounted for notable levels of distress, with 22.3% of students experiencing severe stress. Social related stressors (SRS) were reported at the mild level by 48.5% of respondents, with fewer students (14.8%) indicating severe stress. The drive and desire related stressors (DRS) also contributed to stress, with 20.8% of students reporting severe stress. Group activities (GARS) were associated with a significant level of moderate stress, affecting 43.9% of participants, while 23.1% reported severe stress.

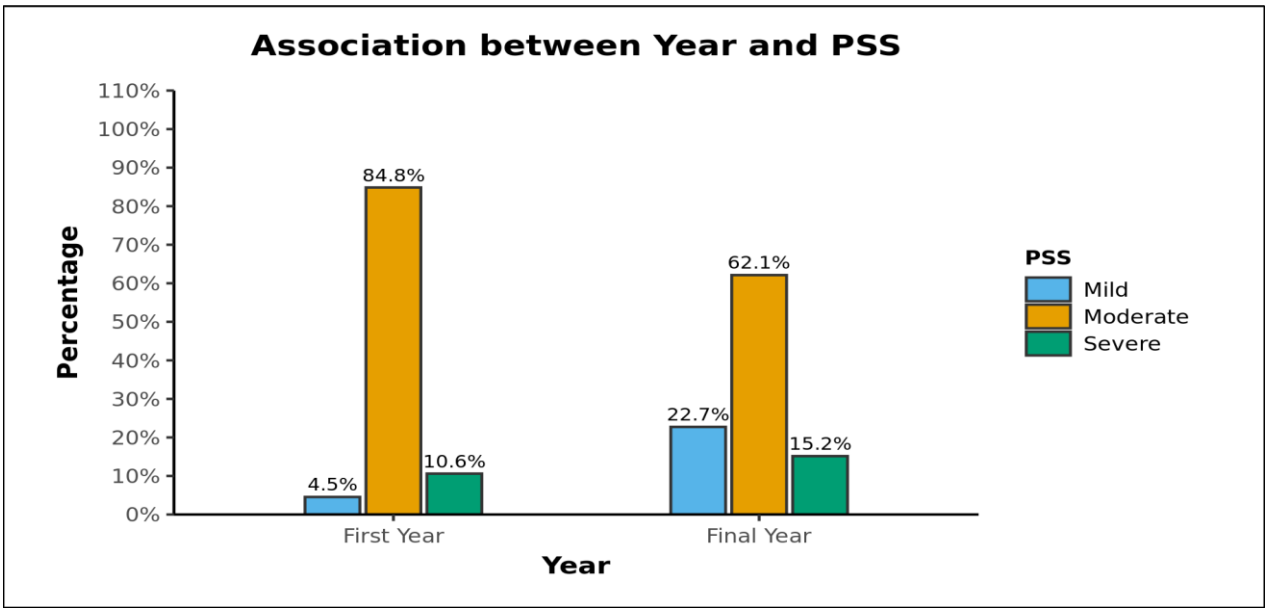

Figure 1: Association between year of study and Perceived stress scale scores

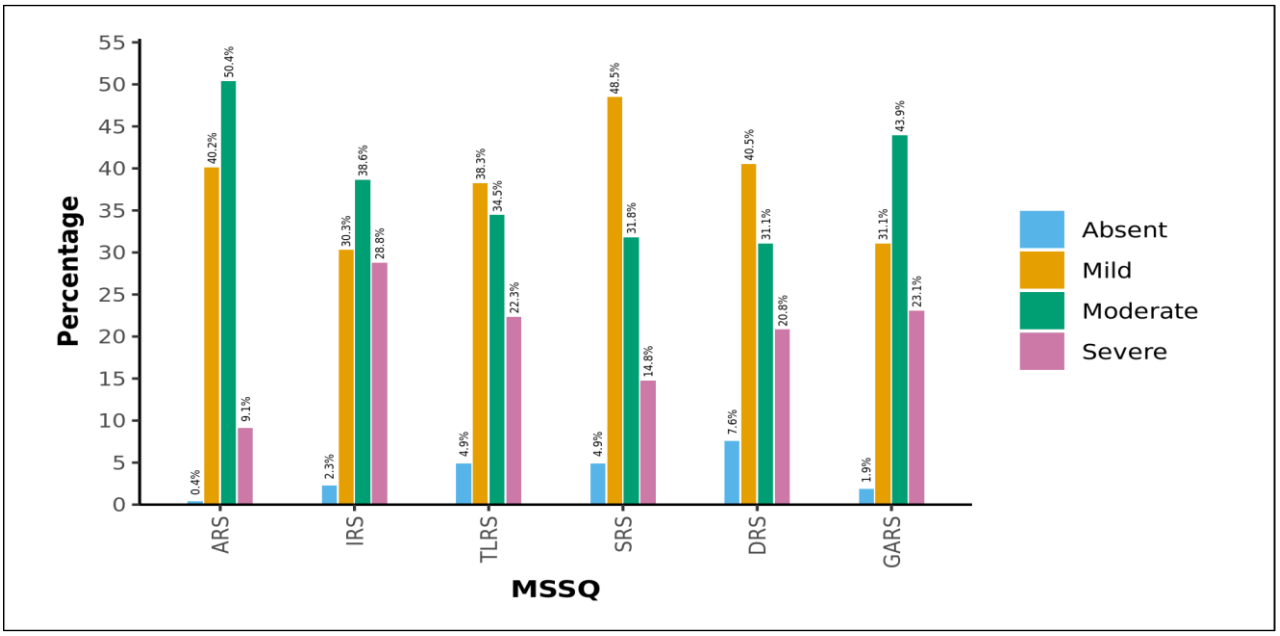

Figure 2: Domains of stressors on Medical Student Stressor Questionnaire (MSSQ)

MSSQ - Medical Student Stressor Questionnaire
ARS - Academic Related Stressors
IRS - Interpersonal and Intrapersonal Related Stressors
TLRS - Teaching and Learning Related Stressors
SRS - Social Related Stressors
DRS - Drive and Desire Related Stressors
GARS - Group Activities Related Stressors

Comparison was made between year of study and MSSQ domains, significance was found with IRS (p= 0.002), TLRS (p= <0.001), DRS (p= 0.046), and GARS (p= <0.001) domains.

Interpersonal and Intrapersonal stressors (IRS) significantly impacted students, with final-year students reporting more mild stress (38.6%) and first-year students experiencing more severe stress (37.9%). Teaching and Learning Related stressors (TLRS) caused mild stress in a significant portion of final-year students (49.2%), while first-year students experienced more moderate (40.2%) and severe (30.3%) stress. Final-year students experienced mild stress (45.5%) due to Drive and Desire Related stressors (DRS), whereas first-year students reported moderate (35.6%) and severe (24.2%) stress. Group Activities Related stressors (GARS) lead to mild stress (43.2%) in final-year students, while first-

year students experience more moderate (50.8%) and severe (29.5%) stress.

Pertaining to coping strategies, problem-focused coping strategies were more frequently used than emotion and avoidant coping strategies by first and final year undergraduate students. Problem-focused coping: First-year students utilized problem-focused coping strategies more frequently (2.70 ± 0.63) compared to final-year students (2.43 ± 0.66), with a highly significant difference ($p < 0.001$). Emotion-focused coping: Final-year students used emotion-focused coping slightly less (2.04 ± 0.51) than first-year students (2.16 ± 0.51), with a significant difference ($p = 0.020$). Avoidant coping: Both first-year and final-year students exhibited similar usage of avoidant coping strategies, but the difference was still statistically significant ($p = 0.046$), as shown in Table 2.

Table 2: Comparison of coping strategies in First year and Final-year students using Brief-COPE

Parameters	Year		
	First year (n = 132)	Final year (n = 132)	P value
Brief-COPE: Problem-focused	2.70 ± 0.63	2.43 ± 0.66	<0.001
Brief-COPE: Emotion-focused	2.16 ± 0.51	2.04 ± 0.51	0.020
Brief-COPE: Avoidant	1.80 ± 0.47	1.73 ± 0.44	0.046

*Chi-square test was done

Comparison was made between stress domains of MSSQ and coping strategies in first and final year students. Among the first-year students, significant associations were found between IRS and both emotion ($p = 0.039$) and avoidant ($p = 0.018$) coping strategies. DRS also showed significant relationships with emotion ($p = 0.036$) and avoidant ($p < 0.001$) coping strategies. Those experiencing moderate stress were more likely to adopt emotion-focused coping, while those with severe stress tended to use avoidant coping strategies. While among final-year students, significant associations were observed across various MSSQ domains (ARS, TLRS, SRS, DRS, GARS) with both emotion and avoidant coping strategies. IRS showed a significant relationship with problem-focused ($p = 0.038$), emotion-focused ($p < 0.001$), and avoidant ($p = 0.002$) coping strategies. Final-year students with severe stress were more inclined to use emotion-focused or avoidant coping strategies.

Overall, the data indicated that first-year students experienced higher levels of severe stress, particularly related to interpersonal, teaching, and drive-related factors, and they tend to adopt avoidant coping strategies more frequently. Final-year students, while still experiencing stress, seemed to rely more on problem-focused coping strategies but also showed a tendency toward emotion-focused and avoidant strategies when facing severe stress.

DISCUSSION

The present study was taken up with the aim to study the differences in perceived stress sources and coping strategies among first and final-year undergraduate medical students.

In the current study, the mean age of first-year students was 18.61 ± 0.82 years, while final-year students had a mean age of 21.60 ± 0.96 years. The sample predominantly comprised females (*n*=169; 64.0%) and students residing in hostels (*n*=147; 55.6%). In comparison, Melaku L *et al*., (2021) reported a mean age of 22.03 ± 2.62 years in their study, with a majority of respondents being male (63.1%) and living on campus (91.5%).

The findings of this study reveal that first-year students exhibit markedly higher levels of moderate stress than their final-year counterparts, with 84.8% reporting moderate stress compared to 62.1% among final-year students. This aligns with previous studies indicating that the transition to medical school is a critical period fraught with challenges, including adapting to a demanding curriculum and navigating new social dynamics (Garg K *et al.*, 2017). It also suggests that they are still acclimating to the pressures of medical training, which can lead to long-term mental health issues if unaddressed (Taneja N *et al.*, 2018). Conversely, final-year students are faced with unique stressors related to impending transitions into internships and professional practice (Garg K *et al.*, 2017). This shift in stress perception highlights the importance of understanding the evolving nature of stressors throughout medical education. As students' progress, the sources of stress may transition from academic-related concerns to anxiety about future career paths and responsibilities (Garg K *et al.*, 2017).

The Medical Student Stressor Questionnaire (MSSQ) results indicated that academic-related stressors were predominant across both cohorts. A majority of students reported moderate stress in this domain, which is consistent with previous findings indicating that high-stakes examinations and extensive curricula are significant stressors for medical students (Jafri SAM *et al.*, 2017). Notably, first-year students reported more severe stress in interpersonal and teaching-related domains, likely due to challenges in forming relationships and adjusting to the collaborative nature of medical education, which is in line with the findings of the study conducted by Melaku L *et al*., (2021) among undergraduate medical students in Southeast Ethiopia. Final-year undergraduate medical students reported

higher mild stress levels related to interpersonal and drive-related stressors. This finding aligns with the study by Battula M *et al*., (2021) which identified elevated levels of stress among final-year medical students, primarily attributed to interpersonal and drive-related stressors. This suggests that, while final year undergraduate medical students may experience less severe stress overall, they are still navigating complex social dynamics and career-related pressures. The prevalence of mild stress among final-year students indicates a need for continued support during this transitional phase (Kumar B *et al*., 2019).

Coping strategies play a crucial role in how students manage stress, and our findings reveal distinct patterns between first and final-year students. First-year students demonstrated a higher frequency of problem-focused coping strategies (2.70 ± 0.63) compared to final-year students (2.43 ± 0.66), highlighting their proactive approach to managing stress. This finding is supported by the research conducted by Salam a *et al*., (2019) which found that first-year undergraduate medical students utilized problem-focused coping strategies more often than their third-year counterparts. This supports the notion that newly admitted students may be more motivated to seek solutions to their challenges as they acclimate to medical education. Also, final-year students in the present study exhibited a greater reliance on emotion-focused coping strategies. This shift may be attributed to the emotional toll of transitioning into the healthcare workforce, where students face uncertainties about their future roles and responsibilities. Research by Neufeld A *et al*., (2021) suggests that third- and fourth-year undergraduate medical students often resort to emotion-focused coping strategies in response to a combination of factors, including the demands of patient care, the stress of board examinations, the competitiveness of elective rotations, long working hours, sleep deprivation, and heightened concerns about their future careers. The increased use of avoidant coping strategies among first-year and final-year students also raises concerns, as avoidance is typically considered maladaptive and could impact both mental health and academic performance (Abouammoh N *et al.*, 2020).

The comparison of stress and coping strategies among first-year and final-year medical students revealed distinct patterns at different stages of their training. In first-year students, moderate stress was linked to emotion-focused coping, while severe stress correlated with avoidant coping. These findings align with research indicating that newcomers to medical school often rely on emotional regulation or avoidance when facing academic and personal stressors, possibly due to limited coping skills and experience (Mathew M *et al.*, 2019 and Chawla K *et al.*, 2018). Early interventions should focus on building problem-solving skills and adaptive coping strategies to help students confront stress directly (Nebhinani N *et al.*, 2021). Final-year students exhibited more complex coping responses, with stress domains (e.g., ARS, TLRS, SRS) linked to both emotion-focused and avoidant coping strategies. Despite a broader repertoire of coping mechanisms, severe stress was still associated with emotion-focused and avoidant coping, suggesting ongoing challenges in managing stress, especially in the face of burnout or emotional exhaustion, as previous research has suggested (Abouammoh N *et al.*, 2020). Notably, problem-focused coping was linked to interpersonal stress, suggesting that final-year students may have developed better strategies for managing relational challenges but still struggle with high levels of academic and professional stress. Interventions for final-year students should focus on enhancing problem-focused coping and reducing burnout (Ogoma SO, 2020).

The data suggest a pressing need for educational institutions to develop tailored interventions that address the specific stressors and coping strategies relevant to each cohort. For first-year students, comprehensive orientation programs that include stress management techniques, peer mentoring, and resources for academic support could significantly alleviate the transition-related stress (Dederichs M *et al.*, 2020 and Nebhinani N *et al*, 2024). Programs that emphasize problem-focused strategies, resilience training, and emotional support may be beneficial, particularly for first-year students (Abouammoh N *et al.*, 2020 and Wu Y *et al.*, 2020). Final-year students facing the unique challenges of impending career transitions, would benefit from mentorship programs and workshops focused on career planning and emotional resilience (Fallatah HI *et al.*, 2018). Providing a supportive environment that encourages open discussions about mental health and coping strategies is essential for fostering a healthier educational atmosphere.

While this study provides valuable insights, it is important to acknowledge its limitations. The cross-sectional design restricts the ability to draw causal inferences about stress and coping strategies. Future longitudinal studies could enhance our understanding of how stressors and coping mechanisms evolve throughout medical education. Additionally, incorporating qualitative methods could provide a richer understanding of the lived experiences of students and the contextual factors influencing their stress and coping behaviours.

CONCLUSION

In conclusion, this study underscores the critical need to understand the differences in perceived stress sources and coping strategies among first and final-year medical students. By recognizing the unique challenges faced by each cohort, medical schools can implement targeted interventions to promote mental well-being and resilience. Addressing these concerns is essential not only for the health of the students but also for ensuring that future healthcare professionals are equipped to provide compassionate and effective patient care. As

medical education continues to evolve, prioritizing student mental health will remain paramount to cultivating a supportive and sustainable learning environment.

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