

Stress faced by medical students – a outlook on prevalence of burnout amongst medical students and their ways of stress coping

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Abstract

Background: Medical education is recognized as one of the most stressful fields of study, exposing students to significant mental and physical challenges. The high prevalence of burnout among medical students has been attributed to demanding curricula, rigorous examinations, and other external stressors. Burnout, characterized by emotional exhaustion, depersonalization, and reduced personal achievement, can adversely impact students' academic performance and overall well-being. Addressing burnout and understanding stress-coping mechanisms are essential to support medical students' mental health.

Methods and Materials: A descriptive study was conducted among 72 international medical students at Kursk State Medical University (KSMU). Participants, spanning from the first to sixth year, completed an anonymous online survey comprising 45 closed-ended questions. The survey included demographic data, the Maslach Burnout Inventory (MBI) to measure burnout dimensions, and the Brief-COPE questionnaire to assess coping mechanisms. Statistical analysis was performed to determine the levels of burnout and coping strategies adopted by students.

Results: The findings revealed that medical students experienced moderate levels of burnout, with emotional exhaustion being the most prominent component. While depersonalization was relatively low, students exhibited significant emotional stress without losing interest in their studies. The majority of participants adopted adaptive coping mechanisms such as problem-focused coping (e.g., seeking solutions and advice) and emotion-focused coping (e.g., venting, humor, and spirituality). Maladaptive coping strategies, such as self-blame and self-distraction, were observed but less prevalent. Academic workload was identified as the primary stressor, followed by financial constraints and relationship challenges.

Conclusion: The study highlights moderate burnout levels among international medical students, emphasizing the importance of effective stress management strategies. Adaptive coping mechanisms were preferred over maladaptive ones, reflecting students' resilience. Targeted interventions, such as counseling programs and stress management training, are recommended to further support medical students' mental health and academic success.

Keywords: Medical student burnout, Stress-coping mechanisms, Emotional exhaustion, Mental health in medical education, Adaptive and maladaptive coping

Introduction

Background:

Globally, medical education has been dubbed one of the most stressful fields of education owing to its consistent tendency for negative kickbacks to medical students' mental and physical wellness. This parallels well with the conundrum plaguing the healthcare field, where young physicians are often associated with stress and their resulting impacts. A systematic review involving 40 students came to conclude that general psychological distress and the prevalence of depression and anxiety are much elevated in medical students as opposed to nonmedical students and their peers of the general population within the same age bracket. This stress rooted itself in the years of academia attributed to demanding curricula, various academic obligations, and difficult examinations, to name a few – of which do not include the other external factors that may factor into the affection of medical students' mental and physical health.

While stress has proven to be necessary and has its plusses, it has its own equally if not more detrimental side effects, including lowered levels of concentration and attention retention, higher risks of errors, absenteeism, negligence, self-medication, cheating, and cribbing during examinations. A cross-sectional study conducted amongst medical students at Tanta University, Egypt, Salwa, in 2018 demonstrated that burnout and/or its subsets were highly relevant (79.9%), particularly at the clinical level of academics. Students were reportedly resorting to consuming medication and entertaining ideas of dropping out of the program to find stress relief as a result of disappointment in their coursework and struggles in achieving their academic goals. Thus far, studies honing on this corner remain consistent with likeness to the elevated levels of perceived psychological impact and prevalence of depression associated with internal and external factors faced by medical students.

This chronic exposure to stress will eventually manifest itself as behavioral misconduct in the healthcare field that could snowball into serious errors that affect not only themselves but also the care that they provide and their patients. This is all the more reason for concentrating attention in this particular direction. Therefore, an investigation dedicated to focusing on students studying in the international faculty of Kursk State Medical University (KSMU) was conducted with particular attention paid to comprehending stress levels, the prevalence of burnout occurrence, the understanding of factors contributing to stress and the investigation of methods of stress-coping adopted by students as well as the assessment of their effectiveness.

This study involved 72 students of the international faculty originating from various countries: Malaysia (32), India (13), Nigeria (10), Sri Lanka (9), Maldives (3), Thailand (2), Botswana (1), Ghana (1) and Brazil (1). Participants were students spanning from 1st year to 6th year. They were required to participate in an anonymous online survey involving 45 closed-ended questions. Participation required participants to be current KSMU medical students studying abroad in the Russian Federation.

Aim:

This study aims to estimate stress levels faced by students of the international faculty studying at Kursk State Medical University (KSMU), the prevalence of burnout amongst them, as well as to comprehend factors contributing to their stress and understanding how stress is coped with.

Objectives:

- A literature review on stress and burnout prevalence amongst students in the medical field, the different perceptions that may exist towards stress by students studying the medical course, the adverse effects of stress on students during their degree and after going out into the workforce, the ways of coping with stress amongst medical students and the effectiveness of these mechanisms.
- To ascertain the stress levels and prevalence of burnout amongst students of international faculty of KSMU.
- To distinguish factors that may contribute to stress amongst students of the international faculty of KSMU.
- To comprehend the effects of stress international medical students of KSMU face on their everyday lives and academics.
- To investigate the ways of coping with stress that international medical students of KSMU have adopted.
- To study the effectiveness of stress coping methods adopted by international medical students of KSMU.
- To dissect the attitudes and openness of international medical students of KSMU to countering stress.

Limitations:

Limitations that may be encountered during the stretch of this project may include factors such as time constraints, as the researcher has been allotted only 3 months to execute and complete the project before the deadline.

Another limitation was the unavailability and limited access to tools and software to assist in data analysis. This thus resulted in the inability to explore certain aspects of the study in detail. Hence, this study will not be able to compare stress levels among students from different backgrounds. This study will also be unable to compare and differentiate stress levels between students from different academic years.

Ethics statement:

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Literature review

Is Stress and Tendency for Burnout Existent Amongst Medical Students?

Burnout amongst students thus comprises the triad of exhaustion, cynicism, and feeling inefficient. A 2021 systemic review on burnout syndrome tendencies amongst students in tertiary-level education revealed a prevalence of approximately 55.4% for emotional exhaustion, 31.6% for cynicism, and 30.9% for feelings of insufficient academic efficacy. Within the same study, medical students were more inclined to develop burnout syndrome than others studying other fields of academia. It was also found that burnout would eventually develop at any point during their life – during their university days after graduation and later on while working as physicians.

A high prevalence of stress was noted amongst medical students from various parts of the world, such as seen in Thailand (61%), Pakistan (60%), the United States of America (57%) and Malaysia (42%). This finding remains consistent with numerous other studies, proving how medical trainees do tend to suffer from burnout syndrome as a result of work-associated stress. In light of this staggering prevalence, medical universities in recent years have been urged to be equipped with student wellness programs, and residents' work hours have become more restricted.

The importance of stress and how it affects medical students – The Pros and Cons.

Is stress truly necessary? The term itself often alludes to negative connotations. To begin with, stress response is adaptive in the way that it secures homeostasis of the organism, and thus, it allows for our continued survival. It is meant to prepare the organism to sustain against extrinsic and intrinsic stimuli presented as challenges (stressors). Stress impacts our entire being, all its systems and organs. It is known that acute stress causes the heart to beat faster, have stronger contractions, dilate the heart, and redirect large volumes of blood to larger muscles. The respiratory muscles under stress work to supply more oxygen to tissues, and the endocrine glands elevate steroid hormone synthesis to activate the body's stress response. The muscles tense to guard the organism against injury and pain. These systems, thus, under short-term stress, contribute to heightened cognitive functions and physical performance. It was also proposed by Dhabar et al. that acute stress plays a role in enhancing the organism's immune protection under stressful events (i.e., after sustaining trauma, wounds, infections, immunizations, etc.).

Dhabar et al., however, went on to discern "good" versus "bad" forms of stress that are distinguished according to the duration of exertion of biological response as well as per its adaptive versus damaging impacts – clarifying that while, in some cases, stress does have its benefits, stress does indeed incite deleterious effects. This is especially true for long-term exertion of stress response. While short-term stress may last minutes to hours, chronic stress may span several hours a day, persisting for weeks or months. This is where undesirable symptoms may begin to surface and affect the organism. It sets up a cycle of distress that ultimately affects the ability to cope even with habitual day-to-day ordinary activities. Numerous ailments have also been associated with chronic stress, including asthma, cancer, depression, diabetes, heart attack, migraines, psoriasis, diarrheas, ulcers, as well as partial and/or complete loss of body hair (alopecia areata and alopecia universalis). Students studying in difficult and demanding disciplines such as medicine are subjected to these debilitating adverse effects – a majority of whom are young adults.

Some may have noted favorable effects of stress on psychological functioning that thus boosted the learning process. However, distress (unfavorable stress) often prevails when students can effectively manage the pressure, and its adverse impacts overrun the positives. In particular, chronic stress has reportedly resulted in the affection of cognitive abilities, concentration levels, and academic performance. For example, irregularities in the circadian cortisol rhythm are a marker that highly coincides with the negating effects of chronic stress exposure on medical students. Medical students were found to no longer prioritize sleep, wherein poor sleeping habits tend to develop in favor of putting in more time for their studies, especially during the examination period. 51% and 59% of medical students in the United States and Lithuania were reported to have poor sleeping habits. With sleep deprivation, these students end up performing poorly on their examinations and are more depressed compared to their peers.

As accentuated by Maslach and Leiter, burnout is the undesirable by-product of chronic exposure to interpersonal stressors. It has been shown that there is a positive correlation between dropout amongst medical students and personal, psychological, and financial repercussions (i.e., emotional distress, health issues, wastage of time, resources, and money). Burnout has often been linked with general distress, poor performance in education, college dropout, suicide ideation, and substance abuse, particularly during their education in medical schools. Depression and burnout may overlap to a degree, albeit their correlation has yet to be fully comprehended. However, there is a direct association of burnout with occupational stress

as well as symptoms of anxiety, wherein the higher the levels of anxiety and stress, the higher the level of burnout. Despite the clear negative connotations of dropping out, a previous study unearthed that, per annum, 11% of medical students have had serious thoughts of dropping out of medical school. The second leading cause of death amongst resident trainees in the US was suicide (4.1 for every 100,000), and an estimated 10 of 100 medical students have reported suicidal ideation.

Thus, it is apparent that stress is necessary and is part and parcel of the organism's prevailing survival. However, in the long run, it proves to be unfavorable and harmful. The harm it brings clearly outweighs the benefits. It is especially alarming as its pervasiveness amongst medical students is commonplace.

Ways of stress-coping – Adaptive and Maladaptive Coping

In regards to burnout, coping is a topic of interest. The term may be used interchangeably with coping mechanisms or coping skills. To date, there are various ways in which coping strategies have been categorized. Carver et al. enumerated 14 coping mechanisms, which, traditionally, could be classified into three forms: approach and avoidance strategies, problem- and emotion-focused strategies, and behavioral and cognitive strategies.

On another spectrum, coping strategies or mechanisms could be split into two classes – adaptive and maladaptive coping. This form of category enumerates that not all coping strategies are effective in managing stress. Adaptive coping strategies involve seeking information, help, social support, accepting, planning, and reframing issues using faith and humor. This category is often found to be associated with engagement in academics.

As opposed to this, maladaptive coping includes strategies that are focused on rumination. Rumination itself is described as the persistence and recurrence of thoughts concentrated on an individual's depressive characteristics and the effects of those characteristics. This is prevalent among community residents, college students, and inpatient groups. Other maladaptive coping styles include self-distraction, denial, self-blame, escape, emotional numbing, intrusive thoughts, and substance use. Unsurprisingly, these maladaptive coping strategies are often linked to elevated levels of psychological disturbance comprising of anxiety and depression seen in both adults and adolescents. Another coping style – Non-adaptive coping may also prevail and is related to burnout. Therefore,

Materials and methods

Study sample:

Descriptive methodology was utilized to accomplish the objectives set for the current study. The study participants were recruited amongst the international faculty students studying medicine at Kursk State Medical University (KSMU), Kursk, Kursk Oblast, Russian Federation. A convenient sample of medical students was selected from Year 1 to Year 6. A total of 72 students participated in the study. Participants were found to originate from various countries: Malaysia (32), India (13), Nigeria (10), Sri Lanka (9), Maldives (3), Thailand (2), Botswana (1), Ghana (1) and Brazil (1).

Study tool:

Data was obtained using an anonymous self-administered online survey (questionnaire). The questionnaire contained 45 close-ended questions. The questionnaire was divided into 4 components: questions on participants' demographic information and general physical and mental well-being, test gauging the degree of burnout, and questions assessing participants' coping methods. Two vital tools were integrated within this study: the burnout test gauging the degree of burnout and the Brief-COPE test. The burnout gauge test was constructed based on the Maslach Burnout Inventory (MBI) Scale questions that integrate 3 core components assessing degree of emotional exhaustion, depersonalization, and personal achievement.

i) **The emotional exhaustion subscale** is characterized by long-term consistent fatigue, difficulties sleeping, and physical issues. The distinguishing factor between emotional exhaustion as part of burnout syndrome and clinical depression is that the symptoms of emotional exhaustion cease outside of work.

Scoring system: High (≥ 30); Moderate (18-29); Low (≤ 17).

ii) **Depersonalization subscale** – This category is characterized by a loss of empathy towards academia, patients, and/or colleagues. Individuals may become socially secluded and display negative behavior towards patients and/or their colleagues.

Scoring system: High (≥ 12); Moderate (6-11); Low (≤ 5).

iii) **Personal achievement** – The lowest score here may determine that the patient is thoroughly demotivated and dissuaded from attempting to accomplish their life's goals.

Scoring system: High (≤ 33); Moderate (34-39); Low (≥ 40).

The Brief-COPE is a self-report questionnaire that assesses the effectiveness and ineffectiveness of stress coping methods. Due to the requirements stipulated by the current study, not all 28 questions were included, and some were omitted and edited to make the questionnaire more concise and briefer for participants. This scale is utilized to ascertain participants' primary coping approaches with grades based on the following 3 subscales: Problem-focused coping, emotion-focused coping, and avoidant coping. Scores indicate the degree to which participants have been engaged in that coping style:

1 = I haven't been doing this at all

2 = A little bit

3 = A medium amount

4 = I've been doing this a lot

i) **Problem-focused coping** – This subscale involves facets of active coping, the utility of informational support, planning, and positive reframing. High scores are indicators that participant's coping strategies are meant to facilitate change in stressful events. It further indicates psychological fortitude, having practical approaches when resolving conflicts, and foretells positive results.

ii) **Emotion-focused coping** – This subscale characterizes facets of venting, the utility of emotional support, acceptance, humor, self-blame, and religion. High scores are indicative of coping strategies aimed to help regulate emotions related to stressful scenarios. However, high or low scores do not consistently mean that there are issues with psychological issues or being unwell, although they could be used to suggest a wider range of participants' styles of coping.

iii) **Avoidant coping** – This category of subscale represents facets of self-distraction, denial, use of substances, and disengagement in behavior. High scores suggest using physical or cognitive effort to detach from stress factors. Lower scores often mean adaptive coping.

Results

Baseline characteristics:

73 students completed and returned the questionnaire. All participants were undergraduates (n = 73) studying medicine in the international faculty. Most participants were in the 22 – 26-year age bracket (71.2%, n = 52), while the remaining participants were within the 18 – 21-year age range (28.8%, n = 21). Most participants were female (76.7%, n = 52). The participants come from various nationalities and characteristics, as listed in Table 1 below.

Table 1.
Demographic and characteristics of participants (N = 73).

<i>Characteristics</i>		n	%
<i>Sex</i>	Male	52	76.7
	Female	21	23.3
<i>Age</i>	18 – 21	21	28.8
	22 – 26	52	71.2
<i>Nationality</i>	Malaysia	33	45.2
	India	13	17.8
	Nigeria	10	13.7
	Sri Lanka	9	12.3
	Maldives	3	4.1
	Thailand	2	2.7
	Mostwana	1	1.4
	Ghana	1	1.4
	Brazil	1	1.4
	<i>Academic Year</i>	1 st year	10
2 nd year		8	11
3 rd year		4	5.5
4 th year		29	39.7
5 th year		12	16.4
6 th year		10	13.7
<i>Religion</i>	Islam	33	45.2
	Hinduism	15	20.5
	Christianity	12	16.4
	Buddhism	11	15.1
	Agnostic	1.4%	1
	Others	1.4%	1

Section B - Mental Health and General Well-being Assessment

The following responses were recorded for the second part of the questionnaire, which consisted of 8 questions in total. Participants' responses are tabulated as shown in *Table 2 below*.

<i>Question</i>	<i>Characteristics</i>	<i>N</i>	<i>%</i>
1) <i>Were you officially diagnosed with any health ailments/illnesses? (More than 1 answer may be applied):</i>	Skin	21	28.8
	Infection (e.g., influenza)	10	13.7
	Nutrition (e.g., hypoavitaminosis)	10	13.7
	Mental health (e.g., addiction)	9	12.3
	Respiratory diseases (e.g., asthma)	9	12.3
	Were involved in past accidents	8	11
	Reproductive health	7	9.6
	None	7	9.6
	Blood disorders (e.g., anemia)	6	8.2
	Inflammatory and immune disorders	4	5.55
	Eye diseases (e.g., glaucoma)	3	4.1
	Oral and gastrointestinal disorders	3	4.1
	Musculoskeletal system	2	2.7
	2) <i>To what extent has your condition affected your everyday life?</i>	N/A: I have recovered/I often recover well (e.g., colds, influenza)	26
Not at all (I pay no mind to it. It does not bother me and my daily routine)		19	26
Slightly affected (I feel it affecting me, but I am not reminded of it every single day)		17	23.3

3) <i>How stressful is your family or personal life?</i>	Moderately affected (I feel it affecting me, and I am reminded of it every single day)	10	13.7	
	Severely affected (It affects me to the point that I worry about it all the time)	1	1.4	
	Moderately stressful	23	31.5	
	Slightly stressful	21	28.8	
	Not stressful at all	12	16.4	
	Fairly stressful	10	13.7	
	Very stressful	7	9.6	
4) <i>My main concerns are:</i>	Studies	68	93.2	
	Financial concerns	38	52.1	
	Relationship challenges	32	43.8	
	Social pressure (e.g., bullying, self-image)	14	19.2	
	Bereavement (e.g., death of close persons)	11	15.1	
	Family (e.g., parental divorce)	11	15.1	
	My health and the health of family members	1	1.4	
	Nothing	1	1.4	
	5) <i>To what extent have your worry/worries affected your everyday life?</i>	Slightly affected	36	49.3
		N/A: I have put it in the past. It no longer affects me in the present time.	11	15.1
Moderately affected		11	15.1	
Not at all		9	12.3	
Severely affected		6	8.2	

6) <i>How stressful is academic life?</i>	Moderately stressful	36	49.3
	Slightly stressful	15	20.5
	Very stressful	12	16.4
	Fairly stressful	8	11
	Not stressful at all	2	2.7
7) <i>The amount of time you have taken to take time off from studying/university:</i>	Never	44	60.3
	1 day of absence	14	19.2
	2 – 3 days	10	13.7
	4 – 5 days	2	2.7
	6 – 7 days	1	1.4
	A few weeks	1	1.4
	A few months	-	0.0
	Gap year (1 year or more)	1	1.4
	8) <i>If you are receiving treatment for burnout, which of the following approaches have you undertaken? (More than 1 answer may be applied):</i>	None	36
Diets (e.g., restricting caffeine, etc.)		18	24.7
Meditation		15	20.6
Prescribed medication		13	17.8
Yoga		10	13.7
Massages		8	11
Psychotherapy/Consulting psychiatrist		7	9.6
Self-medication (e.g., alcohol)		4	5.5
Over-the-counter medication		4	5.5
Homeopathic medication		1	1.4
Extended medical leave		1	1.4
Exercising		1	1.4
Sleeping		1	1.4

Section C – Burnout Gauge Test

<i>Questions</i>	<i>Characteristics</i>	<i>N</i>	<i>%</i>
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1) <i>(E) I feel that there is a lot of weight on my shoulders. I feel that my life is too stressful.</i>	Neutral	33	45.2
	Agree	22	30.1
	Strongly agree	9	12.3
	Disagree	6	8.2
	Strongly disagree	3	4.1
2) <i>(D) I once truly cared for my studies, but now, not really. I don't care about the outcome of classes. I don't care about my performance in classes.</i>	Neutral	24	32.9
	Disagree	20	27.4
	Strongly disagree	13	17.8
	Agree	11	15.1
	Strongly agree	5	6.8
3) <i>(D) I lost interest in medicine. I don't think I can handle studying medicine anymore.</i>	Strongly disagree	27	37
	Disagree	27	37
	Neutral	15	20.5
	Agree	3	4.1
	Strongly agree	1	1.4
4) <i>(E) I just can't study well with all my stress.</i>	Disagree	26	35.6
	Neutral	21	28.8
	Agree	15	20.5

5) <i>(E) I feel emotionally empty at the end of a school day.</i>	Strongly disagree	10	13.7
	Strongly agree	1	1.4
	Neutral	26	35.6
	Disagree	16	21.9
	Agree	14	19.2
	Strongly disagree	8	12.3
6) <i>(P) I feel energetic. I have sufficient strength to perform my duties as a medical student.</i>	Strongly agree	9	11
	Agree	24	32.9
	Neutral	22	30.1
	Strongly agree	12	16.4
	Disagree	11	15.1
	Strongly disagree	4	5.5
7) <i>(E) After waking up every morning, thinking about attending classes makes me tired.</i>	Neutral	27	37
	Agree	24	32.9
	Disagree	10	13.7
	Strongly agree	9	12.3
	Strongly disagree	3	4.1
	8) <i>(E) The mere thought of a full day of class and lecture makes me tired.</i>	Agree	30
Neutral		18	24.7
Disagree		12	16.4
Strongly agree		12	16.4

9) (E) <i>I think I study too much.</i>	Strongly disagree	1	1.4
	Neutral	32	43.8
	Disagree	24	32.9
	Strongly disagree	10	13.7
	Agree	5	6.8
	Strongly agree	2	2.7
10) (P) <i>Studying and preparing for classes satisfies me. I find joy in my studies.</i>	Neutral	34	46.6
	Agree	22	30.1
	Strongly agree	8	11
	Strongly disagree	6	8.2
	Disagree	3	
11) (E) <i>Overall, I just feel exhausted</i>	Neutral	28	38.4
	Agree	22	30.1
	Strongly agree	14	19.2
	Disagree	7	9.6
	Strongly disagree	2	2.7
12) (P) <i>After a day of stress, I am able to calm or de-stress myself.</i>	Agree	32	43.8
	Neutral	25	34.2
	Disagree	8	11
	Strongly agree	7	9.6
	Strongly disagree	1	1.4
13) (E) <i>I feel overwhelmed by the amount of things I need to accomplish.</i>	Agree	30	41.1
	Neutral	26	35.6
	Strongly agree	9	12.3
	Disagree	7	9.6
	Strongly disagree	1	1.4

14) (P) I usually allocate little time, if any, to relax.	Agree	34	46.6
	Neutral	14	19.2
	Strongly agree	13	17.8
	Disagree	9	12.3
	Strongly disagree	3	4.1
15) (D) When I am overwhelmed with tasks, I shut down.	Agree	25	34.2
	Neutral	23	31.5
	Disagree	13	17.8
	Strongly agree	9	12.3
	Strongly disagree	3	4.1
16) (E) I often keep my problems to myself.	Agree	31	42.5
	Strongly agree	22	30.1
	Neutral	12	16.4
	Disagree	7	9.6
	Strongly disagree	1	1.4
17) (E) I feel trapped studying this degree.	Disagree	24	32.9
	Neutral	21	28.8
	Agree	13	17.8
	Strongly disagree	10	13.7
	Strongly agree	5	6.8
18) (P) Even when things are hectic, I am confident that I am able to accomplish things that I need to.	Agree	38	52.1
	Strongly agree	20	27.4
	Neutral	15	20.5

Section D – Brief COPE Test

<i>Questions</i>	<i>Characteristics</i>	<i>N</i>	<i>%</i>
1) (A) <i>I've been turning to work or other activities to take my mind off things.</i>	I've been doing this a little bit	31	42.5
	I've been doing this a medium amount	20	27.4
	I've been doing this a lot	12	16.4
	I haven't been doing this at all	10	13.7
2) (P) <i>I've been concentrating my efforts on doing something about the situation I'm in. I've been taking action to try to make the situation better.</i>	I've been doing this a little bit	31	42.5
	I've been doing this a medium amount	22	30.1
	I've been doing this a lot	12	16.4
	I haven't been doing this at all	8	11
3) (A) <i>I've been saying to myself, "This isn't real."</i>	I haven't been doing this at all	44	60.3
	I've been doing this a little bit	17	23.3
	I've been doing this a medium amount	10	13.7
	I've been doing this a lot	2	2.7
4) (A) <i>I've been giving up</i>			

<i>trying to deal with it.</i>	I haven't been doing this at all	38	52.1
	I've been doing this a little bit	20	27.4
	I've been doing this a medium amount	9	12.3
	I've been doing this a lot	6	8.2
	5) <i>(E) I've been saying things to let my unpleasant feelings escape. I've been expressing my negative feelings.</i>		
I've been doing this a little bit	36	49.3	
I haven't been doing this at all	19	26	
I've been doing this a medium amount	19	12.3	
I've been doing this a lot	9	12.3	
6) <i>(P) I've been getting help and advice from other people. I've been getting emotional support from others.</i>			
I've been doing this a little bit	30	41.1	
I haven't been doing this at all	19	26	
I've been doing this a medium amount	17	23.3	
I've been doing this a lot	7	9.6	
7) <i>(A) I've been using alcohol or other drugs to help me get through it</i>			

<i>and/or to make myself feel better.</i>	I haven't been doing this at all	61	83.6
	I've been doing this a little bit	6	8.2
	I've been doing this a medium amount	5	6.8
	I've been doing this a lot	1	1.4
8) <i>(E) I've been trying to see it in a different light to make it seem more positive. I've been looking for something good in what is happening.</i>	I've been doing this a medium amount	24	32.9
	I've been doing this a lot	23	31.5
	I've been doing this a little bit	20	27.4
	I haven't been doing this at all	6	8.2
9) <i>(A) I've been criticizing myself. I've been blaming myself for things that happened.</i>	I've been doing this a little bit	26	35.6
	I've been doing this a medium amount	19	26
	I haven't been doing this at all	19	26
	I've been doing this a lot	9	12.3
10) <i>(A) I've given up the attempt to cope.</i>	I haven't been doing this at all	37	50.7

	I've been doing this a little bit	29	39.7
	I've been doing this a medium amount	5	6.8
	I've been doing this a lot	2	2.7
11) (E) I've been making jokes about it.			
	I've been doing this a little bit	28	38.4
	I haven't been doing this at all	18	24.7
	I've been doing this a medium amount	15	20.5
	I've been doing this a lot	12	16.4
12) (A) I've been doing something to think about it less, such as watching TV, reading, daydreaming, sleeping, or shopping.			
	I've been doing this a lot	28	38.4
	I've been doing this a medium amount	19	26
	I've been doing this a little bit	17	23.3
	I haven't been doing this at all	9	12.3
13) (E) I've been trying to find comfort in my religion or spiritual beliefs. I've been praying or meditating.			
	I've been doing this a lot	24	32.9
	I've been doing this a medium amount	21	28.8
	I've been doing this a little bit	14	19.2

14) (E) I've been learning to live with it.

I haven't been doing this at all	14	19.2
I've been doing this a lot	26	35.6
I've been doing this a medium amount	22	30.1
I've been doing this a little bit	21	28.8
I haven't been doing this at all	4	5.5

Statistical analysis

Section B of the questionnaire covers questions on the participant's mental health and general well-being. It was found that the majority of participants faced or had experience with one or more health complications at some point in their lives, with only a very small number of them never having any health issues (n = 7, 9.6%). Participants having skin diseases was listed as the highest (n = 21, 28.8%), followed by having infection(s) (n = 10, 13.7%), nutrition deficiencies (n = 10, 13.7%), mental health problems (n = 9, 12.3%), respiratory diseases (n = 9, 12.3%), history of physical trauma (n = 8, 11%), problems in reproductive health (n = 7, 9.6%), blood disorders (n = 6, 8.2%), inflammatory and immune disorders (n = 4, 5.55%), eye diseases (n = 3, 4.1%), oral and gastrointestinal disorders (n = 3, 4.1%) as well as diseases of the musculoskeletal system (n = 2, 2.7%). This question was followed up by one assessing the degree to which their condition(s) have affected their everyday life. It was obtained that only a small portion of them admitted to having their daily life affected to an extent (n = 28, 38.4%).

In the same section, only 12 participants (16.4%) disclosed that their family or personal life was not stressful at all, while the remaining expressed varying degrees of stress from that aspect of their life. The main concerns of the students were also inquired. 93.2% (n = 68) participants chose academics as their chief worry, followed by financial constraints (n = 38, 52.1%), relationship challenges (n = 32, 43.8%), societal pressures (e.g., bullying, self-image) (n = 14, 19.2%), bereavement (n = 11, 15.1%), familial problems (n = 11, 15.0%), own health issue and/or health of family members (n = 1, 1.4%). Adjacent to this, it was found that a significant number of participants expressed some degree of being affected by their concerns (n = 53, 72.6%).

The level of stress towards academics perceived by the participants was also gauged. It was found that the majority perceive it as moderately stressful (n = 36, 49.3%), followed by being slightly stressful (n = 15, 20.5%), very stressful (n = 12, 16.4%) and fairly stressful (n = 8, 11%). Most of these participants also had never taken academic leave due to their circumstances (n = 44, 60.3%). However, it was recorded that some opt for absences by taking 1 day off (the least) to a few weeks (the most) (n = 28, 38.4%). Only 1 participant has ever taken a gap year.

It was also found that a significant number of participants do not take any form of measures to deal with their stress (n = 36, 49.2%). While others listed various activities/measures, including

diet modification (n = 18, 24.7%), doing meditation (n = 15, 20.6%), taking prescribed medication (n = 13, 17.8%), practicing yoga (n = 10, 13.7%), massages (n = 8, 11%), having psychotherapy/consulting psychiatrist (n = 7, 9.6%), self-medication (e.g., alcohol) (n = 4, 5.5%), taking over the counter medication (n = 4, 5.5%), homeopathic medication (n = 1, 1.4%), taking extended leave (n = 1, 1.4%), exercising (n = 1, 1.4%), sleeping (n = 1, 1.4%).

Section C of the questionnaire included 18 questions. 10 questions were tailored to gauge emotional exhaustion, 5 questions were for gauging the participant's sense of achievement, and the remaining 3 questions were dedicated to gauging the participant's level of depersonalization. For the participants' responses, the Likert scale was used with options ranging from: 'Strongly agree,' which is equivalent to a high score of 4, 'Agree' is equivalent to 3, 'neutral' is equivalent to 2, 'Disagree' is equivalent to 1 and 'strongly disagree' is equivalent to 0. Neutral responses here are taken as 'sometimes.'

There was a prevalence of high scores to be recorded in questions for emotional exhaustion. It was observed that there is a tendency for participants to express admittance to feeling stressed, with a significant number of them agreeing or strongly agreeing to feelings of exhaustion upon waking up (n = 33, 45.2%) or at the mere thought of a full academic schedule (n = 42, 57.5%). Within the same vein, overall feelings of exhaustion were recorded amongst the majority (n = 22, 30.1%). However, it was observed that a handful of the participants disagreed that stress impedes their ability to study, with 26 participants (35.6%) agreeing and another 10 (13.7%) strongly disagreeing with this. The majority also disagreed with feeling trapped in studying medicine, with 24 disagreeing (32.9%) and 10 disagreeing (13.7%). It can be understood that while emotional stress is evident amongst most participants, most are not negatively impacted by it to the point of shunning their studies.

In depersonalization, it was found that only a few participants agreed that they care little for the outcome of their studies (Agree – n = 11, 15.1%; Strongly agree – n = 5, 6.8%) and the same for losing interest in medicine (Agree – n = 3, 4.1%; Strongly agree – n = 1, 1.4%). The rest of the participants expressed the opposite opinion. However, many agreed that they tend to shut down when overwhelmed with tasks (n = 25, 34.2%). Therefore, the consensus is that when faced with acute stress, participants could dissociate from their source of stress, yet this does not affect their passion for pursuing their degree.

Regarding personal achievement, it was recorded that attitudes towards performing in their studies and interests in preparing for classes and de-stressing were generally positive. Most of them were found to agree (n = 38, 52.1%) and strongly agree (n = 20, 27.4%) to feeling confident that they would be able to accomplish what they need to despite being swamped with tasks. The majority of the participants also admitted to allocating time to relax (n = 34, 46.6%). Hence, it is apparent that the study participants can manage their stress levels and know to wind down when necessary.

According to the Maslach Burnout Inventory (MBI) scale, all 3 dimensions are taken into account when trying to diagnose burnout. High scores in emotional exhaustion and depersonalization while low scores in personal achievement would indicate a high degree of burnout. In the current study, it was generally seen that participants tended to score high in the emotional exhaustion and personal achievement dimensions and had lower scores in the depersonalization dimension. This could be interpreted as the fact that participants generally have moderate levels of burnout.

Section D includes questions based on the Brief-COPE test used to analyze the effectiveness of coping styles adopted by participants. The following 3 subscales are examined: Problem-focused coping, emotion-focused coping, and avoidant coping. Scores indicate the degree to which participants have been engaged in that coping style: 1 = I haven't been doing this at all, 2 = a little bit, 3 = a medium amount, 4 = I've been doing this a lot. 7 questions were dedicated to assessing avoidant coping, 5 on emotion-focused coping, and 2 on problem-focused coping.

According to problem-focused coping, more participants had expressed their predilection for seeking ways to better cope with their stress, and the same was seen in seeking wanting to seek advice to help better their situation. The overall scores recorded were generally high as compared to the number of participants who have not done anything to seek ways to cope with their stress (n = 8, 11%).

Responses for emotion-focused coping were seen to be higher amongst participants who seek emotional support as opposed to those who do not (n = 19, 26%). High predilection was also noted for choosing venting, humor, and religion/meditation as forms of stress management.

Responses for avoidant coping showed that participants showed a high prevalence of self-blame and self-distraction when coping with stress compared to other forms of avoidant coping, such as substance use and being in denial. However, there is a significant amount of participants resonating with the idea of giving attempts at coping (I've been doing this a little bit - n = 29, 39.7%; I've been doing this a medium amount – n = 5, 6.8%; I have been doing this a lot – n = 2, 2.7%) as compared to those who have not thought about it at all (n = 37, 50.7%).

Therefore, it can be generally said that participants are more favorable toward emotion-focused coping and problem-solving coping than avoidant coping. It can be reasonably said that participants are more inclined towards adaptive coping strategies than maladaptive ones.

Discussion

It is apparent that the findings of the current investigation resonate with previous studies, where there is a high prevalence of burnout amongst students studying medicine, as seen here amongst participants who mostly ended up showing moderate levels of burnout. Participants showed scores that were high in emotional exhaustion and personal achievement, though depersonalization was not significant.

It was generally understood that while emotional stress is high, it is not perceived to be debilitating to the degree that participants felt the need to abandon their academic responsibilities. This was evident when they expressed the ability to de-stress and knew how to manage their stress when needed. Regarding depersonalizing, participants could end up dissociating when experiencing acute stress. However, it does not impede their passion for continuing to pursue the degree.

The current study was also able to understand the coping styles opted by respondents. There was higher favorability towards emotion-focused (i.e., seeking emotional support, venting, humor, and religion/meditation) and problem-solving coping management methods (i.e., seeking advice to solve stress) in comparison to those who prefer more avoidant forms of stress coping – with a higher predilection for self-blame and self-distraction than substance abuse and being in denial.

While academic-associated concerns remain at the forefront amongst the respondents' main worries, there were also other factors found that could have attributed to their current state of burnout. This includes financial constraints, relationship challenges, societal pressures (i.e., bullying, self-image), experiencing bereavement, family problems, own health, and/or the health of family members. The majority of the current respondents admitted that these concerns affect their daily lives to a certain extent. It was also noted that the majority of the participants have or had experienced some form of health complications at some point in their lives. Still, only a few participants perceive it to affect their daily living. This coincides with another study conducted where among the stressors listed by students included having excessive workload, struggling with studying and time management, strain in work-life balance and relationships, managing relationships with medical school peers, having health concerns, and financial difficulties.

It was also found that a significant number of participants do not take any measures to deal with their stress. At the same time, others listed various activities/measures, including diet modification, meditation, taking prescribed medication, practicing, having massages, doing psychotherapy/consulting a psychiatrist, self-medicating (e.g., alcohol), taking over-the-counter medication, taking homeopathic medication, taking extended leave, exercising, and sleeping. It was also seen that academic leave was not a popular choice amongst respondents. Apart from one respondent who took a gap year, others either never take leave from classes or opt for absences that may vary from 1 day being the least to a few weeks.

However, it is important to note that this could be due to the current study's university's system of handling absences amongst students that provokes this sort of result. In KSMU, on top of having 6 days of classes in a week, students who miss classes are obligated to replace their absent days. Failure to do so would not allow them to sit for exams nor pass their credits until they clear their absent days. This may thus explain why absenteeism amongst respondents is not prevalent. This is not a unique problem, though it is not explored succinctly in prior studies. A survey study conducted in 2018 showed that medical students express stress over system-level problems, such as experiencing a lack of counseling associated with career planning and assessment-associated pressure in academic performance. The lack of leeway in regard to granting pardons for absences and having strict class regulations could contribute to the many stressors medical students have to confront.

Therefore, from the current investigation conducted, international medical students of KSMU have shown moderate levels of burnout, and this is enough cause for a further look into and intervention for interested parties as students experiencing burnout have a higher tendency for suicide ideation and are more likely to entertain thoughts of self-harm. Thus, to ensure that medical students avoid further mental deterioration, it is better to educate them on having better stress management strategies and ensure that maladaptive coping mechanisms are avoided.

Recommendations

The current study faced time constraints and limited accessibility to tools for better data analysis. Hence, for better results, it is strongly recommended that the next interested parties conduct their investigation without being pressured to meet deadlines and have access to the right software programs to produce more accurate and useful data.

In relation to the questionnaire construction, it may be better to opt out of "neutral" responses in the Likert scale when measuring participants' opinions, attitudes, or behaviors. This is done to ensure that the investigator would not later face confusion and difficulties when interpreting and analyzing results.

The current study was also unable to explore other facets of the issue deeply. Hence, it is recommended that if further investigation were to be done, there should be a discussion on whether there are different levels of burnout in students studying different academic years due to the difference in the degree of compactness of their respective schedules and number of examinations.

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