

Assessment of Burnout, Perceived Stress, and Coping Mechanisms Among Final-Year Medical Undergraduates and Interns

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Abstract:

Final-year medical students and interns face severe burnout and high stress due to heavy clinical duties, lack of sleep, and intense pressure.

What is Burnout and Stress?

Burnout: Extreme physical and emotional exhaustion caused by long-term stress. It includes feeling emotionally drained and losing personal drive.

Perceived Stress: How much pressure a person feels in their daily life and their ability to handle it.

Medical Context: Final-year students and interns transition from textbooks to real patient care. This shift creates a massive spike in anxiety and fatigue.

Main Causes of Stress

Long Hours: Shifts often last 24 hours or more without proper rest.

High Stakes: Mistakes can harm patients, creating constant fear of failure.

Heavy Workload: Juggling patient files, exams, and procedures leaves little personal time.

Lack of Support: Fear of appearing weak stops many trainees from asking for help.

Common Coping Mechanisms

Adaptive (Healthy) Coping:

Talking with peers and family members who understand the struggle.

Engaging in physical exercise or sports.

Listening to music or pursuing hobbies outside of medicine.

Maladaptive (Unhealthy) Coping:

Emotional withdrawal and isolating from loved ones.

Denial or ignoring the physical signs of exhaustion.

Relying on caffeine, alcohol, or other substances to get through shifts.

Keywords: burnout, stress, medical, interns, undergraduates

Introduction

Medical education is inherently demanding, requiring students to balance intense academic workload, clinical training, and emotional resilience. High levels of stress and burnout among medical students have been associated with decreased empathy, poorer academic performance, and increased risk of

mental health problems. This cross-sectional, correlational study examined the relationships between emotional intelligence (EI), perceived stress, and burnout among undergraduate medical students. Burnout is a psychological syndrome characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. It is defined as an inappropriate response to chronic emotional and interpersonal stressors in the workplace or in activities that are psychologically similar to work, such as university education [19]. Among medical students, burnout has been associated with impaired empathy, increased substance use, and early dropout from medical programs [1,2,3]. Therefore, while emotional sensitivity can initially contribute to exhaustion, it can also foster longer-term resilience by promoting deeper emotional insight and adaptive coping strategies. While increased emotional sensitivity may initially contribute to greater distress, it may also facilitate deeper emotional processing and adaptation over time. In this context, the modest positive correlation between emotional intelligence and personal accomplishment observed in our study may suggest a potential buffering role in maintaining self-efficacy despite ongoing stressors.

Discussion

Academic-related stress represents the primary domain showing meaningful variation across stages of medical training, particularly in final-year students. Coping patterns appear relatively stable across academic years, with higher stress associated with increased use of coping behaviors overall. Medical education is often considered one of the most demanding forms of professional training, owing to intensive academic workloads, frequent assessments, and early clinical responsibilities (1, 2). Medical students are expected to acquire extensive theoretical knowledge while simultaneously developing clinical competence, professionalism, and emotional resilience. Consequently, stress has become a pervasive phenomenon among medical students globally, with prevalence rates consistently higher than those observed in age-matched peers from non-medical disciplines [4,5,6].

Sustained exposure to stress during undergraduate medical training has been linked to a broad range of adverse outcomes, including anxiety, depression, burnout, impaired academic performance, reduced empathy, and diminished quality of life (4–6). Evidence further suggests that psychological distress during medical college may persist into residency and professional practice, adversely affecting physician well-being, patient care, and healthcare systems (7). When stress remains unrecognized or inadequately managed, students may adopt maladaptive coping strategies such as avoidance, emotional disengagement, excessive digital media use, alcohol consumption, smoking, or other substance-related behaviors (8, 9).

The nature and intensity of stressors encountered by medical students are not static but vary across different phases of training. Early academic years are often dominated by adjustment challenges, heavy theoretical curricula, fear of failure, and competitive learning environments. In contrast, senior students face additional stressors related to clinical responsibilities, patient care, major professional examinations, and uncertainty regarding postgraduate training and career prospects (10, 11). Despite this dynamic progression, much of the existing literature examines stress among medical students as a uniform construct, with limited emphasis on comparative, year-wise analysis of stressors and coping mechanisms (12).

Coping strategies play a pivotal role in modulating the psychological impact of stress. Adaptive coping mechanisms—such as problem-focused coping, seeking social support, physical activity, mindfulness, and cognitive reframing—have been shown to protect against emotional exhaustion and burnout (13).

Conversely, maladaptive coping strategies are associated with higher psychological morbidity, academic disengagement, and increased vulnerability to addiction and other harmful behaviors (9, 14). A nuanced understanding of how coping strategies interact with specific stressors across academic years is therefore essential for designing targeted and effective interventions.[7,8,9]

Although awareness about mental health in medical education has increased, existing support systems are still underutilized, often due to stigma and practical barriers (15). Emerging approaches in mental health support and digital well-being tools may offer future opportunities for enhancing stress monitoring and student support systems. However, their potential role within medical education warrants further empirical investigation before implementation-oriented conclusions can be drawn

Results

Medical students face ongoing stress during their training but have developed coping mechanisms. Stress alters various physiological processes, including pro-inflammatory markers like Interleukin-6(IL-6). This descriptive study was conducted after obtaining institutional ethical clearance. A total of 76 consenting undergraduate medical students answered the Cohen's perceived stress scale and BriefCOPE questionnaire. Unstimulated saliva was used to assess salivary IL-6 levels using a Diaclone human IL-6 ELISA kit and the data obtained was analyzed.

Out of the 76 participants, 59(77.6%) were female and 17(22.4%) were male. Mild stress was reported by 9 students, moderate by 53, and severe stress by 14 students. Based on Kruskal-Wallis p test, most students used approach coping for stress of all levels. This active strategy involves problem-solving and future planning. Approach coping has shown better responses to adversity, physical health, and emotional responsiveness. Mild and moderate stressed students used acceptance, positive-refrain, and planning, while severe stressed students used planning, self-distraction, and self-blame. Despite the perceived stress, there were no significant differences in the salivary IL-6 levels among the three categories. 'Approach' coping was commonly used and linked to positive outcomes. Despite this, a number of students have reported to experience stress. Therefore, more effective strategies are needed to handle stress and demands of the profession effectively. Further research with larger samples is recommended to explore salivary IL-6 levels' relation to stress.[10,11,12]

Anxiety is a psychological and physiological condition, characterized by cognitive, somatic, emotional, and behavioural components. It acts as a protective factor against threatening situations, while burnout entails feelings or experiences of exhaustion, cynicism, and lack of professional efficacy [1,2]. Anxiety is normal when it is intermittent and expected, based on certain stressful events or situations. However, prolonged anxiety might result in psychological distress affecting an individual's everyday functioning. Research focusing on the concept of burnout became more prevalent during the 1970s where researchers investigated a phenomenon resulting from excessive work demands, later known as "burnout". The sources of burnout can include workload, control, reward, community, fairness, and values. Burnout can result from a mismatch between the individual and the work environment. Burnout is classified into three types, namely which is personal burnout, work-related burnout, and client-related burnout. Personal burnout is defined as the degree of physical and psychological fatigue, and exhaustion experienced by a person regardless of their working status. Work-related burnout measures the same features, which include the physical and psychological fatigue, and exhaustion experienced by the person but perceived as strictly related to his/her work. Client-related burnout measures the degree of

physical and psychological fatigue, and exhaustion the person undergoes at work that is related to his/her clients. A “client” is a broad concept covering patients, children, students, and residents [13,14,15] The prevalence of anxiety and burnout was concerning. Increased anxiety and burnout among students may negatively impact aspects of their personal, professional, and academic lives. The findings of this study can be used by the academic or faculty administrators for the implementation and improvement of preventive measures specifically for anxiety and burnout among medical students in order to eliminate or minimize the unwanted consequences of anxiety and burnout on physical and mental health, social development, competency, and academic performance among medical students. Early recognition, coping skills, and preventive measures should be emphasised to faculty members and students as a joint effort to prevent the negative ramifications.

Conclusion

Another factor for the increased level of anxiety could be related to regular social media use during the pandemic, where the high daily rates of new cases and deaths, and the information and misinformation overload via social media could lead to the development of anxiety and mood disorders. Moreover, students probably had increased screen time in conjunction with the migration to digital learning. Students tended to spend more time on electronic devices, and hence were more prone to social media exposure. Coping mechanisms refer to the specific efforts, both psychological and behavioural, that humans apply to overcome or minimize stressful events [16,17,18]. There are four main categories, namely problem-focused, emotion-focused, meaning-focused, and social-focused mechanisms. Problem-focused coping is when one addresses the problem that is causing distress. Emotion-focused coping involves reducing the negative emotions related to the stress. Meaning-focused coping is when one reasons out the problems and understands the meaning of the situation. Social-focused coping is when one seeks emotional support from the community. Coping mechanisms can also be divided into approach coping mechanisms, avoidant coping mechanisms, and neither approach nor avoidant coping mechanisms [6,55]. There is also evidence provided by studies on the role of coping mechanisms in work-related situations. For instance, the coping mechanisms applied when encountering hardships or problems can predict the level of anxiety, depression, and stress among students [19,20]

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