


BMJ Open Worried, weary and worn out: mixed-method study of stress and well-being in final-year medical students

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ABSTRACT

Objective Although there is much focus on burnout and psychological distress among doctors, studies about stress and well-being in medical students are limited but could inform early intervention and prevention strategies.

Design The primary aim of this mixed-method, cross-sectional survey was to compare objective and subjective levels of stress in final-year medical students (2017) and to explore their perspectives on the factors they considered relevant to their well-being.

Setting University College Dublin, the largest university in Ireland.

Participants 161 of 235 medical students participated in this study (response rate 69%).

Results 65.2% of students scored over accepted norms for the Perceived Stress Scale (34.8% low, 55.9% moderate and 9.3% high). 35% scored low, 28.7% moderate and 36.3% high on the Subjective Stress Scale. Thematic analysis identified worry about exams, relationships, concern about the future, work–life balance and finance; one in three students reported worry, irritability and hostility; many felt worn out. Cognitive impacts included overthinking, poor concentration, sense of failure, hopelessness and procrastination. Almost a third reported sleep and appetite disturbance, fatigue and weariness. A quarter reported a ‘positive reaction’ to stress. Positive strategies to manage stress included connection and talking, exercise, non-study activity and meditation. Unhelpful strategies included isolation and substance use. No student reported using the college support services or sought professional help.

Conclusion Medical students experience high levels of psychological distress, similar to their more senior doctor colleagues. They are disinclined to avail of traditional college help services. Toxic effects of stress may impact their cognition, learning, engagement and empathy and may increase patient risk and adverse outcomes. The focus of well-being in doctors should be extended upstream and embedded in the curriculum where it could prevent future burnout, improve retention to the profession and deliver better outcomes for patients.

INTRODUCTION

Medicine is regarded as a particularly stressful career with high rates of psychological distress and stress-related mental illness, anxiety, depression and suicide reported at

Strengths and limitations of this study

- The response rate is high compared with other studies in medical student groups.
- Inclusion of subjective and objective measures of stress and a mixed-method approach gives more insight into students' experiences.
- All students were exposed to the same academic demands and scheduling.
- The cross-sectional nature of this survey and the lack of information about ethnicity may limit its generalisability and representativeness.
- The study is limited by the absence of a control group.

all training and seniority levels, irrespective of specialty.^{1–6} Studies exploring psychological distress in hospital doctors estimate that between 22% and 32% experience high distress, while a systematic review of depression and anxiety in doctors and medical students suggests a 14%–60% prevalence of depression and an 18%–55% prevalence of anxiety.^{1 5 7–11}

This distress is known to impact on the quality of patient care and to increase negative outcomes^{12 13} and is linked to absenteeism, attrition from the profession¹⁴ and, more importantly, the stigma and guilt-induced presenteeism that is known to significantly impact on doctor health and patient care.^{15–19} Stressed individuals may demonstrate less empathy, are often irritable, overwhelmed and hostile, making them prone to errors of judgement and poor decision-making and an increased likelihood of malpractice consequences.^{13 20 21} With a rapidly changing modern health system with increasing demands and fewer resources, patient safety is rightly a major focus. The optimum delivery of service means that the health of providers is of critical importance, yet the evidence suggests that this factor is often neglected.^{3 4 16}

Stress is regarded as ‘the epidemic of the 21st century’, and the WHO estimated that by 2020, 5 of the top 10 illnesses worldwide will be linked to stress. Yet they also suggest that stress is preventable and manageable through lifestyle modifications and learnt coping strategies.²² Patterns of poor self-care and stoicism are prevalent in the health professions, identifiable in medical school and thought to deteriorate further after graduation often leading to practitioner neglect of health and unhealthy habits.^{2 4-6 23-29}

Reliable estimates of stress and psychological distress during medical training are important and could help identify, prevent and treat causes of distress among medical students and future doctors. Intervening early at school level could provide future doctors with the strategies to improve their ability to withstand stress and to prevent mental health difficulties and burnout. In the broader context, strategies to improve stress in the medical workplace could lead to better outcomes for patients and improve recruitment and retention rates for the profession overall.^{14 16 27-32}

Studies to date have focused on the workplace demands and factors that might lead to burnout in doctors^{1 2 5 6 14 29 30} rather than fully determine the factors that students identify in their career and personal life or the impact of environmental factors, thinking styles and coping strategies.

We examined final-year medical students’ stress levels using both objective and subjective measures of stress and explored in depth the medical students’ own perspectives and narrative on the factors that impact on their well-being and stress levels during training, their views on the impact of stress on their health and the strategies they use to manage or cope with stress.

METHODS

Participants

The participants in this study were final-year medical students from Ireland’s largest university, University College Dublin (UCD). We chose to examine final-year students as they were closest to graduation, and this cohort seemed a natural extension to the Hayes *et al* post-graduate cohort.²

Final-year medicine is made up of around 240 students who are divided into four groups. Teaching follows a modular curriculum, with an end-of-module integrated knowledge-based and clinical examination in the four clinical subspecialties of psychiatry, obstetrics and gynaecology, general practice and paediatrics. The Psychiatry Module is part of the core curriculum for the Bachelor in Medicine, Bachelor in Surgery and Bachelor in Obstetrics (MB Bch BAO) degree in Medicine. The survey was conducted in week 5 of the 6-week Psychiatry Module, measuring stress levels in the previous 4 weeks, when students were engaged in clinical placements and continuous formative and summative assessments, and at least 10 days in advance of the final modular assessment.

The class included both graduate entry medicine (GEM) and undergraduate (non-GEM) students. In UCD, GEM and non-GEM students come together at year 4. Graduate entry students (GEM) must have obtained a 2:1 undergraduate degree prior to completing the Graduate Medical School Admissions Test (formerly known as the Graduate Australian Medical School Admissions Test; GAMSAT) and undergoing an application process. Undergraduate medical school entrants (non-GEM) are allocated places based on their Health Professions Admission Test (HPAT), which was developed by the Australian Council for Educational Research and used to help select students into medicine and some other health science courses at university and their Central Applications Office (CAO) application, which ranks their performance in the national state examination (Leaving Certificate or A levels) and which centrally processes applications for undergraduate courses in Irish higher education institutions.

The present study is descriptive, mixed-method and cross-sectional in nature and focuses on baseline, subjective and objective stress levels in medical students.

Due to the sensitive nature of the questions, students were informed of the student support services available to them and were encouraged to seek help if needed.

Patient and public involvement

Patients and the public were not involved in this part of the study.

Questionnaire

The questionnaire used in this study (online supplemental appendix 1) collected demographic details to include age, gender and GEM or non-GEM status. We used the Perceived Stress Scale (PSS), which is a widely used, validated and reliable psychological instrument that measures individuals’ perceptions of stress.³³ Items are designed to explore how unpredictable, uncontrollable and overloaded respondents find their lives and includes questions about current levels of stress. The PSS was designed for use in college and community samples. The questions are of a general nature and hence are relatively free of content that would be considered specific to any subpopulation group. The scale measures an individual’s perceived stress levels in the previous month; responses can be summed across all scale items and further divided into low (0–13), moderate (14–26) and high (27–40) perceived stress categories.³³ Normative data have been reported³⁴ and range between 11.9 and 14.7.

We asked students to further rate their subjective level of stress on a Likert scale (Subjective Stress Scale (SSS)) and asked them to mark an X on a line between 0 (lowest) and 10 (highest) to indicate how stressed they had been in the past month. We used this as a continuous variable and also subdivided it into three categories: low (0–3), moderate (4–6) and high (7–10). This allowed us to compare students’ subjective and objective measures as

it has been reported that some people underestimate and some overestimate their stress levels.³⁵

The next section is made up of qualitative free-text questions asking students to list three things under the following headings:

1. What things in your life make you feel stressed (triggers)?
2. How do you feel when you are stressed/how do you react (effects)?
3. How do you cope when you are stressed (coping skills)?

The final question on the questionnaire was an open-ended, free-text, qualitative question: ‘Any other comments?’ which gave students the opportunity to add any further thoughts or comments.

ANALYSES

As the survey had a mixed-method design, both quantitative and qualitative analyses were undertaken. Quantitative analysis was conducted using IBM SPSS Statistics V.24³⁶ and included t-tests and χ^2 tests and correlation analysis between objective (PSS) and SSS measures of stress with the significance level set at $p < 0.05$. The scores were not normally distributed using the Shapiro-Wilk test. Qualitative analysis on the relevant questions was conducted systematically in the form of a step-by-step thematic analysis.^{37 38} Initial analysis identified and described the themes by reading and rereading a selection of the data sheets and summaries by two researchers working independently (AL and EC). These were further discussed and code identified. Data were then systematically coded by the two researchers independently and discrepancies were checked, discussed and clarified. Following this, further analysis of the data to identify the main themes was conducted according to the work of Cohen *et al.*³⁹

RESULTS

There were 235 students in total in the final-year class of 2017; 123 women (52%) and 112 men (48%), 44% GEM and 56% non-GEM, age range 22–46 years. Of these, 161 (response rate 69%) participated in this study with a mean age of 24.76 years (SD 2.6, range 22–42 years). There were 88 women (54.6%) and 73 men (45.3%); 65 (40.4%) were graduate entry (GEM) and 96 (59.6%) were on the undergraduate entry (non-GEM) course.

Quantitative results

Perceived Stress Scale

The mean score on the PSS was 16.94 (SD 7.06, median 16.0 and mode 12, range 1–34). When the scores for men and women were compared, women had higher scores (mean 17.99, SD 7.37) compared with men (mean 15.53, SD 6.59), and this was statistically significant ($p = 0.029$). There was no difference in the scores of GEM versus non-GEM (16.37; SD 7.56 vs 17.30, SD 6.77; $p = 0.849$). Of these students, 65.2% scored over accepted norms for the PSS.

Table 1 PSS and SSS scores compared by gender and GEM status

| | n | % | PSS | | SSS | |
|---------|----|------|-------|-------|------|------|
| | | | Mean | SD | Mean | SD |
| Men | 73 | 45.3 | 15.53 | 6.59 | 4.44 | 2.67 |
| Women | 88 | 54.3 | 17.99 | 7.37* | 5.24 | 2.54 |
| GEM | 65 | 40.4 | 16.37 | 7.56 | 4.85 | 2.72 |
| Non GEM | 96 | 59.6 | 17.3 | 6.77 | 4.93 | 2.57 |

PSS women versus men, * $p = 0.029$; GEM versus non-GEM, $p = 0.849$; SSS women versus men, $p = 0.058$; GEM versus non-GEM, $p = 0.419$.

GEM, graduate entry medicine; PSS, Perceived Stress Scale; SSS, Subjective Stress Scale.

Subjective Stress Scale

On the SSS, the mean score was 4.88 (SD 2.62, median 5 and mode 7, range 0–10). Women again scored higher than men (women 5.24, SD 2.54, and men 4.44, SD 2.67) trending towards significance at $p = 0.058$. There was no significant difference between GEM and non-GEM (4.85; SD 2.72 vs 4.93, SD 2.57; $p = 0.419$) (table 1).

Scores on both measures were moderately correlated ($r = 0.72$, $p < 0.005$) based on 156 complete pairwise observations. Age did not correlate with total scores on the PSS ($r = 0.142$, $p = 0.069$) or SSS ($r = 0.123$, $p = 0.128$).

When the PSS scores were further divided into low (scores 0–13), moderate (scores 14–26) and high (scores 27–40), 34.8% ($n = 56$) scored in the low category, 55.9% ($n = 90$) in the moderate and 9.3% ($n = 15$) in the high. When the SSS was divided into low (scores 0–3), moderate (scores 4–6) and high (scores 7–10), the results were 35% ($n = 55$), 28.7% ($n = 45$) and 36.3% ($n = 57$), respectively. Students’ objective and subjective reports were consistent for low stress levels (34.8% vs 35%) but differed for moderate (PSS 55.9% vs SSS 28.7%) and high (PSS 9.3% vs SSS 36.3%, $\chi^2 52.76$, $df 4$, $p < 0.001$). Forty-two students reported subjectively high stress, although their objective score was low or moderate (figure 1).

The PSS items most endorsed at a moderate or severe level are shown by each bar in figure 2. Responses indicate that students did not feel confident about their ability to handle personal problems (60.5%), did not feel able to control irritations in their lives (59.8%), did not feel that things were going their way (53.1%), felt nervous and stressed (46.9%), did not feel that they were on top of things (46.3%), felt that they were unable to control the important things in their lives (30.2%), have been angered because of things that were outside their control (29.6%), felt difficulties were piling up so high that they could not overcome them (21%), could not cope with all the things they had to do (20.3%) and have been upset because of something that happened unexpectedly (19.8%).

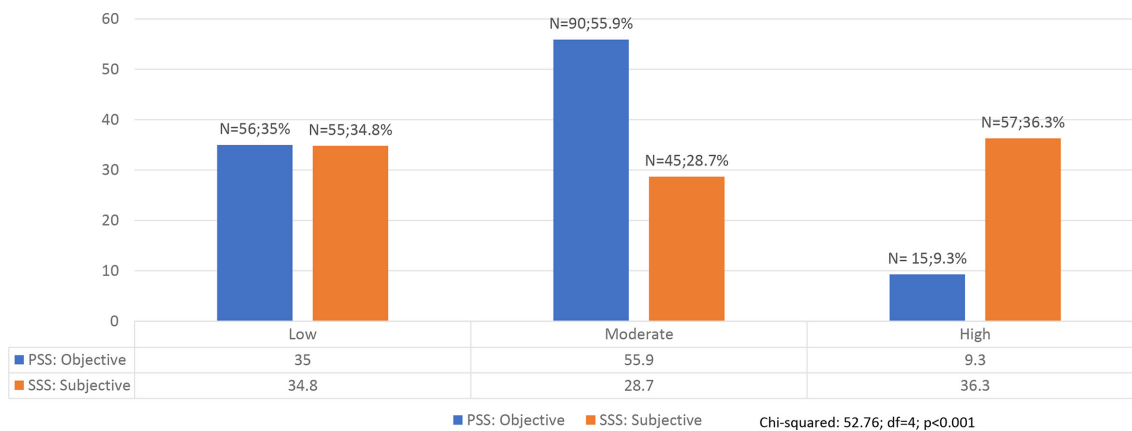


Figure 1 Comparison of medical students' objective and subjective stress levels. PSS, Perceived Stress Scale; SSS, Subjective Stress Scale.

Qualitative results

What things make you stressed?

Answers to this question fell into six main categories or themes and included exams, relationships, future, college, finance and work–life balance/time management (figure 3). Other less frequently reported themes included personal health and illness but in the context of falling behind and not having time to recover. See online supplemental appendix 2 for the detailed list of qualitative comments.

Exams

Exams as a stress was reported by 95 out of the 157 that completed this section; this fell into two broad categories, stress related to demands of the exams and stress related to personal factors, such as students' approach to exams and to their thinking. Many commented on college and personal expectations, along with a fear of failure or performing poorly.

Comments included deadlines, balancing college and exams and work and relationships, the relentless nature of the exams and the 'incessant nature' of the final year, as well

as a negative focus on what students did not know rather than what they knew. Students reported 'not enough hours in the day', 'hypercompetitive environment', 'constant college demands', 'exams close together' and 'volume of work'. Many reported being stressed by 'being unprepared', 'fear of not performing at my best', 'falling behind', 'failing', 'not doing well', 'being left behind', 'expectation on myself vs the reality', 'comparing myself to others and their success', 'my thoughts', 'my reactions to things', 'overwhelmed' and 'procrastination'.

Relationships

Relationships were reported as stressful by 53 and this included family, partner, friends and colleagues, with concern about family members' health, little time to spend with them and interpersonal conflict with family and friends.

Future

Future was reported as a source of pressure by 44. Concern was expressed about immediate issues, such as obtaining electives or residencies, as well as future

Perceived Stress Scale Items

1. In the past month, how often have you been upset because of something that happened unexpectedly?
2. In the past month, how often have you felt that you were unable to control the important things in your life?
3. In the past month, how often have you felt nervous and 'stressed'?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the past month, how often have you felt difficulties were piling up so high that you could not overcome them?

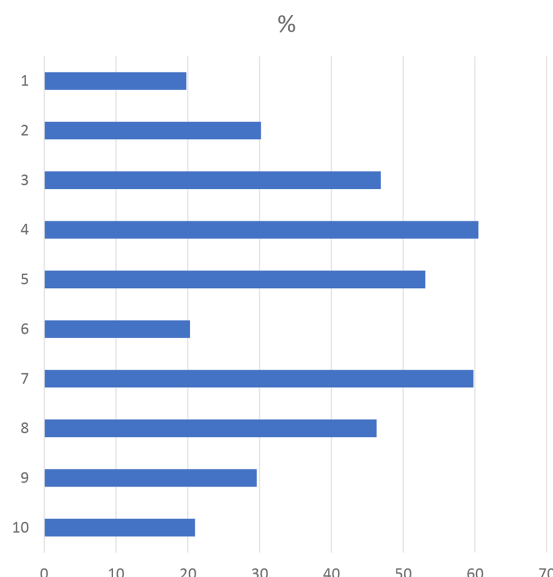


Figure 2 Students' responses to Perceived Stress Scale questions.

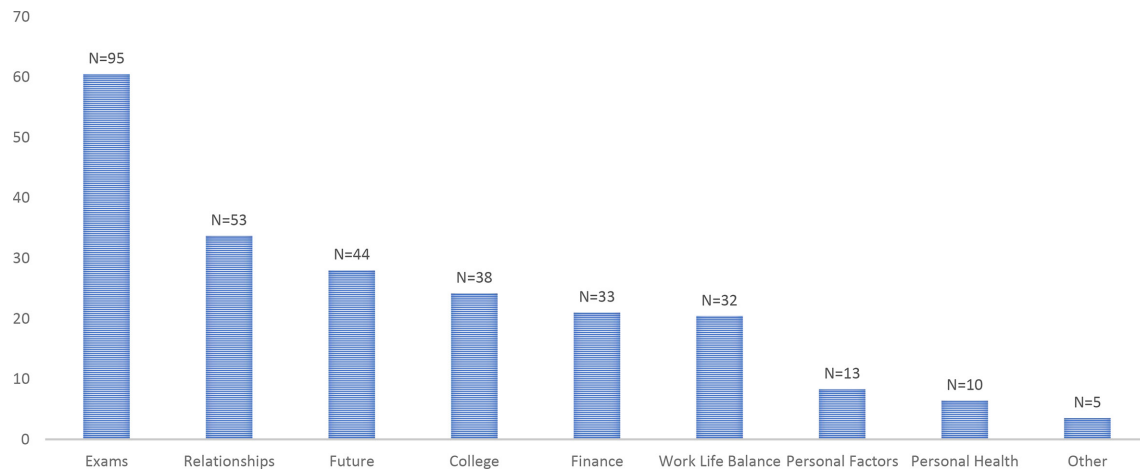


Figure 3 Sources of stress identified by medical students.

career. Comments about the future following graduation and further career path, ‘deciding what type of medicine/surgery to enter’ and the pressure of doing well in medicine as a career choice were prominent, along with particular and frequent mention of future employment uncertainty ‘unsure of my position next year—what job will I have?’. One commented that their stress was increased from the ‘combination of present responsibilities along with planning for the future’ as well as ‘worrying about putting in work now for applications in the future (audits, research and electives)’ and a fear that they did not have the time (because of daily college and exam pressures) to do well in these applications and that this would affect future choices. Others mentioned worry and comparing themselves to peers who had chosen careers other than medicine and who were perceived as being more successful and further along their career path. One commented that they felt ‘pressure to complete and start working when everyone in peer group has holidays to go on. Seems like other career choice would’ve been worth it as we are a clever bunch and could’ve done other things to be successful’.

College

Thirty-eight commented that ‘college’ was stressful. Most did not elaborate further, but those who did included issues with the organisation of the course (medicine) in general and their perception of lack of support, poor structure and communication deficits, as well as academic and financial demands. One commented that ‘constant college’ created stress for them.

Finance

Thirty-three reported financial stress. Most did not comment further than ‘money’ and ‘finances’, but those who did reported financial difficulty due to loans and pressure to pay fees.

Work–life balance

Work–life balance was reported as being stressful by 32 and comments fell into two broad categories, excessive demands and poor time management. Comments

included having few social outlets ‘letting normal life go’, lack of social life, lack of time with friends, limited work–life balance, lack of time to play sport or engage in activity outside college and inability to maintain a balanced lifestyle. Students were aware of their limited work–life balance and of ‘letting other interests and commitments slip’ and of ‘not seeing people outside medicine’. Others commented on their poor time management when trying to manage activities as well as study.

How do you feel when you are stressed?/How do you react?

One hundred forty-eight completed this section and responses were divided into three categories representing the emotional (anxiety, anger and mood), physical and cognitive or thinking manifestations of stress (figure 4).

Emotional

Fifty-eight reported anxiety, and this included excessive worry, agitation and panic. A further 48 reported being irritable, angry, hostile, grumpy and argumentative, and 24 felt low mood and were depressed and sad. Eight reported crying and tears; 13 reported being overwhelmed. When combined, almost all students reported the emotional effects of stress.

Physical

The physical manifestations of stress, such as poor energy, tiredness, sleep disturbance, appetite disturbance, nail-biting, headache, abdominal pain, gastrointestinal upset, palpitations and breathing difficulties were reported by 44.

Cognitive

Thinking problems and cognitive effects were reported by 24, and these included overthinking, poor concentration, sense of failure, hopelessness and procrastination.

Sixteen reported purely positive impacts of stress that helped them increase productivity and get things done. These students reported that stress made them talk to people, exercise, sleep, read, approach the task in a different way and take a break or focus on hobbies. Twenty reported a mixed response to stress where they reported



Figure 4 Emotional, physical and cognitive impacts of stress.

negative, emotional and physical impact but also positive outcomes that increased their focus and productivity. Taken together, this means that 36 students or a quarter of the sample reported that their reaction to stress was either totally or partially helpful.

How do you cope when you are stressed?

Twelve students reported that they did not cope well with stress, while the remaining group reported they used positive strategies to cope with stress. Students were asked to include three coping strategies and most included more (figure 5).

Helpful strategies

Overall, students reported they used five main positive strategies to cope with stress, and these were activities other than study, connecting with friends and family, and exercise, followed by manage thoughts, and meditation/relaxation techniques. Considerable numbers reported using all categories, but interestingly, there was not one mention of using support services, trainers, college resources or professional help.

There was specific mention of reminding themselves of 'all the good things in my life' and that 'it is worth it', and this may account for students' high use of activity other than study and family and friends to cope. Many specifically mentioned linking with non-medical friends

as support. A number mentioned the positive benefit of stress that helps them work harder, focus and perform, but the difficulty and negative impact of what they termed 'incessant pressure'.

Unhelpful strategies

Twelve students reported that they did not deal with stress well. The strategies they used were as follows: anger/outbursts or ignoring the problem (n=10), alcohol (n=6), social isolation (n=5), don't eat or sleep (n=3), cry (n=3), procrastinate (n=2), skin picking (n=1) and not well (n=1). Taking drugs was reported by one respondent, and one student reported smoking in order to cope.

A significant number (n=14) report that they ignore the signs of stress, and comments included 'put a smile on when I don't feel like it', 'usually takes a day or two to realise I'm stressed', 'don't think about it', 'try to work through it', 'start to avoid situations', 'work more hours', 'am compelled to work faster', 'a lot of time I hide away from my stresses' and 'I talk myself out of it—why I don't have to be stressed'.

DISCUSSION

To our knowledge, no study to date has explored the impact of stress on the well-being of final-year medical

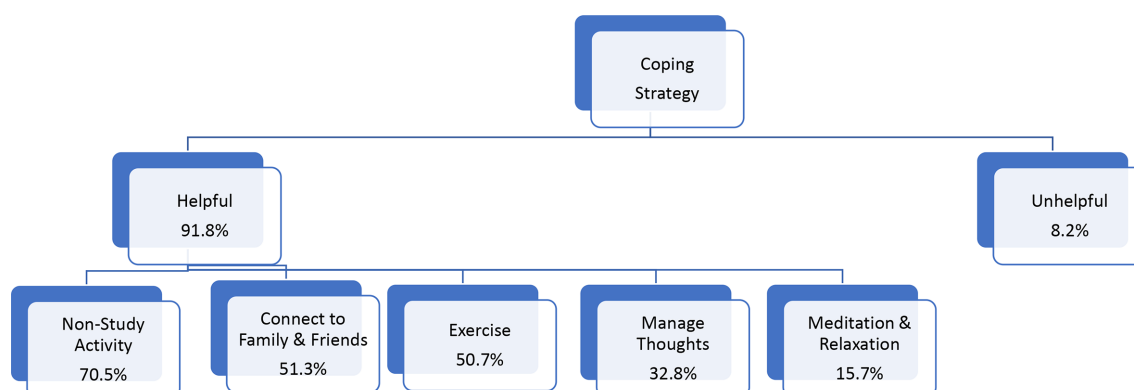


Figure 5 Strategies used by medical students to manage stress.

students, or examined their coping strategies using subjective and objective measures of stress. Our findings indicate that while the majority of students use positive strategies to manage and cope with stress and to improve their resilience, they also report high levels of stress. This is in keeping with suggestions that training in resilience skills alone may not prevent stress.^{31 32}

The final-year medical student narrative reflects the many emotional, cognitive and physical effects of stress related to becoming a doctor. Our findings align with previous stress studies in doctors but provide compelling evidence that doctors' stress and distress predate their exposure to the hospital environment and are not all due to the increased responsibility and the demands that doctors are exposed to after graduation.^{1 2 5 6 14 40}

The final-year medical students in our study who may have benefited from professional support were not inclined to seek out the counselling services provided by the college, stating difficulties with setting up appointment times, and with these clashing with their clinical course work. The same pattern is evident, but not to the same extent, for students in other college courses or countries suggesting that medical students are not inclined to avail of traditional help, often citing stigma, fear and concern about confidentiality.^{7 41 42} These barriers to help-seeking might be overcome by alternative and perhaps non-traditional mechanisms for delivering psychological support. The Royal Medical Benevolent Fund, Practitioner Health Programme and the Stanford Model of Professional Fulfilment are two such initiatives.^{31 32 43} However, embedding stress training and self-care in the curriculum might overcome these barriers at student level and this warrants further research.^{7 39 44}

Effective interventions for stress take the individual and the environment into account, and this requires a multi-faceted approach at university and individual level.^{3 31 44–47} Rather than focus on academic excellence and the assessment of factual knowledge, we need to provide students with the skills to succeed in a diverse and rapidly changing society.⁴⁸ Current legislation places a duty of care on all organisations to protect against stress in the workplace.⁴⁹ Extending this into our educational environments could protect medical students from the negative impacts of stress.⁴⁸ The calls for a learning culture that includes compulsory stress management training and a 'well-being curriculum' for medical students have been met with some resistance. Obstacles include lack of time in an already packed curriculum, difficulty engaging students who often view these lessons as 'waste of time that could be better spent studying', as well as limited faculty buy-in and lack of suitable resources.⁵⁰

Excessive work commitment, high expectations, perfectionism and self-criticism have been identified as typical medical student traits.⁵¹ Although drivers of success, these traits are known to increase an individual's tendency towards distress, self-doubt and guilt, where anything less than 100% is regarded as failure.^{51–54} Medical students in this study report that stress affects their confidence in

their ability to perform and describe a sense of personal failure and worthlessness with comments such as 'feeling worthless' because of a perceived constant focus on 'what we do not know', along with little positive feedback. We need to ensure that, as educators, we alleviate rather than aggravate medical student stress by employing a strengths-based approach to formative feedback.

For many, the experience of studying and practising medicine is positive, and they do not succumb to the toxic effects of stress. This group receives little attention but could provide valuable clues to resilience and coping ability. Over a third of final-year medical students scored in the low-stress category and a quarter reported that stress was either totally or partially helpful and increased their productivity and focus. All students in our study were exposed to the same demands and scheduling, and while this could affect the extent to which our findings could be generalised to other groups, a strength of this approach is that it suggests that other factors, possibly in personal life or in personality or thinking style and habits, may underpin some individuals' stress response.^{51 52}

We have emerging evidence of the positive impact of strategies at university level that adjust exam burden through a modified assessment process that promotes protected 'downtime' and schedule rest breaks that provide financial and administrative support and facilitate access to well-being initiatives, such as exercise, yoga and mindfulness.⁴⁴ However, we know, from interventions with qualified doctors, that when these initiatives are applied in a short-term manner and in isolation, the improvement is often temporary.^{55–58} A more enduring and long-term approach would support the student/future doctor to manage the pressures of medicine as a career and combine practical and academic measures at university level with an individual approach that fosters life-long reflection and personal responsibility. Such an approach, while encouraging self-care and healthy habits, would also enable students to develop the cognitive flexibility to tolerate uncertainty and distress and to manage change irrespective of the environment in which they find themselves working.^{39 44 54} Others have called for this approach with doctors, but our findings suggest the time for this intervention is well before the qualified doctor steps into the working environment.^{2 7 31 54} We contend that embedding socioemotional skills training could empower the student with the strategies to manage uncertainty and unpredictability in a fast-moving world where total perfection is rarely attainable.⁵²

The need to address the negative impact of burnout on learning has been highlighted.⁵⁹ Others outline the need to provide a comprehensive service for student mental health that incorporates student services and community mental health services.⁴⁶ While this initiative could help those with identified mental health issues, the depleted resources of the current psychological support services are likely inadequate to support those with evolving illness or the many others who experience considerable psychological distress. Furthermore, it fails to acknowledge the



clear message that, when needed, medical students do not find the current services user friendly and do not use them.

The transition to student life coincides with a critical period in brain development and a high-risk period for the development of mental illness; 75% of mental illness manifests before the age of 25.^{45 46 60 61} The student brain is already highly sensitive to the myriad of psychosocial stresses associated with mental illness, but when combined with the particular stresses of student life, the perfect environment for distress and stress-related illness is created.^{39 44 45 47 62} Medical students report being under persistent pressure and many comment on the intense, incessant and highly competitive nature of the course. It is incumbent on us as educators not to add to medical student stress and to act as a protective factor rather than to precipitate or perpetuate mental illness.

It is firmly established that untreated or inadequately treated mental illness is associated with poorer outcomes, progression to more complex disorders, substance misuse, higher suicide rates, academic failure and persistently impaired social and occupational functioning.^{45–47 61} Rather than wait for this adverse outcome, we suggest that student life is an important window of opportunity for prevention and timely, early intervention.^{39 44 45 47 55}

CONCLUSION

Our findings suggest that the focus of well-being and self-care in doctors should be extended upstream and into the medical students' classrooms. Embedding stress and self-care skills training in the curriculum would provide students with the skills to manage stress and the ability to protect their well-being and to prevent illness. This format could circumvent some of the barriers to psychological support.^{31 42 44}

Empowering medical students and future doctors with the skills to succeed in today's and tomorrow's workforce can only improve outcomes for doctors and their patients.

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