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EMPIRICAL REPORT

Medical Student Stress, Burnout and Depression in Trinidad and Tobago

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Abstract
Objective Health-care workers in developed nations are well known to experience high levels of burnout and psychiatric morbidity, but little information is available from the Caribbean and other less well-developed regions. This study sought to explore the prevalence of stress, burnout, and depressive symptoms and associated risk factors among medical students in Trinidad and Tobago, the southernmost Caribbean island.
Methods A cross-sectional survey design was used to sample students. Data was collected utilizing standardized questionnaires that assess stress, burnout, and depressive symptoms. Demographic data and information pertaining to potential risk factors was also gathered. Overall, 450 questionnaires were distributed and analysis was performed upon 381 completed surveys (response rate 85 %).
Results Students demonstrated high levels of stress and a significant prevalence of burnout (52 %) and depressive symptoms (40 %). Final year students demonstrated higher levels of burnout and depressive symptoms. Students who (i) felt they lacked emotional support, (ii) had little opportunity for relaxation and exercise, and (iii) did not feel they had control of their daily schedule all demonstrated higher levels of burnout and depressive symptoms. However, students who practiced from a faith base and considered their religion important demonstrated lower levels of both.
Conclusions Medical students in Trinidad and Tobago are experiencing high levels of stress with a large proportion suffering from burnout and depressive symptoms. These data suggest that immediate interventions are necessary to help students cope with the challenges faced during medical school. Additionally, more research is needed to explore the potential causal links between burnout and depression during medical school and the effectiveness of tailored interventions especially within the context of developing nations.

Keywords Stress · Burnout · Depression · Medical students · Trinidad and Tobago · Positive mental health

Burnout is defined as "a state of mental and/or physical exhaustion that is related to one's occupation or care-giving" [1]. It is associated with chronic occupational stress and the burnout rate among physicians is high, with almost 50 % of physicians in the USA demonstrating symptoms of burnout [2]. While long associated with graduates within the care-giving professions, stress and burnout are now being increasingly seen among medical students. Indeed recent meta-analyses suggest that at least half of the medical students within the developed world experienced some form of burnout during their training [1, 3, 4]. Not only does burnout affect the health of students and doctors but it is also now being shown that burnout has implications for patients. Burnout has been shown to decrease patient satisfaction [5], promote unprofessional conduct [6], and ultimately reduce patient care [7].

Few data are available among students from developing nations. In Malaysia, rates of depression and anxiety are close to 30 % among all university students [8]. Similar results are found across Asia [9, 10] but it is important to note that none of these studies actually sought to assess burnout and the concept does not seem to have been well explored, at least not in medical students outside of the developed world. In fact, searches on PubMed, PsychInfo, and Google Scholar found no reports at all for the Caribbean region or other small

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island developing states pertaining to burnout or depression among medical students. Given that these nations are often resource poor, a situation that has the potential to add another stressor to the challenges of completing medical education, one would expect burnout to be of particular concern within these countries. In this context, it should also be noted that stigma concerning mental illness continues to be a challenge in developing nations and may further add to the burden upon students [11]. This study therefore seeks to investigate the prevalence of stress, burnout, and depressive symptoms among students attending medical school in Trinidad and Tobago (TT), the southernmost Caribbean island, as well as any associated risk factors.

Methods

Utilizing a correlational cross-sectional design, the researcher sampled medical students of the Faculty of Medical Sciences, the University of the West Indies (UWI), TT in a stratified random manner. In this case, the strata were according to "year of study." Of the 450 survey packages distributed, 389 were returned. Only 381 questionnaires were utilized in the analysis due to eight incomplete packages, yielding a response rate of 85 %.

The Malasch Burnout Inventory (MBI)—Human Services Version is considered the gold standard for measuring burnout [1]. Participants read 22 statements about their feelings towards medical training and rate each on a 7-point Likert scale (0 = Never, 1 = a few times a year, 2 = once a month, 3 = a few times a month, 4 = once a week, 5 = a few times a week, 6 = every day). The MBI generates a score for three sub-scales of burnout: emotional exhaustion (EE), depersonalization (DP), and a sense of personal accomplishment (PA). [12].

The Perceived Medical School Stress scale (PMSS) is specifically designed to assess stress during medical training [13, 14]. Participants respond to 13 statements about stressors using a 5-point Likert scale (0 = strongly disagree, 1 = disagree, 2 = neutral, 3 = agree, 4 = strongly agree). Total scores were generated by summing all items, with a maximum possible score of 52.

The Patient Health Questionnaire (PHQ-9) is widely used as a screening tool for depression [15]. Participants read nine statements and indicate how often they experienced these symptoms over the past 2 weeks (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day). Scores were totaled with a maximum possible score of 27.

Demographic information on each student was collected including age, gender, marital status, ethnicity, religion, and the importance and practice of religion. For importance of religion participants were asked, "on a scale of 1–10 how important is your religion to you?" Responses were grouped into three categories for further analysis: very important (8–10), moderately important (5–7), and not very important (1–4).

Previous work has shown a link between burnout and factors such as the presence or absence of support networks, lengthy working hours, opportunities for relaxation, and a perceived lack of control of one's time [12, 16]. Therefore, based on previously published work, a mini 10-item questionnaire which participants were required to answer utilizing a 3-point Likert scale (agree, disagree, neither) was developed. Examples of questions were "I receive emotional support from family on a regular basis," "I have enough time during the day for rest and relaxation," "I feel in control of my daily schedule, " and "I am confident I will have the knowledge and skills to become an intern when I graduate."

Approval for this study was granted by the University of Liverpool, International Online Research Ethics Committee and the Ethics Committee at Faculty of Medical Sciences, UWI. Students were approached in class and asked to voluntarily participate in the study. Prior to participation in the study, the formal written informed consent was obtained; no reward was offered for participation.

Data were coded and analyzed in SPSS v17. For all tests, alpha (α) was set at 0.05. A score for stress, burnout, and depressive symptoms was calculated for each individual participant. Analysis of variance (ANOVA) was used to test differences between groups, and Tukey's test provided post hoc analysis. Prevalence rates (expressed as a percentage) of burnout, major depression, and depressive disorder were also obtained. The prevalence rates were compared for significant differences using Pearson's chi-square analysis.

Results

The average age of the participants was 22.4 ± 3 years; 67 % of students were female and 59 % were from the preclinical phase of training (years 1–3). Furthermore, 59 % of students identified themselves as being of Indian ethnicity, 20 % African, and 18 % mixed. These figures are consistent with the overall demographic patterns of the school.

Burnout

The MBI demonstrated good internal consistency, Cronbach's alpha = 0.77. The mean sub-scales scores were EE = 27.1 ± 11.4, DP = 8.1 ± 6.6, and PA = 31.3 ± 8.3. EE scores were highest in year 5, and this was significantly different from students in years 2, 3, and 4 ($p < 0.05$). Likewise for DP, year 5 had the highest score but it was only significantly different from year 3 ($p < 0.05$). There were no significant differences for scores on PA. Using standard criteria (EE ≥ 27 or DP ≥ 13), 53 % of the sampled were classified as being burnt-out.

Stress

The PMMS demonstrated good internal consistency, Cronbach's alpha = 0.81. Table 1 summarizes the percentage responses to the individual questions on the PMSS and the mean score was 29.6 ± 8.9. Significance testing yielded no differences except for year of study. Year 5 students demonstrated higher scores when compared to year 1 ($p < 0.1$; significant at the 10 % level) and year 2 ($p < 0.05$). Similar results were found for year 4 students when compared with years 1 and 2 ($p < 0.05$).

Depressive Symptoms

The PHQ-9 demonstrated very good internal consistency, Cronbach's alpha = 0.9. The mean PHQ-9 score was 9.2 ± 6.8. Using the standard criteria to screen for major depression, 77 students (20 %) were identified as having symptomology suggestive of major depression and 145 students (38 %) presenting with symptoms of a depressive disorder. There were no significant differences between the proportion of students presenting with symptoms of either major depression or a depressive disorder among any of the demographic sub-groups ($p > 0.05$). However, persons who practiced their faith daily had the lowest PHQ-9 scores and the lowest prevalence of depressive disorders.

Risk Factors for Burnout and Depression

Several of the statements relating to social support, time for relaxation, and confidence in their future competence demonstrated significant differences between students with burnout and depressive symptoms and those without. In particular, students who indicated that they received emotional support on a regular basis demonstrated reduced rates of burnout (53 % vs. 76 %) and such persons were almost half as likely to present with symptoms of a depressive disorder (34 % vs. 70 %); see Table 2. Similar results were found for persons who were able to exercise on a regular basis or find time for rest and relaxation. Finally, persons who felt in control of their daily schedule had a two to three times lower prevalence rate of burnout (32 % vs. 69 %) and symptoms of major depression (7 % vs. 31 %) and depressive disorder (18 % vs. 52 %).

There was a strong positive significant correlation between the PMSS scores and both the EE score ($r = 0.48$, $p < 0.001$) and the DP score ($r = 0.31$; $p < 0.001$). As expected, the PMSS score was negatively correlated with the PA score. There were also strong positive correlations between the EE score and the PHQ-9 score ($r = 0.54$, $p < 0.001$) and between the DP score and the PHQ-9 score ($r = 0.35$, $p < 0.001$) (Fig. 1).

Discussion

This study suggests that TT medical students are experiencing high levels of stress, burnout, and depressive symptomology consistent with data emanating from developed nations [1, 3, 16, 17]. However, our report specifically addresses these issues in a small-island developing state and therefore works towards providing a more balanced global picture. Burnout has been shown to trigger substance abuse, psychiatric morbidity, and suicidal ideation, and therefore, these findings are important as they help identify potentially at risk students [15, 17, 18].

Table 1 Percentage responses to statements on the perceived medical student stress scale

	Percent Responses					
	SD	D	N	A	SA	SA/A
I am concerned that I will be unable to master the entire pool of medical knowledge	5	13	14	40	30	70
Medical training controls my life and leaves too little time for other activities	4	16	20	32	27	59
Medical school is more competitive than I expected	5	19	20	34	24	58
Decisions regarding electives and clerkships are made on the basis of information obtained from fellow students and not from the faculty	3	11	32	28	26	54
The attitude of too many of the faculty is that students should be subjected to a 'baptism by fire'	3	11	36	29	21	50
The medical school is fostering a physician role at the expense of one's personality and interests	5	23	24	32	17	49
The majority of students feel that success in medical school is in spite of administration rather than because of it	1	10	42	32	16	48
Finances are a source of concern to me	11	22	20	26	21	47
I am concerned that I will not be able to endure the long hours and responsibility associated with clinical training and practice	14	26	20	29	11	40
Medical school is cold impersonal and needlessly bureaucratized	7	27	28	25	12	37
I do not know what the faculty/administration expect of me	9	27	27	25	11	36
Medical School fosters a sense of anonymity and a feeling of isolation among students	12	26	28	26	8	34
Medical school is more of a threat than a challenge	12	41	26	13	8	21

SD strongly disagree, *D* disagree, *N* neutral, *A* agree, *SA* strongly agree

Table 2 Percentage student agreement with potential risk and protective factors for burnout and depression

	Burnout		Major depression		Depressive disorder	
	%	*p* value	%	*p* value	%	*p* value
I have family that lives in the local area						
Agree	53		20		38	
		0.39		0.94		0.67
Disagree	59		21		40	
I have close friends outside of medical school who live in the local area						
Agree	52		20		36	
		0.12		0.58		0.09
Disagree	61		23		45	
I receive emotional support from family and friends on a regular basis						
Agree	53		18		34	
		0.39		0.94		<0.001
Disagree	76		39		70	
I feel like I have someone to talk to and discuss matters with when I find life difficult						
Agree	54		18		35	
		0.38		0.001		<0.001
Disagree	62		41		67	
I exercise on a regular basis						
Agree	49		13		29	
		0.02		0.003		0.002
Disagree	62		26		45	
I have enough time during the day for rest and relaxation						
Agree	42		8		25	
		<0.001		<0.001		<0.001
Disagree	62		26		45	
I often am required to study and work long hours						
Agree	57		21		39	
		<0.001		0.27		<0.001
Disagree	15		10		20	
I feel in control of my daily schedule						
Agree	32		7		18	
		<0.001		<0.001		<0.001
Disagree	69		31		52	
I am confident I will have the knowledge and skills to become a good intern when I graduate						
Agree	47		12		28	
		<0.001		<0.001		<0.001
Disagree	75		39		61	
I know what I plan to do with my career after internship						
Agree	52		17		36	
		0.16		0.09		0.23
Disagree	60		25		42	

Chi-squared analysis used to calculate significant differences between proportion of student presenting with burnout in various demographic categories

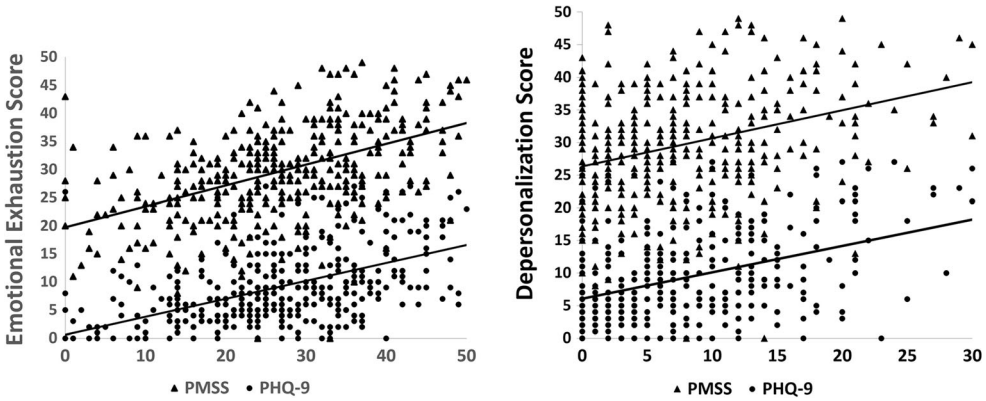

Fig. 1 Line graph showing moderate positive correlation between the Malasch Burnout Subscales of emotional exhaustion (*left*) and depersonalization (*right*) with the measure of depression (PHQ-9) and the measure of stress (PMSS)

Not surprisingly, PMSS scores were strongly correlated with burnout (Fig. 1). Given that at least 35 % of students agreed with the majority of the stressors, it suggests that the areas of concern are known but that not enough is being done to both alleviate these conditions and/or support the students through them. Of note, students who had access to emotional support demonstrated lower rates of burnout adding to the growing literature implicating emotional support as key attenuator of burnout [19, 20]. It is also therefore important to consider that in the developing world, medicine is not simply a career, but an opportunity for social advancement and usually represents one of the few such options. Therefore, there is often increased pressure placed upon students above and beyond their counterparts in developed nations. Indeed, in a report emanating from Nigeria, students identified the high expectations of parents as a stressor at least equivalent to the demands of the academic curriculum [21].

Other predictors of burnout were related to students' perceived lack of control of their daily schedule, requirement to working long hours, and confidence in acquiring the requisite knowledge base to practice medicine. These all point to the academic demands placed upon the students. While difficult to reduce the academic burden associated with the study of medicine, in some cases, medical faculty exacerbate this problem by creating a climate in which students are often embarrassed and harassed [22]. In terms of potential interventions, students who were both able to find time to relax and exercise regularly were found to have lower rates of burnout. This underscores the well-known benefits of relaxation and exercise upon mental health. Indeed, mindfulness and exercise are now being shown to not only prevent burnout but also reverse it [23, 24].

The other major finding of this study was that approximately 40 % of persons demonstrated symptoms consistent with a diagnosis of depression. These figures are substantially higher than previously published studies within TT [25, 26] but in line with data from Jamaica [27]. As expected, there was a strong positive correlation between burnout and the presence of depressive symptoms. Such findings suggest that implementation of measures previously detailed not only have the potential to treat with burnout per se but could also significantly impact the prevalence of depression.

Not surprisingly, the predictors of burnout were also predictive for symptoms of depression. However, one factor did predict high levels of depressive symptoms but not burnout, i.e., the influence of religion. Trinidad and Tobago is a multi-ethnic nation with a rich cultural and religious heritage. The data indicate that students who (i) practice their faith on a daily basis and (ii) who identified religion as being very important to them had the lowest rates of depressive symptoms. This data therefore joins a growing body of research that suggests that religious practice may be used as a coping mechanism to deal with challenging life circumstances, and this can improve outcomes [28].

In considering the factors discussed above, all offer potential areas for intervention and improvements for student psychological well-being. Recently, one school sought to address these factors in a comprehensive reform policy that not only focused upon providing student support but also incorporated curricular changes including moving all examinations to a pass/fail grading system. This approach yielded exceptional results, significantly reducing the levels of stress, anxiety, and depression [29]. Similar results from a multi-school study suggest that changing examination grading actually appears to be a simple and yet effective way to combat stress, burnout, and depression [30]. The success of these measures suggests that a new era in medical education needs to emerge. Administrators and researchers must move from simply investigating and documenting problems to the design of interventions that produce a tangible improvement in student mental health without compromising educational quality.

This study is limited by its cross-sectional design which prevents the identification of causal factors. It is also limited by time and financial constraints that prevented surveys being distributed to all medical students within the faculty, though the sample was comparable in number to other published work from single medical schools. In this light response, bias is also a limitation as persons suffering with burnout and/or depressive symptoms may not have been in class at the time of data collection or may have chosen not to take part in the

survey. However, such bias may actually indicate that these data underrepresent the problem. Finally, we only sampled students from a single school, and while these results may well be generalizable to other Caribbean medical schools, future work would be improved by sampling across several institutions within the region.

Implications for Educators

- The challenges associated with medical education place high levels of stress upon medical students often leading to burnout and psychiatric morbidity.
- This situation is potentially exacerbated in developing and resource-limited nations where the added pressure of family expectations and the opportunity for social mobility increases the stakes associated with medical training.
- Given the large number of medical students experiencing stress, burnout, and early stages of psychiatric morbidity, greater attention needs to be paid by administrators towards creating appropriate resources to support students as they transition through medical school as well as potential curriculum modifications that can reduce the stress associated with training.

Compliance with Ethical Standards Approval for this study was granted by the University of Liverpool, International Online Research Ethics Committee and the Ethics Committee at Faculty of Medical Sciences, UWI.

Disclosure On behalf of all authors, the corresponding author states that there is no conflict of interest.

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