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## ACADEMIC FACTORS ASSOCIATED WITH BURNOUT IN MALAYSIAN MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY

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### INTRODUCTION

Medical programme is known to be stressful, not only because of its known academic workload but also its duration is longer than other programmes. Medical students should prepare themselves academically, psychologically and physically. Due to the programme expectations, many medical students face problems and difficulties in coping with the programme. Stress, burnout and mental health issues such as anxiety and depression are not uncommon among medical students. Due to these reasons, the prevalence of stress among medical students is high and the most common source of stress was academic-related (1–2). In addition to that, the prevalence of burnout among them is also high (3–4). The relationship between stress and burnout has been proven in many studies (5–7).

According to the 11th Edition of the International Classification of Disease, burnout is defined as follows (8):

Burnout is a syndrome conceptualised as resulting from chronic workplace stress that has not been successfully managed. It is characterised by three dimensions:

1. Feelings of energy depletion or exhaustion
2. Increased mental distance from one's job, or feelings of negativism or cynicism related to one's job
3. Reduced professional efficacy

Schaufeli and Greenglass (9) defines burnout as “a state of physical, emotional and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding”. A recent systematic review and meta-analysis of published literature between 2000 to 2017 showed that the mean score of all the burnout scales was higher in medical students than the comparative group of post-secondary education population (10). A literature review of published studies between 1989 and 2016 in China found

that the prevalence was between 25.8% and 71.1% (11). Frajerman et al. also did a meta-analysis on burnout among pre-residency medical students from published literature between 2010 and 2017 (12). From 24 studies and 17,431 medical students, the overall prevalence was 44.2%.

Studies on burnout among medical students in Saudi Arabia showed that the prevalence of burnout was 67.9% and 76.8% (13, 14). In contrast, the prevalence of burnout among medical students in Oman was low (7.4%) (15). A recent study among medical students in England showed that 85% had exhaustion (16). A local study among medical students in Universiti Sains Malaysia (USM) showed that the prevalence of burnout was 67.9% as measured by the Copenhagen Burnout Inventory (CBI) (17). Among the domains, personal burnout was the highest (81.6%), followed by work-related burnout (73.7%) and client-related burnout (68.6%).

Burnout may start as early as in the first year of the medical course which can be as high as 75% (18). Burnout in medical students can be persistent throughout the medical course (19). It was also associated with psychological stress. Psychiatric illnesses, high workload, low self-esteem and excessive worries were associated with burnout (20). Burnout is not only prevalent among medical students, but it is also prevalent among medical doctors. A local study by Al-Dubai et al. showed that the prevalence of emotional burnout among medical interns (house officers) in Malaysia as measured using Maslach Burnout Inventory (MBI) was 36.6% (21). The study involved 191 house officers working in various specialities in Hospital Tengku Ampuan Rahimah, Klang. Burnout score was higher in those being male, Malay, married, international graduate, who, in medical or obstetrics and gynaecology rotation and of senior residents. However, only working long hours and rotations

in medical or obstetrics and gynaecology were statistically significant. Predictors for burnout were average undergraduate performance, Malay, personal and home-life conflict, poor relationship with supervisor and feeling of being underpaid. Protective factors against burnout were shorter work duration, shift work and effective supervisor feedback.

There are many factors that may lead medical students to develop burnout during medical school. Low support from friends, being in clinical years and being female were associated with burnout (22). Burnout was found to be significantly higher in those with no hobbies and no time to exercise or pray (23). Poor social support, dissatisfaction with lecturer and poor satisfaction with education were among the factors associated with burnout (24).

Burnout should be examined in medical students as it is associated with several negative impacts. It is associated with physical health complaints, mental health issues such as depression and anxiety, substance abuse such as alcohol and drugs and poor academic performance (25–26). Dyrbye et al. showed that burnout predicts suicidal ideation among medical students in the United States (27). The study also indicated that the prediction of suicidal ideation in students with burnout was dose-related. Each 1-point increase in emotional exhaustion and depersonalisation scores and 1-point decrease in personal accomplishment scores was associated with 5%, 10% and 6% increase in the odds of suicidal ideation respectively in the following year.

Since there are many studies looking at the prevalence of burnout in medical students and its associated factors, this study aimed to determine the prevalence of burnout with a focus on academic factors associated with burnout among medical students in a new public medical school in Malaysia.

## METHODS

A cross-sectional study was conducted among medical students in a new public medical school in Malaysia. The study was done between November 2019 and January 2020. It involved 200 medical students who were selected using stratified random sampling based on gender, race and year of study. There were 40 students invited from each year. The minimum sample size calculated was 175 based on the objectives and 80% power.

### Study Instrument

The study used the Malay translation of Copenhagen Burnout Inventory (CBI-M) to measure burnout. Copenhagen Burnout Inventory (CBI) was developed by Kristensen and colleagues and published in 2005 (28). The domains in the CBI are personal burnout, work-related burnout and client-related burnout. There are six items under personal burnout, seven items under work-related burnout and six items under client-related burnout. Personal burnout is defined as “the degree of physical and psychological fatigue and exhaustion experienced by the person”. The items under this domain enquire about the personal experience of tiredness, worn out, exhaustion, both physical and emotion and the implication of these symptoms related to susceptibility to illness and feeling of inability to cope. Work-related burnout is defined as “the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work”. Items under this domain focus on the implication of work on his/her feelings of worn-out, exhaustion, tiredness, lack of energy for social relationship, burnt-out and frustration. CBI was tested on 1,914 participants from various types of workplaces. The Cronbach’s alpha value for personal burnout was 0.87, work-related burnout (0.87) and client-related burnout (0.85).

The CBI-M was validated by Chin et al. (29). Face and construct validity were done on medical students. The face validity index of clarity and comprehension were 82.7% and 85.9%, respectively. The overall face validity index was 83.2%. The Cronbach’s alpha values of the personal burnout and work-related burnout factors were 0.85 to 0.87. However, the CBI-M has dropped one item in the work-related factor which is, “Do you have enough energy for family and friends during leisure time?” due to poor item loading into the factor.

CBI has five response categories with two formats according to the type of questions. One format is according to frequency from “always” to “never”. The other format is from “a very high degree” to “a very low degree”. The scoring for frequency is from 100 to 0. The CBI authors decided not to decide on any cut-score to distinguish between a person with burnout and without burnout as they thought it may lead to loss of information. The original study was presented in mean score (28). However, some studies used a cut-off point of 50-points to identify groups with significant burnout and non-significant burnout (30, 17). For the purpose of this study, the words “working/work” in the original CBI were replaced with “study/academic activities” to suit the study population. A cut-off mean score of 50-points or more was used to indicate significant burnout and its two domains based on two previous studies that used the same cut-off point (30, 17). In this study, the client-related scale was dropped as it was not applicable to medical students.

### Data Collection Procedure

The timing of the data collection was scheduled so that it would not be within two weeks prior or after the end of semester or posting examination for each year/group to avoid bias in the results. Prior to data collection, students were assured that participation in this study was entirely voluntary and would have no academic implication from the study.

The study questionnaire was distributed in Google Forms format using WhatsApp Messenger application. The questionnaire contained basic personal data, entry CGPA and whether they made the correct decision to do medicine, were satisfied with course activities, ever failed in any examination, were confident in passing medicine in five years and ever thought of dropping out. The response was in the form of “yes/no”. At the end of the questionnaire, an optional information on participants’ contact number was provided. This information was for those who were interested to know their results or those who thought that they had burnout symptoms and needed further assistance.

### Data Analysis

Data was analysed using the IBM SPSS® (Statistical Package for the Social Sciences) software version 20. Burnout was categorised into significant and non-significant burnout based on the mean CBI-M score. Descriptive statistic was used to generate the prevalence of significant burnout. Each factor was analysed using chi-square test to determine its association with burnout. Entry CGPA was analysed using independent *t*-test. For all analysis, significance level was set at 0.05.

### Ethics Approval

This research was approved by Universiti Sultan Zainal Abidin Human Research Ethics Committee on 21 October 2019 (UniSZA.C/2/UHREC/628-2Jld 2(14)).

## RESULTS

The number of participants who consented and responded to the online questionnaire was 182, fulfilling the minimum sample size of 175. The percentage of response was 91.0%. The socio-demographics of the participants is presented in Table 1.

**Table 1:** Socio-demography of the participants (*n* = 182)

Variables	<i>n</i>	%	Mean (SD)
Gender			
Male	53	29.1	
Female	129	70.9	
Race			
Malay	123	67.6	
Indian	47	25.8	
Chinese	12	6.6	
Year of study			
1	37	20.3	
2	40	22.0	
3	33	18.1	
4	35	19.2	
5	37	20.3	
CGPA			3.94 (0.14)
3.60–3.69	1	0.5	
3.70–3.79	6	3.3	
3.80–3.89	27	14.8	
3.90–4.00	148	81.3	

Majority of the participants were female and Malay, representing the composition of students in the medical school. Each year had an almost equivalent number. Majority were with CGPA 3.90 and above.

The prevalence of significant burnout was 36.8% (95% CI: 29.8;44.3). For personal burnout, the prevalence was 54.9% (95% CI: 47.4;62.3) while for work-related burnout, the prevalence was 31.9% (95% CI: 25.2;39.2). The results show that personal burnout affects more to the overall students’ burnout than work-related burnout.

The percentage of burnout by gender, race, year and entry CGPA category is shown in Table 2.

Significant burnout was higher in male, Malay, third year and those in the lowest CGPA category.

**Table 2:** Percentage of burnout by gender, race, year and entry CGPA category ( $n = 182$ )

Variables	Burnout	
	Significant $n$ (%)	Non-significant $n$ (%)
Gender		
Male	20 (37.7%)	33 (62.3%)
Female	47 (36.4%)	82 (63.6%)
Race		
Malay	46 (37.4%)	77 (62.6%)
Indian	17 (36.2%)	30 (63.8%)
Chinese	4 (33.3%)	8 (66.7%)
Year of study		
1	8 (21.6%)	29 (78.4%)
2	16 (40.0%)	24 (60.0%)
3	18 (54.5%)	15 (45.5%)
4	12 (34.3%)	23 (65.7%)
5	13 (35.1%)	24 (64.9%)
Entry CGPA		
3.60–3.79	5 (50%)	5 (50%)
3.80–3.89	6 (25%)	18 (75%)
3.90–4.00	56 (37.8%)	92 (62.2%)

## ASSOCIATION BETWEEN ACADEMIC FACTORS AND BURNOUT

Factors associated with burnout were analysed using chi-square test for categorical variables and independent  $t$ -test for numerical variables. Results are as shown in Table 3.

Incorrect decision in choosing medical course, unsatisfied with the course and thinking of dropping out are significantly associated with burnout.

## DISCUSSION

The prevalence of burnout among medical students vary from country to country with no specific pattern. Some countries showed low prevalence while some showed high prevalence. Erchens et al. summarised in their systematic literature review and meta-analysis that the prevalence was between 7.0% and 75.2%, depending on the instrument and cut-off point used (10).

**Table 3:** Association between academic factors and burnout

Variables		Burnout		$\chi^2$ (df)	$t$ statistics (df)	$p$ -value
		Significant $n$ (%)	Non-significant $n$ (%)			
Made correct decision in choosing medical course <sup>a</sup>	Yes	55 (32.9)	112 (67.1)	13.107 (1)		< 0.001*
	No	12 (80.0)	3 (20.0)			
Satisfied with the course <sup>a</sup>	Yes	56 (33.5)	111 (66.5)	9.373 (1)		0.020*
	No	11 (73.3)	4 (26.7)			
Ever failed any course exam <sup>a</sup>	Yes	28 (45.9)	33 (54.1)	3.258 (1)		0.071
	No	39 (32.2)	82 (67.8)			
Confident in passing in five years <sup>a</sup>	Yes	56 (35.3)	101 (64.7)	1.138 (1)		0.286
	No	12 (46.2)	14 (53.8)			
Thinking of dropping out <sup>a</sup>	Yes	35 (57.4)	26 (42.6)	16.680 (1)		<0.001*
	No	32 (26.4)	89 (73.6)			
Entry CGPA <sup>b</sup>		3.95 (0.07) <sup>c</sup>	3.96 (0.07) <sup>c</sup>		0.366 (180)	0.668

Notes: <sup>a</sup>Chi-Square test; <sup>b</sup>independent  $t$ -test; <sup>c</sup>mean (SD); \*Statistically significant at 0.05

The present study showed that the prevalence of high burnout among medical students in a new medical school in Malaysia was 36.8%. Comparing this finding with a local study among Universiti Sains Malaysia (USM) medical students, the prevalence of significant burnout using the same tool was 67.9% (20). The significant difference could be due to the difference in curriculum content and delivery, learning environment, physical and social support and resilience and coping of the students. The other two obvious differences between the two institutions are the presence of postgraduate programmes and the higher number of medical students in USM than that of the place of current study.

A recent study was done by Wing et al. in 2018 on Malaysian students studying in Malaysia as well as overseas (31). From the study, the prevalence of burnout among medical students using CBI was 27.3%, lower than the present study. However, their study showed that the prevalence of burnout was higher in medical students than in non-medical students (27.3% vs. 20.1%) and the odd ratio (OR) was 1.50. Their study included varieties of students from medical schools in Malaysia and abroad with different curriculum and different learning environment. Using subjects from different sites may have reduced the rate and may be a better representative of medical students as a whole.

In the present study, entry CGPA was not associated with burnout although the rate of burnout was shown to be higher in the low CGPA group. As entry CGPA was retrospective performance, therefore it may be the reason why the relationship was not seen. When looking at the relationship between burnout and academic performance in medical students, burnout was associated with lower academic motivation, academic achievement and poorer quality of life (32). A study in Turkey also found that burnout was associated with reduced academic efficacy across students from multiple programmes (33). Assuming that students with high CGPA grades are hardworking

and conscientious, this personality was shown to be associated with burnout (34).

A study by Costa et al. in 2012 found that factors associated with burnout were gender, dissatisfaction with the course choice, thoughts of dropping out of the course, lack of confidence in acquisition of skills, dissatisfaction with teaching strategies, feeling uncomfortable in academic activities and not seeing the coursework as a source of pleasure (35). A systematic review of factors associated with burnout among medical students in China showed inconsistent findings (36). Although gender was one of the factors, there was no specific gender consistently associated with burnout. Age was also found to be an inconsistent predictor. However, most studies found that the prevalence of burnout was higher in the clinical years compared to the earlier years. Being in the final year was found to be associated with a higher score in depersonalisation component of MBI (37). Another study in Australia showed that the MBI score significantly increased over time from the final year of undergraduates to during their internship (38). At baseline during student time, the scores were mainly lower than the comparable medical practitioners but later steadily increased after starting their internship. Clinical year was also shown to be associated with higher prevalence of burnout (13–14, 36). Dahlin and Runeson found that the mean score for exhaustion and disengagement was highest in the early clinical years compared to in the first year and the final year (20).

Mathew, in her thesis did a literature review on factors associated with burnout (39). She summarised that burnout was not associated with age but positively associated with higher year in medical school, being female and stress. It was negatively associated with sleep, spirituality and social support. Other socio-demography factors such as age and marital status were also found not to be associated with burnout (3, 40–41). Mangione et al. showed that medical students who were exposed to literature, music, theatre, and visual arts play had

reduced burnout (42). Similarly, students who had extra-curricular activities had lower burnout experience (18). When relating the personality of medical residents with burnout, those with burnout were less likely to have a calm personality and less intention to pursue speciality training (43).

Although personality is not one of the factors studied in the current study, previous research showed that personality is related to burnout. The personality that is mostly used in the literature is the big five personality; neuroticism, agreeableness, openness, extraversion and conscientious. Swider and Zimmerman did a meta-analysis on the relationship between the big five personality and burnout (44). While neuroticism had a positive correlation with emotional exhaustion ( $r = 0.44$ ) the other four types of personality showed a negative correlation. A 12-year prospective study was done by McManus et al. looking at the personality type and learning style of medical students at application and compared them with burnout and stress when they are at housemanship and post-housemanship level (45). They found that neuroticism was associated with stress, disorganised work and high perceived workload, agreeableness with supportive-receptive environment, openness to experience with deep approach to work, conscientious with organised work and extraversion with deep approach to work. It was hypothesised that neuroticism type personality was associated with negative outcomes at work in terms of stress and burnout.

## CONCLUSION AND RECOMMENDATION

Burnout is prevalent among medical students. However, the prevalence varies from country to country and even within the same country. The present study showed that the prevalence of burnout in one of the new medical schools in Malaysia, is at average percentage compared to

another university in Malaysia as well as in other countries. Burnout was found to be associated with some academic factors such as having made the correct choice for medicine, satisfaction with the course and the thought of dropping out. Initiatives to prevent and mitigate burnout among medical students by taking some actions are recommended. Activities to increase awareness and prevent burnout may be incorporated in the medical curriculum such as in personal and professional development course.

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