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# Emotional Intelligence Among Medical Students and Its Relationship with Burnout

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## ABSTRACT

Burnout is associated with stress and mental health issues among medical students. Based on the previous studies, emotional intelligence (EI) has been proven to be protective against burnout. This cross-sectional study was conducted from December 2019 to January 2020 involving 182 medical students from a public university in Terengganu, Malaysia. The objective was to determine the level of EI among medical students and its relationship with burnout. They were requested to answer an online questionnaire that consisted of the Universiti Sains Malaysia Emotional Quotient Inventory (USMEQ-i) and Copenhagen Burnout Inventory (CBI). The mean score for students' EI and burnout were calculated. The relationship between EI and burnout was analysed using Pearson correlation. Further analysis was done using simple linear regression. The findings show that more than half of the medical students had a high EI score ( $n = 105, 57.5\%$ ). The overall mean (SD) score of EI was 2.85 (0.52) which is also in the high category. The social competence domain score was noted to be higher than the personal competence domain. Burnout had a fair negative correlation with EI and it was statistically significant ( $r = -0.395, p < 0.001$ ). An increase in one unit of the EI score will decrease the burnout score by 12.25 units. Thus, EI was significantly and negatively correlated with burnout among medical students. As it may play a role in helping medical students cope with stress and prevent burnout, training in EI is essential for their future professional development.

**Keywords:** *Emotional intelligence, Burnout, Medical students, Medical education, University students*

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## INTRODUCTION

The medical programme is known to be stressful because of its heavy academic workload and longer duration than other programmes. Due to the programme expectations, burnout has been increasingly recognised as among the major issues

in medical students. The main concern of burnout in medical students is its association with negative consequences. Burnout is known to be associated with physical health complaints, mental health issues such as depression (which includes suicidal ideation) and anxiety, substance abuse such as alcohol and drugs, and

deteriorating work performance (1). According to the 11th edition of the International Classification of Disease, burnout is defined as “a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions which are feelings of energy depletion or exhaustion, increased mental distance from one’s job, or feelings of negativism or cynicism related to one’s job and reduced professional efficacy” (2). Schaufeli and Greenglass (3) defined burnout as “a state of physical, emotional and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding”. Another author has defined burnout as a response to chronic emotional and personal job stressors (4).

On the other hand, emotional intelligence (EI) is defined as the ability to monitor one’s own and others’ feelings and emotions, discriminate among them and use this information to guide one’s thinking and actions. Similarly, Goleman (5), defined EI as the ability to recognise and regulate emotions in oneself and others. Research has consistently shown that EI is one of the protective factors against stress and burnout (6–8). This finding is consistent in many countries and different types of occupations. EI is also associated with better coping, better well-being and better performance (9–11). A previous study also showed that medical students had higher EI than students in other programmes (12).

A systematic review and meta-analysis of published literature between 2000 and 2017 showed that the prevalence of burnout among medical students was from 7.0% to 75.2% (11). In Malaysia, the prevalence of burnout among medical students was between 36.8% and 67.9% (13–14). EI was associated with lower levels of anxiety, stress, burnout and higher levels of satisfaction with life in undergraduate students (15). Studies among students in Iran and Korea have reported that EI was consistently shown to have a negative

relationship with burnout (16–19). In another study, healthcare workers who had high EI tend to experience less occupational stress and burnout (7, 20). Swami et al. (8) did a study among 46 resident doctors at an institution in India to look at the relationship between stress, burnout and EI. They found that perceived stress was positively correlated with burnout while EI was negatively correlated with burnout. They also hypothesised that perceived stress has a mediator effect between EI and burnout (8).

One of the main keys in EI is understanding the emotion of self. This is very important for a doctor who involves in managing human beings in general. The way how EI can prevent burnout is by how one controls his/her emotions (21). EI helps an individual to interpret his/her feelings that might lead to a stress response in the brain and know when to take action to prevent burnout (22–23). EI also modifies how an individual responds to negative emotions such as anger, sadness, anxiety and scare (24). Excessive negative responses will lead to burnout. To date, studies on the relationship between EI and burnout among medical students are lacking. The purpose of this study was to determine the level of EI in medical students and its relationship with burnout. It is hoped that the findings of this study will benefit both students and medical institutions. The hypothesised negative relationship between EI and burnout will help the institution to consider developing EI among medical students to prevent or reduce burnout during their medical training as well as in the real working environment in future.

## METHODOLOGY

The study was conducted at one of the public medical schools in Terengganu, Malaysia between November 2019 and May 2020. It was a cross-sectional study involving 200 medical students from year one to year five who had been selected using a proportionate random sampling based

on sex, race and year of study. Then, 40 students from each year were selected as the respondents for this study. Inclusion criteria include medical students at the public university. Those with any psychiatric illness were excluded. The sample size was calculated for each objective. The highest sample size was from the first objective which is to determine the prevalence of burnout among medical students in a public university in Terengganu. Krejcie and Morgan's (25) table was used based on 300 population size and dichotomous response measure (significant burnout and non-significant burnout). Based on the table, the sample size for the first objective was 169. After considering a 20% drop out rate, 200 was taken as the sample size for this study. For the session 2019/2020, 302 medical students were enrolled on the Faculty of Medicine of which approximately 60 students in each year one to year five. Since 200 subjects were required, an equal number of subjects were selected from each year, i.e., 40 respondents each year. The distribution of the number and the sampling is shown in Table 1. The respondents in each stratum were selected based on the name list in the strata, using the online random subject generator.

Two types of validated instruments were used for this study; Universiti Sains Malaysia Emotional Quotient Inventory

(USMEQ-i) to measure EI and Copenhagen Burnout Inventory (CBI) to measure burnout. The permission to use both of the instruments was obtained from the authors. USMEQ-i was developed by Yusof et al. to measure EI in medical students in Malaysia setting (26). It contains 13 items with two domains, the personal competence domain (10 items) and the social competence domain (3 items). The personal competence domain contains items asking about how someone deals with his or her own emotions in various situations while social competence items asking on how someone deals with other people's emotions. Other authors then did a confirmatory factor analysis (CFA) of the USMEQ-i. The results of the CFA showed satisfactory goodness of fit indices (comparative fit index = 0.957, root mean square error of approximation = 0.058) (27). The responses in USMEQ-i are in a Likert scale of 0 to 4; 0 = Not like me, 1 = A bit like me, 2 = Quite like me, 3 = A lot like me and 4 = Totally like me. The final score is the mean score of each item (total item score/13). The USMEQ-i scores are interpreted based on the recommended guidelines provided in the USMEQ-i manual in which a high mean score indicates a high level of EI. USMEQ-i mean score can also be categorised as low (mean score of 0 to 1.2), average (mean score of 1.21 to 2.80) and high (mean score of 2.81 to 4.00).

**Table 1:** The distribution of the number of subjects according to gender and race

	Year of study		Gender		Race		
			Male	Female	Malay	Chinese	Indian
1	Total	60	22	48	47	5	8
	Selected	40	15	25	32	3	5
2	Total	62	19	43	44	6	12
	Selected	40	10	30	28	4	8
3	Total	63	21	42	54	1	8
	Selected	40	13	27	34	1	5
4	Total	56	17	39	30	6	19
	Selected	40	11	29	22	4	14
5	Total	61	11	53	35	6	23
	Selected	40	7	33	22	4	14
Total selected			56	144	138	16	46

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 emotional and the implication of these symptoms related to susceptibility to illness and feeling of inability to cope.

Work-related burnout was defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his or her work. Items under this domain were focusing on the implication of work on his/her worn out, exhaustion, tiredness, lack of energy for a social relationship, burnt-out and frustration. For this study, only personal burnout and work-related burnout were used and client-related burnout was dropped as it was not relevant to the study subjects. One item in the work-related factor which was “Do you have enough energy for family and friends during leisure time?” was also dropped since it was not suitable to be asked in the study subjects. Therefore, the CBI used to measure burnout in this study contained 12 items. CBI contained 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 and degree was from 100 to 0. The maximum score was 100 points which indicates “always” while the minimum score was 0 which indicates “never”. The maximum score was 100 points which indicates a very high degree while the minimum score was 0 which indicates a very low degree. Mean (SD) was calculated to get the final score for burnout.

A questionnaire consisting of participants’ basic personal information, USMEQ-i and CBI was distributed online using Google Forms. The questionnaire was anonymous, so their identity was not established. The Google Forms link was distributed through the social media platform after the participants provided the consent form in hard copy. The study purpose and procedure were explained before signing the consent form. Data were analysed using the IBM SPSS® (Statistical Package for the Social Sciences software version 20). EI was categorised into high, average and low as well as mean (SD). The relationship between EI and burnout was analysed using Pearson correlation. Further analysis using simple linear regression was done to determine whether there is a significant linear relationship between EI and burnout. *P*-value of < 0.05 was considered significant.

## RESULTS

### Demographic Characteristics of Medical Students

A total of 182 participants have completed the online questionnaire. The response rate was 91.0%. The majority of the participants were female ( $n = 129$ , 70.9%) and Malay ( $n = 123$ , 67.6%), representing the composition of the participating medical students. Each year had an almost equivalent number of participants. The demographics of the participants are presented in Table 2.

### The Level of EI and Burnout Among Medical Students

The mean (SD) EI score of the participants as measured by USMEQ-i is shown in Table 3. The overall mean EI of medical students was just above the high category (2.85). More than half of the participants were in the high EI score category ( $n = 105$ , 57.7%). The mean EI for social competence domain was higher than the personal competence domain as shown in Table 3.

The mean (SD) EI and burnout scores by sex, race and year of study are presented in Table 4. The overall EI score was higher in male and non-Malay students. There was no specific pattern of EI based on the year of study although the highest was among the first and fourth-year students and the lowest being in the final year. The range of EI based on year was between 2.72 to 2.90. The mean burnout score was higher in females and highest in Malay students. Third-year students had the highest burnout score followed by fifth-year student.

**Table 2:** Demographic characteristics of the participants ( $n = 182$ )

Variables	$n$ (%)
Sex	
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)

**Table 3:** EI score of participants ( $n = 182$ )

Variables	$n$ (%)	Mean (SD)
Overall EI		2.85 (0.52)
EI domain		
Personal competence domain		2.79 (0.59)
Social competence domain		2.98 (0.65)
EI level category		
Low (0.00–1.20)	1 (0.5)	
Average (1.21–2.80)	76 (41.8)	
High (2.81–4.00)	105 (57.7)	

**Table 4:** The mean EI and burnout scores of the participants by sex, race and year of study ( $n = 128$ )

Variables	Mean (SD)	
	EI	Burnout
Sex		
Male	2.90 (0.50)	42.60 (16.68)
Female	2.83 (0.53)	45.72 (15.90)
Race		
Malay	2.79 (0.52)	46.73 (14.85)
Indian	2.97 (0.56)	39.68 (18.55)
Chinese	2.97 (0.28)	45.25 (15.78)
Year of study		
1	2.90 (0.50)	41.38 (14.62)
2	2.88 (0.52)	42.40 (15.28)
3	2.72 (0.60)	51.82 (14.56)
4	2.90 (0.54)	42.80 (16.45)
5	2.83 (0.45)	46.51 (16.14)

### The Relationship Between the Level of Burnout and the Level of EI Among the Medical Students

The Pearson correlation coefficient ( $r$ ) between EI and burnout showed a fair negative correlation and it was statistically significant ( $< 0.05$ ) as shown in Table 5. An increase in the EI score will decrease the burnout score in the participants.

**Table 5:** Correlation between EI and burnout

Variable	Level of EI	
	$r$	$p$ -value
Level of burnout	-0.395	$< 0.001$

The relationship between EI and burnout was further analysed with simple linear regression. The results of the analysis are as shown in Table 6. There was a significant linear relationship between EI and burnout. EI was a significant predictor of burnout. The results showed that 15.6% of the burnout score was explained by the EI mean score. An increase in 1 unit of EI score will decrease the burnout score by 12.25 units (point).

**Table 6:** Relationship between EI and burnout

Variable	<i>b</i> (95% CI)	<i>t</i> statistic	<i>p</i> -value <sup>a</sup>	<i>r</i> <sup>2</sup>
EI mean score	-12.25 (-16.44, -8.06)	-5.773	< 0.001	0.156

Note: <sup>a</sup>Simple linear regression

## DISCUSSION

### EI in Medical Students

EI is regarded as important in the medical field as well as in medical education because the learning and working environment involve socialising with different types of people from patients, colleagues and administrators. Besides, communication skills, inter and intra-personal skills are all important. One skill that is of utmost importance in the medical field is empathy. For medical personnel to be empathic, firstly they need to understand their own as well as others' emotions. This is when EI is important. In a systematic review by Arora et al. (9), higher EI was positively associated with a better doctor-patient relationship, increased empathy, teamwork, communication skills, stress management, organisational commitment and leadership. Similarly, Stratton et al. (29) also found that EI was associated with better communication skills. In the working environment, EI was associated with patient's trust, higher job satisfaction, higher patient satisfaction and less burnout (10, 30).

A study among medical students of USM in 2015 using the same instrument (USMEQ-i) showed that their EI ranged from 3.13 to 3.97 (31). Their EI level was much higher than our study which is probably due to different year of medical students selected as the study subjects as well as different environment and study setting. However, the other findings were similar to this study in which male and Indian students had higher EI score. Saddki et al. (32) did a study on EI among dental students in USM using the Assessing Emotional Scale questionnaire. In contrast

to the present study and the study in USM medical students, they found that EI scores were higher in female, Malay and senior years.

Studies on the difference in EI between males and females showed conflicting results. Some studies showed that EI score was higher in females while others showed EI was higher in males (31, 33–35). There were also studies which found there was no difference in EI between males and females (36–37). Meshkat and Nejati (38) found that there was no difference in the total score of EI of different sex but females tend to score higher in certain domains such as empathy, interpersonal relationship and self-regard. From a psychological perspective, there was no difference in the perception of emotion between males and females but females tend to be able to detect subtler emotional changes in humans (39). This characteristic results in misleading findings on EI between males and females. Marzuki et al. (40) found that there was no difference in EI score based on sex. However, students from boarding schools, living in the city, from technical-based programmes and with high CGPA had higher EI scores and the factors were all statistically significant.

A local study done by Saibani et al. (41) found contradicting results in terms of race whereby they found that Malay students had higher EI scores compared to other races but they were not statistically significant. On the contrary, another local study in 2015 reported Indian students had higher EI as compared to the other races which were consistent with our study (31). In terms of year of study, we found that first- and fourth-year medical students had higher EI scores as compared to the other years. However, Naeem et al. reported final year students had higher EI than their juniors

in their study. The possible explanation for this uncertain trend of EI across the year of study is the influence of academic performance in which a study showed a significant association between students' high academic achievement and EI (37).

### **Burnout Among Medical Students**

This study also showed that burnout score was higher for females, Malay and among the third-year medical students. Altannir et al. (42) showed that female students had increased odds of having burnout by 4.34 times than male students. Similarly, a study in Brazil showed that females had a higher prevalence of burnout and higher score of emotional exhaustion than males (43–44). In addition to that, occupations of which the majority are females scored high in both personal and work-related burnout (28). The higher prevalence of burnout among female is probably due to the higher tendency of female to develop stress, as a study has shown that females have more life stressors and perceived stress more than males (45). On the other hand, this study showed that the burnout mean score is highest in Malay medical students, which was similar to another local study done in a public university (13). However, Wing et al. (46) and Daud et al. (14) found a contradicting result in which race did not show any significant association with burnout. In the present study, the mean burnout score was the highest for the year three when compared to other years of study. This could be due to the transition period from the pre-clinical phase (year two) to the clinical phase (year three to year five) as well as a new teaching and learning environment. A systematic review of studies on burnout in medical students in China showed that the prevalence of burnout increased with the year of study. Students in clinical years have more prevalence of burnout than pre-clinical years (47).

### **Relationship Between EI and Burnout**

In a field that involves a lot of social interactions and emotions, it can sometimes be distressing and having the skills to manage the emotions is very important. This ability helps to counteract the feelings of dissatisfaction and unhappiness in the working environment (15). The present study showed a fair negative correlation between EI and burnout. Another study among medical students in Malaysia also found that EI significantly reduced burnout levels (26). A study among medical students in the United States and doctors in Taiwan showed similar results where EI was negatively correlated with burnout (10, 48). Although not many studies look at the relationship between EI and burnout in medical students in specific, in general, it shows a negative relationship in non-medical students (16–17). In the working environment, a similar result was seen. There was a negative relationship between EI and burnout among nurses as well as residents in general surgery and internal medicine (6, 19, 49–50). EI also appeared to be protective against burnout with higher EI associated with decreased burnout not only among healthcare workers but also among the university lecturers and school teachers (51–53).

Considering there is a link between EI and burnout, some intervention has been used in the training on EI to prevent burnout. EI, unlike IQ (cognitive intelligence), can be improved by training. Hence, Satterfield et al. (50) suggested that, since EI has a protective effect on burnout, EI education should be incorporated into the residency training for doctors. Studies have shown that EI training among doctors and nurses results in significant improvement on EI, stress and general wellness (55–56). It also improved communication skills among the trainees and they were noted to have lower perceived stress (56).

## CONCLUSION

The EI in the medical students was in the high category and it was negatively correlated with burnout. The present study also showed that EI is an important protective factor against burnout. Since EI can be improved with training, the medical school may consider providing training to improve EI. It may be incorporated into the curriculum, especially in the personal and professional development module. Other than preventing burnout, EI also helps in dealing with interpersonal communication and relationship with patients and others during medical school as well as preparation for the working environment.

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## ETHICAL APPROVAL

The methods used in this study complied with the ethical standards of the Universiti Sains Malaysia Human Research Ethics Committee and were approved on 4th November 2019 [USM/JEPeM/19080470].

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