Stress and Coping Strategies of Students in a Medical Faculty in Malaysia

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Abstract

Background: Stress may affect students' health and their academic performance. Coping strategies are specific efforts that individuals employ to manage stress. This study aimed to assess the perception of stress among medical students and their coping strategies.

Methods: A cross-sectional study was conducted among 376 medical and medical sciences undergraduates in Management and Science University in Malaysia. Stress was assessed by a global rating of stress. Sources of stress were assessed using a 17-item questionnaire. The validated Brief COPE inventory was used to assess coping strategies.

Results: The majority of respondents were females (64.4%), aged 21 years or older (63.0%), and were Malays (68.9%). Forty-six percent felt stress. The most common stressor was worries of the future (71.0%), followed by financial difficulties (68.6%). Significant predictors of stress were smoking (OR = 2.9 , 95% CI 1.3−6.8, P = 0.009), worries of the future (OR = 2.1 , 95% CI 1.3−3.4, P = 0.005), self-blame (OR = 1.3, 95% CI 1.1−1.5, P = 0.001), lack of emotional support (OR = 0.8, 95% CI 0.7−0.9, P = 0.017), and lack of acceptance (OR = 0.8, 95% CI 0.6−0.9, P = 0.010). Students used active coping, religious coping reframing, planning, and acceptance to cope with stress.

Conclusion: Stressors reported by the students were mainly financial and academic issues. Students adopted active coping strategies rather than avoidance. Students should receive consultation on how to manage and cope with stress.

Keywords: coping skills, Malaysia, medical school, social support, stress, students

Introduction

Medical students face different kinds of stressors in their studies and in life. Previous researchers have found high levels of stress among medical students (1,2). The overall prevalence of stress was 31.2% in 3 British universities (3), 41.9% in a Malaysian medical school (4), and 61.4% in a Thai medical school (5). According to Lazarus (6), stress is the result of an individual's perception that they do not have the resources to cope with a perceived situation from the past, present, and future. Stress occurs when an individual is confronted with a situation that is perceived as overwhelming and with which they cannot cope (7). Too much stress or chronic stress can affect mental and physical health and increase the risk of premature mortality (8). Adverse effects of stress result from the interaction between stressors and individual perceptions of and reaction to these stressors. Musculoskeletal disorders, high blood pressure, disturbed metabolism (associated with the risk for type 2 diabetes mellitus), and cardiovascular problems may result from stress (8).

Medical students perceive themselves as being more likely to become ill than others (9). Deterioration in the health of students may affect learning ability and academic performance as well as goal achievement (10). In addition, stress also affects social relationships within and outside the university (10), thus impacting on mental health. In a Swedish study, 2.7% of students had made suicide attempts (2). Previous studies (11,12) identified some important academic and non-academic stressors among medical students. Academic stressors include excessive homework, unclear

assignments (11,12), lack of time management skills, uncomfortable classrooms, weekly tests and assignments, the pressure to earn good grades, and receiving a lower grade than expected (12). Non-academic stressors include social issues and financial problems (11). In Pakistan, the most common stressors among medical students were high parental expectations, frequency of examinations, vastness of academic curriculum, sleeping difficulties, performance in periodic examinations, and worries of the future (13).

Previous studies showed that coping plays a central role in adaptation to stressful life events (14). Coping strategies are the specific efforts, both behavioural and psychological, that individuals employ to master, tolerate, reduce, or minimise stressful events (15).

Coping strategies are classified into active and avoidant coping strategies (16). "Active coping strategies are either behavioural or psychological responses designed to change the nature of the stressor itself or how one thinks about it", while avoidant coping strategies "lead people into activities (such as alcohol use) or mental states (such as withdrawal) that keep them from directly addressing stressful events" (16). Active coping is considered a better way to deal with stress, while avoidant coping is considered as a psychological risk factor for adverse responses to stressful life events (17).

According to Carver (18), active coping strategies include "active coping", which means taking action or exerting efforts to remove or circumvent the stressor; "planning", thinking about how to confront the stressor and planning one's coping efforts; "acceptance", accepting the fact that the stressful event has occurred and is real; and "positive reframing", making the best of the situation by growing from it or seeing it in a more positive light. Avoidant strategies include "denial", defined as an attempt to reject the reality of the stressful event; "behavioural disengagement", giving up or withdrawing efforts from the attempt to attain the goal with which the stressor is interfering; "venting", an increased awareness of one's emotional distress and a concomitant tendency to ventilate or discharge those feelings; and "humour", making jokes about the stressor (18).

Approaches in coping with stress are influenced by ethnic, cultural, and socioeconomic characteristics. For example, symptoms of stress increase with decreasing social status (19), and females tend to use emotional and avoidant coping strategies more than males do (19). Studies from the United Kingdom (20,21)

have reported the use of alcohol, tobacco, and drugs as common coping strategies adopted by medical students. In a study in Pakistan (22), sports, music, hanging out with friends, sleeping, or going into isolation were employed in coping with stress. Students in Nepal (23) adopted active coping strategies (positive reframing, planning, acceptance, and active coping) rather than avoidant strategies (denial, alcohol/drug use, and behavioural disengagement). In a qualitative study of Malaysian students (24), common coping strategies adopted by students were regular exercise, praying, counselling, watching cartoons or comedies, practising meditation including yoga and tai chi, and listening to soft music.

Stress among students has not gained much attention in comparison to work-related stress (7). Only a few studies have assessed the perceptions of stress and coping strategies among medical students (25–27). This study aimed to assess the perceived sources of stress among medical students and coping strategies used to manage stress.

Subjects and Methods

A cross-sectional study was conducted on 376 medical and medical sciences students at the International Medical School, Management and Science University, during the middle of semester in 2009. A self-administrated paper questionnaire consisting of 4 parts was distributed to the students. Stress was assessed by a global rating of stress: "To what extent do you feel you are under stress?" rated from "Not at all" to "I have too much stress". Sources of stress were assessed by a 17-item questionnaire. Each item was rated on a 4-point Likert scale ranging from "Strongly disagree (score 1)" to "Strongly agree (score 4)". The stressors included in the questionnaire were derived by reviewing the literature and through discussion with a group of students. The internal consistency of this questionnaire as indicated by the Cronbach's alpha value was 0.80.

Coping strategies were assessed using the Brief COPE scale, which is an abbreviated version of the COPE Inventory (18). The Brief COPE is used to assess a broad range of coping behaviours among adults with or without clinical conditions (18). It consists of 28 items, and each item is rated on a 4-point Likert scale ranging from "I have not been doing this at all (score 1)" to "I have been doing this a lot (score 4)". The higher score indicates greater coping by the respondents. The items were scored to produce 14 dimensions, each reflecting the use of a coping strategy: active coping, planning, acceptance, denial, self-

distraction, use of substance, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, humour, religion, and self-blame (18). It is a validated instrument in which the Cronbach's alpha values range 0.50–0.90, with only 3 coping strategies falling below 0.60.

The questionnaire also includes socio-demographic information. Written consent was obtained from the participants. Participation was voluntary, and students were assured that participation would be confidential and would not affect their academic progress. Approval was obtained from the ethics committee of the Management and Science University, Shah Alam, Malaysia.

Statistical analysis

Data analysis was performed using SPSS version 13 (SPSS Inc., Chicago, IL). After all data was entered into SPSS, they were reviewed for the accuracy of data entry. Perceived stress was dichotomised into 2 categories: "Not at all" and "A little bit" were considered "no perceived stress", and "I have too much stress" and "I have stress" were considered "perceived stress". To assess the association between perceived stress and the other variables, chi-square test was used. Student's *t* test for independent samples and one-way ANOVA were used to compare the mean values of coping strategies in relation to studied variables. $P < 0.05$ was considered statistically significant. All variables significantly associated with stress in bivariate analysis were entered into multivariate analysis. Multiple logistic regression analysis with backward stepwise technique was performed to obtain the most important predictors of stress.

Results

Socio-demographic characteristics

Of the 376 students, 242 (64.4%) were females, 237 (63.0 %) were aged 21 years or more, 259 (68.9%) were Malays, and 359 (95.5%) were singles. The majority of students (275, 73.1%) were Muslims. Most students had monthly family income ranging RM2000–RM4000 (USD1 = RM3.3) (Table 1). Thirty-five students (9.3%) were smokers.

Perceived stress

There were 174 students (46.3%) who reported having some or too much stress, whereas 179 (47.6%) reported that they felt a little bit of stress. Only 23 students (6.1%) reported no stress (Table 2).

Among the socio-demographic factors, only smoking was significantly associated with perceived stress. The prevalence of stress among smokers (71.4%) was significantly higher (OR = 3.2, 95% CI 1.5–7.0, $P = 0.002$) than in non-smokers (43.7%).

Out of 17 sources of stress, 10 sources were significantly associated with perceived stress ($P < 0.05$). The prevalence of stress was higher among students who agreed that these factors were sources of stress for them (Table 3). Only sources of stress with significant associations were shown in the table.

There was a significant association between perceived stress and 5 of the 14 coping strategies (Table 4). Students who felt stressed used venting (5.0, $P = 0.001$), denial (4.5, $P = 0.032$), self-blame (5.0, $P < 0.001$), and disengagement (4.4, $P = 0.004$) more than non-stressed students did (4.5, 4.1, 4.3, and 3.9, respectively). However, non-stressed students used emotional support (5.9, $P = 0.032$) more than stressed students did (5.6). Non-significant associations were omitted from the table.

In the multiple logistic regression model (Table 5), the independent predictors of stress were smoking (OR = 2.9, 95% CI 1.3–6.8, $P = 0.009$), worries of the future (OR = 2.1, 95% CI 1.3–3.4, $P = 0.005$), self-blame (OR = 1.3, 95% CI 1.1–1.5, $P = 0.001$), lack of emotional support (OR = 0.8, 95% CI 0.7–0.9, $P = 0.017$), and lack of acceptance (OR = 0.8, 95% CI 0.7–0.9, $P = 0.010$). The total model accounted for 19% of the variance in perceived stress. The results of the analysis showed that the data did not violate the multicollinearity assumption (tolerance < 0.720).

Sources of stress among students

Sources of stress, ranked by the percentage of students who agreed that the items were sources of stress, are shown in Table 6. The most important sources of stress reported by students were worries of the future (71.0%), financial difficulties (68.6%), study in general (64.6%), hearing bad news (58.5%), and interpersonal conflict (54.3%). The least important source of stress was trouble with teachers (22.6%).

Coping strategies used by students

The students in this study used active coping strategies such as religious coping, with score (SD) of 6.2 (1.6); active coping, 6.2 (1.3); positive reframing, 6.1 (1.4); and acceptance, 6.0 (1.3); more than avoidant strategies such as denial, 4.3 (1.5); self-blame, 4.6 (1.6); and alcohol or substance use, 2.7 (1.4).

Table 1: Socio-demographic characteristics of participants

Variable		n	%
Age (years)	≤ 21	237	63.0
	> 21	139	37.0
Sex	Male	134	35.6
	Female	242	64.4
Marital status	Single	359	95.5
	Engaged	17	4.5
Ethnicity	Malay	259	68.9
	Indian	48	12.8
	Chinese	35	9.3
	Other	34	9.0
Religion	Muslim	275	73.1
	Hindu	41	10.9
	Christian	31	8.2
	Other	29	7.7
Monthly family income (RM)	<2000	92	24.9
	2000–4000	172	46.5
	>4000	106	28.6

Total number of participants = 376

Table 2: Perceived stress among students

Stress	n	%
Not at all	23	6.1
A little bit	179	47.6
I have stress	139	37.0
I have too much stress	35	9.3

Total number of participants = 376

Females used self-distraction, with score (SD) of 6.1 (1.4); religious coping, 6.3 (1.6); emotional support, 6.0 (1.4); instrumental support, 5.9 (1.4); and planning, 6.2 (1.3), more than males did, with scores (SD) of 5.7 (1.3), 6.0 (1.6), 5.4 (1.4), and 5.8 (1.5), respectively ($P < 0.05$). However, males were involved in alcohol or substance use, with score (SD) of 3.1 (1.6), more than females did, 2.5 (1.4), and this observation is statistically significant ($P < 0.05$). Older students (aged more than 21 years) used active coping, with score (SD) of 6.5 (1.2), reframing, 6.3 (1.3), and planning, 6.2 (1.2), more than younger students did, with scores of 6.0 (1.3), 6.0 (1.4), and 5.9 (1.3),

respectively, ($P < 0.05$). Smokers were more significantly involved ($P < 0.05$) in alcohol or substance use, with score (SD) of 3.4 (1.7), than non-smokers, 2.7 (1.4). Malay students used religious coping, with score (SD) of 6.5 (1.5), more than Chinese and Indian students did, with scores (SD) of 5.2 (1.6) and $P = 0.001$, and 5.6 (1.7) and $P = 0.002$, respectively. Muslims used religious coping, with score (SD) of 6.4 (1.5), more than Hindu students and those of other religious persuasions did, with scores (SD) of 5.6 (1.7) and $P = 0.006$, and 5.2 (1.7) and $P < 0.001$, respectively.

Table 3: Association between sources of stress and perceived stress

Source of stress	OR	95% CI	*P* value
Worries of the future	2.1	1.3–3.3	0.002
Financial difficulties	1.8	1.2–2.8	0.010
Study (in general)	1.6	1.1–2.5	0.023
Interpersonal conflicts	2.1	1.4–3.1	0.001
Family problems	1.7	1.2–2.6	0.008
Low self-esteem	2.2	1.5–3.4	<0.001
Conflict with roommate	2.0	1.3–3.0	0.001
Inability to find support from parents to solve problems	1.6	1.1–2.4	0.028
Living away from family	1.6	1.0–2.4	0.031
Change in eating habit	1.9	1.2–2.9	0.006

Data were analysed using chi-square test. For each item, the reference category was "Disagree". Only sources of stress with significant associations are shown. Total number of participants = 376.

Table 4: Coping strategies and their association with perceived stress

Coping strategy	Perceived stress	No perceived stress	*P* value
	Mean (SD)	Mean (SD)	
Emotional support	5.6 (1.3)	5.9 (1.4)	0.032
Venting	5.0 (1.4)	15 (1.3)	0.001
Denial	4.5 (1.5)	30 (1.4)	0.032
Self blame	5.0 (1.6)	25 (1.5)	<0.001
Disengagement	4.4 (1.7)	24 (1.4)	0.004

Student's *t* test was used to compare mean coping strategies among students who had stress and who had not stress. Only coping strategies with significant association are shown. Total number of participants = 376.

Table 5: Multiple logistic regression analysis of predictors of perceived stress among medical students

Predictor		B	OR	95% CI	*P* value
Smoking	No		1.0		
	Yes	1.097	2.9	1.3–6.8	0.009
Worries of the future	Disagree		1.0		
	Agree	0.728	2.1	1.3–3.4	0.005
Interpersonal conflicts	Disagree		1.0		
	Agree	0.445	1.6	1.0–2.5	0.057
Roommate conflict	Disagree		1.0		
	Agree	0.446	1.6	1.0–2.5	0.056
Acceptance		−0.230	0.8	0.6–0.9	0.010
Emotional support		−0.213	0.8	0.7–0.9	0.017
Self blame		0.240	1.3	1.1–1.5	0.001

Total number of participants = 376.

Table 6: Sources of stress among students, ranked by number and percentage of students who agreed that the items were sources of stress

Source of stress	*n*	%
Worries of the future	267	71.0
Financial difficulties	258	68.6
Study (in general)	243	64.6
Hearing bad news	220	58.5
Interpersonal conflicts	204	54.3
Family problems	197	52.4
Low self-esteem	185	49.2
Trouble with friends	178	47.3
Trouble with boyfriend or girlfriend	174	46.3
Sleep disorders	170	45.2
Conflict with roommate	161	42.8
Inability to find support from parents to solve problems	153	40.8
Pressures related to finding a life partner	144	38.3
Trouble with parents (one or both)	141	37.5
Living away from your family	134	35.6
Change in eating habit	116	30.9
Trouble with teachers	85	22.6

Total number of participants = 376.

Discussion

This study found that the students used active coping strategies (active coping, religious coping, positive reframing, planning, and acceptance) more than avoidant strategies (denial, self-blame, and alcohol or substance use). However, we cannot ignore that some students are still using avoidant coping strategies, which are considered risk factors for adverse responses to stress. A previous study in Nepal (23) showed similar findings. Another qualitative study among medical students in Malaysia (24) found that most common ways to deal with stressful events were the active coping strategies; they did not report any undesirable coping strategies, such as drinking alcohol and smoking. This could be due to the use of focus group discussions, which might result in the students' hesitation to discuss culturally unacceptable behaviours in front of their peers and focus group leaders. In comparison with previous studies from the United Kingdom (20,21) that reported the use of alcohol, tobacco, and drugs as common coping strategies in medical students, it was encouraging to find in our study that alcohol or substance use was

the least common coping strategy. This may be related to the students' religious beliefs, although under-reporting cannot be ruled out.

In this study, male students used active coping less, and alcohol or substance consumption more than female students did. This is in contrast to a previous study (23) in which male students used both active coping and alcohol or substance more than female students did.

In this study, older students used active coping, reframing, and planning more than younger students did. The reasons might be that older students have adapted to the college environment better, and that they have had a longer period of contact with mentors than younger students did.

One of the important findings in this study was the association of smoking with both coping strategies and perceived stress. Smokers used active coping strategies less than non-smokers, which might mean that smoking may affect a student's ability to cope positively with stress. Smokers also used alcohol or substance more than non-smokers did. The current cross-sectional study cannot provide evidence for a causal relationship between smoking and drinking

alcohol, although a previous prospective study among students by Morgen et al. (28) showed that smoking was associated with an increased risk of becoming a heavy drinker eight years later.

This study also showed that students who were smokers perceived greater stress than non-smokers did. Previous studies (29,30) showed that smokers have higher stress levels than non-smokers.

Worries of the future, financial difficulties, and academic life were the most common stressors among medical students in this study. This finding was similar to that of previous studies (13,24).

In this study, there was an association between perceived stress and coping strategies, which may mean that the way students cope with stress might affect their perception of stress. Therefore, teaching students to use desirable coping strategies may reduce stress. This study found a high prevalence of stress among students, at 46.3%, which was higher than that found in two previous Malaysian studies, at 41.9% (4) and 29.6% (31), but was lower than that among students at a medical college in Saudi Arabia, at 57.0% (32). However, these studies used different tools to measure stress.

Conclusion

A substantial number of medical students experience high amount of perceived stress, and the strategies stressed students used to cope with the pressure differ from that used by non-stressed students. Medical students were exposed to a variety of stressors during the course of their study. They used mainly active coping strategies rather than avoidant strategies. Males, smokers, and younger students used active coping strategies less than other students did. Smokers reported high stress and tended to use alcohol or substance more than non-smokers did.

Knowing the causes of stress among students and methods students use to deal with it will help lecturers, career-counselling centres, and university administrators monitor and control these factors in order to reduce stress experienced by students.

The findings of this study indicate a need for stress management programmes in all medical colleges. One approach is to eliminate, or at least reduce, the most commonly identified sources of stress among medical students. Another approach is to conduct workshops on stress and effective coping strategies through the academic years. The presence of counsellors among the faculty may help students overcome stressful conditions.

It is important to maintain a well-balanced academic environment for improved learning experience. A focus on students' needs and problems can help prevent the harmful effects of stress on heath and academic performance. Our results also emphasise the need for further study, particularly in the form of longitudinal follow-up.

Authors' Contributions

Conception and design, analysis and interpretation of the data, drafting of the article: SARA
Collection and assembly of the data: MAA
Critical revision of the article: RAA, KGR
Administrative, technical, or logistic support: RAA, MAA

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