

**ORIGINAL ARTICLE**

**STRESS AND COPING STRATEGIES AMONG MEDICAL STUDENTS IN NATIONAL UNIVERSITY OF MALAYSIA, MALAYSIA UNIVERSITY OF SABAH AND UNIVERSITI KUALA LUMPUR ROYAL COLLEGE OF MEDICINE PERAK**

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**ABSTRACT**

**Introduction :** Stress is part of our life. It can happen anywhere including in medical school. Medical school is perceived as being stressful because their difficulties in education, longest period of study and dealing with the patients. Stress can be perceived as negative or positive. Coping strategies are the method that we can use to prevent stress when it comes to us. The aim of this study was to determine the prevalence of stress and coping strategies among of medical students in National University of Malaysia, Malaysia University of Sabah and Universiti Kuala Lumpur Royal College of Medicine Perak.

**Methods :** This study involved 450 medical students through stratified sampling in which 150 medical students from each of the three universities. This study was conducted through self administered questionnaires. The questionnaires included were socio demographic factor, Personal Stress Inventory (using Stress Symptoms Scale with 52 items), BRIEF COPE (Coping Orientation for Problems Experienced with 28 items). The determination of cut off point for stress symptoms score was using Receiver Operating Characteristic (ROC) curve.

**Results :** Response rate was 90.8%. The prevalence of stress among medical students were 44.1%. The contributory factors to the stress were financial problems, stress of upcoming examination period, relationship problems with parents, peers, siblings and lecturers. Coping mechanisms which had significant association with stress includes self distraction, venting of emotion, denial, behavioral disengagement, humor and self blaming. Multiple linear regression analysis revealed a significant association ( $p < 0.05$ ) between stress scores and venting of emotion, self blaming, problems of relationship with peers, parents, lecturers and financial problems. These factors explained the 30.1% variation of stress score symptoms.

**Conclusion :** Almost half of the medical students had stress and they have used coping strategies during handling the stress from worsening. Financial problems and relationship problems were the two most influencing factors in stress. Therefore, the results of this study can be used to determine the preventive steps in stress among medical students and the coping strategies used in handling stress.

**Key words :** Stress, Coping Strategies, Financial Problems, Relationship Problems.

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## INTRODUCTION

Universities and college students especially those who just had registered to enter the high learning institution is the group of students who were easily to get stress<sup>1</sup>. It probably due to the changes of their life and transition of life in college<sup>2</sup>. Medical students are basically have five to six years course to complete their study. Therefore, stress among medical students can be happen as well as other students in the college. The difficulties to acomodate themselves in the new culture and enviroment can effect themselves<sup>3</sup>. Besides that, the relationship with others students and the thinking of frightened to be expel from medical school are the other causes why the medical students become stress<sup>4</sup>.

In other study in Nepal, it shows that the stress among medical students in medical science college Manipal are due to stays in hostel, high expectation from the parents, academic problems and no time for entertainment and not enough time<sup>5</sup>. The very high intensity and prolong exposure to stress can give negative impacts in health, mentally and physically<sup>6</sup>. When the stress become negative perception and more, it will effect the academic performance<sup>7</sup>. A study done in Universiti Putera Malaysia by Sherina found that 41.9% of medical students are having emotional disorder<sup>8</sup>. However there was no study done to know coping strategies among of medical students. Coping strategies depend on the differences in the student backgrounds and they shows the diferrences of psychological process<sup>9</sup>.

A study in medical college in Mumbai showed how coping strategies among them can reduced or prevent stress among of them<sup>10</sup>. The strength of stress experienced was influenced by the students ability in using effective coping strategies in stressful situation<sup>1</sup>. A study showed that those who did not know how to use coping strategies to handle stress would experience more stressful condition<sup>11</sup>. Those who used coping strategies could handle stress better than who did not<sup>12</sup>. The use of coping strategies are depends of the gender, phase of study and parents occupation<sup>5</sup>. The coping strategies that usually use are planning, acceptance, active coping, emotional support and behavioral changes<sup>3</sup>. Male students usually use active coping, alcohol and supportive instruments<sup>13</sup>.

## OBJECTIVES

The aim of this study was to determine the prevalence of stress and to find out the common coping strategies among medical students in all three universities involve in this study. The study also aims to determine the factors that are associated with the stress score symptoms such as year of study, gender, universities, status, financial problems, relationship problems and depressed during the examination period.

## METHODOLOGY

### *Study design*

A cross-sectional study was conducted among medical students in Universiti Kebangsaan Malaysia (UKM), Universiti Malaysia Sabah (UMS) and Royal College of Medicine Perak (RCMP) from September 2008 to December 2008. The study was approved by the Research and Ethics Committee, Medical Center University Kebangsaan Malaysia.

### *Sample Size*

The inclusion criteria was all medical students in all three universities who were practicing and studying in main campus and the exclusion criteria were those with a medical condition such as mental illness like depression, student on medical leave or on semester break and those who are posting outside from the main campus or main hospital. A total of 450 questionnaires were distributed through stratified sampling by year of studies, gender and universities in which 150 copies of complete questionnaires were distributed to each university and from that number, 30 copies each were given to the sample from each year of study in which 15 from male and 15 from female students from that year of study were recruited. The sample selected from randomized sampling from the list of the students name after the exclusion of students who categorized in the exclusive criteria.

### *Method*

This study was permitted by the Medical and Ethics Research Committee of Medical Center of National University of Malaysia. The questionnaires were given to the students after the briefing and consent was obtained from them. The participation of the students was on voluntary basis and confidentiality of information was assured.

**Research instruments**

A structured self-administered questionnaire was used, divided into Part A (sociodemographic; age, gender, ethnic, marriage status, year of learning, depress during the examination period, having examination), Part B (factors contributing to stress; financial problems, problems in relationship with parents, siblings, friends, boyfriend or girlfriend and lecturers), Part C (Personal Stress Inventory with Stress Symptoms Scale with 52 questions and 11 subscales). The inventory consists of 52 items which are the symptoms of stress. It is scored on a four-point Likert –type response from "none at all" (scored as 0) and "very frequently" (scored as 3). A total of stress score for each respondent from the questionnaire arise after calculated all score from 52 questions. Respondents who rated scores of more than 39 were considered currently as stressed after using ROC curve from the actual stress perceived by the student and stress symptoms scores by the students.

Part 4 (Coping method by using Coping Orientation of Problem Experienced (COPE) to measure the coping strategies with 28 Questions with 4 scales. It is divided into 14 subscales with Alpha Cronbach values between 0.50 to 0.90. A standard questionnaire which was translated into Malay version (Personal Stress Inventory and COPE questionnaire) was used.

**Statistical analysis**

Data entry and analysis were done using the SPSS version 13.0. Statistical significance was considered if  $p < 0.05$ . Bivariate analysis (chi square test and independent t test) and multivariate analysis (linear regression) were used to study the prevalence of stress, associated factors and coping strategies.

**RESULTS**

The overall response rate was 90.8%. RCMP was the highest respond rate of 94.6% and UKM medical students had the lowest response rate with 86%.

Malays were the majority of respondent with 61.4% and Indians were the smallest respondents with 6.6% from all of the respondents. Medical students at second and final years were the commonest respondents with each being 21.3%. Mean of age was  $21.9 \pm 1.9$  years old and the numbers of respondents from both female and male were almost in equal with 51.3% for female students and 48.7% for male students. Almost 97.6% were single with 93.2% claimed to have highest stress level during academic examinations. Nevertheless, only 24.7% were having examination during this research (Table 1).

**Table 1 Sosiodemography of the respondents (n=409)**

	Frequency (n)	Percentage (%)
Age ( years)		
18.00 – 19.99 y.old	35	8.6
20.00 – 21.99 y.old	151	36.9
22.00 – 23.99 y.old	136	33.2
24.00 – 25.99 y.old	78	19.1
26.00 and above	9	2.2
Mean(s.d.)	21.91(±1.89)	
Years of Learning		
First year	79	19.3
Second year	87	21.3
Third year	84	20.5
Fourth year	72	17.6
Fifth year	87	21.3
Gender		
Male	199	48.7
Female	210	51.3

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Ethnic		
Malay	251	61.4
Chinese	97	23.3
Indian	7	6.6
Others	34	8.3
Marital Status		
Married	10	2.4
Single	399	97.6
Academic Factors		
Sitting for examination		
Yes	101	24.7
No	308	76.3
Stress during examination		
Yes	381	93.2
No	28	6.8

The prevalence of stress is 44.1%. The stress status was determined by the total of stress symptoms scale compared to the actual stress perceived by the students during the study done. From these data, the curve of Receiver Operating Characteristic (ROC) was built after the specificity and sensitivity value were obtained. Stress among UKM student was 46.9% compare to UMS 42.3% and RCMP 43.0% (Table 2). However there is no significant from the chi square test. The prevalence of stress among male and female medical students were 40.2% and 47.6% respectively. Though female students had higher stress level compare to male students, they were not statistically significant. Malays are more stress compare to other ethnics and married students are less stress compare to single status. Students perceived stress during examinations had higher stress level compare to those who perceived no stress( $p=0.01$ ). On

the other hand, students who were sitting the exams, had higher stress level compared to those who were not sitting examinations during this study period(Table 2).

Students with mean age  $21.81 \pm 1.9$  year old had higher stress level compare to older age with financial problem being significantly quoted as a stressor according to the independent student t test with t value 3.82 and with mean 1.65. Mean score for problem in peers relationship was higher than the others with 1.37 for stress and 0.87 for those have no stress. Other relationship problems such as problems with parents, siblings and lecturers were significant with p value less than 0.01. However relationship problems with boyfriend or girlfriend was not significant from student t test (Table 2).

**Table 2 Relationship between universities, sociodemography factor, factor of relationship problems, academic factors and stress status among of medical students (n=409)**

<b>Factor</b>	<b>Stress n(%)</b>	<b>Non stress n(%)</b>	<b>χ<sup>2</sup>value</b>	<b>t value</b>	<b>P value</b>
<b>Gender</b>			2.28		0.13
Male	80(40.2)	119(59.8)			
Female	100(47.6)	110(52.4)			
<b>Ethnic</b>			5.40		0.15
Malay	120(47.0)	131(53.0)			
Chinese	33(34.0)	64(66.0)			
Indian	12(44.4)	15(55.6)			
Others	15(44.1)	19(55.9)			
<b>Marital status</b>			0.79		0.07
Married	4(40.0)	6(60.0)			
Single	176(44.1)	223(55.9)			
<b>Sitting for exam</b>			0.56		0.35
Yes	47(46.5)	54(53.5)			
No	133(43.2)	175(56.8)			
<b>Stress during exam</b>			6.22		0.01*
Yes	174(45.7)	207(54.3)			
No	6(21.4)	22(78.6)			
	<b>Mean(s.d.)</b>	<b>Mean(s.d.)</b>			
Age	21.8(±1.97)	22.0(±1.83)		1.03	0.30
Financial Problem	1.65(±1.01)	1.26(±1.04)		3.83	0.01*
Relationship problem with parent(s)	0.69(±0.86)	0.30(±0.59)		5.49	0.01*
Relationship problem with sibling(s)	0.64(±0.85)	0.32(±0.59)		4.49	0.01*
Relationship problem with peer(s)	1.37(0.85)	0.87(±0.78)		6.17	0.01*
Relationship problem with partner	0.62(±0.99)	0.52(±0.83)		1.03	0.32
Relationship problem with lecturer(s)	0.79(±0.92)	0.47(±0.69)		3.99	0.01*
UKM	61(46.9)	69(53.1)	0.67		0.72
UMS	58(42.3)	79(57.7)			
RCMP	61(43.0)	81(57.0)			
Total	180(44.1)	229(55.9)			

Statistical test: Chi square test (χ<sup>2</sup>)

From table 3, mean scores and standard deviation for positive assessment and self development is the highest with 2.12±0.69 for the stress medical students and 2.03±0.71 for non stress group. For religious resolution, the mean and standard deviation is 2.11±0.79 for stress group and acceptance is 2.06±0.65. These are among highest mean scores and

standard deviation. However for coping strategies such as denial, behavioral disengagement, substance abuse, self blaming, self distraction and venting of emotion, these coping method have very low mean scores and standard deviation.

**Table 3 Mean comparison between mean score for coping strategies stress respondents and non stress respondents. (Stress = > 39 score symptoms )**

Coping strategies factors	Stress (n=180) mean (s.d.)	Non stress (n=229) mean(s.d.)	t value	p value
Positive reframing	2.12(0.69)	2.03(0.71)	1.24	0.22
Self distraction	1.15(0.51)	0.91(0.53)	4.55	0.01*
Venting of emotion	1.36(0.65)	1.00(0.70)	5.31	0.01*
Instrumental support	1.88(0.75)	1.76(0.85)	1.44	0.15
Active coping	1.85(0.61)	1.86(0.68)	0.16	0.87
Denial	0.72(0.68)	0.53(0.58)	2.91	0.04*
Religion	2.11(0.79)	1.91(0.91)	2.39	0.07
Humor	1.10(0.78)	0.88(0.66)	3.18	0.02*
Behavioral disengagement	0.68(0.63)	0.39(0.55)	4.90	0.01*
Emotional support	1.88(0.79)	1.80(0.86)	1.01	0.32
Substance abuse	0.18(0.52)	0.10(0.37)	1.77	0.08
Acceptance	2.06(0.65)	2.03(0.71)	0.35	0.73
Self blaming	1.16(0.69)	0.75(0.64)	6.16	0.01*
Planning	2.01(0.68)	2.01(0.71)	0.01	0.99

Statistical test: Independent t test  
Significant at p<0.05  
s.d. : standard deviation

There was weak correlation between stress symptom score and sources of stress in this study although the p value was less than 0.05. The highest correlation is relationship problem with peer(s). Pearson correlation value for all coping strategies are generally weak correlation and only 5 coping strategies are negative correlation compare others are

positive. The highest correlation is acceptance (r=0.770), follow by emotion social support (r=0.710). The weakest correlation are active coping (r=0.065), positive assessment and self development (r=0.072), substance use (r=0.085), humor (r=0.180) and religious resolution (r=0.119) (Table 4).

**Table 4 Correlation between stress symptom score with sources of stress and coping strategies scores**

Sources of stress variable	Stress symptom score	p value
	Pearson Correlation , r	
Financial problem	0.22	< 0.01*
Relationship problem with parent(s)	0.28	< 0.01*
Relationship problem with sibling(s)	0.26	< 0.01*
Relationship problem with partner	0.12	< 0.01*
Relationship problem with peer(s)	0.35	< 0.01*
Relationship problem with lecturer(s)	0.22	< 0.01*
<b>Coping strategies</b>		
Positive reframing	0.072	0.15
Self distraction	0.218	0.01*
Venting of emotion	-0.376	0.01*
Instrumental support	0.122	0.01*
Active coping	-0.065	0.19
Denial	0.189	0.01*
Religion	-0.119	0.02*
Humor	0.180	0.01*
Behavioral disengagement	0.296	0.01*
Emotional support	0.710	0.01*
Substance abuse	-0.085	0.08
Acceptance	0.770	0.01*
Self blaming	0.393	0.01*
Planning	-0.200	0.69

Multivariate linear regression analysis revealed a significant association ( $p < 0.05$ ) between stress scores and emotional support, self blaming, financial problem, relationship

problem with peer, parent and lecturer (Table 5).

**Table 5 Predictor for stress symptoms score among medical students**

Factor/ Variable	$\beta$ value	C.I. 95%	Beta	P value
Constant	13.325			
Venting of emotion	-6.892	-4.215--9.569	-0.231	0.01
Self blaming	6.927	4.193-9.660	0.229	0.01
Financial problem	1.879	0.164-3.593	0.930	0.03
Relationship problem with peer(s)	4.926	2.662-7.190	0.198	0.01
Relationship problem with parent(s)	2.862	0.308-5.417	0.101	0.02
Relationship problem with lecturer(s)	2.389	0.141-4.636	0.920	0.03

Statistical test : Multiple Linear Regression Analysis

Significant at  $p < 0.05$

C.I.= confidence interval ;  $\beta$  = beta

## **DISCUSSION**

The respond rate was 90.8% in total from all three universities however it was lower than the respond rate in the study done in Universiti Putra Malaysia by Sherina<sup>8</sup> in 2002 in which the respond rate was 95.6%. The prevalence of stress was found to be 44.1% which was more than the previous studies by Sherina (41.9%). However she used different instruments. A study done showed the prevalence of stress among medical student in Bangkok Thailand was 61.4%<sup>14</sup>. Whereas a study done in Nepal showed a prevalence of stress was 20.9%<sup>5</sup> and interestingly in Egypt, the prevalence of stress was 94.5%<sup>15</sup>. However it could not be compared due to the different of instrument used and the differences of sociodemography data from different places.

Only three out of eight hypothesis of this study were significant. There were relationship problems with peers and financial problem had significant stress score. Stress among Universiti Kebangsaan Malaysia female students was more than those in Universiti Malaysia Sabah and Royal College of Medicine Perak.

The factors that were associated with the prevalence of stress among these medical students were financial problem, poor relationship with parents, peers, siblings, partner and lecturers. This study showed that female medical students had higher stress compare to male students even though it was not significant. During the study period, students who were sitting for academic examinations had higher stress than those were not. Among the exam takers, there was higher number of students with stress than those who were not stress during academic examinations. The students who claimed stress during the exams during this study, showed that they are having stressed more compared to those who claimed did not stress during the exams. This finding was supported by a study which stated that there was clinically significant emotional distress among medical students during the examinations<sup>16</sup>.

This study showed that poor student-lecturer relationship was a significant stressor. This finding was supported by results from two earlier studies<sup>15,17</sup>. Financial problem was another factor that influenced the stress score among the medical students. It was supported by a study in Egypt in which they found that financial problem is among of the cause factor for stress<sup>15</sup>. A study done by Ross showed that financial problem is a cause of stress among college student<sup>17</sup>.

Relationship problems with peers or course mate is another finding from this study in which significant from statistical study. It was corresponded with study by Sgan-Cohen in which they found that relationship with peers or course mates is part of academic needs in the faculty<sup>18</sup>. Peers or course mates were very important in understanding the lecture given by the lecturers. They could discuss among of them to understand in whatever difficult topics they have. Therefore, if the students have relationship problem with their peers, they will have more difficulties to understand the topic. As we know, learning in medical education, they need to have a group of study to discuss the topics if they want to understand more.

The other causes for stress among medical students are due to relationship problem with parent and siblings. This finding is corresponded with finding by Sherina study in UPM<sup>8</sup> and another study which found the student who have good relationship with parent or sibling able to cope with the stress<sup>19</sup>. Once these students have problem with their parent or sibling, they would have financial problem or getting social support while they studying in medical school.

The coping strategies are basically to prevent stress among of any population. However it can make stress become worst if the students use the negative coping mechanism. Coping strategies can make the stress become worst or vice versa<sup>20</sup>. In the present study shows that the students that use all strategies to prevent stress however, the significant strategies from this study are the self distraction, venting in emotion, denial, behavioral disengagement, humor and self blaming.

From the multilinear regression showed that venting of emotion, self blaming, financial problem, relationship problem with peer, parent and lecturer are the factors that influenced the prevalence of stress among medical students in this study. The positive coping mechanism are suppose to reduce or prevent stress, where as negative coping mechanism can shows vice versa. Most probably due to self blaming coping strategy can make the students cannot focus to their problems that they have. Negative thinking with self blaming will never resolve the problems. Then it will make condition even more stressful. However with venting of emotions, the stress can be reduced.

The study was limited by its design as it is a cross sectional study because it did not show direct cause and effect. The effect from coping strategies that were used by the medical students could not be determined within short of time. The needs of longitudinal study should

be propose to look into the effectiveness of coping strategies besides to find out other causes of stress among of them. Due to technical difficulties, as the students had tight specific schedules during the study period, some questionnaires were not returned to the researcher. Different coping strategies were used by the students who had stress. The study did not include other factors that might contribute to stress such as the detail about academic problems including the academic task, the time management and the differences in academic modules in the three universities that could influence the results of the study. These factors need to be studied to determine the best preventive measures in handling stress among medical students in all universities in Malaysia especially in the studied population of UKM, UMS and RCMP.

### CONCLUSION

The prevalence of stress among medical students in these three UKM, UMS and RCMP is 44.1%. Financial problems and relationship problems were the two most associated factors with stress. Therefore, urgent solutions are needed to help them with coping strategies in the stressful environment in medical school. The results of this study can be used to determine the steps to take in handling stress among the medical students thereby reducing the number of students who need to repeat the exams or from being suspended or expelled from medical school due to poor academic results as a result of unresolved stress.

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