Prevalence and risk factors of Stress, Anxiety and Depression among Preclinical Medical students in Universiti Putra Malaysia in 2014

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Abstract

Aims: To determine the prevalence and risk factors of stress, anxiety, and depression among preclinical medical students of Universiti Putra Malaysia in 2014.

Settings and Design: Cross sectional study design was used.

Methods and Material: A questionnaire was distributed to the students which included questions about the demographic factors of the students, the DASS-21 questionnaire which is made of three domains namely stress, anxiety and depression and the MSSQ-20 questionnaire which was used to determine the risk factors that affect the students.

Statistical Analysis: Data were entered and analyzed using statistical packages for social sciences (SPSS) version 19. Descriptive statistics was used to determine the prevalence of stress, anxiety and depression. Logistic regression was used to determine the risk factors.

Results: Prevalence of stress, anxiety, and depression were 16.9%, 52% and 24.4% respectively. Gender, group activities related stressor, love relationship, and absence of financial support are the main risk factors for stress in preclinical medical students of University Putra Malaysia. Multiple logistic regression shows that there is significant association between living in rural area and anxiety [adjusted OR 2.4, 95% C.I. (1.26, 4.59), $p= 0.008$]. Also, group activities related stressor is significantly associated with anxiety [adjusted OR 2.56, 95% C.I. (1.8, 3.64), $p <0.001$]. Risk factors for depression include gender (females are protected against depression compared to males [adjusted OR

0.21, 95% C.I (0.095, 6.03), *p* <0.001]). As in anxiety and stress, group activities related stressor is associated with depression [adjusted OR 3.76, 95% C.I. (2.35, 6.03), P < 0.001].

Conclusions: Group related activity was found to be the main factor affecting psychological distress in preclinical medical students in Universiti Putra Malaysia in 2014.

Key words: Prevalence, risk factors, anxiety, stress, depression, Malaysia, medical Students, DASS

Introduction

Medical education aims to produce future doctors who are equipped with adequate knowledge, competency, in order to care for their patients, contribute to the development of the art of medicine, and to promote public health. Prospective medical professionals undergo highly selective procedures by the medical schools which aim to recruit brilliant and empathic students who are committed to these aims and willing to dedicate four years to establish them.[1]

The U.S. and Canadian systems of medical education starts with students who have gained a bachelor's degree that minimally consists of basic training in biology, chemistry, and physics, as well as training in the humanities. Applicants usually have experience caring for patients through employment or volunteer work before joining medical school and must undergo comprehensive tests and a rigorous application and interview process. These processes are established to scrutinize individuals who intend to establish a future career in medicine. Once selected, medical schools and the students will work together to prepare students for a useful and fulfilling career at both individual and community levels.[2]

Based on the above, we may expect that medical school would be a time of personal development, achievement, and well-being. However, research shows that there are many negative effect on students' mental health due to the current educational process which may have led to high prevalence of depression, anxiety, and stress among medical students[3]. It has also been theorized that burnout, a measure of distress common among residents and physicians in practice originates in medical school[1]. Many factors are thought to contribute to this decline in students' mental health including academic pressure, workload, financial concerns, sleep deprivation, exposure to patients' suffering and deaths, student and abuse.[4] Some have suggested that psychological distress among students may adversely influence their academic performance[5], contribute to academic dishonesty[6], and play a role in alcohol and substance abuse.[7] Student distress has also been reported to be associated with cynicism, an unwillingness to care for the chronically ill, [8]and decreased empathy.[9]

Psychological distress mainly depression is an increasing problem worldwide; the prevalence varies from country to country as well as from institution to another. Among those students with psychological disorders such as depression a very small percentage seeks treatment and only a fraction of them actually receives it. (Less than 25% of

depression patients have access to psychiatric care and treatment in the world). Depression is predicted to be the leading cause of disease burden by 2030.[10] Medical education, due to its structure, it is considered to be very stressful with a high proportion reaching up to 40% affected with psychological distress. Medical school is a time of significant psychological distress for physicians-in-training. Currently available information is insufficient to draw firm conclusions on the causes and consequences of student distress.[11]

This study aimed to identify the prevalence of psychological distress (stress, anxiety and depression) among preclinical medical students and to explore the possible causes of stress by identifying the main stressor factors. The selection of the preclinical students is determined to identify the problem at an early stage in order to help the students to cope with their future stress in clinical years as the studies showed that the stress levels as persistent throughout the years of medical education as well as in physicians under training.[12,13]

Methods

Study design and population

A cross sectional study to determine the prevalence and risk factors of psychological distress in preclinical medical students of University Putra Malaysia.

Methods of data collection

A questionnaire was distributed to the students which included 3 sections. Section one includes the demographic factors of the students and specific risk factors which include residence, accommodation, religion, financial support, and love relationship. Section two includes the DASS-21 questionnaire which is made of three domains namely stress, anxiety and depression. Section three includes the MSSQ-20 questionnaire which was used to determine the stressors that affect the students. Using the MSSQ, the stressors will be grouped into 6 main domains namely: 1) Academic related stressor, 2) Inter/Intrapersonal Related Stressor, 3) Teaching and Learning Related Stressor, 4) Social Related Stressor, 5) Drive & Desire Related Stressor, and 6) Group Activities Related Stressor.

Statistics

Data were entered and analyzed using statistical packages for social sciences (SPSS) version 19. The distribution and frequencies were examined. The continuous variables were expressed as mean and standard deviation or median and interquartile range. The frequencies and percentages for categorical variables were described. Simple and multiple logistic regression were used to determine the risk factors of psychological distress.

Results

Data was entered, explored, cleaned and analyzed using SPSS version 19.

Characteristics of subjects

A total of 237 students were enrolled in the study. The response rate was 100%. The mean age of the respondents was 19.87 years with a standard deviation of 0.88 years. Forty six percent were year one students and 30% were male. Majority of the students were Malay (67%). Most of the students live in urban area. Sixty nine percent were Muslims. Other factors are shown in table 1.

Prevalence of Psychological distress

Using DASS-21, the prevalence of stress was 16.9%, anxiety was 52% and depression was 24.4%. The details of the severity and the 95% confidence interval are shown in table 2.

Risk factors of psychological distress

Univariate analysis of the risk factors of stress ,using simple logistic regression, shows that females have lower risk compared to males [OR 0.44, 95% C.I. (0.22, 0.88), *P*-value 0.021]. Buddhist have higher risk compared to Muslims [OR 2.33, 95% C.I. (1.05, 5.18), *P*-value 0.037]. Absence of financial support is a risk factor for stress [OR 2.48, 95% C.I (1.14, 5.43), *P*-value 0.023]. Students without love relationship seem to be protected against stress [OR 0.4, 95% C.I. (0.19, 0.83), *P*-value 0.014]. All domains of the MSSQ-20 show a significant association with stress. Results are shown in table 3.

Multivariate analysis shows that gender, group activities related stressor, love relationship, and absence of financial support are the main risk factors for stress in preclinical medical students of University Putra Malaysia (Table 4).

Regarding anxiety, Univariate analysis, using simple logistic regression, shows that all the domains of the MSSQ-20 have a significant association with anxiety (Table 5).

Multivariate analysis, using multiple logistic regression, shows that living in rural area is significantly associated with anxiety [adjusted OR 2.4, 95% C.I. (1.26, 4.59), *P*-value 0.008]. Also, group activities related stressor is significantly associated with anxiety [adjusted OR 2.56, 95% C.I. (1.8, 3.64), *P*-value <0.001] (Table 6).

Univariate analysis for risk factors of depression using simple logistic regression shows that females are protected against depression [OR 0.33, 95% C.I. 0.18, 0.61), *P*-value <0.001]. Also, absence of financial support is a risk factor for depression [OR 2.05, 95% C.I. (1, 4.22), *P*-value 0.05]. Absence of love relationship seems to be a protective factor against depression [OR 0.48, 95% C.I. (0.24, 0.93), *P*-value 0.03]. Similar to stress and anxiety, all the domains of MSSQ-20 show a significant association with depression (Table 7).

At the multivariate analysis, risk factors for depression include gender (females are protected against depression compared to males [adjusted OR 0.21, 95% C.I (0.095, 6.03), *P*-Value <0.001]). Students living in rural area have 3 times the odds compared to those living in urban area [95%C.I. (1.46, 7.61), *P*-value 0.004]. Derive and desire related stressor is significantly associated with depression [adjusted OR 1.59, 95% C.I. (1.09, 2.33), *P*-value 0.017]. Also, group activities related stressor is associated with depression [adjusted OR 3.76, 95% C.I. (2.35, 6.03), *P*-value < 0.001].

Discussion

This study shows that there is a considerable amount of stress, anxiety and depression in medical students at Universiti Putra Malaysia. This is similar to other studies conducted in other Malaysian universities as well as in other parts of the world. [14-17]

Prevalence of stress was 16.9% which is lower than that reported by Inam et al [18] which reported 73% and 66% in year 2 and 1 respectively. Also it is less than that reported by a study conducted in Universiti Sains Malaysia (USM) in 2009. [12] The reason for this could be related to a program held by UPM to enhance the students coping strategies toward stress which is usually conducted at the end of year 1.

Our study shows that there is no association between year of the study, age, place of residence, race, and accommodation, living alone or with friends. However, the main risk factors that contribute to stress include male gender, having love relationship, lack of financial support, and group activities related stressor. Unlike the finding of Zaid et al. [16] having love relationship contribute to the stress significantly, but this could be merely as a result of relationship dynamics.

The prevalence of anxiety was 52% which is supported by the finding of another study conducted in Pakistan, Karachi.[19] and another conducted in USM in 2012.[20] After controlling for confounders the main factors contributing to anxiety among the medical students of UPM were living in rural area and group activities related stressor.

Depression ,on the other hand, had a prevalence of 24.4% which is lower than that reported by Inam et al. [18] and slightly lower than that reported by Sherina et al in a study conducted in UPM in 2003 which reported 35.9%.[14] The main factors that seem to contribute to depression in our study include male gender, living in rural area, derive and desire related stressor, and group activities related stressor.

Unlike other studies and the general understanding of psychological distress, it seems that female gender is a protective factor; however, this should not be taken lightly as the sample contained 70% females which may affect the results. Group activities related stressor found to be as a major factor contributing to the students' mental health which needs further exploration and research to identify their role.

Although most public universities in Malaysia have the same students' demographics, the generalizability of the study results is limited by the characteristics of the sample and we would recommend a major study that includes more than one university to be conducted to further examine the risk factors of stress, anxiety and depression in order to find a proper and generalized solution suitable for Malaysian students.

Conclusion

In this study, the need for complete and integrated strategy to prevent medical students' negative psychological problems has been highlighted. Although the prevalence is based on a screening tools (i.e. questionnaires), it does not affect the importance for further exploration and further research to improve self-reported negative emotion by the future medical professionals. A comprehensive collaboration between stakeholders in the government and medical schools should be implemented in order to improve medical students' psychological health.

Limitations of the study

Being a cross sectional study, this research needs to be supported with further research on medical students in UPM as well as other areas in Malaysia preferably a cohort study to compare the findings with our study.

Conflict of interest: None of the authors has any conflict of interest in publishing this article.

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Table 1: Respondent profile (n=237)

No.	Variable	Categories	Mean (sd)	N (%)	95% C.I.
1.	**Age**	-	19.87 (0.88)	-	19.76 – 19.99
2.	**Year of study**	Year 1	-	108 (45.6)	39.10 – 52.14
		Year 2	-	129 (54.4)	47.86 – 60.89
3.	**Gender**	Male	-	70 (29.5)	23.80 - 35.79
		Female	-	167 (70.5)	64.21 – 76.19
4.	**Race**	Malay	-	160 (67.5)	61.09 – 73.43
		Chinese	-	48 (20.3)	15.33 – 25.94
		Indian	-	23 (9.7)	6.25 – 14.20
		Others	-	6 (2.5)	0.93 – 5.43
5.	**Residence**	Urban	-	178 (75.1)	69.09 – 80.48
		Rural	-	59 (24.9)	19.52 – 30.90
6.	**Accommodation**	Hostel	-	225 (95)	91.32 – 97.36
		Own home	-	12 (5)	2.64 – 8.68
7.	**Living with?**	Alone	-	6 (2.5)	0.93 – 5.43
		Friends	-	221 (93.3)	89.27 – 96.09
		Family	-	10 (4.2)	2.04 – 7.62
8.	**Religion**	Islam	-	164 (69.2)	62.90 – 75.01
		Buddhist	-	42 (17.7)	13.08 – 23.19
		Hindu	-	21 (9)	5.57 – 13.23
		Christian	-	10 (4.2)	2.04 – 7.62
9.	**Working?**	Yes	-	2 (0.8)	0.10 – 3.01
		No	-	235 (99.2)	96.99 – 99.99
10.	**Financial Support**	Full	-	131 (55.3)	48.70 – 61.71
		Partial	-	65 (27.4)	21.85 – 33.58
		Nil	-	41 (17.3)	12.71 – 22.73
11.	**Love**	Yes	-	53 (22.4)	17.22 – 28.20
		No	-	184 (77.6)	71.79 – 82.78

Table 2: Prevalence of Psychological distress using DASS-21 (n=237)

No.	Tool	Category	n	Prevalence	95% C.I.
1.	**DASS (Depression)**	Normal	179	75.5	69.54 – 80.86
		Mild	24	10.1	6.60 – 14.69
		Moderate	24	10.1	6.60 – 14.69
		Severe	6	2.5	0.93 – 5.43
		Extremely Severe	4	1.7	0.46 – 4.26
2.	**DASS (Anxiety)**	Normal	114	48.1	41.59 – 54.66
		Mild	36	15.2	10.87 – 20.40

		Moderate	53	22.4	17.22 – 28.21
		Severe	17	7.2	4.23 – 11.24
		Extremely Severe	17	7.2	4.23 – 11.24
3.	**DASS (Stress)**	Normal	197	83.1	77.73 – 87.66
		Mild	18	7.6	4.56 – 11.74
		Moderate	16	6.8	3.91 – 10.73
		Severe	4	1.7	0.46 – 4.26
		Extremely Severe	2	0.8	0.10 – 2.76

Table 3: Simple logistic regression for risk factors of stress using DASS-21 for pre-clinical medical students of UPM (n=237)

No.	Variables	Categories	OR	95% C.I	P Value
1.	**Year of study**	Year 1	1	-	-
		Year 2	1.70	(0.84 , 3.44)	0.144
2.	**Age**	-	1.42	(0.96 , 2.09)	0.077
3.	**Gender**	Male	1	-	-
		Female	0.44	(0.22 , 0.88)	0.021
4.	**Residence**	Urban	1	-	-
		Rural	1.37	(0.65 , 2.90)	0.414
5.	**Race**	Malay	1	-	-
		Chinese	1.89	(0.86 , 4.14)	0.112
		Indian	0.85	(0.23 , 3.08)	0.805
		Others	1.13	(0.13 , 10.13)	0.911
6.	**Accommodation**	Hostel	1	-	-
		Home	0.98	(0.21 , 4.67)	0.984
7.	**Living with?**	Alone	1	-	-
		Friends	0.39	(0.07 , 2.21)	0.286
		Family	0.50	(0.05 , 4.98)	0.554
8.	**Religion**	Islam	1	-	-
		Buddhist	2.33	(1.05 , 5.18)	0.037
		Hindu	0.97	(0.27 , 3.56)	0.966
		Christian	0.65	(0.08 , 5.35)	0.687
9.	**Financial Support**	Yes	1	-	-
		No	2.48	(1.14 , 5.43)	0.023
10.	**Love**	Yes	1	-	-
		No	0.40	(0.19 , 0.83)	0.014
11.	**Academic related stress**	-	2.78	(1.75 , 4.42)	<0.001
12.	**Inter/Intrapersonal Related Stressor**	-	1.73	(1.20 , 2.50)	0.004
13.	**Teaching and Learning Related Stressor**	-	2.83	(1.82 , 4.40)	<0.001
14.	**Social Related Stressor**	-	2.11	(1.40 , 3.18)	<0.001
15.	**Drive & Desire Related Stressor**	-	2.04	(1.45 , 2.88)	<0.001
16.	**Group Activities Related Stressor**	-	3.68	(2.36 , 5.72)	<0.001

Table 4: Multiple logistic regression for risk factors of stress using DASS-21 for pre-clinical medical students of UPM (n=237)

No.	Variables	Categories	Adj. OR	95% C.I	P Value
1.	**Gender**	Male	1	-	-
		Female	0.33	(0.14 , 0.76)	0.010
2.	**Group Activities Related Stressor**	-	4.32	(2.61 , 7.15)	<0.001
3.	**Love**	Yes	1	-	-
		No	0.34	(0.14 , 0.83)	0.018
4.	**Financial Support**	Yes	1	-	-
		No	2.86	(1.10 , 7.42)	0.031

Table 5: Simple logistic regression for risk factors of anxiety using DASS-21 for pre-clinical medical students of UPM (n=237)

No.	Variables	Categories	OR	95% C.I	P Value
1.	**Year of study**	Year 1	1	-	-
		Year 2	0.88	(0.53 ,1.46)	0.611
2.	**Age**	-	0.93	(0.70 , 1.24)	0.613
3.	**Gender**	Male	1	-	-
		Female	0.87	(0.50, 1.53)	0.634
4.	**Residence**	Urban	1	-	-
		Rural	1.80	(0.98, 3.29)	0.057
5.	**Race**	Malay	1	-	-
		Chinese	0.69	(0.36, 1.32)	0.266
		Indian	0.75	(0.31, 1.80)	0.520
		Others	0.41	(0.07, 2.30)	0.310
6.	**Accommodation**	Hostel	1	-	-
		Home	1.32	(0.41, 4.27)	0.648
7.	**Living with?**	Alone	1	-	-
		Friends	1.05	(0.21 , 5.30)	0.956
		Family	2.33	(0.29 ,18.97)	0.428
8.	**Religion**	Islam	1	-	-
		Buddhist	0.84	(0.43, 1.66)	0.621
		Hindu	0.77	(0.31, 1.90)	0.566
		Christian	0.36	(0.09, 1.45)	0.150
9.	**Financial Support**	Yes	1	-	-
		No	1.56	(0.79, 3.11)	0.203
10.	**Love**	Yes	1	-	-
		No	0.78	(0.42 , 1.45)	0.437
11.	**Academic related stress**	-	1.93	(1.38 , 2.70)	<0.001
12.	**Inter/Intrapersonal Related Stressor**	-	1.36	(1.03 , 1.79)	0.031
13.	**Teaching and Learning Related Stressor**	-	1.71	(1.22 , 2.39)	0.002
14.	**Social Related Stressor**	-	1.77	(1.29 , 2.47)	<0.001
15.	**Drive & Desire Related Stressor**	-	1.34	(1.01 , 1.79)	0.044
16.	**Group Activities Related Stressor**	-	2.40	(1.70 , 3.37)	<0.001

Table 6: Multiple logistic regression for risk factors of anxiety using DASS-21 for pre-clinical medical students of UPM (n=237)

No.	Variables	Categories	Adj. OR	95% C.I	P Value
1.	**Residence**	Urban	1	-	-
		Rural	2.40	(1.26 , 4.59)	0.008
2.	**Group Activities Related Stressor**	-	2.56	(1.80 , 3.64)	<0.001

Table 7: Simple logistic regression for risk factors of depression using DASS-21 for pre-clinical medical students of UPM (n=237)

No.	Variables	Categories	OR	95% C.I	P Value
1.	**Year of study**	Year 1	1	-	-
		Year 2	1.51	(0.83 , 2.77)	0.18
2.	**Age**	-	1.04	(0.74 , 1.46)	0.82
3.	**Gender**	Male	1	-	-
		Female	0.33	(0.18 , 0.61)	<0.001
4.	**Residence**	Urban	1	-	-
		Rural	1.69	(0.88 , 3.25)	0.11
5.	**Race**	Malay	1	-	-
		Chinese	1.62	(0.79 , 3.32)	0.19
		Indian	1.56	(0.60 , 4.10)	0.36
		Others	0.71	(0.08 , 6.32)	0.76
6.	**Accommodation**	Hostel	1	-	-
		Home	1.58	(0.46 , 5.46)	0.47
7.	**Living with?**	Alone	1	-	-
		Friends	0.62	(0.11 , 3.46)	0.58
		Family	1.33	(0.16 , 11.07)	0.79
8.	**Religion**	Islam	1	-	-
		Buddhist	1.84	(0.88 , 3.87)	0.11
		Hindu	1.47	(0.53 , 4.08)	0.46
		Christian	1.58	(0.39 , 6.43)	0.52
9.	**Financial Support**	Yes	1	-	-
		No	2.05	(1 , 4.22)	0.05
10.	**Love**	Yes	1	-	-
		No	0.48	(0.24 , 0.93)	0.03
11.	**Academic related stress**	-	3.36	(2.17 , 5.22)	<0.001
12.	**Inter/Intrapersonal Related Stressor**	-	1.6	(1.17 , 2.23)	0.004
13.	**Teaching and Learning Related Stressor**	-	2.55	(1.72 , 3.77)	<0.001
14.	**Social Related Stressor**	-	2	(1.39 , 2.88)	<0.001
15.	**Drive & Desire Related Stressor**	-	2.03	(1.47 , 2.79)	<0.001
16.	**Group Activities Related Stressor**	-	3.12	(2.13 , 4.58)	<0.001

Table 8: Multiple logistic regression for risk factors of depression using DASS-21 for pre-clinical medical students of UPM (n=237)

No.	Variables	Categories	Adj. OR	95% C.I	P Value
1.	**Gender**	Male	1	-	-
		Female	0.21	(0.095 , 6.03)	<0.001
2.	**Residence**	Urban	1	-	-
		Rural	3.34	(1.46 , 7.61)	0.004
3.	**Drive & Desire Related Stressor**	-	1.59	(1.09 , 2.33)	0.017
4.	**Group Activities Related Stressor**	-	3.76	(2.35 , 6.03)	<0.001