

## The Prevalence of Anxiety Among Medical Students

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### ABSTRACT

**Objective:** This study was conducted to determine the prevalence of anxiety among medical students at a local university in Malaysia and to identify its associated factors. **Methods:** A cross-sectional study design was used. Three-hundred and ninety-six medical students at a local university in Malaysia were included in the study. A pre-tested, modified, self-administered Beck Anxiety Inventory (BAI) was used to screen for anxiety. **Results:** Three-hundred-and-ninety-six out of 414 medical students participated (response rate 95.7%). 38.4% of the medical students were found to have anxiety. **Conclusion:** The overall prevalence of anxiety among medical students was high (38.4%). Factors found to be significantly associated with anxiety were gender, perceived level of pressure, year of study in medical school, ethnicity and depression ( $p < 0.05$ ).

**Keywords:** Anxiety, depression, medical students, prevalence

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### INTRODUCTION

Medical education is well known to be an anxiety producing process for its students, with a large amount of knowledge to be acquired and multiple examinations to pass. As medicine has always been regarded as a popular choice in tertiary education, there is often an excess of applicants. Therefore, only candidates with excellent academic attainment can successfully enter Medicine. Even after being accepted into medical school, only those who can successfully maintain good grades will finally pass out as doctors. Thus, even though medical school is looked forward to by most, it can cause a great deal of stress and anxiety for its students.<sup>[1]</sup>

Anxiety can be defined as excessive worry and tension, on most days, for at least 6 months, together with the following symptoms and signs: increased motor tension (fatigue, trembling, restlessness, muscle tension); autonomic hyperactivity (shortness of breath, rapid heart rate, dry mouth, cold hands and dizziness). If not detected and treated early, anxiety can become a life-long problem. There is also a high rate of co-morbidity with depression. Anxiety causes disruption on day to day functioning and reduction in the quality of life.<sup>[2]</sup> A study by Van Ameringen *et al.* in Canada suggested that anxiety is associated with premature withdrawal from school, therefore causing a negative impact on educational achievement.<sup>[3]</sup>

A study among British medical students found that 39% had clinically significant levels of anxiety.<sup>[4]</sup> Anxiety was often reported among students studying for examinations, and especially in those with fear of failure, uncertainty about supervisors' expectations and uncertainties about their own performance.<sup>[5]</sup>

The objective of this study was to determine the prevalence of anxiety among medical students at a university in Malaysia and to identify its associated factors.

## METHODOLOGY

A cross sectional study was conducted in the Faculty of Medicine at a university in Malaysia, from June to August 2002. All medical students were selected as respondents. Verbal consent was obtained. A pre-test was done among students from another faculty. The pre-tested and modified Beck Anxiety Inventory (BAI) was used to screen for anxiety among the respondents. This validated questionnaire consisted of 21 questions. Scores of 22 and above were considered to be positive for anxiety.<sup>[6]</sup>

The BAI was developed to address the need for an instrument that would reliably discriminate anxiety from depression while displaying convergent validity. It is a self-reported questionnaire which consists of 21 items, each describing a common symptom of anxiety. The respondent is asked to rate how much he / she has been bothered by each symptom over the past week on a 4-point scale ranging from 0 to 3. The items are summed to obtain a total score that can range from 0 to 63. Studies done confirmed the reliability (median = 0.60 for internal consistency and item-total correlations) and validity of the BAI with self-report and clinician-rated scales. The correlation of the BAI with the Beck Depression Inventory (BDI) was 0.48. Based on the results of the studies, BAI has been recommended for use in assessing anxiety in clinical and research settings.<sup>[6]</sup>

The pre-tested and modified BDI consisting of 21 questions was used to screen for depression in the respondents. Scores of 11 and above were considered to be positive for depression.<sup>[7]</sup>

Data was analysed using the Statistical Package for Social Sciences programme version 10.0. Further analysis using logistic regression was done to determine the association of each factor with anxiety.

## RESULTS

Three-hundred-and-ninety-six out of 414 medical students participated and completed the questionnaires giving a response rate of 95.7%.

The overall mean age of the respondents was 21.55 years (95% Confidence interval 21.36 – 21.74 years). The overall age ranged from 18 to 29 years. The mean age for the males (21.66 years) was higher as compared to the females (21.48 years). However, this difference was not statistically significant ( $t = 0.92$ ,  $df = 394$ ,  $p > 0.05$ ).

Table 1 shows the characteristics of the respondents. Out of the 396 respondents, 244 (61.6%) were females and 152 (38.4%) males. Majority of the respondents were Malays (53.0%) followed by Chinese (36.1%) and Indians (6.8%). The highest number of students was in Year 1 ( $n=105$ ) and the lowest number in Year 5 ( $n=58$ ). This is because the intake of medical students has been increasing for the past 5 years. There is also a small number of students who have either failed or left the course causing the number of medical students to decrease as they progress in medical school. 53.8% of the respondents admit to feeling pressure due to exams. However, surprisingly, 46.2% deny feeling any pressure due to examinations. Majority of respondents claim to have good relationships with their parents (88.4%), siblings (86.1%) and course-mates (63.4%). However, only 35.1% claim to have good relationship with their lecturers. Out of 214 respondents who were involved in love relationships, 78 (36.4%) claim that they have problems.

Based on the BAI scores, 152 out of 396 respondents had scores of 22 and above, giving a prevalence of anxiety of 38.4% among the respondents. The mean score was 1.62, SD 0.487. Table 2 shows the factors which are associated with anxiety among the respondents. Anxiety was found to be significantly associated with gender, ethnicity, year of study and pressure due to exams ( $p < 0.05$ ). Table 3 shows the association of anxiety with each ethnic group and each year of study in medical school. There was significant association between anxiety and depression among the respondents ( $\chi^2 = 83.831$ ,  $df = 1$ ,  $p < 0.05$ ) (Table 4).

**Table 1.** Characteristics of respondents (n=396)

Characteristics	Number	Percentage
<i>Gender</i>		
Female	244	61.6
Male	152	38.4
<i>Ethnicity</i>		
Malay	210	53.0
Chinese	143	36.1
Indians	27	6.8
Others	16	4.1
<i>Year of Study</i>		
1 <sup>st</sup> year	105	26.5
2 <sup>nd</sup> year	73	18.4
3 <sup>rd</sup> year	84	21.2
4 <sup>th</sup> year	76	19.2
5 <sup>th</sup> year	58	14.7
<i>Pressure due to exams</i>		
Yes	213	53.8
No	183	46.2
<i>Relationship with Parents</i>		
Good	350	88.4
Poor	46	11.6
<i>Relationship with Siblings</i>		
Good	341	86.1
Poor	55	13.9
<i>Relationship with Coursemates</i>		
Good	251	63.4
Poor	145	36.6
<i>Relationship with Lecturers</i>		
Good	139	35.1
Poor	257	64.9
<i>Involvement in Boy-Girl/Love Relationship</i>		
Yes	214	54.0
No	182	46.0
<i>Problems in Boy-Girl / Love Relationship (n=214)</i>		
Yes	78	36.4
No	136	63.6

**Table 2.** Factors associated with anxiety among the respondents (n = 396)

Associated Factors	Anxiety Present (152)	Anxiety Absent (244)	p-value	95% Confidence Interval	Crude Odds Ratio
<i>Gender</i>					
Female	104	140	*0.028	1.052, 2.463	1.61
Male	48	104			
<i>Ethnicity</i>					
Malay	98	112	*0.000	1.410, 3.245	2.14
Non-Malay	54	132			
<i>Year of Study</i>					
Pre-clinical (1 <sup>st</sup> –3 <sup>rd</sup> year)	111	151	*0.028	1.053, 2.549	1.64
Clinical (4 <sup>th</sup> –5 <sup>th</sup> year)	41	93			
<i>Pressure due to exams</i>					
Yes	93	120	*0.020	1.079, 2.458	1.63
No	59	124			
<i>Relationship with Parents</i>					
Good	133	217	0.665	0.466, 1.628	0.87
Poor	19	27			
<i>Relationship with Siblings</i>					
Good	125	216	0.078	0.338, 1.064	0.60
Poor	27	28			
<i>Relationship with Coursemates</i>					
Good	93	158	0.473	0.564, 1.304	0.86
Poor	59	86			
<i>Relationship with Lecturers</i>					
Good	47	92	0.169	0.481, 1.137	0.74
Poor	105	152			
<i>Involvement in any Boy-Girl / Love Relationship</i>					
No	72	110	0.692	0.613, 1.383	1.09
Yes	80	134			
<i>Problems in Boy-Girl / Love Relationship</i>					
Yes	32	46	0.642		
No	48	88			
<i>Depression</i>					
Present	97	45	*0.000	4.91, 12.388	7.80
Absent	55	199			

\*p&lt;0.05= significant

## DISCUSSION

This study found that the overall prevalence of anxiety among medical students was high (38.4%). This finding corresponds to the study by Ashton and Kamali, who also found that 39% of British medical students complained of anxiety.<sup>[4]</sup>

**Table 3.** Association of anxiety with ethnicity and year of study among the 396

Associated Factors	Anxiety Present (152)	Anxiety Absent (244)	p-value
<i>Ethnicity</i>			
Malay	98	112	*0.004
Chinese	43	100	
Indians	6	21	
Others	5	11	
<i>Year of Study</i>			
1 <sup>st</sup> year	56	49	*0.004
2 <sup>nd</sup> year	25	48	
3 <sup>rd</sup> year	30	54	
4 <sup>th</sup> year	26	50	
5 <sup>th</sup> year	15	43	

\*p&lt;0.05= significant

**Table 4.** Association of anxiety and depression among the 396 respondents

	Depression Present (142)	Depression Absent (254)	95% Confidence Interval	Crude Odds Ratio
Anxiety Present (152)	97	55	2.434, 4.089	3.16
Anxiety Absent (244)	45	199	0.315, 0.519	0.404

 $\chi^2 = 83.831$ , df = 1, \*p < 0.05

Factors found to be significantly associated with anxiety among medical students in this study were gender, ethnicity, year of study in medical school, pressure due to exams and depression.

The prevalence of anxiety was higher among female medical students compared to males in this study. A study by Robichaud M *et al.* on gender differences in worry and associated cognitive-behavioural variables found that females significantly report more worry than males. They found that there was a higher prevalence of tendency to worry among females compared to males, with significantly higher number of females complaining of lacking confidence compared to males.<sup>[8]</sup> This tendency to worry as well as lack of confidence among females could explain the higher prevalence of anxiety among the female respondents compared to males in this study.

In Malaysia, the Malays are the biggest ethnic population group, followed by the Chinese, Indians and others. This proportion is also reflected among the respondents of this study. This study found that anxiety had the highest prevalence among the Malay medical students. A local study conducted by Maniam in 1994, also found that Malays had the highest rate of

psychiatric morbidity compared to other races in Malaysia. These included cases of depression, anxiety and psychological distress.<sup>[9]</sup>

However, whether the reason for these findings is the differences in socio-cultural backgrounds of the different ethnic groups is rather difficult to explain. Further studies need to be undertaken in greater depth to study the association of these factors in the different ethnic groups.

Year 1 medical students had the highest prevalence of anxiety compared to the other years of study in medical school. The reason for this finding could be the fact that Year 1 medical students have to adjust to a different environment in the university compared to their school days. The first year in medical school is particularly trying for many students, having to adjust to a fast-paced and highly competitive environment, and to master a large amount of complex materials.<sup>[10]</sup>

Based on the curriculum at the Medical faculty where this study was conducted, Year 1 to Year 3 was grouped as pre-clinical years. In Years 4 & 5, the students are exposed to the clinical curriculum where they have postings in the hospitals. Therefore, Years 4 & 5 were grouped as clinical years. The prevalence of anxiety was also found to be significantly higher among the pre-clinical students compared to the clinical students. The reason for this could also be the stress in adjusting to a new environment. Factors found to be associated with stress among medical students in Singapore were adjusting to different environments, increased academic workload and little time for personal activities.<sup>[10]</sup>

Students who found that they were under pressure due to exams had a higher percentage of anxiety compared to students who perceived no pressure due to exams. A study by Firth-Cozens also found that clinically significant levels of anxiety were often reported in medical students who were studying for examinations.<sup>[11]</sup>

Anxiety was found to be significantly associated with depression in this study. In fact, among the respondents with anxiety, the odds of also suffering from depression were about 3:1, and among the respondents without anxiety, the odds of having depression was 0.4:1. A study by Lewinsohn *et al.* on anxiety among high school students found that 53.7% of students diagnosed as having anxiety also suffered from depression.<sup>[12]</sup> He explained his findings by quoting the Clark and Watson's tripartite model (1991)<sup>[13]</sup> which suggests that there is both significant overlap and considerable differentiability between anxiety and depression. This model suggested that anxiety and depression syndromes share non-specific components of generalised affective distress or negative affect. The other 2 factors in this model are: (a) anhedonia or diminished positive affect, a factor specific to depression; and (b) physiological symptoms of hyperarousal, a factor specific to anxiety.<sup>[13]</sup>

Enhancing the personal development of each student, as well as placing greater emphasis on health programmes including stress management has been suggested in order to help students cope with the stress of tertiary education. Students who are prepared with more realistic expectation in their academic pursuits, together with a more manageable curriculum, coupled with stress management techniques and good social support would have an advantage in coping.<sup>[14]</sup> In this respect, Medical Faculties should introduce Foundation Courses for new students which provide an overview of what to expect in medical school, as well as lectures on study techniques, stress and time management. The ultimate aim is to help students understand what is required of them and to adapt as quickly as possible.<sup>[11]</sup>

## CONCLUSION

Anxiety is common among medical students. The prevalence of anxiety was found to be higher among female students, Malays, pre-clinical students especially those in the 1<sup>st</sup> year of medical school and students who complained of pressure due to exams. Anxiety was also found to be significantly associated with depression. As BAI measures anxiety cross-sectionally, the results can be affected by the time of conducting the BAI. Therefore, it is pertinent that the survey be conducted among students from Years 1 to 5 during the same period of 'environmental stressors'. This survey can be repeated at different times, for example close to examinations or after examinations. The results obtained during the different times when the study is conducted can then be stated and more relevant conclusions can then be made.

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