

Anxiety Prevalence and its Associated Factors Among University Students In Malaysia: A National Cross-Sectional Study

Nurul Elyani Mohamad

Universiti Putra Malaysia

Sherina Mohd-Sidik (✉ sherina@upm.edu.my)

Universiti Putra Malaysia <https://orcid.org/0000-0001-6754-6145>

Mehrnoosh Akhtari-Zavare

Islamic Azad University

Norsidawati Abdul Gani

Universiti Putra Malaysia

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Abstract

Background

Anxiety disorder is one of the most common mental health problems worldwide, including Malaysia. With the rising suicide rate nowadays, this issue has gained concern and attention from many, including experts and authorities globally. While average levels of anxiety motivate students to perform well in their studies, a high level of anxiety will significantly affect students' performance and self-esteem.

Methods

A cross-sectional study was conducted at selected government and private universities throughout Malaysia. A total of 1851 students participated in this study. The students were asked to complete self-administered questionnaires, which include information such as socio-demographic, academic, and psychosocial characteristics. The Generalized Anxiety Disorder-7 (GAD-7) questionnaire was used to measure the prevalence of anxiety in this study. Chi-square analysis was conducted to find the relationship between the variables and anxiety, and multivariate logistic regression analysis was used to identify the predictors.

Results

The response rate was 97.90%, where 1821 out of 1860 students participated in the study. The prevalence of anxiety in this study was 29%. The data revealed that race, residency, smoking status, alcohol consumption, sleeping quality, body mass index (BMI), academic year, the field of study, financial support for study and current living arrangement were found to be significantly associated with anxiety; with the academic year as the primary predictor.

Conclusions

Anxiety among university students in Malaysia is mainly impacted by the academic year. The findings highlight the current prevalence of anxiety among university students in Malaysia. The outcome of this study can serve as the evident baseline data and help with the development of specific interventions in addressing and managing the issue appropriately.

Background

Anxiety is a body's normal response as a result of feeling worried, fearful, and stress about what is to come [1, 2]. Anxiety can occur in anyone of any age. Occasional anxiety is common, but when it involves intense, persistent, and excessive fear and worry, it can exacerbate and lead to anxiety disorder [1]. It can cause distress syndromes such as sore neck, brain depletion, headache, loss of mental power, anger,

heart arrest, and many other syndromes [3]. Anxiety disorder varies from mild to severe cases and must be treated as it affects daily life. The Generalized Anxiety Disorder-7 (GAD-7) questionnaire is a 7-items of a self-report questionnaire that is used to screen the presence of anxiety and is often used in primary care and mental health settings.

The prevalence of anxiety in a general population was reported to be 3% [4]. It is highest in a high-income country, and the study said that females, those who are below 60 years old, unmarried, have low educational levels, and small household income were statistically associated with GAD worldwide [5]. Located in Southeast Asia, Malaysia is a developing country that is undergoing rapid economic development. The prevalence of anxiety in South East Asia countries was reported to be between 2.1 to 5 percent [6]. With more than 590 higher education institutions; where 20 of them are government universities, education in Malaysia has always strived for better performance to achieve the current targets and producing high-quality graduates to meet the current needs [7, 8]. With the urge to improve their position in the QS World University Ranking, all universities have implemented different strategies to achieve the standard. Considering the disparate educational system nowadays, it can be a healthy growth, not only for the university but also for the country. However, the impact of this growth has been challenging, especially for the students to cope with the demands of tertiary education.

Tertiary education or higher education is a post-secondary education to obtain certificates, diplomas, degrees, and higher degrees [8]. According to a study conducted by Baxter et al. (2014), the prevalence of anxiety increases at the age of 10 to 19 years old and peaked at the age between 20 to 34 years old. Generally, university students are at an age where a high prevalence of anxiety was reported. Unlike high school, the university is not only academically challenging but also requires more attention in terms of social communication, homesickness, tuition fees, and cost of living, among other things [9]. This is justified by Shamsudin et al. (2014) which reported a higher rate of anxiety was detected in students from public universities in Klang Valley, Malaysia [10]. A high level of anxiety affects not only academic performance, but it can also cause many other detrimental effects such as depression, causing health to decline and suicide [11–13]. This study was conducted to identify the prevalence of anxiety and its associated factors among university students in Peninsular and East Malaysia. Determining the incidence of anxiety and its correlation factors among students in universities is essential so that appropriate intervention programs can be implemented in this population.

Methods

Study design

A cross-sectional study was undertaken between June and December 2019 using self-administered questionnaires, including the GAD-7, to detect anxiety. The inclusion criteria for students to participate in this study were Malaysian citizens, age 18 years and above, and are currently doing their tertiary education at the selected government or private universities in Malaysia. A total of 1860 undergraduate students were randomly selected to answer the questionnaires. Incomplete questionnaires and those who

were not Malaysian citizens were excluded from the study. The information sheet related to the study was distributed to the students, and they were briefed before completing the self-administered questionnaires within the time given. The written consent form from each student was taken before the data collection. During the session, body weight and height were measured to determine the current body mass index (BMI) of each student.

Sampling method

A complete list of universities in Malaysia was attained from the Ministry of Higher Education. Multistage cluster random sampling was employed to select universities. First, the universities were sorted into two groups - government and private universities. Second, the universities were further screened based on their ranking. To be selected for this study, the university must be listed under QS University Rankings Asia 2017/2018 for a government university and the Rating System for Malaysian Higher Education 2017 (SETARA) and Times Higher World University Rankings 2018 for a private university. Third, the universities that fulfilled the criteria were sorted according to their location (state). To note, Malaysia can be divided geographically into six zones. Zone A represents Northern region which consists of four states (Perlis, Kedah, Penang, Perak), Zone B represents East coast region which include of three states (Kelantan, Terengganu, Pahang), Zone C represents Central region which consists another three states (Selangor, Federal Territories of Kuala Lumpur, Putrajaya), Zone D represents Southern region which consists of three states (Negeri Sembilan, Melaka, Johor), and finally, Zone E and Zone F which includes one state each (Sarawak and Sabah). Zones A, B, C and D are in Peninsular Malaysia, while Zones E and F are in East Malaysia. For this study, one state was chosen from each zone based on simple random sampling. Subsequently, from each state, three or four universities that fulfilled the criteria were selected by simple random sampling. Each selected university received an invitation letter and a brief explanation of the study. A confirmation letter was provided by the university which agreed to participate. The schedule and participation of students in this study were arranged by the respective universities. Finally, based on the sampling frame for each university, the eligible participants were selected via simple random sampling. In total, there were twenty-two universities listed; however, only sixteen of them agreed to participate in this study. The flow for the sampling method is shown in Fig. 1.

Sample size

Calculation of sample size was done using the formula for testing the difference in proportions between two samples based on the previous study (CP West et al., 2011). To calculate the sample size, confidence level (95%), and values for power (80%) for both groups were desired. As this study followed the cluster sampling method, the sample size was multiplied by 1.2 for the design effect, making the total sample to be 1488. The final sample size is 1860 after taking consideration of 25% of possible dropouts.

Instruments

The questionnaires were developed in dual languages, which were English and Bahasa Malaysia (the national language of Malaysia), and pre-tested among 80 university students who were not included in

the study. A general information questionnaire was used to collect general demographic characteristics including age, gender, ethnicity, marital status, education level, the field of study, family monthly income, current living arrangements, smoking status, and alcohol consumption. Body mass index (BMI) was calculated from height and weight. The WHO (2000) criteria were used to classify the BMI of the participants as underweight ($< 18.5 \text{ kg/m}^2$), average weight ($18.5\text{--}24.9 \text{ kg/m}^2$), overweight ($25.0\text{--}29.9 \text{ kg/m}^2$) and obesity ($> 30.0 \text{ kg/m}^2$). Psycho-social sections were developed by the researchers based on an extensive review of the literature [14]. The psychological part was assessed using GAD-7 questions. GAD-7 measures the presence of symptoms of anxiety in the past two weeks of one's daily life. The original version of the instrument was developed by Spitzer et al. [15]. It was subsequently validated in the Malay version by Sherina et al. [16]. It contains seven items which range from 0 (not at all) to 3 (nearly every day), and cut-off scores are derived from 8 and above to show the presence of anxiety.

Ethical approval

Prior ethics approvals were obtained from the Ethics Committee for Research Involving Human Subjects, Universiti Putra Malaysia, Ministry of Higher Education Malaysia, and Ethics Committee in each selected university. Participation required written consent from each university and each student involved in this study.

Data analysis

Data were entered into the Statistical Package for the Social Sciences (SPSS) software version 25, and the significance level was accepted as $p < 0.05$. Descriptive analysis (mean and standard deviation, frequency, and percentage) was conducted for all continuous and categorical data. The presence of anxiety among respondents was determined based on the cut-off point value on GAD-7 (presence of anxiety $\text{GAD} \geq 8$ and absence of anxiety ($\text{GAD} < 8$). To determine the significant relationship between anxiety and variables, chi-square was used. All the variables with $p < 0.05$ on the chi-square were selected for further analysis. A multivariate logistic regression enter method was performed to determine the predictors of anxiety among students. To do multivariate logistic regression, coding was done on the dependent variable as 0 for the absence of anxiety and 1 for the presence of anxiety; also, the lowest prevalence group or sub-group from the categorical variable was taken as a reference category (RC).

Results

Descriptive Statistics

Out of 1860 of total respondents, 1821 students participated in this study, giving a response rate of 97.9%. Among the participants, 1530 (84%) were aged between 18–22 years old, 271 (14.9%) aged between 23–27 years old and the rest, 20 (1.1%) aged above 28 years old with 683 (37.5%) of them were male, and 1138 (62.5%) were female. The majority of the students were Malay 922 (50.6%), and still single 1799 (98.8%).

Most of the students were currently doing their bachelor's degree, n = 1433(78.7%), and in the first and second year of their study, n = 1120(61.5%) A majority of the students were from Engineering, Manufacturing & Construction, n = 433(23.8%), and Medicine, n = 362(19.9%), courses. A Cumulative Grade Point Average (CGPA) was used to evaluate the academic performance of the students. The CGPA determines the grades of the students for all semesters and courses that they had completed throughout the academic session [17]. In this study, the highest percentage of CGPA was recorded between 3.0-3.74 1128(61.9%), with the lowest was between 2.0-2.24 40(2.2%).

From the data, the students were mostly were from small middle-income families with a total of 1 to 5 members 1151(63.2%), and a total income between RM 951 to RM3900 722(39.6%). Three-quarters of 1367(75.1%) of the students were from urban areas, while almost two-thirds of them, 1092(60%), lived in their university college dormitories. Only a few students reported being involved with alcohol and smoking, 158(8.7%) and 54(3.0%), respectively. All data are presented in Tables 1 and 2.

Table 1

Prevalence and relationship of anxiety based on the socio-demographic characteristics of participants (n = 1821)

Socio-demographic Characteristic	Total number	Anxiety		Statistics
		Yes (GAD ≥ 8) n (%)	No (GAD < 8) n (%)	
Gender	683(37.5%)	186(35.2%)	497(38.5%)	$\chi^2 = 1.75$, df = 1, p = 0.18
Male	1138(62.5%)	343(64.8%)	795(61.5%)	
Female				
Age group category	1530(84.0%)	449(84.9%)	1081(83.7%)	$\chi^2 = 0.99$, df = 2, p = 0.61
18–22	271(14.9%)	76(14.4%)	195(15.1%)	
23–27	20(1.1%)	4(0.8%)	16(1.2%)	
> 28				
Ethnicity	922(50.6%)	236(44.6%)	686(53.1%)	$\chi^2 = 11.11$, df = 3, p = 0.01*
Malay	553(30.4%)	178(33.6%)	375(29.0%)	
Chinese	165(9.1%)	53(10.0%)	112(8.7%)	
Indian	181(9.9%)	62(11.7%)	119(9.2%)	
Others				
Marital status	1799(98.8%)	524(99.1%)	1275(98.7%)	$\chi^2 = 0.98$, df = 2, p = 0.61
Single	20(1.1%)	5(0.9%)	15(1.2%)	
Married	2(0.1%)	0(0.0%)	2(0.2%)	
Divorced & Widow				
Monthly family income (RM)	330(18.1%)	108(20.4%)	222(17.2%)	$\chi^2 = 6.40$, df = 3, p = 0.09
RM950 and below	722(39.6%)	202(38.2%)	520(40.2%)	
RM951-RM3,900	504(27.7%)	132(25%)	372(28.8%)	
RM3,901-RM8,400	265(14.6%)	87(16.4%)	178(13.8%)	
RM8,401 and above				

*Significant at p < 0.05.

Socio-demographic Characteristic	Total number	Anxiety		Statistics
Residency	454(24.9%)	113(21.4%)	341(26.4%)	$\chi^2 = 5.07$, df = 1, p = 0.02*
Rural	1367(75.1%)	416(78.6%)	951(73.6%)	
Urban				
Current smoking	54(3.0%)	22(4.2%)	32(2.5%)	$\chi^2 = 3.96$, df = 1, p = 0.04*
Yes	1767(97.0%)	507(95.8%)	1260(97.5%)	
No				
Alcohol consumption	158(8.7%)	73(13.8%)	85(6.6%)	$\chi^2 = 24.69$, df = 1, p = 0.00*
Yes	1663(91.3%)	456(86.2%)	1207(93.4%)	
No				
Poor sleep quality	779(42.8%)	328(62.0%)	451(34.9%)	$\chi^2 = 112.57$, df = 1, p = 0.00*
Yes	1042(57.2%)	201(38.0%)	841(65.1%)	
No				
Body Mass Index (BMI)	290(15.9%)	104(19.7%)	186(14.4%)	$\chi^2 = 10.95$, df = 3, p = 0.01*
Underweight (Below 18.5)	1068(58.6%)	294(55.4%)	774(59.9%)	
Normal (18.5–24.9)	318(17.5%)	82(15.5%)	236(18.3%)	
Overweight (25.0-29.9)	145(8.0%)	49(9.3%)	96(7.4%)	
Obese (30.0 and above)				
Number of people in household	1151(63.2%)	340(64.3%)	811(62.8%)	$\chi^2 = 0.50$, df = 2, p = 0.77
1–5	648(35.6%)	182(34.4%)	466(36.1%)	
6–10	22(1.2%)	7(1.3%)	15(1.2%)	
≥11				
Parents with tertiary education background	786(43.2%)	240(45.4%)	546(42.3%)	$\chi^2 = 1.47$, df = 1, p = 0.22
Yes	1035(56.8%)	289(54.6%)	746(57.7%)	
No				
*Significant at p < 0.05.				

Table 2

Prevalence and relationship of anxiety based on the academic characteristics of participants (n = 1821)

Academic Characteristic	Total number	Anxiety		Statistics
		Yes (GAD $\geq$ 8) n (%)	No (GAD < 8) n (%)	
Level of education	357(19.6%)	119(22.5%)	238(18.4%)	$\chi^2 = 5.56$, df = 3, p = 0.13
Diploma	1433(78.7%)	403(76.2%)	1030(79.7%)	
Degree	23(1.3%)	4(0.8%)	19(1.5%)	
Master	8(0.4%)	3(0.6%)	5(0.4%)	
PhD.				
Academic year	1120(61.5%)	328(62.0%)	792(61.3%)	$\chi^2 = 8.23$, df = 2, p = 0.01*
1–2	630(34.6%)	191(36.1%)	439(34.0%)	
3–4	71(3.9%)	10(1.9%)	61(4.7%)	
5 and above				
Field of Study	28(1.5%)	13(2.5)	15(1.2%)	$\chi^2 = 23.74$, df = 6, p = 0.00*
Education	201(11.0%)	69(13.0%)	132(10.2%)	
Social Science, Business & Law	161(8.8%)	47(8.9%)	114(8.8%)	
	362(19.9%)	79(14.9%)	283(21.9%)	
Science, Mathematic & Computer	322(17.7%)	93(17.6%)	229(17.7%)	
Medicine	433(23.8%)	116(21.9%)	317(24.5%)	
Health Science	314(17.2%)	112(21.2%)	202(15.6%)	
Engineering & Manufacturing				
Others				

*Significant at p < 0.05; ¥ Cumulative Grade Point Average.

Academic Characteristic	Total number	Anxiety		Statistics
CGPA[¥]	277(15.21%)	82(15.5%)	195(15.1%)	$\chi^2 = 6.97, df = 3, p = 0.07$
3.75-4.00	1128(61.9%)	323(61.1%)	805(62.3%)	
3.0-3.74	376(20.7%)	105(19.8%)	271(21.0%)	
2.25–2.99	40(2.2%)	19(3.6%)	21(1.6%)	
2.0-2.24				
Financial support for the study	998(54.8%)	252(47.6%)	746(57.7%)	$\chi^2 = 15.46, df = 1, p = 0.00^*$
Yes	823(45.2%)	277(52.4%)	546(42.3%)	
No				
Current living arrangements	439(24.1%)	142(26.8%)	297(23.0%)	$\chi^2 = 10.08, df = 3, p = 0.01^*$
Parent's home	1092(60.0%)	290(54.8%)	802(62.1%)	
College Dormitory	282(15.5%)	96(18.1%)	186(14.4%)	
Off-Campus	8(0.4%)	1(0.2%)	7(0.5%)	
Others				
*Significant at p < 0.05; [¥] Cumulative Grade Point Average.				

Association between socio-demographic factors with anxiety

According to our study, the prevalence of students with anxiety was 29% based on the GAD-7 score more and equal to 8. Table 1 shows the relationship between socio-demographic factors and anxiety. Using bivariate analysis, race ($p = 0.01$), residency ($p = 0.02$), smoking status ($p = 0.04$) and alcohol consumption ($p = 0.00$) were significantly associated with anxiety. The number of students with poor sleeping quality was significantly higher as compared to students who had better sleep quality. BMI was also found to be statistically significant with anxiety ($p = 0.01$), where the number of obese and underweight students who had anxiety ($GAD \geq 8$) was higher than the ones who did not have anxiety ($GAD < 8$).

Association between academic characteristic with anxiety

Table 2 showed the prevalence and relationship of anxiety based on the academic characteristics of the students. From our study, academic year, the field of study, financial support for the study, and current

living arrangement showed significant association with anxiety. The percentage of diploma and PhD students who had anxiety ($GAD \geq 8$) were higher than the who had no anxiety ($GAD < 8$) by 0.2% and 4.1%, respectively. On the other hand, students in the first to the fourth academic year, and students with the lowest CGPA (2.0-2.24) showed higher anxiety rates. Among all the courses, medicine, health sciences, and engineering & manufacturing exhibited a smaller number of students having no anxiety ($GAD < 8$) as compared to the students who had anxiety ($GAD \geq 8$). Besides that, the number of students with no financial support who had anxiety was higher than the students who had no anxiety. A similar trend was observed in students who lived with their parents and outside the university.

Association between psycho-social with anxiety

Based on the five psycho-social characteristic questions given to the students, all of them were statistically associated with anxiety. As shown in Table 3, the number of students with a good friend(s) in the university and students who were actively involved in societies was higher in the no anxiety group ($GAD < 8$) as compared to the anxiety group ($GAD \geq 8$). Conversely, students who doubted their future and students who were having problems with their friends and lecturer(s) exhibited higher prevalence in the anxiety group ($GAD \geq 8$) as compared to no anxiety group ($GAD < 8$).

Table 3

Prevalence and relationship of anxiety based on the psycho-social characteristics of participants (n = 1821)

Psycho-social characteristics	Total number	Anxiety		Statistics
	n (%)	Yes (GAD ≥ 8) n (%)	No (GAD < 8) n (%)	
Having a good friend in university	1704(93.6%)	473(89.4%)	1231(95.3%)	$\chi^2 = 21.47$, df = 1, p = 0.00*
Yes	117(6.4%)	56(10.6%)	61(4.7%)	
No				
Having doubt regarding your future	1396(76.7%)	434(82.0%)	962(74.5%)	$\chi^2 = 12.06$, df = 1, p = 0.00*
Yes	425(23.3%)	95(18.0%)	330(25.5%)	
No				
Actively involved in societies	922(50.6%)	235(44.4%)	687(53.2%)	$\chi^2 = 11.49$, df = 1, p = 0.00*
Yes	899(49.4%)	294(55.6%)	605(46.8%)	
No				
Having problems with other students	385(21.1%)	160(30.2%)	225(17.4%)	$\chi^2 = 37.06$, df = 1, p = 0.00*
Yes	1436(78.9%)	369(69.8%)	1067(82.6%)	
No				
Having problems with any lecturer(s)	165(9.1%)	74(14.0%)	91(7.0%)	$\chi^2 = 21.97$, df = 1, p = 0.00*
Yes	1656(90.9%)	455(86.0%)	1201(93.0%)	
No				
*Significant at p < 0.05.				

Predictors of anxiety

Multivariate logistic regression analysis was done to determine the predictor(s) of anxiety. The assumption of linearity, homoscedasticity, and normality of residuals were met, and the model was fit ($\chi^2 = 246$, df = 27, p = 0.00). Based on the analysis, ten variables were found to be the predictors of anxiety. The strongest predictors for anxiety in descending order were those in their first and second academic

year, third and fourth academic year, and those who doubted their future (Table 4). From the results, it showed that students who were in their first and second academic year exhibited anxiety 3.06 times more (OR = 3.06; 95% CI = 1.43–6.51) while students who were in their third and fourth academic year showed anxiety 2.95 times more (OR = 2.95; 95% CI = 1.35–6.47) as compared to those who were in year five and above of their study, respectively. On the other hand, the results showed that students who were doubting r their future had anxiety 1.56 times more (OR = 1.56; 95% CI = 1.17–2.07) as compared to those who had no doubts about their future.

The results also indicated that students who were not drinking alcohol (OR = 0.58; 95% CI = 0.39–0.85), students with good friend(s) in the university (OR = 0.44; 95% CI = 0.29–0.67), students who were actively involved in societies (OR = 0.64; 95% CI = 0.51–0.80), students with good relationships with other student(s) (OR = 0.59; 95% CI = 0.45–0.77) and lecturer(s) (OR = 0.64; 95% CI = 0.43–0.93), students with financial support (OR = 0.73; 95% CI = 0.58–0.92) and students with better sleeping quality(OR = 0.73; 95% CI = 0.58–0.92) were at less risk of having anxiety in this study.

Table 4
Predictors of anxiety based on multivariate logistic regression analysis

Variable	B	Wald	OR	P-value	95% CI
Academic year	1.18	8.40	3.06	0.004	1.43–6.51
1–2	1.08	7.37	2.95	0.007	1.35–6.47
3–4					
5 and above (Ref)					
Financial support for the study	-0.31	7.12	0.73	0.008	0.58–0.92
Yes					
No (Ref)					
Alcohol consumption	-0.545	7.51	0.580	0.006	0.392–0.856
Yes (Ref)					
No					
Poor sleep quality	-1.01	80.99	0.36	0.00	0.29–0.45
Yes (Ref)					
No					
Body Mass Index (BMI)	-0.47	5.31	0.62	0.02	0.41–0.93
Normal (18.5–24.9)	-0.53	5.23	0.58	0.02	0.37–0.92
Overweight (25.0-29.9)					
Obese (30.0 and above) (Ref)					
Having a good friend in university	-0.80	14.84	0.44	0.00	0.29–0.67
Yes					
No (Ref)					
Having doubt regarding your future	0.44	9.48	1.56	0.00	1.17–2.07
Yes					
No (Ref)					
Actively involved in societies	-0.44	14.76	0.64	0.00	0.51–0.80
Yes					
No (Ref)					

*Significant at $p < 0.05$; Odd Ratio (OR); Confidence Interval (CI); Reference Group (Ref)

Variable	B	Wald	OR	P-value	95% CI
Having problems with other students	-0.51	14.77	0.59	0.00	0.45–0.77
Yes (Ref)					
No					
Having problems with any lecturer(s)	-0.44	5.27	0.64	0.02	0.43–0.93
Yes (Ref)					
No					
*Significant at $p < 0.05$; Odd Ratio (OR); Confidence Interval (CI); Reference Group (Ref)					

Discussion

Anxiety is one of the risk factors in suicidal behaviour [18]. It has been reported in many studies involving young people. With the increase of mental health issues and suicidal rates all over the world, it is becoming difficult to ignore all the factors that contribute to the problem. Studies have reported that teens and young adults are likely to be struggling with psychological distress and anxiety as compared to older adults [19]. Most of the university students were young adults ranging from age eighteen to twenty-four, where this is the age when the developmental stage transitions from late adolescence to adulthood [20]. In this study, the prevalence of anxiety was recorded at 29%, where out of 1821 students who participated, 529 of them had anxiety. Our data was found to be similar to studies conducted at the Australian National University [21] and Yale University [22]. Nonetheless, higher anxiety was reported by Nour et al. (2016), where 62.4% of the students who participated in their study showed a potential risk of having anxiety, with 28.7% of them having clinically significant anxiety. Similarly, a study conducted among Portuguese college students also depicted a higher prevalence of anxiety (32.8%) [24].

Socio-demographic characteristics

In our study, race, residency, smoking habit, alcohol consumption, sleeping quality, and BMI showed a significant association with anxiety. Malaysia is a multi-racial country with different cultures, beliefs, and social activities [25]. The association of different race and anxiety by several studies has been reported by Anderson & Mayes (2010) in their review. Our data demonstrated that in terms of ethnicity, Malay students showed a lower prevalence of anxiety among all races. From Table 1, we can see that out of 922 Malay students who participated in the study, only one-fourth of them (236 students) had anxiety. This result, however, contradicts the other studies conducted among university students in Malaysia, where higher anxiety was reported among Malays as compared to other races [10, 27]. The difference in anxiety prevalence among race groups might be influenced by different cultures and beliefs practice among the race.

Another factor that was significantly associated with anxiety is residency. Based on our data, most of the students were from urban areas. A previous study conducted in rural and urban areas of China has shown that adolescents from rural regions exhibited higher rates of anxiety [28]. However, data from our study showed that there no significant differences were observed between the ratio of students who had anxiety with students who had no anxiety in the urban and rural division. Differences in socio-economic and socio-cultural factors might attribute to the prevalence of anxiety in students coming from rural and urban areas. It has been reported that students who are from rural areas have lower self-esteem, and most of them come from a lower-income family [10, 29]. On the other hand, the prevalence of anxiety exhibited by students from urban areas may be caused by excessive stress to get better academic achievement [30, 31].

Smoking and drinking (alcohol) activities were found to be statistically associated with anxiety levels in our study. Studies have shown that there is a positive correlation between smoking and drinking alcohol with anxiety [32, 33]. Students with anxiety tend to smoke as they claim that smoking can help them relieve and alleviate their anxiety [34]. Similarly, anxiety has been reported to be associated with frequent drinking and bingeing by anxious individuals to cope with their emotional distress [35]. However, the insignificant relationship between drinking habit and alcohol consumption with anxiety has been reported among Canadian Youth and university students in Hong Kong [36, 37]. Alcohol consumption and smoking are common customs during social activities in many populations; therefore, the association between alcohol consumption and smoking habit with anxiety can be insignificant in some of the studies [36, 38, 39].

Good sleeping quality is important to the students in the study process, as it is essential for their mental well-being and is interrelated with anxiety [40, 41]. In this study, we found that the sleeping habit was significantly associated with anxiety. Poor sleeping quality among university students is typical, especially during the examination period. Sleep deprivation may cause sleepiness, dizziness and impairment of cognitive and psychomotor of the students, which may lead to a decrease in concentration and difficulties in memorizing the subjects, thus affecting their academic performances [42, 43]. Students who have sleeping deprivation tend to feel anxious, while those who have anxiety prompt to get trouble falling asleep at the same time. Our results were found to be similar to studies conducted among students at The University of Auckland (New Zealand), Assiut University (Egypt) and universities in Ethiopia [44–46].

The body mass index or BMI is widely known to have a positive correlation with anxiety. BMI is mainly influenced by diet. Researchers have proved that there is an interrelation between emotional eating and psychological factors such as anxiety [47–49]. Previous work conducted among European university students indicated that eating behavior among university students could be influenced by many factors such as individual factors, social networks, the physical environment, and the macro-environment [50]. Emotional distress caused by factors such as examination and transition into adulthood can also affect the eating habit and cause the students to eat more or less than the norm [51].

Academic characteristics

The current study revealed the significant association between the field of study and academic year with anxiety levels among university students in Malaysia. A similar finding was reported by Ozen et al. (2010). The significant relationship between anxiety with the academic year and the field of study can be contributed by several reasons such as different approaches by each course, variation in assessment and grading system of each course and differences of teaching methods [52, 53]. Besides that, another study showed that, as the number of the academic year increased, the anxiety level among students increased as the course becomes harder, and their workload increases [54]. This is consistent with our data, where a significantly higher level of association between year of study and anxiety can be seen in year five and above students. On the other hand, a study conducted at Uludag University, Turkey, also showed a significant association between anxiety and the field of study [55]. However, from their data, students who studied social and political sciences demonstrated higher anxiety as compared to students who took basic sciences and engineering or medicine courses, which contradicted with our current data. These differences may be caused by factors such as socio-demographic, sampling methods, the variation of the instrument used and the way the data was interpreted [55].

Despite many studies demonstrating how family support is essential in students' growth and development [56], our data revealed that, out of 439 students who lived with their parents, one-third of them had anxiety. This was justified by Rent & Smith (2011), where in their study, they mentioned that the parenting style had been demonstrated to influence the emotional distress in students. Similarly, the same ratio was observed in students who lived outside the university. Taking socio-economic factors into account, students who lived outside the university have greater difficulties as compared to students who live in their university college dormitories. The cost of living is higher, and they need to travel to the university daily, which is time-consuming and cost them more money. A significant association of living arrangements and anxiety has been reported in a study conducted by Zhang et al. (2019). In their study, Zhang mentioned that living arrangements is a structural factor of social support that contributes to the mental health state.

On the other hand, a significant relationship between financial support for study and anxiety was demonstrated in our study. Students who have financial support exhibited lower anxiety prevalence than students who did not receive any financial support. This is consistent with a study reported by Jones et al. (2018). In their paper, Jones et al. mentioned that financial support would affect not only mental health but also has an impact on the academic performance of the students. This is in conjunction with our previous discussion, where students who lived outside the campus had higher anxiety due to the financial burden that they need to bear.

Psycho-social characteristics

In this study, all the five-question used to describe the psycho-social aspects of the students were found to be significantly associated with anxiety. A previous study showed that students with anxiety disorder tend to avoid all social interaction, isolate themselves, and hardly seek help from others [59]. They do not have good friends where they can share all their problems with and prefer not to engage in any social activities [60–62]. They tend to doubt their future, and, in some cases, they get into trouble with others [61]. All these findings are consistent with our current results.

Strength and limitation

This study is the first cross-sectional study that investigated the prevalence of anxiety among the government and private university students throughout Malaysia. As the questionnaires were conducted in dual language, it helped the students understand better and answer the questions accordingly. Besides that, the large sample size in this study allows the researchers to perform more detailed and accurate statistical analysis. Nevertheless, several limitations of our study are noteworthy. First, since the questionnaire was conducted via self-report, the integrity of some data can be compromised as the students were able to discuss with their friends during the session and thus influenced their judgment when answering the questions. Secondly, data collection could not be done simultaneously. We took around six months to complete the data collection due to the lack of human resources, and more time was required to obtain approval from several universities. Because of this, some of the data collection was done right before or after the examination period, which may have an impact on the current mental health status of the students.

Implication to practice

Stigma against a person with mental health issues prevents those with this problem from getting help. This study highlights the importance of studying the prevalence of anxiety and its predictors among university students in Malaysia. Given the limitations of the available data, disparate findings on the anxiety prevalence data, particularly among university students in Malaysia is important for the development of specific interventions in the future.

Conclusions

In summary, the prevalence of anxiety among university students in Malaysia is worrisome even though the prevalence rate is not as high as in other places. The universities and higher education bodies must place a much greater emphasis on mental health promotion to the students. Early screening and monitoring programs can be done to identify the high-risk students so that proper treatment can be given to them. The data from these findings can be used to design appropriate and systematic interventions and programs to help students at risk of anxiety. Robust support and increase psychological assessment and monitoring among the students must be taken seriously to avoid higher prevalence rates in the future.

Abbreviations

BMI

body mass index

GAD-7

Generalized Anxiety Disorder 7

PhD

Doctor of Philosophy

SPSS

Statistical Package for the Social Sciences

Declarations

Ethics approval and consent to participate

The authors confirm that the research presented in this article met the ethical guidelines and received approval from the Ethics Committee for Research Involving Human Subjects, Universiti Putra Malaysia, Ministry of Higher Education Malaysia, and Ethics Committee within selected institutions.

Consent for publication

Not applicable

Availability of data and materials

Data and materials are available upon request from the corresponding author.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

SMS, MAZ and NAG designed the study. NAG and NEM conducted the study. MAZ performed the analysis. NEM, SMS, NAG, and MAZ wrote the manuscript. All authors read and approved the final manuscript.

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Figures

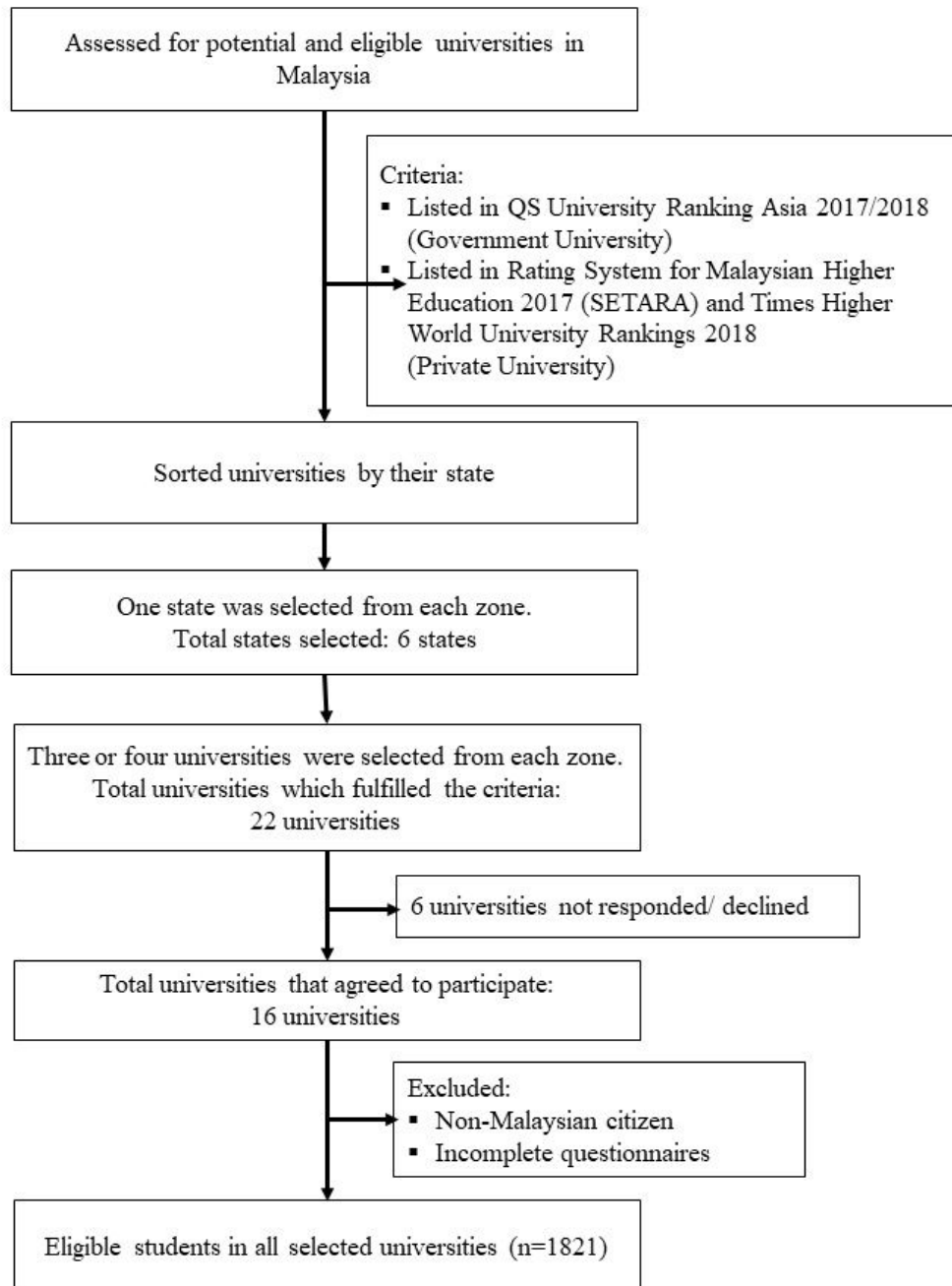


Figure 1

Flow chart of a multi-stage random sampling method. The list of universities in Malaysia was obtained from the Ministry of Higher Education

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