Research Article

THE ASSOCIATION BETWEEN YEARS OF STUDY WITH DEPRESSION AMONG UNIVERSITY STUDENTS IN BORNEO, MALAYSIA

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Abstract

Introduction: Depression is currently one of the significant mental health problems worldwide. Depression can lead to multiple emotional and physical issues and decrease a person's ability to function. It affects someone's feelings, thoughts, and actions. Evidence shows that the prevalence of depression is higher among university students than the average population, with those in Asian countries being more severely affected. This study aims to determine the prevalence and levels of depression among students in a public university in Sabah and to measure the various associated factors with depression which include the year of study they were in. Methods: This is a cross-sectional study with 260 respondents from a public university in Borneo, Malaysia. The Patient Health Questionnaire (PHQ-9) was used to measure the level of depression. The sociodemographic questionnaire was included for sociodemographic profiling, particularly the year of study they were in at the time of the study. The International Physical Activity Questionnaire (IPAQ-M) was used to assess physical activity. Participants answered the given questionnaires through Google form. Binary logistic regression was used to test the associations between depression and variables of interest while adjusting for confounders. Results: Findings showed the prevalence of depression among university students in a public university in Borneo was 82%, with 46% having mild depression, 30.0% having moderate depression, 17.9% having moderate-severe depression, and 6.1% having severe depression. The year of study was significantly associated with depression. Students in Year 1 and Year 2 were two to three times more likely to experience a higher level of depression than those in Year 3 and Year 4. (OR: 2.55, 95% CI: 1.25, 4.06). Conclusion: Given that junior students were more prone to a higher level of depression due to adjustment factors, the university and health care providers should target this group while implementing programs and interventions.

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Introduction

Depression is currently one of the leading causes of morbidity, affecting more than 264 million people worldwide [1-3]. In Malaysia, the 2019 National Health Morbidity Survey (NHMS) showed that 2.3% of adults had depression [4]. An individual with depression can have a variety of emotional and physical problems. A systematic review done in 2013 by Sarokhani et al. showed that the prevalence of depression among university students is higher than the average population [5]. In Malaysia, approximately 24% to 30% of university students were reported to show symptoms of depression [6,7]. This can be attributed to many factors, such as sociodemographic (age, gender, living condition, years of study, household income, academic performances) and environmental (family relationships, academic-related issues, etc.) [8,9]. Physical inactivity is another risk factor for depression among Malaysian university students [10,11]. Accord-

ing to the 2019 NHMS, 25.1% of adults were physically inactive [12].

Literature Review

According to the American Psychiatric Association (APA), depression causes feelings of sadness and/or a loss of interest in activities an individual once enjoyed (Depression). Depression can lead to multiple emotional and physical issues and can decrease a person's ability to function. It affects someone's feelings, thoughts, and actions [13-15]. Globally, the prevalence of depression ranges are between 2% to 6% [2,16]. In the Asia Pacific region, between 1.3 to 5.5% of adults were reported to have major depression within the last one month, while 1.7 to 6.7% had the same problem within the last year [17]. In Malaysia, 2015 NHMS findings showed an increasing trend in mental health problems among adults; the prevalence increased from 10.7% in 1996 and 11.2% in 2006 to 29.2% in 2015 [18]. Prior studies, on the other hand, reported that the prevalence of depression among university students was more than 35%, with Asian countries most affected [5].

In the year 2011, 1 in 10 Malaysian students suffered from depression. This figure increased to 1 in 5 in 2016 [19,20]. Local studies showed that the prevalence of moderate to extremely severe depression among undergraduate students was 13.9% to 29.3% [19,21]. University life can be a very stressful period for a student, given the transition from adolescence to adulthood, along with accompanying academic pressures [22]. Factors that contribute to depression among this group are gender (female students were more depressed) and year of study (junior students were found to be more depressed). Others include living arrangements (students living away from parents were more likely to develop depression than those staying with their parents) and low socio-economic status [7,23]. A study in Brazil found that those with low level of physical activity were two times more likely to exhibit symptoms of depression than their active counterparts [24]. Corroborated this finding in his study among students of Universiti Putra Malaysia. It was reported that more than half of participants were inactive, and among these, 40% showed symptoms of depression [11].

A number of recent studies were conducted among Malaysian university students to measure depression, but the evidence is scarce when it comes to its associated factors and especially in the context of Sabah. This study was conducted to address this gap. We aimed to determine the prevalence of depression among students in a public university in Sabah and to identify its associated factors.

Methodology

Study design, setting and data collection

This is a cross-sectional study involving 260 university students from various bachelor degree programs. The university in which the study was conducted is one of the biggest public universities in Sabah, which has 4000 undergraduate students comprising various ethnicities. We conducted the study between the 1st November 2020 and 31st December 2020 during the Recovery Movement Restrictions Order (RMCO) of the Covid-19 pandemic.

Sampling strategy and sample size determination

Due to Covid-19 related situations and restrictions, data was collected online, and convenience sampling was employed. Inclusion criteria were: (a) undergraduate students; (b) aged between 18 to 25 years old and; (c) able to communicate in Bahasa Melayu. Students with a previous history of mental illness were excluded from this study to ensure homogeneity of the population.

The sample size was calculated using the Open Epi Sample Size Calculator (www.openepi.com). Using a prevalence of 23.3%, the formula yielded a total sample size of 260 after taking into account a 20% potential non-response rate [6].

Tools and variables

The questionnaires were provided via Google forms and distributed through the students' emails and WhatsApp groups obtained from the Student Representative Councils' network with the Academic Office of University's approval. The questionnaire included sociodemographic profiling, the Malay version of the Patient Health Questionnaire (PHQ-9), and the Malay version of the International Physical Activity Questionnaire (IPAQ-M). The PHQ-9 is a self-report measure consisting of nine questions based on the nine DSM criteria for major depression. It is used to determine the presence or absence of depression and its level of severity. This instrument has been validated in previous studies [25]. The IPAQ was first used in Geneva in the year

1998 to assess physical activity patterns. It is a 27-items self-administered questionnaire that captures physical activity in the last seven days, covering five domains; job-related physical activity, transportation-related physical activity, housework, recreation/sport, and sitting times. The Malay version of IPAQ too has been validated, with good reliability and validity [26].

Statistical analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 23. The sociodemographic factors and physical activity are the independent variables in this study, while depression is the dependent variable. Descriptive statistics were used to analyse the sociodemographic characteristics of study respondents. Continuous variables were reported as means and standard deviations, while categorical variables were reported as percentages and frequencies. Associations between two categorical variables were tested using Chi-Square's tests.

Continuous variables were tested for normality and then analysed using simple logistic regression (SLogR). Variables showing a p-value of less than 0.25 from the SLogR was then included in the next step. The final model comprised a binary logistic regression model that tested the associations between selected independent variables and depression. Prior to that, all the assumptions of binary logistic regression were checked. A p-value of less than 0.05 was considered statistically significant, and 95% CI was reported along with odds ratio and standard errors.

Ethics

Ethical approval was obtained from the Faculty of Medicine Universiti Teknologi MARA Research Committee, Medical and Research Ethics Committee, Universiti Teknologi MARA, 600-TNCP (5/1/6), REC/03/2020 (MR/54).

Results

Background of participants

A total of 260 students were included in the study, with a mean age of 20.33 (SD=1.73). The majority were female participants (71.9%), and more than half lived without family members (60.8%). In terms of ethnicity, most were Malay (32.7%), followed by Dusun (23.5%), Kadazan (16.9%), Bajau (14.6%), Brunei (6.5%), Murut (1.9%), and others (3.8%). First-year students comprised 48.5% of the sample, followed by second-year (24.2%), fourth-year (15.8%), and third-year (11.5%). The majority of study respondents (62.3%) were in the Bottom 40 group (B40), less than one-third (31.2%) were in the Middle 40 group (M40), and the rest (6.5%) were in the Top 20 group (T20). In terms of cumulative grade point average (CGPA), more than half (59.2%) scored between 3.51-4.00, followed by 33.1% with CGPA between 3.01-3.50, 6.9% between 2.01-3.00 (6.9%), and 8.0% less than 2.00.

Physical activity among participants

The level of physical activity was reported in the metabolic equivalent of task (MET). The level was categorised into low (total activity less than 600 MET-minutes/week), moderate (total physical activity at least 600 MET-minutes/week), and high (total physical activity at least 3000 MET-minutes/week) [27]. Figure 1 shows that most respondents scored moderate (41.2%), followed by high (31.9%) and low (26.9%).

Symptoms of depression among participants

There were 213 (82%) respondents with symptoms of depression. Figure 2 shows that from a total of 213 participants, 98 (46.0%) had mild depression, 64 (30.0%) had moderate depression, 38 (17.9%) had moderate-severe depression, and 13 had severe (6.1%) depression.

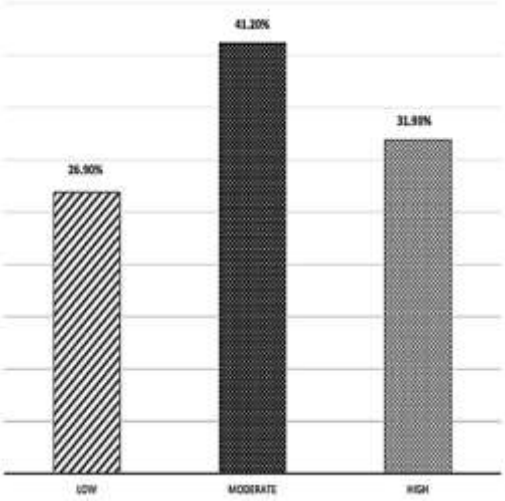

Figure 1. Level of physical activity among students in a public university in Sabah

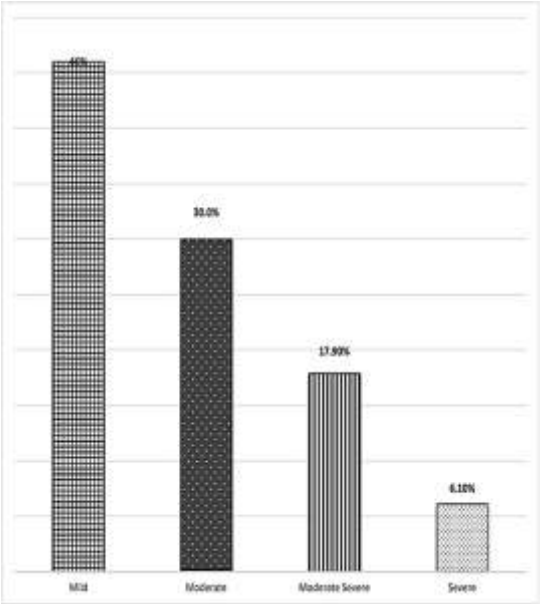

Figure 2. Severity of depression among students in a public university in Sabah

Association between sociodemographic profiles and physical activity and depression

While testing for associations using bivariate analysis (Chi-squared tests), depression was categorized into normal-mild and moderate-severe. Table 1 showed a significant association between depressive symptoms and year of study with X^2 (1, N=260)=7.34, p=0.007; however, there was no significant association between physical activity with depression, X^2 (1, N=260)=1.40, p=0.234. Other variables were also not found to be significant.

Table 1. Analysis of association between sociodemographic profiles with symptoms of depression among study subjects using chi-square

Variables		Symptoms of Depression		Statistics	
		Normal-mild n (%)	Mode-Severe, n (%)	χ^2	p value
Age	<20 years old	68 (59.1)	47 (40.9)	1.171	0.280
	>20 years old	76 (52.4)	69 (47.6)		
Gender	Male	45 (61.6)	28 (38.4)	1.609	0.205

	Female	99 (53.0)	88 (47.0)		
Living	With Family	58 (56.9)	44 (43.1)	0.148	0.7
	Without Family	26 (51.9)	132 (48.1)		
Ethnicity	Malay	18 (27.7)	67 (72.3)	0	0.981
	Non-Malay	29 (16.6)	146 (83.4)		
Year of Study	First and Second Year	95 (50.1)	94 (49.9)	7.343	0.007
	Third and Fourth Year	49 (69.0)	22 (30.1)		
Household Income	B40 and M40	96 (59.3)	66 (40.7)	4.17	0.124
	T20	6 (35.3)	11 (64.7)		
CGPA	<3.00	90 (58.4)	64 (41.6)	3.602	0.308
	≥ 3.00	45 (52.3)	41 (47.7)		
Physical Activity	Low	43 (61.4)	27 (38.6)	1.416	0.234
	Moderate and Vigorous	101 (53.2)	89 (46.8)		
The Bottom 40 group (B40)=total household income less than RM 3860; the Middle 40 group (M40)=total household income between RM 3860 and RM 8319; the Top 20 group (T20)=total household income of more than RM 8319. n, number; SD, standard deviation; χ^2, chi-square					

Associations between depression and other variables of interest among study participants

The independent variables, sociodemographic factors (age, gender, living companion, ethnicity, year of study, household income, CGPA), and physical activity were first screened using SLogR. From the results of SLogR on each independent variable, the variables with a p-value less than 0.25 were selected to be included in binary logistic regression using the enter method. After adjusting for potential confounders, there was a significant association between years of study with symptoms of depression.

Binary logistic regression results in Table 2 show that the first and second-year students had 2.25 the odds of having moderate-severe depression compared to the third and fourth-year students (AOR=2.25 and p=0.007). This indicated that junior students in the first two years were two to three times more likely to experience higher level of depression.

Table 2. Results of logistic regression for factors associated with symptoms of depression among study subjects

	Crude OR[a] (95% CI)	Adjusted OR[b] (95% CI)	Standard Error	P value[b]
Physical Activity	0.713 (0.41,1.25)	0.72 (0.41,1.27)	0.29	0.252
Gender	0.70 (0.40, 1.22)	0.74 (0.42,1.31)	0.29	0.3
Household Income	0.42 (0.15, 1.16)	0.39 (0.14,1.12)	0.54	0.372
Year of study	2.20 (1.24, 3.92)	2.25 (1.25,4.06)	0.3	0.007
OR, odds ratio; CI, confidence interval [a]Simple logistic regression [b]Multiple logistic regression				

Discussion

Prevalence of depression

The prevalence of depression in this study is 82% which is higher compared to the previous study in other universities in peninsular Malaysia, which stood at 23.43% [6]. The difference is due to the data collection location, where the previous study was done in the rural area compared to this study that has been done in the city area. From the previous study in Sabah, there is only one data for the prevalence of stress among university students, which is 33.3%, but it was done only to the medical students [28]. However, compared to our study, the participants were from various bachelor degree programmes from business, accountancy, agriculture and engineering faculty. The other reason for the high prevalence of depression for this study is might be due to the Covid-19 pandemic that explained the emotional challenges of not being able to do daily activities as usual. This is consistent with several recent studies that showed Covid-19 pandemic is one of the contributing factor for depression among university students due to its uncertainty and long-term psychological distress [29-32]. This study was done during the Recovery Movement Restrictions Order (RMCO) whereby the students' movement were restricted to other places and the classes system was changed to online. This is similar to the previous

study that showed being isolated during Covid-19 lockdown and changed to the online classes and examination also contribute to stress in the students' life [33]. One of the studies in Italy also showed high prevalence of depression among university students due to Covid-19 pandemic which is 72.93% [30].

Association between year of study and depression among university students

Our study found that only the year of study was associated with a higher level of depression. Students in Year 1 and 2 were two to three times more likely to develop moderate-severe depression compared to their counterparts in Year 3 and 4. The result was consistent with several studies showing that first and second-year students are more prone to depression, said to be due to the stresses of the transition period from school to college/university [21,34]. There are changes in environment and learning style as students shifted from schools to higher education centres. In the university, the learning style is more independent, and at own initiative in which lecturers serve as facilitators; it is quite different compared to teachers in secondary school. Another possible reason for distress during the junior year could be the students had left their homes and family members for the first time. The previous study findings also showed that separation from home and attachment objects such as parent contribute to the distress among students [35]. Struggling with these sudden changes may predispose students to emotional distress and symptoms of depression [36].

Meanwhile, no association was found between gender and depression among university students. The same finding was found some other studies that showed no differences in male and female students in developing depression [37,38]. This study also showed insignificant association between living situation and depression among our participants, despite the contradicting evidence documented in prior studies. For instance, Chen et al. reported that students who were lived away from their parents were 1.63 times more likely to develop depression than those who stayed with their parents [7]. One possible explanation for this could be in the East Malaysia's culture, it is common for young adults to stay away from family members since they are migrate for work or educational purposes. Ethnicity, household income, and CGPA also showed no association with depression in this study [39,40].

Limitations and Recommendations

This study has a number of limitations. First, the cross-sectional design did not allow us to infer cause-and-effect relationships. Second, our respondents were selected using the convenience sampling approach. This could have caused selection bias; those who participated could have possessed distinct characteristics that did not represent the whole student population. Third, the limitations of PHQ-9 could have contributed to a less accurate measurement of depression-a drawback that could be compensated by using a diagnostic tool to measure depression. Lastly, we are aware that many other variables that could play a role as risk factors for depression were not measured in this study. Future researchers can complement our study constraints by employing a probability sampling strategy and a longitudinal design, besides including a wider range of variables to capture a more holistic understanding of what may cause depression.

Conclusion

This study showed a high prevalence of depression among university students compared to other previous studies. This might result from the COVID-19 pandemic and its counter-measures that confined people to specific areas, incurring a high sense of uncertainty. We found that junior students were more likely to have moderate-severe depression compared to their senior counterparts. This should prompt the university management and affiliated health care and mental health service providers to design programs or interventions that target this specific group. Examples of initiatives are mental health awareness programs and mental health screening. Other faculty members should also be included in the awareness programs because they interact with students frequently and thus constitute their support system.

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