

SYMPTOMS OF DEPRESSION AMONG HEALTH SCIENCES STUDENTS AND ITS RELATION TO LOCUS OF CONTROL

NUR FARAH SYAFIEKA JASDI¹ AND PADMA A RAHMAN^{1*}

¹Center for Occupational Therapy Studies, Faculty of Health Sciences, Universiti Teknologi MARA (UiTM), Puncak Alam Campus, Selangor, Malaysia.

*Corresponding author: padma553@uitm.edu.my

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Abstract: Depression frequently has an onset during university years and students that develop depression during university life may be influenced by locus of control. This study aimed to identify the prevalence of depression among students of health sciences in UiTM Puncak Alam and the association between locus of control and depression. A cross-sectional study was done on 315 health sciences students via convenience sampling. Data were obtained through an online questionnaire using CES-D and MHLC-A. The result showed that the prevalence of symptoms of depression among health sciences students was high (42.9%). A negative association was found between depression and the internal locus of control, IHLC ($r_s = -0.558, p < 0.001$), while a positive association was found between depression and both the external locus of control, PHLC ($r_s = 0.236, p < 0.001$) and CHLC ($r_s = 0.470, p < 0.001$). Socio-demographic characteristics that were significantly associated with depression are gender ($p = 0.044$), CGPA ($p = 0.006$), living arrangement ($p = 0.003$), parent's marital status ($p = 0.002$) and family income ($p = 0.023$), while socio-demographic characteristics that were significantly associated with locus of control is CGPA ($p = 0.001$), living arrangement ($p = 0.001$) and parent's marital status ($p = 0.004$). Locus of control can be considered one of the significant variables when addressing depression among students. The implication of this study for occupational therapy practice is to plan for prevention and develop interventions to assist students in adapting and facing challenging situations.

Keywords: depression, locus of control, university students, health sciences students.

Introduction

Depression among university students has become a rising concern worldwide as it is one of the most common health issues affecting university students and it frequently has an onset during university years (Hunt & Eisenberg, 2010). Various stressors could lead to depression among students during university life, such as being away from family, financial problems, relationship problems, and academic stress (Bitsika *et al.*, 2010; Uehara *et al.*, 2010) 11,164 freshmen filled out the Diagnostic and Statistical Manual for Mental Disorders (DSM.

Depression occurs not only depending on genetic, neurobiological, and psychosocial factors but may also be affected by the students' locus of control (Mongale & Amone-P'Olak, 2019). Locus of control is the belief of whether the events in life are controlled by one's behaviour and abilities or by external forces

(Mongale & Amone-P'Olak, 2019). Individuals with an internal locus of control tend to believe that they have control over the events and outcomes of their lives as it depends mostly on their behaviour (Kurtović *et al.*, 2018). However, individuals with an external locus of control believe they have little control over their life as they tend to attribute the events to external factors such as powerful others, chance, fate, or luck.

Students that develop depression during university life may be influenced by their locus of control. Several studies investigated the relationship between depression and locus of control among university students. Most findings concluded that depression is positively correlated with an external locus of control and negatively correlated with an internal locus of control. Individuals with an external locus of control believe they cannot prevent

negative events from happening, which causes them to experience more anxiety, distress, and depression (Cirhinlioğlu & Özdikmenli-Demir, 2012). A study by Inozu *et al.* (2012) among undergraduate students found that a higher level of external locus of control was significantly associated with higher levels of depression symptoms.

There is no study found regarding the prevalence of symptoms of depression among UiTM Puncak Alam students. Besides that, students that develop depression during university life may be influenced by their locus of control and there are various variables of the socio-demographic characteristics that could lead to depression among students and their locus of control. Therefore, the objectives of this study were to identify the prevalence of depression among students of health sciences in UiTM Puncak Alam, to identify the association between locus of control and depression, and to identify the relationship between socio-demographic characteristics with depression symptoms and locus of control.

Materials and Methods

Study Design

A cross-sectional study was conducted on health sciences students from UiTM Puncak Alam from September 2020 until March 2021. Convenience sampling was used, where the participants were selected based on their availability and willingness to participate in the study. The inclusion criteria for the study participants are students from the Faculty of Health Sciences in UiTM Puncak Alam at the time of the study. The exclusion criteria are students that had received a psychiatric diagnosis. A total of 315 students participated in this study. Ethical approval for this study was obtained from the UiTM Research Ethics Committee, reference number REC/10/2020 (UG/MR/197).

Instruments

The instruments used for this study were the Center for Epidemiologic Studies Depression

Scale (CES-D) (Radloff, 1977) by correlations with clinical ratings of depression, and by relationships with other variables which support its construct validity. Reliability, validity, and factor structure were similar across a wide variety of demographic characteristics in the general population samples tested. The scale should be a useful tool for epidemiologic studies of depression. The Center for Epidemiologic Studies Depression Scale (CES-D Scale and Multidimensional Health Locus of Control Scale Form A (MHLC-A) (Wallston *et al.*, 1978). The first part of the questionnaire contains information on the respondent's demographic data: age, gender, program, years of study, Cumulative Grade Point Average (CGPA), living arrangement, parent's marital status, and family monthly income.

Centre for Epidemiologic Studies Depression Scale (CES-D)

CES-D was developed to measure the symptoms associated with depression in the general population (Radloff, 1977) by correlations with clinical ratings of depression, and by relationships with other variables which support its construct validity. Reliability, validity, and factor structure were similar across a wide variety of demographic characteristics in the general population samples tested. The scale should be a useful tool for epidemiologic studies of depression. The Center for Epidemiologic Studies Depression Scale (CES-D Scale). It consists of 20 items with a possible score range of zero (none of the time) to three (all the time). Items 4, 8, 12, and 16 are positively worded and these items' scores need to be reversed. The total score ranged from zero to sixty, with a higher score reflecting greater symptoms of depression. CES-D score of equal to or greater than 16 is typically considered a cutoff for clinical depression (Smarr & Keefer, 2011). The internal consistency of CES-D was high, with Cronbach's Alpha ranging from 0.85 in the general population to 0.90 in the psychiatric population (Radloff, 1977) by correlations with clinical ratings of depression, and by relationships with other variables which support

its construct validity. Reliability, validity, and factor structure were similar across a wide variety of demographic characteristics in the general population samples tested. The scale should be a useful tool for epidemiologic studies of depression. The Center for Epidemiologic Studies Depression Scale (CES-D Scale).

Multidimensional Health Locus of Control Scale Form A (MHLC-A)

MHLC-A was developed for the general population to measure a person's beliefs regarding their health condition (Machado *et al.*, 2016). It consists of three subscales which are Internal Health Locus of Control (IHLC), Powerful Others Health Locus of Control (PHLC), and Chance Health Locus of Control (CHLC). PHLC and CHLC are the external loci of control. Each of these subscales contains six items with a six-point Likert scale ranging from one (strongly disagree) to six (strongly agree). It is scored by summing respective items for a total scale score. Higher scores indicate a stronger tendency towards that type of control. The Cronbach's Alpha of MHLC subscales was moderately acceptable, ranging between 0.66 to 0.77 (Wallston *et al.*, 1978; Kuwahara *et al.*, 2004; Moshki *et al.*, 2007).

Data Collection Procedures

The data was collected using a self-administered questionnaire through an electronic medium, Google Forms. The link to the questionnaire was distributed to health sciences students through social media. The participants were allowed to withdraw from participation at any point during the study without being penalized.

Data Analysis

Statistical Package for Social Science (SPSS) program version 25.0 was used for data analysis. Descriptive statistics were used to analyze the demographic data and to determine the prevalence of depression. The correlation coefficient was used to examine the association between locus of control and depression among

students, while the Chi-square test was used to measure the relationship between demographic characteristics with depression symptoms and locus of control.

Results

Demographic Background of Respondents

Table 1 shows the socio-demographic characteristics of health sciences students in UiTM Puncak Alam. Among the respondents, 42 (13.3%) were males, while 273 (86.7%) were females. The age group of the respondents was from 19 to 25 years old, with a mean age of 21.5 (SD = 1.46). A total of 151 students (47.9%) were below 22 years old, while the other 164 (52.1%) were 22 years old and above. From the total respondents, there were 23 (7.3%) nursing students, 29 (9.2%) optometry students, 26 (8.3%) physiotherapy students, 53 (16.8%) medical imaging students, 69 (21.9%) occupational therapy students, 50 (15.9%) nutrition and dietetics students, 36 (11.4%) medical laboratory technology students, and 29 (9.2%) environmental health and safety students. There was a total of 48 students (15.2%) that were in the first year, 92 (29.2%) in the second year, 63 (20.0%) in the third year, and 112 (35.6%) in the fourth year.

For the Cumulative Grade Point Average (CGPA), none of the respondents have a CGPA of 1.99 or below, while 35 (11.1%) have a CGPA from 2.00 to 2.99, 194 (61.6%) have a CGPA of 3.00 to 3.49, and 86 (27.3%) have a CGPA of 3.50 and above. As to the living arrangement, 261 students (82.9%) lived with their families, 34 students (10.8%) stayed in the dormitory, while the other 20 students (6.3%) lived in rented accommodation. The parent marital status of 272 students (86.3%) was married, while 30 of them (9.5%) had a single parent and 13 of them (4.1%) had a separated parent. Among the respondents, 47 (14.9%) had a family monthly income of below RM 1,500, 157 (49.8%) had a family monthly income between RM 1,500 and RM 5,000, while the remaining 111 (35.2%) had a family monthly income above RM 5,000.

Table 1: Demographic background of respondents (n =315)

Variables	n (%)
Gender	
Male	42 (13.3)
Female	273 (86.7)
Age	
Below 22	151 (47.9)
22 and above	164 (52.1)
Program	
Nursing	23 (7.3)
Optometry	29 (9.2)
Physiotherapy	26 (8.3)
Medical imaging	53 (16.8)
Occupational therapy	69 (21.9)
Nutrition and dietetics	50 (15.9)
Medical laboratory technology	36 (11.4)
Environmental health and safety	29 (9.2)
Years of study	
First year	48 (15.2)
Second year	92 (29.2)
Third year	63 (20.0)
Fourth year	112 (35.6)
CGPA	
2.00 – 2.99	35 (11.1)
3.00 – 3.49	194 (61.6)
3.50 or above	86 (27.3)
Housing status	
With family	261 (82.9)
Dormitory	34 (10.8)
Rental	20 (6.3)
Parent's marital status	
Married	272 (86.3)
Separated / Divorced	13 (4.1)
Single parent	30 (9.5)
Family monthly income	
Below RM1,500	47 (14.9)
RM1,500 – RM5,000	157 (49.8)
Above RM5,000	111 (35.2)

Prevalence of Depression among Health Sciences Students

Table 2 shows the prevalence of depression measured by CES-D among health sciences students in UiTM Puncak Alam. The overall prevalence of depression among the respondents was 42.9%. A higher prevalence was observed among females (45.1%) than males (28.6%). There were only small differences in the prevalence between students aged below 22 (40.4%) and students aged 22 years old and above (45.1%). The prevalence to the program of medical laboratory technology, nursing, environmental health and safety, optometry, nutrition and dietetics, occupational therapy, medical imaging, and physiotherapy was 58.3%, 52.2%, 44.8%, 44.8%, 44.0%, 40.6%, 37.7%, and 23.1% respectively. In addition, second-year students had the highest prevalence (53.3%), followed by students in the third year (44.4%), fourth year (42.0%), and first year (22.9%).

The prevalence was also found to be high among students with a CGPA of 2.00 to 2.99

(91.4%), followed by students with a CGPA of 3.00 to 3.49 (39.7%) and 3.50 and above (30.2%). Students living with family had a lower prevalence (39.1%) compared to students living in dormitories (52.9%) or rented accommodation (75.0%). The prevalence among students with married parents was low (39.3%) compared to students with a single parent (63.3%) and separated parent (69.2%). The prevalence of depression was the highest in family monthly income below RM 1,500 (61.7%), followed by RM 1,500 to RM 5,000 (43.3%) and above RM 5,000 (34.2%).

Students' gender, CGPA, living arrangement, parents' marital status, and family monthly income were significantly associated with depression symptoms ($p = 0.044$; $p = 0.006$; $p = 0.003$; $p = 0.002$; $p = 0.023$). There was a higher proportion of depressed students among students of the female gender, CGPA below 3.50, living in a dormitory or rented accommodation, having a separated or single parent, and having a family income below RM 5000.

Table 2: Prevalence of depression based on CES-D and the association between students' socio-demographic characteristics with their depression symptoms (n = 315)

Variables	Symptoms of depression		p-value*
	Yes n (%)	No n (%)	
Overall	135 (42.9)	180 (57.1)	
Gender			
Male	12 (28.6)	30 (71.4)	0.004
Female	123 (45.1)	150 (54.9)	
Age			
Below 22	61 (40.4)	90 (59.6)	
22 and above	74 (45.1)	90 (54.9)	0.397
Program			
Nursing	12 (52.2)	11 (47.8)	
Optometry	13 (44.8)	16 (55.2)	
Physiotherapy	6 (23.1)	20 (76.9)	-
Medical imaging	20 (37.7)	33 (62.3)	
Occupational therapy	28 (40.6)	41 (59.4)	
Nutrition and dietetics	22 (44.0)	28 (56.0)	
Medical laboratory technology	21 (58.3)	15 (41.7)	
Environmental health and safety	13 (44.8)	16 (55.2)	

Years of study			
First year	11 (22.9)	37 (77.1)	
Second year	49 (53.3)	43 (46.7)	1.000
Third year	28 (44.4)	35 (55.6)	
Fourth year	47 (42.0)	65 (58.0)	
CGPA			
2.00 – 2.99	32 (91.4)	3 (8.6)	
3.00 – 3.49	77 (39.7)	117 (60.3)	0.006
3.50 or above	26 (30.2)	60 (69.8)	
Housing status			
With family	102 (39.1)	159 (60.9)	
Dormitory	18 (52.9)	16 (47.1)	0.003
Rental	15 (75.0)	5 (25.0)	
Parent's marital status			
Married	107 (39.3)	165 (60.7)	0.002
Separated / Divorced	9 (69.2)	4 (30.8)	
Single parent	19 (63.3)	11 (36.7)	
Family monthly income			
Below RM 1,500	29 (61.7)	18 (38.3)	
RM 1,500 – RM 5,000	68 (43.3)	89 (56.7)	0.023
Above RM 5,000	38 (34.2)	73 (65.8)	

The Association Between Locus of Control and Depression

Table 3 shows the association between locus of control and depression among health sciences students in UiTM Puncak Alam based on MHLC-A and CES-D. There was a statistically significant association between depression and internal locus of control. The IHLC was found to be negatively and moderately associated with depression ($r_s = -0.558$, $p < 0.001$). A statistically significant association was also found between depression and both external locus of control, the PHLC and CHLC, which

were positively associated with depression though the correlation was weak ($r_s = 0.236$, $p < 0.001$) and fair ($r_s = 0.470$, $p < 0.001$).

Table 4 shows the association between socio-demographic characteristics and locus of control. Students' CGPA, living arrangements, and parents' marital status were significantly associated with locus of control ($p = 0.001$; $p = 0.001$; $p = 0.004$). A higher proportion of students with an external locus of control among students with a CGPA below 3.50, living in a dormitory or rented accommodation, and having a separated or single parent.

Table 3: Association between locus of control and depression among health sciences students based on MHLC-A and CES-D (n = 315)

Variables	IHLC score	PHLC score	CHLC score
CESD score	-0.558 ^a (< 0.001) ^b	0.236 ^a (< 0.001) ^b	0.470 ^a (< 0.001) ^b

^a Spearman's correlation coefficient, r_s

^b p-value

Table 4: Association between the students' socio-demographic characteristics with their locus of control (n = 315)

Variables	Locus of Control		p-value*
	External n (%)	Internal n (%)	
Gender			
Male	9 (21.4)	33 (78.6)	0.059
Female	99 (36.3)	174 (63.7)	
Age			
Below 22	56 (37.1)	95 (62.9)	0.315
22 and above	52 (31.7)	112 (68.3)	
Years of study			
First and second year	48 (34.3)	92 (65.7)	1.000
Third and fourth year	60 (34.3)	115 (65.7)	
CGPA			
Below 3.50	91 (39.7)	138 (60.3)	0.001
3.50 and above	17 (19.8)	69 (80.2)	
Housing status			
With family	79 (30.3)	182 (69.7)	0.001
Dormitory/Rental	29 (53.7)	25 (46.3)	
Parent's marital status			
Married	85 (31.3)	187 (68.7)	0.004
Separated/Single parent	23 (53.5)	20 (46.5)	
Family monthly income			
Below RM 5,000	76 (37.3)	128 (62.7)	0.132
Above RM 5,000	32 (28.8)	79 (71.2)	

*Pearson Chi-square test

Discussion

Prevalence of Depression Among Health Sciences Students

The finding shows a higher prevalence of depression (42.9%) compared to previous studies found in Malaysia, which is International Islamic University Malaysia (36.4%, n = 365) (Nahas *et al.*, 2019), Melaka Manipal Medical College (30.7%, n = 397) (Teh *et al.*, 2015) and University of Malaya (29.4%, n = 1017) (Islam *et al.*, 2018). The prevalence was also found to be higher compared to the prevalence of depression among students in other countries such as Saudi Arabia (36.5%, n = 450) (Ibrahim *et al.*, 2013) Jeddah, Saudi Arabia. Methods: A

cross-sectional study was carried out during 2010-2011. A stratified random sample method was used to select 450 medical students. A confidential, anonymous & self administered questionnaire included Standardized Hospital Anxiety & Depression Scale was used. Results: The mean scores for anxiety and depression were 9.32 ± 3.77 & 6.59 ± 3.62 , respectively. There is a positive correlation between anxiety & depression scores ($r = 0.52$, $P < 0.001$, Nepal (29.78%, n = 94) (Basnet *et al.*, 2012), Ethiopia (27.7%, n = 300) (Berhanu, 2015) and Sri Lanka (19.0%, n = 100) (Wickramasinghe *et al.*, 2019). On the other hand, a higher prevalence of depression than the current study was

reported among students from China (51.8%, n = 5245) (Chen *et al.*, 2013) and Southern Africa (52.7%, n = 272) (Khumalo & Plattner, 2019). The differences in prevalence between studies might be due to the different measurement tools because the type of assessments and criteria used to ascertain depression in each measurement tool might widely differ. In addition, some individuals might have biased responses when reporting depression symptoms due to favourable self-presentation and social desirability. Cultural differences may also influence one's likelihood of reporting the symptoms of depression due to the stigma and knowledge associated with the illness.

Besides that, the prevalence of depression among female students was probably higher than among male students since female students tend to be more concerned about their marks and performance, leading them to express their sadness more easily (Fawzy & Hamed, 2017) anxiety and stress symptoms among medical students who were enrolled in a public university in Upper Egypt and determine the association of these morbidities with the students' basic socio-demographic variables. This cross-sectional study included 700 students. A self-administered, questionnaire for the socio-demographic characteristics, Depression Anxiety Stress Scale (DASS 21). The high prevalence of depression among older students might be due to concerns regarding future uncertainties compared to younger students (Shamsuddin *et al.*, 2013). Students in the first year have the least prevalence of depression, probably because they still do not experience study difficulties and stress compared to the senior-year students (Islam *et al.*, 2018). Besides that, students with high CGPA have a low prevalence of depression because they usually feel more confident with themselves and their academic performance, causing them to experience lower academic stress (Yusoff *et al.*, 2013).

In addition, students who lived away from their parents were more likely to develop depression due to the loss of familiar surroundings (Islam *et al.*, 2018) and a break in

social ties (Tariku *et al.*, 2017). Students with separated parents were also found to be more prone to depression because the cohesiveness of a family might be disrupted, which will lead to poor physical and mental health outcomes (Zhai *et al.*, 2015) which included 2645 males and 2538 females. Students were questioned with respect to social demographics and suicidal ideation factors. The data were analyzed with factor and logistic analyses to determine the association between suicidal ideation and poor family environment. Results: The prevalence of suicidal ideation was 9.2% (476/5183). Other than that, students with low family income were found to have a higher prevalence of depression because they might experience problems with their everyday expenses (Teh *et al.*, 2015), as well as the rising cost of stationery materials, house rent, and photocopy services (Tariku *et al.*, 2017).

Apart from that, the high prevalence of depression among university students might also be due to the current COVID-19 pandemic situation. The COVID-19 pandemic has resulted in social isolation, which harms mental health as it can reduce interpersonal communication, increase loneliness, and lead to depressive symptoms (Tang *et al.*, 2020; Yu *et al.*, 2021). Besides that, university students with family members or relatives with confirmed cases or suspected cases of COVID-19 tend to have negative psychological feelings since they feel more likely to be infected (Wang *et al.*, 2020). Individuals living in areas with a higher number of confirmed COVID-19 cases also tend to have depressive symptoms as it makes them feel to be more vulnerable to the disease (Chi *et al.*, 2020).

The Association Between Locus of Control and Depression

This study found that the internal locus of control was negatively associated with depression, while both external locus of control (chance and powerful others) were positively associated with depression. Individuals with an internal locus of control are less likely to be depressed since they tend to use a more constructive technique in

responding to negative events, such as searching thoroughly for solutions and using appropriate coping methods (Buddelmeyer & Powdthavee, 2016). They also tend to believe that they can make their own decision to improve their quality of life, leading them to show healthy behavior and have fewer depressive symptoms (Sharif, 2017). Meanwhile, individuals with an external locus of control tend to lack satisfaction and happiness since their performance is not attributed to themselves but to external forces (April *et al.*, 2012). Individuals with an external locus of control typically suffer from depression because they believe that they were unable to prevent or stop negative things from happening, thus resulting in self-accusation and viewing the self as worthless which may cause despair (Cirhinlioğlu & Özdikmenli-Demir, 2012).

The Relationship Between Socio-Demographic Characteristics with Depression Symptoms

This study found a significant association between gender, CGPA, living arrangement, parent's marital status, and family monthly income with depression symptoms. The association between gender and depression might be due to increased exposure to stressors and hormonally linked stress sensitivity in females due to age-related changes in biological or social circumstances (Thapar *et al.*, 2012). Students' CGPA was also significantly associated with depression because poor academic performance might lead students to develop feelings of academic disappointment (Yusoff *et al.*, 2013). Besides that, the living arrangement was found to be one of the risk factors for depression, as the living arrangement might affect the amount of social support that an individual could receive (Parro-Pires *et al.*, 2018). Parents confined at home due to the COVID-19 pandemic may be deeply worried about their economic future, causing a lack of attention and support given to the children (Daniel, 2020).

Other than that, parents' marital status was found to be associated with depression. Individuals raised by divorced or widowed parents tend to have higher psychological

distress since they have greater burdens such as having housework responsibilities and taking part-time jobs to improve their family's financial condition (Geshica & Musabiq, 2019). Apart from that, household income was also found to be one of the risk factors for depression. Financial hardship could lead to difficulties in meeting the basic requirements of daily life and students from a family with financial instability are more likely to have depressive symptoms (Butterworth *et al.*, 2012; Beiter *et al.*, 2015).

The Relationship Between Socio-Demographic Characteristics with Locus of Control

This study also found a significant association between CGPA, living arrangements, and parents' marital status with the locus of control. Students' CGPA was found to be significantly associated with locus of control. Students were academically more successful when they believed the reasons for their results or performance were within their power (Hrbáčková *et al.*, 2012). Besides that, the living arrangement was significantly associated with locus of control. Students living away from family might have less perceived social support, leading them to have a weaker feeling of personal control (Satici *et al.*, 2013). Other than that, parents' marital status was also found to be associated with locus of control. Individuals with separated or divorced parents are more vulnerable to psychological distress due to emotions such as shame and guilt, which may cause them to have an external locus of control (Besharat *et al.*, 2018).

Conclusion

This study revealed a high prevalence of symptoms of depression among health sciences students and students with an external locus of control are more likely to present with depressive symptoms. The findings suggest help-seeking behaviour among health sciences students, especially when facing depressive symptoms. The result of this study can be used as a baseline measurement of depression among university students. In addition, locus of

control can be considered one of the significant variables when addressing depression as a mental health problem among students. The findings may assist health services or academic staff and counsellors on the campus in planning prevention and developing interventions to help university students adapt and face challenging situations in life.

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