

ORIGINAL ARTICLE

# THE OCCURRENCE OF DEPRESSION AMONG STUDENTS IN UNIVERSITY OF CYBERJAYA DURING MOVEMENT CONTROL ORDER (MCO) OF COVID-19 PANDEMIC

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## ABSTRACT

*In this study, we demonstrate the prevalence of depression and factors associated with depression among foundation students in University of Cyberjaya during Movement Control Order (MCO) of Covid-19 Pandemic. A cross-sectional study was conducted from July 2021 to February 2022, a period where phase three of MCO was declared in Malaysia. Data was collected by using online Patient Health Questionnaire-9 as the scoring system for depression and was analysed using Jeffrey's Amazing Statistics Program (JASP) version 0.14.1.0. Statistical analyses such as descriptive analysis, chi-square and multinomial logistic regression was applied in this study. Our result showed that the prevalence of depression among foundation students during MCO was high. The students enrolled in Foundation in Art program reported to have the highest severe depression compared to the other foundation programs. Although sociodemographic factors exhibited relevant prevalence pattern among the foundation students, however there is no significant ( $p < 0.05$ ) association between sociodemographic factors with prevalence of depression in this study. We further analysed the following predominant factors which could affect the learning process and root cause of depression among the students during MCO. Interestingly, students unsatisfied with online classes ( $p = 0.028$ ) and have poor internet connection ( $p = 0.027$ ) revealed significant association with depression level. Thus, in order to improvise the learning outcomes, we suggest to have an interactive learning and blended teaching method to overcome the depression and mental stress in students.*

**Keywords:** Depression, Mental stress, MCO, Foundation students, Patient Health Questionnaire-9.

## INTRODUCTION

The covid-19 pandemic had inevitably caused a huge impact on individuals all around the world both physically and mentally. According to the World Health Organization, as of 22<sup>nd</sup> March 2022, the number of cases has reached up to 470 million confirmed Covid-19 cases accompanied by 6 million deaths. Malaysia alone has been affected with around 4 million cases<sup>1</sup>. Based on the National Health Morbidity Survey (NHMS) the prevalence of depression among adults in Malaysia had increased from 10.7 % in 1996 to 29.2 % in 2015. Furthermore, among the age group where students reside - 15 to 19 years old - the prevalence of depression was at 2.1 %, which translates to almost 20,000 people affected with depression<sup>2</sup>.

Following the high escalation in the number of Covid-19 cases, the Malaysian government had implemented several regulations starting from 18<sup>th</sup> March 2020 to lessen and control the widespread of the disease. Some of the measures taken during movement control order (MCO) include temporary closure of non-essential services, online classes

(Closure of all education institutions), and home quarantine. These factors could be an additional stressors and challenging period in tertiary educational life for students<sup>2</sup>. A recent study on the prevalence of depression among Management and Science University students in Shah Alam, Selangor was reported 64.94 % during MCO of Covid-19 pandemic<sup>3</sup>. This clearly evident that uncertainty during this pandemic had unavoidably taken a toll on the mental depression of the university students.

Depression is inevitably an important element which could affect a student's life in terms of studies, performance, and social life. Having low confidence and self-esteem are common symptoms of depression which easily impact a student's socialising capability by making it an exhausting or terrifying experience. According to a study done in University of British Columbia, students have various demands that needs to be manage such as; transitioning from adolescence to adulthood, forming new social circles, being independent and adapting to unfamiliar environment while managing

demands of daily life, and these are all potential stressors that contribute to depressive symptoms<sup>4</sup>. Furthermore, a study conducted in Western Michigan University showed that depression and academic productivity has an inversely proportional relationship. The study showed among 121 depressed students, 14.64% missed many classes, 5.45% failed to hand in assignments, 1.36% missed examinations and 0.74% dropped out of courses<sup>5</sup>.

Therefore, further studies are required to measure the occurrence of depression among university students and the factors associated with. In this research, we designed a cross-sectional study to determine the prevalence of depression among University of Cyberjaya students. We also study the correlation between predominant factors with depression level among students during MCO of Covid-19 pandemic, whereby most of the participants were residing together with their family.

## METHOD

This study was conducted at University of Cyberjaya, Persiaran Bestari, Cyber 11, 63000 Cyberjaya, Selangor campus.

### Sample size

Sampling size was obtained using the following formula:

$$n = \left[ \left( \frac{z}{m} \right)^2 \times P(1 - P) \right] + 10\% \text{ nonrespondent}$$

- $n$  = number of samples
- Z score,  $z = 1.96$  (95% CI)
- Margin of error,  $m = 0.07$  (7%)
- Proportion,  $P$  = Anticipated population proportion from pilot study

### Study population

Students as stepping into tertiary education in universities are more prone to depression than secondary school students<sup>3</sup>. Thus, in this study students that were enrolled in foundation programs at the University of Cyberjaya were included as the study population that fulfilled the inclusion and exclusion criteria. The inclusion criteria were, 18 to 24 years old students who were joined university during MCO of covid-19 pandemic; students who studied in foundation programs which includes Foundation in Science (FIS), Foundation in Allied Science (FAS) and Foundation in Art (FIA) and are from the March 2021 intake. Whereas the exclusion criteria, students with physical disabilities; students with pre-existing medical conditions and students with mental disabilities. If the student failed to complete the questionnaire, it was counted as non-responsive data.

## Study Design

A cross-sectional study was conducted at the University of Cyberjaya from July 2021 to February 2022. This period of study was nationally declared as period of MCO (phase 3). Thus, this study period fits well for online data collection as questionnaires in the form of Google Form distributed through email to all students. An electronic informed consent was obtained from the participants before they proceeded to fill up the questionnaire. The students have the rights to choose to participate in the study voluntarily or to withdraw anytime from it. The study population was students from foundation programs of March 2021 intake comprised of FIS, FAS, and FIA. The total number of foundation students from these three programs was 254, and we successfully retrieved 167 respondents through convenience sampling method.

Firstly, we obtained the sociodemographic data which were the participants' gender, ethnicity, household income and place of residence. We analysed these sociodemographic factors whether they have any association with the prevalence of depression. Subsequently, we investigated whether the foundation programs had any correlation with the depression level. We also investigated the predominant factors which associated with depression such as: the satisfaction with online classes; stability of internet connection; living status either with or away from family; physical activity probability; and family history of depression. Finally, the last part of the online questionnaire was a series of questions unchanged from the Patient Health Questionnaire (PHQ-9) which consisted of 9 questions. Each answer for every question of the PHQ-9 possess their own scoring system, where the numbers were summed up at the end of the questionnaire to produce the final score which then determined the severity of depression from none to severe depression level.

### Data analysis

The data obtained was analysed using Jeffrey's Amazing Statistics Program (JASP) version 0.14.1.0, where descriptive analysis, Chi-square and multinomial logistic regression were used. Descriptive analysis allowed us to find the prevalence of depression among students in their respective study programs. We utilized the Chi-square method to study the association between the factors of depression and its severity level. Furthermore, we used multinomial logistic regression to study the strength of association between the variables. Thus, we were able to determine the significance value.

### Ethical Approval

This research was approved by the Cyberjaya Research Ethics Committee, Faculty of Medicine,

University of Cyberjaya (CRERC) with CRERC Reference Number: UOC/CRERC/ER/323.

**RESULTS**

Out of 167 respondents, about 85.2% given their response for this study. The sociodemographic data showed the age range for most of the students were

≥18 to <20 years old (51.5%), followed by ≥20 to <22 years old (34.7%) and ≥22 to 24 years old (13.8%). Among the students, most of them (31.1%) were exhibited to have severe depression, followed with mild depression (27.5%), moderate depression (25.7%) and without any depression (15.7%) (Table 1).

**Table 1: Severity of depression among foundation students in University of Cyberjaya during MCO.**

Depression levels	Frequency, <i>n</i>	Percentage, %
None	26	15.7
Mild	46	27.5
Moderate	43	25.7
Severe	52	31.1
Total	167	100

Among all the foundation programs studied, students who enrolled in FIA program had the highest prevalence of severe depression (40.6%) compared to students who were in FAS program

(29.6%) and FIS program (28.4%) (Table 2). Majority of FAS students (33.3%) recorded prevalence of moderate depression (Table 2).

**Table 2: Prevalence of depression by foundation programs enrolled in University of Cyberjaya during MCO.**

Study Programme	Depression levels			
	None Frequency (%)	Mild Frequency (%)	Moderate Frequency (%)	Severe Frequency (%)
FIS ( <i>n</i> = 81)	17 (21.0)	21 (25.9)	20 (24.7)	23 (28.4)
FAS ( <i>n</i> = 54)	4 (7.5)	16 (29.6)	18 (33.3)	16 (29.6)
FIA ( <i>n</i> = 32) <i>n</i> =167	5 (15.6)	9 (28.2)	5 (15.6)	13 (40.6)

*n*=Total number of students; FIS: Foundation in Science; FAS: Foundation in Applied Science; and FIA: Foundation in Art.

We further analysed the distribution patterns of sociodemographic factors with depression levels among students in University of Cyberjaya during MCO. Female students were reported to have a higher prevalence of severe depression (33.3%) compared to male students (24.4%) (Table 3). Ethnicity wise, majority are Malays and Others showed severe depression while Chinese with mild depression and Indians equally with mild and moderate level of depression (Table 3). For household income, most of the respondents were in M40 category, followed by B40 and T20. Students who were in B40 and M40 both showed severe depression levels (28.8% and 38.0%, respectively) compared to students who were in T20 category (21.6%) (Table 3). The multiple logistic regression analysis<sup>6</sup> revealed that students in B40 [95% CI (0.66, 6.61)] and M40 [95% CI (0.85, 8.00)]

categories, were approximately 2 times more likely to develop depression during the MCO compared to students who were in T20 category (Table 4).

In addition, most of the respondents in this study were living in the urban area (*n*=148) while only a minority from rural area (*n*=19) (Table 3). However, in term of depression prevalence, rural area students had slightly more severe depression levels (31.6 %) compared to students in urban area (31.1 %) (Table 3). This result corresponds well with our odds ratio obtained where rural area students presented more depression compared to those with urban lifestyle (Table 4). Our result also revealed that none of the sociodemographic factors studied have significant \**p*<0.05 association with the prevalence of depression among foundation students during MCO (Table 4).

**Table 3: Distribution of sociodemographic factors with depression levels among students in University of Cyberjaya during MCO.**

Sociodemographic Factors	Depression levels				Total
	None Frequency (%)	Mild Frequency (%)	Moderate Frequency (%)	Severe Frequency (%)	
<b>Gender</b>					
Male	5 (12.2)	13 (31.7)	13 (31.7)	10 (24.4)	41
Female	21 (16.7)	33 (26.2)	30 (23.8)	42 (33.3)	126
<b>Ethnicity</b>					
Malay	9 (12.1)	17 (23.0)	17 (23.0)	31 (41.9)	74
Chinese	6 (19.4)	11 (35.5)	9 (29.0)	5 (16.1)	31
Indian	10 (21.7)	13 (28.3)	13 (28.3)	10 (21.7)	46
Others	1 (6.3)	5 (31.2)	4 (25.0)	6 (37.5)	16
<b>Household Income</b>					
B40	9 (15.3)	16 (27.1)	17 (28.8)	17 (28.8)	37
M40	9 (12.7)	20 (28.2)	15 (21.1)	27 (38.0)	71
T20	8 (21.6)	10 (27.1)	11 (29.7)	8 (21.6)	37
<b>Place of Residence</b>					
Urban	24(16.2)	41 (27.7)	37 (25.0)	46 (31.1)	148
Rural	2 (10.5)	5 (26.3)	6 (31.6)	6 (31.6)	19

**Table 4: Association between sociodemographic factors with depression prevalence among students in the University of Cyberjaya during MCO.**

Sociodemographic Factors	Logistic Regression Coefficient	p-value	Depression prevalence		
			Odds Ratio	95% Confidence Interval Lower	Upper
<b>Gender</b>					
Male	0.56	0.320	1.76	0.58	5.32
Female	1	1	1		
<b>Ethnicity</b>					
Malay	1	1	1	1	1
Chinese	-0.86	0.172	0.43	0.12	1.45
Indian	-0.86	0.120	0.42	0.14	1.25
Others	0.72	0.515	2.06	0.24	18.01
<b>Household Income</b>					
B40	0.74	0.209	2.09	0.66	6.61
M40	0.96	0.096	2.60	0.85	8.00
T20	1	1	1	1	1
<b>Place of Residence</b>					
Urban	1	1	1		
Rural	0.08	0.921	1.09	0.22	5.47

*p value (p>0.05) indicates no significance association between sociodemographic factors and depression prevalence.*

We also investigated the predominant factors including the satisfaction with online classes; stability of internet connection; living status either with or away from family; probability of physical activity; and as well family history of depression. The results in Figure 1 exhibits the distribution of predominant factors associated with depression levels. Students who were living in hostel or not living with family showed highest level of depression 83.3%, followed by the other factors in descending order; not satisfied with online classes

(47.3%), with family history of depression (43.8%), physically inactive (39.7%) and poor internet connection (32.5%) (Figure 1). Those foundation students without any depression symptoms (none) also marginally affected by these factors except for the factor not living with family (Figure 1). Interestingly, students who were not satisfied with online classes and who experienced poor internet connection showed strong association with depression; significance of *\*p=0.028* and *\*p=0.027*, respectively (Table 5).

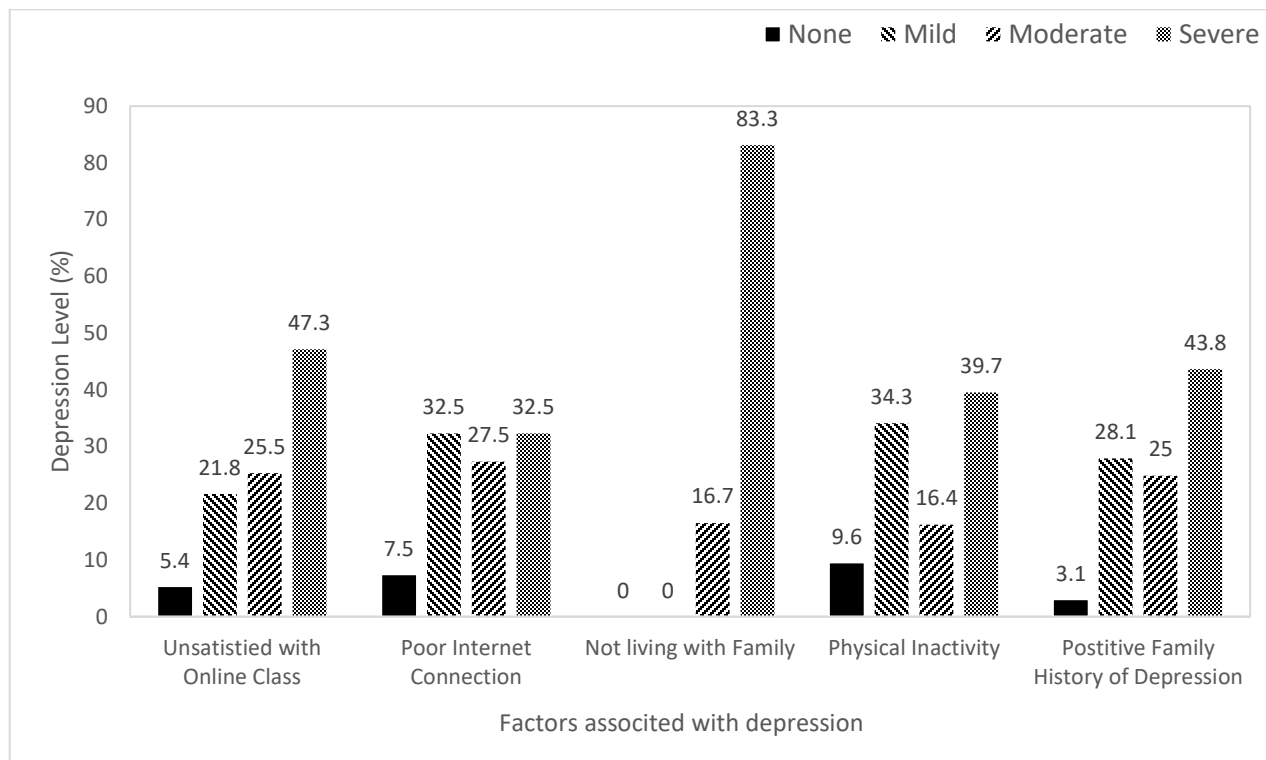


Figure 1: Factors associated with depression level among students in University of Cyberjaya during MCO.

Table 5: Association between the predominant factors with depression levels among foundation students during MCO.

Factors	Logistic Regression Coefficient	p-value	Depression levels		
			Odds Ratio	95% Confidence Interval Lower	Upper
Unsatisfied with Online Class	1.461	0.028*	4.22	1.17	15.20
Poor Internet Connection	1.136	0.027*	3.11	1.13	8.52
Physical Inactivity	0.659	0.188	1.93	0.73	5.15
Family History of Depression	1.870	0.077	6.49	0.82	52.69

\*p<0.05 indicate significance of factors associated with depression level.

**DISCUSSION**

The movement control order (MCO) during covid-19 pandemic had caused huge psychological impact on individuals all around the world and about 3.8% of individuals are suffering from depression<sup>1,7</sup>. According to our study, students in the University of Cyberjaya during MCO showed that 84.3% of them experienced depression from mild to severe level (Table 1), which was 2-fold higher compared to a cross-sectional study that was done previously<sup>3</sup>. Our prevalence could be higher due to additional stressors which include peer pressure, family problems, mode of lectures, financial issues, and lifestyle status.

In our study we correlated depression with certain sociodemographic factors such as gender, ethnicity, household income and place of residence. Our findings revealed that the odds of depression prevalence during MCO were higher among male

students compared to female students (Table 4), this however contradicts with another study<sup>8</sup>. A possible reason for this disparity could be due to higher proportion of female participants compared to male.

On the other hand, our studies showed that the Malay students had the highest prevalence of severe depression in comparison with other ethnicity students (Table 3). This result was supported by a study<sup>9</sup> where the Malay participants had the highest prevalence compared to Chinese, Indian and others. Our findings also consistent with another study<sup>10</sup>, where the Malay participant has the highest prevalence among other ethnicity studied. In this study, it also stated that there is no specific ethnicity to be susceptible to depression. However, we cannot rule out as this could be due to the cultural differences that may contribute to the level of stress and depression. As Malaysia is a multicultural nation, the influence of cultural

values to the state of depression may probably vary<sup>10</sup>.

In addition, our study showed that the students who were under M40 had the highest prevalence of depression during MCO compared to B40 and T20 (Table 3). This result was supported by<sup>11</sup>, where similar pattern of depression prevalence was observed. However, our study is inconsistent to a study<sup>12</sup>, where B40 had more prevalence of depression compared to M40 and T20. The difference in our findings may be due to the lifestyle of the students, and how they cope with the factors that affect them.

Moreover, students who were living in rural areas had a higher odds of depression prevalence compared to those who lived in urban areas (Table 4). However, this study was inconsistent to a study done in Bangladesh<sup>13,14</sup>, where students who live in urban area have more prevalence of depression during MCO compared to those who live in rural area. Malaysia is under developing country status, but Bangladesh is still in the transition from least developed country to developing country and the rural cities which are experiencing overwhelming population growth and extreme poverty could be the reason for the contradicted results. Our study also showed a significant association ( $*p<0.05$ ) between satisfaction with online classes and poor internet connection with depression. We observed that students who were not satisfied with online classes and experienced poor internet connection were 4.2 times and 3.1 times more likely to be depressed respectively (Table 5). Up to 32.5% of students were experiencing poor internet connection which caused disruption of learning process (Figure 1). This resulted in high academic pressure and increased competency among students leading to depression<sup>5</sup>. Therefore, this issue should be addressed and solved accordingly to assist students to have better learning experience. Previous study has shown that by reducing the amount of time spent in front of the electronic devices screen could reduce the depression level especially at night as it can disturb the sleeping habits<sup>15</sup>.

Furthermore, in our study, students who were physically in-active, were 2 times more likely to have depression which was in conjunction with the study<sup>16</sup>. Virtual fitness events during MCO should be promoted among students as it would promote both physical and mental health<sup>17,18</sup>. Students having family history of depression were 6.5 times more likely to be depressed than those who did not have family history of depression<sup>18,19</sup>. However, our results reported poor association between physically inactive and family history with occurrence of depression among students (Table 5).

## CONCLUSION

Our study demonstrated that the prevalence and factors associated with depression among foundation students during Movement Control Order (MCO) was high. Foundation students would more likely suffer from depression during MCO as they just progressing into tertiary education<sup>20,21</sup>, and would benefit from extra support and reassurance, especially from family and friends. Among the entire factors that were studied, dissatisfaction with online classes and poor internet connection had significant value which could affect the learning outcomes. To improvise the teaching and learning outcomes, students and academicians are recommended to have an interactive learning and blended teaching concept with games incorporated in education like “Kahoot” to overcome the stress and depression level among university students<sup>22</sup>. Despite some limitations where respondents are only foundation students from one university, further extended cross sectional studies are required to explore the insight of depression factors and levels among different university students in Malaysia as this country is a multicultural nation, hence the influence of cultural values to the state of stress and depression may probably vary<sup>10</sup>.

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## Competing Interests

The authors declared there is no conflict of interest.

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## REFERENCES

1. WHO. Depression. <https://www.who.int/news-room/fact-sheets/detail/depression> (accessed 30 January 2021).

2. Nahas ARMF, Elkalmi RM, Al Shami AM, et al. Prevalence of depression among health sciences students: Findings from a Public University in Malaysia. *J Pharm Bioallied Sci* 2019, 11(2):170-5.
3. Faez M, Hadi J, Abdalqader M, et al. Impact of lockdown due to covid-19 on mental health among students in private university at Selangor. *Eur J Mol Clin Med* 2020, 7(11):511-7.
4. Sawatzky RG, Ratner PA, Richardson CG, et al. Stress and depression in students: The mediating role of stress management self-efficacy. *Nurs Res* 2012, 61:13-21.
5. Alketa H, Steven LH, Clayton RR. The Impact of Depression on the Academic Productivity of University Students. *J Ment Health Policy Econ* 2005, 8:145-51.
6. Sperandei S. Understanding logistic regression analysis. *Biochemia Medica* 2014, 24(1): 12 - 18.
7. Roma P, Monaro M, Colasanti M, et al. A 2-Month Follow-Up Study of Psychological Distress among Italian People during the COVID-19 Lockdown. *Int J Environ Res Public Health* 2020, 17(21): 8180.
8. Marielle W, Stéphane D, Guillaume V, et al. Factors associated with mental health disorders among university students in France confined during the COVID-19 Pandemic. *JAMA network open* 2020, 3(10):1-13.
9. Kalok A, Sharip S, Abdul Hafizz AM, et al. The psychological impact of movement restriction during the COVID-19 outbreak on clinical undergraduates: A cross-sectional study. *J Environ Res Public Health* 2020, 17(22):8522.
10. Salleh R, Kiat NJ, Ghafar IHBA, Khalid NBM, Majeed S, et al. Depression Status And Covid -19 Pandemic Among Undergraduate Student Of University Kebangsaan Malaysia. *International of Public Health and Clinical Sciences* 2021, 8(5):2289 - 7577.
11. Saadeh H, Saadeh M, Almobaideen W, et al. Effect of COVID-19 quarantine on the sleep quality and the depressive symptom levels of university students in Jordan during the Spring of 2020. *Front Psychiatry* 2021, 12:605676.
12. Wong LP, Alias H, Omar IS, Nor AM, Tan MP, Baranovich DL, Che CC, Myint K, Zainuddin S, Chung I, et al. Escalating progression of mental health disorder during the Covid-19 pandemic: Evidence of a nationwide survey. *Plos one* 2021, 16(3):e0248916.
13. Islam MA, Barna SD, Raihan H, et al. Depression and anxiety among university students during the COVID-19 pandemic in Bangladesh: A web-based cross-sectional survey. *Plos One* 2020, 15(8):1-12.
14. Islam MS, Sujana MSH, Tasnim R, et al. Psychological responses during the COVID-19 outbreak among university students in Bangladesh. *Plos One* 2020, 15(12):1-15.
15. Mheidly N, Faresd MY, Fares J. Coping with stress and burnout associated with telecommunication and online learning. 2020. *Front Public Health* 2020, 8:574969.
16. Rogowska AM, Pavlova I, Kuśniercz C, et al. Does physical activity matter for the mental health of university students during the COVID-19 Pandemic? *J Clin Med* 2020, 9(11):3494.
17. Al Omari O, Al Sabei S, Al Rawajfah O, et al. Prevalence and predictors of depression, anxiety, and stress among youth at the time of COVID-19: An online cross-sectional multicountry study. *Depress Res Treat* 2020, Article ID 8887727.
18. Fawaz M, Samaha A. E-learning: Depression, anxiety, and stress symptomatology among Lebanese university students during COVID-19 quarantine 2020. *Nurs Forum* 2020, 56(1):52-7.
19. Khan AH, Sultana MS, Hossain S, et al. The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study. *J Affect Disord* 2020, 277:121-8.
20. Aylie NS, Mekonen MA, Mekuria RM. The psychological impacts of COVID-19 pandemic among university students in Bench-Sheko zone, South-west Ethiopia: A community-based cross-sectional study. *Psychol Res Behav Manag* 2020, 13:813-21.

21. Kecojevic A, Basch CH, Sullivan M, et al. The impact of the COVID-19 epidemic on mental health of undergraduate students in New Jersey, cross-sectional study. *Plos One* 2020, **15**(9):e0239696.
22. Sun S, Goldberg SB, Lin D, et al. Psychiatric symptoms, risk, and protective factors among university students in quarantine during the COVID-19 Pandemic in China. *Glob Health* 2021, **17**(1):15