Analyzing the Level of Depression, Anxiety and Stress of Students at the University during COVID-19

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ABSTRACT

Nowadays, COVID-19 has broadly attacked several psychological aspects of students during lectures at university, but it is still unknown accurately which psychological aspects more impacted and which factors that triggered them. This study aims to determine the impact of the COVID-19 pandemic on levels of depression, anxiety and stress in students. A cross-sectional online survey study was adopted in this study. Subjects (n=85) came from five universities in Indonesia and had differences in demographics. The measurement of depression, anxiety and stress level was using DASS-21. Data were analyzed using Chi-square and univariate analysis. Results indicate that the COVID-19 pandemic caused level of depression, anxiety and stress in students to be in the normal range, mild to moderate and there was a significant relationship between demographic variables and levels of depression, anxiety and stress. It can be concluded that COVID-19 has a fairly strong impact on students' depression, anxiety and stress aspects, while undergoing physical education courses. This research is benefit for lecturers in carrying out physical education lectures, so they can optimize student academic achievement in the COVID-19 era.

1. INTRODUCTION

All countries including Indonesia are still experiencing a massive spread in COVID-19 infection. Indonesia is one of the countries that has been significantly affected by this global pandemic and the fact is that Indonesia has the highest number of positive COVID-19 patients in the Asian region. Problems that often arise due to the impact of COVID-19 are related to physical health, which causing enormous deaths, all activities including industry, worship activities, events sports [1] until education are unable to run normally [2], [3]. In addition, the current impact of COVID-19 has attacked the psychological aspect of a person. The latest data reported that policies issued by several countries in the world such as lockdown, social and physical distancing, quarantine/isolation [4], work and school from home, closure of school and universities, are the main factors that cause disturbances in the psychological aspects of children, adults to parents [5]. A study found that the current COVID-19 has attacked a person's psychological aspects, such as stress, anxiety, depression, fear and anger levels, and this situation are getting higher in the current pandemic era [6], [7].

Depression, anxiety and stress are the most highlighted aspects because they have been increased significantly

during the current COVID-19 pandemic [8], [9]. Depression is a mood disorder experienced by a person with sadness, anxiety or depression symptoms when encounter with existing conditions and it is mostly shown by students' behavious who often stay silent, cry, do not want to be spoken to and tend to daydream, which finally might cause people do not have any purpose in life [10]. Anxiety and stress are psychological states of a person when experiencing nervous, emotions, and are often indicated by symptoms of sweating, shaking, unable to stay still, heart beating fast and nausea, unable to concentrate [11]. International research conducted by several previous studies in several countries found that 37.4% of students in Qatar experienced symptoms of depression and high anxiety caused by COVID-19 [12]. A cross-sectional study conducted in China found that respondents experienced severe (0.9%), moderate (2.7%) and mild (21.3%) anxiety and it was reported that the prevalence of college students with suicidal ideation increased by 9.2% [13]. Furthermore, according to Basheti, Mhaidat, & Mhaidat [14], during the current global pandemic, the level of depression, anxiety and stress continues to increase significantly and become a very crucial problem in the world. The real impact felt by students is related to stress when undergoing the online learning process during a pandemic [15] and demands from families to achieve academic success [16]. A recent finding highlights an increase level of stress, depression and anxiety among students due to changes in the learning system from face to face (offline) to online [17], experienced uncertainty or lack of knowledge in the present [18]. Then the facts showed that women have higher levels of depression, stress anxiety than men and adolescents tend to have higher levels than adults [19].

During the COVID-19 pandemic, there were numerous researches in several country concerning stress, fear, anxiety and depression levels and has been reported [20- 22], [8], [14]. However, there are still limited research regarding levels of, depression, anxiety, and stress on students while attending lectures in the physical education during COVID-19. This research offers different perspective, which is a national cross-sectional survey research in Indonesia on students of different sexes, ages, universities, faculties, course materials, cities, and religions. This study have implications in providing information about the level of depression, anxiety and stress of students to lecturers and the University, in order to facilitate them to provide an appropriate solution to reduce the level of these three psychological aspects. Therefore, the purpose of this study was to conduct a national survey in Indonesia about the impact of COVID-19 on levels of depression, anxiety and stress among students during physical education lectures.

2. Methods
This study used online survey method with cross-sectional use [21], which purpose to analyze the impact of COVID-19 on levels of depression, anxiety and stress among students during physical education learning.

2.1 Subjects
The subjects in this study were eighty-five students who were undergoing lectures in the physical education and sport science major, from several universities in different regions in Indonesia. All subjects were required to sign a willingness letter to participate in all the activities that conducted in this study. The way the subject was selected was using a purposive sampling technique, namely by selecting students who often showed negative behavior during lecture activities, such as: depression, anxiety and stress. No monetary incentives of any kind were given to participate in this study and all subjects stated their willingness to help voluntarily. The declaration from Helsinki was strictly followed, and no identifying information was collected. The demographic characteristics of the subject is presented in Table 1.

Table (1): Demographic characteristics of the subject

Variable	Frequency (n)	Percentage (%)

Gender		
Male	48	56.5%
Female	37	43.5%
Age		
18-20 Years	20	23.5%
21-23 Years	62	72.9%
Above 23 Years	3	3.5%
University		
Sebelas Maret	24	28.2%
Suryakancana	19	22.4%
Singaperbangsa	14	16.5%
Halu Oleo	15	17.6%
Malang	13	15.3%
Faculty		
Sport Science	24	28.2%
Physical Education	61	71.8%
Lecture Materials		
Volleyball	29	34.1%
Swimming	16	18.8%
Pencak Silat	6	7.1%
Football	16	18.8%
Badminton	18	21.2%
City		
Jakarta	17	20.0%
Bekasi	7	8.2%
Bogor	2	2.4%
Cianjur	17	20.0%
Karawang	14	16.5%
Kendari	15	17.6%
Malang	13	15.3%
Religion		
Islam	77	90.6%
Christian	8	9.4%

2.2 Instrument

DASS-21. Depression level. Anxiety and stress in students when attending physical education lectures during the COVID-19 pandemic crisis were measured with the Depression, Anxiety and Stress Scale (DASS-21) [8]. DASS-21 is an instrument that has been tested to measure the state of depression, anxiety and stress felt by a person. Each of the three scales (Depression, Anxiety, Stress) contains seven items, for example, Depression contains items of 3, 5, 10, 13, 16, 17 and 21, and Anxiety contains items of 2, 4, 7, 9, 15, 19 and 20 while for Anxiety contains items of 1, 6, 8, 11, 12, 14 and 18. DASS-21 instrument used a 4-Likert scale from 0 = "never", 1 = "ever", 2 = "sometimes", 3= "always", up to 4= "almost always". The scores of DASS-21 were classified into three ranges: average, high, and very high. The DASS-21 instrument has been used by previous

studies and has a reliability value of 0.74 for depression, 0.82 for anxiety and 0.85 for stress. [8The scores for the DASS-21 were as follows: normal (0-9), mild (10-12), moderate (13-20), severe (21-27), and very severe (28-42) for depression. Normal (0-6), mild (7-9), moderate (10-14), severe (15-19), and very severe (20-42) for Anxiety. Normal (0-10), mild (11-18), moderate (19-26), severe (27-34), and very severe (35-42) for Stress [21], [8].

Demographic Characteristics. All subjects were asked to provide researchers with information about gender, age, university, faculty, course material, city and religion.

2.3 Research Procedure
This research was conducted from October to November 2021 and we had asked permission from the five universities involved prior this study (Approval number N0:262.74/SP2H/UN65.10/LL/2021) and this research followed the ethics of the Declaration of Helsinki which is intended for research using human subjects. The DASS-21 questionnaires were made in Google Form and then distributed via Whatsapps to the subjects. The questionnaire was filled out with a duration of 10-15 minutes per individual. All subjects filled out the questionnaire in their respective houses by online, so they can fill out the questionnaire in a calm state. In one day there were 5 to 10 subjects filled out the questionnaire. After the questionnaire has been filled in by the subject, the questionnaire must be sent back to the researcher via Whatsapp and then the researcher who is an expert in physical education and psychology will process the data.

2.4 Statistical analysis
In analyzing the data of this study we used IBM SPSS Statistics version 25.0 (New York, NY). Chi-square, univariate analyzes were used to investigate the significant relationship between subject characteristics and levels of depression, anxiety and stress during the COVID-19 pandemic. The significant level used is 0.05.

3. Findings and Discussion
The Impact of COVID-19 on Students' Depression Levels. Based on Table 2, it shows that demographic variables have a significant relationship with depression levels among students and as a factor that trigger higher levels of depression.

Table (2): Associations between demographic variables and depression (DASS-21) levels during the COVID-19

Variable	Depression					Chi Square	P
	Normal	**Mild**	**Moderate**	**Severe**	**Extremely Severe**		
Gender						14.587	0.001
Male	26 (54.2%)	14 (29.2%)	4 (8.3%)	3 (6.3%)	1 (2.1%)		
Female	15 (40.5%)	6 (16.2%)	8 (21.6%)	5 (13.5%)	3 (8.1%)		
Age						8.910	0.000
18-20 Years	8 (40.0%)	5 (25.0%)	3 (15.0%)	2 (10.0%)	2 (10.0%)		
21-23 Years	32 (51.6%)	14 (22.6%)	9 (14.5%)	5 (8.1%)	2 (3.2%)		
Above 23 Years	1 (33.3%)	1 (33.3%)	0 (0.0%)	1 (33.3%)	0 (0.0%)		
University						9.701	0.002
Sebelas Maret	14 (58.3%)	6 (25.0%)	3 (12.5%)	1 (4.2%)	0 (0.0%)		
Suryakancana	10 (52.6%)	4 (21.1%)	3 (15.8%)	1 (5.3%)	1 (5.3%)		

Singaperbangsa	6 (42.9%)	3 (21.4%)	2 (14.3%)	2 (14.3%)	1 (7.1%)		
Halu Oleo	7 (46.7%)	4 (26.7%)	2 (13.3%)	1 (6.7%)	1 (6.7%)		
Malang	4 (30.8%)	3 (23.1%)	2 (15.4%)	3 (23.1%)	1 (7.7%)		
Faculty						7.607	0.004
Sport Science	13 (54.2%)	4 (16.7%)	3 (12.5%)	2 (8.3%)	2 (8.3%)		
Physical Education	28 (45.9%)	16 (26.2%)	9 (14.8%)	6 (9.8%)	2 (3.3%)		
Lecture Materials						11.267	0.000
Volleyball	13 (44.8%)	7 (24.1%)	5 (17.2%)	3 (10.3%)	1 (3.4%)		
Swimming	8 (50.0%)	4 (25.0%)	2 (12.5%)	1 (6.3%)	1 (6.3%)		
Pencak Silat	3 (50.0%)	1 (16.7%)	1 (16.7%)	1 (16.7%)	0 (0.0%)		
Football	7 (43.8%)	4 (25.0%)	2 (12.5%)	1 (6.3%)	2 (12.5%)		
Badminton	10 (55.6%)	4 (22.2%)	2 (11.1%)	2 (11.1%)	0 (0.0%)		
City						10.448	0.000
Jakarta	8 (47.1%)	5 (29.4%)	3 (17.6%)	1 (5.9%)	0 (0.0%)		
Bekasi	3 (42.9%)	1 (14.3%)	1 (14.3%)	1 (14.3%)	1 (50.0%)		
Bogor	1 (50.0%)	0 (0.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)		
Cianjur	9 (52.9%)	4 (23.5%)	2 (11.8%)	1 (5.9%)	1 (5.9%)		
Karawang	6 (42.9%)	3 (11.4%)	1 (7.1%)	3 (21.4%)	1 (7.1%)		
Kendari	8 (53.3%)	4 (26.7%)	2 (13.3%)	1 (6.7%)	0 (0.0%)		
Malang	6 (46.2%)	3 (23.1%)	2 (15.4%)	1 (7.7%)	1 (7.7%)		
Religion						11.045	0.000
Islam	37 (48.1%)	19 (14.7%)	10 (13.0%)	7 (9.1%)	4 (5.2%)		
Kristen	4 (50.0%)	1 (12.5%)	2 (25.0%)	1 (12.5%)	0 (0.0%)		

Impact of COVID-19 on Student Anxiety Levels. Based on Table 3, it is known that demographic variables have a significant relationship with anxiety levels among students and are factors that trigger higher levels of anxiety.

Table (3): Associations between demographic variables and anxiety (DASS-21) levels during the COVID-19

Variable	Anxiety					Chi Square	P
	Normal	**Mild**	**Moderate**	**Severe**	**Extremely Severe**		
Gender						14.587	0.001
Male	21 (43.8%)	15 (31.3%)	6 (12. %5)	4 (8.3%)	2 (4.2%)		
Female	2 (5.4%)	19 (51.4%)	7 (18.9%)	5 (13.5%)	4 (10.8%)		
Age						11.489	0.00
18-20 Years	6 (30.0%)	7 (35.0)	1 (5.0%)	2 (10.0%)	4 (20.0%)		
21-23 Years	16 (25.8%)	26 (41.9%)	12 (19.4%)	6 (9.7%)	2 (3.2%)		
Above 23 Years	1 (33.3%)	1 (33.3%)	0 (0.0%)	1 (33.3%)	0 (0.0%)		
University						12.576	0.000
Sebelas Maret	8 (33.3%)	12 (50.0%)	2 (8.3%)	1 (4.2%)	1 (4.2%)		

Variable	Normal	Mild	Moderate	Severe	Extremely Severe	Chi Square	P
Suryakancana	5 (26.3%)	7 (36.8%)	4 (21.1%)	2 (10.5%)	1 (5.3%)		
Singaperbangsa	3 (21.4%)	5 (35.7%)	3 (21.4%)	2 (14.3%)	1 (7.1%)		
Halu Oleo	5 (33.3%)	5 (33.3%)	2 (13.3%)	2 (13.3%)	1 (6.7%)		
Malang	2 (15.4%)	5 (38.5%)	2 (15.4%)	2 (15.4%)	2 (15.4%)		
Faculty						7.117	0.003
Sport Science	6 (25.0%)	9 (37.5%)	3 (12.5%)	4 (16.7%)	2 (8.3%)		
Physical Education	17 (27.9%)	25 (41.0%)	10 (16.4%)	5 (8.2%)	4 (6.6%)		
Lecture Materials						13.533	0.000
Volleyball	9 (31.0%)	14 (48.3%)	3 (10.3%)	2 (6.9)	1 (3.4%)		
Swimming	4 (25.0%)	6 (37.5%)	3 (18.8%)	2 (12.5%)	1 (6.3%)		
Pencak Silat	1 (16.7%)	2 (33.3%)	1 (16.7%)	1 (16.7%)	1 (16.7%)		
Football	4 (25.0%)	5 (31.3%)	3 (18.8%)	2 (12.5%)	2 (12.5%)		
Badminton	5 (27.8%)	7 (38.9%)	3 (16.7%)	2 (11.1%)	1 (5.6%)		
City						10.097	0.002
Jakarta	7 (41.2%)	9 (52.9%)	0 (0.0%)	1 (5.9%)	0 (0.0%)		
Bekasi	2 (28.6%)	2 (28.6%)	2 (28.6%)	1 (14.3%)	0 (0.0%)		
Bogor	0 (0.0%)	2 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Cianjur	4 (23.5%)	6 (35.3%)	3 (17.6%)	2 (11.8%)	2 (11.8%)		
Karawang	3 (21.4%)	4 (28.6%)	3 (21.4%)	2 (14.3%)	2 (14.3%)		
Kendari	4 (26.7%)	7 (46.7%)	2 (13.3%)	1 (6.7%)	1 (6.7%)		
Malang	3 (23.1%)	4 (30.8%)	3 (23.1%)	2 (15.4%)	1 (7.7%)		
Religion						9.662	0.000
Islam	21 (27.3%)	30 (39.0%)	13 (16.9%)	8 (10.4%)	5 (6.5%)		
Kristen	25 (5.0%)	4 (50.0%)	0 (0.0%)	1 (12.5%)	1 (12.5%)		

The Impact of COVID-19 on Student Stress Levels. Based on Table 4 it is known that demographic variables have a significant relationship with stress levels among students and are factors that trigger higher stress levels.

Table (4): Associations between demographic variables and stress (DASS-21) levels during the COVID-19

Variable	Stress					Chi Square	P
	Normal	**Mild**	**Moderate**	**Severe**	**Extremely Severe**		
Gender						14.587	0.001
Male	24 (50.0%)	10 (20.8%)	9 (18.8%)	4 (8.3%)	1 (2.1%)		
Female	8 (21.6%)	13 (35.1)	10 (27.0%)	5 (13.5%)	1 (2.7%)		
Age						7.201	0.003
18-20 Years	10 (50.0%)	4 (20.0%)	3 (15.0%)	2 (10.0%)	1 (5.0%)		
21-23 Years	21 (33.9%)	18 (29.0%)	15 (24.2%)	7 (11.3%)	1 (1.6%)		
Above 23 Years	1 (33.3%)	1 (33.3%)	1 (33.3%)	0 (0.0%)	0 (0.0%)		
University						11.884	0.000
Sebelas Maret	8 (33.3%)	6 (25.0%)	7 (29.2%)	2 (8.3%)	1 (4.2%)		
Suryakancana	7 (36.8%)	5 (26.3%)	5 (26.3%)	1 (5.3%)	1 (5.3%)		

Singaperbangsa	5 (35.7%)	4 (28.6%)	3 (21.4%)	2 (14.3%)	0 (0.0%)		
Halu Oleo	7 (46.7%)	5 (33.3%)	1 (6.7%)	2 (13.3%)	0 (0.0%)		
Malang	5 (38.5%)	3 (23.1%)	3 (23.1%)	2 (15.4%)	0 (0.0%)		
Faculty						6.571	0.002
Sport Science	12 (50.0%)	7 (29.2%)	3 (12.5%)	1 (4.2%)	1 (4.2%)		
Physical Education	20 (32.8%)	16 (26.2%)	16 (26.2%)	8 (13.1%)	1 (1.6%)		
Lecture Materials						13.769	0.000
Volleyball	10 (34.5%)	8 (27.6%)	9 (31.0%)	2 (6.9%)	0 (0.0%)		
Swimming	6 (37.5%)	4 (25.0%)	4 (25.0%)	1 (6.3%)	1 (6.3%)		
Pencak Silat	2 (33.3%)	2 (33.3%)	1 (16.7%)	1 (16.7%)	0 (0.0%)		
Football	6 (37.5%)	5 (31.3%)	2 (12.5%)	3 (18.8%)	0 (0.0%)		
Badminton	8 (44.4%)	4 (22.2%)	3 (16.7%)	2 (11.1%)	1 (5.6%)		
City						9.646	0.000
Jakarta	8 (41.1%)	5 (29.4%)	3 (17.6%)	1 (5.9%)	0 (0.0%)		
Bekasi	3 (42.9%)	2 (28.6%)	1 (14.3%)	1 (14.3%)	0 (0.0%)		
Bogor	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Cianjur	5 (29.4%)	5 (29.4%)	4 (23.5%)	2 (11.8%)	1 (5.9%)		
Karawang	4 (28.6%)	3 (21.4%)	4 (28.6%)	2 (14.3%)	1 (7.1%)		
Kendari	7 (46.7%)	4 (26.7%)	3 (20.0%)	1 (6.7%)	0 (0.0%)		
Malang	4 (30.8%)	3 (23.1%)	4 (30.8%)	2 (15.4%)	0 (0.0%)		
Religion						8.069	0.001
Islam	29 (37.7%)	20 (26.0%)	18 (23.4%)	8 (10.4%)	2 (2.6%)		
Kristen	3 (37.5%)	3 (37.5%)	1 (12.5%)	1 (12.5%)	0 (0.0%)		

This study aims to investigate the impact of COVID-19 on depression, anxiety and stress levels among students during physical education lectures. Findings from our study showed that the impact of COVID-19 caused anxiety levels to be in the normal (27.1%), mild (40%) to moderate (15.3%) range, while depression levels were in the normal (48.2%), mild (23.5) range. %) to moderate (14.1%) and stress was in the normal range (37.6%), mild (27.1%) to moderate (22.4%). From these data, it can be interpreted that the impact of COVID-19 in Indonesia causes a greater level of anxiety than depression and stress aspects. In line with the previous study conducted by Wang & Zhao [22], found that respondents experienced severe anxiety at 0.9%, moderate at 2.7% and mild at 21.3%. Most of the impacts caused by COVID-19 trigger symptoms of depression, anxiety and stress, for example, friends or lecturers who have been positive for the COVID-19 virus will cause psychological problems. Another factor was related to quarantine/isolation [23], [24]. Based on the univariate analysis of our research, we found significant factors that influence the level of depression, anxiety and stress, namely gender [8], age, university, faculty, lecture material, city and religion which associated with the higher levels of depression, anxiety and stress.

4. Conclusion

Empirical evidence from our research shows that students experienced from normal, mild to moderate levels of depression, anxiety and stress due to the impact of COVID-19. Gender, age, university, faculty, course material, city, and religion were significantly related to the level of depression, anxiety and stress among students. The university which has an important role in helping students overcome depression, anxiety and stress is expected to find a solution, for example when physical education lectures are carried out face to face, the university should strictly implement the COVID-19 protocol, or when lectures conducted online, the

university should provide quotas for students. In addition, lectures with identical game sports material which carried out with relatively large groups (e.g., volleyball, soccer) should be conducted by dividing 3-4 small groups, to minimize the transmission of the COVID-19 virus among students. It is expected that the university could provide psychological services to students both in face-to-face and online-based physical education learning, inorder to reduce the levels of depression, anxiety and stress in students. Our study has limitation within, since we used questionnaires which has uncertainty as to whether the subjects answered questions honestly. In relevance of the limitation of this project, suggestion for further research include the following points: conduct a cross-sectional survey research by adding other psychological aspects or adding other factors to the demographic variables.

5. References

[1]   A. Y. Y. Wong et al., "Impact of the COVID-19 pandemic on sports and exercise," Asia-Pacific J. Sport. Med. Arthrosc. Rehabil. Technol., vol. 22, pp. 39–44, 2020, doi: 10.1016/j.asmart.2020.07.006.

[2]   A. Almonacid-fierro, R. Vargas-vitoria, R. S. De Carvalho, and R. Vargas-vitoria, "Impact on teaching in times of COVID-19 pandemic : A qualitative study," Int. J. Eval. Res. Educ., vol. 10, no. 2, pp. 432–440, 2021, doi: 10.11591/ijere.v10i2.21129.

[3]   G. González-Calvo, D. Bores-García, and D. Hortigüela-Alcalá, "The (virtual) teaching of physical education in times of pandemic," Eur. Phys. Educ. Rev., 2021, doi: 10.1177/1356336X211031533.

[4]   D. I. Bourdas and E. . Zacharakis, "Impact of COVID-19 Lockdown on Physical Activity in a Sample of Greek Adults," Sport (Basel, Switzerland), vol. 8, no. 10, p. 139, 2020, doi: doi:10.3390/sports8100139.

[5]   N. Chawla, A. Tom, M. S. Sen, and R. Sagar, "Psychological Impact of COVID-19 on Children and Adolescents: A Systematic Review," Indian J. Psychol. Med., vol. 43, no. 4, pp. 294–299, 2021, doi: 10.1177/02537176211021789.

[6]   A. S. Bahar Moni et al., "Psychological distress , fear and coping among Malaysians during the COVID-19 pandemic," PLoS One, vol. 16, no. (9);e0257304, pp. 1–21, 2021, doi: 10.1371/journal.pone.0257304.

[7]   R. Khanna, S. G. Honavar, A. L. Metla, A. Bhattacharya, and P. K. Maulik, "Psychological impact of COVID-19 on ophthalmologists-in-training and practising ophthalmologists in India," Indian J. Ophthalmol., vol. 68, no. 6, pp. 994–998, 2020, doi: 10.4103/ijo.IJO.

[8]   C. Mazza et al., "A nationwide survey of psychological distress among italian people during the covid-19 pandemic: Immediate psychological responses and associated factors," Int. J. Environ. Res. Public Health, vol. 17, no. 9, pp. 1–14, 2020, doi: 10.3390/ijerph17093165.

[9]   F. Johansson, P. Côté, S. Hogg-Johnson, and E. Skillgate, "Depression, anxiety and stress among Swedish university students during the second and third waves of COVID-19: A cohort study," Scand. J. Public Health, no. June, pp. 1–5, 2021, doi: 10.1177/14034948211031402.

[10]   J. Siegrist and N. Wege, "Adverse Psychosocial Work Environments and Depression — A Narrative Review of Selected Theoretical Models," Front. Psychol., vol. 11, no. February, pp. 1–10, 2020, doi: 10.3389/fpsyt.2020.00066.

[11]   D. Oludipe and J. O. Awokoy, "Effect of cooperative learning teaching strategy on the reduction of students' anxiety for learning chemistry," J. Turkish Sci. Educ., vol. 7, no. 1, pp. 30–36, 2010.

[12]   S. Reagu et al., "Psychological impact of the COVID-19 pandemic within institutional quarantine and isolation centres and its sociodemographic correlates in Qatar : a cross- - sectional study," BMJ Open, vol. 11, no. e045794, 2021, doi: 10.1136/bmjopen-2020-045794.

[13]   Y. Wang, Y. Di, J. Ye, and W. Wei, "Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China (COVID-19) in some regions of China," Psychol. Health Med., vol. 26, no. 1, pp. 13–22, 2020, doi: 10.1080/13548506.2020.1746817.

[14]   I. A. Basheti, Q. N. Mhaidat, and H. N. Mhaidat, "Prevalence of anxiety and depression during COVID-19 pandemic among healthcare students in Jordan and its effect on their learning process : A national survey," PLoS One, vol. 16, no. 4, pp. 1–16, 2021, doi: 10.1371/journal.pone.0249716.

[15]   M. Aristeidou and S. Cross, "Disrupted distance learning : the impact of Covid-19 on study habits of distance learning university students," Open Learn. J. Open, Distance e-Learning, vol. 00, no. 00, pp. 1–20, 2021, doi: 10.1080/02680513.2021.1973400.

[16]   A. Aristovnik, D. Keržic, D. Ravselj, N. Tomazevic, and L. Umek, "Impacts of the COVID-19 Pandemic on Life of Higher Education Students : A Global Perspective," Sustain., vol. 12, no. 20:8438, pp. 1–34, 2020, doi: https://doi.org/10.3390/su12208438.

[17]   H. Jumareng, E. Setiawan, I. A. Patah, M. Aryani, A. Asmuddin, and R. A. Gani, "Online Learning and Platforms Favored in Physical Education Class during COVID-19 Era: Exploring Student' Perceptions," Int. J. Hum. Mov. Sport. Sci., vol. 9, no. 1, pp. 11–18, 2021, doi: 10.13189/saj.2021.090102.

[18]   M. H. E. M. Browning et al., "Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States," PLoS One, vol. 16, no. 1, p. e0245327, 2021, doi: 10.1371/journal.pone.0245327.

[19]   I. Padrón, I. Fraga, L. Vieitez, C. Montes, and E. Romero, "A Study on the Psychological Wound of COVID-19 in University Students," Front. Psychol., vol. 12, no. January, pp. 1–15, 2021, doi: 10.3389/fpsyg.2021.589927.

[20]   S. K. Brooks et al., "Rapid Review The psychological impact of quarantine and how to reduce it : rapid review of the evidence," Lancet, vol. 395, no. 10227, pp. 912–920, 2020, doi: 10.1016/S0140-6736(20)30460-8.

[21]   M. Passavanti et al., "The psychological impact of COVID-19 and restrictive measures in the world," J. Affect. Disord., vol. 283, no. September 2020, pp. 36–51, 2021, doi: 10.1016/j.jad.2021.01.020.

[22]   C. Wang and H. Zhao, "The Impact of COVID-19 on Anxiety in Chinese University Students," Front. Psychol., vol. 11, no. May, pp. 1–8, 2020, doi: 10.3389/fpsyg.2020.01168.

[23]   K. Chinna et al., "Psychological impact of COVID-19 and lock down measures : An online cross-

sectional multicounty study on Asian university students," PLoS One, vol. 16, no. 8:e0253059., pp. 1–12, 2021, doi: 10.1371/journal.pone.0253059.

[24]   Z. Ren et al., "Psychological Impact of COVID-19 on College Students After School Reopening : A Cross-Sectional Study Based on Machine Learning," Front. Psychol., vol. 12, no. April, 2021, doi: 10.3389/fpsyg.2021.641806.