▪ Global Social Sciences Review (GSSR) ▪ Vol. VII, No. I (Winter 2022) ▪ Pages: 147 – 156
▪ DOI: 10.31703/gssr.2022(VII-I).15 ▪ URL: http://dx.doi.org/10.31703/gssr.2022(VII-I).15
▪ L- ISSN: 2520-0348 ▪ p- ISSN: 2520-0348 ▪ e-ISSN: 2616-793X
▪ Citation: Anjum, F., Akram, M., & Sheharyar. R. (2022). The Psychological Effects of Online Classes on Students: A Study of Pakistan in Covid-19 Pandemic. *Global Social Sciences Review*, *VII*(I), 147–156.https://doi.org/10.31703/gssr.2022(VII-I).15

Cite Us

The Psychological Effects of Online Classes on Students: A Study of Pakistan in Covid-19 Pandemic

Faiza Anjum * Madieha Akram † Raja Shaharyar ‡

Contents:

- Introduction
- Objectives of the Study
- Review of Literature
- Methods of the Study
- Data Collection and Sampling
- Data Analysis
- Results
- Discussion
- Conclusion
- Limitations
- References

Abstract: *The learning process in the university and the environment on campus have a crucial role in the development of students' psychological and physical well-being. The present study aims to highlight the problems of online classes faced by university students during the period of the COVID-19 pandemic. It also examines the factors of online classes that caused depression among Pakistani students. The data was collected through an online survey and students were asked to fill survey comprised of perceptions and problems of online classes and Patient Health Questionnaire-9. A total of 820 students were approached. Among them, 734 (89.51%) had completed the survey. The results showed that most of the students had moderately (31.34%) or moderately severe (24.39%) depressive symptoms because considerable problems occurred in their educational learning process due to online classes amid the COVID-19 pandemic. It is concluded that emotional support is necessary for the well-being of students as a study examining the COVID-19 outbreak has an extraordinary burden on university students.*

Key Words: COVID-19, Online Classes, Perception, Problems, Depression

Introduction

During the last two decades, viral diseases have been emerging, causing serious health issues to human beings, including SARS-COV and HINI influenza. In recent times, a viral disease causing low respiratory infection was detected in Wuhan in December 2019. The Chinese center for disease control launched an investigation on the disease and found that this was initiated by a novel virus. Later on known as coronavirus or COVID-19 in an announcement by World Health Organization (WHO, 2020a, 2020b). COVID-19 is basically the acronym for "coronavirus disease 2019". About coronavirus, it was recommended that it originated from bats and then moved into other mammals before jumping into humans. The spread of coronavirus has become a serious public health risk throughout the world as the strength of its patients increased 13 times in other countries as compared to china.

* Assistant Professor of Sociology, National Textile University, Faisalabad, Punjab, Pakistan.
† Assistant Professor, Department of Sociology, The Women University Multan, Punjab, Pakistan.
‡ Social Welfare Officer, CDP, Tehsil Kot Chutta, District D. G. Khan, Punjab, Pakistan.
Email: dr.madieha@gmail.com *(Corresponding Author)*

In Pakistan, on 26th February, the first patient with COVID-19 was registered when an Iran return student got his COVID-19 test report positive (Gul, 2020). Up to 18th March 2020, all four provinces registered cases with alternate patient strength (Geo news, 2020). According to The Ministry of Health in Pakistan (2021), the total confirmed positive cases of COVID-19 were 962,313, which led to 22,408 deaths on 4th July 2021. The highest reported cases were in Punjab (346,728), followed by Sindh province (339,962), Khyber Pakhtunkhwa (138,421), and Islamabad (82,916), Balochistan (27,387), Azad Jammu and Kashmir (20,505) and Gilgit Baltistan had 6,394 confirmed cases. The death rate was 2.3 and the recovery rate was 94.3% in Pakistan during the last 24 hours (Ministry of National Health, 2021).

The government of Pakistan had imposed an emergency and followed preventive measures to control the transmission of infection including the lockdown in terms of smart or partial lockdown in response to an extensive spread of COVID-19. Within the passage of time, cases and mortality rate was increasing rapidly in Pakistan as a result of the high transmission rate of cases. Pakistan's government had given an order to close all over countrywide educational institutions as an emergency imposed on all sectors (Gostin & Wiley; 2020, Sahu, 2020). Hence, higher education institutions were restricted from the closure of university campuses without suspension of learning. All public and private universities in Pakistan had started online classes immediately, depending on numerous approaches to achieving goals (Nicola *et al.*, 2020). The learning process in the university environment on campus has a crucial role in the development of students' mental and physical well-being. Home quarantine-related problems can be hypothesized with psychological distress among university students. It was a compulsion for students to carry out their academic activities via the internet and other online platforms instead of face-to-face classroom learning. It had an immense effect because students experienced this situation first time in their lives (Akram et al., 2020).

In a short span of time, it was immense and troublesome to shift all the ongoing courses online during COVID-19. Generally, an elegant design of lesson plans and teaching support material including audiovisual contents, is required for an online course. In China, after the outbreak of Covid-19, to conduct online classes, the faculty members and students were observed to struggle as they lacked the experience to work online (Bao, 2020). A number of previous studies have identified the potential effects of online learning on the mental health of university students during the epidemic. But, the effects of online learning on depression during COVID-19 had not been identified specifically in the scenario of Pakistan. The present study was conducted in March-April in Pakistan. The main objective of the study was to highlight the problems of online classes faced by university students in Pakistan during the COVID-19 pandemic. The study also examines the factors of online classes that cause depression among university students. Pakistan is a developing country and university students are facing a number of problems due to online classes. Most of the students were from remote areas or least developed areas, where access to the internet is very rare. Even the shortage of electricity in cities also affects the consistency of the network. In this context, the study will provide assistance in executing coping strategies related to the problems of online classes. It would also help to improve the online academic performance of university students.

Objectives of the Study

The purpose of the study was to:

1. Know the perception of university students towards online classes.
2. Highlight the problems of online classes faced by university students during the COVID-19 pandemic.
3. Examines the factors of online classes causing depression among university students.

Review of Literature

The outbreak of COVID-19 has an extensive effect on psychological distress due to uncertainty. Disruptions in daily routine and lives increase anxiety and depression and cause widespread panic

© 2022 The Author(s). This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

in individuals (Wang et al., 2020). Previous studies showed the uncertain situation of the pandemic and its relations with mental health. Duration of quarantine, inadequate information, rumors, fear of infection, lack of supplies and financial loss all caused depressive symptoms, anxiety, stress and confusion as reported in SARS-COV, Ebola, HINI and influenza pandemic (Rith-Najarian et al., 2019; Sprang and Silman, 2013; Wu et al., 2009; Taylor et al., 2008; Bai et al., 2004).

In addition, other researchers have concluded that suspected infectious patients, their children and family members and medical staff had faced physical and psychological problems repeatedly in COVID-19 (Chen et al., 2020; Xiang et al., 2020: Duan and Zhu, 2020). Besides the other mental health problems, depression is the most common psychological disorder in developing countries, with a prevalence rate of 10–44% and it is considered to be the fourth foremost cause of the disease (Azad et al., 2017). University students are at a higher risk of depression in normal conditions, resulting in academic pressure as compared to the general population (American College Health Association, 2018).

Methods of the Study

Research Model

The conceptual model is presented in Figure 1. The given model indicates the effects of online classes on students' mental health during COVID-19. Furthermore, the relationships between problems of online classes and depressive symptoms among university students were analyzed.

Conceptual Framework

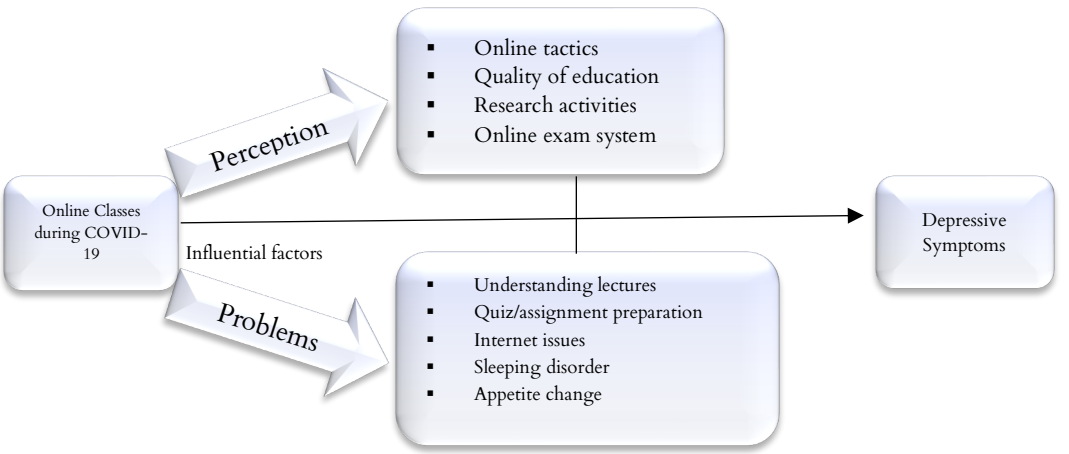

Figure 1

Data Collection and Sampling

An online survey was conducted to collect the responses in a research-oriented university in Punjab, Pakistan, namely National Textile University, Faisalabad. For the present study, all four-year undergraduate students of the university were included. The respondents of the present study represented the distribution of all-over Pakistani students, as enrolled students in National Textile University, Faisalabad, are from different provinces of the country. The questionnaire was developed online and circulated to 820 undergraduate students and the return rate of the responses was 89.51%, as 734 filled questionnaires were received. The population was accessed through email, where the email ID of students was taken from the university. The total number of ungraduated students was 2622 at the time of data collection.

A sample of 820 students was taken randomly and the survey was mailed to the selected students.

The data was collected from 20th July to 27th July 2021, using Survey Monkey software (Survey Monkey, San Mateo, CA, USA). The survey (Questionnaire) was developed by the researcher and divided into three parts. The first part of the questionnaire was comprised of the perception of students towards online classes started due to COVID-19. While the questions of the second part assessed the problems of online classes faced by students. The response of these two parts was collected as not at all, to some extent and a great extent. The third part of the survey was the PHQ-9 (Patient Health Questionnaire-9), which is a simple 9-items self-reported questionnaire developed by Kroenke for screening depression.

The tool PHQ-9 was applied to measure the symptoms of depression among students. The categories of PHQ-9 were none, mild, moderate, moderately severe and severe. Each question was scored on a Likert-type scale of 1–4 (based on responses: not at all, several days, more than one-half the days, nearly every day). Positive depression screening is defined as a score of ≥ 10 on the PHQ-9 (Kroenke et al., 2001). For the present study, the levels of depression were classified as mild (score range 5-9), moderate (score range 10-14), moderately severe (score range 15-19) and severe (score range ≥ 20).

Data Analysis

The data were analyzed through SPSS (Statistical Package for Social Sciences) software. Results were articulated as frequency distribution and percentages. Human behavior cannot be measured or described in a single concept because of its complexity. So, multivariate (regression statistic) was applied to inspect the multiple factors of online classes that caused depression among university students. It is a suitable tool for checking the relative importance of predictive variables to the response variable (Batool, 2010; Pearson, 1908). In this study, a multiple linear regression model was developed in order to measure standardized coefficient, estimation of standard error and the value of 't' and value of 'p <0.05' were considered significan.

Results

Table 1. Perception towards Online Classes (n=734)

Statements	Not at All	To Some Extent	To a Great Extent
Satisfied with the commencement of online classes	394 53.68	280 38.15	60 8.17
Satisfied with feedback mechanism of online classes	384 52.32	260 35.42	90 12.26
Satisfied with online classes tactics	324 44.96	344 46.87	66 8.99
Effects on quality of education	110 14.99	144 19.62	480 65.39
Effects on research activities	110 14.99	170 23.16	454 61.85
Online classes cause inadequate concentration in subjects	100 13.62	270 36.78	364 49.60
The online exam system is difficult	170 23.16	150 20.44	414 56.40

A total of 734 students in both universities had completed the online survey. Table 1 shows the perception of students towards online classes during COVID-19. Of the total number of respondents, more than half of them (53.68%) and (52.32%) were not satisfied with the commencement of online classes and its feedback mechanism to a great extent, respectively. The majority of participants (44.96%)

were also not satisfied with the online class's tactics. Most participants (65.39%) and (61.85) were of the view that online classes have negative effects on the overall quality of education and research activities, respectively. Almost half percent of respondents couldn't concentrate their attention on subjects and considered the online exam system a difficult one for them.

Table 2. Problems and Effects of Online Classes (n = 734)

Statements	Not at All	To some Extent	To a Great Extent
Problems in understanding lectures	120	190	424
	16.35	25.89	57.76
Internet issue while attending online classes	70	190	474
	9.54	25.88	64.58
An online quiz/assignment causes more anxiety as compared to a classroom quiz/assignment	160	260	314
	21.80	35.42	42.78
A fear of lack of time while attempting a quiz	90	210	434
	12.26	28.61	59.13
A fear of link down/drop signal while attempting quiz	60	210	464
	8.17	28.61	63.22
The problem of link down/drop signal while attempting quiz or upload assignment	364	270	100
	49.60	36.78	13.62
Learning on a device all the time is irritating	90	240	404
	12.26	32.70	55.04
Online classes disturb the sleeping routine	200	224	250
	27.25	30.52	42.23
Appetite changes due to online classes	190	304	240
	25.88	41.42	32.70

Table 2 reveals the problems of online classes faced by university students in Pakistan. According to the results, only 16.35% of respondents were informed that they have no problem understanding lectures via online classes. Internet issue such as dis-connectivity and slow speed is to be considered a leading cause of creating hurdles in attending online classes. In this context, about 90% of the total have faced this problem either to a great or some extent. Due to internet problems, an online quiz/assignment causes more anxiety as compared to a classroom quiz/assignment, which was reported by almost 78% of students. Of the total subjects, 87% and 91% of them have a fear of lack of time and link down/drop signal while attempting quiz, respectively. While, almost 50% of the university students had not faced the link down/drop signal problem while attempting a quiz or uploading an assignment. Furthermore, 87% claimed that they felt irritated while learning on the device all the time because of un-habitually. About 1/3rd part of the population was on the view that online classes disturb their sleeping routine and their appetite change as well.

Table 3. Depressive Symptoms of Participants (n = 734)

Depressive Symptoms	Frequency	Percentage
Mild	220	29.97
Moderate	230	31.34
Moderately severe	179	24.39

Severe	105	14.30

Table 3 shows the depressive symptoms of participants when they were taking online classes during the COVID-19 outbreak. Results found that 31.34%, 24.39% and 14.30% of participants had depressive symptoms of moderately, moderately severe and severe, respectively. Only 1/3rd part of the sample had no depressive symptoms.

Table 4. Multiple Linear Regression Model to Predict Depression Related to Online Classes During the COVID-19 Pandemic.

Independent Variable	Std. Error	Beta	T-test value	p-value
Satisfied with the commencement of online classes	.034	-.138	-3.498	.001*
Satisfied with feedback mechanism of online classes	.038	-.141	-3.169	.002*
Satisfied with online classes tactics	.033	-.039	-.838	.43
Effects on quality of education	.080	.100	2.223	.027*
Effects on research activities	.061	.134	2.923	.004*
Online classes cause inadequate concentration in subjects	.062	.085	1.858	.064
The online exam system is difficult	.052	.137	3.041	.003*
Problems in understanding lectures	.050	.090	2.111	.036*
Internet issue while attending online classes	.056	.135	2.694	.007*
Online quiz/assignment cause more anxiety as compare to classroom quiz/assignment	.061	.245	4.746	.000*
A fear of lack of time while attempting a quiz	.068	.205	4.460	.000*
A fear of link down/drop signal while attempting quiz	.065	.234	4.380	.000*
Problem of link down/drop signal while attempting quiz	.051	.032	.746	.456
Learning on device all the time is irritating	.065	.100	2.187	.030*
Online classes disturb the sleeping routine	.075	.063	1.065	.288
Appetite change due to online classes	.063	.027	.533	.594
R^2 .604				

In table 4 multiple linear regression model is established to check the significance of predictive variables on the response variable (depression during COVID-19). In the model, all the significant and non-significant predictor variables are enclosed, and predictive variables are specified along with t value, standard error, beta (standardized coefficient) and level of significance. Whereas, the significance of each predictive variable is identified at <0.05 level of significance. The analysis of multiple linear regression indicates the potential risk factors of depression related to online classes during the COVID-19 pandemic. The results revealed that not being satisfied with online classes (β = -.138, p <.001) and its feedback mechanism (β = -.141, p <.002) increase the level of depression among the university students. Quality of education (β = .100, p <.027) and research activities (β = .134, p <.004) has been affected by the commencement of online classes. Difficulty in exams (β = .137, p <.003), understanding lectures (β = .90, p <.036) and internet issue (β = .135, p <.007) were found to predict depressive symptoms. In addition, online quiz/assignment cause more anxiety as compared to classroom quiz/assignment (β = .245, p <.000). A fear of lack of time, link down/drop signal while attempting a quiz and all-time learning on the device were significantly associated with

depression. However, online class tactics, inadequate concentration in subjects, sleeping routine and appetite change were not found to be significant in depression.

Discussion

On the base on our research information, this is the first-ever study on online classes that caused depression among Pakistan's university students during the COVID-19 pandemic. The current study found that approximately 70% of the total sample have experienced depression, where the depression was measured by PHQ-9 (Patient Health Questionnaire). The depressive symptoms were positively associated with the commencement of online classes due to COVID-19. Another, the uncertain situation of COVID-19 has negative effects on the mental health of students as it uplifts the chances of fear, anxiety, frustration, depression, stress and brings complexity to emotions. All these psychological issues should be kept in mind and dealt with wisely when faculty members deliver online lectures (Wang and Zhao, 2020). Besides, Shukla (2020) concluded that more than 80% of students claimed that this pandemic had negative effects on their mental health because of change in routine, the sudden closure of academic institutions and restrictions on social and physical distance. About 90% of students reported that COVID-19 crises have negative effects on their mental health as the uncertain closure of educational institutions and online classes caused anxiety and depression (Lederman, 2020).

An analysis is carried out on social media to record the challenges faced by the students due to the commencement of online classes. The majority of the students face difficulties because of inadequate good learning attitudes. Moreover, other problems include a lack of proper learning material, a good learning environment and self-discipline when they get isolated at home (Bao, 2020). Another also concluded in the same line as the compulsion of online learning started immediately in response to COVID-19 caused anxiety among students (Wang and Zhao, 2020). In Pakistan, online classes have been started unexpectedly due to COVID-19, so most of the students were not satisfied with online classes and their feedback mechanism, as found in the present study. Whereas, these two factors have a strong negative association with depression among students at 0.001 and 0.002 levels of significance. It means that as the satisfaction level towards online classes has decreased, students have high depressive symptoms. In conventional teaching, an instructor uses body language, ups and downs in the voice as well as facial expressions as important tools. However, in online classes, students feel a lack of such tools (Bao, 2020). In contrast with our study, another study concluded that all over the world, the majority of the university faculty staff, as well as the students, got enthusiastic about the commencement of online classes. The reason behind this fact is that the faculty members were already trained to do that work and it was not something new for them (Lim, 2020). Online learning becomes a challenge for students to handle the new technology and it also reflects their competency. On the other side, if we talk about students, some of them feel it easy to work at home as it is time-saving. Online learning becomes a challenge for students to handle the new technology and it also reflects their competency (Lee, 2020).

The primary study reveals that the emergence of online classes has an adverse effect on the quality of education and research activities as the study was conducted in research oriented-universities. The closure of universities has reduced the potential ability of students related to how to apply strategies of practical work. Students are at higher risk of depression who themselves are unable to cope with research work strategies as viewed in the regression model, significant at 0.004 level. They are not allowed to go outside the home due to lockdown or a dire need to meet the criteria of research objectives. With the increasing pressure of an online exam, approximately 56% of the population has symptoms of depression. It is evident from the present result that the value of the regression coefficient of 0.137 means that difficulty in exams increases the chances of depression as students cannot handle the online exam system. They claimed that the mode of online exams is a new experience and they didn't experience it earlier. In addition, internet disruption caused more

depression while attending online classes as well as elevated the chances of fear and anxiety while attempting a quiz.

The present findings showed that a very normal sample (9.0%) of the total population was not facing internet issues. Moreover, after covid-19, the online classes became a headache for students because it led to high demand for internet connectivity and IT equipment. Also, for many institutes, it was not possible for them to provide resources immediately (Dill, et al., 2020). One previous study indicated that many students got depressed because they couldn't afford expensive IT equipment and internet access was not available in their rural areas. For engineering students, how practical work can be performed from home. Questions were also raised about the maintenance of the quality of education (Timmis et al., 2016). Because of Covid-19, the worldwide education system has been disturbed generally and in the developing countries specifically. Such developing countries, including Pakistan, were not in full preparation to deal with online learning. Consequently, they struggled because students had left the universities and returned home. The students of remote rural areas do not have access to internet facilities. In Pakistan, the majority of the students are those who have no internet access and they also do not afford android mobiles; hence, it results in their failure (Rasheed, 2020).

This study included that the fear of lack of time, link down and online quiz/assignments were the most influential factors in uplifting the chances of depression as compared to classroom quizzes/assignments. The p-value of 0.000 of all these explanatory variables showed a strong association with the response variable. While the proportion of actually facing the problem of link down/drop signal was less as compared to the fear of link down. It resulted in; the problem of link down/drop signal being non-significant in the regression model as analyzing the p-value of 0.456. Another researcher added in addition to problems that were faced by the students is a lack of active academic involvement (Bao, 2020).

Conclusion

The study concluded that undergraduate students of Pakistan had higher depressive symptoms in response to the commencement of online classes during the COVID-19 pandemic. Psychological support is necessary for the well-being of students as a study examining the COVID-19 outbreak has an extraordinary burden on students related to the completion of research projects and online exams. The academic staff of universities, specifically faculty members, can provide emotional support to the students prior to dealing with online classes. Immediate assistance should be provided in attempting the quiz and completing assignments and exams because fear of the online quizzes and exams causes depression among students.

Limitations

The current study has some limitations. Firstly, the sample was drawn from one university in Punjab province in Pakistan, not represented by all Pakistan's universities. Secondly, the sample size was too small. The study suggested that there is a need to design further studies by adding more students from multiple universities all over Pakistan. Thirdly, the present study only investigated the depression level of university students, not other related mental health problems such as stress, post-traumatic disorder and its preventive measures as well as coping strategies. However, further research could be examined in the future.

References

Akram, A., Anjum, F & Batool, Z. (2020). Covid-19: A Reason behind Digital Education in Pakistan. *Mediterranean Journal of Social Sciences,* 11(4): 19-26. DOI: https://doi.org/10.36941/mjss-2020-0037

American College Health Association (2018). *American College Health Association National College Health Assessment II: Reference Group Executive Summary Fall 2017.* Hanover, MD: American College Health Association. https://www.acha.org/documents/ncha/NCHA-II_Fall_2018_Reference_Group_Executive_Summary.pdf.

Azad, N., Shahid, A., Abbas, N., Shaheen, A., & Munir, N. (2017). Anxiety and depression in medical students of a private medical college. *J. Ayub Med. Coll. Abbottabad Pak., 29*(1), 123–127. https://jamc.ayubmed.edu.pk/index.php/jamc/article/view/850

Bai, Y., Lin, C. C., Lin, C. Y., Chen, J. Y., Chue, C. M., & Chou, P. (2004). Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatr. Serv., 55*(9), 1055–1057. doi: 10.1176/appi.ps.55.9.1055.

Bao, W. (2020, 7th April). *COVID -19 and online teaching in higher education: A case study of Peking University.* https://onlinelibrary.wiley.com/doi/full/10.1002/ hbe2.191.

Batool, Z. (2010). Socio-cultural factors affecting anemia and their effects on mother, and child health in rural areas of district Faisalabad, Punjab, Pakistan. (Doctoral Dissertation, University of Agriculture, Faisalabad.

Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., et al. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry, 7*(4), e15–e16. doi: 10.1016/S2215-0366(20)30078-X.

Dill, E., Karin. F., Beth, M., & Beckie, S. (2020, March 6). As coronavirus spreads, the decision to move classes online is the first step. What comes next?. (2020). https://www.chronicle.com/article/As-Coronavirus-Spreads-the/248200.

Duan, L., & Zhu, G. (2020). Psychological interventions for people affected by the COVID-19 epidemic. *Lancet Psychiatry. 7*(4), 300-302. doi: 10.1016/S2215-0366(20) 30073-0.

Geo news. (2020, March, 18). *Coronavirus updates, Latest news on the coronavirus outbreak from Pakistan and around the world.* https://www.geo.tv/latest/277853-coronavirus-updates-march-18-latest-news-on-the-coronavirus-outbreak-from-pakistan-and-around-the-world.

Gostin, L.O., Wiley, L.F. (2020). Governmental public health powers during the COVID-19 pandemic:stay-at-home orders business closures and travel restrictions. *JAMA. 323*(21), 2137–2138. doi:10.1001/jama.2020.5460.

Gul, A. (2020, 26th February). *COVID-19 Pandemic: Pakistan Detects First Coronavirus Cases, Links to Iran Outbreak | Voice of America - English".* Voice of America. https://www.voanews.com/science-health/coronavirus-outbreak/pakistan-detects-first-coronavirus-cases-links-iran-outbreak.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med., 16*(9), 606-13. doi: 10.1046/j.1525 1497.2001.016009606.x.

Lederman, D. (2020, 27th March). "*Presidents Fear Financial, and Human, Toll of Coronavirus." Inside Higher Ed.* https://www.insidehighered.com/news/survey/college-presidents-fear-financia-and-human-toll-coronavirustheir-campuses.

Lee, K. (2020, 9th March). *Coronavirus: universities are shifting classes online - but it's not as easy as it sounds.*

http://theconversation.com/coronavirus-universities-areshiftingclasses-online-but-its-not-as-easy-as-it-sounds-133030.

Lim, M. (2020, 20th March). *THE. Educating despite the COVID-19 outbreak: lessons from Singapore.* https://www.timeshighereducation.com/blog/educating-despite-covid-19-outbreak-lessons

Nicola. M., Alsafi, Z., Sohrabi. C., Kerwan, A., Al-Jabir, A., Iosifidis. C., et al. (2020). The Socio-Economic Implications of the Coronavirus and COVID-19 Pandemic: A Review. *Int J Surg, 78*, 185–193. doi:10.1016/j.ijsu.2020.04.018.

Pearson, K. (1908). On the generalized probable error in multiple normal correlation. *Biometrika, 6*, 59-68.

Rasheed, M. (2020, 7th July). *Covid-19 and Digital Education Failure in Pakistan.* https://moderndiplomacy.eu/2020/07/07/covid-19-and-digital-education-failure-in-pakistan/.

Shukla, P. (2020). Impact of COVID-19 on Students' Mental Health and Well-being.

Sprang, G., & Silman, M. (2013). Post-traumatic stress disorder in parents and youth after health related disasters. *Disaster. Med. Public Health Prep., 7*(1), 105–110. doi:10.1017/dmp.2013.22.

Taylor, M. R., Agho, K. E., Stevens, G. J., & Raphael, B. (2008). Factors influencing psychological distress during a disease epidemic: data from Australia's first outbreak of equine influenza. *BMC Public Health, 347*(8), 1-13. doi: 10.1186/1471-2458-8-347.

The Ministry of National Health Services. (2021, 4th July). *Regulation and coordination.* http://covid.gov.pk/stats/pakistan.

Timmis, S., Broadfoot, P., Sutherland, R., & Oldfield, A. (2016). Rethinking assessment in a digital age: opportunities, challenges and risks. *Br Educ Res J., 42*(3), 454-476. 10.1002/berj.3215.

Rith-Najarian, L. R., Boustani, M. M., & Chorpita, B. F. (2019). A systematic review of prevention programs targeting depression, anxiety, and stress in university students. *J. Affect. Disord., 257*, 568–584. doi: 10.1016/j.jad.2019.06.035

Sahu, P. (2020). Closure of Universities Due to Coronavirus Disease 2019(COVID-19): Impact on Education and Mental Health of Students and Academic Staff. *Cureus. 12*(4), e7541. doi:10.7759/cureus.7541.

Wang, C., & Zhao H. (2020). The Impact of COVID-19 on Anxiety in Chinese University Students. *Front. Psychol., 11*, 1-8. World Health Organization (2020a, 18th June). *Coronavirus Disease (COVID-19) Advice For The Public. Geneva: World Health Organization.* https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/healthy-parenting.

World Health Organization (2020b, March 16). *Coronavirus Disease 2019 (COVID-19) Situation Report – 56. Geneva: World Health Organization.* https://www.who.int/docs/default-source/coronaviruse/ situation-reports/20200316-sitrep-56-covid-19.pdf?sfvrsn=9fda7db2_6.

Wu, P., Fang, Y., Guan, Z., Fan, B., Kong, J., Yao, Z., et al. (2009). The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *Can. J. Psychiatry, 54*(5), 302–311. doi:10.1177/070674370905400504.

Xiang, Y.-T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry, 7*(3), 228–229. doi: 10.1016/S2215-0366(20)30046-8.