ORIGINAL ARTICLE

Impact of Emergency Remote Teaching (ERT) on Mental Health Status and Education of UniKL-RCMP Students during COVID-19 Pandemic.

Nur Afiqah Mohamad Ayub, Nour Hanah Othman.

Faculty of Pharmacy and Health Sciences, Royal College of Medicine, Universiti Kuala Lumpur, Ipoh, Malaysia.

Corresponding Author
Dr Nour Hanah Othman
Faculty of Pharmacy and Health Sciences, Royal College of Medicine Perak,
Univerisit Kuala Lumpur, 30450, Ipoh, Perak, Malaysia.
Email: nourhanah@unikl.edu.my.

Submitted: 16/08/2022. Revised edition: 18/10/2022. Accepted: 19/10/2022. Published online: 01/11/2022

Abstract

Background: The movement control order (MCO) implemented during the COVID-19 pandemic has caused higher learning institutions to utilise online teaching otherwise known as emergency remote teaching (ERT). Besides the changing mode of teaching and learning, prospective stressors were found to affect students' mental health. This study is aimed at evaluating the effect of ERT and associated stressors on mental health status and education among undergraduate students of UniKL-RCMP.
Methods: A cross-sectional study was undertaken with data collection conducted from March to April 2021. An online questionnaire was delivered to all students of UniKL RCMP, using the snowball method. The number of students who responded was 307. The data was analysed using SPSS version 21.
Results: Out of 307 respondents, anxiety (68.7%), stress (41.4%), and depression (55.7%), ranging from mild to severe, were found to occur among the undergraduates. Prospective stressors which include living conditions, Internet accessibility and sleeping hours, predominantly affect undergraduate mental health problems. The negative impact of ERT was found to be on decrease in level of attentiveness (51.5%) and assessment grades or marks (37.8%). Students disagreed (58.3%) that completing the course virtually is more effective than face-to-face learning while 45.9% of them felt that they have lagged in their education.
Conclusion: ERT with some stressors were reported to have caused drawbacks in education and gave rise to mental health issues among students during the COVID-19 pandemic.

Keywords: *ERT, mental health, online teaching, stressors, pandemic.*

Introduction

At the end of December 2019, an outbreak of the novel coronavirus disease 2019 (COVID-19), also known as SARS-CoV-2, was discovered in Wuhan, Hubei Province, China. [1] On 11 March 2020, the World Health Organization organisation declared the COVID-19 outbreak a pandemic. [2] A mass religious gathering triggered a substantial number of cases and the Government of Malaysia (GOM) decided to implement a lockdown via the Movement Control Order (MCO) nationwide, beginning March 2020. [3] The effort to stop the virus outbreak involved working from home, closing schools, colleges and universities, and businesses. The protocols that were implemented resulted in universities and colleges having to cancel all face-to-face classes, including labs and other normal learning experiences. All these changes were unprecedented and staggering. Emergency remote teaching (ERT), a substitute to physical learning, emerged as an alternative mode of teaching delivery, as all teaching institutions have to operate remotely.

In contrast to the well-planned online course that takes a development time of six to 9 months, ERT is a temporary shift of instructional delivery to an alternative one due to emergency crises. [4] It involves the use of fully remote teaching solutions for instruction and education that would otherwise be delivered as face-to-face or blended courses with the primary objective of providing temporary access to instructional support that is quick to set up. Online education during crises is not new. For instance, in the US, online courses were provided during Hurricane Katrina in New Orleans in 2005. [5] This shifting to online learning involved only regional responses. The COVID-19 pandemic is a worldwide occurrence that disrupted education.

The COVID-19 pandemic has had a significant impact on the physical and emotional health of students and instructors. Teaching and learning activities had to be changed to the online platform and both groups have to adapt and modify all academic activities in the context of implementing the emergency remote education model. The effect of the lockdown and change in teaching modality has brought about issues of mental health among instructors and students, especially females while males resented the lack of socialization in work and study. [6]

ERT was found to be stressful because it was not efficiently designed by the affected government agencies due to the sudden physical class restriction and non-familiarity with the concepts of online teaching-learning. [7] Both educators and students face various obstacles due to the alteration in the education delivery mode, which also induces negative mental well-being. The ideal way of psychological functioning and a general feeling of well-being, described as good mental well-being, is being affected by these changes. As a result, negative mental well-being associated with more extreme symptoms of depression, anxiety, and stress, [8,9] surfaced across various cultures during this pandemic.

Various prospective factors have been studied and associated with the negative influence on students' mental health during the COVID-19 pandemic. They were students' residence, technology infrastructure, sleeping patterns, and long-term exposure to digital technology, which is the new norm associated with students' private lifestyle. [10] Additionally, social effects are imminent, especially for undergraduate students who are faced with the challenges of alteration in their educational activities. A study has also shown that emotions including anxiety influence perceived academic control in the academic setting. [11] Students' education via the ERT has other negative impacts, such as lagging in academic performance and poor interaction between educators and students due to the suspension of physical educational practices. [12]

As students need to continue their studies through the online platform for an indefinite period until the COVID-19 pandemic recedes, the study aims to determine the effects of ERT on the mental health status of undergraduate students, the

prospective stressors associated with it and the impact of ERT on students' education.

Materials and methods

Sampling, participants and setting

A cross-sectional study was undertaken at Universiti Kuala Lumpur Royal College of Medicine Perak (UniKL-RCMP) on all undergraduate students. At the time of participants' recruitment, there were a total of 446 medical, 400 pharmacy and 274 nursing students, 200 pharmaceutical technology students, 100 physiotherapy students, and 57 medical imaging students of UniKL RCMP. 307 students responded to the questionnaire. The sample size was calculated using Raosoft ®, with an accepted margin error of 5%, a confidence interval set at 95%, and a response distribution at 50%. The minimum recommended sample size was 306.

Participants for this study were recruited for three months from March until May 2021. The inclusion criteria are students of UniKL-RCMP who attend online classes during the COVID-19 pandemic of both genders and can answer the questionnaire in either English or *Bahasa Melayu.*

Survey Instrument

An online questionnaire was developed for the study. It consists of 2 sections. Section A is composed of 4 questions each on the demography of the respondents, prospective stressors related to the online mode of education, and the effect of ERT on the students during the pandemic. All questions were close-ended and for *the effect of ERT on students,* respondents were asked to select agree, somewhat agree or disagree. Some questions and and answer choices were adapted from previous studies. [12,13]

Section B is composed of the psychometric properties of the Depression, Anxiety and Stress Scale (DASS-21) which was found valid in measuring mental health status. [14] DASS-21 item is an updated and shorter version of the original DASS-42 item. For this scale, data obtained through the public survey from the online platform are not considered for any clinical diagnosis purpose. This self-reported survey which was adapted from the original version, [15] contains 21 Likert scale range questions and is composed of three subscales: depression, anxiety, and stress, in which each subscale has seven items with scales ranging from 0 ("never") to 3 ("always"). To determine the final score, scores on the items per subscale would need to be added and multiplied by 2. The severity level of mental health was determined and calculated by the following recommended cut-off scores, as shown in Table 1.

Section A of the questionnaire was reviewed by the two faculty members to ensure face and content validity. Based on their feedback and suggestions, several changes to the questionnaire were made. After the changes were made, the questionnaire was piloted. The pilot study was conducted on 30 medical and pharmacy students from UniKL RCMP, which comprises 10% of the total target respondents to ensure its internal consistency.

In the pilot study, four questions regarding the impact of ERT on education among respondents resulted in good reliability with Cronbach's alpha value of 0.83. The Cronbach's alpha for the DASS-21 scale's reliability was 0.79, 0.89, and 0.94, respectively for the anxiety, stress, and depression subscales, while for the overall DASS-21 was 0.94. The pre-test response uncovered a few opinions among the respondents. This questionnaire was then used for the study with only slight modifications.

Data Collection Procedure

The data collection process began with an online invitation to UniKL RCMP students to participate in the study. The softcopy version of the questionnaire was distributed through the internet via WhatsApp and Telegram messenger to each class representative from each programme of study in UniKL RCMP. They were given a link to a Google Form that contained the questionnaire. Participation is voluntary and each respondent was asked for his/her agreement in the

questionnaire. The respondents were expected to take about 5-10 minutes to complete each questionnaire.

The online survey was further promoted on social media. The link to the Google Form questionnaire was shared via a QR code with respondents. Respondents who participated in the pilot study were not included in the study sample. The snowball method was used to achieve the complete number of responses. All the responses were compiled into the Microsoft Office Excel 2013 data collection form to be analysed.

Ethical Consideration

All the information obtained in this study are kept in a confidential manner and complied with the Declaration of Helsinki on ethical principles for medical research involving human subjects.

Data Analysis

Data from the respondents were analysed using the IBM Statistical Package for Social Science (SPSS) ® Version 21.0. Descriptive statistics were used for discrete data; means and standard deviation for continuous data. Continuous data that were analysed for mean and standard deviation include age, stress, anxiety and depression score. The association between students' demographic variables and mental health status was analysed by using the Chi-square test. A *p*-value of less than or equal to 0.05 was considered statistically significant. The association between stressor variables and mental health status in each subscale for anxiety, stress, and depression was analysed using ANOVA with a 95% confidence interval (CI). If the two-sided *p*-value was less than or equal to 0.05, the association of variables was considered significant.

Results

Respondents' characteristic

A total of 307 responses from UniKL RCMP students were obtained from March to April 2021. Female students made up almost three-quarters (74.3%) of the respondents. The majority (86%) of the respondents were between 18-23 years of age, while the remaining (14%) were 24-29.

The respondents consisted of Bachelor and Diploma programme students. Students who took Pharmacy courses (Bachelor and Diploma) made up the highest number of respondents with 41.4%, followed by those from MBBS, Physiotherapy (both Bachelor and Diploma), Pharmaceutical Technology and Medical Imaging programmes. Most of the respondents live in urban areas (71%).

Mental health status

Table 1 summarizes the respondents' score which determined their mental health status.

From the score obtained by the respondents, it was found that the percentage of respondents having severe stress and depression were 5.2% and 9.4%, respectively. However, slightly more than a quarter (26%) of students had severe anxiety. The mean score and standard deviation for anxiety, stress, and depression status were calculated from scores obtained by all the respondents. The mean score for stress was 14.5 ($\pm$10), for depression was 12.14 ($\pm$10.02) and anxiety was 12.72 ($\pm$9.22). The mean score for stress falls at the normal level, while for depression and anxiety falls at a mild to moderate level. Overall, there were more than 50% of respondents classified as experiencing mild to severe anxiety and depression.

Table 2 provides the association between demographic variables and the score of students with mild to severe mental health problems for each subscale (anxiety, stress and depression), which was analysed by using the Chi-square test. A p-value less than or equal to 0.05 is considered statistically significant.

The percentage of respondents who experienced mild to severe anxiety was 68.7% (211/307). From the total number of 211 students, there were 153 (72.5%) females and 58 (27.5%) males. The percentage of mild to severe anxiety among males is 73% (58/79) which is slightly higher than among female students at 67% (153/228). There

were 84.4% (178/211) who were between 18 to 23 years old. They made up 67% (178/264) within this age range. For the 24 to 29 age range 15.6% (33/211) experienced anxiety symptoms; which is 77% (33/43) of all students in this age range.

Pharmacy students make up 47.4% (100/211), medical 22.7% (48/211), physiotherapy 10.9% (23/211), and pharmaceutical technology 7.1% (15/211) of all respondents that experienced anxiety symptoms. Other than that anxiety symptoms were also observed in nursing students and medical imaging students, with 6.2% (13/211) and 5.7% (12/211), respectively. However, a comparison between each group of students revealed that anxiety symptoms ranged between 57% - 82%; the lowest being among nursing students which is 57% (13/23), and the highest among physiotherapy students which is 82% (23/28). Pharmacy students that make up the highest number of respondents also showed a high percentage (79%, 100/127) of students with anxiety symptoms.

Of the respondents who experienced anxiety symptoms, 68.2% (144/211) live in urban areas while 31.8% (67/211) lived in rural areas. It was also found that more of those living in rural areas (74%) are having anxiety symptoms compared to those from urban areas (66%).

About fourty-one per cent (41.4%) of the total respondents experienced mild to severe stress. The stress level of mild to severe was found to be low amongst the respondents. Within both age groups, it was around 40% and within the different courses it ranged between 30% - 50%; again the nursing students experienced the least stress while the highest was found among students in the Medical Imaging course.

Depression is more likely to happen among female respondents as 59% (134/228) have mild to severe symptoms as compared to 47% (34/79) of male respondents. The majority of the respondents with depressive symptoms live in the urban areas, 67.3% (115/171) than in the rural areas, 32.7% (56/171), but the place of residence is not significant. The percentage of all the respondents that experienced depression symptoms was below 50% for pharmacy (42.7%), medical (23.4%), and health sciences students (36.8%). The association between depression and students of different programmes is not significant.

Analysis of the *p-value* obtained between the demographic profile and DASS-21 scale at the mild to severe level of all respondents did not show any significant association.

Potential stressors

The students' feedback on potential stressors to online education during pandemic COVID-19 is shown in Table 3.

Throughout the ERT period, most of the respondents stayed together with their families (75.6%), rather than living with friends (23.1%) or living alone (1.3%). More than half (56.8%) of the respondents reported that they were not having any problem accessing the Internet. Some of them (43.3%) reported having difficulty accessing the Internet, with the majority (75.2%) reported having difficulty in connection availability.

As the majority of the respondents live with their families, 59.5% of them considered helping their parents or doing household tasks a burden to them. Many respondents (63.5%) reported that the duration of their sleep during this period is less than the average hours, while 32.3% reported that they slept within the normal average hours of sleep. Only 4.2% reported that they sleep more than the average hours of sleep.

The results show that 79% [R^2=0.79; F (4,302)=6.497, p<0.001] of the variance in anxiety can be accounted for by three out of four stressor variables. Problems accessing the Internet, doing household tasks or helping parents considered a burden and sleeping hours are the predictors contributing to anxiety. The same stressor variables also significantly predicted depression, with 93% [R^2=0.93; F (4,302)=7.7728, p<0.000] accounting for the variance**.** For stress, the stressor variables accounting for a variance of 42% [R^2=0.42; F (4,302) =3.291, p>0.001 are having a problem

accessing the Internet and doing household tasks or helping parents considered a burden.

Effect of ERT on learning

Table 4 shows the feedback of undergraduate university students of UniKL RCMP regarding the sudden ERT on their education status and performance.

The results shown in Table 4 represented the respondents' feedback regarding the sudden shift from physical class to online education. More than 90% of the respondents agree and somewhat agree that their level of attentiveness is reduced in class during online education compared to during the face-to-face learning session. The majority (58.3%) of the respondents also disagree that online classes are more effective in completing a course than face-to-face learning. Most (81%) of the respondents agree and somewhat agree that their assessment grades or marks are affected due to online classes and were agreeable that they were lagging (86.6%).

Discussion

The majority of the UniKL RCMP students had experienced mild to moderate levels of anxiety stress and depression, with anxiety having a higher prevalence than stress and depression. Sundarasen *et al*. (2020) also showed that university students in Malaysia have a higher prevalence of mild to moderate anxiety during pandemic COVID-19. [10] Compared to the study by Islam *et al*. (2020) the percentage of students with at least severe symptoms was higher for university students in Bangladesh for stress and depression which accounted for 27.5% and 16.5%, whereas in our study it was 5.2% and 9.4% respectively. [13] The prevalence of anxiety was slightly higher for our students with 25.7% as compared to 19.7% in Bangladesh. Using the Zung Self-Rating Scale (SAS and SDS), Villani et.al. (2021) found that 35.3% and 72.93% of their students had mild symptoms of anxiety and depression, respectively. [9]

Even though there was no statistically significant correlation between gender and mental health found in this study, female respondents have a higher proportion of all three DASS-21 subscales, with more than 70% of them experiencing mental health issues. These findings are similar to the study by Shamsuddin *et al*. (2013) who reported that female university students had higher mental health issues as compared to male undergraduates in Malaysia. [16] Women were found to be more vulnerable to stress and anxiety disorders in the aftermath of stressful events as they show their feelings more, while men are more resilient (Sundarasen *et al*., 2020). [10] There was no significant relationship between the other demographic profile and the mental health level of respondents.

During the lockdown, more than three-quarters of the students stayed with their family. While family support is important during those trying times, there have been negative effects on students learning. More than half of the students considered helping their parents and doing household chores a burden to them. In one study, students have also reported that their home is a distractive environment. [18] This stressor and sleep disruption were found to have an association with anxiety and depression. Other studies have shown that sleep deprivation and disruption are common problems among students in the pandemic. [18, 19]. Apart from these two stressors, problems with Internet access also contributed to the respondents' stressful conditions.

The majority of the respondents felt that ERT has negative impacts on them. In this study, the respondents agreed that their attentiveness is decreased and their assessment grades or marks are affected. The students found that they have lagged in their education and preferred face-to-face learning to virtual education. While our study found negative effects impacting the respondents, the impact of ERT can differ among the different student populations. Students with easy access to technology and good online skills

accepted online learning and exams more favourably [20].

Limitations

The limitation of the study is that the data was collected only on students of UniKL-RCMP. Furthermore, almost all students at this campus are of one race i.e. Malay. Therefore, the findings of the study cannot be generalised to all university students in Malaysia. Despite these limitations, the findings revealed the effect of the lockdown and pandemic on students' mental health, types of stressors that led to mental health issues and their thoughts on the impact of ERT on their education.

Conclusion

This study had found that emergency remote teaching (ERT) affected the mental health status and education of students at UniKL-RCMP students during the COVID-19 pandemic. The majority of the students who participated in the study experienced anxiety and depression that ranged from mild to severe. Nevertheless, less than half of them experienced mild to severe stress. Three factors found to cause anxiety, depression and stress are helping parents and doing household chores as burdensome, sleep disruption and problems with Internet access. The respondents also alluded that online learning caused them to be less attentive, lag in their studies and affected their grades.

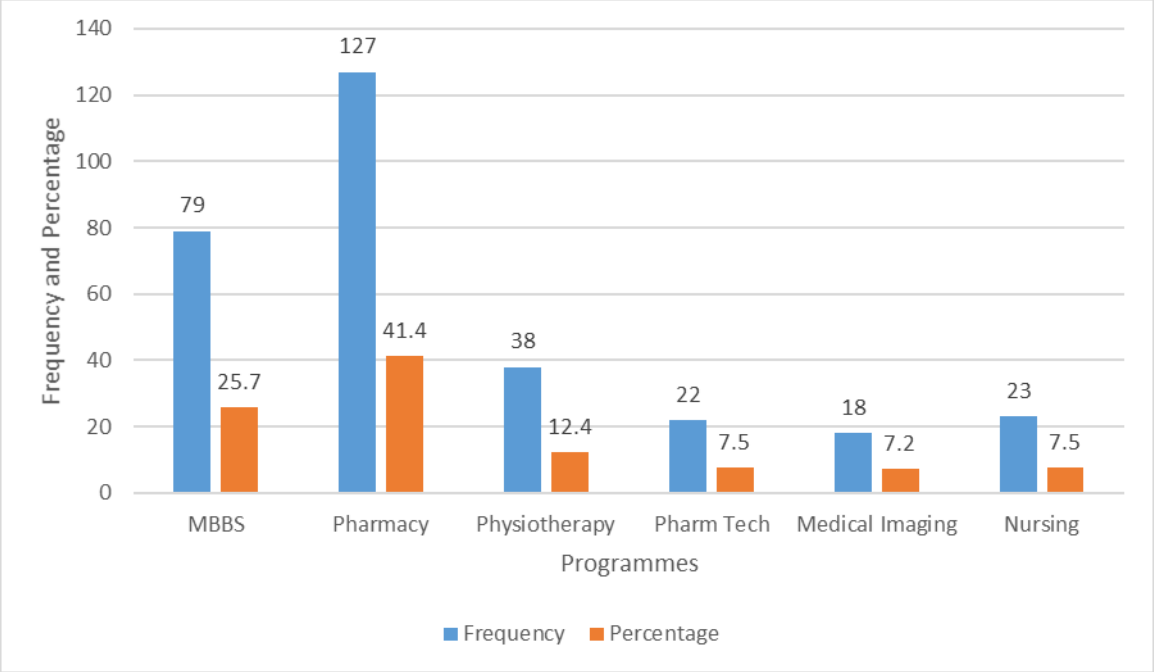

Figure 1. Number and Percentage of Students by Programme of Study

Table 1. Mental health level of respondents' by score on DASS-21 scales

Mental Health Status	Characteristics	Frequency (n)	Percentage (%)
Anxiety	Normal	96	31.3
	Mild to Moderate	132	43.0
	Severe	79	25.7
	Total	307	100
Stress	Normal	180	58.6
	Mild to Moderate	111	36.2
	Severe	16	5.2
	Total	307	100
Depression	Normal	136	44.3
	Mild to Moderate	142	46.3
	Severe	29	9.4
	Total	307	100

Table 2. Association between demographic profile and mild to severe levels of anxiety, stress, and depression.

Variables	Anxiety			Stress			Depression		
	Mild to Severe level (n=211; 68.7%)			Mild to Severe level (n=127; 41.4%)			Mild to Severe level (n=171; 55.7%)		
	n	**%**	***p-value****	**n**	**%**	***p-value****	**n**	**%**	***p-value****
Gender									
Male (n=79)	58	27.5	0.327	26	20.5	0.086	37	21.6	0.068
Female (n=228)	153	72.5		101	79.5		134	78.4	
Age									
18-23 (n=264)	178	84.4	0.287	110	86.6	0.868	152	88.9	0.136
24-29 (n=43)	33	15.6		17	13.4		19	11.1	
Programme of Study	**N=211**			**N=127**			**N=171**		
Medical (n=79)	48	22.7		29	22.8		40	23.4	
Pharmacy (n=127)	100	47.4		57	44.9		73	42.7	
Nursing (n=23)	13	6.2		7	5.5		13	7.6	
Physiotherapy (n=38)	23	10.9	0.055	15	11.8	0.723	20	11.7	0.836
Medical Imaging (n=18)	12	5.7		9	7.1		10	5.8	
Pharmaceutical Technology (n=22)	15	7.1		10	7.9		15	8.8	
Students living area									
Rural area (n=90)	67	31.8	0.178	41	32.3	0.374	56	32.7	0.165
Urban area (n=217)	144	68.2		86	67.7		115	67.3	

*Note: * Fisher's Exact Test*

Table 3. Respondents' Feedback on Potential Stressor Variables

Variables/Questions	**Feedback (**N= 307)	**Frequency (n)**	**Percentage (%)**
With whom do you live?	Family	232	75.6
	Friends	71	23.1
	Alone	4	1.3
	Total	307	100.0
Do you have a problem accessing the Internet?	Yes	133	43.3
	No	174	56.7
	Total	307	100.0
If yes, what is your problem with accessing the Internet?	Insufficient data	20	15.0
	Connection availability	100	75.2
	Costly	13	9.8
	Total	133	100.0
Is helping parents or doing household tasks burden you?	Yes	16	5.2
	Sometimes	184	59.9
	No	107	34.9
	Total	307	100.0
What is your average hour of sleep?	Less than average (<6 hours)	195	63.5
	Normal (7-8 hours)	99	32.2
	More than average (>9 hours)	13	4.2
	Total	307	100.0

Table 4. Effect of ERT on learning (N=307)

Questions	Answers	Frequency (n)	Percentage (%)
Is your level of attentiveness reduced in class?	Agree	158	51.5
	Somewhat Agree	129	42.0
	Disagree	20	6.5
	Total	307	100.0
Online classes are more effective in completing a course compared to face-to-face learning.	Agree	30	9.8
	Somewhat Agree	98	31.9
	Disagree	179	58.3
	Total	307	100.0
My assessment grade or marks are affected during online classes?	Agree	133	43.3
	Somewhat Agree	116	37.8
	Disagree	58	18.9
	Total	307	100.0
I think I am lagging?	Agree	141	45.9
	Somewhat Agree	125	40.7
	Disagree	41	13.4
	Total	307	100.0

References

1. Lu H., Stratton CW, Tang YW. Outbreak of pneumonia of unknown etiology in Wuhan China: the mystery and the miracle. J Med Virol. 2020;92:401-402
2. Adhanom, T. *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. WHO Director General's Speeches. www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-mission-briefing-on-covid---11-march-2020
3. Bunyan, J. *Malaysia under movement control order from Wed until March 3, 2020*. Malay Mail. https://www.malaymail.com/news/malaysia/2020/03/16/pm-malaysia-in-lockdown-from-wed-until-march-31-all-shops-closed-except-for/1847204
4. Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. Remote teaching and online learning. Educause Review. 2020. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning. Retrieved on 4 March 2021
5. Lorenzo, G. (2008). "The Sloan Semester." Journal of Asynchronous Learning Network. 2008; 12(2): 5–40.
6. Zapata-Garibay, R., González-Fagoaga, J. E., Asadi-González, A. A., Martínez-Alvarado, J. R., Chavez-Baray, S. M., Plascencia-López, I., & González-Fagoaga, C. J. Mental health stressors in higher education instructors and students in Mexico during the emergency remote teaching implementation due to COVID-19. Frontiers in Education 2021; *6*. https://doi.org/10.3389/feduc.2021.670400
7. Hasan, N., & Bao, Y. (2020). Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss." Children and Youth Services Review. 2020.

https://doi.org/10.1016/j.childyouth.2020.105355
8. Salari N, Hosseinian-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. Global Health. 2020;16(1):1–11.
9. Leonardo Villani1*†, Roberta Pastorino2†, Enrico Molinari3,4, Franco Anelli5, Walter Ricciardi1,2, Guendalina Graffigna3,4 and Stefania Boccia. Global Health, 2021; 17:39. https://doi.org/10.1186/s12992-021-00680-w
10. Sundarasen, S., Chinna, K., Kamaludin, K., Nurunnabi, M., Baloch, G. M., Khoshaim, H. B., Hossain, S. F. A., & Sukayt, A. Psychological impact of COVID-19 and lockdown among university students in Malaysia: Implications and policy recommendations. Int J. Environ Res Public Health. 2020; 17(17): 6206. https://doi.org/10.3390/ijerph17176206
11. You JW, Kang M. The role of academic emotions in the relationship between perceived academic control and self-regulated learning in online learning. Computers and Education. 2014; https://doi.org/10.1016/j.compedu.2014.04.018
12. Adnan M. Online learning amid the COVID-19 pandemic: Students perspectives. Journal of Pedagogical Sociology and Psychology. 2020; 2(1): 45 – 51. https://doi.org/10.33902/jpsp.2020261309
13. Islam, M., Sujan, S. H., Tasnim, R., Sikder, T., Potenza, M., & Van Os, J. Psychological responses during the COVID-19 outbreak among university students in Bangladesh. PsyArXiv, 2 June 2020; Web. https://doi.org/10.31234/osf.io/cndz7
14. Henry JD, Crawford JR. The short-form version of the Depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. Br J Clin Psychol. 2005; 44(2): 227–239. https://doi.org/10.1348/014466505X29657
15. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behav Res Ther. 1995; 33(3): 335 – 343. https://doi.org/10.1016/0005-7967(94)00075-U
17. Shamsuddin K, Fadzil F, Ismail WSW, Shah SA, Omar K, Muhammad NA, Jaffar A, *et. al*. Correlates of depression, anxiety and stress among Malaysian university students. Asian J Psychtr. 2013; 6(4): 318–323. https://doi.org/10.1016/j.ajp.2013.01.014
18. Son C, Hegde S, Smith A, Wang X, Sasangohar F. Effects of COVID-19 on students' mental health in the United States: Interview survey study. J Med Internet Res. 2020 Sept; 22(9): e21279
19. Tang W, Hu T, Hu B, Jin C, Wang G, Xie C, et. al. Prevalence and correlates of PTSD and depressive symptoms one month after the outbreak of the COVID-19 epidemic in a sample of home-quarantined Chinese university students. Journal of Affective Disorders 2020 Sept; 274: 1–7
20. Alghaudi S, Ali M. Pharmacy students' perceptions and attitudes towards online education during COVID-19 lockdown in Saudi Arabia. Pharmacy 2020; 9(4): 169 https://doi.org/10.3390/pharmacy9040169.