SEMARAK ILMU PUBLISHING

Journal of Advanced Research in Applied Sciences and Engineering Technology

Journal homepage:
https://semarakilmu.com.my/journals/index.php/applied_sciences_eng_tech/index
ISSN: 2462-1943

Assessing the Impact of COVID-19 on the Mental Health of Higher Education Students: A Qualitative Study in Malaysia

Rohaya Latip[1,*], Farah Hanis B.[2], Sazlinah Hasan[1], Mohd Ali Khameini Ahmad[2], Mazen Farid[3, 4], A.V. Senthil Kumar[5]

[1] Department of Communication Technology and Network, Universiti Putra Malaysia, Selangor, Malaysia
[2] Department of Mathematical Sciences, Universiti Teknologi Malaysia, Johor, Malaysia
[3] Faculty of Engineering and Technology, Multimedia University, Melaka, Malaysia
[4] Faculty of Education, Department of Computer Science, Lahij University, Lahij, Yemen
[5] Hindusthan College of Arts and Science, Coimbatore, Tamil Nadu, India

ARTICLE INFO

Keywords:
Stress; anxiety; COVID-19; mental health; students in Malaysia

ABSTRACT

COVID-19 has triggered student's mental health since the closure of schools and universities due to the MCO. Furthermore, it worries that student's mental health keeps worsening during their studies. The purpose of this study is to analyze the mental health of higher education students during the COVID-19. The research is qualitative method. A questionnaire conducts using a google form to collect data from 151 participants in Malaysia. The mental health of students was measure using a 5-point Likert scale. Next, this study assesses the causes of student's mental health and how to cope with someone having a problem with their mental health like stress or anxiety. The study uses SPSS 27.0 software to analyze the data collection. This study founds the factors that influence student's mental health. The results of this study gathered that 73.5% of higher education students had difficulty concentrating in studies during the pandemic.

1. Introduction

World Health Organization [1] claims that emotional, psychological, and social well-being contribute to our mental health. It influences our thoughts, feelings, and actions. It affects how to deal with stress, communicate with others, and make the right judgments. The anticipated increase in mental health, with the potential for increased suicidality, is thought to be most likely in the mid and post-pandemic phases, as economic contraction, constrained mental healthcare resources, individual vulnerabilities, and the stark reality of dramatically altered lifestyles coalesce [2].

The emergence of the new coronavirus illness COVID-19 is a global public health emergency [1]. The closure of the university has affected hundreds of millions of students. One of the ways to reduce the transmission on COVID-19, university students need to have online learning instead face to face learning. This issue has increased the stress and anxiety of students due to the unavoidable

* *Corresponding author.*
E-mail address: rohayalt@upm.edu.my

https://doi.org/10.37934/araset.64.4.91101

circumstances of having online classes from home. The psychological and emotional impact is also evident since the start of the COVID-19 pandemic. Roy *et al.,* [3] indicates that the emergence and spread create lots of concern for people. It leads to an increase in the levels of anxiety and stress. The mental health of Malaysian deteriorated because of the widespread COVID-19. According to psychologists, coronavirus infection has increased psychological disorientation in people.

These studies were conducts to determine how the study influenced students' mental health during the COVID-19 epidemic. During the pandemic, things that raised students' fear or anxiety weighed heavily on their mental health. It may disrupt a student's daily schedule and increase their workload. Students who have good mental health will have no issues in their academics or will be able to address their problems, but students who have a problem with their mental health will want assistance and consultation. It may pose issues for students, such as inability to focus in class and a desire to abandon or complete their education during the epidemic. Shifting from face-to-face to online classrooms has already had a significant influence and effect on students from remote regions who demand resources such as computers or laptops. Students face psychological damage, and lockdowns create social isolation between them and others [4]. Due to the shutdown of universities, education is responsible for affecting student's mental health.

This study aimed to analyze the mental health of higher education students and measure the factor of student's mental health during the COVID-19 pandemic. In addition, this study to exploring the causes that affecting student's mental health. Also, provide for intervention in student's mental health.

2. Related Work

People who develop mental health are distinct to encountered relapse, intensification of symptoms, and impaired functioning during the COVID-19 pandemic [5,6]. The action of an individual as a unit of society or a community has a significant impact on the dynamics of a pandemic, including the intensity, degree of flow, and aftereffects [7]. Moreover, people need to isolate themselves, having social distancing, the closure of the school, universities, and workplace causing people to stay at home to break the chain of COVID-19. When information from official channels is absent or is transmitted irregularly, people may be exposed to certain false social and media information [8,9]. COVID-19 fears, as well as the poor mental health that comes with it, implies that some communities will face a more difficult uphill fight to recover from this public health catastrophe [10].

Children may encounter worry, discomfort, and an abusive environment, which can have both immediate and long-term impacts on their mental health [7]. Excessive crying and distressing behavior, increased unhappiness and concern, difficulty with focus and attention, and changes in eating habits are all typical changes in children's behavior. The severity of the long-term impacts of mental health disorders in children significantly outweighs the effect of early physical health problems [11-13]. Parents must remain calm, deal with the situation rationally, and spend time explaining the COVID-19 epidemic to their children, as well as giving some encouraging facts, statistics, and information [7].

Authors in Ariffin *et al.,* [14] investigate the correlation between students' motivation, mindset, computer competency, and technological familiarity in online learning post-COVID-19. Conducted in four community colleges in Kelantan, Malaysia, the study reveals students' high intention to continue e-learning, positively linked with motivation, computer competency, and technological familiarity. However, no evidence supports a connection between mindset and intention, while a serial mediation relationship is confirmed between computer competency, familiarity with technology, and future intention towards online learning adoption. Authors in Azmi *et al.,* [15] examine the

relationship between technology use and health-related behavior and physical activity in a university setting, aiming to promote a healthy campus environment. Findings indicate a significant correlation between digital technology use and both health-related behavior and physical activity, highlighting the potential of technology-based interventions for improving university health-promoting lifestyles. The COVID-19 pandemic has driven a transition to online learning in Malaysia, posing challenges like network coverage and digital competency.

A systematic review Rahman *et al.,* [16] identifies three key themes for online learning: online platform, learner profile, and learning experience, stressing the importance of adopting learner profiles for effective online teaching strategies to meet diverse student needs and ensure long-term sustainability beyond the pandemic. Amid the pandemic, e-learning has become crucial for managing educational processes, enabling instructors to handle student records and facilitate communication. The survey in Suherman *et al.,* [17] examines students' acceptance of technological devices for e-learning in Malaysian higher education during the pandemic, revealing a positive attitude towards their ongoing use, consistent with the extended Technology Acceptance Model (TAM). The study Yamin *et al.,* [18] explores psychological stress levels among construction workers in Hulu Selangor, focusing on factors and management barriers. Findings indicate moderate stress levels, with workers attributing stress to managerial responsibilities, suggesting the need for technological solutions and structural adjustments to alleviate stress in the construction technology sector.

According to medical experts, people aged 60 or above are more likely to get the COVID-19 and can develop a significant and life-threatening condition even if they are in good health [7,19]. Due to physical distancing, elder and disabled people facing negatives effects on their mental health. In this context, elders people depend on young ones for their daily needs, and self-isolation can critically damage a family system. According to the World Health Organization, family members should check on the elderly in their homes regularly and spend time communicating with them.

3. Methodology

Qualitative research methods were used to analyze the mental health of higher education students. The population of students included 151 higher education students from 22 universities. The questionnaire consists of 25 questions that the participants need to answers with demographic questions, Likert scale questions, multiple-choice questions, and open-ended questions.

3.1 Research Design

This study uses qualitative methods, which include analysis, descriptions, and participation observation questionnaires. Qualitative methods are how the participant describe what they have been experiencing during the pandemic. Due to pandemic, online qualitative methods make it easier, more commutative, and descriptive since the questionnaire was create using google form. Table 1 show the author's strengths and weakness.

Table 1
The summary of the author's strengths and weakness

Authors	Strengths	Weakness
O'Connor *et al.,* [5]	The author studies the impact of mental health features. The author also studies about the consequences impact of COVID-19 on mental health.	The author did not propose how to overcome the impact of COVID-19 on mental health.

Javed *et al.,* [7]	The author observed the impact of mental health risks in children, teens, elder people, and health workers. The author also discusses ways to overcome the risk of mental health.	The author did not concern about children, teens, and elder people that have an unhealthy family.
Fitzpatrick [10], Power *et al.,* [20], Jie and Mat [21]	The authors studies about fear of COVID-19 and the consequences. The author also does a comprehensive study to examining the diffusion of fear across time and place.	The author did not observe how to overcome the fear of COVID-19. The comprehensive study was conducted in America only.
Goodman *et al.,* [11], De *et al.,* [22]	The author observed several key domains of an individual's lives in childhood and adulthood. The author observed the estimations effect for the individual lives.	The individual's confidential information might leak.
Torales *et al.,* [8] Yamin *et al.,* [18]	The author observed COVID-19 and the impact on global mental health. The author reviewed the impacts based on other work.	The author reviewed the impacts based on other work.

3.2 Participants

On August 5, a questionnaire conducts through a google form. Approximately 35 participants completed the questionnaire. On August 20, we conducted this research questionnaire. The google form approach to distributing the questionnaire online. The questionnaire was shared on social media such as Facebook, Instagram, and WhatsApp friends. The participants have mainly aged 18 to 32 higher education students. Approximately 151 participants completed the questionnaire. Out of 151 participants who filled out the questionnaire, 124 female students and 27 male students. According to gender, female students had the highest rate in the research sample. The second layer questionnaire where questionnaire provides two questions. Around 110 of the participants, there are only 60 participants who fill in the questionnaire.

3.3 Data Collection

There are three processes of data collection. The first process is to distribute the questionnaire to 30 participants to see the reliability value either more than 0.7 or less. The second process was to distribute the questionnaire to at least 150 participants in two weeks. Calculate the reliability value, mean and standard deviation. The third process distributes a second layer questionnaire to measure the factor and students' opinions. The questionnaire was distributed to the higher education students through online platforms. Since face-to-face data collection was not practical, data collection was approach via social media and messaging services. This method is preferable since it needs to create in a limited and short time. In addition, the data collection is capable gather data from a small number of respondents.

3.4 Data Analysis

The data was analyzed using SPSS 27.0. Twelve Likert scale items are to assess what are the participants experiencing during the pandemic. The options are (none of the time, rarely, some of the time, often, and all of the time), which is describing their feelings and experiences. The reliability and validity of this second process questionnaire have been evaluating. In this study, the Cronbach's Alpha coefficient of the participant's current well-being was 0.92. The questionnaire was to measure how students had been feeling about their studies during the pandemic. The options were Yes, No, and Maybe. There are five questions asked to assess how students have been coping with their studies. One question asked how the students have been managed their stress and anxiety during

the pandemic. Two open-ended questions are to assess the factor that increases the student's levels of stress or anxiety. Also, opinion on how to face if someone with a mental health problem.

This questionnaire is to know the factor why the participants having difficulty concentrating. There are four options of the answer which technical problem, Environment condition, Overwhelmed with many tasks, and distraction from the internet. The next question asks about why students stress when not able to engage with their lecturer. This type of question is an open-ended question. All statistical analyses were perform using SPSS Statistics 27.0 (IBM Corp). Means (M) and standard deviation (SD) have been measures to describe the data.

4. Results and discussion

The demographic information for 151 participants (124 females and 27 males), as shown in Table 2. The mean score for gender is 1.18 though the standard deviation is 0.384. Their ages ranged from 18 to 32. Most of them were between 22 years old (72.8%). The mean score for age is 22.22 and the standard deviation is 1.280. About (57%) of participants live in a rural area. About (43%) of the participants live in an urban area. The mean score for the area of living is 1.43 and the standard deviation is 0.497.

Table 2
Demographic characteristics of the participants (n =151)

Variable		Sample (n=151)	Percentage (%)
Gender	Female	124	82.1%
	Male	27	17.9%
Age	18	1	0.7%
	20	3	2.0%
	21	10	6.6%
	22	110	72.8%
	23	18	11.9%
	24	3	2.0%
	25	4	2.6%
	29	1	0.7%
	32	1	0.7%
Area of living	Rural	86	57.0%
	Urban	65	43.0%

The distribution of the participants in the study by area of the living type is examined. It observed that participants who live in a rural area and urban area are about the same. There are around (95.8%) participants from a public university and around (4.2%) participants from a private university in Malaysia as illustrated in Figure 1. The mean score for the institution is 7.42 whereas the standard deviation is 6.036. Approximately (68.4%) of the participants taking a course related to science and (31.6%) taking courses other than science such as banking and english communication as illustrated in Figure 2. The mean score is 5.72 and the standard deviation is 5.198.

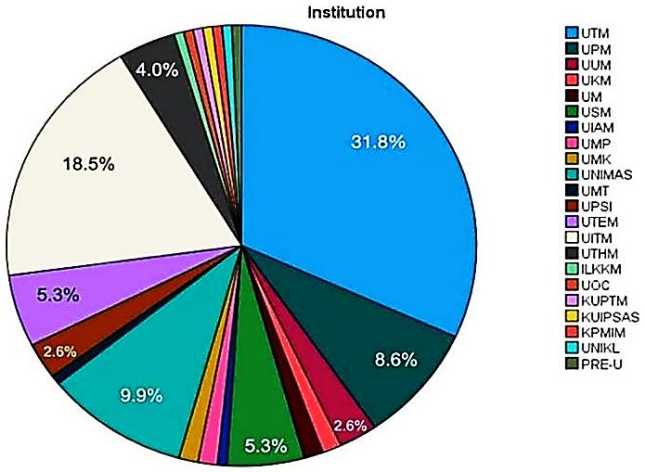

Fig. 1. The institutions of the participants

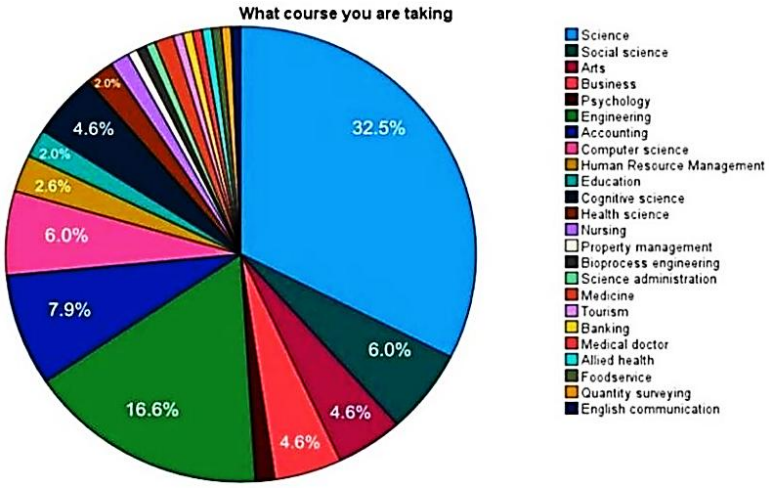

Fig. 2. The course that the participants been taking

4.1 Students Current Well-Being

Table 3 illustrated what the students experience during the pandemic. As the mean and standard deviation scores detailed, the most influential aspect for students' mental health having a mean score of 3.2125 and a standard deviation of 0.9227.

Table 3
Students' mental health in Malaysia (n = 151)

Variables	Mean	SD
I have been feeling optimistic about the future	3.24	0.830
I have been feeling useful	3.07	0.822
I have been feeling relaxed	3.28	0.896
I have been dealing with problems well	3.21	0.821
I have been thinking clearly	3.20	0.817
I have been feeling good about myself	3.14	0.959
I have been feeling close to other people	2.97	1.029
I have been feeling confident	3.01	0.980
I have been able to make up my own mind about things	3.30	0.878
I have been feeling loved	3.38	0.979
I have been interested in new things	3.46	1.044
I have been feeling cheerful	3.29	1.017

During the pandemic, students experience and feel such as students have been interested in new things. About 41.1% (often) and 13.9% (all of the time) students experience or interest in new things. also, around 33.8% (often) and 12.6% (all of the time) answered that they have been feeling loved. It shows that students are in positive and good mental health. But there are around 7.3% (None of the time) that do not feel confident. Around 6.0% (none of the time) not feeling close to other people.

4.2 Students Concern in Study

Table 4 as shown was to assess students feeling during studies along with the COVID-19 pandemic. The question that asking whether the participants feeling stress or not when they cannot engage with their lecturer during the pandemic, there are 53.6% of participants answered (yes) and 35.8% answered (maybe) and others answered (no). based on the second layer question, the study found that student feels stressed when cannot engage with their lecturer. it is due to a miscommunication that the student cannot have a clear explanation even though have been contacting their lecturer. the next question is (is the dateline of your assignment too short causing stress or anxiety), there are 62.3% of participants answered (yes) and 23.8% answered (maybe). for (are you having difficulties falling asleep during examination week due to pandemic?) around 49% of the participant answered (yes) and 32.5% answered (no). then, for (are you having trouble concentrating on things such as studying or doing assignments during a pandemic?) about 73.5% of the participants choose (yes) and 17.9% of the participants choose (maybe).

Table 4
Students concern in study (n = 151)

Variables	Mean	SD
Are you stressed when you cannot engage with your lecturer during pandemic?	1.82	0.932
Is the dateline of your assignment too short causing of stress or anxiety?	1.62	0.847
Are you having difficulties falling asleep during examination week due to pandemic?	1.70	0.766
Are you having trouble concentrating in things such as studying or doing assignment during pandemic?	1.44	0.780

Next, the lecturer not replying to their chat or email on time. The students have to wait for the lecturer to respond and sometimes the lecturer might not notice the chat or email. From one lesson to one lesson, it leads to many lessons afterward due to procrastination. After being left behind a few classes, students become uninvolved to show up in class and start to skip. The next question is (How much do you feel that study has affected your mental health during a pandemic) based on Figure 3 is a Likert scale question in the range from 0 (not being affected at all) to 10 (being severely affected). Highest voted is range 7 which is about (23.2%) of the participants. It has shown that student's mental health is almost severely affected during the pandemic. Also, the second-highest voted is range 8 which is about (22.5%) of the participants, and the third-highest voted is range 5 which is about (17.2%) of the participants.

Based on Figure 4, the factor that influences students' levels of stress and anxiety during a pandemic is difficulty in concentrating (73.5%). The mean score is 1.26 and the standard deviation is 0.443. From this, we can specify why students having difficulty concentrating in the discussion part. The second factor that triggered stress level is increased concerns on academic performance (63.6%). The mean score is 1.36 and the standard deviation is 0.483. The third factor is decreased social interactions due to physical distancing (59.6%). The mean score is 1.40 and the standard deviation is 0.492.

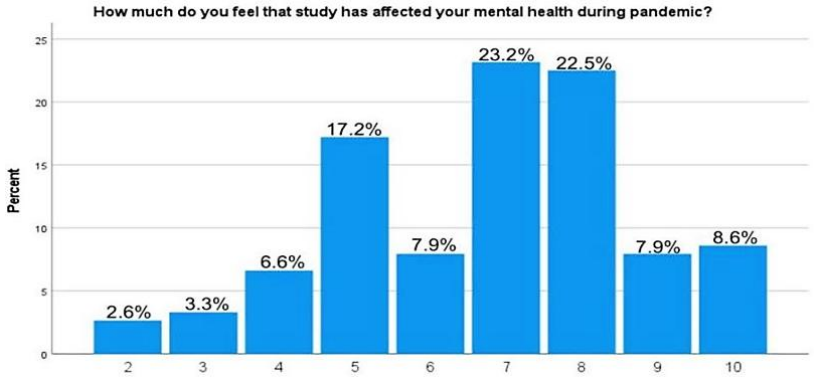

Fig. 3. How much students' mental health affected during pandemic

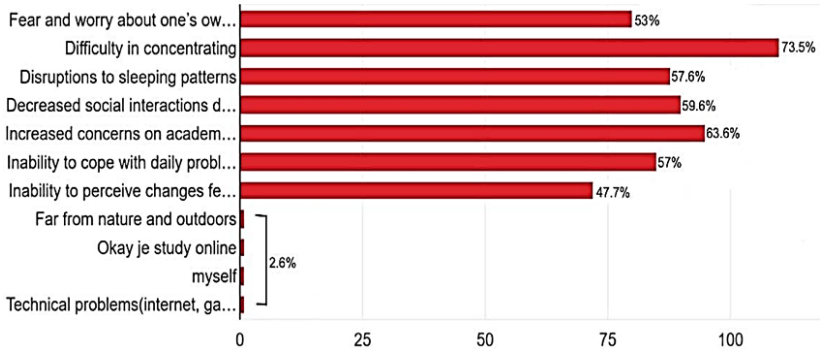

Fig. 4. Factor that influences students' levels of stress and anxiety

Students who are having difficulties concentrating have been facing pressure such as technical problems, environmental conditions, being overwhelmed with many tasks, and distraction from the internet as illustrated in Figure 5. The participants most voted that it is because of technical problems such as internet, accessibility, and gadget (68.3%). The second-highest voted is due to environmental conditions such as parents, siblings, and pets (65%), and the third-highest voted is due to being overwhelmed with many tasks (61.7%). Based on technical problems, students live in a rural area that is poor in internet connection and low bandwidth. These will disrupt the learning process in an online class. For accessibility and gadget, some students who have many siblings need to share the device with their siblings due to online classes.

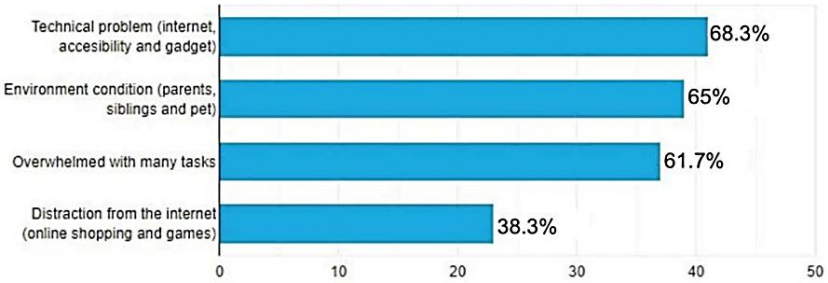

Fig. 5. The factor which makes students difficult in concentrating

The distraction that the students have been facing are environmental conditions. Due to online classes, students need to have classes from home or hostel. Students who are having classes from home will give them lots of distractions such as parents, siblings, and pets. Also, an unconducive place to having class or study is one of the factors students having difficulties concentrating. Other is overwhelmed with many tasks which is due to online, students given too much task, assignment or homework. With overwhelmed tasks, students spend a lot of time to finished and submit the tasks.

Last, a distraction from the internet such as online shopping and games. Based on Figure 6, most of the participants have been coping with their stress and anxiety during the pandemic by getting outside for a walk (66.2%) which is around 100 from 151 participants. The mean score is 1.34 and the standard deviation is 0.475. Next, the participants will drink a lot of water (60.3%) about 93 participants. The mean score is 1.40 and the standard deviation is 0.491. Also, the participants will do exercise and relaxation (55.6%) about 84 participants. The mean score is 1.44 and the standard deviation is 0.498.

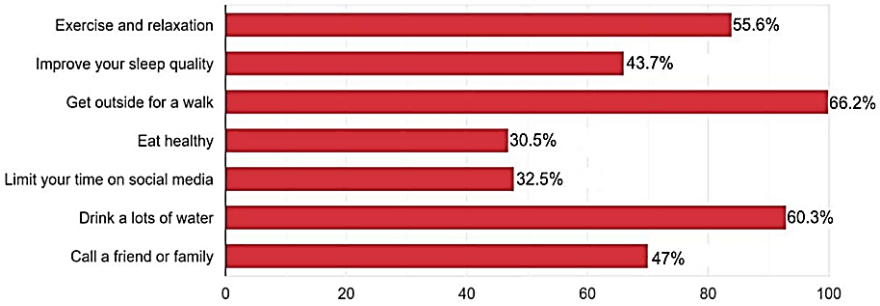

Fig. 6. How students coping with their mental health during pandemic

Students have to cope with their stress and anxiety by going outside for walks, drinks a lot of water, and exercise and relaxing. Also, students necessary to get outside for a walk place which can lift all of the stress. Also, by drinking a lot of water as a two-liter of water per day. The students also need to do exercise and relaxing at least three times a week. Based on the questionnaire, the open-ended question for the question is (If someone you know facing a problem with mental health what did you do?) as illustrated in Figure 7 most of the participants answered that be a good listener (86.1%) around 130 participants. The mean score is 1.42 and the standard deviation is 0.496. The second way are to give motivation and moral support (64.9%), which about 98 participants answered. The mean score is 1.35 and the standard deviation is 0.479.

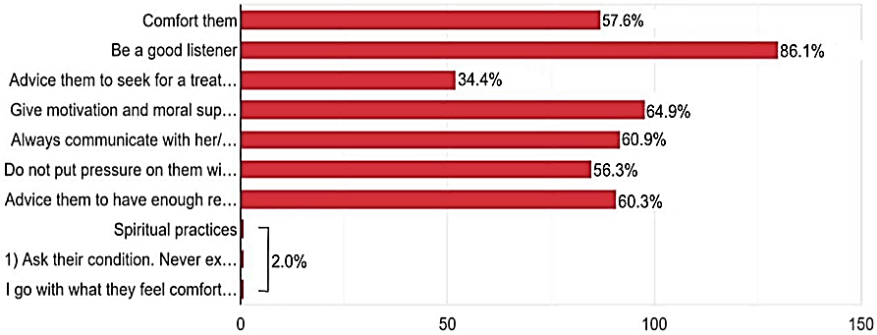

Fig. 7. How students' people surroundings with mental health problems

This study found that most of the participants answered that if someone you know facing a problem with mental health, need to be good listener, give motivation and moral support, and always communicate with them. Based on others, the participants answered that by reading and learn more about how people deal with mental health want to listen and spiritual practices.

5. Conclusions

Mental health is not a new thing in this world. Before and after COVID-19, mental health is a disease that involves being mentally affected by feeling, well-being, what the individual is

experiencing, and the individual's environment. Due to COVID-19, the circumstances were unpredictable to the lecturer and students where the learning process neither might nor might not achieve the learning targets. Students have been struggled to adapt to COVID-19 life and study though lecturers seek to learn some systems for students to have a good learning process. Another problem that students encountered was the communication problem. Students were not able to engage with the lecturer and not being able to share the same physical environment with their peers and lecturer. In this context, different students and lecturers facing different types of distractions and struggles.

Based on the study, students' mental health has been influenced by the COVID-19 pandemic. Based on student's current well-being questionnaire, students affected to their mental health such as sometimes feeling useful, feeling cheerful, been dealing with problems well, feeling relaxed, feeling good about themselves, thinking clear, feeling close to other people, feeling confident, feeling loved, able to make up their minds about things, feeling optimistic about future, and sometimes not.

In summary, this study found that the mental health of higher education students is very significant during the COVID-19 pandemic. This study also indicated that technical problems, environmental conditions, being overwhelmed with many tasks, and distraction from the internet is the factor that increased students' levels of stress or anxiety during this pandemic. These results highlight the need for the ministry of education to take appropriate actions to help students who have difficulties in studies, also the need for local governments to take appropriates mental health interventions on higher education students. Future research should move beyond the cross-sectional design of the present study to explore the other factors that influence students' mental health during the pandemic.

References

[1] WHO. "Coronavirus disease (COVID-19) pandemic." *World Health Organization* (2020).

[2] Gavin, Blanaid, John Lyne, and Fiona McNicholas. "Mental health and the COVID-19 pandemic." *Irish Journal of Psychological Medicine* 37, no. 3 (2020): 156-158. https://doi.org/10.1017/ipm.2020.72

[3] Roy, Deblina, Sarvodaya Tripathy, Sujita Kumar Kar, Nivedita Sharma, Sudhir Kumar Verma, and Vikas Kaushal. "Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic." *Asian Journal of Psychiatry* 51 (2020): 102083. https://doi.org/10.1016/j.ajp.2020.102083

[4] Uddin, Miraz, and Burhan Uddin. "The impact of Covid-19 on students' mental health." *Journal of Social, Humanity, and Education* 1, no. 3 (2021): 185-196. https://doi.org/10.35912/jshe.v1i3.525

[5] O'Connor, Karen, Margo Wrigley, Rhona Jennings, Michele Hill, and Amir Niazi. "Mental health impacts of COVID-19 in Ireland and the need for a secondary care mental health service response." *Irish Journal of Psychological Medicine* 38, no. 2 (2021): 99-107. https://doi.org/10.1017/ipm.2020.64

[6] O'Connor, Rory C., Karen Wetherall, Seonaid Cleare, Heather McClelland, Ambrose J. Melson, Claire L. Niedzwiedz, Ronan E. O'Carroll, Daryl B. O'Connor, Steve Platt, Elizabeth Scowcroft, Billy Watson, Tiago Zortea, Eamonn Ferguson, and Kathryn A. Robb. "Mental health and well-being during the COVID-19 pandemic: longitudinal analyses of adults in the UK COVID-19 Mental Health & Wellbeing study." *The British Journal of Psychiatry* 218, no. 6 (2021): 326-333. https://doi.org/10.1192/bjp.2020.212

[7] Javed, Bilal, Abdullah Sarwer, Erik B. Soto, and Zia-ur-Rehman Mashwani. "The coronavirus (COVID-19) pandemic's impact on mental health." *The International Journal of Health Planning And Management* 35, no. 5 (2020): 993-996. https://doi.org/10.1002/hpm.3008

[8] Torales, Julio, Marcelo O'Higgins, João Mauricio Castaldelli-Maia, and Antonio Ventriglio. "The outbreak of COVID-19 coronavirus and its impact on global mental health." *International Journal of Social Psychiatry* 66, no. 4 (2020): 317-320. https://doi.org/10.1177/0020764020915212

[9] Fusar-Poli, Paolo, Gonzalo Salazar de Pablo, Andrea De Micheli, Dorien H. Nieman, Christoph U. Correll, Lars Vedel Kessing, Andrea Pfennig, Andreas Bechdolf , Stefan Borgwardt, Celso Arango, Therese van Amelsvoort. "What is good mental health? A scoping review." *European Neuropsychopharmacology* 31 (2020): 33-46. https://doi.org/10.1016/j.euroneuro.2019.12.105

[10] Fitzpatrick, Kevin M., Casey Harris, and Grant Drawve. "Fear of COVID-19 and the mental health consequences in America." *Psychological Trauma: Theory, Research, Practice, and Policy* 12, no. S1 (2020): S17. https://doi.org/10.1037/tra0000924
[11] Goodman, Alissa, Robert Joyce, and James P. Smith. "The long shadow cast by childhood physical and mental problems on adult life." *Proceedings of the National Academy of Sciences* 108, no. 15 (2011): 6032-6037. https://doi.org/10.1073/pnas.1016970108
[12] De Los Santos, Janet Alexis A., Leodoro J. Labrague, and Charlie C. Falguera. "Fear of COVID-19, poor quality of sleep, irritability, and intention to quit school among nursing students: A cross-sectional study." *Perspectives in Psychiatric Care* 58, no. 1 (2022): 71. https://doi.org/10.1111/ppc.12781
[13] Kotera, Yasuhiro, Su-Hie Ting, and Siobhan Neary. "Mental health of Malaysian university students: UK comparison, and relationship between negative mental health attitudes, self-compassion, and resilience." *Higher education 81,* no. 2 (2021): 403-419. https://doi.org/10.1007/s10734-020-00547-w
[14] Ariffin, Arihasnida, Nur Nadia Mohd Faisal, Siti Nur Kamariah Rubani, Norhasyimah Hamzah, and Normah Zakaria. "Psychological Stress and Role Management on Construction Technology Industry: Post-Pandemic Challenges." *Journal of Advanced Research in Applied Sciences and Engineering Technology* 41, no. 1 (2024): 127-133. https://doi.org/10.37934/araset.41.1.127133
[15] Azmi, N. H., N. Ibrahim, E. M. Saari, A. A. Mutalib, and N. Akma. "Student profiling for online learning during Covid-19: A systematic review." *Journal of Advanced Research in Applied Sciences and Engineering Technology* 34, no. 2 (2024): 50-61. https://doi.org/10.37934/araset.34.2.5061
[16] Rahman, Azira Hanani Ab, Nur Ain Ayunni Sabri, Siti Rohana Mohamad, and Nur Syafiqah A. Samad. 2024. "Examining the Mediation Effect of Computer Competency on the Familiarity with Technology and the Acceptance of Online Learning Post-COVID-19." J*ournal of Advanced Research in Applied Sciences and Engineering Technology* 33, no. 3: 293–306. https://doi.org/10.37934/araset.33.3.293306
[17] Suherman, Adang, Nur Indri Rahayu, J. Jajat, and M. Muktiarni. "Technology-Based Intervention for Building Healthy Campus: Health Promoting Lifestyle in the Universities." *Journal of Advanced Research in Applied Sciences and Engineering Technology* 32, no. 1 (2023). https://doi.org/10.37934/araset.32.1.227237
[18] Yamin, Fadhilah Mat, Mastora Mustafar, Mawaddah Mohamad, Jasmine David, Mona Fairuz Ramli, Shukriwani Saad, and Samsudeen Sabraz Nawaz. "students' acceptance of technological devices for e-learning during covid-19 pandemic in malaysian higher education." *Journal of Advanced Research in Applied Sciences and Engineering Technology* 33, no. 1 (2023): 1-9. https://doi.org/10.37934/araset.33.1.19
[19] Liang, Leilei, Hui Ren, Ruilin Cao, Yueyang Hu, Zeying Qin, Chuanen Li, and Songli Mei. "The effect of COVID-19 on youth mental health." Psychiatric quarterly 91 (2020): 841-852. https://doi.org/10.1007/s11126-020-09744-3
[20] Power, Emmet, Sarah Hughes, David Cotter, and Mary Cannon. "Youth mental health in the time of COVID-19." *Irish Journal of Psychological Medicine* 37, no. 4 (2020): 301-305. https://doi.org/10.1017/ipm.2020.84
[21] Jie, C. Y., and N. Mat Ali. "COVID-19: What are the challenges of online learning? A literature review." *International Journal of Advanced Research in Future Ready Learning and Education* 23, no. 1 (2021): 23-29. https://doi.org/10.37934/frle.23.1.2329
[22] Bani, Siti Aishah Shah, and Norhisham Mohamad Nordin. "Optimizing creative digital content among magazine publishing company in Malaysia during pandemic Covid-19." *Journal of Advanced Research in Applied Sciences and Engineering Technology* 30, no. 2 (2023): 190-204. https://doi.org/10.37934/araset.30.2.190204