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Barriers faced by nursing students during COVID-19 pandemic and its impact on their attitude toward E-learning

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COVID-19 pandemic forced the people to social distancing across the world. This pandemic disrupted various aspects of life including educational activities which resulted in implementation of online teaching and learning strategies for schools, colleges and universities' students. About 1500 million students suffered due to closure of the educational institutions. The overall effects of this closure of educational institutes on students' learning, including nursing students, have been negative**.** This study was aimed to investigate the impact of barriers to learning, faced by undergraduate nursing students on their attitudes towards e learning during COVID-19 pandemic in Pakistan. A Descriptive, analytical study was conducted on a sample of 250 undergraduate nursing students from four nursing colleges in Pakistan. A standardized questionnaire consisted of a total of 53 questions for the collection of information related to e- learning barriers and their effects on the attitudes of undergraduate nursing students towards e-learning was used for data collection. The results of this research study showed that (82.8%) of the undergraduate nursing students were facing certain barriers with regard to e-learning. The most dominant barriers faced by undergraduate nursing students were the infrastructure and technology dimension (88.8%) technical and management support dimension (83.2%), and curriculum content dimension (82%). The results of the current study demonstrated that a high percentage of the respondents (64.8%) has a negative attitude towards e-learning. the undergraduate nursing students faced various types of barriers towards e-learning during COVID-19 Pandemic. The majority of the learners had negative attitudes toward e-learning. However, there was no significant association present between barriers to e-learning and students' attitude towards e-learning.

Keywords: COVID-19; e-learning; nursing students; attitudes; barriers

INTRODUCTION

Severe Acute Respiratory Syndrome coronavirus-2 (SARS-Coronavirus-2), resulting in COVID-19, was first time emerged at the end of 2019 at Wuhan city, China(Temsah et al. 2020)that became pandemic over a few months(Shen et al. 2020) The World Health Organization promptly declared the COVID-19 crises as a worldwide pandemic in March 2020(Kapasia et al. 2020)Since COVID-19 was declared as a worldwide pandemic, it became a threat to public health and mental health. Millions of people like researchers, academicians, business personals, general public and students were forced by the national governments to stay at home, they were isolated by globally imposed complete or partial lockdown(Cooper et al. 2020)Precautions for prevention of droplets transmission recommended by World Health Organization (WHO) and Center for Disease Control and Prevention (CDC), the precautionary measures are to wash hands with disinfectants or soap, avoid touching of mouth nose, and eyes, and cover the nose and mouth during sneezing, coughing, , maintain social distancing by putting two meter of distance between individuals, wear a face mask if sick, and Additionally, the Government directed social distancing and state lockdowns in order to minimize the risk of this deadly virus(Galbadage et al. 2020).

Due to the fast spreading nature and increase severity of SARS-CoV-2 across the world, social distancing was considered as the immediate measure of decreasing the spread of the pandemic.This resulted in the physical closure of schools, and businesses globally(Adedoyin and Soykan, 2020). Moreover, conferences, seminars, sports events, expos and other essential meetings as well as cultural launches such as museums, galleries were strictly closed (Dahiru et al. 2006)

Physical access to classroom was repeatedly restricted as a result of imposed lockdown for an extended period of time, just as it did in other areas of life. About 1500 million university, college and school going students

suffered because of the inflicted lockdown due to COVID-19 outbreak worldwide(Hasan and Bao, 2020). The closer of educational institutes affected the students' psychological health negatively and caused anxiety and depression among many of them(de Oliveira Araújo et al. 2020)

According to literature, e-learning is the use of computer-based technologies, as well as the internet to make possible learning and teaching. Therefore, the integration and escalation in the use of teaching technology and e-learning strategies in Higher Education were greatly emphasized (Guillasper et al. 2020).Hence, e-learning is provided by a wide Modes of technology-based education via video conferencing, mobile apps, websites, YouTube, learning portals, and many other types of educational websites for online learning tools(Shahzad et al. 2021). The standardized way to implement e-learning system can be based on how the online teaching learning program is accomplished by both the teachers and students(Thongsri et al. 2019). However, physical classroom is promising alternatives to the online teaching, but, students have a negative perception toward e-learning behavior(Ramos-Morcillo et al. 2020)

The nursing profession is an integral part of today's health care system where professional trainees need to learn both in the theoretical and practical domains. Nursing instructors and teachers must assure that the students meet the academic requirements. They also recognize the current situation faced by the health care services and their demands at the time of such pandemics (Ramos-Morcillo et al. 2020). It is also essential to decide how to carry on with nursing education in future, and also to find solutions for the multiple educational problems, which all are based on distance education.(Ramos-Morcillo et al. 2020)

The teachers, experts in the subjects and experienced about the didactics of physical classes, have found themselves compelled to deal with e-learning overnight, while not all of them were prepared. The same situation has occurred with the students, who had to change from physical (face-to-face) learning, to model in which they had to freely and voluntarily become involved in their learning (online) (Ramos-Morcillo et al. 2020)

MATERIALS AND METHODS

Study Design and population:

A Descriptive, analytical study was conducted in two provinces of Pakistan. The study population included undergraduate nursing students from nursing colleges of Punjab and Khyber Pakhtunkhwa, provinces of Pakistan.

Sample selection:

The collection of sample from the study population was based on the following inclusion and exclusion criteria.

Inclusion criteria:

- Students enrolled in the undergraduate nursing programs (BScN and Post RN) having experience of e-learning.
- The students who had spent at least one semester after being enrolled in the aforementioned nursing programs.

Exclusion criteria:

- Newly enrolled students.

Sample size:

- A sample of 250 undergraduate nursing students was taken from four nursing colleges of Punjab and Khyber Pakhtunkhwa Provinces.

Sample technique:

A simple random sampling technique was used to select the required sample from the targeted population. Balloting method was used to select the participants randomly and to ensure equal chance to every subject of being selected in the sample.

Study Tool:

The tool used for the present study was an adopted questionnaire to investigate the barriers faced by nursing student and their effects on the attitudes of students toward e-learning during COVID-19 pandemic.

Ethical consideration:

Ethical considerations were observed according to the Ethical Review Board of University of Health Sciences Lahore

Data Collection Process:

A total of 250 undergraduate nursing students were selected from the target population, according to specified exclusion and inclusion criteria by using the Simple Random Sampling technique. Nursing students of Generic BSN and Post RN BSN first, second, third, and fourth year, from Sharif College of Nursing and Akhter Saeed College of Nursing from Lahore Punjab and two colleges of Khyber Pakhtunkhwa i.e. National College of Nursing Swat and MTI (Medical Teaching Institution) Mardan College of Nursing, Bacha Khan Medical College Mardan Khyber Pakhtunkhwa (KP), were included in the sample. The study purpose was explained to the participants in every college and written informed consent (Annexure-1) was obtained prior to their participation in the study. Detailed demographic data of the participants were recorded (Annexure II). Guidance was provided to the participants regarding questions asked in the questionnaire for their proper understanding and response.

A standardized questionnaire related to barriers and their effects on nursing student's attitudes towards e-learning (Annexure-III) was used for data collection. The

questionnaire consisted of a total of 53 questions for the collection of information related to e- learning barriers and their effects on the attitudes of undergraduate nursing students towards e-learning.

Statistical Analysis:

The collected data were entered into Statistical Package for Social Sciences (SPSS) version 20 for storage and analysis. The data were double checked for any errors. Frequencies and percentages were calculated for demographic variables. Chi-square test was applied to check the association between the barriers faced by undergraduate nursing students and their attitude toward e-learning. A p-value of 0.05 was considered as significant.

Rating and Scoring:

The participants' responses were rated on a five points Likert type scoring scale as"strongly disagree=1 to strongly agree=5. The score of the items were summed-up and the total was divided by the number of the items, giving a mean score for each domain of the e-learning. Mean overall scores were calculated as well, by summing all the five domains and calculating their average. The score of sixty percent (60%) and more was considered to indicate the presence of barriers while a score less than sixty percent (<60%) was considered to indicate that no barriers were present during applying e-learning system.

Similar scoring system was applied for assessing the attitudes of the students. The attitude scale scores of less than 60% was considered as negative attitudes, while the scores of 60% and above was considered as positive attitudes toward e-learning.

RESULTS

Information regarding participants who participate in the study the total 250 undergraduate nursing student were involved show in table 1 62% were female and 38% were male. 92 (36.8%) out of 250 participants' age was in the range of 15-20 years, 131 (52.4%) were in the range of 21-25years and 27 (10.8%) were in the range of 26 and above category. The majority (52.4%) of them were in the age range of 21-25 years. Among the total participants, majority 82.4% were unmarried and Muslims (86%) by religion. Majority of them (65.6%) were living in nuclear family, and most of them (54%) were living in rural areas. Table- 2 showed the distribution of student according to college. Equal number of students were selected from every college. Table-3 shows that 38(15.2%) of the participants used laptop as a tool, 203(81.2%) were using mobile phones, 3(1.2%) were using computer, and 6(2.4%) out of 250 participants used Tablet for the purpose of e-learning as a tool.

Table 1: Demographic characteristics of the study participants (N=250)

	Frequency	Percentage (%)	Cumulative Percent
Gender			
Male	95	38	--
Female	155	62	--
Age			
15-20 Years	92	36.8	36.8
21-25 Years	131	52.4	89.2
26 and Above	27	10.8	100.0
Marital status			
Married	44	17.6	17.2
Un Married	206	82.4	99.6
Religious			
Muslim	215	86.0	86.0
Non-Muslim	35	14	100.0
Family Structure			
Nuclear	164	65.6	65.6
Extended	86	34.4	100.0
Place of Living			
Rural	135	54.0	54.0
Urban	115	46.0	100.0

Table 2: Institute wise distribution of nursing students

Institute	Frequency	Percent	Cumulative Percent
Akhtar Saeed College	62	24.8	24.8
MTI Mardan College	62	24.8	49.6
National College Swat	63	25.2	74.8
Sharif College, Lahore	63	25.2	100.0
Total	250	100.0	

Table 3: Tool Used by Study Participants for e-learning (N=250)

Tool used For e-learning		Frequency	Percent	Valid Percent	Cumulative Percent
LA	Laptop	38	15.2	15.2	15.2
	Mobile	203	81.2	81.2	96.4
	Computer	3	1.2	1.2	97.6
	Tablet	6	2.4	2.4	100.0
	Total	250	100.0	100.0	

Table 4: Distribution of Participants according to the attitude status toward e-learning

Attitude	Frequency	Percent
Negative	162	64.8
Postive	88	35.2
Total	250	100

Table 5: Distribution of e-learning barriers about learners' characteristics, technical management support, infrastructure and technology dimensions among the nursing students (n=250)

E Learning Barriers	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Learners' characteristics dimension 1. Lack of sufficient knowledge and skill in the use of e-learning?	12.8%	18%	11.2%	42%	16%
2. Lack of devices to use for e-learning	6.8%	22.2%	18.8%	42.4%	10%
3. Lack confidence and shyness from learning online	8%	31.2%	14%	33.6%	13.2%
4. No internet connection.	8.4%	20.8%	13.6	34%	23.2%
5. Lack time management skills to keep up with the pace of the course.	4.8%	14.4%	10.4%	51.6%	18.8%
6. Lack of interaction with my colleagues through the e-learning platform.	4.4%	15.6%	12%	44.4%	23.6%
7. Lack language skills and typing skills for online learning	5.2%	19.2%	12.8%	42.4%	20.4%
Technical and Management support dimension 8. Faced with system errors and lack of access to the e-learning platform	3.2%	11.6%	12%	52%	21.2%
9. The slowness of network is an obstacle to my learning online	4%	10%	10.8%	48%	27.2%
10. Lack of support services such as tutors	6%	16.8%	12.4%	46.8%	18%
11. The e-learning system is unavailable most of the time.	7.2%	14%	8%	54%	16.8
12. The college does not provide technical support for using e-learning	8.4%	18.8%	8.4%	42.8%	21.6%
13. University books are not compatible with the use of e-learning	6.4%	26%	12%	39.6%	16%
14. Lack technical assistance to handle technological problems	3.6%	13.6%	12.4%	52.4%	18%
Infrastructure and technology dimension 15. Low bandwidth connections with frequent breakdowns	2%	11.6%	23.6%	49.2%	13.6%
16. Lack of proper training before using e-learning platform	3.6%	16.4%	8%	44.8%	27.2%
17. The cost of internet fees/charges from the private cafe' impede e-learning	6%	11.6%	10.8%	40.8%	30.6%
18. Lack of counselling during taking e-learning courses.	4.8%	12.8%	7.6%	53.2%	21.6%
19. e-learning system design is not flexible and difficult to use	5.6%	18.8%	9.2%	44%	22.4%
20. Erratic power supply at home hinders my use of e-learning resources	4%	12%	22.8%	46.8%	14%
21. The rules and program directions in using online discussion are difficult to me.	3.2%	15.2%	11.6%	48%	22%

Table 5: (Continued) Frequency of e-learning barriers regarding curriculum content dimension, and Instructors' characteristics dimension from the nursing students (n=250)

E Learning Barriers	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Curriculum content dimension 22. Learning and teaching resources that are available on the e-learning system are not in accordance with the curriculum	7.6%	33.6%	17.6%	32.8%	8.4%
23. Difficult to access e-resources from the e-platform when at home	2%	16.8%	12.8%	49.2%	19.2%
24. Difficult to learn the contents of my subject using e-learning	5.2%	15.2%	7.6%	48.8%	23.2%
25. Difficult to understand the contents of the subject through e-learning	3.6%	14.8%	9.2%	47.2%	25.2%
26. Disproportion of e-learning with curriculum content	2.8%	17.6%	27.2%	36%	16.4%
27. Concerns about the practical nature of some courses are not offered electronically	5.6%	15.6%	14.4%	47.6%	16.8%
28. Lecture notes are supported by multimedia tools	8%	16.8%	10%	46.8%	18.4%
Instructors' characteristics dimension 29. Instructors do not have sufficient knowledge and skill to use e-learning	13.2%	36%	9.2%	32.4%	9.2%
30. My teachers not confident in using e-learning	20%	40.4%	16%	16.4%	7.2%
31. Lack of clear instructions from my teacher	14.8%	33.3%	14.4%	31.2%	6.4%
32. Lack of timely feedback from instructor	8.8%	26.8%	14.4%	38.8%*	11.2%
33. My teachers prefer conventional ways of teaching and research	7.6%	16%	21.2%	41.6%	13.6%
34. My teacher's delay in submitting courses online on time affects my performance	8%	25.6%	14.4%	36%	16%
35. Difficulty contacting with academic staff when at home	6%	19.6%	13.6%	45.6%	15.2%

Table 5: Distribution of attitudes towards e-learning concerning e-learning usefulness, e-learning ease of use and Behavioral intension among nursing students (n=250)

Attitudes towards e-learning	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
e-learning usefulness 1. e-learning contents are informative	6.0%	23.6%	22.8%	43.6%	4. %
2. e-learning enhances my learning efficiency	12. %	26.8%	24.4%	32.4%	4.4%
3. e-learning is a useful learning tool in providing distance education	10.4%	24%	14.8%	40.4%	10.4%
4. E learning improves my success in my study	12%	39.6%	15.2%	27.2%	6%
5. e-learning enables me to accomplish the learning activities more quickly	11.6%	39.6%	16%	27.6%	5.2%
6. e-learning encourages me to search for additional information on the topic of learning	11.6%	28%	15.6%	37.2%	7.6%
e-learning ease of use 7. It is easy for me to handle e-learning content	11.6%	40%	15.2%	28%	5.2%
8. e-learning gives all the materials I need in my studies	14.4%	38%	16%	26%	5.6%
9. e-learning reduces students educational cost	19.6%	32.4%	10.4%	29.2%	8.4%
10. e-learning provides flexible interaction with teachers and friends	16%	38.8%	16.8%	25.6%	2.8%

11. e-learning gives facilities to manage my time efficiently	16%	36.6%	20.4%	24%	3.2%
12.e-learning makes my learning process easier	17.2%	42.4%	12.4%	22.8%	5.2%
Behavioral intension 13. e-learning is efficient as teaching method	15.6%	41.6%	16.4%	24.8%	1.6%
14. I prefer to use e-books for my studies	12.8%	32.2%	14.8%	26.8%	13.6%
15. I interested in studying courses that use e-learning	16.4%	38%	16.8%	24.4%	4.4%
16. E learning is better than face-to-face education in learning process	45.2%	30.4%	8.8%	12.8%	2.8%
17. I recommend using e learning system for other students	30.8%	32.8%	16%	16%	4.4%
18. I enjoy using e learning system on my course	20.4%	35.2%	13.2%	25.6%	5.6%

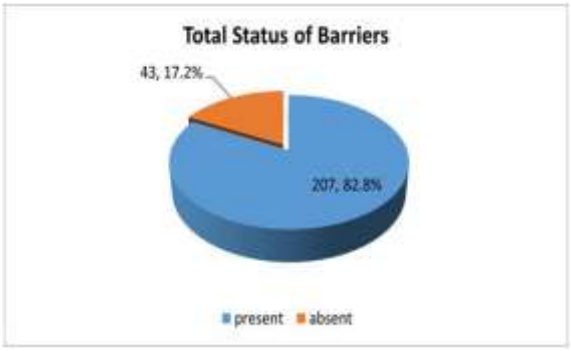

Figure 1: Distribution of Participants according to the presence of Barriers to e-learning

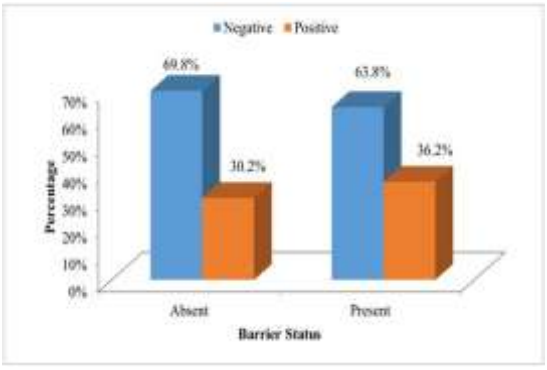

Figure 2: Association of Barriers with Attitude towards E- Learning (n=250)

The figure number 1 shows that Out of the total 250 participants, 207(82.8%) demonstrated the presence of barriers whereas only 43 (17.2%) showed that barriers were absent Attitude toward e learning status. In table -4 explains that in the current study Majority162 (64.8%) of the participants demonstrated the present of negative attitude toward e-learning and only 88(35.2%) positive attitude present.

Association between barriers faced by nursing students during COVID-19 Pandemic and its impact on their attitude toward e- learning.Figure-2 shows an insignificant association between barriers faced by nursing students during COVID-19 Pandemic and its impact on their attitude toward e- learning. Table- 5 shows response percentage of all the question in questionnaire.

DISCUSSION

In this study a total of 250 undergraduate nursing students were recruited from four colleges of Punjab and Khyber Pakhtunkhwa. Both male and female students were included where 62% were females and 38% were males. Similar results were found in a study conducted in India on undergraduate nursing student during lock down. More than half (53.6%) of the students were females(Gaur et al. 2020a). The participants in the age between 15 years to 20 years were 36.8% while those in the age group from 21 years to 25 years were 52.4%. However, the age group from 26 and above were only 10.8%.

Majority 82.4%of the participants were unmarried and most of them 54% were from rural area. Similar proportions of subjects were seen in the study conducted by Gaur et al. (2020), in which most of the respondents belonged to rural community 263 (66.8%).(Gaur et al. 2020a).Another study revealed that68.7% of the respondents were from rural population and likewise majority were unmarried (Diab and Elgahsh,2020). The current study highlighted the barriers faced by undergraduate nursing students towards e-learning during ongoing pandemic in the dimensions of learners' characteristics, technical and management support, infrastructure and technology, curriculum content and instructors' characteristics. These five barriers' dimensions were present among 82.8% of the study participants. The most dominant barriers faced by undergraduate nursing students were infrastructure and technology dimension 88.8%, technical and management support dimension 83.2%, and curriculum content dimension 82%. While, the less frequently faced barriers were in the dimensions of learners' characteristics 75. 6%, and instructors'

characteristics 57.2%.

These findings were similar to the results of a study conducted at the Department of Nursing, in University of Menoufia, Egypt where the major barriers present were related to infrastructure and technology 87.1%, technical and management support dimension 85.2%. In another study, up to 62.5% students agreed that low internet bandwidth was one of the main issue in applying of e-learning system(Al-Azawei et al. 2016). Similarly a study conducted in Jordan showed that poor infrastructure was the main barrier faced by students in online learning (Aljaraideh and Al Bataineh, 2019).

One of the barriers highlighted in the current study was the technical and management support system indicated by majority of the students. According to respondents, they had the problems of system errors, lack of access to the e-learning platform, and lack of technical assistance to handle technological problems during COVID-19 pandemic. Similar findings were reported by(Diab and Elgahsh, 2020). The current study results showed that technical and management support barriers were mostly present and students faced especially the problem of system errors, lack of access to the e-learning platform, and lack of technical assistance to handle technological problems. Similar barriers were reported in another study conducted in Tehran which highlighted the importance of technical support services in the continuity of e-learning (Mohammadzadeh et al. 2017).

Another study conducted by Ali et al. 2018 highlighted that the main obstacles in the use of e-learning were technical difficulties such as technical support, and poor internet connectivity problems. In addition, a study conducted in India confirmed that majority (61%) of the participants faced barrier of technical support services during online classes in COVID-19 pandemic in India (Mohammadzadeh et al. 2017)

The results of the current study demonstrated that the highest percentage of the respondents had a negative attitude toward e-learning. The findings showed that overall 64.8% of the study subjects had negative attitudes towards e-learning. However, there was insignificant association present between obstacles to e-learning and students' attitudes towards e-learning. These results were similar to the findings of the study conducted by, Diab and Elgahsh, 2020 which also revealed insignificant association between barriers faced by nursing students and their attitude toward e-learning[1]. Likewise, a study conducted in India on Undergraduate nursing students' attitude towards online classes during lockdown period highlighted that 76% of the respondents showed negative attitude towards online classes(Gaur et al. 2020b). Similar evidence was provided by another study which reported that 77.4% of the students had negative attitude toward e-learning during COVID 19 lockdown(Abbasi et al. 2020).

On the contrary, in a study conducted by Jamil et al. 2016 a huge majority 95% of the students were in favor of e-learning (Jamil et al. 2016). Similarly, in their study accompanied in Africa on undergraduate nursing students, pointed out that students had favorable attitude towards e-learning. These dissimilar results however, can be due contextual differences like the infrastructure facilities, the types of students etc(Gaur et al. 2020a).

CONCLUSION

The current study concluded that there were various types of barriers towards e-learning faced by nursing students. The highest percentages of barriers present were related to infrastructure and technology dimension (88.8%), and in technical and management support dimension (83.2%). The majority (64.8%) of the students had negative attitude toward e-learning while the highest negative attitude (85.2%) was present in behavioral intention dimension, and then in the e-learning ease of use dimension (80.8%). There was no significant association found between barriers faced by undergraduate nursing students and their attitude toward e-learning during COVID-19 Pandemic.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

All authors have seen and agreed to submission of this paper. We confirm that this work has not been published and is not under consideration for publication elsewhere.

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