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Undergraduate nursing student's perception on e-learning during COVID-19 pandemic in Bangladesh

Bishwajit Mazumder *

Dhaka Nursing College, Dhaka, Bangladesh.

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Abstract

Background and aims: E-learning is important issue for undergraduate nursing students to acquire and disseminate knowledge during COVID-19 pandemic in Bangladesh. The assessment of perception on e-learning during Covid-19 pandemic form nursing student's viewpoints is limited. The aim of study was to assess the level of undergraduate nursing student's perception on e-learning during covid-19 pandemic.

Method: This was a descriptive cross-sectional study. The participants were selected using convenience sampling technique. Data were collected by using self-administered questionnaires.

Result: Findings of the study shows that mean perception of the students was calculated as 3.52(SD=0.51) out of maximum of 5 points. It indicated moderate perception of students regarding e-learning during COVID-19 pandemic. Findings also showed that monthly income ($t = -2.03$; $P = 0.04$), internet connectivity ($F = 5.75$, $P = .004$), and institutional setting ($t = -3.10$, $P = .002$) were statistically significant correlated with student's perception of e-learning.

Conclusion: Nursing students had moderate level of perception regarding-learning during COVID-19 pandemic. However, monthly income, internet connectivity, and institutional settings were significantly associated with student's perception on e-learning. Strategy may develop to increase student's perception on usage of e-learning by using information technology properly.

Implications for Nursing Education: Authorities and educational institute should facilitate provide better opportunities for students to access internet and information technology. This will be helpful to establish reciprocal and clear expectations among the nursing students which would be create a healthy academic atmosphere to contribute effective learning.

Keywords: Under graduate Nursing Student; Student's Perception; E-learning; COVID 19 pandemic

1. Introduction

E-learning as the "e" implies for "electronic" includes all form of educational activities carried out by the usage of electronic resources like internet, computers, and smartphones to acquire and disseminate knowledge. The novel coronavirus pandemic is one of the burning issues in the world [1]. In Bangladesh, the first COVID-19 patients were followed on March 8 in the capital, and in the consequence of the country went into general lockdowns from March 26. Since then, people are keeping themselves at home except for emergencies while educational institutions and most industries and business centers remain shut down [2]. The government of Bangladesh shut down all educational institutions from 17th March [3] which are due to open only when the situation gets better [4]. The COVID-19 pandemic

* Corresponding author: Bishwajit Mazumder
Dhaka Nursing College, Dhaka, Bangladesh.

has also had a severe impact on higher education as universities closed their premises and countries shut their borders in response to lockdown measures and closed educational institutions affecting more than 70% of the world's student population [5]. COVID 19 pandemics have already changed the landscape of education and nursing education as well [6].

This Pandemic has already engulfed every aspect of our life including education, one of the basic needs of the human being. Therefore, online platforms are currently used by educational institutions to support the learning process of students [7]. But lack of sufficient resources and adequate teacher training, insufficient access to technology, faculty preparedness, late adoption of learners' online learning, lack of technical facilities in rural areas are the most frequently faced obstacles in online education [8]. A study was done in Pakistani medical and dental students in which students did not prefer e-teaching over face-to-face teaching during the lock down situation. 77% students had negative perceptions towards e-learning [9].

After switching to online classes during the pandemic, students may face new difficulties related to online class preparedness, participation, and activities [10]. The key obstacles to online education in Bangladesh are the lack of technical resources, high cost, and internet connectivity consistency, the family financial crisis, and the psychological burden on students [1]. Medical education which requires a ton of clinical work and observations is also been transferred to the online learning framework [11] Recent research reviewed that lab work and practical classes are not possible to take online and many universities governments or nongovernment nursing college do not have proper resources and infrastructure to facilitate the online education [12]. Another study concluded that the pandemic hurts Ghanaian students as they are not practiced to efficiently learn by themselves [13]. The University Grants Commission (UGC) of Bangladesh provided guidelines for universities to continue classes and conduct examinations online to avoid semester clusters and help university students graduate on time [14]. Due to COVID-19, shut down all the educational institutions, the Minister of Education instructed all universities to introduce online education at university level [6]. Many public and private universities, colleges, and schools of Bangladesh have moved their classes online [16] and the Director General Nursing & Midwifery, Bangladesh have progressed online nursing education, all types training, meeting and others conference from 26th March' 2020 [17].

Previous studies from developed countries supported nursing student's perception on e- learning during COVID-19 effective were helpful for further development and guidance [18] and [10]. However, the findings from developed countries are not suitable to the Bangladeshi undergraduate nursing students' perspective. As there is metamorphosis in students' perception, study environment and country context cultural variation among the developed and developing country of Bangladeshi undergraduate nursing students and nursing facilities. There is only one study found identifying the students' views of a Non-Government Medical College in Bangladesh [19]. Moreover, developed countries like Bangladeshi nursing education field, e-learning is a new approach to teach students. So, it is the worthwhile to endeavor a study regarding undergraduate nursing students' perceptions on e-learning during covid 19 pandemic among the students of Bangladesh.

2. Material and methods

2.1. Sample selection

In this descriptive correlational study, we explored the level and relationship between the perceptions of e-learning during covid 19 pandemic among the students of Bangladesh. I collected data at a public and a private undergraduate nursing college in Dhaka, Bangladesh from October'2021 to March'2022.

We selected 180 nurses by a simple random sampling technique. The estimated sample size was calculated for an acceptable minimum level of significance (α) of <0.05, an expected power (1- β) of 0.80, and an estimated population effect size of 0.25 (γ) [20].

2.2. Instrument

In this study, the questionnaires consisted of two sections that focused on nurses' demographic information (age, gender, year of education in nursing, monthly income, device(s) use during e-learning, rated connectivity of internet, nature of current residence, institutional setting), and Scale of Students' Perception of e-learning.

E-learning was measured using the Scale of Students' Perception of e-learning [21]. This scale was developed to determine undergraduate nursing student's perception of the activities that contribute to e-learning. It contains 14 questions divided into four dimensions as follows: Perceived Usefulness of E-Learning, Perceived Self-Efficacy of Using

E-Learning, Perceived Ease of Use of E-Learning, and Behavioral Intention of Using E-Learning. These questions are rated by a 5-point Likert scale (1 = strongly disagree, 2 = Disagree, 3 = Neutral 4 = Agree, 5 = strongly agree). A higher score indicates higher perception about e-learning during COVID-19 in an organization.

The pilot study was conducted to 20 nurses working in the both colleges. For the internal consistency, the Cronbach's alpha coefficient was 0.88 for Scale of Students' Perception of e-learning, indicating that these instruments are reliable.

2.3. Statistical Analysis

Data were analyzed using the SPSS (version 23). Descriptive statistics were used for frequency, percentage, mean (M), standard deviation (SD), and range. The internal consistency of the scale was analyzed by Cronbach's alpha coefficient. As indicated by the Kolmogorov-Smirnov one-sample test, the Scale of Students' Perception of e-learning normally distributed. The difference in each scale between groups was examined by nonparametric tests such as the independent T test, one way ANOVA test. Furthermore, the relationships among Scale of Students' Perception of e-learning and their dimension were examined by Pearson Correlation coefficient (r). All tests were two-tailed, and the alpha level for significance was 0.05.

3. Results

The Statistical Package for the Social Sciences (SPSS) version 23 was used to analyze the data. Frequencies and percentages were calculated for study sample characteristics. Descriptive statistics, including, measures of central tendency and means were calculated for each subscale and total score of e-Learning readiness scale. Independent T test, one way ANOVA analysis of variance was used to compare e-Learning readiness among different student's groups. The students were grouped according to their academic levels and their preference to study through e-learning.

Table 1 illustrates the demographic profile of the 180 participants. It showed that the mean age was $M= 21.58$ years ($SD= 1.71$, range (18-25), and most of them were female ($n = 160, 88.9\%$), and the highest number students was Muslim ($n = 130, 72.2\%$), whereas ($n=40, 22.2\%$) Hindus and others. Around 35.6% of the respondents were in 2nd year and individually 32.2% were 3rd & 4th year. And they have monthly income were below 30,000/= (72.2%) and over were (27.78%). During e-learning, they used smartphone (90.0%) and others (10.0%) used laptop and desktop. This finding also stated that (85.0%) students have no previous experience on e-learning and others (15%) have little bit experience on e-learning. In the time of COVID-19 infection they were in their own residence. In this study, participants were in (58.3%) urban and (41.7%) in rural. Their internet connectivity was (22.8%) in low quality, (70.0%) in moderate quality, and (7.2%) were high quality. They also expressed that they used smartphone/ laptop under 1 year (6.7%), under 5 year (80.0%), over 5 years were (13.3%). Institutional settings were of the participants was public (57.8%) and private (42.2%).

We examined the statistical difference between the demographics (age, gender, level of education, monthly income of family, salary, uses device, previous experience, rated connectivity of internet, using device, nature of residence during pandemic, and institutional setting) and independent variable is scale of student's perception of e-learning. We compared two independent groups using independent-sample t-test in age (<24, >24), gender (male, female), religion (Muslim, Hinduism and others), monthly income of family (taka) (<30,000 and >30,000), previous experience of e-learning (yes, no), nature of residence (rural, urban), using device have been (< 5 years and > 5 year), using device (smartphone, laptop and desktop), and institutional setting (public, private). Furthermore, we compared two independent groups one-way analysis of variance (ANOVA) based on level of education (2nd year, 3rd, & 4th year rated connectivity of internet (low quality, moderate quality, and high quality),

The results showed that there is no significant relationship between male and female ($t= -.80, P=0.43$), but female students ($3.54+0.49$) were more likely to be perceived with online learning compared to male students ($3.44 +0.65$). The study findings revealed that perception of e-learning and monthly income has significance relationship ($t = -2.03; P= 0.04$) and also revealed that higher income ($3.65+0.51$) has more perception than lower income ($3.58+0.50$). Perception level is more Hinduism and others ($3.64+0.49$), than Muslim ($3.48 +0.50$) ($t= -1.76, P= -0.16$).

The study findings revealed that Perception level is more in relation to device(s) use during e-learning smartphone ($3.53+0.49$), laptop & desktop ($3.49+0.69$) ($t= 0.32, P=0.75$). Those who have previous experience of attending e-learning yes is 15% ($3.57+0.44$) is little bit more than who have no experience they are 85% ($3.52+0.52$) ($t=0.52, P =0.61$). There is significant difference rated connectivity of internet low quality ($3.34+0.50$), moderate quality ($3.55+0.50$), and high quality ($3.84+0.43$), ($F=5.75, P=.004$) and high-quality internet connectivity has more perception on e-learning during covid 19 pandemic.

Table 1 Relationship between under graduate students' perceptions and their selected profile characteristics (n=180)

Demographic characteristic		Frequency (n)	(%)	M+SD	t/r//F	p
Age				21.58 + 1.71	-0.23	.76
	<18	174	96.6			
	≤24	6	3.4			
Gender				1.89 + 0.32	-0.80	.43
	Male	20	11.1	3.44+0.65		
	Female	160	88.9	3.54+0.49		
Religion				1.33 + 0.58	-1.76	-.16
	Muslim	130	72.2	3.48 + 0.50		
	Hindu & others	50	31.8	3.64 +0.55		
Year of nursing education				1.79 +0.83	0.49	0.62
	2nd year	64	35.6	3.49+0.47		
	3rd year	58	32.2	3.58+0.56		
	4th year	58	32.2	3.51+0.50		
Monthly income of family (in taka):				1.28 +0.46	-2.03	0.04
	Less than 30,000	130	72.2	3.48+0.50		
	More than 30,000	50	27.78	3.65+0.51		
Device(s) use during e-learning					0.32	.075
	Smartphone	162	90.0	3.53+0.49		
	Laptop & desktop	18	10.0	3.49+0.69		
Previous experience of attending e-learning				1.85 + 0.36	0.52	0.61
	Yes	27	15.0	3.57+0.44		
	No	153	85.0	3.52+.52		
Rated connectivity of internet				1.84 +0.53	5.75	0.004
	Low quality	41	22.8	3.34+0.50		
	Moderate quality	126	70.0	3.55+0.50		
	High quality	13	7.2	3.84+0.43		
Nature of current residence				1.58 +0.49	0.15	0.88
	Rural	75	41.7	3.53+0.52		
	Urban	105	58.3	3.52+0.51		
How long have you been using the computer?				1.13 +0.34	0.1	0.92
	Less than 5 years	156	86.67	3.53+ 0.48		
	More than 5 years	24	15.33	3.51+.66		
Institutional setting				1.42 +0.50	-3.10	0.002
	Public	104	57.8	3.43+0.51		
	Private	76	42.2	3.66+0.48		

There is no statistical difference between nature of current residence rural (3.53+0.52), urban (3.52+0.51) ($t=.15$, $P = .88$). There is no statistically difference using the device ≤ 5 year (3.53+ 0.48), > 5 year (3.51+.66) ($t=0.1$, $P = 0.92$). There is significant difference institutional setting including public (3.43+0.51) private (3.66+0.48) ($t= -3.10$, $P = 0.002$) and also shows that private student has more perception than public student. The scale of Students' Perception of e-learning obtained a Cronbach's alpha coefficient of 0.83, which suggests that they are reliable [22].

Table 2 Mean, standard deviation, range, and the level of dimensions of the student's perception of e-learning (n = 180) Section II Scale of Students' Perception of e-learning

Factors	M +SD	Items	M +SD
Perceived Usefulness of E-Learning	3.57+0.65	1. Studying through e-learning mode provides the flexibility to the study at the time convenient to the learner.	3.60+0.86
		2. E-learning can enable people to study irrespective of where they are located in the world.	3.39+1.09
		3. There are technologies available to enable one to take tests and submit assignments electronically.	3.69+1.00
		4. There are electronic tools available to enable interactive communication between instructor and student without meeting face-to-face.	3.60+0.93
Perceived Self-Efficacy of Using E-Learning	3.29+0.69	5. I feel confident while using e-learning system.	3.48+0.91
		6. I feel confident while operating e-learning functions.	3.22+0.96
		7. I feel confident while using online learning content.	3.18+0.90
Perceived Ease of Use of E-Learning	3.53+0.59	8. I believe e-learning platforms are user friendly.	3.49+0.78
		9. It would be easy for me to find necessary information when using an e-learning platform.	3.73+0.88
		10. I believe that using e-learning service can simplify the learning process.	3.66+0.89
		11. The set-up of the e-learning service is compatible with the way I learn.	3.23+0.90
Behavioral Intention of Using E-Learning	3.69+0.74	12. I intend to use e-learning to assist my learning.	3.71+0.94
		13. I intend to use e-learning to get updated my subject knowledge with the latest amendments.	3.76+0.88
		14. I intend to use e-learning as an autonomous (free) learning tool.	3.59+0.93
Scale of Students' Perception of e-learning (Total)			3.52+0.51

Table 2 shows the mean scores of the Scale of Students' Perception of e-learning. The mean overall score of the Scale of Students' Perception of e-learning was (3.52+0.51), among the four seven dimensions, "Perceived Usefulness of E-Learning" (3.57+ 0.65) obtained the highest mean score, followed by "Perceived Ease of Use of E-Learning" (3.53+0.59), "Behavioral Intention of Using E-Learning" (3.69+0.74) and the "Perceived Self-Efficacy of Using E-Learning" (3.29+0.69) showed the lowest mean score. Among all items, I feel confident while using online learning content (3.18+0.90) and I feel confident while operating e-learning functions (3.22, + 0.96) showed the lowest value.

4. Discussion

This study investigated the undergraduate nursing student's perceptions on e-learning during covid-19 pandemic and their difference in their gender, religion, income, device, previous experience, rated connectivity of internet, residence, the device used, and institutional settings in accessing online education. The sociodemographic analysis in this study showed that most of the participants were female (90%), the mean age was 21.58 years, and over 87% of the participants had under 5 years' experience of using device.

In this study there is no significance difference between male and female but female was more perception than male. But in terms of perception scores, the study noticed that female students had a more positive perception of e-learning than male students. Our finding is quite similar to a previous study conducted by [23] revealing that female students quickly adopted online learning and felt more flexible in e-learning education and thought online assignments were easier than male students.

The findings showed that the significance relationship between student's perception on e-learning and lower- and upper-income family ($t=-2.03$; $P=0.04$) and lower income family have lower perception on online learning. This study congruent with [2]. Researcher assumed that in lock down their day-to-day expenditure is more increase, including internet expanse and the lockdown has deprived them of such opportunities, their access to good internet connection seems to have become limited for economic reasons. Another study [24] also pointed out, online learning cannot produce effective results in developing countries because of monetary problems.

In this study shows that 90% student uses smartphone and perception of smartphone is more ($3.53+0.49$) than desktop and laptop which support smartphones were very useful to the students. This finding is congruent with the study of [25] identified that smartphone has been playing an important role in students' everyday life especially for their educational purpose to continue their study particularly in an unexpected situation such as COVID-19 pandemic.

Study findings also revealed that there was a significant relationship between students' perception of e-learning and rated connectivity ($F=5.75$, $P = .004$). Respondents highlighted that majority percent (70%) stated that moderate quality and low quality (41%) and others are high quality. A recent report [26] showed that Bangladesh had the lowest download speed (7.8 mbps) among 42 countries studied during the COVID-19 pandemic. A powerful internet connection is required to attend an online class, and most complained aspects and accessing online courses through mobile internet is expensive, which is unaffordable for many students in Bangladesh.

This study found that most of the nursing students living in urban (58.3%) areas and there was no significant relationship between the perceptions of e-learning and current residence of participants. Researcher surmised that internet facility is helpful both urban and rural in Bangladesh which congruent a recent study revealed that 95% of Bangladesh's population is covered by 4G mobile network, 53% of the mobile users are still using 2G and 3G [27]. Our current study indicates that regarding residence, students residing in urban places have a more positive perception towards online classes than rural areas, which also matches with the study findings of [28]. In spite of the online learning system is a very uncommon and newer approach in developing countries like Bangladesh and the study indicated that most of the participants had no previous experience to attend e-learning session. Furthermore, the low quality of internet infrastructure and load-shedding remain significant obstacles for executing online activities in Bangladesh [23].

In this study found that there was a significant positive relationship between perception of e-learning and institutional setting ($t= -3.10$; $P = 0.002$). The study findings also highlighted that nursing students of private college have more perception than public students which congruent as previous findings. [29] Assumed that most of the private institution provides teaching strategy followed by modern technology, and uses of modern information technology, internet facilities, and supporting facilities such as modern laboratory & library, integrated learning process. On the other hand, especially among public institutions were inadequate and outdated teaching, without proper classroom facilities, such as speakers and multimedia and learning facilities pose a significant challenge for the delivery of quality education such as delivery of lecture is hindered, making teaching and learning less effective [30].

In Bangladesh, provision of quality perception on e-learning has been challenging for undergraduate nursing students for decades and e-learning is new concept in Bangladesh. Our participants reflect perception of e-learning through four dimensions including "perceived usefulness of e-learning", "Perceived Self-Efficacy of Using E-Learning", "Perceived ease of use of e-learning" and "behavioral intention of using e-learning".

In the study findings, students rating rate (65%) is overall agree with perceived usefulness of e-learning and participants stated that they learning model is easy, flexible and continent, proper uses of technology and properly submit their assignment in electronically, and easy to communicate between teacher, student without face to face, and overall learning process. The study clinched in previous study, in the 21st century, perceived usefulness is a fundamental element of an intention, which motivates students to accept new advanced and user-friendly technologies [31]. The study reflected perceived self-efficacy of using e-learning overall (46%) which was the lower impact of perceived self-efficacy and they are not confident to using e-learning system and function and their belief. Another researcher [32] identified that self- efficacy has a vital role in online learning and expected to complement the determinants of the success of e-learning and enrich knowledge in online learning.

The study reflected that perceived ease of use of e-learning (80%) respondents highlighted that e-learning platforms are easy and simply to find out necessary information and they get updated my subject knowledge with the latest information, and it acts as an autonomous (free) learning tool which congruent with [21]. Perceived ease of use relates to the individual user's perception of easiness of using the system associated with the accomplishment of the e-learning responsibility and when users' find technology easy to use, their perception is that the technology is very beneficial [33].

Another dimension behavioral intention of using e-learning (84%) respondents expressed their opinion on e-learning gets update knowledge on the topic, assists their e-learning, and acts as an autonomous (free) learning tool. [34] Suggested that users' behavioral intention shapes their actual use of the technology. Researcher assumes that, when student's perception on behavior intention to use e-learning systems is adequate, they are more likely to employ and utilize more effective online learning strategies. However, all educational activities including nursing education are operating online during this covid-19 pandemic. The results also suggest that e-learning could be used to enhance their interaction with fellow students and their teachers and were sure that whether e-learning could support higher order learning. During interviews, students highlighted that e-learning was an essential component of their learning during covid-19 pandemic and such activities provided them with great flexibility in interacting with their instructors and learning material. Moreover, researcher suggested that high speed internet and advanced computers with updated features would certainly enhance the knowledge towards e-learning.

5. Conclusion

With the uprising of the internet, e-learning has better progress to become increase of knowledge that continues to grow day by day. Considering undergraduate nursing students' perception toward e-learning is important in successful development of e-learning in higher education, it offers many opportunities for supporting teaching –learning process and ensuring better and improved learning outcomes. The present study showed that students have favorable perceptions towards e-learning during the ongoing COVID-19 pandemic.

In spite of, the e-learning system is relatively new and an innovative teaching approach in Bangladesh. Currently, the government of Bangladesh has taken many initiatives to improve their nursing education. Such initiatives include computer and information technology training, e-governance training, various kinds of meeting through zoom, google met, and establishing many governments & non-governments educational institute for improving and the scope for a higher education in nursing by studying in abroad. Researcher assumes that strategy of incorporating e-learning including stable internet connection, sufficient training, institutional setting, cost effective uses of equipment bring higher perception of e-learning will lead to maximizing the learning outcomes and lead to an overall improvement in education sector. The insights gained from this study may be of general interest to researchers, instructors, administrators, and authorities in higher education, who are striving to create a learner-friendly environment, improve learners' learning experience. This will be helpful to establish reciprocal and clear expectations among the nursing students which would be obliging to create a healthy academic atmosphere to contribute effective learning.

However, this study has some limitations. The study was conducted in only one public and private nursing college and noticeable sample size is 180; thus, the results may not be generalizable to all educational institute settings. Other personal factors, such as a student's characteristics and previous experience, can be included in future studies. Thus, further study in different areas is needed to explore more comprehensive perception of e-learning during covid-19 pandemic.

Compliance with ethical standards

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Statement of ethical approval

The International Review Board and the Dhaka Medical College, Dhaka approved this study.

Statement of informed consent

All participants provided an informed consent. They were assured of the anonymity and confidentiality of their responses and that only the overall results were presented to the authority of nursing educational institute to design the needed administrative interventions.

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