

## Original Research Article

# Barriers encountered during online classes among undergraduate nursing students during COVID-19 pandemic in India

Rakhi Gaur<sup>1\*</sup>, Shiv Kumar Mudgal<sup>2</sup>, Isha Thakur Dharni<sup>3</sup>,  
Ravikant Sharma<sup>4</sup>, Neha Suyal<sup>3</sup>

<sup>1</sup>Obstetrics and Gynecology Nursing, <sup>2</sup>Medical Surgical Nursing, <sup>3</sup>Child Health Nursing, Akal College of Nursing, Eternal University, Baru sahib, Himachal Pradesh, India

<sup>4</sup>Medical Surgical Nursing, Saraswati College of Nursing, Udaipur, Rajasthan, India

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### \*Correspondence:

Dr. Rakhi Gaur,

E-mail: [rakhigaur1308@gmail.com](mailto:rakhigaur1308@gmail.com)

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## ABSTRACT

**Background:** The advents of new technologies are providing a variety of effective learning environment. However, many adult students still prefer traditional, academic settings and do not want to take online or hybrid classes.

**Methods:** Present study included cross sectional descriptive survey design which was carried out on 394 undergraduate nursing students. Convenient sampling technique was chosen for selection of samples. A five-point Likert self-structured scale was used for data collection. Descriptive and inferential statistics were used to analyze the data in SPSS.

**Results:** Study findings showed that there were 209 (53%) female participants. Significant difference ( $p=0.05$ ) was found among participants' gender and year of study, area of residence, father education, family income and whether they had ever attended online classes. Lack of control over the group was top perceived barrier with highest score (261 marks). Majority of participants (61%) perceived barriers encountered during online classes. Mann Whitney U test showed the significant differences of participants' perceived barriers among male and female participants by their age, year of study, fathers' education and family income ( $p<0.05$ ).

**Conclusions:** As more students are growing up familiar with internet-based learning, many students were still opposing to go with online classes. Barriers explored in the study can limit the acceptance of online classes among undergraduate nursing students. Higher authorities must find the ways for making online education user friendly.

**Keywords:** Barriers, E-learning, Online classes, Undergraduate nursing students

## INTRODUCTION

COVID-19 has resulted in schools shut all across the world. Globally, over 1.2 billion children are out of the classroom. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching has been undertaken remotely and on digital platforms. The spread of COVID-19 has forced millions of students and teachers to move their communication online. Currently worldwide, the

education sector is facing a huge impact as a result of this pandemic, with universities forced to shift their teaching to e-learning and blended learning modes.<sup>1</sup>

The outbreak of corona virus has greatly disrupted our educational system. Schools, colleges, and universities across the country have been closed to keep students safe and healthy at home. But many academic institutions, particularly schools, have started conducting virtual classes through different digital and social media

platforms, and television channels to complete the syllabus and prepare students for utilizing this time in a better way.<sup>2</sup>

E-learning has been defined as an educational method that facilitates learning by the application of information technology and communication providing an opportunity for learners to have access to all the required education programs. The World economic forum reported a surge in the use of language apps, virtual tutoring, video conferencing tools, and online learning software in the last three months. India, too, is witnessing an e-learning boom. Classes on Zoom, Whats app and Skype are becoming the norm for students, parents, and teachers. Online classes are become a significant approach to supply education in educational institutions and experiencing rapid development.<sup>3,4</sup>

Indeed it is now leading the world towards maximum utilization of the technology and became an alternative of traditional view of education. The concept of virtual classroom has now really come true for school and university education.<sup>5</sup>

However, forced online teaching and learning process is fraught with challenges such as lack of requisite digital equipment, reliable internet access, and sufficient technical know-how, improper notification of classes, unavailability of handwritten short notes, Confused and stressed students have to struggle hard to receive instructions. It has harmed their physical and mental health. In the absence of proper interaction with teachers and peers, creativity is at stake. Moreover, the practical part of education such as sports, lab work, and manual skills is completely amiss. Home-learning programs thus forfeit the very aim and purpose of education in the prevailing scenario.<sup>1,3,6</sup>

E-learning system has exposed the economic differences among the students. Economically weaker students are unable to bear the cost of efficient electronic gadgets, internets, and accessories. Moreover, such students may be unaware of technological advancements. It may develop a fear of falling behind and ultimately lead to depression and mental illness in those students. Therefore this study is an effort to unravel the barriers encountered during online classes among undergraduate nursing students during the covid-19 pandemic.

## **METHODS**

This research study included cross sectional survey design and carried out among undergraduate nursing students enrolled in nursing colleges of Northern India to find out the common barriers encountered during online classes. Ethical approval was taken by the Institutional review board of Akal college of nursing, Baru Sahib, Himachal Pradesh, India. Inclusion criteria for participation in the study was participants willingness and

if they understand English. Data were collected during the month of July 2020.

### ***Study population***

Data were being collected through online survey. E-forms were created and sent on the email of participants. First year to fourth year students were enrolled for study. All the participants were explained about the purpose of the study and instructed to fill the form completely. There were no missing data found. Participants' consent was secured and they were made assured that their anonymity will be maintained.

### ***Sample size calculation***

The estimated sample size of the present study was 385, which was calculated by using equation

$$(Z1 - a/2)2(p)(q)/d2$$

5% margin of error and 95% confidence interval with 50% prevalence was considered for calculation.<sup>7</sup> A total 480 students were recruited for this study and a sample of 394 eligible students, who fulfilled the inclusion criteria were enrolled.

### ***Study instrument***

With the purpose of data collection a self structured questionnaire was used which was based on 5 point Likert scale. Scale ranged from strongly disagree (1) to strongly agree (5). Minimum score was 15 and maximum score was 75. Scores between 15 to 44 (strongly disagree and disagree) were considered as not perceived barriers during online classes, 45 considered as neutral and 46-75 (strongly agree and agree) scores were considered as perceived barrier during online classes. Tool was sent to the seven experts for validity and with some modifications suggested by the experts, it was found valid to administer. Cronbach's alpha was calculated for the items and tool was found reliable with 0.89. Questionnaire included participants socio-demographic background which comprised of age, year of study, residence, father and mother education, family income and 15 items as their commonly encountered barriers. E forms were being sent to 480 undergraduate nursing students and 394 responses were recorded and it was 82%.

### ***Data analysis and presentation***

Collected data were analyzed statistically by using statistical product and service solutions (SPSS version 23) and presented in tables and graph. Demographic variables were calculated in frequency, percentage and mean and standard deviation was calculated for test variables. Data were checked for its normality by applying Kolmogorov Smirnov test and it were not normally distributed. So, nonparametric Chi square and

Mann Whitney U test were applied to establish statistical significance. Statistical significance was set on  $p < 0.05$ .

## RESULTS

Participants demographic backgrounds are presented in (Table 1). Among all the participants 53% (209) were females and 47% (185) were male. Majority of the participants 182 (46.2%) were in 19-21 age group and the overall mean age of participants were  $20.49 \pm 1.88$ . Approximately two-third 263 (66.8%) of participants belonged to rural background and majority of participants 371 (94.2%) had experience of having online classes.

**Table 1: Socio-demographic profile of participants.**

Variables n=394	Frequency (%)
<b>Age (in years)</b>	
17-19	60 (15.2)
19-21	182 (46.2)
21-23	152 (38.6)
<b>Gender</b>	
Male	185 (47)
Female	209 (53)
<b>Year of study</b>	
First year	104 (26.4)
Second year	86 (21.8)
Third year	116(29.4)
Fourth year	88(22.3)
<b>Area of residence</b>	
Rural	263 (66.8)
Semi-urban	48 (12.2)
Urban	83 (21.1)
<b>Mother education</b>	
Illiterate	87 (22.1)
Primary	92(23.4)
Secondary	70 (17.8)
Graduation and above	145 (36.8)
<b>Father education</b>	
Illiterate	161 (40.9)
Primary	48(12.2)
Secondary	50 (12.7)
Graduation and above	135 (34.3)
<b>Family income (per month in rupees)</b>	
<10000	82 (20.8)
10000-20000	100 (25.4)
20000-30000	97 (24.6)
>30000	115 (29.2)
<b>Ever attended online classes</b>	
Yes	371 (94.2)
No	23 (5.8)

Results of Chi-square test illustrated significant difference ( $p < 0.05$ ) among participants' gender and year of study, area of residence, father education, family

income and whether they had attended online classes ever (Table 2).

**Table 2: Significant difference among participants' socio-demographic variables.**

Variables n=394	Male=185 N (%)	Female=209 N (%)	P value
<b>Age (in years)</b>			
17-19	30(50.0)	30 (50.0)	
19-21	81 (44.5)	101 (55.5)	0.051
21-23	74 (48.7)	78 (51.3)	
<b>Year of study</b>			
First year	46 (44.2)	58 (55.8)	
Second year	42 (48.8)	44 (51.2)	0.050**
Third year	60 (51.7)	56 (48.3)	
Fourth year	37 (42.0)	51 (58.0)	
<b>Area of residence</b>			
Rural	129 (49.0)	134 (51.0)	
Semi-urban	20 (41.7)	28 (58.3)	0.050**
Urban	36 (43.4)	47 (56.6)	
<b>Mother education</b>			
Illiterate	43 (49.4)	44 (50.6)	
Primary	51 (55.4)	41 (44.6)	
Secondary	33 (47.1)	37 (52.9)	0.051
Graduation and above	58 (40.0)	87 (60.0)	
<b>Father education</b>			
Illiterate	80 (49.7)	81 (50.3)	
Primary	19 (39.6)	29 (60.4)	0.050**
Secondary	26 (52.0)	24 (48.0)	
Graduation and above	60 (44.4)	75 (55.6)	
<b>Family income (per month in rupees)</b>			
<10000	35 (42.7)	47 (57.3)	
10000-20000	51 (51.0)	49 (49.0)	0.050**
20000-30000	48 (49.5)	49 (50.5)	
>30000	51 (44.3)	64 (55.7)	
<b>Ever attended online classes</b>			
<b>Yes</b>	174 (46.9)	197 (53.1)	0.050**
<b>No</b>	11 (47.8)	12 (52.2)	

\*Significant difference among students' socio- demographic variables at the level of  $p < 0.05$

Barriers encountered by the undergraduate nursing students during online classes were shown in (Table 3). Three topmost statements which were perceived as significant barrier by the UG nursing students were, online classes are lacked in control over the group (261 marks), online classes require strong internet access (260 marks) and online classes usually lead to more physical problems like fatigue, eye pain, headache (256 marks). Top three statements which were not perceived as barriers were, online classes are tough to understand due to instruction in English (255 marks), online classes are lacked in privacy (219 marks) and online classes are very

costly in terms of internet recharge (181marks). motivation (162 marks).  
 Highest neutral statement was online classes are lacked in

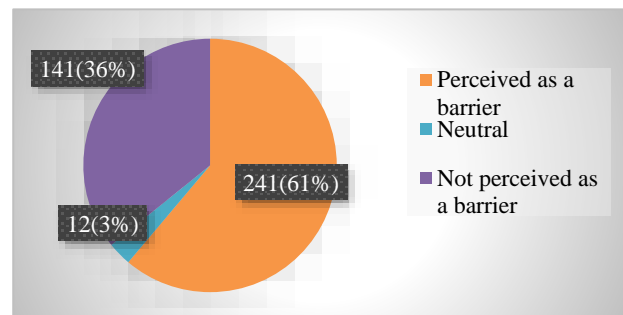
**Table 3: Participants’ perceived barriers encountered during online classes.**

Statements	SDA N (%)	DA N (%)	N N (%)	A N (%)	SA N (%)
Online classes are lacked in motivation	53 (13.5)	97 (24.6)	162 (41.1)	49 (12.4)	33 (8.4)
Online classes are lacked in student’s evaluation	95 (24.1)	45 (11.4)	62 (15.7)	155 (39.3)	37 (9.4)
Online classes create anxiety or stress due to less technical assistance	94 (23.9)	52 (13.2)	52 (13.2)	153 (38.8)	43 (10.9)
Online classes are lacked in student-teacher interaction	83 (21.1)	39 (9.9)	47 (11.9)	159 (40.4)	66 (16.8)
Online classes are tuff to understand due to instruction will be given in English	121 (30.7)	134 (34.0)	59 (15.0)	71 (18.0)	9 (2.3)
Online classes give less time to learn	84 (21.3)	65 (16.5)	63 (16.0)	147 (37.3)	35 (8.9)
Online classes are very costly in terms of internet recharge	102 (25.9)	79 (20.1)	59 (15.0)	105 (26.6)	49 (12.4)
Online classes are lacked in privacy	114 (28.9)	105 (26.6)	86 (21.8)	72 (18.3)	17 (4.3)
Online classes require advance technical knowledge	93 (23.6)	50 (12.7)	73 (18.5)	144 (36.5)	34 (8.6)
Online classes require strong internet access	86 (21.8)	19 (4.8)	29 (7.4)	134 (34.0)	126 (32.0)
Online classes are lacked in discussion among students	96 (24.4)	36 (9.1)	34 (8.6)	151 (38.3)	77 (19.5)
Online classes usually lead to more physical problems like fatigue, eye pain, and headache	90 (22.8)	27 (6.9)	21 (5.3)	113 (28.7)	143 (36.3)
Online classes are lacked in control over the group	35 (8.9)	53 (13.5)	45 (11.4)	85 (21.6)	176 (44.7)
Online classes are dependent on electricity and need a proper setup (computer and earphone)	95 (24.1)	34 (8.6)	34(8.6)	127(32.2)	104(26.4)
Online classes commonly have more interruptions	104 (26.4)	44 (11.2)	49 (12.4)	139 (35.3)	58 (14.7)

\*(SDA= Strongly disagree, DA= Disagree, N= Neutral, A=Agree SA= Strongly agree)

Data revealed that 241 (61%) participants agreed that they encountered different barriers during online classes. However 141 (36%) did not perceive any significant barrier and 12 (3%) participants had neutral response regarding barriers during online classes (Figure 1).

It was revealed that differences on barriers towards online classes between male and female students were analyzed by Mann Whitney U test; analysis showed the significant differences of participants perceived barriers among male and female participants by their age, year of study, fathers’ education and family income (Table 4).



**Figure 1: Percentage of participants’ perceived barriers encountered during online classes.**

**Table 4: Differences in barriers encountered during online classes among undergraduate nursing students by demographic profile.**

Variables, n=394	Male (Mean±SD)	Female (Mean±SD)	P value
<b>Age (in years)</b>			
17-19	48.10±10.37	41.83±15.22	0.173
19-21	40.82±14.94	46.58±13.14	0.011**
21-23	47.48±12.52	48.15±11.47	0.759
<b>Year of study</b>			
First year	42.41±14.08	39.55±14.41	0.393
Second year	44.90±13.65	46.68±14.38	0.252
Third year	43.66±14.86	51.33±9.71	0.007**
Fourth year	48.83±10.57	48.88±9.69	0.997
<b>Area of residence</b>			
Rural	43.26±13.75	44.01±14.32	0.397
Semi-urban	45.95±15.37	51.07±7.54	0.516
Urban	49.00±11.82	50.80±9.19	0.666
<b>Mothers' education</b>			
Illiterate	49.06±13.08	49.04±11.51	0.892
Primary	39.75±14.76	37.17±15.80	0.688
Secondary	44.42±12.39	44.70±12.60	0.902
Graduation and above	45.86±12.85	50.34±9.84	0.055
<b>Fathers' education</b>			
Illiterate	44.20±13.68	50.16±10.17	0.004**
Primary	41.26±17.20	32.86±15.97	0.096
Secondary	40.61±14.84	44.54±15.61	0.376
Graduation and above	48.13±11.31	48.41±9.82	0.972
<b>Family income (per month in rupees)</b>			
<10000	39.57±15.78	36.10±16.14	0.452
10000-20000	47.96±12.37	47.61±11.51	0.970
20000-30000	41.58±14.18	49.59±8.46	0.011**
>30000	47.78±11.45	50.87±10.06	0.113
<b>Ever attended online classes</b>			
Yes	44.37±13.74	46.13±13.17	0.183
No	49.36±12.82	52.25±7.17	0.516

\*p&lt;0.05.

## DISCUSSION

According to UNESCO, since the outbreak of COVID-19 began, education in 138 countries worldwide has been affected by school and university closures. Nearly 60.2 million school teachers and university lecturers are no longer in the classroom. So the world of education and learning is moving towards online training and courses. Despite having lots of benefits, online classes have list of challenges faced by students during the commencement of course.<sup>6</sup>

After extensive search author did not able to retrieve many studies related to barriers perceived during online classes among undergraduate nursing students so we tried to correlate our findings with other university students.

In our study majority of participants were undergraduate female nursing students. In contrary a study conducted in Northern Border University, Arar<sup>8</sup> on MBBS students where majority of participants (63%) were male. Study carried out on teachers by Berge et al where half (21) of the respondents were female.<sup>9</sup>

More studies must be conducted in South East Asian region and on both school as well as university students and include males and females as well. Given the growing importance of e-learning and its use in the workplace, it is critical to understand the barriers that act upon and hinder the successful adoption of such technologies.

Our study presents that more than half of the students encountered with different barriers during online classes. Most commonly encountered barrier was online classes

are lacked in control over the group. In contrast to this, study conducted by Khyzer et al showed that 70% students perceived insufficient class time as a most common barrier in adoption of online classes with 66% suggested that faculty members were more familiar with traditional classes and 40% believed that faculty members were not trained for taking online lectures.<sup>8</sup> Similarly study results showed that time requirement is more in interactive learning than traditional classes and rejection of students by the virtual faculty due to lack of time is also a major barrier.<sup>10,11</sup>

Results of different studies showed that some of the commonly encountered barriers in previously conducted studies were cost of set up, more stressful for both student and faculty, requires more trained faculty for making learning more effective and apprehension regarding assessment plans.<sup>12-14</sup>

More studies must be carried out on large samples to find out the barriers responsible for less interest of students in online classes. Understanding learners' perception of barriers, the different types of barriers, and their relative importance, will enable those who are responsible for workforce development to focus upon the most critical potential barriers to successful e-learning implementation.

In another study carried out by Shahmoradi et al and Maryam et al represented that 40% participants reported access to technology and slow speed of internet were major barrier.<sup>10,15</sup> Similarly in our study participants considered that online classes require strong internet access and it was one of the major barriers. Study suggests that students' attitude and perception regarding teaching strategies is an evident factor towards effective learning outcomes.<sup>16</sup>

Technological advancement is necessary to create interest of students and their parents towards online classes. Internet is the basic requirement for successfully conducting interactive classes. In India government must focus on rural areas where network is a major challenge. More cyber cafes and internet towers should be established in villages.

Different study results showed that major barriers perceived during online classes were faceless teaching, increased time required for preparation of online classes, required technologically advanced system, fear of replacement of faculty by computers, lack of training, less technological assistance, high cost material and resistance to change.<sup>17-24</sup> In contrary our study findings explored that more physical problems like fatigue, eye pain, headache, dependent on electricity, need a proper setup (computer and earphone), lacked in discussion among students and lacked in student-teacher interaction were the barriers which were found more pronounced.

Government must pay attention to equip the faculty and students with skills for effective utilization of technology. Some training programs must be started to train both the groups and some IT experts must be appointed in schools and universities to solve the issue immediately.

### **Limitations**

This study was limited to a part of India and involved undergraduate nursing students only. Convenient sampling technique can lead to selection bias. Author had to rely on the information provided by the participants so generalizability of the findings should be done cautiously.

### **CONCLUSION**

The purpose of this study was to identify and categorize barriers to online classes adoption, and to assess their relative impact on learners. Majority of participants encountered with different barriers during online classes. Although participants were agreed that implementation of online classes are best option for utilization of this pandemic time yet due to some hurdles they were hesitant to adopt it. It is crucial to understand the obstacles faced by the students and practically solve the issues so that the world of online education can be developed.

### **Recommendations**

This study recommends that central education department must conduct such kind of surveys to explore the barriers in successful implementation of online classes. So that online learning can be a routine part of curriculum and our technologically sound students will be ready to deliver high quality care.

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