

# PERCEPTION OF ONLINE LECTURES AMONG UNDERGRADUATE MEDICAL, DENTAL AND NURSING STUDENTS DURING COVID-19 PANDEMIC: A CROSS-SECTIONAL STUDY AT A TERTIARY TEACHING HOSPITAL

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## ABSTRACT

### Introduction

The COVID-19 pandemic significantly affected medical education and has forced educators to switch to online teaching-learning activities worldwide. Online teaching-learning activities has ensured the safe delivery of the lectures to the students.

### Objective

To assess the perception of students towards online lectures and to analyze the perceived barriers to online learning in our context during the COVID-19 lockdown period.

### Methodology

A cross-sectional online descriptive study was conducted among undergraduate students at a tertiary teaching college in Eastern Nepal during September-November 2020. The link of the Google form consisting of the semi-structured questionnaire was sent to the students through email. Descriptive statistics frequency and percentage were calculated using Microsoft Excel 2010. The study was approved by the Institutional Review Committee (IRC/2069/20).

### Result

A total of 211 students participated in the study. Mean age of the students was 20.5±1.5 years. Out of 211, 130 (61.61%) students used smart phones to attend online lectures and 176 (83.41%) students had not attended any online classes before the COVID-19 pandemic. The most common perceived advantage of the online lectures was availability of recorded lectures (186, 88.15%) whereas reduced interaction (179, 84.83%) was the most common disadvantage. More than half (126, 59.72%) of the students disagreed/strongly disagreed that online lectures are more effective than traditional face-to-face lectures.

### Conclusions

Most of the students had negative perception towards the online lectures. The study findings recommend using a hybrid of conventional face-to-face classroom based teaching and newer online teaching-learning activities for delivering medical education.

## KEYWORDS

Learning, medical education, online, perception, students



## INTRODUCTION

The COVID-19 pandemic has transitioned the world and significantly affected the medical education.<sup>1</sup> The medical institutions switched almost overnight to online teaching-learning mode.<sup>2</sup> Online teaching-learning mode is one of the fastest growing trend in the educational uses of internet technology.<sup>3</sup> However, there are some challenges regarding online teaching, which includes teaching in isolation, lack of communication, ignoring learners learning speed, inaccessibility to the students who live in geographically remote areas not having internet facility and who do not have laptop or smartphone. Dropout rates have been shown to be greater in online learning environments.<sup>4</sup>

B.P. Koirala Institute of Health Sciences (BPKIHS) is a tertiary teaching medical college located in Eastern Nepal. Nationwide lockdown called on March 24, 2020 due to COVID-19 pandemic led to disruption of theory and practical classes and clinical postings of undergraduate students in all the medical colleges across the country.<sup>5</sup> In response to the ongoing crisis of the pandemic and situational demand, online teaching-learning activities for various academic programs were started at BPKIHS on 26<sup>th</sup> April 2020. The undergraduate curriculum of BPKIHS does not contain online teaching-learning activities as a mode of delivering education. Most of the faculty are not yet trained on online teaching-learning activities at BPKIHS.

Ultimately, it is the acceptance of online lectures among students that helps in reaping the benefits of online classes. Despite the increasing amount of reliance on online teaching, information about the perception of students toward online teaching-learning activities is scarce in our context. It would be interesting to explore whether the students are enjoying online lectures, prefer any modifications or want to go back to conventional face-to-face learning altogether. We aimed to assess the perception of students towards online lectures and to analyze the perceived barriers to online learning in our context during the COVID-19 lockdown period.

## METHODOLOGY

**Study design and setting:** A web-based descriptive cross-sectional study was conducted among undergraduate students at BPKIHS between September-November, 2020. The undergraduate medical, dental and nursing students who were studying in 1<sup>st</sup> and 2<sup>nd</sup> year, who were attending the online lectures conducted during the lockdown and who gave their consent were enrolled in the study. Postgraduate students were not included in the study.

**Sample size calculation:** The study considered 95% confidence interval (CI) and 90% power to estimate the sample size. In a study by Gupta et al, 76.9% students agreed that the online class is distracting.<sup>6</sup>

Therefore, Prevalence (p)=76.9

Complement of p (q)=100 – p=23.1

Z=1.96 at 95% Confidence Interval

L= 10% of p at 90% power=7.69

$$n = \frac{z^2 * p * q}{L^2}$$

$$= 115$$

After adding 10% in calculated sample size, the final sample size was 127.

**Data collection tool:** A semi-structured questionnaire was developed from previously used surveys on perception of students toward online learning and modified appropriately to suit our study participants and context.<sup>6-9</sup> It consisted of three sections: (A) basic sociodemographic [age, gender, academic stream, academic year of study, residence, nationality], (B) Computer skills and accessibility to computer and internet (5 items having single response), (C) advantages and disadvantages of online lectures (2 items having multiple response), (D) Perception of online lectures (5 items), (E) Perceived barriers to online lecture (1 item having multiple response). The items on perception of online lectures were accompanied by 5 point Likert scale ("Strongly agree", "Agree", "Neutral", "Disagree" and "Strongly disagree").

The questionnaire was revised several times by three subject experts and the research team to ensure face and content validity. The questionnaire was then pilot tested in 13 respondents for its acceptability and consistency. Data from the pilot study were not included in the final analysis. Internal consistency was determined by the Cronbach's alpha ( $\alpha = 0.63$ ) and was found to be in acceptable range.<sup>10</sup>

**Data collection technique:** Convenience sampling technique was used to collect the data. Link of the Google Form (docs.google.com/forms) containing the questionnaire was sent anonymously to the participants via email. The first page of the link contained a brief introduction to the study's objectives, eligibility criteria, declaration of confidentiality and anonymity and informed consent. The study participation was purely voluntary. The consent was implied by completion of the questionnaire. They were also informed that all opinions provided by them would be kept confidential. The study was approved by the Institutional Review Committee (IRC/2069/20).

**Statistical Analysis:** The filled questionnaires were extracted from the Google Forms and exported to Microsoft Excel 2010. Descriptive statistics like frequency, percentage and standard deviation were calculated and the data were presented as tables and graphs.

## RESULTS

A total of 211 students participated in the study. The gender distribution was almost equal. The age of the students ranged from 17 to 31 years. Mean age of the students was  $20.5 \pm 1.5$  years with 115 (54.5%) in the age group of 17–25 years. One hundred and thirty eight (65.40%) students had urban residency and 180 (85.31%) were from Nepal. One hundred thirty four (63.51%) students were studying Bachelor of Medicine and Bachelor of Surgery (MBBS) and 122 (57.81%) were in the first year of the academic course (Table 1).



**Table 1: Sociodemographic characteristics of the students (n=211)**

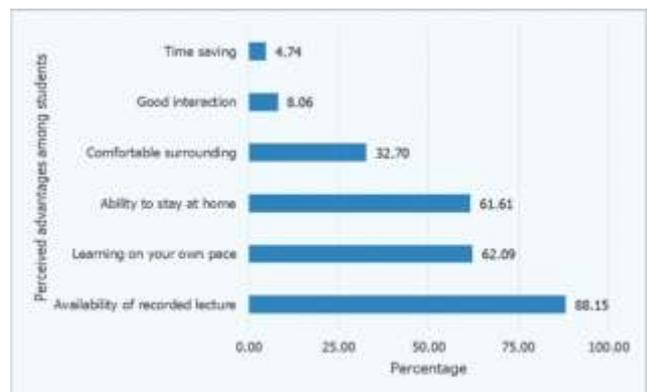
Characteristics		Frequency (%)
Gender	Male	103 (48.82)
	Female	108 (51.18)
Age group (years)	17–20	115 (54.5)
	21–25	93 (44.08)
	>25	3 (1.42)
Academic stream	Bachelor of Medicine and Bachelor of Surgery	134 (63.51)
	Bachelor of Dental Surgery	47 (22.27)
	Bachelor of Science in Nursing	30 (14.22)
Academic year	First	122 (57.82)
	Second	89 (42.18)
Nationality	Nepal	180 (85.31)
	India	31 (14.69)
Residence	Rural	73 (34.6)
	Urban	138 (65.4)

One hundred and eighty three (86.73%) students stated that they had internet access at home and 130 (61.61%) students agreed that the status of their internet connection was usually satisfactory. One hundred and seventy six (83.41%) students had not attended any online classes before the COVID-19 pandemic. Out of 211, 130 (61.61%) students used smartphones to attend the online classes. In addition, 111 (52.61%) students used to spend 3-5 hours per day on their mobile or laptop for study purposes (Table 2).

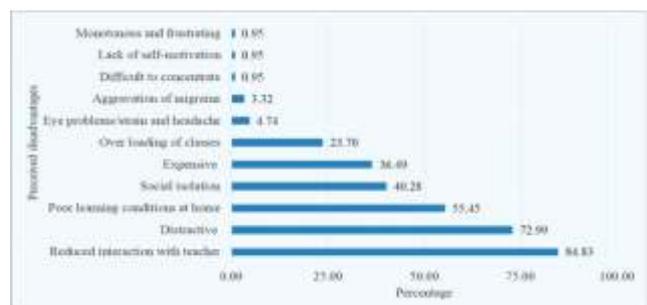
**Table 2: Computer skills and accessibility to computer and internet (n=211)**

S.N.	Variables	Responses	Frequency (%)
1.	Do you have internet access at home?	Yes	183 (86.73)
		No	28 (13.27)
2.	The status of my internet connection is usually:	Good	57 (27.01)
		Satisfactory	130 (61.61)
		Bad	24 (11.37)
3.	Which device do you commonly use to attend online classes?	Desktop	1 (0.47)
		Laptop	80 (37.91)
		Smartphone	130 (61.61)
4.	How many online classes did you previously attend before the COVID-19 pandemic?	1-3	10 (4.74)
		4-5	5 (2.37)
		>5	20 (9.48)
5.	How much time (in hours) do you spend on your mobile or laptop for study purposes in a day?	1-2 hours	57 (27.01)
		3-5 hours	111 (52.61)
		> 5 hours	43 (20.38)

The most common perceived advantages of the online lectures was availability of recorded lectures (186, 88.15%) followed by learning at own pace (131, 62.09%) and ability to stay at home (130, 61.61%). Similarly reduced interaction with the teacher (179, 84.83%) was the commonest disadvantage followed by distractive (154, 72.99%) and poor learning conditions at home (117, 55.45%) (Figure 1).



**Figure 1: Perceived advantages of online lectures among students (n=211)**



**Figure 2: Perceived disadvantages of online lectures among students (n=211)**

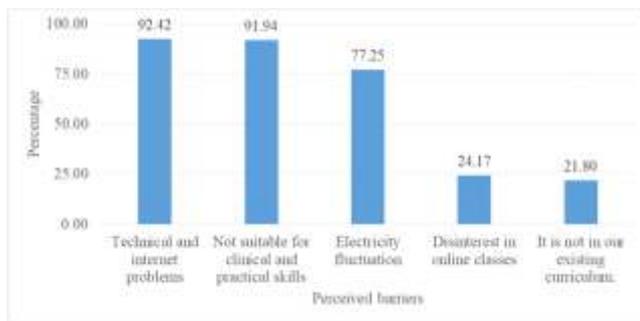
Out of 211, 126 (59.72%) students disagreed/strongly disagreed that online lectures are more effective than traditional face-to-face lectures in terms of increasing knowledge. Ninety-five (45.03%) students disagreed that they actively participate during online lectures compared to the traditional face-to-face lectures. Only 20 (9.48%) agreed that they can interact more during online lectures compared to the traditional face-to-face lecture. Similarly, 131 (62.08%) students agreed that they feel isolated during online lectures compared to the traditional face-to-face lecture. However, only 64 (30.33%) students responded that they enjoyed online lectures. Sixty-five (30.8%) students agreed that when colleges fully reopen, online lectures should remain part of teaching and learning activity in our college (Table 3).

**Table 2: Computer skills and accessibility to computer and internet (n=211)**

S. N.	Variables	Responses				
		Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
1.	Online lectures are more effective than traditional face-to-face lectures in terms of increasing knowledge.	2 (0.95)	18 (8.53)	65(30.81)	93 (44.08)	33 (15.64)
2.	I actively participate during online lectures compared to the traditional face-to-face lectures.	1 (0.47)	33 (15.64)	82 (38.86)	81 (38.39)	14 (6.64)
3.	I can interact more during online lectures compared to the traditional face-to-face lecture.	0 (0.0)	20 (9.48)	47 (22.27)	119 (56.40)	25 (11.85)
4.	I feel isolated during online lectures compared to the traditional face-to-face lecture.	36 (17.06)	95 (45.02)	44 (20.85)	29 (13.74)	7 (3.32)
5.	I enjoyed online lectures during the COVID-19 pandemic.	2 (0.95)	62 (29.38)	85 (40.28)	50 (23.70)	12 (5.69)
6.	When colleges fully reopen, online lectures should remain part of teaching and learning activity in our college.	7 (3.32)	58 (27.49)	58 (27.49)	67 (31.75)	21 (9.95)



Technical and internet problems (92.42%) were the most common perceived barriers to online learning in our context (Figure 3).



**Figure 3:** Perceived barriers to online learning among students (n=211)

## DISCUSSION

The present study aimed to provide an overview of the situation experienced by the students and to know the perception of the students towards online lectures delivered to them during the lockdown period due to COVID-19 pandemic. Our study showed that the majority of undergraduate students had negative perception towards online lectures as compared to the traditional face-to-face learning. Similar findings were also reported by Koirala et al (54.1%)<sup>11</sup> and Abbasi et al (77.4%).<sup>12</sup> More than half (59.72%) of the students disagreed/strongly disagreed that online lectures are more effective than traditional face-to-face lectures in terms of increasing knowledge. Similar findings were also reported by Adnan et al (67.5%),<sup>13</sup> Muthu prasad et al (44.45%)<sup>14</sup> and Sharma et al (63.98%).<sup>15</sup> Traditional face-to-face classroom learning is far more effective as compared to online learning as there might be limited opportunities to ask questions in the online lectures.

In the present study, majority of the students (45.03%) disagreed that they actively participate in the online lectures. Significant fraction of students (38.86%) were neutral with respect to the statement "I actively participate during online lectures compared to the traditional face-to-face lectures". One of the reasons might be the lack of an interactive approach when delivering the online lecture to the students as majority of the faculty are not well trained for online teaching-learning methods. More than half of the students disagreed that they can interact more during online lectures compared to the traditional face-to-face lecture in our study. This was similar to the report by Chalise et al (64.7%).<sup>16</sup> In contrast, majority (67%) of the respondents rated that the online classes were interactive in a study by Tuladhar et al.<sup>7</sup> The rating of online lectures as more interactive in other studies might be due to use of interactive platform for online lecture and the faculty might be well trained. Non-interactive online lectures might lead to demotivation for online learning as students usually actively participate in academic activities in traditional classes due to their face-to-face engagement with faculties and class fellows. Gamification can be incorporated to boost the interactivity of online learning.<sup>17</sup> Similarly online quizzes

and multiple choice questions can also be incorporated in the online lectures to make it more interactive and interesting.

Nearly two-third (62.08%) of the students agreed that they felt isolated during online lectures compared to the traditional face-to-face lecture in our study. However, Chalise et al had reported that only one-third (35%) of the students felt isolated during online lectures in their study.<sup>16</sup> The present study showed that majority of the students disagreed/strongly disagreed that they enjoyed online lectures during the COVID-19 pandemic. In contrast, majority of the respondents (73%) rated online learning as enjoyable in a report by Bączek et al.<sup>8</sup> It might be due to their higher internet connection quality, prior exposure to online learning or trained faculties for online learning modules.

Our study also showed that most of the students (86.79%) had an internet connection at their home; however, only three-fifth of the students (61.61%) had a satisfactory internet connection. It highlights that poor internet connection might act as the main obstacle for online learning. The students might be discouraged due to poor internet connection and hence the online teaching-learning activity might be less effective. Therefore, the medical educators should think about the quality of internet connection before implementing online lectures to the students. Majority of the students (83.41%) in our study had not attended any online lectures before the COVID-19 pandemic and similar findings were also reported by Gupta et al (89.2%),<sup>6</sup> Bączek et al (60%)<sup>8</sup> and Muthu prasad et al (52.2%).<sup>14</sup> Most of the students (61.61%) were using smartphone for attending online lectures in this study and this was in line with Tuladhar et al (74.6%),<sup>7</sup> Koirala et al (51.9%)<sup>11</sup> and Muthuprasad et al (65%).<sup>14</sup> The students might choose smartphones for their online learning because student-teacher interaction through the smartphone is much easier as compared to other devices.<sup>18</sup> A study also found that smartphones have wonderful influence on the education as it had easy access to relevant resources through internet.<sup>19</sup> The smartphone is also described as a potential "learn anywhere" resource for the students.<sup>20</sup> The medical educationists should consider smartphones as an adjunctive tool to the conventional face-to-face classroom teaching and ensure their usage to enhance the learning experiences through online lectures.<sup>21</sup> More than half (52.61%) of the students used to spend three-to-five hours per day on their mobile or laptop for online lectures in the present study. In contrast, Muthuprasad et al had reported that majority (48.86%) of the respondents spent only two-to-four hours in a day for online class.<sup>14</sup> It is good to have small session of online lectures and small break in between two classes to prevent eye straining as too much screen time is harmful for eye.<sup>22</sup> Too much screen time may lead to sleep problems, less time with family and friends, not enough outdoor or physical activity, weight problems and mood problems.<sup>23</sup>

One of the most important advantages of online teaching-learning is that it has flexibility and hence it enables the students to learn at their own pace and our study findings

also supported this. The students in the present study perceived that availability of recorded lectures, learning at their own pace, ability to stay at home and comfortable surroundings were some of the advantages of online lecture. Similarly, ability to stay at home (69%), continuous access to online materials (69%), the opportunity to learn at your own pace (64%) and comfortable surroundings (54%) were advantages of online lectures in a study by Bączek et al.<sup>8</sup> Therefore, availability of the recorded lectures helps the students to learn at their own pace. The positives of lecture recordings outweigh the negatives and its continued use in higher education is recommended by O'Callaghan et al.<sup>24</sup> However, Schnee et al had reported that lower-performing students benefit from attending live lectures.<sup>25</sup> The policy makers should consider these factors during formulation and implementation of online learning.

Reduced interaction with the teacher, easy distraction by the social media, poor learning conditions at home and social isolation due to prolonged use of smartphone and laptop were some of the perceived disadvantages of online lectures in our study. Similar findings were also reported by Bączek et al in which lack of interactions (70%) and technical problems with IT equipment (54%) were the main disadvantages.<sup>8</sup> The students also experienced headache and eye strain during online learning in our study. This finding was also supported by the findings that they used to spend more than three hours daily on screen. Sharma et al had reported similar finding.<sup>15</sup> Interaction between students and faculties is one of the major driving forces for success of online teaching-learning activities. It is essential to develop and sustain a collaborative learning space within an e-learning environment to maximize the satisfaction of the students.<sup>26</sup> Online lectures should engage the students through frequent and meaningful activities that help to keep them focused in the class. It is important to have frequent interactions to make online classes more effective and memorable.<sup>27</sup> Overloading of the online classes was one of the disadvantages perceived by one fifth of the students in the present study. A Chinese study had also documented that back-to-back classes caused high levels of stress among the students.<sup>28</sup>

The transformation from traditional face-to-face learning to complete online learning presents several challenges to the students as well to the educationists.<sup>29</sup> This study found technical and internet problems as the most common perceived barrier to online learning in our context. This was similar to the finding of Olum et al conducted in Uganda among undergraduate students which also identified poor internet connectivity (84%) as the most important barriers to e-learning.<sup>30</sup> Online learning requires a reliable and fast internet connection and the laptop, desktop or smartphone and an uninterrupted electricity supply. The students should also have a sound skill toward computers and information technology to learn effectively from online teaching-learning activities. This ultimately helps them in effective time management without facing any difficulty. The students in this study found online learning unsuitable for practical and clinical classes and a similar finding was also

reported by Khalil et al.<sup>31</sup> Clinical skills and experience and human interaction are two most extremely important requirements for the practice of medicine, dentistry and nursing. Nothing can replace seeing a patient.<sup>32</sup> However, online learning may serve as an efficient resource for learning these clinical skills by integrating different modalities like virtual simulation technologies and computer-based models of real-life processes. This can provide opportunities to learn skills in a safe environment. A computer-based virtual patient program can be designed and implemented to simulate real-life clinical scenarios. Such programs might be useful for students to learn history taking and physical examination that encourages diagnostic and therapeutic decision-making among the students.<sup>33</sup>

Our study also showed that less than one-third of the students wanted online lectures as a part of teaching and learning activity in our college when it fully reopened after the pandemic. This was consistent with the finding of Ansari et al in which more than 50% agreed that they would recommend it in the future.<sup>34</sup> Our study findings also indicated that we need to review the existing medical curriculum and design appropriate content for online lectures. Given the needs of the academic environment where teaching-learning activities can progress in optimal manner, the curriculum has to be frequently revised to improve the quality of medical education.<sup>35</sup> It should be better to introduce online teaching-learning activities gradually along with the regular face-to-face lectures after the end of COVID-19 pandemic which ultimately may be accepted by the majority of the students; however, it will take some time to achieve fruitful outcomes. There is always much room for improvement as far as online learning goes. It is of utmost importance to provide excellent training and support to both the students and teachers regarding the usage of online teaching-learning activities that helps in increasing their comfort ability.

#### LIMITATION OF THE STUDY

The present study was performed in a single medical college; therefore, the results may not be generalized to other medical colleges in the country. A substantial number of students also gave "neutral" response to perception of online lectures. It is likely that our students might not have formed a concrete opinion. We could not explore the role of parents' education in facilitating students' online teaching-learning activities. As the results of the present study are only based on students' perceptions, "with as the results of the present study are based on only students perceptions" the inclusion of faculty opinions in future studies might help in understating the overall impact of online teaching-learning activities on medical education.

#### CONCLUSION

Within the limitations of the present study, we conclude that the majority of undergraduate students showed a negative perception towards online lectures. The students perceived many challenges during online learning and these factors must be further explored to make online learning



acceptable, effective and enjoyable. We recommend using a hybrid of online teaching-learning activities and conventional face-to-face teaching that would be more effective. The administrators, faculties, students and policy makers should work in harmony to remove the barriers in online teaching-learning activities.

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## CONFLICT OF INTEREST

None conflict of interest

## FINANCIAL DISCLOSURE

None declared

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