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Effectiveness of e-Learning during the COVID-19 Pandemic among the Undergraduate Medical Students in Nepal: An Online Survey

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Abstract

Introduction: The COVID-19 pandemic has shifted the medical education to the virtual mode in most of the countries. Though online learning has been practiced for long and proved to be effective, its usefulness should be looked for in developing countries like Nepal. Methods: An online survey was conducted among undergraduate medical students with the help of a structured self-administered questionnaire consisting of demographic information, modalities of online classes they are taking and their opinion regarding the online classes. Results: Most of the students had access to the devices and internet facilities though some of the students responded that they have no internet facility at home. More than half of the students have answered that they are having some sort of visual problem after the online classes have started. Most of the students responded that the internet connectivity issue is a hindrance to online learning. More than half of the students strongly disagree that online class should be continued even after the pandemic is over. Conclusion: There are lots of obstacles in virtual learning in resource-limited countries like ours. The effectiveness of e-learning should be evaluated among the students and the shortcomings of virtual learning should be addressed by concerned authorities.

Key words: e-learning, COVID-19 pandemic, Medical education, Online class, Medical school.

INTRODUCTION

Avoiding the crowds and maintaining the physical distance of at least one meter is one of the important measures to be followed for the prevention of ongoing COVID-19 pandemic.[1] After this pandemic has begun, many of the schools, colleges and universities have been shut down for the safety measures to narrow the chain of transmission. So, the teaching-learning activities have moved online.[2] Medical education has also been affected largely: classes have been suspended, evaluations including the examinations have been postponed and clerkships and residency have been delayed all over the world.[3,4]

Amid this pandemic, medical schools have adopted online learning for their students by means of various virtual platforms like Zoom, Google Meets and other interactive software.[3] The method of learning with these platforms has been shown to be better in engaging and motivating for the medical students.[5]

Online learning by means of these platforms has been initiated in different medical schools of Nepal among the undergraduate medical students after this pandemic halted the regular classes. This study was conducted with the objective of exploring the perception of online classes among the medical students regarding its effectiveness and usefulness in their learning process.

We aim to take feedbacks from the students who are taking online classes regarding the difficulties they are facing and the level of satisfaction for them in the learning process. Also, it will help to guide the respective authorities to improve the flaws regarding the online learning process and if this could be continued in an integrated approach in the coming days even after the pandemic is over.

METHODS

We conducted an online survey to know their perception regarding the online classes among undergraduate medical students studying in different medical schools of Nepal. A self-administered questionnaire was developed by the authors consisting of the following parts: demographic information, modalities of online class they are taking and their opinion regarding the online class. Likert scale questionnaires were used to know their perception and effectiveness of online classes where they rate their experience in five points scale. Questions were entered in a Google form in a structured way. Pre-testing of the questionnaire was done among the small sample after which suggestions from them were incorporated to form the final version. After that, it was circulated among the undergraduate medical students studying in different medical schools by means of social media, Viber and messenger groups after which the responses were collected.

The introduction along with the objectives of the study was mentioned on the first page of the form and anonymity of the subjects filing the form was assured. Those who were willing to take part in the survey need to tick on the consent that they agree to participate in the study after which only the questionnaire page is displayed.

RESULTS

A total of 518 responses were received out of which 12 didn't agree to participate in the survey and skipped the study. The response rate was calculated as 97.7%.

Demographic characteristics

Female participants comprise the major of respondents (54.5%) in our study. The mean age of the participants is 20.693 years. Most of them currently reside in Nepal (93.1%) and the majority belongs to the MBBS stream (90.3%). Maximum students that participated in the survey were from the second year (37.2%) followed by the first year (33%) and the third year (16.4%). The detailed information on demographic characteristics is shown in Table 1.

Accessibility to IT services and modalities of online class

Most of the students (97.6%) have their own devices for attending the online class. Some of the students (15.6%) responded that they have no internet facility at home. Most of the institutions (87.7%) have used incorporated application by Zoom Video Communications, San Jose, CA, USA as the platform for the virtual learning followed by Google meets (5.3%) and Microsoft teams (4.1%). The majority of students (34.6%) have reported that they take 3 hr of online class per day. More than half of the students (55.9%) have answered that they are having some sort of visual problem after the online class has started. Also, the majority of the students (52%) have responded that online lectures are not always feasible as per their time. Besides the online lectures, the students are using Youtube videos, e-books, textbooks and self-made notes for learning purposes. The detailed information on Accessibility to IT services and modalities of online class is shown in Table 2.

Perception and effectiveness of online class

Students were asked to respond their perception and effectiveness of online class on five points Likert scale. Most of the respondents agree to some extent that the software used for online learning is user friendly but internet connectivity is an important issue hindering the smooth conduction of their class. Many of the students believe that the learning process has been hampered due to a lack of practical classes. More than half of the students (52.8%) strongly disagree with the statement online class should be continued even after the pandemic is over. Also, their response has inclined over the fact that online classes are less effective over traditional lectures. The detailed response regarding their opinion towards online learning can be found in Table 3.

Table 1: Demographic characteristics.

Demographic characteristics	Modalities	Number (N=506)	Percentage (%)
Gender	Female Male	276 230	54.5 45.5
Age range	16-19 20-23 24-27 >27	125 359 21 1	24.7 70.9 4.2 0.2
Country of Residence	Nepal India Srilanka	471 34 1	93.1 6.7 0.2
Stream	MBBS BDS BPH Nursing Physiotherapy	457 45 2 1 1	90.3 8.9 0.4 0.2 0.2
Year of study	First Second Third Fourth Fifth	167 188 83 41 27	33 37.2 16.4 8.1 5.3

DISCUSSION

e-Learning and teaching activities have been practiced since long earlier before the COVID-19 pandemic started and it has been found to be effective among the medical students.[5,6] It has been found to be of greater educational opportunities for the students and also simultaneously enhances the faculty effectiveness and efficiency.[7] After the pandemic has begun, virtual learning has gained more attention and has been practiced all over the world.[8]

In our study, we tried to explore the pros and cons of the e-learning and its effectiveness in undergraduate medical education in resource-limited countries like Nepal. Most of the students had access to the devices and internet facilities for virtual learning though some of the students responded that they have no internet facility at home (15.6%). Notably, smartphones and the internet have eased not only the communication among the people but also the teaching-learning activities in medical education too.[9,10] Most of the institutions (87.7%) have used incorporated application by Zoom Video Communications, San Jose, CA, USA as the platform for the virtual learning followed by Google meet and Microsoft teams. Other similar studies had also shown that zoom application has been widely used in this COVID-19 pandemic for delivering lectures and presentations in medical education.[8,10]

Table 2: Accessibility to IT services and modalities of online class.

Questionnaires	Modalities	Number (N=506)	Percentage (%)
Own device to attend class	Yes No	494 12	97.6 2.4
Devices used to attend classes (Multiple responses taken)	Mobiles Laptop Ipad/tablet	372 293 17	73.5 57.9 3.4
Facility of internet service available at home	Yes No	427 79	84.4 15.6
Internet service mostly used for online learning	Wifi Mobile Data Both	384 120 2	75.8 23.7 0.4
Software used for online learning	Zoom Google Meet Microsoft-Teams Others	444 27 21 14	87.7 5.3 4.1 2.9
Class hours per day	1 2 3 4 5 >5	14 159 175 126 26 6	2.8 31.4 34.6 24.9 5.1 1.2
Encountered vision-related problem after online class started	Yes No	283 223	55.9 44.1
Feasibility of class timing	Yes No Not always	206 37 263	40.7 7.3 52
Resources used for studying other than online class (Multiple responses taken)	Textbooks Pdf/ebooks Self-made notes Youtube videos Others	236 351 171 314 5	46.6 69.4 33.8 70.2 1

Table 3: Perception and effectiveness of online class.

Questionnaires	1 % (n)	2 % (n)	3 % (n)	4 % (n)	5 % (n)	Mean categorical value
Interruption due to internet connectivity (1-Never, 5-Always)	10.1 (51)	24.1 (122)	30.6 (155)	22.9 (116)	12.3 (62)	3.03
User-friendliness of the software used for e-learning (1-Not very, 5-Very much)	7.5 (38)	15.4 (78)	32.4 (164)	31 (157)	13.6 (69)	3.27
Level of satisfaction of the online class (1-Not satisfied, 5-Very satisfied)	18.6 (94)	24.7 (125)	35.2 (178)	18.6 (94)	3 (15)	2.62
Easy to grab information (1-Very hard, 5- Very easy)	16.6 (84)	29.4 (149)	38.1 (193)	13.8 (70)	2 (10)	2.55
Sincerity level of the attendees of online class (1-Not at all, 5-All the time)	4.3 (22)	13 (66)	22.7 (115)	28.1 (142)	31.8 (161)	3.69
Concerns being neglected by the tutor (1-Not at all, 5-Very frequently)	3.2 (153)	29.4 (149)	22.9 (116)	11.7 (59)	5.7 (29)	2.33
Learning process hampered due to lack of practical classes (1-Not at all, 5-Very much)	3.2 (16)	3.6 (18)	12.5 (63)	25.1 (127)	55.7 (282)	4.26
Online learning effectiveness is equivalent to the lectures in class (1-Strongly disagree, 5-Strongly agree)	35.4 (179)	28.3 (143)	20.9 (106)	10.7 (54)	4.7 (24)	2.21
Continuation of online lectures after pandemic is over(1-Strongly disagree, 5-Strongly agree)	52.8 (267)	19.4 (98)	13.4 (68)	7.5 (38)	6.9 (35)	1.96
Effectiveness of ebooks in the learning process (1-Not at all, 5-Very much)	19.6 (99)	30.6 (155)	29.8 (151)	14 (71)	5.9 (30)	2.56

Maximum students have reported that they take 3 hours of online class per day. More than half of the students (55.9%) have answered that they are having some sort of visual problem after the online class has started. The use of digital devices for a long time for work and social purposes may increase the risk of digital eye strain and visual problems.[11] It may not be that all have developed the visual problems due to the ongoing online classes as the regular digital screen time of most of us has been increased amidst of the lockdown and staying in the home, but it's an issue that needs to be addressed while imposing long virtual lectures for the students. Also more than half of the students have responded that the online lectures are not always feasible as per their time. Besides the online lectures, the students are using YouTube videos, e-books, textbook, and self-made notes for learning purposes.

Internet connectivity, easy accessibility, and power interruptions are the common issues that we face often being in developing countries for virtual learning.[12,13] In our study too, though more respondents believe that the software used for online learning is user friendly but the internet connectivity is an important issue hindering the smooth conduction of class. A study conducted in Liberia for introducing e-learning solutions in medical education has also concluded that inadequate infrastructure, limited internet bandwidth, lack of skilled staffs, and unreliable electricity supply are the major hindrances in the resource-limited settings for virtual learning.[14]

Many of the students believe that the learning process has been hampered due to a lack of practical classes. A study conducted in the UK among undergraduate medical students to know the value of e-learning in clinical skills has concluded that it was a useful tool in learning of clinical skills if a good learning environment and approach is followed.[6]

More than half of the students strongly disagree with the statement online class should be continued even after the pandemic is over. Also, their response has inclined over the fact that online classes are less effective over traditional lectures. A similar study conducted among the orthopedic residents in Chile to know about the perception of online education during the COVID crisis had concluded that face-to-face theoretical activities are still valued by most of the residents for their learning process rather than only virtual learning process.[10]

There may be various issues that a significant number of students were not satisfied with the virtual learning methods currently practiced here in the medical colleges of Nepal. We have also taken open responses if the students have suggestions for improvement of the ongoing virtual classes. Internet connectivity issues, power cut off are the major issues reported by them. Many of the students suggested rather than live virtual class, recorded lectures would be of greater value as it would be convenient for them to watch during their leisure time as internet connectivity and power cut-offs would not hamper to a greater extent. Similarly, many of the students reported that eye strain and headache has become a problem for them after the online lectures have been started as they spend plenty of time looking at the screen during their home stay after the pandemic has begun. Also, many of them have raised the issue that lack of practical class is relatively hampering their learning process.

We had certain limitations in our study. One is, our questionnaires were not validated by prior research as there are very few similar studies conducted in similar settings. More participants of the study were from MBBS and BDS faculties and we could not collect more data from other nursing and paramedical students.

CONCLUSION

e-Learning during this COVID-19 pandemic has somehow continued the educational activities among the medical students and helped the students as well as faculties engaging in the teaching-learning process. But, there

are a lot of hindrances and obstacles in virtual learning in resource-limited countries like ours. The effectiveness and usefulness of e-learning should be evaluated among the students and the shortcomings of virtual learning should be addressed by concerned authorities by any means as far as possible.

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CONFLICT OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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