

ORIGINAL RESEARCH ARTICLE

PERCEPTION OF EQUIVALENCE OF ONLINE CLASSES TO FACE TO FACE CLASSES AMONG DENTAL AND MEDICAL UNDERGRADUATE STUDENTS OF GANDAKI MEDICAL COLLEGE, NEPAL

Bijayata Shrestha^{1,*}, Sushil Subedi², Ujjwal Koirala², Pratik Manandhar³, Prakash Baral⁴

¹Department of Oral Pathology, Gandaki Medical College, Nepal

²Department of Oral and Maxillofacial Surgery, Gandaki Medical College, Nepal

³Department of Prosthodontics, Gandaki Medical College, Nepal

⁴Department of Human Anatomy, Gandaki Medical College, Nepal

Received: 12 Jan, 2021

Accepted: 15 Mar, 2021

Published: 25 Mar, 2021

Key words: Equivalence; Face to face learning; on-line learning; Students' Perception.

***Correspondence to:** Bijayata Shrestha, Department of Oral Pathology, Gandaki Medical College, Pokhara, Nepal.

Email: bijayata_shr@yahoo.com

Citation

Shrestha B, Subedi S, Koirala U, Manandhar P, Baral P. Perception of equivalence of online classes to face to face classes among dental and medical undergraduate students of Gandaki Medical College, Nepal. Journal of Chitwan Medical College. 2021;11(35):56-60.



Peer Reviewed

ABSTRACT

Background: Online learning has become a common mode of delivering education in Covid-19 era and our institute is not an exception. The objective of this study was to examine the perception of our students regarding the equivalence of online and face to face learning.

Methods: This questionnaire based online study was conducted at Gandaki Medical College, Pokhara among all the medical and dental undergraduate students with a sample size calculated as 180. The students' perception in terms of general equivalence, flexibility, level of interaction, knowledge gained, and ease of online courses were collected. The data was entered in SPSS 20 and descriptive statistics was performed. The correlation between the variables was done using Spearman's correlation analysis.

Results: The total participants in this study were 187. Online learning wasn't perceived to be equivalent to face-to-face learning in general (2.82±1.10). Online class was perceived to be more flexible (4.49± 1.10), to provide less opportunity to interact with instructor and peers (3.17±1.13), and to gain less knowledge (3.36± 1.27). However, both were perceived to be relatively similar in terms of ease (3.79±0.8). The comparatively less interaction was correlated to less knowledge gained through online classes (r value = 0.67, P<0.01).

Conclusions: The result of this study suggests that the students didn't find the online learning to be equivalent to face-to-face learning and the online learning experience can be correlated with interactive sessions.

INTRODUCTION

Nationwide restriction imposed to control the spread of COVID-19, had a major impact on every aspect of life including medical education.¹ Online learning had become a common option to continue delivering the medical education.² Online learning was seen to be an applicable and effective teaching modality and was accepted by the medical undergraduates.^{3,4} Recent meta-analysis showed the learning outcome of online learning is comparable to face-to-face learning, leading the transition in teaching method to online teaching.^{1,5} In 21st century, Medical education has undergone a paradigm shift with application of web based learning, however none of the medical schools had integrated e-learning in Nepal before Covid-19.⁶ The flexibility makes online learning an attractive option for time-crunched, place-bound students. However, greater amounts of flexibility may also be associated with less interaction with instructors and peers.^{7,8}

We adopted online classes as an alternative, though we were not accustomed to this new modality of teaching. Online e-learning has its own common challenges faced by faculties and students in developing countries; however, the current

scenario should be taken as an opportunity to integrate e-learning in medical education. For implementation of online learning in medical education, the evaluation of the perception of students towards it, is equally important.⁹

In this context, we conducted this study to determine the perceptions of students towards general equivalence, comparative interaction, comparative flexibility, comparative knowledge gain and comparative ease of online learning verses face to face learning.

METHODS

This cross-sectional study was conducted among medical and dental undergraduates of Gandaki Medical College from 20th September to 20th November 2020. Ethical approval from Institutional Review committee of Gandaki Medical College was obtained (Reference number 91/077/78). Using the formula $n = [z^2 * p * (1 - p) / e^2] / [1 + (z^2 * p * (1 - p) / (e^2 * N))]$; confidence level at 95% (z-score=1.96), population proportion at 50% and the margin of error at 6%, the sample size was calculated to be 180. The current total number of medical and dental undergraduates in this institute was 551.

A questionnaire, adapted from previous study, was prepared in google form after obtaining permission from the author.⁷ The adapted questionnaire was pretested to test its' reliability and validity. The pretesting was done among 30 final year medical students and Cronbach alpha value of 0.9 was obtained. Students enrolled in Dental and Medicine undergraduate programme in Gandaki Medical College, were included in this study and students from other medical institutes and from other disciplines were excluded. The email address and phone numbers of all the medical and dental undergraduates were generated from the Administrative office, Gandaki Medical College. The link to the questionnaire was attached in social networking application (viber application) and was sent to the students. The sampling was done using random sampling technique. A consent form was attached as a first page and the participant who agreed to be a part of this study responded to questionnaire. The questionnaire consisted of 2 parts: the first part included the demographic data and the second part consisted of questions on their perceptions comparing the online and face to face classes in terms of equivalence, flexibility, level of interaction, knowledge gained, and ease of online courses compared to face-to-face courses.⁷

The perception of participants regarding the equivalence of online classes to face to face classes was measured using four item rated on seven point Likert scale.

A mean score less than 4 suggested that the students perceived that the online classes were not equivalent to face-to-face class in general and a mean score more than 4 indicated a perception that online classes were equivalent to face to face classes in general.

Seven items rated on a seven-point Likert-type scale (strongly disagree to strongly agree) was used to measure the perception of students regarding relative flexibility of online.

A mean score less than 4 suggested that the students perceived that the online classes were less flexible than face-to face classes and a mean score more than 4 indicated a perception that online classes were more flexible.

Ten-item rated in seven-point Likert-type scale was used to evaluate perception of students regarding the level of interaction with their peers and instructor in online classes.

A mean score less than 4 indicated a less self perceived interactions in online classes versus face-to-face classes and

a mean score more than 4 indicated more self perceived interaction. A six- item rated with seven-point likert-type scale was used to compare the self perceived gain of knowledge in online courses versus face-to-face course.

A mean score less than 4 indicated a less self perceived gain in knowledge in online classes than in face-to-face classes; a higher mean score indicated a perception that one learned more in online classes.

The five-item scale rated on a seven-point Likert-type scale measured self perceived ease of online class relative to face-to face classes.

A mean score less than 4 indicated a perception that online classes were harder than face-to-face classes; a higher mean score indicated a perception that online classes were easier.

The data was collected over a period of 2 months (September 20 to November 20, 2020). The data was entered in SPSS 20 and descriptive statistics was performed. The correlation between the students' perception on general equivalence, relative flexibility, relative interaction, relative knowledge gain and relative ease of online learning was done using Spearman's correlation bivariate analysis. The level of significance was set at the level of P<0.01.

RESULTS

The total of 187 dental and medicine undergraduate students participated in this study. Among 187 participants, 179 were females (58.3%), 77 were males (41.2%), and 1 (0.5%) preferred not to reveal the gender. The age of the participants ranged from 18 to 28 (mean age: 21.28 with SD = 1.63). The participants included were: 39 first year students, 37 second year students, 55 third year students, 35 fourth year students and 21 final year students. All the participants had attended the online classes conducted by the institute.

Online learning, was not perceived as equivalent as face-to-face learning in general, was perceived more flexible, was perceived to provide less opportunity to interact with instructor and peers, and to gain less knowledge as the mean score of items for each was 2.82±1.10, 4.49± 1.10, 3.17±1.13 and 3.36± 1.27 respectively. However, both were perceived to be relatively similar in terms of ease (3.79±0.8). The Table 1-5 showed the frequency and percentage of students' response to items on equivalence, level of interaction flexibility, knowledge gained and ease of online classes in comparison to face to face classes respectively.

Table 1: The frequency and percentage of students' response to items on equivalence

Compared to face-to-face classes	Students' response n (%)						
	extremely different	Very different	somewhat different	Neutral	somewhat similar	Very similar	extremely similar
I think online classes are.....	51 (27.3)	45(24.1)	65(34.8)	10(5.3)	15(8)	1(0.5)	0
I think online classes are.....	extremely not alike	very much not alike	somewhat not alike	Neutral	somewhat alike	very much alike	extremely alike
	33(17.6)	58(31)	49(26.2)	14(7.5)	24(12.8)	8(4.3)	1(0.5)

I think online classes are.....	extremely not equivalent	very much not equivalent	somewhat not equivalent	Neutral	Somewhat equivalent	very much equivalent	extremely equivalent
	18(9.6)	45(24.1)	55(29.4)	19(10.2)	43(23)	6(3.2)	1(0.5)
I think online classes are ...	Extremely not the same	very much not the same	Somewhat not the same	Neutral	somewhat same	very much same	extremely the same
	32(17.1)	55(29.4)	55(29.4)	15(8)	26(13.9)	4(2.1)	0

Table 2: The frequency and percentage of students' response to items on comparative level of interaction

Compared to face-to-face classes, I think I could	Students' response n (%)						
	extremely less	less	some-what less	neutral	Some-what more	more	extremely more
be...engaged in an online class.	24(12.8)	17(9.1)	57(30.5)	48(25.7)	25(13.4)	11(5.9)	5(2.7)
be...attentive in an online class.	27(14.4)	33(17.6)	54(28.9)	39(20.9)	16(8.6)	6(3.2)	12(6.4)
participate...in class discussions in an online class.	28(15)	22(11.8)	52(27.8)	46(24.6)	23(12.3)	7(3.7)	9(4.8)
be ...involved in an online class.	22(11.8)	16(8.6)	61(32.6)	53(28.3)	19(10.2)	7(3.7)	9(4.8)
have...chances to interact with the instructor in an online class.	32(17.1)	19(10.2)	51(27.3)	52(27.8)	22(11.8)	7(3.7)	4(2.1)
have...chances to interact with my classmates in an online class.	67(35.8)	29(15.5)	42(22.5)	33(17.6)	9(4.8)	4(2.1)	3(1.6)
be...willing to express my opinions in an online class.	33(17.6)	15(8)	45(24.1)	62(33.2)	24(12.8)	2(1.1)	6(3.2)
get to know ...about the instructor in an online class.	31(16.6)	27(14.4)	57(30.5)	53(28.3)	10(5.3)	1(0.5)	8(4.3)
get to know ...about my classmates in an online class.	54(28.9)	28(15)	44(23.5)	50(26.7)	4(2.1)	2(1.1)	5(2.7)
feel ...like a member of the class in an online class.	25(13.4)	25(13.4)	44(23.5)	76(40.6)	9(4.8)	2(1.1)	6(3.2)

Table 3: The frequency and percentage of students' response to items on comparative flexibility

Compared to face-to-face classes, I think online classes	Students' response n (%)						
	strongly disagree	disagree	more or less disagree	Neutral	more or less agree	agree	strongly agree
offer more flexibility in managing my study time.	7(3.7)	25(13.4)	15(8)	31(16.6)	29(15.5)	62(33.2)	18(9.6)
offer more flexibility in my study location.	7(3.7)	22(11.8)	15(8)	26(13.9)	30(16)	54(28.9)	33(17.6)
offer more flexibility in designing my own study agenda.	2(1.1)	20(10.7)	13(7)	36(19.3)	38(20.3)	58(31)	20(10.7)
offer more flexibility in organizing my study materials.	8(4.3)	26(13.9)	14(7.5)	36(19.3)	44(23)	43(23)	16(8.6%)
offer more flexibility in terms of deadlines.	13(7)	16(8.6)	36(19.3)	65(34.8)	42(22.5)	7(3.7)	8(4.3)
are easy to fit into my schedule.	8(4.3)	13(7)	29(15.5)	54(28.9)	54(28.9)	13(7)	16(8.6)
allow me to work at my own pace.	8(4.3)	10(5.3)	17(9.1)	52(27.8)	56(29.9)	18(9.6)	26(13.9)

Table 4: The frequency and percentage of students' response to items on knowledge gain

Compared to face-to-face classes, I feel I would	Students' response n (%)						
	Extremely less	less	Somewhat less	Neutral	Somewhat more	more	Extremely more
learn ...in an online class.	24(12.8)	18(9.6)	64(34.2)	48(25.7)	19(10.2)	9(4.8)	5(2.7)
understand ...in an online class.	19(10.2)	23(12.3)	59(31.6)	52(27.8)	24(12.8)	4(2.1)	6(3.2)
take awayinformation in an online class.	20(10.7)	26(13.9)	56(29.9)	51(27.3)	20(10.7)	9(4.8)	5(2.7)
gain ...knowledge in an online class.	18(9.6)	17(9.1)	61(32.65)	65(34.8)	13(7)	7(3.7)	6(3.2)
be ...motivated to learn in an online class.	31(16.6)	27(14.4)	51(27.3)	44(23.5)	22(11.8)	7(3.7)	5(2.7)
feel ... desire to learn in an online class	25(13.4)	27(14.4)	45(24.1)	53(28.3)	25(13.4)	6(3.2)	6(3.2)

Table 5: The frequency and percentage of students' response to items on comparative ease

Compared to face-to-face classes	Students' response n (%)						
	extremely more difficult	more difficult	somewhat more difficult	Neutral	somewhat more easier	more easier	extremely more easier
I think online classes are ...in general.	15(8)	18(9.6)	50(26.7)	44(23.5)	37(19.8)	12(6.4)	11(5.9)
I think online classes are...to get a high grade in.	17(9.1)	26(13.9)	44(23.5)	61(32.6)	26(13.9)	8(4.3)	5(2.7)
I think online classes are ...to follow.	17(9.1)	24(12.8)	65(34.8)	33(17.6)	28(15)	13(7)	7(3.7)
I think online classes have...assignments.	5(2.7)	11(5.9)	19(10.2)	109(58.3)	28(15)	8(4.3)	7(3.7)
I think online classes are...challenging. (reverse coding)	less	Fairly less	Somewhat less	Neutral	Fairly more	Somewhat more	more
	10(5.3)	9(4.8)	42(22.5)	55(29.4)	46(24.6)	14(7.5)	11(5.9)

Table 6: Correlation between the participants perception on online classes versus face to face classes using spearman correlation analysis

Items	General equivalence	Comparative flexibility	Comparative interaction	Comparative knowledge gain	Comparative ease
General equivalence	—	0.358**	0.452**	0.613**	0.483**
Comparative flexibility	0.358**	—	0.303**	0.455**	0.577**
Comparative interaction	0.452**	0.303**	—	0.67**	0.53**
Comparative knowledge gain	0.613**	0.455**	0.67**	—	0.66*
Comparative ease	0.483**	0.577**	0.532**	0.66**	—

** shows correlation is statistically significant with P<0.01

The correlation between the students' perception on general equivalence, relative flexibility, relative interaction, relative knowledge gain and relative ease of online learning done using spearman's correlation test is shown in Table 6.

DISCUSSION

In our study, students' perceived comparatively more flexibility in study time, study location, designing own study agenda, organizing own study materials and flexibility in terms of deadlines (overall mean 4.49 ± 1.10). They even perceived online learning to be easy to fit into their schedule and allowed them to work at their own pace. This finding was consistent with previous findings and was only perceived advantage of online learning.^{1,7,8,10} Online education can enhance students' educational learning experience, support development, ease time limitation, overcome geographical limitations and offer greater flexibility.¹⁰

In contrast to previous findings, online class wasn't perceived to be equivalent to face-to-face courses in general (2.82 ± 1.10) suggesting that the online classes were unable to provide satisfactory experiences for most students included in this study.^{4,11} Although the study respondents did not perceive online courses to be generally equivalent to face-to-face courses, they also did not perceive them easier (mean 3.79 ± 0.8), a finding similar to Platt et al.⁷ In a comparative study by Wiecha et al, improvement in educational performance among students learning online exceeded that of face to face learning suggesting at least equivalence, if not superiority, of the online method. Moreover, medical students were equally satisfied and online education was acceptable.¹¹ Similarly in another study, synchronized online classes were well-accepted by the medical students and most of the preclinical students even preferred online learning for the upcoming academic years.⁴ The perceived overall equivalence of online and face to face learning has been seen to increase with previous experience with online learning and with the number of online courses taken.^{7,12}

In our study, students' had the perception of comparatively less interaction with tutor and peers (overall mean 3.17 ± 1.13), which was consistent with previous study.^{7,8,13-15} Lack of or difficulty in interaction may be common even in the face to face lectures in large classroom and can be exacerbated in the online environment.¹⁵ The root cause of this learning experience might include lack of previous experience of online teaching, lack of training to engage students, lack of formal

training for online assessment and lack of awareness of the strategies to incorporate quizzes, polls, and mini assignments in the online teaching in order to keep the students engaged and making the lectures more interactive.^{16,17} A course designed for effective students' engagement including the seven principles for good practice in undergraduate education has been seen to be successful in the online learning environment. These principles states that the good instructional practice encourages contact between student and teacher, develops cooperation among students, encourages active learning, provides prompt feedback, emphasizes timely completion of assigned task, communicates the high expectations, and respects diverse talents and ways of learning.¹⁸ Traditional Lecture classes may be useful, in face to face classes, but may not facilitate engagement and interactions with tutor and peers in online environment.¹⁴ Failure to actively engage students promote distractions from the home environment and the current state of heightened anxiety and uncertainty likely made it even harder to maintain engagement.¹⁵ The students' engagement had been shown to be encouraged and promoted through online student response systems incorporating methods such as online real time polls, quizzes or small group discussion through breakout rooms and even monitoring a chat feed.^{1,19} Several other innovative teaching methods such as flipped classroom model, pre-recorded mini-lectures provided beforehand, micro-learning pedagogy, online question and answer sessions, clinical procedures and clinical examination videos and assessment in the form of multiple choice questions/case scenario-based questions has also been advocated to engage the students online.^{20,21} Consistent to previous finding, students' perception of comparatively less interaction was positively correlated to perception of comparatively less gain in knowledge.⁷

In our study, students' experienced less gain in knowledge which was consistent with previous finding.⁷ In contrast, the learning outcome of online learning has been seen to be comparable to face-to-face learning.^{5,22} Inês C. Moreira et al showed that e-learning can provide relevant knowledge gains.²² The study by Platt et al found that the students with less exposure to online courses perceived online learning environments as less conducive to learning and suggested that the previous experience with online courses affected the student perceptions of knowledge gained.⁷ Even if the students are exposed to the interactive lecture with the faculty, they may feel isolated from their peers, and remain in a state of distracting anxiety, thus reducing cognitive domain.¹⁵

Rhim et al in a review article provided five guidelines for designing online curriculum in the medical education context which recommended embracing experiential learning such as flipped classroom, accommodating both synchronous and asynchronous online learning to create a social presence as well as provide time for reflection, facilitating interactions among peers and facilitator through small group discussion in breakout rooms, promoting practice opportunities through online platforms in certain patient cases, and promoting a learning community to maintain a sense of a learning community even in an online environment. The adoption of online learning with application of these guidelines in the medical school may supplement the traditional medical education or even provide additional benefits in the new normal after the COVID-19 pandemic.²³

This study has its own limitation of sample population being from single institution. Hence, the result of this study lacks

generalizability.

CONCLUSION

The perception of students, who will be taking the online class, should be taken into consideration. The result of this study suggests that the students didn't find the online learning to be equivalent to face-to-face learning and the effective online learning experience is dependent on interactive sessions.

ACKNOWLEDGEMENT

We would like to thank Dr Ishwori Sharma Paudel, Professor in Department of Community Medicine, for his support in carrying out statistical analysis and interpretation of result.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

REFERENCES:

- Dost S, Hossain A, Shehab M, Abdelwahed A, Nusair LA. Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. *BMJ Open*. 2020;10:e042378. [\[DOI\]](#)
- Gaur U, Majumder MA, Sa B, Sarkar S, Williams A, Singh K. Challenges and Opportunities of Preclinical Medical Education: COVID-19 Crisis and Beyond. *SN Compr Clin Med*. 2020;2:1992-7. [\[DOI\]](#)
- Tang B, Coret A, Qureshi A, Barron H, Ayala AP, Law M. Online Lectures in Undergraduate Medical Education: Scoping Review. *JMIR Med Educ*. 2018;4(1):e11. [\[DOI\]](#)
- Khalil R, Mansour AE, Fadda WA, Almisnid K, Aldamegh M, Al-Nafeesah A, et al. The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: a qualitative study exploring medical students' perspectives. *BMC Med Educ*. 2020 Aug 28;20(1):285. [\[DOI\]](#)
- Pei L, Wu H. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Med Educ Online*. 2019;24(1):1666538. [\[DOI\]](#)
- Memon AR, Rathore FA. Moodle and Online Learning in Pakistani Medical Universities: An opportunity worth exploring in higher education and research. *J Pak Med Assoc*. 2018 Jul;68(7):1076-8. [\[PMID\]](#)
- Platt CA, Raile AN, Yu N. Virtually the same? Student perceptions of the equivalence of online classes to face-to-face classes. *Journal of Online Learning & Teaching* 2014;10(3):489-503. [\[LINK\]](#)
- Abbasi S, Ayoob T, Malik A, Memon SI. Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pak J Med Sci*. 2020 May;36(COVID19-S4):S57-S61. [\[DOI\]](#)
- Farooq F, Rathore FA, Mansoor SN. Challenges of online medical education in Pakistan during covid-19 pandemic. *J Coll Physicians Surg Pak*. 2020 Jun;30(6):67-9. [\[DOI\]](#)
- Reeves S, Fletcher S, McLoughlin C, Yim A, Patel KD. Interprofessional online learning for primary healthcare: findings from a scoping review. *BMJ Open*. 2017;7:e016872. [\[DOI\]](#)
- Wiecha JM, Chetty VK, Pollard T, Shaw PF. Web-based versus face-to-face learning of diabetes management: the results of a comparative trial of educational methods. *Fam Med*. 2006;38(9):647-52. [\[PMID\]](#)
- Wang C, Xie A, Wang W, Wu H. Association between medical students' prior experiences and perceptions of formal online education developed in response to COVID-19: a cross-sectional study in China. *BMJ Open*. 2020 Oct 29;10(10):e041886. [\[DOI\]](#)
- Gupta A, Shrestha RM, Shrestha S, Acharya A, Pandey N. Perception of BDS students of Kathmandu University on online learning during COVID-19 pandemic. *Orthodontic Journal of Nepal*. 2020;10:20-8. [\[DOI\]](#)
- Mather M, Sarkans A. Student Perceptions of Online and Face-to-Face Learning. *International Journal of Curriculum and Instruction*. 2018;10(2):61-76. [\[LINK\]](#)
- Seymour-Walsh AE, Weber A, Bell A. Pedagogical foundations to online lectures in health professions education. *Rural Remote Health*. 2020;20(2):6038. [\[DOI\]](#)
- Tuladhar S, Pradhan D, Parajuli U, Manandhar P, Subedi N. Study on the effectiveness of online classes for undergraduate medical and dental students of Gandaki Medical College during COVID 19 pandemic period in Nepal. *Orthodontic Journal of Nepal*. 2020;10(2):36-40. [\[DOI\]](#)
- O'Doherty D, Dromey M, Loughheed J, Hannigan A, Last J, McGrath D. Barriers and solutions to online learning in medical education - an integrative review. *BMC Med Educ*. 2018 Jun 7;18(1):130. [\[DOI\]](#)
- Crews TB, Wilkinson K, Neill J. Principles for good practice in undergraduate education: effective online course design to assist students' success. *Journal of Online Learning and Teaching*. 2015;11(1):87-103. [\[LINK\]](#)
- Muir S, Tirlea L, Elphinstone B, Huynh M. Promoting classroom engagement through the use of an online student response system: A mixed methods analysis. *Journal of Statistics Education*. 2020;28(1):25-31. [\[DOI\]](#)
- Verma A, Verma S, Garg P, Godara R. Online Teaching During COVID-19: Perception of Medical Undergraduate Students. *Indian J Surg*. 2020;1-2. [\[DOI\]](#)
- Major A, Calandrino T. Beyond chunking: micro-learning secrets for effective online design. *FDLA Journal* 2018; 3(1): 13. [\[LINK\]](#)
- Moreira IC, Ramos I, Ventura SR, Rodrigues PP. Learner's perception, knowledge and behaviour assessment within a breast imaging E-Learning course for radiographers. *European Journal of Radiology*. 2019;111:47-55. [\[DOI\]](#)
- Rhim HC, Han H. Teaching online: foundational concepts of online learning and practical guidelines. *Korean J Med Educ*. 2020;32(3):175-83. [\[DOI\]](#)