ORIGINAL ARTICLE

IMPACT OF COVID-19: FACULTY SUGGESTIONS REGARDING ONLINE MEDICAL TEACHING

Mashaal Sabqat[1], Anbreen Aziz[2], Tayyeba Iftikhar Mirza[3], Bushra Adeel[4]

[1]Department of Health Professions Education) National University of Medical Sciences, Islamabad-Pakistan
[2]Army Medical College, National University of Medical Sciences, Rawalpindi, [3]Foundation University Medical College, Islamabad,
[4]Rashid Latif Medical Complex, Lahore-Pakistan

Background: As a result of the SARS-CoV-2 related government lockdown, academic institutions in Pakistan, including medical and dental colleges and universities, had to forgo on-site classes and make an emergency shift to online teaching. This study explores the perspective of the faculty, as a key stakeholder, on ways to increase the effectiveness of online teaching and learning at these medical and dental colleges and universities. **Methods:** A descriptive cross-sectional qualitative survey was conducted in April–July 2020 in 32 medical and dental colleges of Pakistan. The sample size was not pre-determined and the participants included teaching faculty of both clinical and basic sciences. Data were iteratively collected and analyzed till data and time saturation were achieved. Thematic analysis of data was done by running two coding cycles. All authors ensured analytical triangulation by analyzing the data independently before developing consensus on the subthemes and themes. **Results:** One hundred and thirty-two medical teachers responded. Data analysis revealed three themes regarding suggestions to improve teaching methods improve assessment and increase the effectiveness of online teaching and learning. The participants suggested supplementing real-time classes with recorded lectures, providing broadband internet services, using assignment-based and active learning strategies, continuous formative assessment, faculty training, and standardization of online teaching by higher authorities. **Conclusion:** The current study offers actionable steps to decision makers at medical colleges and universities to make online teaching and learning more efficient and valuable, based on the suggestions from their faculty.

Keywords: SARS-CoV-2; COVID-19; Medical, Education; Online teaching; Recommendations

Citation: Sabqat M, Aziz A, Mirza TI, Adeel B. Impact of COVID-19: faculty suggestions regarding online medical teaching. J Ayub Med Coll Abbottabad 2022;34(2):304–8.

INTRODUCTION

Corona virus (SARS-CoV-2) originated in China at the end of 2019[1] and soon became a pandemic[2]. In Pakistan the first SARS-CoV-2 case was reported on February 26, 2020[3] with more than 516,000 confirmed cases till January 16, 2020.[4] Since the transmission of the virus is mainly interpersonal,[2] countries around the world including Pakistan took drastic measures to control the spread of this virus[5]. These measures included implementing lockdowns that pushed medical colleges and universities towards a transition to online teaching, as opposed to on-site. This transition was quite sudden, and thus the faculty and students experienced a number of challenges in adjusting to this 'new normal'.[6] These challenges stemmed from a lack of familiarity with the required technology, or access to them. Similarly many universities struggled due to the lack of infrastructure, resources and necessary planning to start online teaching with immediate effect.[3]

This experience with online teaching has made the importance of online teaching and learning evident to the stakeholders. Online teaching may prove to be an effective supplement or even alternative to in-person medical education.[7] Numerous studies show the inclination of stakeholders towards continuation of online teaching in the post Covid-19 era.[8,9]

It is thus the need of the hour to explore ways to overcome the challenges faced during online teaching to make it more effective. This study aims to take input from one key stakeholder, i.e., the faculty and explore their suggestions. This can in turn help the medical universities improve the delivery of online medical teaching and learning.

MATERIAL AND METHODS

A descriptive cross-sectional qualitative survey was conducted in April-July 2020 in different medical and dental colleges of Pakistan. Ethical approval was obtained from the Ethical Review Board of Foundation University Medical College (FUMC), Rawalpindi.

An open-ended qualitative questionnaire consisting of five items was developed. The questions were designed to obtain the participants' suggestions to improve online teaching. The questionnaire was piloted (n=10) to improve comprehension of the questions and to correct any technical errors. Minor changes were made and the final questionnaire was approved by all authors.

The study sample included teaching faculty from 32 public and private medical and dental colleges.

The sample size was not pre-determined. Maximum variation sampling strategy was employed. The questionnaire was disseminated via email. Moreover, snowballing approach was used though institutional WhatsApp groups. Data were iteratively collected and analyzed till data and time saturation were achieved.

The demographics of the study participants were analyzed by descriptive statistics whereas thematic analysis was used for qualitative data. In-vivo coding was done independently by all the authors to ensure analytical triangulation. A second cycle of coding was run to develop categories that were finally consolidated to form themes. The coding scheme was discussed among all the authors and a final thematic framework was agreed upon.

RESULTS

One hundred and thirty-two faculty members at different levels of seniority from 32 public and private institutions of Pakistan responded. By gender, the sample comprised predominantly of females (66%), while almost 78% of the participants were found to fall in the 30–49 age group (Table-1). Data analysis revealed three main themes with nine subthemes (Table-2).

The respondents expressed concerns about privacy and security on the different online teaching platforms, with some suggesting proprietary software development by universities instead. Also, to adapt to the online world, respondents suggested using active teaching strategies. They recommended supplementing real time teaching sessions with recorded lectures and slides that student could access on their own time, as well as videos or other more immersive tools like simulations of procedures wherever applicable. However, data analysis shows most respondents recommended focusing on cognitive skills in online teaching, and expressed concerns about the feasibility of teaching clinical skills online.

Many respondents were in favor of using high cognitive level E-assignments. They suggested employing continuous formative assessment which should be given weightage in final assessment. They further recommended using open book tests to increase self-learning capabilities in the students and time-bound well-structured MCQs test after each online lecture. According to them, such assessment strategies can ensure student attentiveness and improve learning.

Both basic and clinical sciences faculty recommended conducting seminars and workshops for faculty development and training regarding online teaching modalities and strategies. According to some faculty, engaging the students during online teaching sessions can be challenging for which they recommended short duration sessions, asking questions during the sessions, using real life cases and group activities. They further recommended reducing the cognitive load on students and workload on faculty to avoid added mental stress in already stressful circumstances induced by the pandemic. They also put forth the issue of internet availability and IT tools for both faculty and students. For the faculty, it was recommended that broadband internet services should be provided by giving them the option of recording/conducting their sessions in the college. For the students, they recommended reaching out to students in remote areas and ensuring the delivery of recorded teaching sessions via USB memory or a CD media.

Several quality assurance measures were recommended by the faculty. These included assigning a moderator for each teaching session, effective student-teacher communication by giving the students access to teachers' email addresses and standardization of online teaching by PMC and HEC. The also pointed out that many frameworks from on-site classes continue to add value to online classes, like adhering to fixed time tables, and seeking student feedback.

Table-1: Characteristics of study partic-1pants (n=132)

Characteristics		Frequency (N)	Percentage
Gender	Male	45	34
	Female	87	66
Age groups (Years)	20-29	11	8.3
	30-39	58	43.9
	40-49	45	34
	50-59	12	9
	60-69	6	4.5
Designation	Professor	25	18.9
	Associate Professor	27	20.5
	Assistant Professor	49	37.1
	Demonstrator	31	23.4
Workplace	Capital	61	46.2
	Punjab	40	30.3
	Khyber Pakhtunkhwa	22	16.6
	Sindh	9	6.8
Specialty	Basic Sciences	96	72
	Clinical Sciences	36	28
Total number of institutes = 32			

Table-2: Suggestions of faculty to improve online teaching and learning

Themes	Subthemes	Codes	Corresponding quotes
Suggestions for Online Teaching methods	Methods for teaching cognitive components	Flipped Classrooms	"There should be some flipped classroom kind of activities to make sure students are actively involved."
		Real-time lectures along with audio recorded PowerPoint lectures	"Online classes along with later on uploading of recording of the same lecture with audio is beneficial."
		Small group sessions	"Divide students into small groups for individual attention."
	Methods for clinical Skills teaching	Clinical skill teaching not possible	"Online teaching cannot be a substitute for normal teaching, and clinical teaching cannot be possible."
		Videos of procedures	..videos of clinical procedures can be uploaded.
		Video game simulations	"we could use some video game simulations to help them with the clinical skills."
		Virtual reality 3D atmosphere	"It should be more virtual reality 3D atmosphere in which one can feel physical presence of oneself and students."
	Apps/Forums for online teaching	WhatsApp	"We can have Zoom classes and WhatsApp group discussion."
		Zoom	
		Hangouts Meet	"student faculty direct interaction using Hangouts Meet program maybe or Skype…should also be done."
		Skype	
		Proprietary software development	"I think institutes should develop their own online teaching software as we experienced some distracting/unethical incidences on this zoom software."
Suggestions for Online assessment	E-assignments	Assignments of a higher cognitive level	"assignments should be given covering and assessing the cognitive portion of the course work."
	E-assessment	Continuous formative assessment	"..continuous formative assessments must be done online."
		Time-bound MCQs test after an online lecture	"MCQs test should be given after online lecture and should be submitted in time frame given to students."
		Open book tests	"open book tests to inculcate the concept of self-learning and development of interpretation and reasoning skills."
		Weightage in final evaluation	".online tests with their weightage in final evaluation can be helpful."
Suggestions to enhance effectiveness of online teaching and learning	Faculty development and training	Developing proper IT department and DME	Actually I think this COVID -19 outbreak should be taken as blessing in disguise as far as online teaching is concerned...This all can't be done without having proper IT and DME staff."
		Peer-assisted learning	"People with some online teaching experience should guide others."
		Online workshops and multi-institute seminars	"There should be an online session of faculty from different institutes and ideas should be shared how they are managing the online system."
	Enhancing student interest	Providing multiple learning resources	"They should be given along with enough resources such as videos and articles so that the concept is well understood."
		Short teaching sessions	"…small online sessions should be conducted."
		Asking questions during sessions	"Student participation and questioning and answering during lecture will be helpful."
		Adding real life cases	"…try to make your lecture interesting by adding real life cases…"
		Group activities and tasks	"…try to generate group activity."
		Avoiding overburdening for mental health	"…faculty and students and the institute should not be overburdened. We should also look into the effects on mental health."
	IT access and internet quality	Ensuring broadband internet availability	"Access to internet should be confirmed first and made clear as some people live in hostel and after lockdown, they have to shift to their home town in rural area, where facility of internet is very limited. So, we should keep this type of limitations in mind and improve accordingly."
		Provision of IT tools by institutes	"…colleges must…encourage them to keep personal tools like gadgets and internet devices. Colleges can offer these tools on loan or instalments."
	Quality assurance	Role of a moderator	"In selected cases a moderator in addition to teacher may be assigned for scheduling things recording attendance, maintaining discipline and give help to students."
		Recording of sessions in teaching institutes	"…faculty to be called in institution from where they can record their lectures on good quality audio and video using the institution's systems."
		Standardization by relevant higher authorities	"At university and PM&DC level centralized policies need to be prepared for university and country level uniformity and standardization if the crisis extends more than two months."
		Effective communication between students and teachers	"All aspects of communication among faculty and students need to be on the same platform. Having to use different platforms makes the whole process cumbersome, and less effective due to lowered willingness and compliance."
		Fixed schedule	"…should be conducted according to academic timetables."

DISCUSSION

The global SARS-CoV-2 pandemic has impacted different walks of life including education, and so medical education has also been affected. Consequently, the faculty at various medical and dental colleges in the country have had to quickly transition to an online paradigm of teaching.[7] In this study, we have explored the improvements they suggest as a key stakeholder in online teaching and learning.

According to the study participants, while there is no complete substitute for on-site learning for clinical skills, the effectiveness of online learning can still be assured for other topics like those in the cognitive domain, by adopting certain proposed strategies. In our study the participants suggested using active online teaching strategies like flipped classroom. A previous study validated the effectiveness of using flipped classrooms as an online teaching strategy for undergraduate medical students.[8] Additionally our study recommended supplementing real time sessions with recorded presentations to enable students to revisit the subject matter. It is interesting to note that another study that used students' perspective also recommended the use of both real time and recorded online sessions.[9] Such an approach additionally facilitates the students as they are adult learners requiring more flexibility in their schedules.[10] Our study recommended reducing the cognitive load on students during online teaching sessions for the psychological wellbeing of both faculty and students. This is corroborated by another recent study that showed how online learning can be impacted positively by decreasing the cognitive load and enhancing interest in order to keep students engaged.[11] The results of our study also suggest that online lectures should be of short duration, considering the attention span of the young generation that most students fall in. This finding is supported by the literature[12] which shows that the new generation of learners learns in a different way from their ancestors. They are used to getting instant responses thus reducing their attention span. Moreover a recent case study of Peking University recommended dividing the teaching content into smaller units for online teaching as it helps the students concentrate better.[13]

Our study results further show that faculty training can play a major role in overcoming the challenges faced by the medical teachers in terms of familiarity and use of various IT tools and online teaching platforms. This finding is confirmed by many other studies. According to one such recent study,[14] faculty development teams must find ways to meet the institutional need in helping their faculty develop skills to work and teach in an online environment in the current pandemic. With the rapid changes unfolding around us, there is a constant need to rapidly train and retrain people in new technologies, products, and services available within the environment.

The results of the current study showed that the universities and the institutes should ensure broadband internet availability for smooth online teaching and learning. In multiple other studies,[11,15] the participants believed that one of the major challenges with e-learning is lack of suitable internet access speed and recommended overcoming this challenge to allow active participation of faculty and students in the teaching and learning process.

Two schools of thought were found among our respondents regarding online teaching of clinical skills. Some were of the view that online clinical skills teaching was not possible and online teaching methods should focus on cognitive component of teaching only. However, some respondents suggested innovative methods like video game simulations and uploading procedural videos on online teaching platforms as a way to teach clinical skills online. The role of online videos in teaching procedural skills has been established by another recent study which has regarded online videos as a valuable educational tool for procedural skill.[16]

Assessment is a measure of student learning as highlighted by a recent article that sheds light on both asynchronous and synchronous methods of online assessment.[17] This article suggests assignments as an asynchronous method of online assessment as assignments can assess higher order thinking of the students. It further recommends using open book tests and MCQs as synchronous methods of online assessment. These suggestions resonate with the findings of our study where the teaching faculty has recommended using higher cognitive level E-assignments, open book tests and MCQs to enhance student learning during the pandemic.

Our study participants mostly belonged to medical and dental colleges of the Capital territory with fewer participants from some provinces of the country. Despite this limitation, this is a multi-center study and provides valuable insight into the ways that online teaching and learning can be made more effective.

CONCLUSION

During SARS-CoV-2, the struggle of the medical colleges of Pakistan to adapt to the sudden transition from on-site to online teaching has made the importance of online teaching evident to the stakeholders. The current study explored the opinions of the medical teaching faculty for different

improvement areas in this regard. The study participants agree that with the right investment in the relevant technology-related tools, infrastructure and training, online teaching can add much needed value. They also suggest using active teaching strategies as well as assignment-based and innovative assessment methods like open-book tests. These will enhance students' interest and make the teaching of both cognitive and clinical skills components not only possible but effective also. These strategies along with quality assurance measures can help our medical colleges and universities put online teaching modalities to best use.

Future studies should explore the perspective of the other key stakeholder, that is, the students for their recommendations to improve online teaching and learning.

Acknowledgement: The authors would like to acknowledge the contribution of all the study participants for their valuable time and suggestions.

Disclaimer: The abstract of this study has not been previously presented or published in any conference. It is not a part of any thesis or PhD project.

AUTHORS' CONTRIBUTION

MS: Idea of the research topic, literature search, questionnaire design, data analysis, write-up, drafting. AA: Data collection, review and feedback on data analysis. TIM: Review and feedback on data analysis, write-up. BA: Data collection, critical feedback, feedback on data analysis.

REFERENCES

1. Jones DS. History in a Crisis - Lessons for Covid-19. N Engl J Med 2020;382(18):1681–3.
2. Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. J Dent Res 2020;99(5):481–7.
3. Waris A, Atta UK, Ali M, Asmat A, Baset A. COVID-19 outbreak: current scenario of Pakistan. New Microbes New Infect 2020;35(20):100681.
4. Pakistan Coronavirus - Worldometer. [Internet]. [cited 2021 Jan]. Available from: https://www.worldometers.info/coronavirus/country/pakistan/
5. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. Int J Antimicrob Agents 2020;55(3):105924.
6. Li L, Xv Q, Yan J. COVID-19: the need for continuous medical education and training. Lancet Respir Med 2020;8(4):e23.
7. Newman NA, Lattouf OM. Coalition for medical education-A call to action: A proposition to adapt clinical medical education to meet the needs of students and other healthcare learners during COVID-19. J Card Surg 2020;35(6):1174–5.
8. Goh PS, Sandars J. A vision of the use of technology in medical education after the COVID-19 pandemic. MedEdPublish 2020;9(1):1–8.
9. Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. Pak J Med Sci 2020;36:27–31.
10. Sahu P. Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. Cureus 2020;2019(4):e7541.
11. Han PKJ, Piccirillo J, Gutheil C, Williams D, Wartak MM, Dufault C, *et al*. Development and Evaluation of an Online Risk Communication Teaching Program for Medical Students. Med Sci Educ 2016;26(4):557–67.
12. 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;36(COVID19-S4):S57–61.
13. Taylor DCM, Hamdy H. Adult learning theories: Implications for learning and teaching in medical education: AMEE Guide No. 83. Med Teach 2013;35(11):e1561–72.
14. Uukkivi A, Researcher I, Labanova O. E Learning Materials, Methods and Tools to activate Students E-learning. 2019; p.31–9.
15. Bao W. COVID-19 and online teaching in higher education: A case study of Peking University. Hum Behav Emerg Technol 2020;2(2):113–5.
16. Hodges C, Moore S, Lockee B, Trust T, Bond A. The Difference Between Emergency Remote Teaching and Online Learning. Educ Rev 2020;27(1):1–9.
17. Kumar S. Awareness, Benefits and Challenges of e-Learning among the Students of Kurukshetra University. Int j Inf Dissem Technol 2019;4(1):16–21.

Submitted: January 18, 2021	*Revised: May 17, 2021*	*Accepted: June 8, 2021*

Address for Correspondence:

Maashaal Sabqat, NUMS Campus, 968, Block C Police Foundation, Rawalpindi-Pakistan
Cell: +92 323 441 6575
Email: mashaal.sabqat@numspak.edu.pk