USE OF ONLINE SURVEY TOOLS TO CONDUCT ONLINE MEDICAL EXAMINATION DURING LOCKDOWN TIME

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ABSTRACT

Background: During these COVID lockdown days almost all universities in India are using online classes, webinars, and online survey tools for medical education and evaluation. But the effectiveness and acceptance of these by the medical students are unclear. **Objective:** To study the conduct and the perception of medical students towards online exam using online survey tools during lockdown time. **Methodology:** Study design - Descriptive study; Participants - Final year medical students (177 in total). Intervention - An online assessment using Google form is used to assess the basic demographics, online exams, and their perspective towards them. The same was repeated after 2 months of online exams to see the changes in their perspectives. **Results:** The mean age was 22.1yrs, 72.3% female, 79.7% Above Poverty Line (APL), 96% uses mobile phones out of which 94.9% had their own which later increased to 97.7%. 37.9% had problems mainly with network connectivity and power failure which later decreased to 22.5%. Initially, 92.7% could only complete the online exams but later with experience, it increased to 96.7%. According to the students, online exams were better and easier than traditional pen and paper exams with (p-value of 0.002 and 0.03 respectively). The fear of the home environment during lockdown influences their performance in online exams which got changed in time (p-value of 0.03).**Conclusion:** Online exams using online survey tools like Google forms are an effective means to conduct medical exams.

Keyword: COVID - 19, Medical education and examination, Medical students, Online survey.

INTRODUCTION

"The internet is becoming the town square for the global village of tomorrow," said Bill Gates. As medical education improves through times, newer, and improved methods of teaching and assessment are being used. From lecture halls with blackboards to video-assisted classrooms with interactive sessions, it is constantly evolving. In recent years, the mode of medical exams is also changing from pen and paper exams to online exams with the auto algorithmic assessment. During these COVID lockdown days, almost all the universities in India are using online classes, webinars, and online survey tools for medical education and evaluation. But the effectiveness and acceptance of these by the medical students are unclear.

The Novel Corona Virus Disease (COVID-19) outbreak was declared as The Public Health Emergency of International Concern on January 30, 2020 (**1**). It was later declared as a pandemic by the World Health Organization on March 11, 2020 (2). The government of India clamped a lockdown of the Nation on March 25, 2020 (**3**). On 23rd March 2020 Kerala University of Health Sciences, India advised all the affiliated medical colleges to conduct online classes and assessments to continue medical education during COVID lockdown. However, there were no guidelines or standardized protocols for the conduct of these classes or online exams. The traditional teaching methods face difficulties due to falling in routine clinical works, inability to conduct

medical and clinical examinations due to social distancing as well as students living away from medical colleges due to quarantine or lockdown (**4,5**). Major educational institutions like the Indian Institute of Technology Delhi, Jawaharlal Nehru University, and other universities have shifted their teaching-learning procedure online (**6**).

For a medical university or college from a remote or rural area, it is a Himalayan task to reach this level, especially during these COVID lockdown days. But as it is the student's education at stake, it is necessary to develop a reliable, cheap but effective online assessment tool to continue medical education in these times. Students from poor economic backgrounds will have a tough time if we focus our online medical education and assessment depending on their personal gadgets. In order to get universal acceptance, the mode of online education and assessment must ideally be free, reliable, safe, and accessible by any device. According to Vinesh Menon, Chief Executive officer of Education, Consulting, and Skilling of Indian Government, it is essential to have a structured approach and advisory by an education regulator to ensure an effective learning outcome (**7**). But there are only a few Indian or international studies examining online learning outcomes (**4,5**). Therefore, we conducted this study to assess medical students' perceptions regarding online evaluation via online survey tools.

Methodology

A descriptive study was conducted by the Department of Paediatrics, in a medical college hospital in a semi-rural area in Kerala from May 2020 to August 2020 after getting consent from the institutional ethical committee.

The study participants were the final year MBBS students of our medical college for whom regular online classes were started as soon as the college had to be shut down. A total of 177 final year MBBS students of both 2016 and 2017 batches were included in the study. Weekly tests were conducted by the Department of Paediatrics every Saturday on the topics taught in that week. The selection of the online survey tool was done by the faculty with the consent of the Head of Department. After 2 online tests, an assessment form using the online survey tool Google form was given to the students. The validated questionnaire used close-ended questions with multiple choice answer options, with an option

to write down; if it was none of the options. The questionnaire included details on basic demographics followed with prerequisites necessary for attending the online examinations, like the availability of electricity, internet, and gadgets for the same. Students were also asked 10 dichotomous questions related to their perception of the online exams. The same questionnaire was used again after 2 months of online teaching and evaluation to see whether the acceptance increased with increasing experience.

Medical students who could not take the survey due to logistical reasons were to be excluded from the study. After obtaining informed consent the study participants fulfilling the inclusion criteria were asked to fill in the questionnaire online through google forms. The data collected was analysed and reported. Statistical analysis was done using SPSS version 23. Results were represented as percentages and the Chi-square test was used to find the proportions at a 95% confidence level. A P-value of less than 0.05 was considered statically significant.

Results

A total of 177 students responded to the survey. The mean age of the study population was 22.1 years. Female students comprised around 72.3% of the study population. 79.7% of the students belonged to the above poverty line (APL). Among the respondents, 88.1% had previous experience with online medical exams. 96% of the students used mobile phones to participate in the online exams, out of which 94.9% had their own mobile phones. By the time of the repeat assessment, 97.7% had their own mobile phones. 75.7% were using their mobile data while 21.5% were using broadband facilities for their internet needs. Around 15.8% had access to both and the rest were using other modes for internet connection. 62.1% of the students could attend the online classes without any problems, but 37.9% had problems. By the time of repeat assessment, the number decreased to 22.5%. The main barrier faced were problems with network connectivity and power failure. 92.7% had enough time to complete online exams and by the repeat assessment, the number increased to 96.7%. 6.2% had skipped online medical exams due to personal reasons. Perception of students towards online exams in Table 1.

Students perception towards online exams (Table 1)

No.	Question	Response in May		Response in July		P
		Agree	**Disagree**	**Agree**	**Disagree**	
1	Online exams are better than traditional pen and paper exams	49.1%	50.9%	71%	29%	0.002
2	It is easier for a malpractice in an online exam	56%	44%	52%	48%	0.3
3	It is difficult for a medical student to participate in an online exam due to poor experience or lack of knowledge of technology	39%	61%	44.4%	55.6%	0.5
4	Your home environment during lockdown influences your performance in online exams	62.2%	37.8%	47.6%	52.4%	0.03
5	It is not fair to assess a medical student in online exams as there is always a provision for autocorrection and other helping tools in the devices	59.3%	40.7%	59.6%	40.4%	0.9
6	Online exams are easier than traditional pen and paper exams to score	58.2%	41.8%	74.4%	25.6%	0.03
7	Open book online exams are better for medical education	49.7%	50.3%	47.3%	52.7%	0.7
8	MCQs in online exams are better than short note/ essay questions in traditional exams	69.4%	30.6%	61.9%	38.1%	0.8
9	Online exams using google forms with automatic assessment eliminates examiner bias	66.8%	33.2%	63.4%	36.6%	0.5
10	Google forms is easy to use and reliable online survey 10tool.	66.1%	33.9%	68.4%	31.6%	0.7

P value of less than 0.05 is significant.

DISCUSSION

Unprecedented times require unprecedented measures. The world has braced itself for the pandemic of COVID-19 caused by the novel virus SARS-CoV-2. India too took extraordinary measures to prevent and control it by social distancing and lockdowns. This dramatically impacted medical education, as all the medical colleges in India, stopped classroom teaching, and started online education. However online exams and assessments are still a problem in many medical colleges as there is no structured approach or regulations to ensure an effective learning outcome.

Imperial College London took an unsupervised online medical exam from home for their final year students, possibly first of its kind during COVID 19 pandemic. It has put 280 sixth-year medicine undergraduates through two online exams (**8**). Oxford University conducts more than 160 online assessments for a total of over 17,000 of their students. Over 50 of these are formal university exams. They have reliable servers, necessary hardware, and software to conduct these in the university premises itself (**9**). The main drawback of online exams is the cost and its inherent reliability on technologies. Lack of reliability can relate to the hardware, software, or even the power supply (**10**).

It is necessary to have a reliable, cheap, easily accessible but effective online assessment tool to continue medical education in these desperate times (**7**). Our study is one of the first studies in COVID pandemic lockdown time to assess online evaluation in Paediatrics using the online survey tool (Google Form) in India. We used Google forms as it is free, reliable, effective, and easily accessible with mobile phones, laptops, computers, or other devices. It also allows auto assessment once the answer key is created and this automatic grading reduces the work of correcting answer papers. Studies like ours will help identify the problems associated with online examinations and improve medical education for a better tomorrow.

Rafi et al conducted a recent study in an urban medical college in Kerala to find the barriers and

perceptions of undergraduate students regarding medical education in this COVID 19 lockdown period **(11)**. The mean age in that study was 21.2 years while it was 22.1 years in ours. 72.3% were female students in our study while it was 69% in theirs. 79.7% of our students were from good economic backgrounds like Kumar LR et al study conducted at Yenopoya University in Mangalore **(12)**.

In our study, 96% of the students used their own mobile phones and 75.7% used mobile data to participate in the online exams. It was 89% and 72.8% in Rafi et al study. At first, 37.9% of the students in our study had problems with online examinations mainly due to network connectivity and power failure. But as we are from a developing country these problems were expected as seen in Walsh et al study **(10)** and Rafi et al study, in which 43.7% had network connectivity problems and 13.8% had problems due to power failures **(11)**. By the time of the repeat assessment, the use of their own mobile phones increased to 97.7%, and the problems in online examinations decreased to 22.5%. This could be explained by the fact that with the increased use of their own mobile phones, the problems arising due to power failure and network connectivity decreased. With experience, more of them could able to finish the exams in time, from 92.7% to 96.7%.

We studied whether the perspective of the medical students changed with experience, with regard to online exams. Initially itself most of the students thought online exams would not be difficult for them even if they don't have prior experiences (61%). Students also thought that it would not be fair as there is provision for autocorrection and other helping tools within most devices (59.3%), but western studies like Petrisor et al shows 70.4% think online exams are more secure **(13)**. In our study 58.2% of students found online exams easier, 66.8% felt online exams reduce examiner bias and 69.4% thought MCQs are better than traditional pen and paper exams, which didn't change statistically in the repeat assessment. Similar results were found in Petrisor et al study where 69.6% of students found online exams are better suited for determining theoretical knowledge and 74.2% thought it is more objective **(13)**.

The student's perception that online exams were better and easier than traditional pen and paper exams got stronger with repeat experience with statistical significance (49.1% to 71%). Most of the students fear that their home environment during lockdown would influence their performance in online exams, got changed with repeat experience with statistical significance (62.2% to 47.7%). In our study as well as Petrisor et al study it has been found that the acceptance increased with experience **(13)**.

Limitations of the study. The study was conducted in a private medical college in Kerala. As a result, there may not be an adequate representation of the challenges faced by economically backward students in participating in an online exam. The gender ratio is skewed for females. Medical students who could not take the survey due to logistical reasons were to be excluded from the study. However, not a single student needed to be excluded on these grounds. Kerala is one of the two states with the highest network connectivity even in rural areas because of which it was relatively easy to conduct the online exam.

Amidst all uncertainties or pandemics, medical colleges and universities are obliged to continue the medical education and assessments to give academics a sense of direction and credibility for a better future **(14)**. Studies like this help to make a structured approach and regulations in the future.

CONCLUSION

Online exams using online survey tools like Google forms are an effective means to conduct medical exams in this pandemic situation and hence able to conduct medical education without any hindrance. In order to get universal acceptance, the mode of online education and assessment must ideally be free, reliable, safe, and accessible by any device. Universities and colleges need to provide Wi-Fi access and power back-ups in hostels and campus if we need to shift to online examinations in the near future.

What is already known: The world is shifting towards online education and evaluation especially in lockdown time.

What this study adds: Online exams using online survey tools like Google forms are an effective means to conduct medical exams in this pandemic situation

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