

Perceptions of undergraduate medical students towards online theory assessment

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Abstract

Background and objective: The COVID 19 pandemic has had its impact on all aspects of life globally, and medical education was no exception. As E-learning and assessment became the new norms in education under this scenario, the Medical Education Department of a teaching hospital under a deemed university felt the need to study the satisfaction and usefulness of online assessment, as perceived by the undergraduate medical students.

Method: This was an observational study. A questionnaire based survey developed by the faculty members of the Medical Education Department was content validated and reliability tested using Cronbach's alpha. Based on the pilot conducted the sample size calculated was 26 but we could get responses from 178 students covering four phases of undergraduate medical course. The questionnaire was administered as Google forms to the study subjects. Statistical analysis was done using IBM SPSS 20 (SPSS Inc, Chicago, USA).

Results: More than half of the participants were moderately satisfied with the current online modalities and felt it was useful in assessing their knowledge level. But majority opined that online assessment was not useful in testing their clinical and practical skills.

Conclusion: Despite many practical challenges faced during online assessment like network and connectivity issues, students have accepted it as the way forward. Though a good majority of them have found the present methods quite satisfactory, they have put forward suggestions, like having a greater number of MCQs and Viva-voce and automatic time out sessions to improve the fairness and quality of online assessments.

Key words: Medical education, medical students, online learning, perception, questionnaire.

Introduction

The Covid-19 pandemic has taken the world by storm since March 2020. It has had major impact on all aspects of life across the globe, including medical education. With the necessity of social distancing as the main preventive strategy, medical education has been seriously disturbed, as it involves in-person didactic lectures and tutorials, clinical rotation exposure, laboratory experiences and observing and assisting relevant medical and surgical procedures^[1,2]. In this situation, the importance of e-learning and assessment becomes paramount. Failure to modify established methods of teaching and assessment would result in significant long-term impact on

the educational trajectory and/or potential career progression for students across the world^[3].

Challenges to online medical education include those related to the use of technology, problems in communication, lack of prior exposure to online teaching, and student assessment. Since assessment drives learning and plays a key role in evaluating competence and ensuring quality in medical education, the need for valid and reliable online assessment tools cannot be overemphasized^[4]. Our institute too had to resort to online assessment methods mainly for theory evaluation. We conducted both formative and summative assessments which included viva voce, MCQs and three hour written

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exams in the online mode. Online assessment raises several challenges including ensuring honesty and fairness from the part of the students, internet issues, to name a few. While several medical schools adapted themselves by conducting exams in a heterogeneous fashion by delaying examinations or using aggregate scores from previous formative and summative assessments, some have even resorted to open book online examinations. At Agha Ghan University in Pakistan, assessment of student learning was conducted with proctored online examination from home, after pilot testing^[5]. Apart from significant student engagement and attendance; they received promising feed-back from the students as well. However, some of the studies, such as the ones conducted by Noradila Iskandar, Nishantini Ganesan et.al on students in University of Malaysia have reported that both undergraduate and postgraduate students preferred traditional assessment than online assessment^[6]. Though there is good experience in e-learning and assessment in medical education in the western world^[7,8] the same is not true about developing countries such as ours. There are very few studies from our part of the world which seek to assess the perception of medical students towards online assessment. Our study was done among different phases of undergraduate medical students who were subjected to different modes of online theory assessment unlike in other studies conducted earlier. Since we must anticipate similar situations in future, online assessments will soon become a part of the curriculum and as improvement in assessment modalities is essential to better the performance of students, we conducted this study to determine the level of satisfaction and usefulness of online assessment as perceived by undergraduate medical students.

Materials and Methods

This was an observational study conducted by the Medical Education department of a teaching hospital in South India. The study proposal was presented in the Institutional Review Board. It was approved (ECASM-AIMS-2021-367), but exempted from Ethics Committee review as it belonged to one of the exceptions viz. 'Comparison of instructional techniques, classroom methods and curricula', in accordance with Section 4 (sub-section 4.8) of the ICMR (Indian Council of Medical Research) Guidelines for Biomedical Research.

The questionnaire used for the study was developed by the medical education unit. The questionnaire was sent to five faculty members of the teaching institute for content validation. Content validity

analysis was done followed with reliability analysis (72.3% Cronbach's alpha) from the pilot study results of 10 samples. A pilot study was done to arrive at a sample size and to check if any modification in the questionnaire was needed. The pilot was done on ten students representing each of the four phases of the MBBS course.

Based on the Mean and SD of perceived level of satisfaction 6.60 ± 1.713 with the online theory assessment modalities in subjects observed from the results of pilot study conducted in 10 samples (from four phases) and with 10 unit relative precision and 95% confidence the minimum sample size comes to 26.

Questions 14 and 15 in the questionnaire were used for sample size calculation. The questionnaire was administered as Google forms to students belonging to all the four phases of the MBBS course. All students who were willing to participate in the study and had given online test at least once were included and those who were absent at the time of the study and who had not attended an online test were excluded. They were given a period of two weeks to submit their responses. The questionnaire consisted of 20 items, divided into 4 sections. The first section comprised of questions related to the modalities of online assessment that the students had been subjected to, and the technical difficulties they faced. The questions in the second session were targeted at the advantages and disadvantages of giving online examination from home when compared to offline classroom examination, while the third section was based on the overall perceived level of satisfaction of the students regarding online assessment. The response to questions in both these sections was rated on a five-point Likert scale. There were three questions in the fourth section which targeted the main objectives of the study. The responses to these were categorized into low, moderate and high for the purpose of statistical analysis. The last section had open ended questions. All the questions were mandatory. An introduction and consent form were attached along with the questionnaire.

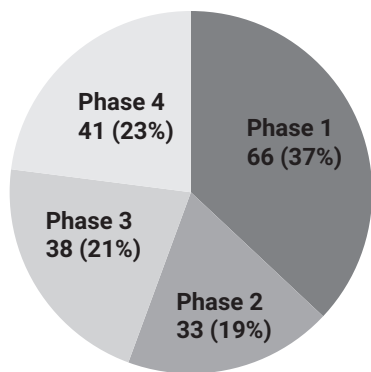
Statistical Analysis

Statistical analysis was done using IBM SPSS 20 (SPSS Inc, Chicago, USA). For all the categorical variables represented as number and percentage, Mean & SD of perceived level of satisfaction and usefulness of the online theory assessment modalities was computed. To test the statistical significance of difference in the proportion level of satisfaction and usefulness of online theory assessment modalities among different phases of undergraduate medical

students' chi-square test was used. A p value < 0.05 was considered as statistically significant.

Results

Out of the total 400 students to whom the questionnaire was sent, 178(44.5% response rate) responded. The minimum sample size required was 26 but we got 178 responses. The phase wise responses are shown in figure 1.



The first question in our questionnaire was regarding the types of assessments the students had been subjected to. Of the total 178 participants, 117(65.7%) of the participants had given written exams, MCQs and viva voce in online mode, 21(11.8%) were exposed to written exams and MCQs, 19(10.7%) had only online written exams while 15(8.4%) had online written exams and viva voce. For the question related to technical difficulties faced during online assessments, 61(34.3%) students listed network / connectivity issues, the need to use two different devices for monitoring and submission, and difficulty in uploading and submission of answer sheets as their major areas of concern. Repeated requests to keep adjusting the camera, poor image upload quality, frequent crashing of the main servers to which answer sheets are uploaded, were few other difficulties mentioned.

The responses to questions 4, 5, 6, 7, 8 are given in table 1.

Table 1: Comfort level of students regarding online assessments.

Criteria	Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree
Giving online exam from home was more distracting than offline assessment	58(32.6%)	23(12.9%)	48(27%)	34(19.1%)	15(8.4%)
The online exam was less stressful due to the comfort of attempting from home	52(29.2%)	21(11.8%)	48(27%)	43(24.2%)	14(7.9%)
Interaction with invigilators during online theory exam was more difficult than in a classroom	73(41%)	25(14%)	50(28.1%)	21(11.8%)	9(5.1%)
Instruction/s given to individual students by the invigilator during online theory exam was more distracting than during offline exam	56(31.5%)	25(14%)	55(30.9%)	32(18%)	10(5.6%)
Time factor was less of a concern during online theory/ MCQ exam as compared to classroom	36(20.2%)	44(24.7%)	72(40.4%)	13(7.3%)	13(7.3%)

These questions were directed primarily at the comfort level of students during online exams. More than half of the participants (32.6% agreed and 19.1% strongly agreed) felt that giving online exams from home was more distracting than offline assessment. But 53.4% of them felt that online assessments were less stressful when attempting from home. Interaction with the invigilators was felt to be more difficult during online exams by 54% of the students and 45.5% of them felt distracted by the invigilators' instructions to the other students. 24.7% of the students felt that time factor was a concern during online theory/ MCQ exam as compared to classroom; whereas 20.2% felt

otherwise and 40.4% remained neutral. Question 9 was related to online viva being more comfortable due to physical absence of examiner for which less than half of the students answered in the affirmative.

The responses to questions 11, 12 and 13 are given in the Table 2.

Table 2: Perception of students regarding fairness of online assessment.

Criteria	Agree	Disagree%	Neutral%	Strongly Agree	Strongly Disagree
Chances of copying/ malpractice are more during online assessment	76(42.7%)	13(7.3%)	29(16.3%)	46(25.8%)	14(7.9%)
Fairness of evaluation in online assessment is a significant area of concern	70(39.3%)	10(5.6%)	56(31.5%)	36(20.2%)	6(3.4%)
The present online assessment system is likely to affect my academic progress	62(34.8%)	13(7.3%)	69(38.8%)	29(16.3%)	5(2.8%)

38% of the students agreed that there was temptation to use unfair means during online MCQ tests and more than half the students agreed that chances of copying are more during online assessment. A large majority of students (59.5%) also had concerns regarding fairness of evaluation in online assessment. 62% of the students believed that the present online assessment system will affect their academic progress. There

was no significant difference in this opinion among different phases of students.

Regarding their satisfaction level with online assessment 23.03% were highly satisfied, 65.73% were moderately satisfied and 11.2% were least satisfied. The satisfaction levels were compared among the students belonging to different phases of the course (Table 3),

Table 3: Level of satisfaction of online assessment among different phases of medical students

		Phase I n=66 (%)	Phase II n=33(%)	Phase III n=38(%)	Phase IV n=41(%)	p value
Satisfaction level	Low	7 (10.6)	3 (9.1)	5 (13.2)	5 (12.2)	NS
	Moderate	43 (65.2)	22 (66.7)	23 (60.5)	29 (70.5)	
	High	16 (24.2)	8 (24.2)	10(26.3)	7 (17.1)	

but there was no significant difference in this regard. 56.7% of the students felt that online assessment was moderately useful, 22.5% felt it was highly useful and 20.8% felt it was least useful in testing knowledge of students. There was no significant difference on the utility of online assessment among the different

phases. Regarding the assessment of clinical and practical skills, 53.9% of the subjects felt that it was least useful. This perception of the utility of online assessment in judging the clinical and practical skills, differed significantly (p value=0.004) among the different phases of medical students (Table 4).

Table 4: Perception of different phases of students regarding usefulness of online assessment in testing Clinical and Practical skills

Usefulness	Phase I n=66 (%)	Phase II n=33(%)	Phase III n=38(%)	Phase IV n=41(%)	p value
Low	23 (34.8)	18 (54.5)	24 (63.2)	31 (75.6)	0.004
Moderate	36 (54.5)	12 (36.4)	12 (31.6)	9 (22)	

The difference was maximum between phase 4 and phase 1 students. While the former felt that the utility was limited, the latter group did not find it a matter of concern. The (Mean±SD) from the primary analysis for satisfaction level with online assessment was 6.06±2.037, for usefulness of online assessment in testing knowledge of student was 5.66±2.365 and for usefulness of online assessment in testing practical and clinical skill of student was 3.63±2.407 observed from 178 students.

MCQs were preferred by 38.8% of the subjects, while 37.6% preferred viva-voce. The students were unanimous in their opinion that writing exams from their homes was the biggest advantage of online assessment as it reduced their exam related

stress. The need for travel to the examination hall was also eliminated, thereby saving time for last minute revision. Network issues, the need to use two devices, one for monitoring and the other for viewing the question paper, difficulty in uploading and submission of answer sheets and higher chance for malpractice were the disadvantages of online assessment listed by majority of the participants. The major suggestions given by the students to improve the online assessment efficacy and fairness included opting for more MCQs and Viva, reducing the duration of each examination and incorporating time-out features to automatically close the answer sheet submission time.

Discussion

Formative and summative assessments form the backbone of medical education. Effective assessment should incorporate tools to assess the cognitive, psychomotor, and communicative skills of students. Until the recent COVID pandemic, classroom and/or bedside based assessments were the norm. However, the past 2 years have witnessed a sea of change in medical education, with the focus shifting to online teaching and assessments. While both the teacher and student community were quick to adapt themselves to online teaching, online assessment continued to be an uphill task. At our institute, we have been conducting various modalities of online assessments for the different phases of medical students, over the past 2 years. The general feedback was that of dissatisfaction. Hence, we felt the need to identify and rectify the lacunae in our current methods.

Many of the participants in our study agreed that the current online assessment methods are indeed useful in testing their knowledge. This was in concurrence with the study conducted by Snehalatha et al.^[4] However more than half of them felt that clinical and practical skills were not accurately gauged by these assessment modalities. A similar study by Rafi et al.^[9] also concluded that online modes of assessments did not do justice in testing practical skills. The students belonging to the first and second phases of medical education, who have relative lesser practical skills to be assessed, did not find this a problem.

MCQs and Viva were equally preferred by the study subjects. The former was preferred in view of the ease of submission (compared to scanning and uploading answer sheets) and as they served as a practice session for future competitive exams. This was akin to a study conducted by Rajani et al.^[10] among undergraduate medical students at Oman Medical College, where 54% of the participants agreed that MCQ type of e-assessment added value to their learning as it promoted critical thinking and not just recall. The importance of well-constructed, valid, and reliable MCQs is the key. The subjects who preferred Viva, justified their preference by mentioning that online viva-voce gave more opportunity for student teacher interaction and immediate feedback.

Studies by Latha Rajendra Kumar et al.^[11] and Fathima et al.^[5] have also reported network connectivity issues to be one of the main hurdles in online assessment which is in agreement with our study as well. Internet connectivity issues or lack of tech-savviness leading to problems in uploading the answer sheets and submitting them online, were also a matter of concern

to a good number of students.

Chances of copying and malpractice were perceived to be more during online assessment by most of the students. The fairness of evaluation was a matter of concern and hence, a good number of them felt that it would affect their academic progress. However, considering the need of the hour, the comfort of writing examinations from home and the fact that online assessment did justice in testing their knowledge, our students were overall, satisfied with the present system. In fact, an increasing number of recent studies have reported a trend of preference for e-assessment over paper-based assessment^[12].

This study was particularly useful from feedback aspect, as some specific suggestions could be obtained from the main stakeholders, the students.

Conclusions

In the present study, the experiential perception of medical undergraduate students regarding online assessment was that the current methods are quite satisfactory despite having several practical challenges like network and connectivity issues. They have put forth suggestions which include, having greater number of MCQs, Viva-voce and automatic time-out sessions to improve the fairness and quality of these assessments.

Recommendations

Medical faculty to be given hands on training in information technology and how to utilise it for medical education so as to explore newer modalities in online assessment.

Limitations

The limitations of the study were that, it was conducted at a single centre and with a small sample size.

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