



ONLINE FORMATIVE ASSESSMENT IN PHYSIOLOGY DURING CORONA PANDEMIC. BOON OR BANE FOR MEDICAL STUDENTS ?

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ABSTRACT This cross-sectional descriptive study was conducted on 137 first year MBBS students (70 females and 67 males), in the age group of 17-21 years, by administering a pre-tested questionnaire via Google forms. The aim of the study was to get a feedback on the online tests (both objective and subjective) taken in Physiology during the lockdown period as formative assessment plays a key role in improving the learning and teaching abilities of the students and teachers. The study found that most of the students (92%) were somewhat aware of the online assessment methods even before the lockdown. 20.43% of the students expressed their likability and 27.7% of students felt that it was extremely helpful in adding value to their education. In conclusion it was found that online formative assessment had many positives especially during Covid 19 pandemic as it was less stressful, more comfortable, got quick results and was unbiased. Few respondents complained though that it was not completely secure leading to adoption of unfair means. E-assessment did have its own disadvantages like adjusting to new system of learning, internet connectivity, loneliness and lack of assessment of practicals/ Labwork which have a high weightage in the MBBS curriculum. E-evaluation is promising though and can be adopted in a blended form in the future. One of the limitation of the study was that the sample population had been drawn from a single, private medical college, so cannot be generalised. More work needs to be done in this direction.

KEYWORDS : formative assessment , online exams , medical student , covid 19, physiology

INTRODUCTION:

Traditional classroom-based learning is shifting to online mode in a compulsive environment where there is complete or partial shutdown across the world. Students have been asked to attend online classes or use communication technologies like hangout, skype, online videos for continuing their learning. Closure of traditional learning is getting compensated partially by online learning. However, the examination process is one of the critical aspects of the academic cycle. The right evaluation of students is essential to understand the progress of the student in terms of knowledge gained, conceptual understanding of the subject or topic, more so when it comes to professional education. MBBS as a course has always adopted the traditional examination process which is not possible in the present scenario. Even if the students are allowed to give the final exams in campus setup, formative assessment has to be done for the students to be able to sit for the final exam. Moreover with the latest medical council of India guidelines stating not to promote students without conducting exams and that too within two to three months of coming to the Institutions. (1) the students have to be made ready to sit for the exams. Institutes need to identify and adopt new ways and means to conduct the exams for the formative assessment of the students (2). Without conducting secure exams academic year would become meaningless and motivation for learning might get diminished for the students. The intention of conducting this study was taking a feedback on online formative assessment and in turn make the students exam ready as much as possible before coming to the campus.

MATERIAL AND METHODS

It was a cross-sectional questionnaire-based study carried out in a private medical college set up in Uttar Pradesh. The study was done after six months of students taking to online classes to get an appropriate response from the participants. After a brief pilot study one hundred and fifty 1st Year undergraduate MBBS students were included in the study. A standard questionnaire (3), consisting of 29 questions which were 4 awareness based, 15 process based, 8 outcome based, and 2 opinion/suggestion based were sent via a link in google forms with a time limit of 72 hrs. The aim of the study was to get a feedback from students about the various assessments they were exposed to during the past six months of lockdown period. The

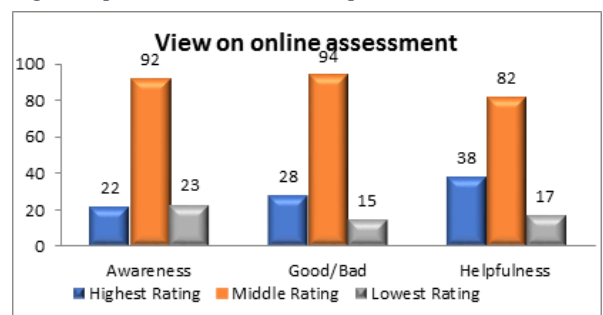
assessment methods taken into account were of three types i.e objective questions (MCQs) through google forms given weekly, Subjective questions via email initially weekly and then daily and face to face online viva through whatsapp videochat twice. 137 responses out of 150 were received until the deadline period. Two of the students could not participate due to ill health. Rest did not wish to participate due to various reasons. Data thus received was analysed (Microsoft excel) and the observations and result were expressed in the form of tables, graphs and charts.

OBSERVATIONS AND RESULT

In the present study out of 137 students in the age group of 17-21 yrs, 67 (49%) were males and 70 (51%) were females. The questions were divided into four categories and the responses were displayed accordingly in tabular form. **Table 1, 2 and 3** show the absolute values of the 137 responses.

As displayed in **Table 1**, we found that most of the students were aware of the online classes and assessments before Covid 19. Only 16.7% of the respondents were not in tune with the online methods. 88.8% of the students even liked the idea of online assessment. 27.7% of students felt it was very helpful in adding value to their education. Although more than 97% felt that online classes were beneficial, a small percentage (2.9%) felt that it was not at all helpful with regard to the learning. **Fig 1** shows the views on online classes.

Fig 1 : Response to awareness related questions



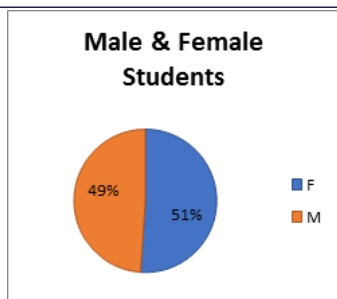


Table 1

Questions based on awareness about online assessment		Response		
		Males (67)	Females (70)	Total (137)
How aware were you about online evaluation methods before Covid 19	Very much aware	13	9	22
	Somewhat aware	43	49	92
	Not aware at all	11	12	23
How do you like the idea of online assessment	Very good	15	13	28
	Good	46	48	94
	Bad	6	9	15
How helpful do you think online assessment is in MBBS as a course	Very helpful	23	15	38
	Somewhat helpful	36	46	82
	Not helpful at all	8	9	17
How helpful do you think were online classes of Physiology for you to score well in the tests?	Very helpful	30	40	70
	Somewhat helpful	34	29	63
	Not helpful at all	3	1	4

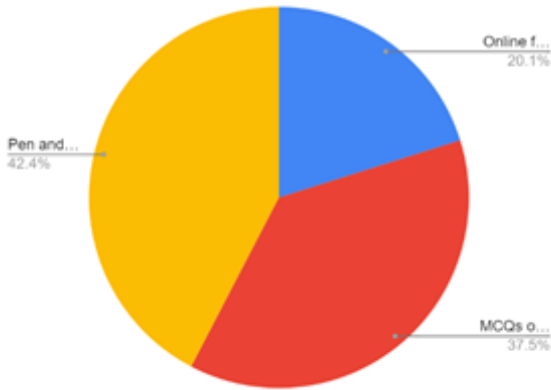
Table 2 displays the responses of the participants to the questions which were related to the process of the evaluation. Regarding the attendance in tests 75.9 % students appeared in all online MCQ tests . Female students had a better attendance (84.28%) in comparison to male students (67.16%) . Online viva through whatsapp had an overall high rate of attendance (92.7%) with male students(88.05%) and female students (97.14%). Overall absentee rate was only 2.18 % . Regarding the subjective online assignments, 43.79% of students submitted all assignments on time and 48.17% of students submitted 80% on time. Only 8% students submitted less than 50% of assignments on time. Respondants found face to face to face online viva more challenging in comparison to subjective assignments and MCQ tests .The students had a mixed reaction when it came whether they had enough time to prepare .37.9% students agreed that they got enough time for preparation whereas 47.44% was doubtful about it . For most of the students the single most important reason for appearing for the tests was either self evaluation (48.9%) or for scoring better in internal assessment (45.9%). Other reasons were peer pressure , fear of teacher or to have better attendance . Most students found the tests to be lengthy (47.44%) but some students were comfortable with the questions (35.7%). 8% found the paper to be difficult . Most of the students gave their assessments from the comfort of their homes (86.12%) with good internet connection (83.93%). 16.05% complained that they had consistent internet issues . 49.6% students agreed that the quality of both audio and video in face to face online was good. Stress during the tests were present but was manageable (91.96%) .8% claimed they had no stress during exams .It was also observed that female students felt more stressful in comparison to their male counterparts. 74.45%of students claimed that they did not use any unfair means whereas 16.78% did not wish to answer. When asked the same question about other fellow students , 58.29% did not wish to comment on it and 27% thought that it was highly probable. Only 14.5% agreed with the fact that it was not possible to cheat . 57.66% felt that the process lwas completely fair and 39.41% that it was somewhat fair.

Table 2

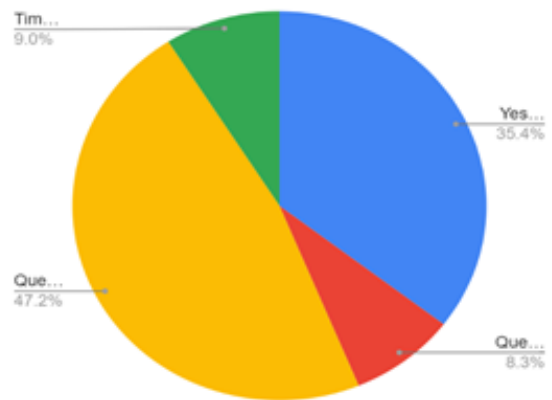
Questions based on process of assessment		Male (67)	Female (70)	Total (137)
How many online MCQ tests did you appear in	Appeared in all the tests	45	59	104
	Appeared in more than 75% tests	21	11	32
	Appeared in less than 60% tests	1	0	1

Online Viva through whatsapp was conducted twice, did you participate in it?	Was present both times on the designated date and time	59	68	127
	Was present both times but not on the designated date and time	6	1	7
	Was present in only one of the vivas	2	1	3
Did you submit the online assignments on time?	Submitted all assignments on time(100%)	24	36	60
	Submitted most assignments on time(>80%)	35	31	66
	Submitted only a few assignments(<50%)	8	3	11
. According to you which type of evaluation was the most difficult	Pen and paper with time limit	27	20	47
	Online face to face viva	24	25	49
	MCQs online	16	25	41
. According to you which type of evaluation was the easiest	Pen and paper with time limit	26	32	58
	Online face to face viva	14	13	27
	MCQs online	27	25	52
Which of the following was the single most important motivating factor to give the online exams?	For scoring better in internal assessment	30	33	63
	For self evaluation purpose	30	37	67
	For having better attendance	3	0	3
	Fear of the teacher	1	0	1
Peer pressure	Peer pressure	3	0	3
	Yes	28	24	52
.Do you think you had enough time to prepare for the tests	May be	27	34	61
	No	12	12	24
	Yes , they were perfect	27	22	49
Do you think the tests were well designed with regard to the type of questions and the time allocated for the tests	Questions were good but there was lack of time	28	37	65
	Time was ample but questions were difficult	5	6	11
	Questions were difficult and there was less amount of time	7	5	12
	Yes almost always	15	7	22
Did you face internet issues during online tests	Occasionally	45	55	100
	No, never	7	8	15
	Very stressed but functional (score 5-8)	36	41	77
Stress levels during online exams	Somewhat stress (score 1-4)	22	27	49
	Could not handle stress (score 9-10)	1	2	3
	No stress (score 0)	8	0	8
	What was your experience regarding viva in whatsapp	Both audio and video were good	27	41
Audio was good ,video was bad		13	8	21
Video was good , audio was bad		11	16	27
Both audio and video were bad		16	5	21
.How comfortable were you working from home (giving tests from a familiar environment)	Very much comfortable	29	17	46
	Somewhat comfortable	28	44	72
	Not comfortable at all	10	9	19
Did you use unfair means during the online tests?	Yes	8	4	12
	Not willing to mention	10	13	23
	Not at all	49	53	102
What was the probability of other students taking to unfair means during the online tests?	Very much probable	17	20	37
	Cannot comment on this	41	39	80
	Not very possible to cheat	9	11	20
Was the evaluation fair according to you?	Very fair	43	36	79
	Somewhat fair	22	32	54
	Not fair	2	2	4

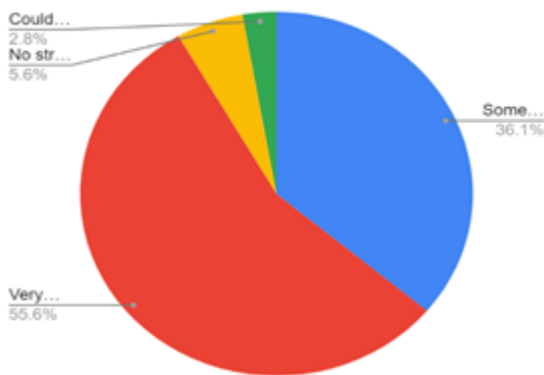
Count of . According to you which type of evaluation was the easiest



Count of Do you think the tests were well designed in regard to the type of questi...



Count of . From a score of 0-10 , how stressful/anxious were you before the te...



Count of Out of the three first year subjects ,according to you which subject had the best evaluation process.

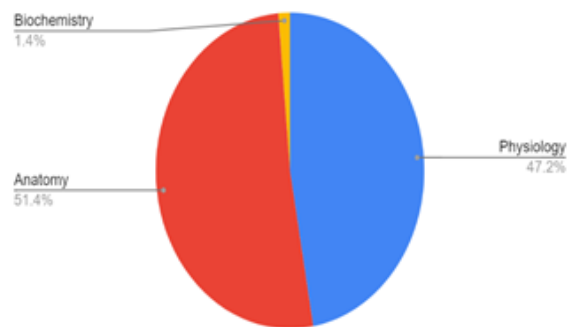
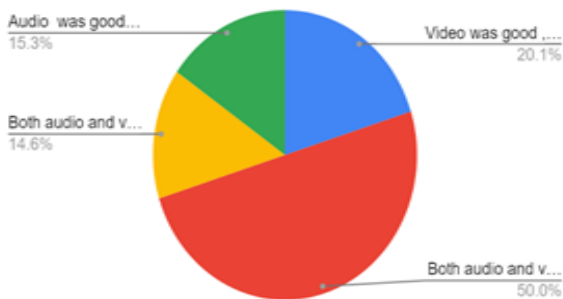


Fig 2 : Some interesting responses to questions

Count of What was your experience regarding viva in whatsapp



Count of What was the probability of other students taking to unfair means during the online tests?

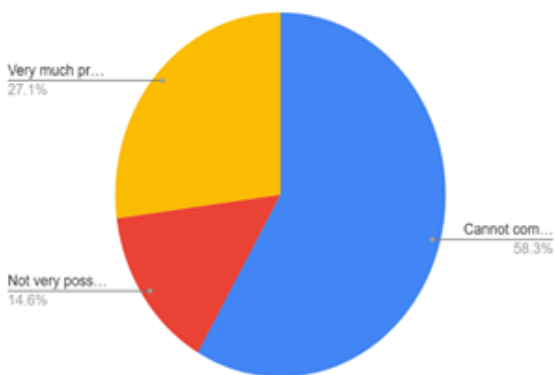


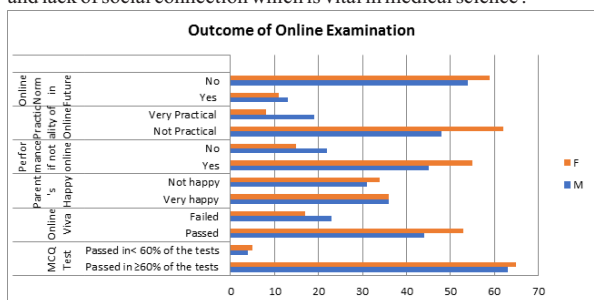
Table 3 represents the outcome based questions .40.14% passed in all tests whereas 5.83% students only passed in 30% of the tests . In face to face online viva 57% passed in both and 26 % passed in one . Females had a better percentage in passing when compared to their male counter parts in all types of assessments .52.55% students admitted that their parents were happy with the e-classes and the evaluations .22.62% parents were not concerned about the assessments . 72.99% students said that although they were comfortable at home they would have performed better had it been an in campus exam. There was not much difference between males and females in this opinion. The students also claimed that of the three subjects ,the best assessment process was of Anatomy followed by Physiology and then Biochemistry. Last but not the least the respondents agreed that although e-learning and e-evaluation is convenient , it cannot replace the conventional education especially in the medical field .A mixed approach could be possible in the future tough. Fig 3 shows the outcome of online assessment.

Table 3

Questions based on outcome		Male (67)	Female (70)	Total (137)
What was the outcome of the objective type tests	Passed in all tests	29	26	55
	Passed in more than 60% of the tests	34	39	73
	Passed in more than 30% of the tests	4	4	8
	Failed in all tests	0	1	1
What was the outcome in face to face online viva	Passed in both	20	38	68
	Passed in one	24	21	45
	Failed in both	14	10	24
How happy are your parents with the evaluation	Very happy	36	36	72

	Not happy	16	18	34
	Not concerned	15	16	31
Do you think you would have performed better had it been an offline/ on campus exam?	Yes	45	55	100
	No	22	15	37
How practical do you think online evaluation is in medical education?	Not practical, as some aspects cannot be evaluated online	48	62	110
	Very practical , can be used as a substitute to in-campus evaluation	19	8	27
Which 1 st year subject had the best evaluation process.	Physiology	33	32	65
	Anatomy	32	38	70
	Biochemistry	2	0	2
Online evaluations should be the norm in future in higher education	Yes	13	11	24
	Maybe	32	31	63
	No	22	28	50

In the opinion based questions, the top three advantages of e-assessment were safety and convenience during covid-19 , keeping updated and evaluated in academics even when the colleges are closed and getting assessment results quickly and online. The top three disadvantages according to the respondents were lack internet and technical knowhow , lack of assessment of practicals and lab/clinical and lack of social connection which is vital in medical science .



DISCUSSION:

E-learning or online learning has been the norm in many non-medical fields in developed countries for the past few years (4) In the developing countries though, it has been an recent addition , more importantly after the Covid-19 pandemic due to closure of school and colleges(5) . Medical education has always been done the traditional way . One recent event claimed that medical education including assessment can also take the online way. For example , at Imperial college of London , 280 medical students successfully completed final year exams which the University says was a historic first for medical studies (6) The internet has been flooded recently with studies on online education (7,8) . Most of the studies were done immediately after the covid 19 outbreak when the schools and colleges were shut down due to the pandemic (5,8) The present study was done six months post lockdown when the students were more oriented to online education. Our study revealed that the students were quite aware of the e-learning and e-evaluation process which is consistent with other studies done in this direction all over the world (9,10) . The respondents also liked the idea of online assessment methods as it was quick and reliable (11).The awareness could also be due to the selection of the participants who were mainly urban tech savvy individuals . In the present study the most important motivating factor to engage in online assessment was self evaluation and bettering internal assessment marks .Online assessment methods had a positive role due to its quick evaluation . The present study also observed that online evaluation was less stressful (41.2%) , more comfortable (86.12%) and was unbiased (96.07%). This is in agreement with some earlier studies (12) . Some participants though thought that it was highly probable to use unfair means (27%) . This scenario has also been reported in few studies (13) where students have enrolled with fake ids or hacked into the systems. So online assessments cannot be fool proof completely ,in the present conditions especially in medical education where the system is still evolving .Last but not the least ,although online assessment has many positives, still it is not a very popular method in medical courses like MBBS as some aspects of

learning need in campus training (14,15) .The participants also projected the same .

CONCLUSION:

In conclusion it is found that online formative assessment had many positives especially during Covid 19 pandemic as it was less stressful , more comfortable , got quick results and was unbiased . Few students complained though that it was not completely secure . E-assessment did have its own disadvantages like adjusting to new system of learning , internet connectivity ,loneliness and lack of assessment of practicals/ Labwork which have a high weightage in the MBBS curriculum. E-evaluation is promising though and can be adopted in a blended form in the future .

Limitation of the study: One of the limitation of the study is that, sample population has been drawn from a single private medical college . The participants belonged to a socio economic urban strata with a fair knowledge of technology and good internet connection. Therefore, results of the study cannot be generalized. More work needs to be done in the future.

Data availability The data of this study are available from the corresponding author upon reasonable request.

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