Section: Physiology

Original Research Article

COMPARATIVE STUDY OF OBJECTIVELY STRUCTURED VIVA VOCE VERSUS TRADITIONAL VIVA-VOCE IN PHYSIOLOGY AMONGST FIRST-YEAR MBBS STUDENTS

Sanhita Mukherjee[1], Sujoy Mukherjee[2], Debalina Sengupta[3], Soma Roy[4], Karabi Baral[5]

[1]Professor, Department of Physiology, Rampurhat Govt. Medical College, Rampurhat, Birbhum, West Bengal, India.
[2]Assistant Professor, Department of Physiology, Rampurhat Govt. Medical College, Rampurhat, Birbhum, West Bengal, India.
[3]Associate Professor, Department of Physiology, Rampurhat Govt. Medical College, Rampurhat, Birbhum, West Bengal, India.
[4]Assistant Professor, Department of Physiology, Rampurhat Govt. Medical College, Rampurhat, Birbhum, West Bengal, India.
[5]Principal & Professor, Department of Anatomy, Rampurhat Govt. Medical College, Rampurhat, Birbhum, West Bengal, India.

Received *: 15/03/2024*
Received in revised form *: 20/05/2024*
Accepted *: 05/06/2024*

Corresponding Author:
Dr. Sanhita Mukherjee
Professor, Department of Physiology, Rampurhat Govt. Medical College, Rampurhat, Birbhum, West Bengal, India.
Email: drsanhita@gmail.com

DOI: 10.5530/ijmedph.2024.2.101

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (2); 521-527

ABSTRACT

Background: The traditional or conventional viva-voce examination often does not satisfy the standards of parameters such as validity, reliability, and reproducibility. Objectively structured viva-voce examination (OSVV) can maintain an undeviating pattern of questions and ameliorate the conventional assessment tool of viva-voce. **Aim & objectives**: Considering the shortfalls and biases of traditional viva this study was organized to compare the structured & conventional method of viva-voce examination for assessment of students in Physiology and to obtain the perceptions of students and teachers about objectively structured viva voce.

Materials and Methods: This study was conducted as part of the formative assessment covering topics included in first Physiology internal assessment exam. Four sets of (A, B, C, D) structured viva question bank was prepared. Lottery system was adopted for drawing the question card, which was drawn by students themselves. A total of 20 questions (each of 2 marks) were asked. Questions were from three levels of difficulty easy questions, difficult questions and very difficult questions. Two examiners assessed the students by OSVV. Equal time of 8 minutes was given to each student. Examiner 3 assessed the same students by conventional viva. Feedback of students and teachers at the end of both viva sessions obtained about the OSVV. Statistical analysis: paired sample t-test and Kappa statistics.

Result: There is significant difference between the scores of OSVV and Traditional viva ($p<0.05$). Excellent/Substantial agreement ($k=0.7696$) was found between the two examiners as regards allotment of marks in OSVV. Strikingly students with extremely good (>75% score) or extremely poor (<25% score) performance were flawlessly proclaimed by both OSVV and traditional viva-voce. No statistically significant difference was found between the scores given by examiners who took OSVV and traditional viva for these extreme scorers. Majority of students strongly agree and agree with OSVV in terms of well-organized system (78%), covers most of the topics from syllabus (87.4%), unbiased and from all difficulty levels (75%), useful in enhancing performance (89%), better than traditional viva (75%).

Conclusion: Objectively structured viva-voce is a reliable, objective and convenient tool and positive perception toward OSVV in terms of its acceptability as an assessment tool.

Keywords: Objectively structured viva-voce, Traditional viva-voce, Physiology, 1st year MBBS Students' perception.

INTRODUCTION

The learning cycle is a trinity of educational objectives, instructional methodology and assessment. Amongst this assessment is a vital issue. Viva voce has been an age-old traditional method and continued to be an indispensable component of examination in medical courses. It can assess all five cognitive domains-knowledge, comprehension, application, analysis, synthesis, and communication power in 'question and answer' pattern.[1,2,3] It has immense face validity and assesses what cannot be assessed by a written examination.

In recent times objective methods are favoured over the subjective methods. In traditional viva voce there may be disparity in the time allotted to each student, number of questions asked, and difficulty level of the questions. Questions may not include the entire syllabus. There may be some biases such as the "dove/hawk" effect designating some assessors as more amiable or tough than others, the "halo effect" scoring an overall high or low mark cantered on carryover from a score in one section of the assessment.[4,5] At the same time, candidates appearing for oral examination feel a level of anxiety and discomfort which can affect their performance.[6] Keeping the short comings of conventional viva-voce examination such as validity, objectivity, comprehensiveness, inter-evaluator variability, repeatability, and possible gender bias,- in mind there is an exigency for enhancement in the form of proper planning and distinct instructions to examiners for this method of evaluation. The oral examination should be conducted in a way that the examinee feels congenial & non-threatened and gives his/her best performance. One step in this direction is Structured Viva-voce examination (SVE) which can bring equalness to assessment & augment student satisfaction.[10] If students are accustomed with the structure and likely content of the assessment, anxiety can be greatly alleviated through reducing the degree of unpredictability. Objectively Structured Viva-voce (OSVV) examination is a novel concept with very few studies done specially in medical students and in Physiology discipline.6It uses checklist of questions to be asked and pre-ordained marking system to standardize the viva process.

This study is planned to find out the effectiveness of OSVV for assessment of medical students.

Aim and objectives of the study were to compare the structured & conventional method of viva-voce examination for assessment of students in Physiology and to obtain the perceptions of students and teachers about objectively structured viva voce.

MATERIAL AND METHODS

This study was conducted in Department of Physiology, Rampurhat Govt. Medical College, West Bengal, India during first IA or internal assessment (formative assessment). It was Interventional study carried out in January 2024. Ninety-eight (two were absent) 1st year MBBS students (2023-24 batch) were included in this study. All the teaching faculties of Department of Physiology participated in the study. A written permission from the Institutional Ethics Committee was obtained before starting the study.

The participants were already sensitised (in three sessions) to the OSVV during their regular classes. The entire students were informed about the purpose of the study, OSVV procedure and how they would be judged. Departmental staff was also sensitised well in advance regarding OSVV. Informed consent of all the participants was obtained. It was decided to conduct OSVV for 40 marks as allotted to viva voce in first IA.

Question pattern: A total of 20 questions (each of 2 marks) were asked. General physiology, Nerve-muscle physiology, Respiratory physiology, Haematology and GI physiology were the chapters included in 1stIA.Number of questions from each system was decided by the weightage of each system given by NMC (in terms of hour) and depicted in table 1. Questions were from must know (60%), desirable to know (30%) and nice to know areas (10%). For each system these questions were categorised in three levels of difficulty easy questions to probe recall, difficult questions to probe depth of knowledge and very difficult questions to probe application of knowledge. Four sets of (A, B, C, D) such structured viva question bank was prepared by covering all the topics of syllabus. Lottery system was adopted for drawing the question card, which was drawn by students themselves.

Standardized answers were prepared by a group of faculty with inputs from all those who have participated in the teaching process.

Two examiners (Examiner1 and Examiner 2) sat together and assessed the students by OSVV. Both the examiners were provided with standardised mark sheet. Marks distribution for the objectively structured viva voce was detailed in table 1. Equal time of 8 minutes was given to each student.

Examiner 3 assessed the same students by conventional viva. Statistical analysis was carried out as shown in table 2.

RESULTS

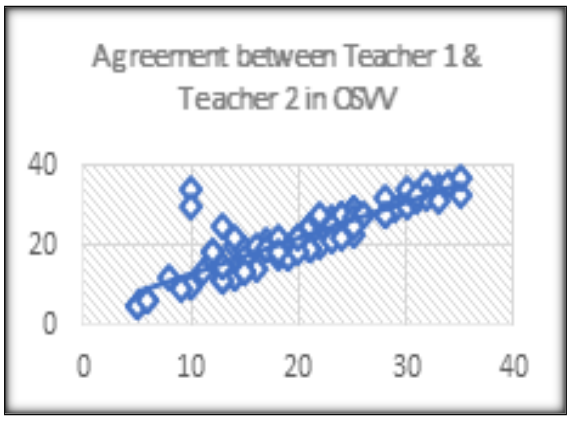
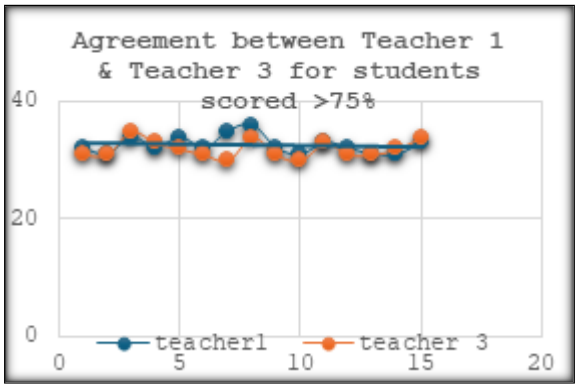
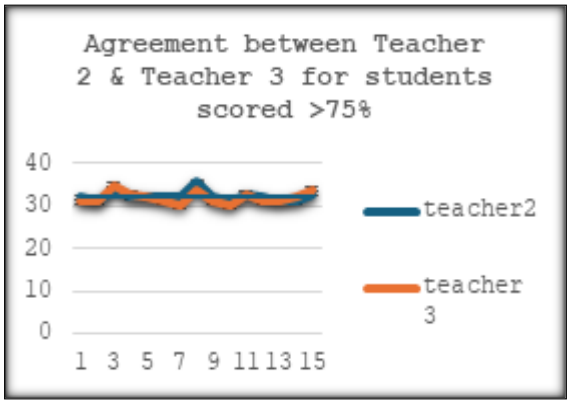
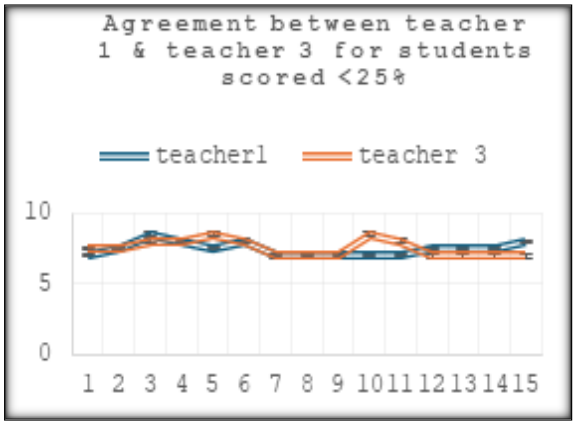


Figure 1: Agreement between Teacher 1 & Teacher 2 in OSVV







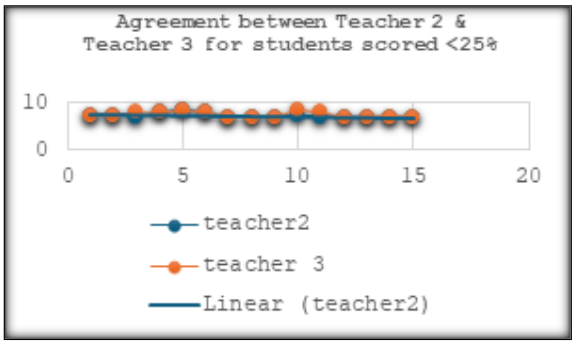


Figure 2,3,4,5: Agreement between Teacher 1 (OSVV) & Teacher 3 (Traditional) for students scored >75%, Agreement between Teacher 2 (OSVV) & Teacher 3 (Traditional) for students scored >75%, Agreement between Teacher 1 (OSVV) & Teacher 3 (Traditional) for students scored <25%, Agreement between Teacher 2 (OSVV) & Teacher 3 (Traditional) for students scored <25%

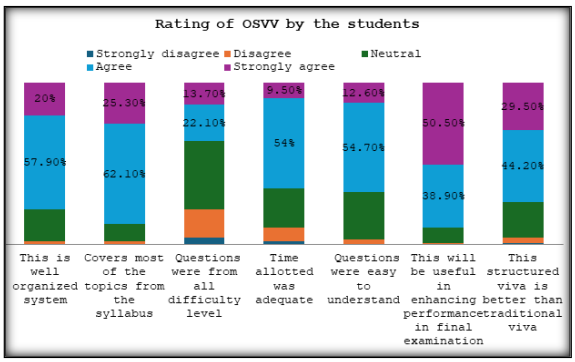


Figure 6: Overall rating of OSVV by the students - ended questions by Students

A total of 98 1st prof MBBS students participated in the study. All the students appeared for both Traditional viva and OSVV. Marks distribution of different topics is demonstrated in Table 1. Statistical analysis was carried out as shown in Table 2.

Range of marks obtained by students out of 40 in both Conventional viva and OSVV is presented in table 3. The mean marks obtained in conventional viva were more than OSVV. There is significant difference between the scores of OSVV and Traditional viva ($p<0.05$).

Table 4 shows there is no statistically significant difference of scores between two examiners of OSVV. Kappa statistics was used to see agreement (table 5) between the marks given by two examiners. Graph 1 depicts Excellent/Substantial agreement ($k=0.7696$) between the two examiners as regards allotment of marks in OSVV.

Considering 50% of marks as cut off value for passing viva, 40 students (40.81%) passed. 14 out of 98 students (14.28%) scored more than 75% both in OSVV and traditional viva. There is no significant statistical difference of scores between OSVV and traditional viva in these students. (Table 6)16 out of 98 students (16.32%) scored less than 25% both in OSVV and traditional viva. There is no significant

statistical difference of scores between OSVV and traditional viva in these students. (Table 7).

Table 8 shows, for the students who scored more than 75% and less than 25% respectively, there is no significant difference between scoring of teacher 1 (OSVV) and teacher 3 (traditional) and teacher 2 (OSVV) and teacher 3 (traditional).

Graph 2,3,4,5 depicts agreement between Teacher 1(OSVV), Teacher 2 (OSVV), & Teacher 3 (Traditional) for students scored >75%, Agreement between Teacher 1 (OSVV), teacher 2 (OSVV) & Teacher 3 (Traditional) for students scored <25%

Feedback from students and teachers based on Likert scale is presented in Graph 3 and table 9. Opinions of students and teachers on Advantages and disadvantages of OSVV are depicted on table 10 and 11 respectively.

Table 1: Marks distribution of different topics as per weightage

Total lecture hour physiology	General Physiology	Nerve-muscle physiology	Respiratory physiology	Blood/Haematology	GI physiology
160 hours (as per NMC guideline)	8 hour (5%)	10 hour (6.25%)	14 hour (8.75%)	16 hour (10%)	12 hour (12%)
	2 questions	3 questions	5 questions	6 questions	4 questions

Table 2: Statistical analysis

Evaluation	Instrument	Type of analysis
Difference of score of same student in Traditional vivavs. OSVV	T test	Quantitative
Difference of score between two teachers in traditional viva	T test	Quantitative
Agreement between marks given by structured viva examiners	Kappa statistics	Quantitative
Agreement between marks given by traditional viva examiners	Kappa statistics	Quantitative
Difference of mean score obtained by students who scored below 25% and more than 75%	T test	Quantitative

Table 3: Marks obtained in Traditional viva and OSVV

Score in OSVV (n=98)	Score in traditional viva (n=98)	p value
Mean± SD	Mean± SD	
17.88±8.35	20.80 ±7.52	0.011184**

Table 4: Teacher 1 vs Teacher 2 score in OSVV

Teacher 1 OSVV (n=98)	Teacher 2 OSVV (n=98)	
Mean± SD	Mean± SD	
19.89±7.53	21.07 ±8.01	0.1036

Table 5: Agreement among two teachers in OSVV

Percentage of agreement	Cohen's κ	Agreement
88.65%	0.7696	Excellent/Substantial

Table 6: Traditional Vs OSVV marks for students who scored >75%

Score in OSVV (n=14)	Score in traditional viva (n=14)	p value
Mean± SD	Mean± SD	
32.4±1.87	31.93±1.53	0.473

Table 7: Traditional Vs OSVV marks for students who scored <25%

Score in OSVV (n=16)	Score in traditional viva (n=16)	p value
Mean± SD	Mean± SD	
7.56±2.34	7.53±0.581	0.963

Table 8: Teacher 1 (OSVV) vs Teacher 3(Traditional)marks and Teacher 1 (OSVV) vs Teacher 3 (Traditional) marks among >75% scoring students and <25% scoring students

For students who scored>75%			For students who scored <25%		
Teacher 1 (OSVV) (n=14)	Teacher 3 (Traditional) (n=14)	p value	Teacher 1 (OSVV) (n=16)	Teacher 3 (Traditional) (n=16)	p value
Mean± SD	Mean± SD		Mean± SD	Mean± SD	
32.6±1.54	31.93 ±1.53	**0.246**	7.46±0.485	7.53±0.581	0.734
Teacher 2 (OSVV)	**Teacher 3 (Traditional)**	**p value**	**Teacher 2 (OSVV)**	**Teacher 3**	**p value**

(n=14)	(n=14)		(n=16)	(Traditional) (n=16)	
Mean± SD	Mean± SD		Mean± SD	Mean± SD	
32.26± 1.33	31.93 ±1.53	**0.53**	7.33±0.487	7.53±0.581	**0.316**

Table 9: Overall rating of OSVV by the teachers

		Agree	Strongly agree	Disagree	Neutral	
1	This is well organized system	%	%	%	%	Frequency
		100%	0%	0%	0%	1.33
2	Covers most of the topics from the syllabus	100%	0%	0%	0%	1.33
3	Questions were from all difficulty level	33.30%	0%	33.30%	33.30%	3
4	Time allotted was adequate	66.60%	33.30%	0%	0%	3
5	Questions were easy to understand	66.60%	33.30%	0%		3
6	This will be useful in enhancing performance in final examination	33.30%	0%	33.30%	33.30%	3
7	This structured viva is better than traditional viva	0%	0%	0%	100%	1.33

Table 10: Typical Responses to the open- ended questions by Students

Responses	Frequency
Positive points about OSVV	
Tests every bit of knowledge , as more questions , so we have plenty of chances and not just favourite questions of examiner	5
Covers almost every topic from syllabus. Gives equal chance to everyone, reduced 'luck factor 'in exam	4
It is a well-structured organized form of viva	3
Ensures equality in the process	2
Helpful in preparation for final exam	1
Negative points about OSVV	
Time consuming	5
Leakage of question. Students who came out of the viva room conveyed what questions were present in his particular set. So all the students took preparation of the questions, and viva went well for all. This better preparation for already known questions might produce false positives.	4
More than one station is time consuming. It would be better if only one station was there for the entire viva which may have reduced the time significantly	3
Excess time is allotted to 1 student during viva.	2
Tiresome, confusing	1

Table 11: Typical Responses to the open- ended questions by Teachers

Positive points about OSVV	
Real time framing questions may not cover all systems, difficulty level can not be controlled always for each student. A structured paper helps to cover all aspect of topics with different difficulty level in an unbiased manner.	3
Equal opportunity provided to each student to answer to utmost ability for uniform questioning"	2
Question distribution covering most of the syllabus possible to a better extent than traditional viva	1
Negative points about OSVV	
Time consuming	3
Chance of leakage of questions	2
Prefixed questions mean flexibility allowed to students for topics they are not well versed with this minimum. Traditional viva gives greater opportunity to score in areas students are confident to answer better.	1

DISCUSSION

Significant difference was observed between marks obtained in OSVV and Traditional viva in this study. This result is compliant with a study performed by Chhaiya SB et al.[11] The mean marks obtained in conventional viva is more than the OSVV. This result is also in accordance with a study done by Dr. Rajendra Bhanudas Surpam, et al12 who stated that the mean marks obtained by students in Traditional viva were little more than OSVV but Dr. Surpaum et al failed to get any significant difference and significant correlation between marks obtained in the two viva-voce formats.

In this study OSVV was found to be a reliable method of assessment as Excellent/Substantial agreement was found between two examiners who assessed the students by OSVV. Similar findings were reported by Poorva A. Sule,[13] et al and Priti V Puppalwar,[14] et al in their studies. In contrast to results obtained in the current study, a study from Bhuj, Gujarat,[15] has found poor co-relation between marks obtained in the two viva-voce formats. A similar study16 from Patan, Gujarat has reported that greater variation in the average marks allotted by two different examiners in Traditional

viva as compared to those allotted in OSVV and that student obtained significantly less marks in the OSVV format.

The interesting point depicted in this study is, in case of students who got more than 75% marks or less than 25% marks (that is for extreme scorers) there is substantial agreement between teachers of both OSVV and Traditional viva. Although so many previous studies pointed out that there is a significant 'halo effect' in traditional viva where an examiner's overall judgment of the candidates' competency is seriously flawed by the external appearance or other inconsequential attributes of the examinee,[14,15,16] this study depicted students with extremely good or extremely poor performance are flawlessly proclaimed by traditional viva-voce. No statistically significant difference was found between the scores given by examiners who took OSVV and traditional viva for these extreme scorers.

Feedback from students and teachers based on Likert scale revealed that majority of respondents agreed or strongly agreed that OSVV is more organized, curtails the examiners bias, permits equal scope to each student, of benefit in upgrading student's performance in the examination and OSVV is more appropriate and advantageous than traditional viva. These results are in correspondence with a questionnaire analysis performed by Mrunal et al,[17] in a study on introduction of structured oral examination (SOE) as a novel assessment tool to first year MBBS students in Physiology which outlined that students were overall satisfied with the structured viva and perceived it superior to the traditional viva. In feedback on open-ended questions students mentioned that OSVV has advantages like it tests every bit of knowledge, as more questions, so they have plenty of chances and not just favourite questions of examiner, ensures equality in the process and helpful in preparation for final exam. Students also pointed out some disadvantages such as it is time consuming and chances of leakage of questions. To address leakage of question issue they suggested making a higher number of smaller sets (e.g. 10 sets of 5 questions each).

Teachers opined that real time framing questions may not cover all systems, difficulty level cannot be controlled always for each student. They felt a structured paper helps to cover all aspect of topics with different difficulty level in an unbiased manner. Regarding negative points of OSVV teachers depicted prefixed questions gives less flexibility to students for topics they are not well versed. Traditional viva gives greater opportunity to score in areas students are confident to answer better.

Thus, it can be concluded that objectively structured viva-voce is a reliable, objective and convenient tool. Although reliable validity of OSVV remains subject to discussion. So a combination of OSVV and traditional viva will be a helpful method which will be objective as well as flexible.

CONCLUSION

Study limitations

This is a single institutional study. More studies involving all medical disciplines in multiple centres will provide a better understanding of the topic.

REFERENCES

1. Shafique A. Comparative performance of undergraduate students in objectively structured practical examinations and conventional orthodontic practical examinations. Pakistan Oral & Dental Journal. 2013;33(2);312-7.
2. Rehman R, Syed S, Iqbal A, Rehan R. Perception and performance of medical students in objective structured practical examination Andviva voce: Pak J Physiology. 2012;8(2);33-6
3. Poorva A. Sule1, Milind R. Ubale1, Sundaram Kartikeyan2, Deepali D. Belurkar1, Vrushali V. Kulkarni. Comparative Study of Objectively Structured Versus Traditional Viva-Voce in Microbiology amongst Second-Year MBBS Students. IOSR Journal of Research & Method in Education. Volume 7, Issue 3 Ver. IV (May - June 2017), PP 15-18.
4. Singel T, Shah C, Dixit D. Small group structured oral Examination: An innovation in oral Examination. NJIRM. 2014;5(1);141-6.
5. Shenwai MR, Patil KB. Introduction of Structured Oral Examination as A Novel Assessment tool to First Year Medical Students in Physiology: Journal of Clinical and Diagnostic Research. 2013;7(11);2544-7.
6. Kaur N., Manzoor S., Kaur S., Goyal A. Comparative evaluation of structured viva-voce examination and conventional viva-voce examination in II MBBS students. Int.J.Med.Sci. Educ 2019;6(4):1-5.
7. N. Rahman, S. Ferdousi, N. Hoq, R. Amin, and J. Kabir, Evaluation of objective structured practical examination and traditional practical examination, Mymensingh Med J, 16(1), 2007, 7-11.
8. S. Khan, H. Acemoglu, and Z. Akturk, an objective structured biostatistics examination: a pilot study based on computer-assisted evaluation for undergraduates, J Educ Eval Health Prof, 9, 2012, 9.
9. S. Ferdousi, S. A. Latif, M. M. Ahmed, and A. Nessa, Summative assessment of under graduate medical student's performance in physiology by structured oral examination, Mymensingh Med J, 16(1), 2007, 64-69.
10. Dangre-Mudey G, Damke S, Tankhiwale N, Mudey A. Assessment of perception for objectively structured viva voce amongst undergraduate medical students and teaching faculties in a medical college of central India. Int J Res Med Sci 2016; 4:2951-4.
11. Chhaiya SB, Mehta DS, Trivedi MD, Acharya TA, Joshi KJ. Objective structured viva voce examination versus traditional viva voce examination-Comparison and students' perception as assessment methods in pharmacology among second M.B.B.S students. Natl J Physiol Pharm Pharmacol 2022;12(10):1533-1537.
12. Dr.Rajendra Bhanudas Surpam, etal. "Comparative Study of Objectively Structured Versus Traditional Viva-Voce in Microbiology amongst Second-Year MBBS Students". IOSR Journal of Research & Method in Education (IOSR-JRME), 10(1), 2020, pp. 24-29.
13. Comparative Study of Objectively Structured Versus Traditional Viva-Voce in Microbiology amongst Second-Year MBBS Students. Poorva A. Sule1, Milind R. Ubale1, Sundaram Kartikeyan2, Deepali D. Belurkar1, Vrushali V. Kulkarni2. IOSR Journal of Research & Method in Education (IOSR-JRME). Volume 7, Issue 3 Ver. IV (May - June 2017), PP 15-18.
14. Priti V Puppalwar1*, Alka Rawekar2, Anita Chalak3, Archana Dhok4, Meenakshi Khapre5. Introduction of

Objectively Structured Viva-Voce in Formative Assessment of Medical and Dental Undergraduates in Biochemistry. Journal of Research in Medical Education & Ethics Vol. 4, No. 3, November, 2014, pp-321-325.
15. S. K. Gor, D. Budh, and B. M. Athanikar, Comparison of conventional viva examination with objective structured viva in second year pathology students, Int J Med Sci Pub Health, 3(5), 2014, 537-539.
16. K. Khilnani, J. Charan, R. Thaddanee, R. R. Pathak, S. Makwana, and G. Khilnani, Structured oral examination in pharmacology for undergraduate medical students: Factors influencing its implementation, Indian J Pharmacol, 47(5), 2015, 546-550
17. Mrunal R, Patil KB. Introduction of structured oral examination (SOE) as a novel assessment tool to first year M.B.B.S. students in Physiology. Clin Diagn Res 2013;7(11):2544–7.