Education Section

Student Assessment in Pharmacology: A Prospective Observational Study

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ABSTRACT

Introduction: The assessment of student is an important step to check learning in medical education. Conventional Oral Viva Voce (COVV) is an important assessment tool but have certain demerits like more subjectivity, gender bias. So, COVV should be modified to make it proper assessment tool in second year MBBS students as per new curriculum in medical education.

Aim: To develop and assess Structured Oral Viva Voce (SOVV) and compare with COVV in second year MBBS students.

Materials and Methods: A prospective observational study was done in the second year medical undergraduate students of fourth semester at GMERS Medical College and Civil Hospital, Sola, Ahmedabad, Gujarat, India. Viva cards for SOVV were developed and was validated by the experts. Teachers and students were sensitised for SOVV. A total 116 students participated and were randomly assigned to four groups: Group A, Group B, Group C and Group D for viva voce in between four examiners. Group A and B were assessed by SOVV and Group C and D were assessed by COVV then groups were crossed over. In SOVV part, students picked up one viva card consisting of nine questions of different level and had to give answers in 10 minutes. Students and faculties perception were taken by perception questionnaires. Data were analysed by Microsoft Excel and Graph Pad Instate 3 (version 3.06).

Results: In SOVV, mean marks given by all examiners having uniformity, while in COVV, there was significant difference in mean marks given by examiners, mainly examiner A (7.66±1.86) and examiner D (10.01±2.08), (p<0.05). About 100% of faculty and 83.62% students agreed that SOVV is a better method than COVV.

Conclusion: Based on study results and feedback from students in this college set-up, SOVV in pharmacology brings uniformity in viva process, increases objectivity and removes inter-examiner variability.

Keywords: Conventional oral viva voce, Examiner variability, Objectivity, Structured oral viva voce

INTRODUCTION

Viva voce is a tool for assessment of medical students conducted by asking questions orally. Joughin G states that assessment of students by oral viva voce as "Assessment in which a student's response to the assessment task is verbal, in the sense of being expressed or conveyed by speech instead of writing" [1]. In Bloom BS taxonomy, higher cognitive can be assessed in oral viva examination by asking standardised structured questions but in COVV only recall type of questions are asked [2,3]. In COVV, flexibility to ask the questions can be changed according to student's need, students can defend for their answers and assess students' knowledge in subject as broad curriculum [4,5]. In COVV, performance of students can be affected because of anxiety of facing viva [6] and sometimes difficulty to understand language used by examiner. Achievement of marks by students are affected in COVV because of gender bias, first coming students given more marks [7] and time [8] by examiner compared to last, clues given and total questions asked are dissimilar for all students and examiners tendency for marking differs [9,10]. Because of all these drawbacks of COVV is less valid, more subjective so less reliable and more time consuming assessment method [11]. SOVV lessens the drawbacks of COVV. Structuring of viva process requires proper planning before exam, depending on syllabus proper framing of cards containing different types of questions along with answers and allotment of marks.

Same kind of study has been completed in other subjects like physiology, community medicine and few studies in pharmacology also [5,12,13]. In GMERS Medical College and Civil Hospital, Sola, Ahmedabad, India, COVV is also unstructured in both internal and summative assessment. So, this was first time to plan out the study in students of this college to overcome the demerits of COVV and to standardise the viva voce.

The Aim was to develop SOVV, to assess marks given by examiners in both COVV and SOVV, to see perception of students and faculty towards SOVV.

MATERIALS AND METHODS

A prospective observational study was carried out in second year MBBS students of fourth semester at GMERS Medical College and Civil Hospital, Sola, Ahmedabad, Gujarat, India, from June 2018 to September 2018. Institutional Ethics Committee (IEC) approval (No. ECR/404/Inst/GJ/2013/RR-16) was obtained. Students who passed first year MBBS and was willing to participate were included in the study. So 116 students were included who gave their written informed consent to participate. Students and faculties were sensitised for SOVV. The Central Nervous System (CNS) was selected for viva voce. Viva cards for SOVV were developed, discussed and validated by subject expert in pharmacology and medical education unit for content, coverage of syllabus, covering different areas of learning, language, number of questions and allotment of marks. Authors have prepared such 20 viva cards, each card containing nine questions of must to know, good to know and nice to know areas in pharmacology. Total 15 marks in viva card were distributed as shown in [Table/Fig-1].

Distribution of questions	Number of questions	Marks allotted for one question	Total marks
Must to know	5	1	5
Good to know	3	2	6
Nice to know	1	4	4
Total	9		15

[Table/Fig-1]: Distribution of marks in viva cards.

Also, prepared perception questionnaires of SOVV by using five points likerts scale with reference of Shenwai MR and Patil BK study [12]. Perception questionnaire of SOVV was validated by

medical education unit and content validity index value was 0.99 and cronbach's alpha score was 0.9.

Total 116 students were divided according to roll number in four groups Group A, Group B, Group C, and Group D (n=29 in each group). On the day of examination first Group A, B appeared for SOVV and Group C, D appeared for COVV concurrently and then groups were crossed over. Four examiners of assistant professor and above post took viva voce examination. Students appeared for SOVV were not allowed to interact with other students whose examination was not yet finished. SOVV and COVV were started simultaneously. SOVV was taken as per structured process and COVV as per routine exam pattern. Questions were asked and marks given accordingly (total marks 15 in both vivas). Total time given for SOVV to each student was 10 minutes. Student's and faculty's perception towards SOVV was taken after viva.

STATISTICAL ANALYSIS

Data were analysed by Microsoft Excel and Graph Pad Instate 3 (version 3.06). Mean±Standard Deviation (SD) was calculated for marks given by different examiners. Student's t-test was applied for comparison of marks given by examiners and a p-value <0.05 was considered to be statistically significant.

RESULTS

In SOVV, mean marks given by all examiners having uniformity, while in COVV, there was significant difference in mean marks given by examiners, mainly examiner A (7.66±1.86) and examiner D (10.01±2.08) [Table/Fig-2].

Examiner	Mean±SD of marks in SOVV	Mean±SD of marks in COVV	p-value
Examiner A	8.90±2.24	7.66±1.86	0.0254*
Examiner B	8.62±2.25	9.03±2.08	0.4700
Examiner C	8.72±2.31	9.76±1.81	0.0629
Examiner D	8.83±2.22	10.01±2.08	0.0398*

[Table/Fig-2]: Comparison of mean marks given by examiners in SOVV and COVV by t-test. Total marks 15. N=29 students in each group.
Examiner A and Examiner D *p-value is less than 0.05; SD: Standard deviation

83.62% of students were agreed that SOVV was better than COVV. In SOVV 81.03% of students felt no anxiety of viva and agreed that syllabus was covered well. Percentage of students who felt that SOVV can improve performance in final exam was 75.86%. Student's feedback for SOVV were that it increases confidence, they came to know type of questions asked in viva and areas need to be learned more and it should be implemented in examinations [Table/Fig-3].

All the examiners agreed that SOVV was better than COVV and overall viva session was good. All examiners agreed for objectivity of SOVV, questions were well framed, uniform and covered must to know, good to know and nice to know aspects of curriculum and equal time was given to all the students [Table/Fig-4].

Faculties also opined that preparing viva card require subject expertise, identify core area in subject and need of students. Faculty

Sr. No.	Item	Strongly agree (5) Number of students (%)	Agree (4) Number of students (%)	Not sure (3) Number of students (%)	Disagree (2) Number of students (%)	Strongly disagree (1) Number of students (%)
1	Well organised method	42 (36.21)	61 (52.59)	9 (7.76)	3 (2.59)	1 (0.86)
2	Cover most of topics from the syllabus	49 (42.24)	45 (38.79)	17 (14.66)	4 (3.45)	1 (0.86)
3	Questions were well structured and easy to understand	52 (44.83)	48 (41.38)	14 (12.07)	2 (1.72)	0 (0.00)
4	All difficulty level questions were asked	60 (51.72)	41 (35.34)	12 (10.34)	3 (2.59)	0 (0.00)
5	Viva does not deviate from the topic	68 (58.62)	39 (33.62)	7 (6.03)	2 (1.72)	0 (0.00)
6	Didn't felt anxious/stressed during viva	54 (46.55)	40 (34.48)	14 (12.07)	5 (4.31)	3 (2.59)
7	Allotted time was well utilised	49 (42.24)	44 (37.93)	12 (10.34)	6 (5.17)	5 (4.31)
8	It eliminates gender bias	59 (50.86)	41 (35.34)	8 (6.90)	6 (5.17)	2 (1.72)
9	Language was clear	65 (56.03)	44 (37.93)	6 (5.17)	0 (0.00)	1 (0.86)
10	Viva was not influenced by mood of examiner	68 (58.62)	40 (34.48)	4 (3.45)	0 (0.00)	4 (3.45)
11	This can be helpful in enhancing performance in final examination	41 (35.34)	47 (40.52)	22 (18.97)	3 (2.59)	3 (2.59)
12	Overall viva session was good and student friendly	49 (42.24)	49 (42.24)	12 (10.34)	4 (3.45)	2 (1.72)
13	Structured oral viva voce was better than conventional oral viva voce	52 (44.83)	45 (38.79)	15 (12.93)	4 (3.45)	0 (0.00)

[Table/Fig-3]: Student's perception of Structured Oral Viva Voce (SOVV) N=116.

Sr. No.	Item	Strongly agree (5) Number of faculty (%)	Agree (4) Number of faculty (%)
1	Overall viva session was good	2 (50)	2 (50)
2	Viva was more objective	3 (75)	1 (25)
3	Uniformity of questions asked to all the students	3 (75)	1 (25)
4	Covered all the must know, good to know and nice to know aspects from the curriculum	3 (75)	1 (25)
5	Questions were precise, well designed	1 (25)	3 (75)
6	Equal time was given to each student	2 (50)	2 (50)
7	Viva was not diverted to other path	4 (100)	0 (0)
8	Perfect scoring can be done for each student by use of checklist	4 (100)	0 (0)
9	Structured oral viva voce was better than conventional oral viva voce	1 (25)	3 (75)

[Table/Fig-4]: Faculty's perception of Structured Oral Viva Voce (SOVV) N=4.

also told that SOVV, helps students to identify their understanding of subject, taken without bias towards students and students can easily understand questions and should be implemented in second MBBS student's examination.

DISCUSSION

Student assessment checks accomplishment of different levels in learning process, recognise weak areas and guides students in learning process [14]. Medical students are assessed by different methods of assessment. Student's assessment method should be valid and reliable [10]. Viva voce examination is one of the assessment tools that are used to assess knowledge, communication skill, behaviour and personality of students. Structured oral viva assesses cognitive skill like ability to solve problems, do interpretation and to make proper decision [15].

In this study in COVV, examiners marking, numbers of questions asked were variable and it was more subjective. It is comparable to Shah HK et al., and Davis MH and Karunathilake I study that COVV marks given were different for different examiners and it was difficult to properly differentiate low and high performers [13,16]. In this study in SOVV, no significant variability in mean marks given by examiners because they have to use predefined criteria for marking each student and assess all students by equal method. While in COVV, there was significant difference in mean marks allotted by two examiners 7.66±1.86 and 10.01±2.08. Similar result were found in Khilnani AK et al., study that more inconsistency in mean marks in conventional oral viva by two examiners 9.4-19.0 as compared to structured oral viva 9.1-15.7 [7]. Puppalwar PV et al., study showed that less variability in examiners marking in SOVV [17].

Study by Sharma DB et al., Verma A et al., and Kshirsagar SV and Fulari SP showed that structuring viva voce properly makes it more objective and reliable similar to present study finding [18-20]. A study by Shenwai MR and Patil BK, Shah HK et al., showed that SOVV was better than COVV similar to this study in which, 83.62% of students and all faculties (100%) agreed for the same [12,13]. Student's perception for design of SOVV was very good. In this study 88.79% of students agreed that SOVV was well organised. In this study, more than 80% of students were agreed that SOVV covered most of topics from the syllabus and they don't felt anxious, time was well utilised in viva, no bias, clear language, no influence of mood of examiner and well structuring of viva questions. Study of Bhadre R et al., showed students feedback that in structured viva better coverage of syllabus similar to this study [4]. Study findings by D'Souza UJA et al., were comparable to this study that students felt that structured viva was overall satisfying with clear language, well framed questions, removed anxiety [2]. In this study, students gave feedback that SOVV identifies areas to be improved, because it assesses in depth knowledge of student and it should be implemented in assessment, similar findings in study by Puppalwar PV et al., [17].

In this study, all examiners strongly agreed that perfect scoring can be done by use of predefined marking criteria in SOVV and viva not deviated to other path. All examiners agreed that in SOVV more objectivity, questions well framed, syllabus is covered and equal time is given to all students, uniform questions for all students. Similar to this study Khilnani AK et al., study faculty's opinion for structured viva was that proper coverage of topic and equal time to all students [7]. In this study faculty's feedback was that in SOVV to prepare viva cards for assessment require subject expertise, identification of core area and need of students. Other opinions of faculty in this study were that SOVV taken without bias towards students and it helps students to identify their understanding of subject. In Vankudre AJ et al., study, faculty's feedback was that

structured viva diminishes bias and takes uniformity similar to this study findings [21].

In this study, 10 minutes was given for SOVV for nine questions and students and faculties felt it was sufficient. In study by Verma A et al., also fixed time of 10-15 min for 10 items of different difficulty level [19]. In study by Puppalwar PV et al., eight minutes were assigned for 8-items [17]. Authors found in this study that in SOVV uniformity in marking by all examiners and students and faculty were agreed that SOVV was well organised and properly structured assessment method with objectivity, proper time distribution, uniformity, proper syllabus and without bias and anxiety to students.

Limitation(s)

Outcome is based on assessment of students by viva on only CNS according to syllabus covered. More numbers of study are required in other participants also, so it will give better idea for incorporating in assessment method.

CONCLUSION(S)

SOVV is more objective, consistent and uniform for examination process and also removes inter-examiner variability in the marking pattern. With due limitations of this study and feasibility, availability of staff, infrastructure of respective institute authors recommend that SOVV in pharmacology can be implemented in second MBBS student's assessment.

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