



## Oral assessments; Knowledge and perception of faculty in undergraduate dentistry program

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### ABSTRACT

**Objective:** Medical education globally constitutes formative and summative assessments. Oral examination is an integral part of assessment used to assess various learning domains; conventional oral assessment has been criticized for its reliability and validity. Hence, with the changing trends, emphasis is given on structured oral assessments (SOE). The aim of this study is to know the knowledge and perception of faculty on oral assessments.

**Methods:** A cross-sectional questionnaire was designed, and faculty members of dentistry program participated.

**Result and statistical analysis:** A total of  $n = 45$  faculty members participated in the survey. Descriptive data were presented in the form of frequency, percentage, mean, and standard deviation. An independent sample t-test was used to compare the response scores between the genders. Chi-square test was used to test the association between the gender and study responses.

**Conclusion:** The structured oral assessment was the most preferred type, but time and student willingness were the major barriers. All five domains of Bloom's taxonomy along with knowledge and interpersonal skills can be successfully assessed by SOE. There is a need for periodic faculty workshops to help them implement the newer trends in teaching and learning.

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Structured oral assessment, Bloom's taxonomy, Miller's pyramid.

## Introduction

Assessment is gathering of information to determine the knowledge, skills, abilities, and performance levels of students or candidates for graduation, licensure, or certification. There are various assessment tools used in the current dental/medical education such as written assessments (MCQs, short answers, and structured essay), oral examination/viva voce, multisource assessments (clinical/preclinical and standardized patients), multicompetency, and comprehensive assessments (OSCE, Triple Jump Exercise) [1]. Viva voce was defined by Joughin as an "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" [2].

Muzzin and Hart described four basic formats for oral examinations: a) the interview style, in

which the examinee is quizzed on general topics; b) the clinical style/chair side, in which questions are specifically regarding diagnosis and treatment plans for a particular patient; c) the cognitive style that requires problem solving around specific cases; and d) the role-playing style, with students assuming various "roles" with the examiner [3]. Oral examination/viva voce has become an integral part of formative and summative examinations in various universities. Of late, conventional oral examination (COE) is criticized for being too subjective and being influenced by academic and nonacademic factors related to teachers and students [4]. It may largely depend on the knowledge, attitude (offering verbal/nonverbal clues and prompting), and mood of examiners. The scores also correlate with personality scores [5].

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With the limitations, also viva voce is still used as a central part of assessments in medical teaching and learning (Fig. 1). It is flexible, driven by student's responses, and tests several aspects of clinical competence and ability to defend the decision in a given clinical situation that cannot be tested by written examinations [6]. The process-related factors are leniency, central tendency, "Halo effect," and error of contrast. In addition to that, student-related www include gender, accent and vocabulary used, and ability to pick nonverbal cues. Candidate's level of anxiety and test environment also determine the scores [7].

All these hitches may be dazed by replacing COE by structured oral examination (SOE). This can be done by predeciding the syllabus to be covered, competencies to be measured, and preparing a blueprint/checklist of questions to be asked in the viva [8]. With the changing trends in teaching and learning in medical education, few universities have experimented and adopted SOE as a type of assessment. The aim of this paper was to know the knowledge and perception of faculty regarding oral assessment use in bachelors program of dentistry courses in Saudi Arabia.

### Material and Methods

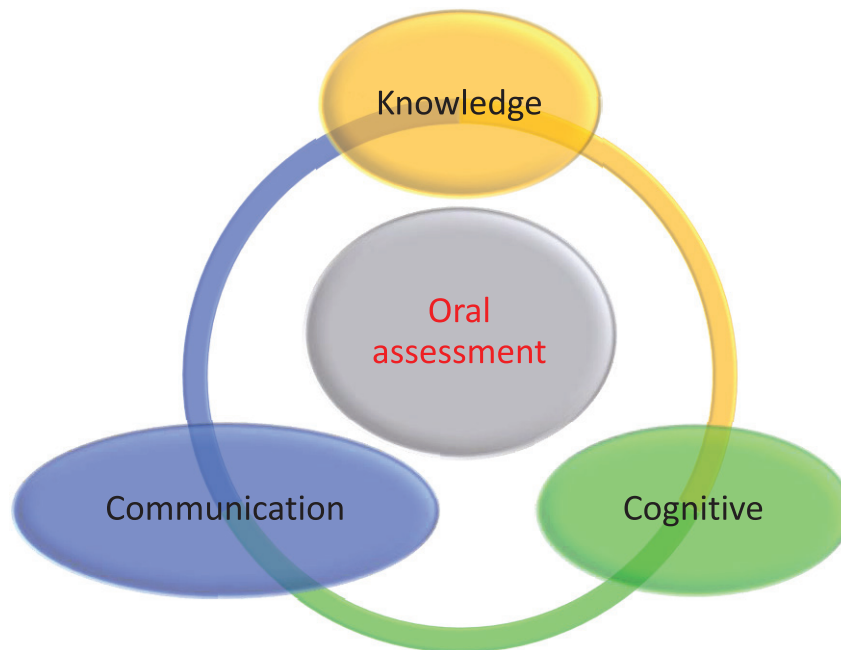
The present study was conducted in Buraydah College of Dentistry and Pharmacy, Buraydah, an institution comprising of completely segregated

male and female campuses. Consent was formally taken from the Institution's Ethical Committee. All the faculty members ( $n = 45$ ) including the course directors and contributors voluntarily participated in the study. A common questionnaire was prepared for all the male and female faculty members with emphasis on questions pertaining to the knowledge and perception of oral assessment.

### Results and Statistical Analysis

A total of 45 faculty members participated in the present study, of which 25 (55.6%) were male and the rest 20 were female (44.4%). The data collected were entered into Microsoft Excel spreadsheet and analyzed using IBM SPSS Statistics, Version 22 (Armonk, NY: IBM Corp). The descriptive data were presented in the form of frequency, percentage, mean, and standard deviation. An independent sample *t*-test was used to compare the response scores between the genders. Chi-square test was used to test the association between the gender and study responses. *P* value < 0.05 was considered to be statistically significant.

Analysis of the questionnaire revealed that 86.7% of participants considered oral assessment important to their courses (Table 1), of which 60% believed that it should comprise <10% of the total assessment (Table 1). Time and student willingness (40% and 24.4%, respectively) were considered as major barriers in conducting such assessment



**Figure 1.** Showing different course learning outcomes can be assessed by oral assessment.

**Table 1.** Percentage distribution of faculty response according to the gender.

		Gender		Total	p-value
		Male	Female		
Q1	1	22 (88.0%)	17 (85.0%)	39 (86.7%)	1.00
	2	3 (12.0%)	3 (15.0%)	6 (13.3%)	
Q2	1	12 (48.0%)	15 (75.0%)	27 (60.0%)	0.09
	2	12 (48.0%)	4 (20.0%)	16 (35.6%)	
	3	1 (4.0%)	1 (5.0%)	2 (4.4%)	
Q3	1	6 (24.0%)	4 (20.0%)	10 (22.2%)	0.02*
	2	14 (56.0%)	4 (20.0%)	18 (40.0%)	
	3	2 (8.0%)	9 (45.0%)	11 (24.4%)	
	4	3 (12.0%)	3 (15.0%)	6 (13.3%)	
Q4	1	7 (28.0%)	8 (40.0%)	15 (33.3%)	0.16
	2	6 (24.0%)	1 (5.0%)	7 (15.6%)	
	3	12 (48.0%)	9 (45.0%)	21 (46.7%)	
	4	0	2 (10.0%)	2 (4.4%)	
Q5	1	12 (48.0%)	13 (65.0%)	25 (55.6%)	0.47
	2	8 (32.0%)	3 (15.0%)	11 (24.4%)	
	3	5 (20.0%)	4 (20.0%)	9 (20.0%)	
Q6	1	3 (12.0%)	8 (40.0%)	11 (24.4%)	0.04*
	2	20 (80.0%)	12 (60.0%)	32 (71.1%)	
	3	2 (8.0%)	0	2 (4.4%)	
Q7	1	24 (96.0%)	19 (95.0%)	43 (95.6%)	1.00
	2	1 (4.0%)	1 (5.0%)	2 (4.4%)	
Q8	1	24 (96.0%)	17 (94.4%)	41 (95.3%)	1.00
	2	1 (4.0%)	1 (5.6%)	2 (4.7%)	
Q9	1	25 (100.0%)	17 (94.4%)	42 (97.7%)	0.41
	2	0	1 (5.6%)	1 (2.3%)	
Q10	1	24 (100.0%)	17 (85.0%)	41 (93.2%)	0.09
	2	0	3 (15.0%)	3 (6.8%)	
Q11	1	15 (68.2%)	13 (72.2%)	28 (70.0%)	0.781**
	2	7 (31.8%)	5 (27.8%)	12 (30.0%)	
Q12	1	23 (92.0%)	13 (65.0%)	36 (80.0%)	0.06
	2	2 (8.0%)	7 (35.0%)	9 (20.0%)	
Q13	1	23 (92.0%)	16 (80.0%)	39 (86.7%)	0.38
	2	2 (8.0%)	4 (20.0%)	6 (13.3%)	
Q14	1	5 (21.7%)	4 (21.1%)	9 (21.4%)	1.00
	2	18 (78.3%)	15 (78.9%)	33 (78.6%)	

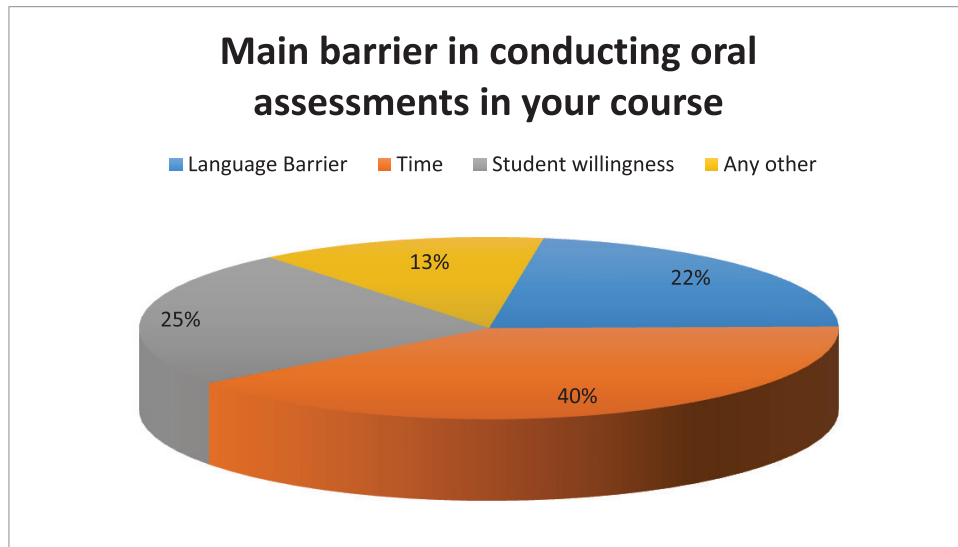
Fisher's exact test

Subjects with response "Not sure" are not included in the analysis. \* $p < 0.05$  statistically significant.

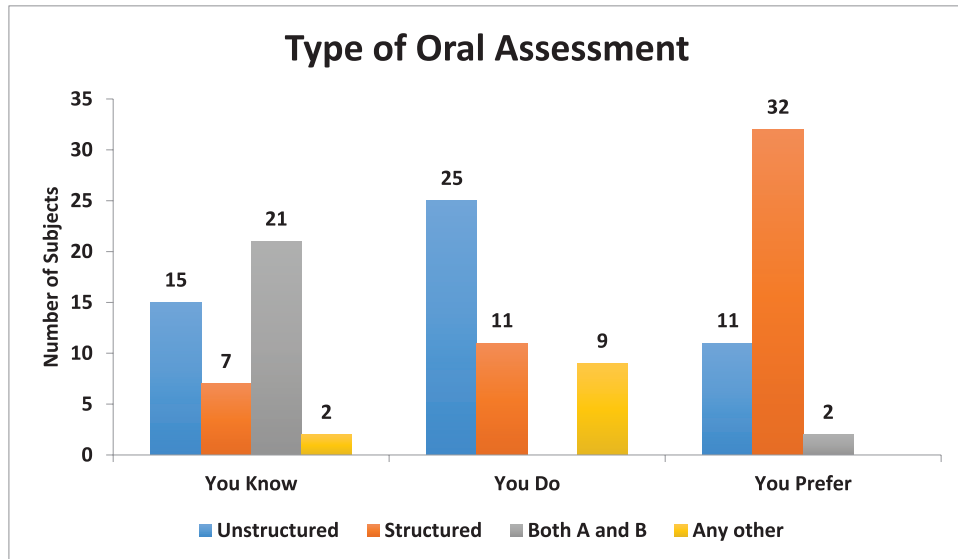
$P > 0.05$  NS = nonsignificant.

(Fig. 2). The perception about oral assessment, 55.6% ( $n = 25$ ), was following unstructured type, but majority of the faculty members preferred conducting the SOE (71.1%,  $n = 32$ ). About 47% ( $n = 21$ ) of the participants were well versed with both SOE and COE (Fig. 3). They considered (95.5%)

reliability and validity as important factors in oral assessment. Ninety-three percentage relied on SOE to evaluate knowledge, cognitive, and interpersonal skills of learning domains. Concerning Miller's pyramid and Bloom's taxonomy, 91% and 62%,



**Figure 2.** Pie chart showing “Main barrier in conducting oral assessments in your course”.



**Figure 3.** Bar graph showing the response for type of oral assessments “you know, you do, you prefer doing”.

respectively, believed that each could be reliably tested using oral assessment (Table 2).

### Discussion

Oral assessment is an important component of student evaluation and provides greater insight into student understanding process, problem-solving ability as well communication skill. In the formative and summative examinations, it is done in the traditional manner. The main objection to COE as a tool of assessment is a lack of consistency and reliability. The procedure of SOE is a method of conducting a

viva voce in a manner that seeks to minimize variation due to a variety of reasons including skewed coverage of topics, examiner bias, luck factor, and an inconsistent level of difficulty.

In the present study, 39 participants (86.7%) agreed on oral assessment being an important part of assessment in their course (Table 1). According to Rushton and Eggett [9], oral examination has several advantages over other forms of tests, including direct personal contact and also recognition of safe and competent clinicians. It can provide a constructive forum to ascertain the student’s appropriate use of

**Table 2.** Distribution of the study participants according to responses to the various questions.

Questions	Options					A–D	
	A	B	C	D	E	Mean	Standard deviation (SD)
<b>Q7.</b> Reliability and validity are important factors in oral assessments	19 (42.2)	24 (53.3)	2 (4.4)	0	0	1.62	0.58
<b>Q8.</b> Examiner, atmosphere, questions, and feedback are integral part of SOE	17 (37.8)	24 (53.3)	2 (4.4)	0	2 (4.4)	1.65	0.57
<b>Q9.</b> SOE helps in evaluating knowledge, cognitive, and interpersonal skills of learning domain's	20 (44.4)	22 (48.9)	1 (2.2)	0	2 (4.4)	1.56	0.55
<b>Q10.</b> SOE is a tool to measure knows and knows how of Miller's pyramid	18 (40.0)	23 (51.1)	1 (2.2)	2 (4.4)	1 (2.2)	1.70	0.73
<b>Q11.</b> SOE tests all five domains of Bloom's taxonomy	8 (17.8)	20 (44.4)	10 (22.2)	2 (4.4)	5 (11.1)	2.15	0.80
<b>Q12.</b> SOE requires multiple instructors	14 (31.1)	22 (48.9)	6 (13.3)	3 (6.7)	0	1.96	0.85
<b>Q13.</b> SOE is time consuming – preparation is required	22 (48.9)	17 (37.8)	5 (11.1)	1 (2.2)	0	1.67	0.77
<b>Q14.</b> Can oral assessments be a substitute to written assessments	2 (4.4)	7 (15.6)	7 (15.6)	26 (57.8)	3 (6.7)	3.36	0.93

the “scientific language” and also to test the student’s persuasive skills and oral poise [10].

Jacobson et al. [11] pointed out that many examiners consider oral examinations as a useful feedback mechanism, and by personally examining a sample of students, they can elicit valuable information on the strengths and weaknesses of the curriculum. Moreover, it provides a meaningful way to test student’s cognitive domains and offer overall progress [12]. Twenty-seven (60%), 12 male and 15 female, of the total participants favored <10% of the overall assessment to consist of oral assessment (Table 1).

Time was considered as the most common barrier (40%) in conducting oral examination followed by concern over student willingness (Fig. 2). Any well-planned examination was found to be costly in terms of examiners’ time and effort [9]. Rahman [10] and Khilnani et al. [14] also pointed out that time is a limiting factor in conducting oral assessment [13, 14].

Student willingness was the second common barrier; 45% of female faculties expressed their concern for the same (Fig. 2). There was a statistically significant difference  $p = 0.02$ , found in the perceived barriers between the male and female faculties. This could be attributed to error in oral performance ratings due to the tendency for some evaluators to be lenient and others to be stringent in their assignment of ratings. As studied by Holloway

et al. [15], there is an inverse relationship between anxiety and performance in the oral examinations. Forty-seven percentage of the participants were aware of both the structured and unstructured types of oral assessment and 15% knew only the structured type (Table 1). Therefore, the study revealed that a total of 62% ( $n = 28$ ) of the participants have knowledge about the structured type of oral assessment (Fig. 3). Many authors in the literature have agreed that structuring and preplanning viva voce lead to a better validity and reliability of viva as an assessment tool for undergraduates and postgraduates [16–18].

Majority of the participants, 56% ( $n = 25$ ), conducted the unstructured oral examination in their courses. However, 71% ( $n = 32$ ) of participants preferred the structured form of oral assessment (Fig. 3), but the preference of SOE by male faculty was in contrast with COE by female faculty ( $p = 0.04$ , Table 1). A similar opinion was expressed by faculty members who participated in the study conducted by Shenwai and Patil [17], they claimed that the SOEs were better in terms of reducing bias, minimizing luck factor, and uniformity of questions, making it a fair assessment tool. Similar results were found in a study conducted by Kini [19], where faculty opined that it was better in terms of uniformity of difficulty level and coverage of the topic. Sharmila Torke et al. maintained that reliability had been demonstrated



with structured, standardized orals using hand-picked examiners [20].

Most of the participants of this study (95.5%) were convinced by the fact that validity and reliability are important factors in oral assessment (Table 2). Many studies have shown that structured examinations have a better validity and reliability, with less susceptibility to gender or cultural bias than unstructured examinations [20,21].

It was a prevalent view (91%) among the participants that examiner, atmosphere, questions, and feedback are integral part of structured assessment (Table 2). Examiners should be formally trained in oral examination issues and methods. Selection and preparation of questions should be done from each learning objective with intense care and training of the examiners to follow the rules for framing of the questions from different areas to test the students' overall knowledge.

A significant part of the error in oral performance ratings is due to the tendency for some evaluators to be soft and others to be strict in their assignment of ratings. Correcting for such errors would change the pass/fail decisions for about 6% of the examinees. Marks awarded to candidates by different examiners indicate a low reliability between the ratings, and an agreement between the examiners is often poor. All these problems may be overcome by replacing the traditional viva by SOE [4].

The atmosphere during traditional oral examination is often threatening, and at times, the dialogue takes the shape more of a confrontation than discussion. This too can be overcome by the judicious use of SOE [17].

The questions should be capable of being asked in a few sentences which are clear, unambiguous, uncomplicated, and without repetition. They should have been thought out clearly beforehand but not so rigidly that it cannot be changed to suit the candidate's response. This requires each question to have a decision tree prepared [10].

The key factors to consider when setting assessment questions are as follows:

- Validity – appropriateness and suitability
- Reliability – objectivity, consistency, accuracy, and repeatability.
- Fairness – clarity of expectations and ways of preparing [13].

Feedback is an evaluative response which gives information on all aspects, experiences, difficulties,

interpretations, and proposals from learners. The perception of students can be used for a series of reforms in the process of improving the quality of teaching and assessment methods. This can, thus, be employed to improve educational programs and to facilitate in-depth learning and satisfaction among students, for better university ranking and standards [22].

Norman suggested that the oral examination must sample more broadly across cases and examiners to enhance reliability (control observer bias, drift, and fabrication) and enhance the scope of feedback [23]. Jacobson et al. [11] pointed out that many examiners consider that oral examinations are a useful feedback mechanism for the examiners]. Rahman [10] concluded, from their study, that the assessment of various domains of competence should be in an integrated, coherent, and longitudinal fashion with the use of multiple methods and provision of frequent and constructive feedback.

Ninety-seven percentage of the participants, in our study, agreed that structured oral assessment can be used to evaluate knowledge, cognitive, communication, and interpersonal skill domains of our intended learning outcomes of dentistry program. Most of the faculty members (93%) were in the opinion that structured oral assessment was a tool to measure knows and knows how of Miller's pyramid (Tables 1 and 2). As also stated by Mustafa Asani in his work, the base of Miller's pyramid consisting of knows (basic facts) followed by knows how (applied knowledge) is better assessed with various methods, one of them being oral examination [19,24].

The oral examination format enables instructors to test the students on all five cognitive domains of Bloom's taxonomy [17], and 62.2% ( $n = 28$ ) of the participants are in accordance with the same (Table 2). While many of these domains can be assessed through the written examination, the oral examination allows the instructor to probe these areas to ascertain if the student "really knows what he/she is talking about" [10]. Ostensibly, the rationale is that instructors could use the oral format to probe, challenge, and critically assess the depth and breadth of student's knowledge, understanding, and use of various concepts. This form of assessment is well suited for the evaluation of reflective and critical thinking competencies along with problem-solving abilities and analytical abilities [25].

Eighty-seven percentage of the participants ( $n = 39$ ) were in the opinion that structured oral assessment is time consuming, in which preparation requires time (Table 2). Oakley and Hencken [26] questioned the cost-effectiveness of oral examinations when the cost, in terms of professional time and energy, is weighed against its reliability and validity as a measure of professional competence. Any well-planned examination, however, is costly in terms of examiners' time and effort [26].

As George Miller pointed out in his elegant address to the 8th Annual Research in Medical Education conference, "while the evidence is persuasive that these techniques provide insights that cannot be obtained through more conventional methods, it is also clear that large-scale examinations of this kind are costly both in money and manpower" [27].

Approximately 80% ( $n = 36$ ) of the participants disagreed that the oral examinations could act as a substitute to written examinations (Table 1). No single examination can be expected to assess the wide range of features as thought to be important for a "good doctor." Examiners should identify those aspects that they wish to test and then provide an appropriate format. No single examination format can guarantee acceptability, feasibility, validity, and reliability; identifying the strengths and weaknesses of each approach is recommended [28]. Hence, oral examinations are used not only as a substitute but also as a complement to written examinations.

While reviewing the study participants' response to various questions according to the gender, it was observed that the difference between male and female was statistically significant only in questions pertaining to the perceived barriers in oral assessment ( $p = 0.02$ ) and the preferred type ( $p = 0.04$ ). As apparent from the questionnaire analysis, 65% of the female faculties were currently

following the unstructured form of oral assessment. The inherent disadvantages associated with this form of assessment could be attributed as one of the reasons why the female faculty perceived student unwillingness as one of the main barriers (Table 2).

The analysis of the study participant's preference and utilization of oral assessment type according to their knowledge resulted in a statistically significant difference ( $p = <0.001$ ) between the components (Table 3). Therefore, it can be deduced that even though the participants had knowledge of both the forms of assessment and preferred the structured type, most of the faculties were utilizing the unstructured type of oral assessment.

In conclusion, oral assessment is irrefutably accepted as a method of assessment. Time and student willingness were the main constraints in using this form of assessment. Even though there is a knowledge regarding the different types of oral assessment, the unstructured type is more widely followed. However, it is essential to apply the structured type in practice. SOE can be a better assessment tool, and with some modifications in blueprinting, it will be acceptable to the students as well as faculty. There is a need for periodic faculty workshops to help them implement the newer trends in teaching and learning. Extensive ground work is needed to bring about a shift in students' assessment from traditional viva to SOE. The change should not only be restricted to one subject but also needs to get extended to all other subjects. Substantial work, however, is needed to develop the traditional oral examination into a best practice oral format appropriate for medical or dental education.

Limitation of this study was relatively small sample size, and students' and faculty perceptions could be likened if student group was included.

**Table 3.** Faculty preference and utilization of oral assessment type according to their knowledge.

		Q4				Total	p-value
		1	2	3	4		
Q5	1	6 (40.0%)	2 (28.6%)	15 (71.4%)	2 (100.0%)	25 (55.6%)	<0.001*
	2	0	5 (71.4%)	6 (28.6%)	0	11 (24.4%)	
	3	9 (60.0%)	0	0	0	9 (20.0%)	
Q6	1	10 (66.7%)	0	1 (4.8%)	0	11 (24.4%)	<0.001*
	2	5 (33.3%)	5 (71.4%)	20 (95.2%)	2 (100.0%)	32 (71.1%)	
	3	0	2 (28.6%)	0	0	2 (4.4%)	

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## Conflict of interest

The authors declare that they have no conflicts of interest.

## References

- [1] Kramer GA, Albino JE, Andrieu SC, Hendricson WD, Henson L, et al. Dental student assessment toolbox. *J Dental Educ* 2009; 73(1):12–35.
- [2] Joughin G. Dimensions of oral assessment. *Assess Eval High Educ* 1998; 23:367–78.
- [3] Muzzin LJ, Hart L. Oral examinations. In: Neufeld VR & Norman GR (Eds.), *Assessing Clinical Competence*. Springer, New York, 71–93, 1985.
- [4] Thomas CS, Mellsop G, Callender K, Crawshaw J, Ellis PM, Hall A, et al. The oral examination: a study of academic and non-academic factors. *Med Educ* 1993; 27:433–9.
- [5] Memon MA, Joughin GR, Memon B. Oral assessment and postgraduate medical examinations: establishing conditions for validity, reliability and fairness. *Adv Health Sci Educ Theory Pract* 2010; 15:277–89.
- [6] Vu NV, Johnson R, Mertz SA. Oral examination: a model for its use within a clinical clerkship. *J Med Educ* 1981; 56:665–7.
- [7] Iqbal IZ, Naqvi S, Abeysundara L, Narula AA. The value of oral assessments: a review. *Bull R Coll Surg Engl* 2010; 92:1–6.
- [8] Rangachari PK. The targeted oral. *Adv Physiol Educ* 2004; 28(4):213–4.
- [9] Rushton P, Eggett D. Comparison of written and oral examinations in a baccalaureate medical-surgical nursing course. *J Prof Nurs* 2003; 19:142–8.
- [10] Rahman G. Appropriateness of using oral examination as an assessment method in medical or dental education. *J Educ Ethics Dentistry* 2011; 1(2):46.
- [11] Jacobson E, Klock PA, Avidan M. Poor inter-rater reliability on mock anesthesia oral examinations. *Can J Anesth* 2006; 53:659–68.
- [12] Kanti RM, Suranjana R, Unmesha R. Technology enabled assessment viva-voce: a new challenge. *J Adv Res Biol Sci* 2013; 5(3):238–42.
- [13] Rahman H, Rahman MA. A review on structured oral examination (SOE). *Dinajpur Med Col J* 2016; 9(1):113–117.
- [14] Khilnani AK, Charan J, Thaddanee R, Pathak RR, Makwana S, Khilnani G. Structured oral examination in pharmacology for undergraduate medical students: Factors influencing its implementation. *Indian J Pharmacol* 2015; 47(5):546.
- [15] Holloway PJ, Hardwick JL, Morris J, Start KB. The validity of essay and viva voce examining technique. *Br Dent J* 1967, 123(5):227–32.
- [16] Patel BS, Kubavat A, Piparva K. Correlation of student's performance in theory and practical of final summative pharmacology examination in MBBS curriculum: a critical insight. *Natl J Physiol Pharm Pharmacol* 2013; 3:171–5.
- [17] Shenwai MR, Patil KB. Introduction of structured oral examination as a novel assessment tool to first year medical students in physiology. *J Clin Diagn Res* 2013; 7:2544–7.
- [18] Schubert A, Tetzlaff JE, Tan M, Ryckman JV, Mascha E. Consistency, inter-rater reliability, and validity of 441 consecutive mock oral examinations in anesthesiology: Implications for use as a tool for assessment of residents. *Anesthesiology* 1999; 91:288–98.
- [19] Kini S. Student and faculty perception of objective structured viva voce (Osvv) As A Reliable, Objective and Valid Method of Oral Assessment. *Global J Res Anal* 2016; 5(5).
- [20] Torke S, Abraham RR, Ramnarayan K, Asha K. The impact of viva-voce examination on students' performance in theory component of the final summative examination in physiology. *J Physiol Pathophysiol* 2010; 1(1):10–12.
- [22] Simpson RG, Ballard KD. What is being assessed in the MRCGP oral examination? A qualitative study. *Br J Gen Pract* 2005; 55:430–6.
- [22] Rehman R, Syed S, Iqbal A, Rehan R. Perception and performance of medical students in objective structured practical examination and viva voce. *Pak J Physiol* 2012; 8(2):33–6.
- [23] Norman G. Examining the examination: Canadian versus US radiology certification exam. *Can Assoc Radiol J* 2000; 51:208–9.
- [24] Asani M. Assessment methods in undergraduate medical schools. *Nigerian J Basic Clin Sci* 2012; 9(2):53.
- [25] Gibbs H, Habeshaw S, Habeshaw T. *Interesting Ways to Teach: 53 Interesting Ways to Assess your Students*. Bristol: Technical and Educational Services, 1988.
- [26] Oakley B, Hencken C. Oral examination assessment practices: effectiveness and change with a first year undergraduate cohort. *J Hosp Leis Sport Tour Educ* 2005; 4:3–14.
- [27] Miller GE. The assessment of clinical skills/competence/performance. *Acad Med* 1990; 65(9):S63–7.
- [28] Lowry S. Assessment of students. *BMJ: Br Med J* 1993; 306(6869):51.