

# Students perception on different formats of written assessment in Medical Education

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## Abstract :

**Introduction :** Learning of medical students is assessed worldwide by using theory, practical and clinical examinations including written papers as well as objective structured clinical examinations (OSCE), case studies, and viva voce examinations. The written assessments are done with the help of multiple choice questions and subjective or descriptive open-ended questions. The descriptive questioning may be in the form of long essay questions (LEQ), structured essay questions (SEQ) and modified essay questions (MEQ). The objective of the study was to assess the preference of undergraduate medical students among the three methods of written assessment in open ended questions.

**Methodology :** A cross sectional study was conducted among medical students at private medical college, Karnataka. A lecture was delivered on a topic. Test was conducted on the same topic and a question was asked in 3 different formats: LEQ, SEQ and MEQ. After the test, a pretested and semi structured questionnaire was used for data collection and analyzed using appropriate statistical methods.

**Results :** Modified essay question was preferred for being: easier to answer, enjoyable, less time consuming, the best method to assess problem solving skills and clinical reasoning ability, to adequately assess the knowledge and a method, which is free of evaluator bias. Long essay question was considered as the best method to assess answer presentation skills and it covered greater spectrum of content.

**Conclusion :** Assessment methods have both advantages and disadvantages. Finding the right assessment method depends on evaluators purpose to assess students in terms of skills, knowledge and understanding.

**Key words :** Assessment methods, LEQ, MEQ, Medical Education, SEQ,

## Introduction :

The challenge to educators in the health care professions is to produce clinicians who are competent to practice in a variety of settings and who have the abilities to respond to fluctuating changes and demands placed on them within the health care system. Recently, extensive changes have taken place in most countries at all levels to improve the standard of medical education. Medical education, the art and science behind medical learning and teaching, has progressed remarkably. Teaching and learning have become more scientific and rigorous, Curricula are based on sound pedagogical principles, and Problem based and other forms of active and self-directed learning have become the mainstream. Teachers have progressed from the role of problem-identifier to that of the solution-provider.<sup>1</sup>

At undergraduate level there are three domains of skills to be evaluated i.e. Cognitive, Affective and Psychomotor. Cognitive domain can be evaluated at different levels including Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. Modified bloom's taxonomy identified three levels of cognitive domain. In medical education, the major emphasis is on developing and evaluating the level III or problem solving skills, as most of the physician's time is spent in analyzing patient's problems.<sup>2</sup>

Learning and progress of medical students is assessed worldwide by using theory, practical, and clinical examinations including written papers as well as objective structured clinical examinations (OSCE), case studies, and viva voce examinations.<sup>3</sup> Assessment methods have several functions, e.g. to make sure that

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students have learnt the essential part of a course, and to give feedback to students and teachers on the effectiveness of learning and teaching. It may also be assumed that the form of examination influences the pedagogical process at large, thereby contributing to what is sometimes referred to as systemic validity.<sup>4</sup> It is generally agreed that reviewing the teaching and assessment methods at regular intervals is necessary so that methodologies can be modified for improving the undergraduate medical education.<sup>5</sup>

Despite the proliferation of assessment methodologies which attempt to test the competence of medical students directly, such as OSCE, OSPE, case-based assessment, mini-CEX and workplace-based assessment, written assessments remain in widespread use. Much of the knowledge base required by the clinician is not necessarily testable in the performance format. Additionally, in comparison with most practical assessment formats, written tests are easier to organize and deliver, requiring little more than pen and paper or a computer, a venue, question setters and markers who need not be physically present.<sup>6</sup>

The written assessments are done with the help of multiple choice questions (MCQ) and subjective or descriptive open-ended questions.<sup>1</sup> The open-ended, descriptive, structured, and essay questions are considered useful in testing the higher-order thought process and interpretation skills.<sup>3</sup> The descriptive questioning may be in the form of long essay questions (LEQs), structured essay questions (SEQs) and modified essay questions (MEQs). Long essay questions are open ended, unstructured questions which can be used for assessment of complex learning situations that cannot be assessed by other means (writing skills, ability to present arguments succinctly).<sup>1</sup> Main purpose of long essay question is to assess student's understanding of subject-matter content as well as to assess their writing abilities.<sup>7</sup> Essay questions provide scope for creativity and individuality of approach; however, to some extent leave a chance of subjectivity in assessment.<sup>3</sup>

Structured essay questions is a type of questioning which has structured components containing open-ended questions, and expects specific answers to those components. These questions are used to test the knowledge as well as the capacities of analyzing, reasoning, application and integrating. There may be a freedom of flexibility of response and individuality of approach, and such questions help in evaluation of interpretative skills. SEQs are known to test the knowledge as well as the capacities of analysis and reasoning, and hence they are useful to evaluate how the

students can apply and integrate the knowledge.<sup>3</sup>

The Modified essay questions is a compromise between the multiple-choice question (MCQ) and the essay. The MEQ is designed to sit in between these two test instruments in terms of the ability to test higher cognitive skills and the ease of marking to a consistent standard. The aim of the modified essay question is to broadly measure both the absolute amount of knowledge retained by the candidate and the ability of the candidate to use that knowledge to reason through and evaluate clinical problems.<sup>8</sup> Modified essay questions consist of a case followed by a series of questions that relate to the case and that must be answered in the sequence asked. This leads to question interdependency and a student answering the first question incorrectly is likely to answer the subsequent questions incorrectly too. A well-written MEQ assesses the approach of students to solving a problem, their reasoning skills, and their understanding of concepts, rather than recall of factual knowledge.<sup>9</sup>

With this background, the following study was undertaken to assess the attitude, perception as well as the preference of assessment methods among the undergraduate medical students in the study setting.

### **Objective of the study**

To assess the preference of undergraduate medical students among the three formats of written assessment in open ended questions: Long essay question, Structured essay question and Modified essay question.

### **Methodology**

A cross sectional study was conducted among second year undergraduate students of medicine for duration of 3 months from March 2015 to May 2015 at Subbaiah Institute of Medical sciences and Research Centre, Shivamogga, Karnataka. The purpose of the study was explained in detail to the students and informed consent was taken. Those who were not present on the day of data collection were excluded from the study. A lecture on selected topic "Non Tuberculous Mycobacteria" was delivered to the whole class for duration of 40 minutes by a facilitator with the help of audiovisual aids. Test was announced on the same topic, to be conducted next day and students were asked to complete an assignment on the same. The main objective of the lecture and assignment was to make students well prepared for the topic test.

On the following day, in the morning session, test was conducted on the same topic for duration of an hour. Same question was asked in 3 different formats: Long essay question, Structured essay question and Modified essay question allotting 20 minutes each for the three

questions. At the end of the test, a pretested and semi structured questionnaire was administered to the students to assess their perception, attitude as well as their preference among the three different modalities of open ended questions, which were asked in the test. The main purpose of conducting the test was to not to assess their performance but to expose them to all the 3 modalities of questions, which will help them fill the questionnaire more efficiently. Data collection was done anonymously. Data thus obtained was entered in excel sheet and analyzed using appropriate statistical methods.

#### **List of questions asked in the topic test:**

##### **Long essay question (LEQ):**

Classify atypical mycobacteria. Write in detail about ulcer causing Mycobacteria. (10 marks)

##### **Structured essay question (SEQ):**

Classify Non Tuberculous Mycobacteria according to Runyon with an example in each category and disease caused by them. Write eight differences between Mycobacterium ulcerans and Mycobacterium marinum. (2+2+2+4 marks)

##### **Modified essay question (MEQ) :**

A 40 year old Canadian, who is employed as a swimming pool instructor, sees his physician because of a non-healing ulcer on his left arm. He is afebrile and gives no history of night sweats, weight loss or other constitutional symptoms. Biopsy of the lesion shows granulomatous inflammation and rare acid fast organisms. A tuberculin test is negative.a) Which organism is the person infected with? (1 mark)

b) Classify that organism according to Runyon classification with an example in each category and disease caused by them. (2+2+2 marks)

c) Write 3 salient features of this organism. (3 marks)

#### **Results :**

In our study, 165 second year undergraduate students participated. Majority i.e. 97 (58.78%) of them were females and the rest were males. Table No. 1 reveals the perception of undergraduate students towards three different modalities in written assessment. As evident from the table, majority of the students preferred Modified essay question over other two formats as it was easier to answer, enjoyable, less time consuming, the best method to assess problem solving skills, clinical reasoning ability, for adequate assessment of the knowledge as well as a method of assessment, which is free of evaluator bias. Among the remaining students, Structured essay question was preferred by most of the

students for all the above mentioned reasons except for a method to assess problem solving skills and knowledge of the topic, where Modified essay question was considered.

With regard to a method to assess the answer presentation skills, most of the students considered Long essay question to be more appropriate followed by Structured essay question. Similarly, LEQ was considered by more than 60% (105) of students to cover greater spectrum of content against only 20% (34) and 17% (26) of the students, who considered SEQ and MEQ respectively. From the point of view of fetching more marks, SEQ was selected by the majority (47.26%) followed by MEQ and LEQ which was preferred by very few in our study. Taking into consideration the interest of students in answering questions, it was found that, MEQs were preferred by most students i.e. 55.75% and very few i.e. <10% preferred LEQ.

Further analysis of the data revealed that, out of 154 students who preferred MEQ as a method for testing clinical reasoning ability only 104 (67.5%) considered it as time saving, 80 (51.9%) of students found it easier to answer and only 85 (55.1%) preferred to answer MEQ against other questions. Similarly among 149 students who believed MEQ as a method to improve problem solving skills, only 73 (48.9%) of students assumed it as a means to test knowledge of the topic adequately and only 62 (41.6%) thought that it will fetch them more marks. Long essay question was considered to test answer presentation skills by 97 (58.7%) of students, out of which only 12 (12.3%) found it easier to answer, 9 (9.2%) preferred to answer and only one student considered it as time saving.

#### **Discussion :**

In our study, it was found that majority of the undergraduate students' preferred Modified essay question against Structured essay and Long essay questions for many reasons which are already mentioned in the results. A study done among students of Royal College of general practitioners comparing the performance of candidates in examination based on both traditional long essay question and MEQ, found that the proportion of students performing better was more in MEQ exam. Also, those who failed in the exam opined that MEQ exam was both fair and relevant to general practice experience against long essay question, similar to the findings of our study.<sup>10</sup>

A study done among internal medicine students in Sweden revealed that the MEQs were appreciated by the students over others, which is consistent with the findings of our study.<sup>4</sup> Structured essay question was

considered to fetch more marks by the students in our study. A comparative study between MCQs and SEQs done by Sharma HS *et. al.*<sup>3</sup> found that the MCQ scores were significantly higher than SEQ scores.

**Conclusion :**

The assessment is an integral component of overall educational activities. Assessment should be designed prospectively along with learning outcomes. It should be purpose driven. All assessment formats have both advantages and disadvantages, and there is no single assessment method that results in a perfect assessment so

combination of formats based on rational selection is more useful. Finding the right assessment method depends on evaluators purpose to assess students in terms of skills, knowledge and understanding.

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**Table No. 1:**

Preference of undergraduate students among three different modalities of open ended written assessment methods: Long essay question, Structured essay question and Modified essay question.

SL. NO.	QUESTIONS	Long essay (LEQ)		Structured essay (SEQ)		Modified essay question (MEQ)	
		No.	%	No.	%	No.	%
1	Which type of question do u think is time saving?	01	0.6	50	30.3	114	69.08
2	Which type of question can test your problem solving skill?	04	2.42	12	7.92	149	90.29
3	Which type of question is easier to answer?	16	9.69	62	37.57	87	52.72
4	Which type of question is better for testing your clinical reasoning ability?	06	3.63	5	3.03	154	93.32
5	Which type of question do you think can adequately test your answer presentation skill?	97	58.78	47	28.48	21	12.72
6	Which type of question do you think can adequately test your knowledge of the topic?	63	38.17	24	14.54	78	47.26
7	Which type of question covers greater spectrum of content?	105	63.63	34	20.60	26	17.16
8	Which type of question do you think can remove Teacher/ Evaluator bias in assessing your answer?	36	21.81	49	29.69	80	48.48
9	Answering which type of question do you think can fetch you more marks?	19	11.51	78	47.26	68	41.20
10	Which type of question do you enjoy answering?	08	4.84	39	23.63	118	71.5
11	Which one of the three types of questions do u prefer to answer?	10	6.06	63	38.17	92	55.75

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