

Preference between Multiple Choice Questions over Essay Type Questions for the Purpose of Theoretical Assessment among Undergraduate Students of a Medical College in West Bengal

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Received: 01-07-2024 Revised: 15-08-2024 / Accepted: 21-09-2024

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Conflict of interest: Nil

Abstract

Background: Doctors are ultimately required to perform in a real-life setting that does not offer a list of choices. The goal of assessment in medical education is usually to support learning and to establish the competence of individual doctors. This study was conducted on MBBS undergraduate students of Bankura Sammilani Medical College during August – October 2019 to compare the preferences between Multiple Choice Questions (MCQ) and Modified Essay Type Questions (MEQ) for theoretical evaluation.

Materials and Methods: 190 students of different professional years of MBBS in Bankura Sammilani Medical College were given a pre-designed, pre-tested Google form questionnaire and their responses were collected.

Results: Mean age of the 190 students was 21.61 ± 1.17 (SD) years. Majority of the students (84.2%) were in the age group 21-24, male (62.1%), belonged to Hinduism (87.9%) and studying in MBBS 2nd professional. 57.4% students preferred Short Answer Questions (SAQ) for theoretical assessment. Preference of the type of questions for theoretical assessment was significantly associated with the professional year of MBBS ($p = 0.016$), class attendance ($p = <0.001$) of the students etc. 57.4% students thought MCQ is the preferred type of question for testing of knowledge. 62.1% students thought MCQ is the preferred type of question for testing the ability to apply knowledge. 43.7% students thought MCQ is the preferred type of question for testing the skills.

Conclusion: The present study findings can clearly infer the less popularity of essay type questions among undergraduate students.

Keywords: MCQ; MEQ; SAQ; Theoretical assessment, Undergraduate.

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Introduction

Assessment is an ongoing process aimed at understanding and improving student learning. The goal of assessment in medical education is usually to support learning and / or to establish the competence of individual doctors; it helps the person being assessed in identifying and responding to his or her own learning needs.[1] There are many feasible tools for the assessment of clinical practice, but there is a wide consensus on the fact that the simultaneous use of different

methods could be strategic for a comprehensive overall judgment of clinical competence.[2] Modified Essay Questions (MEQ) are often used to assess the higher order abilities in preference to other forms of assessment, including multiple-choice questions (MCQ). MEQ often form a vital component of end-of-course assessments in higher education.[3] On the other hand, Multiple Choice Questions (MCQ) are widely used in undergraduate and postgraduate medical examinations. Selection

of the correct answer in MCQ may be subject to cueing and therefore might not test the student's knowledge.[4] Besides, premature closure (arriving at a decision before the correct diagnosis has been considered) is a common reason for diagnostic errors in clinical practice.[5] In contrast to this artificial construct, doctors are ultimately required to perform in a real-life setting that does not offer a list of choices. There are also some studies which are concluding that a well-constructed MCQ is superior to MEQ in testing the higher cognitive skills of undergraduate medical students in a problem-based learning setup.[6] However, a scarce has been seen while searching the response of learners in this respect. The preferences of the medical undergraduate students for their assessment while appearing for any formative or summative evaluation are yet to be documented. With this background the present study aimed at comparing the preferences for both MCQ and MEQ among medical undergraduate students of a government medical college in West Bengal. This study aimed to compare the preference between multiple choice questions and essay-type questions for theoretical assessment among undergraduate students and to determine the factors influencing the preferences of undergraduate students of Bankura Sammilani Medical College and Hospital.

Materials and Methods

This was a descriptive study with a cross-sectional design conducted in a government medical college in West Bengal. It was conducted from June to August 2021 among undergraduate medical students except those who have not appeared in a single theoretical evaluation yet. Assuming the popularity of MCQs among students to be 50%, a confidence interval of 95%, and an absolute error of 8%, the minimum required sample size became 150. Considering 25% non-response the sample

size fixed to be 190. These 190 students were selected from all the professional years of MBBS present in the college. Every alternate response was taken till the desired sample size was reached by systematic random sampling.

A predesigned and pretested expert-validated questionnaire was sent to all the students as a Google form and their responses were recorded. The first page of the Google form contained informed consent. The further pages contained:

[A] Socio-demographic variables- Age, gender, religion, academic year of joining MBBS, professional year of MBBS

[B] Exposure variables

1. Proportion of medical undergraduate students according to their academic year
2. Proportion of medical undergraduate students according to their result in the last theoretical evaluation
3. Proportion of medical undergraduate students according to their attendance in the class

[C] Outcome variable: Proportion of medical undergraduate students according to their preference of multiple-choice questions over essay-type questions for the theoretical evaluation

Data collection and analysis: After collection data were entered into MS Excel sheet and it was checked twice to detect any erroneous entry. After organizing and presenting the data in the forms of tables and diagrams they were analysed applying the principles of descriptive statistics. SPSS version 20 was used to analyse the data.

Results

Mean age of the 190 students was 21.61 ± 1.17 years. The minimum and maximum ages were 19 and 27 years respectively.

Table 1: Distribution of students according to background characteristics: (n=190)

Background characteristics	Number of students (%)
Age	
≤20	27 (14.2)
21-24	160 (84.2)
≥25	3 (1.6)
Gender	
Male	118 (62.1)
Female	72 (37.9)
Religion	
Hindu	167 (87.9)
Islam	22 (11.6)
Others	1 (0.5)
Academic year of joining MBBS	
2019	121 (63.7)
2018	53 (27.9)
2017	16 (8.4)
Professional year of MBBS	

MBBS 2 nd Professional	121 (63.7)
MBBS 3 rd Professional part I	53 (27.9)
MBBS 3 rd Professional part II	16 (8.4)

Table no 1 showed that majority of the students (84.2%) were in the age group 21-24, male (62.1%), belonged to Hinduism (87.9%) and joined MBBS in 2019 (63.7%) and were in phase 2 undergraduates.

Table 2: Distribution of students according to preferred assessment with respect to different perspectives: (n=190)

Perspective of preferences of type of questions	Number of students (%)
Preferred for theoretical assessment	
MCQ	67 (35.2)
MEQ	14 (7.4)
SAQ	109 (57.4)
Preferred for testing of knowledge	
MCQ	109 (57.4)
MEQ	41 (21.5)
SAQ	40 (21.1)
Preferred for testing the ability to apply knowledge	
MCQ	118 (62.1)
MEQ	30 (15.8)
SAQ	42 (22.1)
Preferred for testing the skills	
MCQ	83 (43.7)
MEQ	58 (30.5)
SAQ	49 (25.8)
Total	190 (100)

Table no 2 revealed that 57.4% students preferred Short Answer Questions for theoretical assessment. However, when asked about testing the knowledge or ability to apply the knowledge or testing the skills majority preferred Multiple-Choice Questions. 57.4% students thought MCQ is the preferred type of question for testing of knowledge.

62.1% students thought MCQ is the preferred type of question for testing the ability to apply knowledge. 43.7% students thought MCQ is the preferred type of question for testing the skills. These findings can clearly infer the less popularity of essay type questions among undergraduate students.

Table 3: Type of preferred questions according to professional year of students: (n=190)

Professional year of MBBS	Type of preferred questions			Total (%)
	MCQ	MEQ	SAQ	
Preferred for theoretical assessment				
2 nd Professional	40	5	76	121 (63.7)
3 rd Professional part I	23	5	25	53 (27.9)
3 rd Professional part II	4	4	8	16 (8.4)
χ^2 value, df, p value: 12.15, 4, 0.016				
Preferred for testing of knowledge				
2 nd Professional	64	29	28	121 (63.7)
3 rd Professional part I	38	7	8	53 (27.9)
3 rd Professional part II	7	5	4	16 (8.4)
χ^2 value, df, p value: 6.83, 4, 0.145				
Preferred for testing the ability to apply knowledge				
2 nd Professional	70	23	28	121 (63.7)
3 rd Professional part I	36	5	12	53 (27.9)
3 rd Professional part II	12	2	2	16 (8.4)
χ^2 value, df, p value: 4.06, 4, 0.398				
Preferred for testing the skills				
2 nd Professional	51	38	32	121 (63.7)
3 rd Professional part I	26	17	10	53 (27.9)
3 rd Professional part II	6	3	7	16 (8.4)
χ^2 value, df, p value: 4.36, 4, 0.359				

Table no 3 showed that preference of the type of questions for theoretical assessment was significantly associated with the professional year of MBBS ($p = 0.016$).

Table 4: Type of preferred questions according to class attendance and score in the last theoretical examination: (n=190)

Characteristics	Type of preferred questions			Total (%)
	MCQ	MEQ	SAQ	
Class attendance				
< 50%	45	4	38	87 (45.8)
50% - 75%	11	4	43	58 (30.5)
>75%	11	6	28	45 (23.7)
χ^2 value, df, p value: 25.515, 4, <0.001				
Score in the last theoretical examination				
< 50%	4	1	3	8 (4.2)
50% - 75%	55	12	86	153 (80.5)
>75%	8	1	20	29 (15.3)
χ^2 value, df, p value: 3.201, 4, 0.457				

Table no 4 showed that preference of the type of questions for theoretical assessment was significantly associated with class attendance of the students ($p = <0.001$) though no significant association of the preference was found with their score in the last theoretical examination.

Table 5: Distribution of students according to their perception regarding advantages and disadvantages of multiple-choice questions: (n=190)

Perception	Number of students (%)
If a single advantage is asked to state	
Objective	84 (44.2)
No subjective assessment	55 (29.0)
Easier to prepare for examination	32 (16.8)
Scope of scoring by guessing	19 (10)
If a single disadvantage is asked to state	
Need to mug up a lot of information	40 (21.0)
More scope of cheating	26 (13.7)
Guessing without knowledge	48 (25.3)
No scope of partly correct answer	76 (40)

Table no 5 revealed that 44% students thought that the best advantage of Multiple-Choice Questions is the objective nature of the questions whereas regarding worst disadvantage of MCQ 40% opined about the scope of correctness i.e. there is no scope of providing partly correct answer of a multiple-choice question.

Regarding other advantages 29% thought that there is no subjective assessment, 16.8% found the preparation for MCQ as easier while 10% relied upon the scoring by guessing which was again stated as disadvantage by 25.3% of students followed by 21% students who opined about the need to mug up a lot to answer MCQs while according to 13.7% more scope of cheating is the worst disadvantage of MCQ.

Discussion

In the present study, mean age of the 190 students was 21.61 ± 1.17 (SD) years. Majority of the students (84.2%) were in the age group 21-24, male (62.1%), belonged to Hinduism (87.9%) and studying in MBBS 2nd professional. 57.4% students preferred Short Answer Questions for theoretical assessment. Preference of the type of questions for

theoretical assessment was significantly associated with the professional year of MBBS ($p = 0.016$), class attendance ($p = <0.001$) of the students etc. 57.4% students thought MCQ is the preferred type of question for testing of knowledge. This finding resembles with that of Veloski et al. [7] and Wood et al. [8] where the MCQ has been shown as a type of question for knowledge recall. 62.1% students thought MCQ is the preferred type of question for testing the ability to apply knowledge. Similar concept was there in the studies of Berner et al. [9], Collins et al. [10], Wilkinson et al. [11] and Irwin et al. [12] 43.7% students thought MCQ is the preferred type of question for testing the skills. These findings can clearly infer the less popularity of essay type questions among undergraduate students. This finding resembles with the less reliability of MEQ shown in the studies of Feletti et al. [13] and Schuwirth et al. [14] In contrast to that MCQs provide a better reliability as shown in the studies of Downing et al. [15]. 44% students thought that the best advantage of Multiple-Choice Questions is the objective nature of the questions whereas regarding worst disadvantage of MCQ 40% opined about the scope of correctness i.e.

there is no scope of providing partly correct answer of a multiple-choice question.

Other advantages of MCQ as stated by the students were: No subjective assessment (29%), Easier to prepare for examination (16.8%), Scope of scoring by guessing (10%); whereas according to them the other disadvantages were: Guessing without knowledge (25.3%), Need to mug up a lot of information (21%), More scope of cheating (13.7%) etc.

Conclusions

The present study revealed that popularity of modified essay type questions among medical undergraduates is quite less than that of multiple-choice questions and short answer questions. Majority of the undergraduates preferred short answer questions for theoretical assessment followed by multiple choice questions. For testing knowledge and its application as well as skills also, they preferred multiple choice questions. The various factors influencing popularity of these types of questions were professional year of studying MBBS, attendance of the students in the class etc.

Further studies will delineate the different ways to converge various types of assessment towards learner's preference in the recent competency based medical education.

Declarations

Ethical clearance- The Institutional Ethics Committee permitted conduction of the study.

Acknowledgements: The authors are thankful to all the faculty members of the Department of Community Medicine, Forensic Medicine, and Toxicology and all the study participants.

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