Short Communication

Mnemonic strategy for multiple choice question formulation- quick guide to medical educators

Rahul Ramesh Bogam[1],*, Mohamed Iheb Bougmiza[1]

[1]*Primary Health Care Corporation, Doha, Qatar*

A B S T R A C T

Multiple choice question (MCQ)/item is one of the common objective type of questions, which is being used extensively in most of the examinations. If MCQ is constructed in appropriate way, it can be an effective and efficient way to assess learning outcomes. Multiple guidelines are available from various resources regarding construction of MCQ/item. The objective of this paper was to provide simplified and easy to remember guidelines of MCQ writing to medical teachers; so that they can easily practice into their regular teaching activities. The following MCQ writing guidelines are given in mnemonic form so that teachers/readers can easily memorize without any difficulty.

1. Introduction

The objective type of questions provides a distinct advantage of being more reliable not only because of predetermined correct answer but also because of the more content being tested.[1] Multiple choice question (MCQ)/item is one of the common objective type of questions, which is being used extensively in most of the examinations. In fact, it signifies one of the most essential well-established examination tools widely used in assessment at the undergraduate and postgraduate levels of medical examinations.[2]

Well-constructed MCQs can be an effective and efficient way to assess learning outcomes.[1] Several guidelines are available from various resources regarding construction of MCQ/item.[2–4] However, easy to remember and mnemonic based guidelines on MCQ construction are sparse in the literature. The present paper was intended to provide simplified mnemonics in the form of ABCD like alphabets for MCQ construction, so that medical educators can easily incorporate it into their regular teaching practices.

2. All the above/ None of the above Questions

Try to avoid these two options as far as possible. For instance, in case of 'all of the above' option, if students recognize two correct options, they may easily tick 'all of the above' option without reading third option.

3. Beginning Section

Provide clear instructions to the students regarding type of questions, scoring system, allotted time etc.

4. Central Theme

Maintain single central theme for each item. For example, instead of focusing on signs, symptoms as well as treatment of sunstroke, it is better to focus on one theme rather than focusing on different aspects like signs, symptoms and treatment of sunstroke in single item.

* *Corresponding author.*
E-mail address: rahulramesh2122@gmail.com (R. R. Bogam).

5. Distractors

Experts generally recommend 4 options (one key and three distractors) in MCQ. It is crucial to ensure the quality of distractors. If you have 3 options and unable to think of 4th effective option, leave the options at 3 rather than 4. Select only the most plausible distractors (alternatives) and arrange them in the form of options.

6. Emphasis on Higher-Level Thinking Questions

Use memory-plus application questions as they need students to recall principles, facts as well as real life context.

7. Facility Value and Discrimination Index

These two indices are essential aspects of 'Item analysis'. The items having these indices within the acceptable limits must be retained for further use.

8. Grammar

Use simple, precise and unambiguous words in an item. Students will be more likely to choose the right option by finding the grammatically correct option.

9. Hints to Correct Answer

Avoid answering one question in the test by giving the answer somewhere else in the test. Avoid giving clues by use of a/an. For example – " Imipramine is an ….. Antidepressant (option)"

10. Independent and Complete Item

Each item should be complete and independent. If a subsequent item depends on the previous item, students may be penalized twice for one incorrect option.

11. Judgment and Problem-Solving Knowledge and Understanding

Construct an item as per Bloom's Taxonomy including Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation.

12. Key Answer should be the Best Choice

In item, key answer should be the best choice. If there is ambiguity or any subjective element in an item, it may confuse students.

13. Language

Use language which is appropriate to the level and vocabulary of students. For example – For Hepatitis A spread, 'Droplet infection' seems to be appropriate instead of 'Tiny air molecules'.

14. Multiple Text

Avoid repetition of words. If there are common words in the options, they must be included in the stem. For example – for protein requirement of Indian reference man (stem), there is no need to write per kg body weight in each option. It can be included in stem only.

15. Negative Words

Avoid using negative words in stem or its use should be minimum. If they are inevitable, highlight them in the form of capitals, italics or by underlying them. Avoid double negatives at any cost. For example - "Which of the following is not a loop diuretic except".

16. Options Length

Length of option may help students to make guesswork without knowing the answer. Avoid making too long or too short answer. Maintain the uniformity in length of all options.

17. Peer Evaluation

Make corrections if any in given item before proceeding. One of the best strategies to ensure the quality of items is to have them checked by your colleagues. It has been documented that half of the items are discarded as 'not good' by using this strategy.

18. Question Format should be Standard

Write stem on top and begin the options from next line. Each option should be in one line. The options may be numbered like a, b, c, d instead of 1,2,3,4 because students may get confused later with serial number of the item.

19. Rank Order of Options

All options in an item must be arranged in rank order so that, students do not have to hop through the options to find out the correct answer.

20. Stem with Clear Problem

Jot down clear problem and do not write stem with single word.

21. Testing of Various Domains

Each item should be supplemented with specific learning objectives and learning domains (cognitive, psychomotor and affective) need to be identified for each item.

22. Unambiguous and Inarguably Correct Answer

Cross check the accuracy of the answer. Make sure that it should be unambiguous and unarguably the correct answer.

23. Vague Terminologies

Avoid using words like 'excellent', 'majority', 'fairly high', 'always', 'never', 'usually' in item. These types of words can confuse students.

24. Window Dressing of Stem

Avoid superfluous and unnecessary words in stem which can confuse the students. In short, avoid 'flowery language' in item.

25. Xclusive Options should be Avoided

Avoid mutually exclusive options in item.

26. Yield Standard Format

Write stem on top and begin the options from next line. Each option should be in one line. The options may be numbered like a, b, c, d instead of 1,2,3,4 because students may get confused later with serial number of the item.

27. Zero Abbreviations

Abbreviations must be avoided in stem. This is mainly true for non-standard terms.

References

1. Singh T, Gupta P, Singh D. Principles of medical education. 5th ed. New Delhi: Jaypee Brothers Medical Publishers; 2021.
2. Flavio T, Mazzone A, Berti F, Pinna G, Bortolotti I, Colombo F, et al. Are multiple-choice questions a good tool for the assessment of clinical competence in Internal Medicine. *Ital J Med*. 2018;12(2):88–96.
3. Brame CJ. Writing Good Multiple-Choice Test Questions; 2021. Available from: https://cft.vanderbilt.edu/guides-sub-pages/writing-good-multiple-choice-test-questions.
4. Rules for Writing Multiple Choice Questions; 2021. Available from: https://testing.byu.edu/handbooks/14%20Rules%20for%20Writing%20Multiple-Choice%20Questions.pdf.

Author biography

Rahul Ramesh Bogam, Community Medicine Specialist Trainer

Mohamed Iheb Bougmiza, Program Director