Multiple Choice Questions in Medical Education: Indispensable or Expendable?

Sir,

In an interview, a medical teacher who was asked about his views on multiple choice questions (MCQs) could only mumble the words: "guessing" and "cheating." Unfortunately, the majority of academics in India seem to hold the view that an MCQ is nothing but a guessing-and-cheating game. Such a misconception has adverse effects on medical education. MCQs, it should be borne in mind, are much more than just a type of question: it is an educational tool with four facets: it tests the student, teaches the student, tests the teacher, and teaches the teacher. The first role is preeminent and widely known. What is rarely appreciated is that the MCQ also "teaches the student:" every time a student guesses the answer, logically or randomly, rightly or wrongly, he or she stands to gain from it when told the correct answer. More importantly, the concepts gained from good MCQs tend to lodge themselves in the intermediate-term memory, the reason for which is to be found in the way the brain functions: only those events that are associated with emotions are stored in the intermediate-term memory. The challenge of solving a good MCQ ends with either elation or frustration: both forms of emotion help in etching the core-concept ensconced in the MCQ into the intermediate-term memory of the student. On the same premises, MCQs can also be used by the teacher in a pretest to broach a lecture topic and prime the students to the core concepts that are to be discussed. The quality of MCQs constructed by teachers sets apart the good teachers from the mediocre and thereby "tests the teacher;" it requires considerable knowledge, intelligence, acumen, and devotion to write good MCQs, and only the best teachers are able to do so. Moreover, ever-so-often, students point out fallacies in the MCQs with convincing arguments and references to textbooks, and thus, the MCQ "teaches the teacher." The same is rare in short-answer questions (SAQs) since their answers are mostly latitudinal, obviating any scope for debates or arguments.

Before discussing the merits of MCQs, it is important to mention the demerits of open-ended questions, if only because MCQs were conceived to eliminate the inherent ambiguities and other shortcomings of the latter. It is an open secret the world over that answer scripts are barely read. In his book "Doctor in the House," Richard Gordon narrates his conversation with his friend Richard Grimsdyke, who tells him that the examiner throws the answer scripts down the staircase as he enters his flat: the scripts that are stuck on the topmost step are awarded the highest marks and those that roll down to the bottom get the lowest marks! Although a satire, it is not far from truth: examiners have to struggle against impossible deadlines for grading answer scripts and needless to say, they end up grading them more intuitively than perspicaciously, more so because not many students in India have the necessary command of English to answer questions related to "why" or "how" and it is difficult to evaluate answer scripts when the answers are not to-the-point, the handwriting is illegible, or the grammar is so flawed that the text is incomprehensible or outright unintelligible. The marks allocated to the questions, often in the range of 5–10, make little sense since it is never clear as to the depth in which a question has to be answered to score full marks or any fraction thereof: in general, the "full marks" remains an elusive goal. The most students believe that to score high, they should write whatever they know even if they are remotely related to the question and should embellish the text with bullets, colorful diagrams, flowcharts, highlighted text, underlined words, and whatnot. I appreciated the merit of this notion only after I, as a faculty member, evaluated answer scripts against impossible deadlines. I also realized that a good handwriting helps in scoring better, if only because the examiners do not have the time to read every line: they look for the overall layout of the text. Surely, such grossly subjective and ill-defined criteria for the evaluation of answers should have long been eliminated, but they have not been so in India. Last but not the least, few take cognizance of the fact that the examiner may not be in a position to fairly evaluate a diverse set of questions: it is not unusual for a faculty member to have difficulty in recalling the concepts of topics beyond his/her subspecialty.

That said, one has to concede that subjective evaluation must necessarily remain an adjunct to objectivity: What is required is a combination of an MCQ test which is outright "objective" followed by an unavoidably "subjective" viva voce. The latter should take the form of a moderation that takes into consideration the marks scored in the MCQ test. Interestingly, such a policy would be in consonance with an unwritten principle of measurements which says that to measure anything, one must have a rough idea of its measure. With optical mark reader, MCQ answer sheets can be corrected in a matter of hours and the marks scored by the candidates can be made available to the examiners during the viva voce so that the latter can ascertain if the candidate is truly worthy of the marks scored and understands the intricacies of the subject: after all, high scores are possible in MCQ through mindless rote. Without the theory scores ready at hand, the examiner is likely to flounder in assessing the student. On the flip side, an examiner who was a self-confessed ignoramus admitted to me that he was clueless about the answers to the questions he asked in the viva voce and that he judged students by their body language: those who replied confidently were

given good marks while those who fumbled got bad marks! It is also common knowledge among medicos that over the decades, biased, or madcap examiners have unfairly detained many meritorious students: there was a lunatic examiner who, just in jest, detained students who entered his room for viva voce with their right foot forward! The objective score in MCQ test would be a bulwark against such frivolity and tyranny in the viva voce.

As mentioned at the outset, the main diatribe against MCQ is that it can be answered by guessing. While that is true to some extent, a little calculation will show how minuscule its probability is. The probability of guessing the answer to a 4-option-MCQ correctly is 1/4. Hence, the probability of answering two consecutive answers correctly through guessing is 1/16, three consecutive questions correctly is 1/64, and so on. Hence, the probability of scoring high through guessing in a test paper with 100 MCQ is miniscule. Another common rant against MCQ is that its answer can be communicated among the examinees through sign language, which is true. However, this menace can be effectively curbed by having multiple sets of question papers, each set with a different sequence of the same questions.

It is time to accept that MCQs are here to stay, especially in the competitive examinations for the undergraduate and postgraduate (PG) courses. If it is argued that MCQs are not a good way of testing knowledge, it has to be conceded in the same breath that the students admitted to the MBBS and MD/MS courses are not the best since the entrance tests for both are MCQ based. Arguments aside, it is true that several MCQs in the PGentrance test papers are seriously flawed, the reason for which is not far to seek: for the most part, the MCQs in the question bank are unvetted since the examination boards approach faculty members directly for MCQs. Worldwide, however, the widespread use of MCQs in examinations has led to the creation of large question banks, together with the data based on item analysis. In India too, MCQs must be used in a big way in examinations in every medical college, if only to ensure that the All India PG Medical Entrance Examination question bank only has vetted questions with the discrimination and difficulty indices calculated and regularly updated after every examination. For the same reason, MCQ-bank administrators should not approach individual faculty members: they should approach the institutes for assuredly vetted MCQs.

In the PG-entrance test, a candidate is ranked by his/her overall score, and no weightage is given to the marks scored in the individual subjects either in the test itself or during the MBBS course. Thus, a candidate who, for example, has consistently excelled in subject-A in the undergraduate years might have to settle for subject-B, if only because the assessment in MBBS is subjective and cannot be relied upon. In essence, therefore, the marks scored during the MBBS years are useless because the entire system of evaluation in the MBBS examinations, both theory and practical, is totally subjective. A high rank in the PG-entrance test can be a flash in the pan, and therefore, if the internal examinations are objective, there would be a definite case for stipulating a minimum score in the internal assessment of the concerned subject for the eligibility in the PG course of the same subject. A well-maintained record of the internal assessment of the student in the MBBS course can be a credible proof of the caliber and consistency of a medical graduate provided that the class tests are MCQ-based. For example, if the topper in the PG-entrance test wants to opt for subject-X, the same should be granted only if his/her score in subject-X during MBBS is above a stipulated minimum. The vagaries of the current MBBS examinations preempts such a policy, and therefore, a candidate who never took subject-X seriously or attended its clinics and wards can walk away with an admission to the PG course in subject-X (which may be in great demand), if only his/her overall score in the PG entrance test is high and even if he/she wrongly answered the questions related to subject-X in the test paper!

It can be argued with ample justification that of all the science subjects on which a student needs to be tested, the medical subjects are the ones that are most appropriate for MCQs. The practice of medicine is replete with situations where the doctor has to deal with closed-ended questions related to the "most/least probable diagnosis," "the most/least important investigation," or "the medicine to prescribe/not prescribe" and these questions lend themselves perfectly to MCQs. Indeed, so long as a student is able to answer brain-teasing MCQs through reasoning, it is immaterial whether or not he/she is able to rattle off the details of a disease and the related investigations and pharmacopeia: after all, such details can be stored in a palmtop and readily accessed when necessary. It is also possible that the student may not encounter the certain types of patients during his/her limited clinical posting but solving good MCQs will teach them the nuances of diagnostic and therapeutic decision-making more easily than they would if they were not primed through MCQs.

To conclude, the farce of long answer question/SAQ-based test papers and the pussyfooting of MCQs have gone on far too long, and a total transition to MCQ-based tests, at every level of examinations related to the medical sciences, is a must if the standard of medical education in India is to improve.

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