Original Article

Quality of Multiple-Choice Questions (MCQs) as Perceived by the Postgraduate Residents Appearing in Mid Training Assessment (MTA) During January 2022 at Rawalpindi Medical University

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INTRODUCTION

Assessment in medical education is of paramount significance to verify the achievement of desired learning outcomes. Multiple Choice Questions (MCQs) are primarily designed to assess the knowledge of the students due to their validity, reliability and cost-effectiveness [1]. It is quite feasible to implement MCQs based assessment pertinent to all cognitive domains in any institute in compliance with the employed faculty [2]. MCQs are purposely constructed with meaningful and equally plausible distractors for assessing the students and promoting their deep learning[3]. They are commonly used in higher education for efficiently assessing the extensive course material in a short time period [4]. Being a user-friendly assessment, multiple choice testing is carried out in numerous educational settings globally [5]. Questions for high stake examinations like that of undergraduate and postgraduate medical education should properly be constructed and reviewed before administration by experts in order to ensure their flawlessness [6]. Apart from recall of knowledge, multiple choice questions are

ABSTRACT

Impartiality and reliability of Multiple-Choice Questions (MCQs) render them an ideal assessment tool for measuring higher order cognition. Objective: To determine the perception of postgraduate medical trainees pertinent to the quality of MCQs administered in Mid Training Assessment (MTA) January 2022. Methods: A cross-sectional descriptive study was carried out among 60 postgraduate trainees who appeared in MTA during January 2022. About 23, 12 and 05 of these trainees were doing MS and MD training at Benazir Bhutto Hospital, Holy Family Hospital and DHQ Hospital Rawalpindi respectively. Trainees were enrolled in the study through consecutive non-probability sampling. The feedback from the trainees about quality of MCQs was gathered by means of a structured questionnaire based on 5-point likert scale. Data analysis was done by using SPSS version 25.0. Results: About 87% of the trainees were pleased with the quality and construct of MCQ in their assessment in terms of illustration of the information in their stems needed to understand the clinical problem. More than 82% trainees satised with the time allocated for attempting MCQs papers. Only 55% trainees agreed with alignment of MCQs with given Table of Specification (TOS). Most (32.5%) wanted to have difficulty level of the MCQs in accordance with level of training. Around 27.5% and 22.5% of the residents proposed to incorporate more clinical reasoning and problem solving MCQs respectively. Conclusions: Trainees were substantially contented with the standard of MCQs. They suggested for inclusion of more clinical reasoning and problem-solving type questions in alignment with TOS.
Quality of Multiple-Choice Questions (MCQs) as Perceived by the Postgraduate Residents

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also designed and administered for conceptual testing and measuring the problem-solving skills of the students [7]. MCQs are preferably used for assessing the knowledge due to easiness of scoring and non-subjectivity [8]. Moreover, high achievers can very well be differentiated from low achievers by means of well-constructed MCQs [9]. Students who cannot perform well in MCQs are incapable of adequately attempting other types of assessment [10]. Elimination of the distractors by the students from MCQ options illustrates that students have knowledge of content more than that is questioned [11]. Some experts challenge the ability of MCQs to assess higher order learning that is basically attributed to poor quality MCQs having ineffective distractors [12]. Poorly designed MCQs are also known to negatively influence the students' learning that is basically attributed to poor quality MCQs having ineffective distractors [12]. Poorly designed MCQs are also known to negatively influence the students' learning that is basically attributed to poor quality MCQs having ineffective distractors [12]. Poorly designed MCQs are also known to negatively influence the students' learning that is basically attributed to poor quality MCQs having ineffective distractors [12].

**METHODS**

A cross-sectional descriptive study was done to get feedback of 40 postgraduate trainees who appeared in MTA during January 2022. About 23, 12 and 05 of these trainees were doing MS and MD training at Benazir Bhutto Hospital, Holy Family Hospital and DHQ Hospital Rawalpindi respectively. These 3 teaching hospitals were affiliated with Rawalpindi Medical University Rawalpindi. Trainees were enrolled in the study through consecutive non-probability sampling. The feedback from the trainees about standard of MCQs was gathered by means of a structured questionnaire based on 5-point likert scale.

**RESULTS**

Of the 63 postgraduate trainees appearing in Mid Training Assessment (MTA) during January 2022 at Rawalpindi Medical University, 40 trainees gave their viewpoints about the quality of Multiple-Choice Questions (MCQs) that were incorporated in their assessment. Of the 40 trainees, most (17.5%) were doing training in Obstetrics and Gynecology. The number of residents enrolled in each training program from all three teaching hospitals is revealed below in Table 1.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem of the MCQs had adequate information necessary to understand the question and choose the correct answer</td>
<td>33 (82.5%)</td>
<td>04 (10%)</td>
<td>03 (7.5%)</td>
</tr>
<tr>
<td>MCQs scenarios were too long to read in specified time</td>
<td>14 (35%)</td>
<td>12 (30%)</td>
<td>14 (35%)</td>
</tr>
<tr>
<td>All the options of MCQs were of the same length</td>
<td>22 (55%)</td>
<td>11 (27.5%)</td>
<td>07 (17.5%)</td>
</tr>
<tr>
<td>There were no grammatical errors or spelling mistakes in MCQs</td>
<td>28 (70%)</td>
<td>02 (5%)</td>
<td>10 (25%)</td>
</tr>
<tr>
<td>MCQs were based on problem solving</td>
<td>33 (82.5%)</td>
<td>01(2.5%)</td>
<td>06 (15%)</td>
</tr>
<tr>
<td>MCQs were designed to assess our knowledge application in addition to recall of knowledge</td>
<td>30 (75%)</td>
<td>03 (7.5%)</td>
<td>07 (17.5%)</td>
</tr>
<tr>
<td>Options of “all of the above” and “none of the above” were sternly avoided</td>
<td>31 (77.5%)</td>
<td>07 (17.5%)</td>
<td>02 (5%)</td>
</tr>
<tr>
<td>It was easily understandable what is being asked in the scenario without reading the options</td>
<td>20 (50%)</td>
<td>13 (32.5%)</td>
<td>07 (17.5%)</td>
</tr>
<tr>
<td>Unnecessary difficult vocabulary was avoided</td>
<td>30 (75%)</td>
<td>07 (17.5%)</td>
<td>03 (7.5%)</td>
</tr>
<tr>
<td>Presence of any abbreviation in the MCQs’ stem that was not clear to you</td>
<td>17 (42.5%)</td>
<td>09 (22.5%)</td>
<td>14 (35%)</td>
</tr>
<tr>
<td>The content asked in MCQs was according to the TOS (Table of Specification) given in your MS / MD curriculum</td>
<td>22 (55%)</td>
<td>06 (15%)</td>
<td>13 (32.5%)</td>
</tr>
<tr>
<td>Time allocated for paper-I was sufficient</td>
<td>34 (85%)</td>
<td>04 (10%)</td>
<td>02 (5%)</td>
</tr>
<tr>
<td>Time allocated for Paper-II was adequate</td>
<td>33 (82.5%)</td>
<td>04 (10%)</td>
<td>03 (7.5%)</td>
</tr>
</tbody>
</table>

Table 1: No. of residents from different training programs (n = 40)

Feedback was gathered from the university residents regarding standard of MCQs and around 66.7% trainees were satisfied with their quality. In addition to the stem of MCQs, the time allocated for solving them and their problem solving aspect were agreeable among our residents as illustrated below in Table 2.

<table>
<thead>
<tr>
<th>Training programs</th>
<th>Holy Family Hospital (HFH)</th>
<th>Benazir Bhutto Hospital (BBH)</th>
<th>DHQ Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS Obstetrics &amp; Gynecology</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>MS Urology</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>MS General Surgery</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>MS Neurosurgery</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>MS Orthopedics</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MS Pediatric Surgery</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MD General Medicine</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>MD Nephrology</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MD Cardiology</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>MD Gastroenterology</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MD Dermatology</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>MD Pediatrics</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MS Otorhinolaryngology</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>MS Anesthesiology</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>MD Diagnostic Radiology</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Feedback of the trainees about MCQs of Mid Training Assessment (MTA) January 2022
Most (32.5%) of our trainees were dissatisfied with the difficulty level of MCQs and suggested for designing them in compliance with acquisition of respective competencies. About 22.5% trainees recommended for incorporation of more problem-solving questions in assessment as shown below in Figure 1.

Difficulty level of MCQs should be in accordance with level of assessment
More problem solving MCQs should be incorporated
MCQs should be incorporated in alignment with Table of Specification (TOS)
Length of MCQ stem should be appropriate
MCQs should be more clinical knowledge based instead of only basic sciences

Figure 1: Suggestions of postgraduate trainees to improve the quality of MCQ

Although multiple choice questions are frequently administered assessment tool due to their objectivity, validity and reliability; their quality should be optimal for accurately differentiating the high from low performers [14]. In current study, about 82.5% postgraduate trainees appearing in Mid Training Assessment during January 2022 perceived the stem of MCQs in their theory papers appropriate with respect to illustration of considerable information deemed necessary to comprehend and choose from the given options as correct answer. About 50% of our respondents confessed they chose the correct answer conveniently just by reading the stem of MCQs. Developing MCQs with suitable scenario for understanding the healthcare problem in accordance with lead in statement is not an easy job. Likewise, MCQs developed for access exam to diverse medical specialties from 2009-2013 were identified with multiple errors. One of them was negative/unfocussed stems of MCQs and this defect persisted throughout the 5 years. Such stems were quite cumbersome that candidate faced difficulty in choosing the correct answer without reviewing all the options. However, such flaws in stems were intensified periodically [15]. Similarly, a study by Dowing SM et al revealed such flaws related to construct and content of MCQs that deprived medical students from good scores in their achievement examination [16]. Such flawed items make it difficult for the candidates to attempt the paper in specified time. The faculty members involved in designing MCQs should be skilled enough to avoid technical aws. National Board of Medical Examiners (NBME) has developed a guide for convenience of the Higher Education faculty in this regard [17]. However, faculty members should also be well-versed in recent medical advancements in order to meet the requirements of World Federation for Medical Education (WFME) [18]. The present study revealed satisfaction among 55% of our MS and MD trainees who appearing in MTA at Rawalpindi Medical University with respect to allocation of test items in accordance with Table of Specification (TOS) that was shared with them for guidance well before assessment. TOS is made available to the candidates ahead of exam in order to ensure content validity of the assessment [19]. Ideally learning objectives of a curriculum should be aligned with its assessment [20]. In addition to getting arrayed with the teaching methodologies. This is imperative to promote students’ learning. Provision of TOS to students ensures content validity of an assessment; in other words, TOS reflects the course on the basis of which performance of the students is scored [21]. Continuing Professional Development (CPD) of the teaching faculty should regularly be organized in higher education institutes for capacity building and guaranteeing the assessment of the future professionals in true spirit. Although 82.5% of our respondents perceived the MCQs incorporated in their MTA assessment as based on problem solving traits, however 27.5% recommended to design items to judge their clinical reasoning more than that of their basic sciences knowledge as this has already been tested while enrolling for postgraduate training through central induction process. Being high stake assessments, clinical reasoning should substantially be merged in test items predominantly designed for postgraduate trainees for adequate comprehension of problem and to rationalize the respective treatment [22]. Clinical vignette multiple choice questions are also essential to elicit critical thinking after appraising the case [23]. Cognition level of MCQs should preferably be advanced in order to make real difference in undergraduate and postgraduate medical assessments. Most (32.5%) of our respondents opined that difficulty level of questions should be according to their level of assessment. As Mid Training Assessment (MTA) is executed for the trainees who have successfully accomplished all training requisites with respect to their training years, so their assessment should vary substantially from those who are assessed on training completion. Professional teachers are bestowed with an art of fusing knowledge of the topics taught with problem solving skills in real life scenario [24]. Although difficulty index of MCQs can accurately be determined by item analysis [25], the feedback of the trainees for improving the existing scenario also carries weightage. Developing curriculum before commencement of program and year-wise segregation of course content along with its learning objectives and assessment TOS can prove valuable in
assessing the postgraduate trainees in congruence with level of training.

CONCLUSIONS

Although candidates were substantially satisfied with the quality of MCQs; however, incorporating more clinical vignette-based items and paper setting in compliance with level of training was strongly suggested. Apart from getting trainees’ feedback, MCQs should also be reviewed by the faculty involved in designing the items in addition to educationist for comprehensive review in accordance with standard MCQ writing guidelines. Faculty training for their capacity building in this regard at institutional level will also be beneficial.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES


[19] DiDonato-Barnes N, Fives H, Krause ES. Using a table of specifications to improve teacher constructed traditional tests: An experimental design. Assessment in Education: Principles, Policy, and

[21] Alade OM and Igbinosa VO. Table of specification and its relevance in educational development assessment.


