Use of multiple choice questions to assess the knowledge and awareness about HIV/AIDS - A core competency, among first and second MBBS students of KBNIMS, Gulbarga

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1. Introduction

The ultimate aim of medical education is to improve the health and the health care of the population. The outcomes of all medical education programs, in general, are focused on this aim. So assessments become necessary to measure accurately the students’ progress towards achievement of this outcome. Test with multiple choice questions (MCQ) and analyzing their options have become the choice of many examiners in medical colleges. Multiple-choice questions (MCQs) are one of the popular and accepted means of evaluation in medical education. MCQ test items are advantageous as they can cover wider section of lessons and scrutinize large numbers of students in lesser time simultaneously. The tests can be employed for both paradigms of assessment (formative and summative). Colleges are incorporating MCQs tests in their examinations as there is rising trend of adopting MCQs for postgraduate medical entrance examinations. Its acceptance is based on its objectivity, feasibility, high internal consistency and accuracy. Although MCQs are not commonly used in assessment of MBBS and medical postgraduate students, these are often the choice for most of the graduate and postgraduate medical entrance examinations. MCQs can be designed to assess the higher cognitive levels of the students.

With this prospect, the study was conducted to assess the knowledge and awareness on HIV/AIDS using MCQ as an assessment tool to cover wider area on a topic.

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2. Materials and Methods
The study included 100 1\textsuperscript{st} MBBS students and 100 2\textsuperscript{nd} MBBS students under the age group of 18-22 years of KBNIMS, Gulbarga. Institution Ethical Clearance was obtained for the study. Written consent was obtained from the students. The students were given 14 MCQ’s on HIV/AIDS. The options given were yes or no type and true or false type. The numbers of options were between 2-4. The results were analysed using frequency and percentage and then compared.

2.1. Inclusion criteria
Students under the age group of 18-22 years.

3. Results
The study showed a better performance of 2\textsuperscript{nd} year students compared to first year students. The Study shows that 2\textsuperscript{nd} year students, as compared to 1\textsuperscript{st} year students, knows the cause of HIV/AIDS (100%). 100% of 2\textsuperscript{nd} year students answered correctly that it is not curable, whereas, 83% of 1\textsuperscript{st} year students answered that it is not curable. There was no much difference in answering whether HIV/AIDS is contagious (37% and 30%). Regarding the modes of transmission, 2\textsuperscript{nd} year students answered 100% for blood transfusion, unsterile needles and sexual transmission, whereas, mother to child transmission, the results were 92%, 73% and 76% respectively for pregnancy, delivery and breastfeeding. 98% of 2\textsuperscript{nd} MBBS students knows that HIV/AIDS is not spread by mosquito, whereas, 83% in 1\textsuperscript{st} MBBS students. On prevention of HIV/AIDS, majority of the 2nd MBBS students answered correctly compared to 1\textsuperscript{st} year students, though not of much difference. Graph 1 shows the prevention of HIV/AIDS, and Graph 2 shows the modes of prevention of HIV/AIDS and Graph 3 shows the modes of transmission of HIV/AIDS.

4. Discussion
According to Angelo (1995) “Assessment can be defined as an ongoing process aimed at understanding and improving student learning”.\textsuperscript{6,7} The goal of assessment in medical education is usually to support learning or to establish the competence of individual doctors; it helps person being assessed, identify and respond to his or her own learning needs.\textsuperscript{8} MCQs are considered as an efficient and reliable testing tool and could yield valid information of clinical reasoning skills.\textsuperscript{6,9} It has also been demonstrated that MCQs have predictive value for more recognized problem solving tasks and can elicit higher order problem solving ability such as forward reasoning.\textsuperscript{6,10,11} Magzoub et al concluded that the MCQ test is able to detect learning outcomes in the cognitive domain.\textsuperscript{12}

MCQs bring a lot of advantages into the assessment process. In the first place, as a result of case specificity; the reliability and content validity of an examination depends on a broad sampling of problems; such sampling is easier to do with tests such as MCQs.\textsuperscript{10}

In undergraduate medical education, a well-constructed MCQ can easily assess a student’s ability to apply, evaluate and judge medical education knowledge.\textsuperscript{13,14} Scully (2017) invalidated the perception that MCQs can only assess lower ordered thinking\textsuperscript{15} and Palmer EJ and Devitt (2007) illustrated that the percentage of question testing lower ordered thinking is same in both MCQs and MEQs.\textsuperscript{16} It also shows that a well-constructed MCQ is a better tool to assess higher ordered thinking in medical students than an MEQ (Palmer & Devitt, 2007). There is nothing innate in the MCQ assessment format which prevents testing of higher-ordered thinking.\textsuperscript{17} Besides, medical schools are training their faculty members to develop multiple-choice questions which ensure assessment of higher ordered thinking of their students.\textsuperscript{13}

There is a general perception that MCQs emphasize on knowledge recall i.e. Level I of revised Bloom’s Taxonomy and MEQs are capable of testing higher ordered thinking. The criticism against MCQs is basically due to
Table 1:

| Have you heard about AIDS | 1st year MBBS | 2nd year MBBS |
|---------------------------|---------------|---------------|
|                           | N  | %  | N  | %  |
| Yes                       | 100| 100| 100| 100|
| No                        | 0  | 0  | 0  | 0  |

Table 2:

| What causes HIV AIDS | 1st year MBBS | 2nd year MBBS |
|----------------------|---------------|---------------|
|                      | N  | %  | N  | %  |
| Virus                | 98  | 98 | 100| 100|
| NA                   | 2   | 2  | 0  | 0  |

Table 3:

| Is HIV/AIDS curable | 1st year MBBS | 2nd year MBBS |
|---------------------|---------------|---------------|
|                     | N  | %  | N  | %  |
| Yes                 | 11 | 11 | 0  | 0  |
| No                  | 83 | 83 | 100| 100|
| Don’t know          | 4  | 4  | 0  | 0  |
| NA                  | 2  | 2  | 0  | 0  |

Table 4:

| Is HIV/AIDS contagious | 1st year MBBS | 2nd year MBBS |
|------------------------|---------------|---------------|
|                        | N  | %  | N  | %  |
| Yes                    | 54 | 54 | 63 | 63 |
| No                     | 30 | 30 | 37 | 37 |
| Don’t know             | 10 | 10 | 0  | 0  |
| NA                     | 6  | 6  | 0  | 0  |

Table 5:

| What are the modes of sexual transmission | 1st year MBBS | 2nd year MBBS | Don’t know |
|------------------------------------------|---------------|---------------|------------|
| Yes                                      | N  | %  | N  | %  | N  | %  |
| Heterosexual                             | 79 | 79 | 21 | 21 | 89 | 89 |
| Homosexual                               | 46 | 46 | 54 | 54 | 89 | 89 |
| Anal intercourse                         | 40 | 40 | 60 | 60 | 67 | 67 |
| Vaginal intercourse                      | 81 | 81 | 19 | 19 | 96 | 96 |

Table 6:

| Is unprotected sex harmless between two HIV infected people? | 1st year MBBS | 2nd year MBBS |
|-------------------------------------------------------------|---------------|---------------|
|                                                             | N  | %  | N  | %  |
| Yes                                                         | 25 | 25 | 30 | 30 |
| No                                                          | 63 | 63 | 70 | 70 |
| Don’t know                                                  | 0  | 0  | 0  | 0  |
| NA                                                          | 12 | 12 | 0  | 0  |

Table 7:

| Percentage of prevention of HIV/AIDS by condom | 1st year MBBS | 2nd year MBBS |
|------------------------------------------------|---------------|---------------|
|                                                | N  | %  | N  | %  |
| 100%                                          | 95 | 95 | 95 | 95 |
| 0%                                            | 1  | 1  | 0  | 0  |
| < 100%                                        | 4  | 4  | 0  | 0  |
Table 8:

| Knowledge about disease per se | 1st year MBBS | 2nd year MBBS |
|--------------------------------|---------------|---------------|
| A. Infected person need not show symptoms and signs of AIDS | True 65 | False 29 | NA 6 | True 71 | False 29 | NA 0 |
| B. Body cannot defend itself from certain diseases | True 88 | False 7 | NA 5 | True 89 | False 11 | NA 0 |
| C. HIV/AIDS can be cured if detected early | True 50 | False 34 | NA 6 | True 46 | False 54 | NA 0 |
| D. HIV/AIDS can be identified by how he or she looks | True 11 | False 85 | NA 4 | True 21 | False 79 | NA 0 |
| E. Vaccine available to prevent HIV infection to occur | True 26 | False 67 | NA 7 | True 7 | False 93 | NA 0 |

Table 9:

| Knowledge about disease per se | Yes | No | Yes | No |
|--------------------------------|-----|----|-----|----|
| F. Is there any difference between HIV and AIDS | 81% | 19% | 90% | 10% |
| G. Symptoms of AIDS include | | | | |
| a. Weight loss | 90% | 10% | 97% | 3% |
| b. prolonged fever | 86% | 14% | 89% | 11% |
| c. diarrhoea | 72% | 28% | 73% | 27% |
| d. repeated infections | 93% | 7% | 96% | 4% |

Table 10:

| Source of information about HIV/AIDS | 1st year MBBS | 2nd year MBBS |
|--------------------------------------|---------------|---------------|
| A. TV | 84% | 100% |
| B. Radio | 68% | 100% |
| C. Friends | 71% | 100% |
| D. Parents | 58% | 100% |
| E. Partners | 53% | 100% |
| F. Community health workers | 69% | 100% |
| G. Civil Society | 55% | 100% |
| H. News papers/magazines | 82% | 100% |
| I. School | 83% | 100% |
| J. PU College | 88% | 100% |
| K. Internet | 86% | 100% |

Table 11:

| Was any formal sex education imparted in your school or college | 1st year MBBS | 2nd year MBBS |
|---------------------------------------------------------------|---------------|---------------|
| Yes | 72% | 76% |
| No | 25% | 24% |
| NA | 3% | 0% |

Table 12:

| Was it a part of the regular biology classes or was it taken differently | 1st year MBBS | 2nd year MBBS |
|------------------------------------------------------------------------|---------------|---------------|
| a. was part of biology class | 86% | 84% |
| b. was taken differently | 10% | 16% |
| c. Not answered | 4% | 0% |
its poor construction rather than the format itself. A study reveals that in assessing cognitive skills, MCQs significantly correlate with MEQs when their assessment’s content is matched.13,16

5. Conclusion
In this study we found that MCQs can be used as assessment tool to compare the knowledge and awareness about HIV/AIDS among UG medical students. We found that the knowledge and awareness of AIDS is better among 2nd year students who have the topic as core competency to learn.

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7. Conflict of Interest
None.

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None.

References
1. Namdeo S, Sahoo B. Item analysis of multiple choice questions from an assessment of medical students in Bhubaneswar, India. Int J Res MedSci. 2016;4(5):1716–1719.
2. Chandratilake M, Davis M, Ponnampерuma G. Evaluating and designing assessments for medical education: the utility formula. Intern J Med Edu. 2009;1:1–7.
3. Hingorjo MR, Jaleel F. Analysis of one-best MCQs: the difficulty index, discrimination index and distracter efficiency. J Pak Med Assoc. 2012;62:142–148.
4. Chandra K. Creating Valid Multiple-Choice Questions (MCQs) Bank with Faculty Development of Pharmacology. Indian J Pharmocol. 2018;62(3):359–366.
5. Patil R, Palve S, Vell K, Boratne A. Evaluation of multiple choice questions by item analysis in a medical college at Pondicherry, India. Int J Community Med Public Health. 2016;3(6):1612–1616.
6. Olayemi E. Multiple Choice Questions as a tool for assessment in medical education. Ann Biomed Sci. 2013;2(1).
7. Angelo T. Reassessing (and defining) assessment. AAHE Bull. 1995;48:7–9.
8. Auwarakul C, Downing SM, Jaturatamrong U, Praditsuwan R. Sources of validity evidence for an internal medicine student evaluation system: an evaluative study of assessment methods. Med Educ. 2005;39(3):276–283.
9. Farmer EA, Page GA. Practical guide to assessing clinical decision-making skills using the key features approach. Med Educ. 2005;39:1188–1194.
10. Fenderson BA, Damjanov I, Robeson MR, Veloski JJ, Rubin E. The virtues of extended matching and uncued tests as alternatives to multiple choice questions. Hum Pathol. 1997;28(5):526–532.
11. Gruppen L, Grum C. Multisite reliability of a diagnostic pattern-recognition knowledge - assessment instrument. Acad Med. 1994;69:65.
12. Hakstian AR. The Effects of Type of Examination Anticipated on Test Preparation and Performance. J Educ Res. 1971;64(7):319–324.
13. Javaeed A. Assessment of Higher Ordered Thinking in Medical Education: Multiple Choice Questions and Modified Essay Questions. Med Ed Publish doi:10.15694/mep.2018.0000128.1.

14. Vanderbilt A, Feldman M, Wood I. Assessment in undergraduate medical education: a review of course exams. Medical Education Online. 2013;18(1):20438–20438. Available from: https://dx.doi.org/10.3402/meo.v18i0.20438.

15. Scully D. Constructing multiple-choice items to measure higher-order thinking. Res Eval. 2017;22(4):1–13.

16. Palmer EJ, Devitt PG. Assessment of higher order cognitive skills in undergraduate education: modified essay or multiple choice questions? Research paper. BMC Med Educ. 2007;7(1):49.

17. Norcini JJ, Swanson DB, Grosso LJ, Shea J, Webster GD. A comparison of knowledge, synthesis, and clinical judgment. Multiple-choice questions in the assessment of physician competence. Eval Health Prof. 1984;7:485–499.

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