Analyses of the First Professional Medical Undergraduate Regional Anatomy Written Short Answer Questions of Four Public Universities of Bangladesh

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Abstract

Introduction:
Anatomy has been a keystone subject of medical undergraduate curriculum for hundreds of years. A deep understanding of Anatomy is essential for all branches of medical science. Analysis of the assessment instrument is a good way of developing insight into what and how students are learning a particular subject. One valid way to do this must be an analysis of the question papers. Study of the question paper swould identify that how the different cognitive domains are addressed, how problem-based and other clinically-oriented knowledge of the student are assessed.

Objective:
To analyze the Regional Anatomy portion of the First Professional MBBS Anatomy written question papers of the last five years (January 2012 to November 2016) of the four public universities of Bangladesh for determining: the frequencies of 'question-segment's addressing the different levels of cognitive domains andthe frequencies of 'problem-based' and 'other clinically-oriented' 'question-segment's.

Methods:
The cross-sectional descriptive study was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University, Dhaka during the period of March 2017 to February 2018. The study, all the 'question-segment's of Anatomy written question papers (only SAQ) dealing with Regional Anatomy of the First Professional MBBS Examination of the four public universities of Bangladesh of the last five years (January 2012 to November 2016) was targeted for analyzing. The frequencies of 'question-segment's those addressing different levels of cognitive domains(Remember, Understand, Apply, Analyze, Evaluate and Create level); 'problem-based' and 'other clinically-oriented' 'question-segment's were determined.

Results:
Most (89%) of 'question-segment's of the question of the question papers addressed the recall-level of the cognitive domain. 11% of 'question-segment' addressed the understand-level, but no 'question-segments' for addressing other levels of the cognitive domain could be identified. The frequency of 'question-segment's assessing the 'other clinically-oriented' question is 10.84%. No problem-based question-segments was identified.

Conclusion:
The result suggested that the higher levels of cognitive domains were neglected in the assessment-system and need to be addressed with appropriate weighting in the Anatomy written question papers.

Keywords: First professional MBBS, Regional anatomy, SAQ

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Introduction:

Medical students usually, spend at least their one and half years in the medical college studying Basic Science before being involved in their clinical clerkship. Anatomy has been a keystone subject of medical undergraduate curriculum for

hundreds of years. A deep understanding of Anatomy is essential for surgeons and also has value for anyone who performs an invasive procedure on a patient; carries out emergency procedures; examines radiological imaging; performs a physical examination of a patient; or explains a procedure to a patient.[1] In past years, most of the medical undergraduates believe that Anatomy is primarily about the identification and learning of many terms, structures, often on bare skeletons, or on isolated bones or organs. But nowadays, most of the medical students, teachers including both preclinical and clinical phases change their point of view. Miller et al. have recognized that Anatomy is the basis for understanding normal function for being able to recognize how normal functions may be affected when the anatomy has been altered as the result of developmental defect, disease, or trauma; and for determining how normal or near normal function might be restored.[2]

Many Anatomist and other clinicians strongly believe that the teaching of Anatomy is undergoing evolution. The evolutionary trend is the introduction of newer methods, approaches, philosophies, and strategies for teaching-learning processes as well as building curriculum in Anatomy. Traditionally, students learn anatomy grossly in three divided parts: Gross Anatomy, Microscopic Anatomy, and Developmental Anatomy. Among them, students learn more detail information about the gross anatomy and information are presented and learned using a regional approach, i.e., thorax, abdomen and upper extremity, etc. In this approach Anatomy is mainly emphasized on regional morphology and relationships between organs. Clinical Anatomy is also incorporated with each of this region in the most of the textbooks of Anatomy. Less but clinically relevant information was delivered in regional approaches. But in Bangladesh, it was not assessed that how this Clinically-oriented Regional Anatomy knowledge is applied in the clinical course. Integration of newer teaching modalities and modern technology encouraged the interest of the undergraduate and also increase the retention of the anatomical knowledge and its clinical relevance. Discussions and experimentations are going on, with a wide range of views about the teaching-learning and assessment in clinically-oriented Regional Anatomy available in the contemporary literature on Medical Education. Assessments have three main goals: to optimize the capabilities of all learners and practitioners by providing motivation and direction for future learning, to protect the public by identifying incompetent physician, and to provide a basis for choosing applicants for advanced training.[3] Therefore, analyses of the question papers and assessment of the student performances' are useful tools for assessing the recent situation of the educational system. So, the present study was aimed at analyzing the First Professional MBBS Examination written questions on Regional Anatomy regarding the level of cognitive domain addressed as well as 'problem-based' and 'other clinically-oriented' knowledge.

Methods:

It was a cross-sectional descriptive type study involving quantitative analyses of the First Professional MBBS written questions (only SAQ) of Regional Anatomy of the last five years (January 2012 to November 2016) of the four public universities of Bangladesh. The study was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka during the period of March 2017 to February 2018. Questions from histology, embryology, radiology, brain & eyeball and MCQ were excluded from the study.

For the analysis of the undergraduate written Anatomy question papers, all the available Anatomy question papers of the First Professional MBBS Examinations (under the latest curriculum) of the four public universities of Bangladesh (Dhaka, Rajshahi, Chittagong, Shahjalal Universities) held in last five years (from January, 2012 to November, 2016) were targeted. Usually, two First Professional MBBS Examinations are held per year and each examination is divided into two papers. In this study, as only SAQ portion was targeted for analyzing, total 90 SAQ portion, only regional anatomy questions (Chittagong University, 17. Dhaka University, 28. Rajshahi University, 24. and Shahjalal University 21) were included for analyzing.

There were fourteen (14) questions (Items) in the Short Answer Question (SAQ) portion of each Anatomy written question paper. Each question had one or more 'question-part's. Each 'question-part' again comprises one or two 'question-segment's. Thus, a total of 2500

'question-segment's were analyzed from total 90 questions of four universities.

Levels of cognitive domain addressed

Levels of the cognitive domain have been identified in Revision Bloom's Taxonomy of educational objectives This taxonomy followed in determining the levels of cognitive domain addressed in a particular 'question-segment' of a question while analyzing the question papers in the present study.

a. Remember-level

Thus, the term 'remember-level' was used for the 'question-segment's of a question that was addressed the undergraduates' remembering of previously learned the material.

b. Understanding-level

The term 'understand-level' was used for the 'question-segment's of a question that had addressed the undergraduates' ability to grasp the meaning of material.

c. Apply-level

The term 'apply-level' was intended for the 'question-segment's of a question that had addressed the student's ability to use learned materials in new and concrete situations.

d. Analyze-level

The term 'analyze-level' was intended for the 'question-segment's of a question that had addressed the undergraduate's ability to break down material into its component parts so that the relationships between parts can be analyzed.

e. Evaluate-level:

The term 'evaluate-level' was intended for the 'question-segment's of an item that had addressed the undergraduate's ability to judge the value of compiled material for a given purpose.

f. Create-level

The term 'create-level' was intended for the 'question-segment's of a question that had addressed the undergraduate's ability to resolve contradictions and to put parts together to form a new whole.

Variables studied in the analyses of Anatomy written question papers

1. Percentage frequencies of Regional Anatomy 'question-segment's of questions addressing the different levels (Remember, Understand, Apply, Analyze, Evaluate and Create level)of cognitive domain:
2. Percentage frequencies of the 'question-segment's of questions of Regional Anatomy assessing 'problem-based' and 'other clinically-oriented' knowledge for the eachuniversity of Bangladesh.

Result:

Remember-level 'question-segment's constituted more than 89%. Occasional understanding-level 'question-segment's which is 11% could be identified, but no apply-level, evaluate-level and create-level of' question-segment's identified in any Anatomy written question paper of four public universities of Bangladesh. Some clinical question (11%) was present in every university written question papers in the form of remembering (remember-level of the cognitive domain) or understanding (understand-level of the cognitive domain). Chittagong University had the highest percentage frequency (17.17%) while Rajshahi University had the lowest (7.21%). There was no problem-based 'question-segment's present in Anatomy written question papers of any four public universities of Bangladesh which are suitable to test the undergraduate's ability to apply the knowledge in new situations (Table-I).

Table-I: Percentage of the 'question-segment's of question of the regional anatomy portion of the written anatomy question papers (only SAQ) of the last five year rirst professional MBBS examination (January 2012 to November 2016) of the four public universities of Bangladesh addressing different levels of cognitive domain and competency level of the medical undergraduates

Cognitive domain	University-wise percentage				Mean percentage ±SD
	Chittagong n=716	Dhaka n=707	Rajshahi n=396	Shahjalal n=677	
Cognitive domain addressed					
Remember-level	84.34	80.59	93.86	99.70	89.62±8.73
Understand-level	15.40	18.30	7.07	1.77	10.64±7.59
Competency assessed					
Clinically-oriented knowledge	17.17	11.45	7.21	7.53	10.84±4.64

n=Number of 'question-segment's that have dealt with Regional Anatomy in all the available question papers of a university.

Discussions:

The present study was a study done in the context of worldwide concerns about the importance and implication of Anatomy in the clinical practice.

In the present study, the question papers of the Regional Anatomy portion of the First Professional MBBS examinations were analyzed for understanding how the different level of cognitive domains have been addressed and how the problem-based and other clinically relevant knowledge has been addressed in the questions. The results of the study can probably be more easily generalized for Bangladesh because question papers were collected from four public universities of Bangladesh.

Attributes of an ideal question paper are to give proper weight to each one of these six levels of cognitive domain, thereby highlighting the development of these learning outcomes in the educational program. But according to Centre for Medical Education for medical undergraduate only recommended covering three levels of cognitive domain (Remember, Understand and Apply).[4] So it should be mandatory to incorporate the question those also addressing other three levels of cognitive domain.

There was a virtual absence of 'question-segment's of question addressing the higher levels of the cognitive domain in the Regional Anatomy portion of written question papers of the last five years of the four public universities of Bangladesh. This is in sharp contrast with what has been recommended in the MBBS curriculum. It may be noted that the undergraduate Anatomy curriculum of Bangladesh has allotted 60% questions for the recall-level, 30% for the understanding-level and 10% for the application-level of cognitive domain. This by weight but we perform by percentage frequency.

From the result chapter, it was found that in case of the four public universities of Bangladesh more than 89.16% 'question-segment's is remember-level. From these findings, it may be said that the MBBS written assessment system is more biased towards the theoretical aspects of the Regional Anatomy rather than towards the practical application of undergraduates' knowledge. If question format change to address a higher level of the cognitivedomain, then it will motivate the learning pattern of medical undergraduates'. Education is more effective when it is undertaken in the context of a future task.[5] So, in the basic and clinical science, education should be facilitated for future clinical work learning within a clinical context or within the clinical framework.

It must be realized that medical undergraduate is would-be future doctors. The Regional Anatomy to be learned by them must be relevant for the creation of a doctor rather than an anatomist. Some anatomists of Bangladesh thought that in the situation of Bangladeshi reality, clinical orientation makes things critical for the undergraduates. But it is essential to realize that curriculum planning must put more emphasis on the 'importance' of a topic regarding the expected outcome of a course rather than its 'difficulty level' as a criterion for inclusion in the course content.[6]

Anatomy should be presented and learned as a dynamic basis for problem-solving and for application in practice. Vasan, DeFouw, and Holland concluded that gross anatomy teaching-learning should be refinement with the additional clinical scenario and anticipate the students to apply their knowledge of anatomy to their clerkship years.[7]

Conclusion:

The result of the present study suggest that higher levels of cognitive domains are being somewhat neglected in the written assessment of Regional Anatomy, and need to be addressed with appropriate weighting. Necessary modifications such as specific mark allocated for clinical anatomy in written exam, practical exam in the curriculum, as well as teaching-learning methods, are also recommended in meeting the above expectations. Such analyses can provide an insight into the situation and help teacher and curriculum planners to make the necessary adjustment.

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