

Efficacy of Anatomy Teaching-Learning Tools in Undergraduate Medical Education of Bangladesh

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Abstract

Context: Use of different kinds of tools in teaching of Anatomy is practiced year after year to facilitate the learning process. But selection of appropriate and effective teaching-learning tool is mandatory to get better outcome from the learners. Objectives of the study is to find out the opinion of the medical undergraduates of Bangladesh regarding efficacy of the teaching-learning tools used in teaching of Gross Anatomy, Embryology and Histology.

Materials and Methods: A structured questionnaire were distributed among 113 medical undergraduates of a private medical college of Bangladesh. Their responses were analyzed using descriptive statistics.

Results: The study results revealed, 92.03% medical undergraduates opined use of viscus and bone as 'good' in learning of Gross Anatomy whereas 81.41% opined the use of model and 94.69% opined the use of high-resolution histological images as 'good' respectively in learning of Embryology and Histology.

Conclusion: Findings of this study might be helpful to select the best tools in teaching-learning of different aspects of Anatomy.

Keywords: Opinion, medical undergraduate, Anatomy

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Introduction

Teaching and learning of Anatomy is one of the most challenging subjects for both teachers and students.¹ Anatomy has always been recognized as an indispensable foundation for clinical brilliance.²

Many first year MBBS students experience learning of Anatomy is somehow unpleasant due to high volume of syllabus and adjusting with the human skeleton, viscus and cadaver as study material.³ In almost all medical colleges of Bangladesh, the teaching methodologies used for teaching Anatomy are the didactic lectures, tutorials and practical classes using different types of teaching tools like cadaver, bone, viscus, model, three-dimensional

audio-visual, plasticine, radiological image etc.² But most of the methods are teacher centered with minimal active participation from the students.⁴

In the modern concept of medical education, the role of faculty member is to facilitate the learning process through using multiple technique as teaching and learning material to reach to as many learners as possible.³ And it should be a matter of concern to know the opinion of the students regarding the best teaching materials that will facilitate their learning process effectively.

The purpose of the present study is to find out the opinion of the medical undergraduates of Bangladesh regarding efficacy of the best teaching-learning tools used in teaching of Gross Anatomy, Embryology and Histology, so that the gained knowledge can be utilized later in clinical works or studies.

Methods

This study was cross sectional and descriptive in nature. It was conducted on 113 medical undergraduates, in the Department of Anatomy of

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a private medical college of Bangladesh. Out of total, the number of males was 53 and the females was 60 and the range of age was 20-22 years.

All of the participants were 1st Professional MBBS examinee and willingly participated in this study. Written consent was taken from all the participants. Data was collected using a predesigned questionnaire. The questionnaire gathered opinion of the participants regarding efficacy of the best teaching-learning tools used in teaching of Gross

Anatomy, Histology and Embryology throughout the academic year. All opinions were rated using a three-point Likert scale, which ranges from 'good' to 'poor'.

Data processing and analysis

After collection the data were analyzed using descriptive statistics. The tables were prepared to present the responses both in numbers and percentages from the participants.

Results

Table I

Opinion of the medical undergraduates regarding the effectiveness of tools used in teaching of Gross Anatomy (n= 113)

Teaching tool	Frequency of responses of the students		
	Good	Average	Poor
Viscus and bone	104 (92.03%)	9 (7.96%)	0 (0%)
Cadaver	99 (88.32%)	13 (11.50%)	1 (0.88%)
Model	97 (86.13%)	15 (13.27%)	1 (0.88%)
Multimedia presentation	87 (77.26%)	21 (18.58%)	5 (4.42%)
Radiological image	88 (77.87%)	24 (21.23%)	1 (0.88%)
White board	33 (29.86%)	54 (47.78%)	26 (23.01%)
Printed figure	65 (57.52%)	40 (35.39%)	8 (7.07%)

Table II

Opinion of the medical undergraduates regarding the effectiveness of tools used in teaching of human 'Embryology' (n= 113)

Teaching tool	Opinion of the students		
	Good	Average	Poor
Embryological specimen	90 (79.22%)	16 (14.16%)	7 (6.19%)
Model	92 (81.41%)	18 (15.93%)	3 (2.65%)
Multimedia presentation	89 (78.76%)	22 (19.46%)	2 (1.76%)
White board	28 (24.77%)	53 (46.90%)	32 (28.31%)
Printed figure	60 (53.09%)	46 (40.70%)	7 (6.19%)

Table III
Opinion of the medical undergraduates regarding the effectiveness of tools used in teaching of 'Histology' (n=113)

Teaching tool	Opinion of the students		
	Good	Average	Poor
Microscope	99 (87.61%)	13 (11.50%)	1 (0.88%)
White board	37 (32.74%)	52 (46.01%)	24 (21.23%)
Multimedia presentation	100 (88.49%)	10 (8.84%)	3 (2.66%)
High-resolution image of histological structure	107 (94.69%)	5 (4.42%)	1 (0.88%)

Discussion

Detailed knowledge on the structural and functional Anatomy of the human body has always been a matter of concern in order to determine the structural and functional alteration during clinical practice.^{5,6} But the longevity of basic science knowledge relies a lot upon the learning processes.⁵ The aim of the present study was to know the opinion of some medical undergraduates of Bangladesh regarding the effectiveness of teaching tools used in Anatomy teaching-learning processes.

Among different types of tools used in teaching of Gross Anatomy, a large percentage of the participants (92.03%) have been agreed about the use of viscus and skeletal component as good as a teaching tool but a study conducted by Bandyopadhyay² found good response from majority of the participants (57%) in use of cadaver. Another study conducted by Nagar et al³ also depicted that cadaveric dissection is the best method for teaching of Gross Anatomy. The quality and availability of the dissected cadaver may be a responsible factor for this difference in opinion. Between the multimedia presentation and white board, it was thought that white board teaching would be preferred by majority of the participants but only 29.86% has responded it as 'good' in this study whereas 77.26% considered multimedia presentation as 'Good'. Jaiswal et al⁷ also found multimedia presentation as a best tool from 54.26% students but Rokade et al⁸ reported that more than 2/3rd of their participants expressed use of white board as more interesting than multimedia presentation. Here, contents of the slides, making of presentations and way of delivery of the presentation may create this difference in opinion.

In case of teaching of Embryology, most of the classes were taken by multimedia presentation but highest number of good responses (81.41%) has been found regarding use of models. Bandyopadhyay² also found use of model as an effective tool from 57% participants in learning of developmental Anatomy. The preference of embryological model over multimedia presentation may be due to inability to comprehend sequence of developmental events in multimedia presentation within inadequate time. On the other hand, use of 3D embryological models has been found to be effective for simplifying information, giving less detail and making the events clear.⁷

In assessment of the efficacy of the teaching tools of Histology, around 94.69% participants opined the use of high-resolution image of the histological structure as 'good'. Though microscope is one of the fundamental tools of Histology teaching, both high-resolution image (94.69%) and multimedia presentation (88.49%) have been preferred over the use of microscope (87.61%) in this study. This finding shows similarity with the finding of another study where microscope had been considered as an average tool in Histology teaching by 53.5% of the participants.² Poor image quality under microscope, complex staining patterns, the need of precise focusing, and lack of knowledge of tissue orientation may become responsible for this finding.^{7,9} On the contrary, high-resolution images in the books and multimedia presentation may be helpful for the undergraduate students to clearly identify different cells and tissues.

Through literature review, a good number of studies has been found on students' perception on Anatomy

teaching methodologies but as far as researcher's knowledge, this is the first study done on the medical undergraduates of Bangladesh regarding the effectiveness of the teaching tools of Anatomy. Collection of data from a single center and small sample size are two important limiting factors of this study.

Conclusion

Findings of this study might be helpful to choose the best teaching-learning tools in pedagogy of Anatomy. As the teaching-learning has changed a lot over the years, the opinions of the learners should be considered seriously so that the medical educators can deliver knowledge to the learners effectively.

References

1. Silverthorne, DU. Incorporating active learning in practical experiments for students. International Workshop: Modern Approaches to Teaching and Learning Physiology. San Jose, Costa Rica: 2000; Nov. 16-18th
2. Bandyopadhyay R, Biswas R. Students' perception and attitude on methods of anatomy teaching in a medical college of West Bengal, India. Journal of clinical and diagnostic research: JCDR. 2017 Sep;11(9):AC10.
3. Nagar SK, Malukar O, Kubavat D, Prajapati V, Ganatra D, Rathwa A. Students' Perception on Anatomy Teaching Methodologies. National journal of medical research. 2012;2(01):111-2.
4. Ghosh S. Combination of didactic lectures and case-oriented problem-solving tutorials toward better learning: Perceptions of students from a conventional medical curriculum. Advanced Physiological Education 2007; 31;193-7
5. Gupta S, Gupta AK, Verma M, Kaur A, Singh K. The attitudes and [2]perceptions of medical students towards basic science during their clinical years: A cross-sectional survey. Int J App Basic Med Res. 2014;4:16-19.
6. Kurkcuoglu A, Pelin C, Zagyapan R, Ogus E. Opinions of medical students [5] about phase i anatomy education: A preliminary study. Rev Arg de Anat Clin. 2015;7(1):26-33.
7. Jaiswal R, Sathe S, Gajbhiye V, Sathe R. Students perception on methods [8]of anatomy teaching and assessment. Int J Anat Res. 2015;3(2):1103-08.
8. Rokade SA, Bahetee BH. Shall we teach anatomy with chalk and board or [6]power point presentations? An analysis of Indian student's perspectives and performance. Sch J App Med Sci. 2013;1(6):837-42.
9. B Karmer and J T Soley. Medical student perception on problems in Anatomy. East African medicaljournal. August 2002;79(8):408-414