

# Students' Perception and Attitude on Methods of Anatomy Teaching in a Medical College of West Bengal, India

RAKTIM BANDYOPADHYAY<sup>1</sup>, ROMY BISWAS<sup>2</sup>

## ABSTRACT

**Introduction:** Incorporating newer teaching aids over traditional one in Anatomy has been challenging both for the teachers and the learners. Different educational strategies are being used for teaching of Anatomy.

**Aim:** To elicit the perception and attitude toward teaching approaches in the Anatomy curriculum among first year medical students.

**Materials and Methods:** A cross-sectional, descriptive study was undertaken with the help of predesigned, pre-tested questionnaire to elicit knowledge in four domains of classroom teaching which were: a) gross anatomical structure; b) organ identification; c) topography; and d) radiological anatomy and self-assessment of acquired skills in respective fields among 114

first year students.

**Results:** A total of 57% of students opined good in gross structure of anatomy. A 60.5% of students preferred chalk and board method and 33.3% with LCD projector. Regarding acquiring knowledge, 72.8% of medical students gathered knowledge in gross anatomical structure domain whereas 58.8% in radiological anatomy. The overall mean score of attitude of the students regarding incorporating newer techniques in Anatomy teaching is  $14.17 \pm 2.26$ .

**Conclusion:** The perception of Anatomy teaching and attitude among medicos have been studied and opinion from them had thrown light for incorporation of newer techniques in their teaching curriculum.

**Keywords:** Early clinical exposure (ECE), Knowledge, Opinion, Teaching aids

## INTRODUCTION

Teaching and learning anatomy in preclinical discipline is one of the most important and challenging subject for both teachers and students [1]. Anatomy has always been recognized as one of the most difficult subject and foundation for clinical excellence. Adult learning principles in medical education is challenging nowadays both for the teachers and students in spite of different educational strategies. The Medical Council of India (MCI) in the Vision 2015 document has recommended curricular reforms for undergraduate and postgraduate medical students. Traditionally the teaching of students of gross anatomy has been delivered through cadaver dissections and didactic lectures.

It was recommended by MCI that the foundation course in first year should be an integrated curriculum consisting of early clinical exposure and skill development training for the undergraduate medical students.

Integrated learning refers to when knowledge and skills from across the disciplines are called upon to address patient cases and problems, to create learning experiences for students.

The students demanded horizontal integration, e-learning and early clinical exposure during their Anatomy days. Comprehensive knowledge of Anatomy plays a vital role in proper understanding of further clinical disciplines like Medicine and Surgery. Recent technologies like three-dimensional audio visuals, digital radiological imaging, and web-based study materials, use of models; plasticines etc., have been introduced to make Anatomy more interesting and easier among the students as well as teachers.

Student's feedback is a useful basis for modifying and improving medical education. Through feedback we can identify areas of strength and weakness of teaching methodology. More emphasis is being placed on student centered, integrated, problem based,

clinically relevant teaching and learning.

Early Clinical exposure (ECE) is a teaching learning methodology, which fosters exposure of the medical students to the patients as early as the first year of medical college [2]. It is an early exposure given to the students side by side to develop the clinical skills with the knowledge of basic sciences [3]. This early clinical exposure helps the student to socialize with the profession and encourages the student to learn professional behaviour. However, the effect of early clinical exposure among students should be studied over a period of time. Proper utilization of newer technologies along with the traditional teaching methods will lead to better understanding of gross anatomy and will improve educational values.

Keeping in mind with these ideas, the present study was conducted in a medical college of West Bengal to elicit the first year students' perception regarding the teaching aids appropriate for Anatomy and knowledge acquired by them during their studentship.

## MATERIALS AND METHODS

A cross-sectional, descriptive study was conducted among all first year students (total 125 students), who have already passed their first professional examination, in Burdwan Medical college, West Bengal for August 2016 to September 2016. Students who were absent and refused to give consent were excluded (11 students were excluded).

Data was collected using a pre-tested schedule consisting of two parts:

- The first part includes the personal characteristics of the students, like age, sex, place of residence, type of family.
- The second part includes feedback questions regarding the method of teaching used in four fields of anatomy like

gross structures, identification of organs, topography and radiological anatomy among students who have passed the first professional examination. The aids included were chalk and board, overhead projector, LCD projector, Visceras and specimens, models and plasticines. Self-assessment of acquiring skills in the above fields and opinion of integration with other disciplines and early clinical exposure were also explored among them.

- Early clinical exposure means learning using electronic media mainly internet providing study materials and even online classes, seminar etc. It also means effective use of multimedia. Early clinical exposure means exposure to students to clinical problems through patients earlier in their first years. This will help them to correlate medical and surgical problems, procedures, raise interest and understanding in the related subjects both in anatomy and clinical disciplines.

The content was discussed with the students and the questions were framed and validated by the experts in the field of Anatomy.

The individual score of each question is considered three for 'agree' response, two for 'neutral' and one for 'disagree' in the knowledge domain. So, the maximum overall mean score would be 18 in six approaches and three in each statement (Appendix 1).

**Data collection technique:** Structured exit interviews were conducted with the schedule among students after a class, obtaining informed consent from them. Anonymity and confidentiality was ensured for information obtained from them before the interview.

### STATISTICAL ANALYSIS

After collecting the data, it was entered in Microsoft excel datasheet 2007. Data was organised and presented by applying principles of descriptive statistics. Analysis of the data was done by using IBM statistical package for social sciences version 20 (SPSS 20). Continuous data was analysed showing mean and standard deviation and tested by t-test.

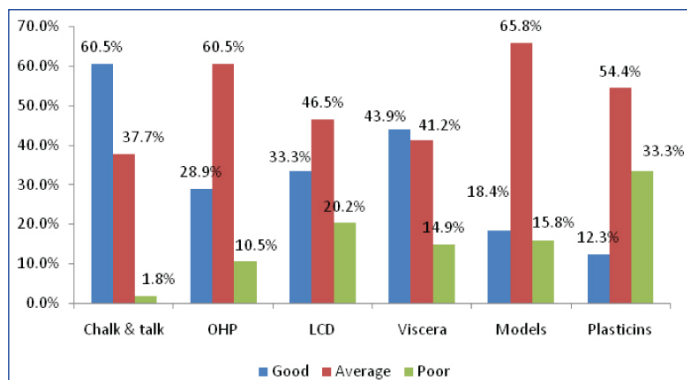
**Ethical clearance:** Ethical approval was taken from the Institutional Ethics Committee of Burdwan Medical College. Permission was also obtained from the Principal of Burdwan Medical College. Anonymity and confidentiality was ensured to each of the student.

### RESULTS

A descriptive type of study was undertaken among the first year students of Burdwan Medical College to assess their perception

Topic	Opinion after classrom teaching n (%)			
Microscopic structures of anatomy (Histology)				
	Good	Average	Poor	Total
	51(44.7)	61(53.5)	2(1.8)	114(100)
Gross Anatomy (Cadaver dissection)				
	Good	Average	Poor	Total
	65(57.0)	46(40.4)	3(2.6)	114(100)
Central Nervous System (Demonstration)				
	Good	Average	Poor	Total
	48(42.1)	62(54.4)	4(3.5)	114(100)
Developmental anomalies (Models)				
	Good	Average	Poor	Total
	47(41.2)	57(50)	10(8.8)	114(100)

[Table/Fig-1]: Opinion of students regarding topics of anatomy after classroom teaching.



[Table/Fig-2]: Aids used in Teaching of structure and development of Human Anatomy.

Anatomical domains	Good (%)	Average	Poor
Gross anatomical structure	83(72.8)	30(26.3)	1(0.9)
Identifying organs	70(61.4)	42(36.8)	2(1.8)
Marking surface topography	74(64.9)	30(26.3)	10(8.8)
Radiological Anatomy	67(58.8)	42(36.8)	5(4.4)

[Table/Fig-3]: Students' perception of acquiring knowledge in the Anatomical domains (n=114).

	Horizontal integration	Vertical integration	Early clinical exposure	Surgical procedure	Man-nequin introduction	e-learning	Total score
Mean	2.49	1.83	2.72	2.53	2.11	2.61	14.17
S.D.	.812	.924	.645	.789	.925	.770	2.261

[Table/Fig-4]: Attitude scoring among students regarding newer techniques of teaching.

regarding teaching, learning methods of anatomy and attitude toward newer teaching approaches. They were interviewed after their professional examination to elicit certain areas of classroom teaching methods.

Out of total 64.9% of them were males and 51.8% were below the age of 20 years, 63.2% came from nuclear family but 47.4% have their residences in urban area. The mean age of the medical students was 19.61±1.07 years.

[Table/Fig-1] reveals the opinion regarding four main topics of anatomy in classroom teaching, 57% of students opined good in gross structure of anatomy through cadaver dissection teaching but 41.2% opined good in developmental anomalies.

[Table/Fig-2] shows the different teaching aids used during lecture classes while teaching gross structure and developmental anatomy. It was found from the table that 60.5% of students felt comfortable with chalk and board teaching method and only 12.3% with the plasticines. A 33.3% marked good with LCD projector.

The perception of students is depicted in [Table/Fig-3] regarding acquiring knowledge in anatomical domains. The 72.8% of students gathered good knowledge in the gross anatomical structure domain whereas 58.8% of them gathered good knowledge in radiological anatomy.

The individual score of each question is considered three for 'agree' response, two for 'neutral' and one for 'disagree'. So from the [Table/Fig-4], it is found that the mean score is highest in introduction of early clinical exposure (2.72) and e-learning field (2.61). Vertical integration is not welcomed by the students (1.83±0.924). The overall mean score of attitude regarding introduction of newer techniques is (14.17±2.261).

### DISCUSSION

The mean age of the medical students of the present study is 19.61±1.07 years but a study in Thrissur showed the mean age to

be  $21.58 \pm 1.51$  years [4].

The longevity of basic science knowledge learned in medical school has always been a cause of concern [2]. Detailed knowledge on the normal morphological and functional structure of the healthy human body is essential in order to determine pathological disorders. It is necessary to give detailed knowledge on healthy human body and to teach the basic medical knowledge to be used during diagnostic approaches, clinical practices and treatment planning [5].

Plasticines and LCD projector were poorly used according to the students. This finding is in concordance with many studies. Rokade SA et al., reported that majority of students expressed that the chalk and Board method was more interesting than power point presentation [6]. The 64% students indicated that problems in understanding embryology due to an inability to visualize, comprehend the sequence of events which characterize developmental process, particularly 3 D and inadequate time and sequence followed in lectures as Karmar B and Soley JT in 2002 [7].

A study by Jaiswal Rashmi et al., in Bhopal showed that 54.26% students preferred multimedia teaching methods as a best anatomy teaching methodology and it relies on scientific and does not cause lack of attention [8]. As for the teaching methodology majority of students feel that dissection hall teaching is the best method followed by slide projector/AV projection/Multimedia, conventional chalk and board methods as opined by Gholamreza Hassanzadeh, Narges Hassanpoor [9].

The perception of acquiring knowledge in the anatomical domains of the present study reveals that the students were most comfortable in gross anatomical structure and marking topography but 64.9% of them were good in identifying organs 58.8% in radiological anatomy.

A study in Maastricht University, the Netherlands among undergraduate medical students mentioned problems in applying theoretical knowledge in the clinical context, such as memorizing, retrieving and then using knowledge of the musculoskeletal system when examining and diagnosing a patient or interpreting X-Rays, CT scans or MRIs [10]. They associated anatomy learning with having to memorize vast amounts of factual knowledge, requiring more self-discipline than understanding. Students suggested that both lectures and laboratory sessions in anatomy could be made more effective by providing links with radiology or pathology. They also said that they had mastered the broad outlines, but not all the important details.

A longitudinal experiment on the effectiveness of new methods for learning neuroanatomy described by Chariker JH et al., is a good example of the type of further research that is needed to elucidate ways to attain the combination of learning, transfer and retention of anatomical knowledge [11].

Anatomy remains a core topic for 1<sup>st</sup> year medical students, but the volume and method of delivery has changed such that Problem-Based Learning (PBL) and Self-Directed Learning (SDL) are utilized to a greater degree than previously [11-13].

Vertical and horizontal integration is emphasized in almost all medical colleges and early introduction to clinical medicine, one could argue that integration of an imaging anatomy module into the anatomy curriculum is challenging in the pre-clinical context when students do not have experience of hospital procedures and basic awareness of the clinical diagnosis. Newer concepts of radiological procedures like angiography, cholangiography, contrast examinations, etc., and the many minimally invasive and more invasive ways of acquiring these images are introduced widely worldwide [14-16].

Modules in Clinical and Imaging Anatomy should be integrated into modules in Clinical Medicine, Surgery and Radiology at a

later stage in the undergraduate curriculum, when familiarity with imaging examinations will be much greater. Traditionally, the foundation years of medical students have made them thorough in biomedical sciences but have hardly provided them with any clinical experience [17]. It helps them to acquire a wide range of subject matter and makes their learning more real and relevant. To ease the students in clinical sciences was again a challenge for many as described by a qualitative study by Dornan T et al., [18].

## LIMITATION

The study was conducted in 1<sup>st</sup> year students only and they might have answered in a favourable way to their teachers.

## CONCLUSION

The teaching of Anatomy plays an important role in the process of training medical professionals and thereby, ensuring safe medical practices. Pedagogy of gross anatomy has always been through cadaver dissections and didactic lectures.

As the learning and teaching has changed a lot over the years, both students and teachers can choose the best suited method to enrich and deliver the knowledge. The students had opined good to average in acquiring skills in different domains of Anatomy. They also welcomed the Early Clinical Exposure in their curriculum. Other newer techniques like horizontal integration and e-learning were also needed for their betterment of studying Anatomy.

## 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] Gupta S, Gupta AK, Verma M, Kaur A, Singh K. The attitudes and 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.
- [3] Kachur EK. Observation during early clinical exposure is an effective instruction tool or a bore. *Med Educ.* 2003;37:88-89.
- [4] Jayanthi A, Sarjna MV, Benjamin B. Students' perception of teaching learning method in dissection and histology lab. *IOSR Journal of Dental and Med Sciences.* 2014;13(11):24-28.
- [5] Kurkcuoglu A, Pelin C, Zagyapan R, Ogun E. Opinions of medical students about phase i anatomy education: A preliminary study. *Rev Arg de Anat Clin.* 2015;7(1):26-33.
- [6] Rokade SA, Bahetee BH. Shall we teach anatomy with chalk and board or power point presentations? An analysis of Indian student's perspectives and performance. *Sch J App Med Sci.* 2013;1(6):837-42.
- [7] Karmar B, Soley JT. Medical student perception on problems in Anatomy. *East African Medical Journal.* 2002;79(8):408-14.
- [8] Jaiswal R, Sathe S, Gajbhiye V, Sathe R. Students perception on methods of anatomy teaching and assessment. *Int J Anat Res.* 2015;3(2):1103-08.
- [9] Hassanzadeh G, Hassanpoor N, Jalali A, Hassanzadeh N, Jafari M, Panahi N. Teaching anatomy: viewpoints of Iranian anatomists. *Thrita J Med Sci.* 2012;1(2).
- [10] Bergman EM, De Bruin AB, Herrler A, Verheijen, IW, Scherpbier AJ, Vleuten VD. Students' perceptions of anatomy across the undergraduate problem-based learning medical curriculum: a phenomenographical study. *BMC Medical Education.* 2013;13:152.
- [11] Chariker JH, Naaz F, Pani JR. Computer-based learning of neuroanatomy: a longitudinal study of learning, transfer, and retention. *J Educ Psychol.* 2011;103(1):19-31.
- [12] McHanwell S, Davies D, Morris J, Parkin I, Whiten S, Atkinson M, et al. A core syllabus in anatomy for medical students—adding common sense to need to know. *Eur J Anat.* 2007;11(S1):3-18.
- [13] Sugand K, Abrahams P, Khurana A. The anatomy of anatomy: a review for its modernization. *Anat Sci Educ.* 2010;3(2):83-93.
- [14] Drake RL, McBride JM, Lachman N, Pawlina W. Medical education in the anatomical sciences: the winds of change continue to blow. *Anat Sci Educ.* 2009;2(6):253-59.
- [15] Burkill G, Francis I. Trends in radiological anatomy teaching in the UK and Ireland. *Clin Radiol.* 2003;58(7):570.
- [16] Ganske I, Su T, Loukas M, Shaffer K. Teaching methods in anatomy courses in North American medical schools the role of radiology. *Acad Radiol.* 2006;13(8):1038-46.
- [17] Ahmed K, Rowland S, Patel VM, Ashrafian H, Davies DC, Darzi A, et al. Specialist anatomy: is the structure of teaching adequate? *Surgeon.* 2011;9:312-17.
- [18] Dornan T, Bundy C. What can experience add to early medical education? Consensus survey. *BMJ.* 2006;329:1-6.

**PARTICULARS OF CONTRIBUTORS:**

1. Assistant Professor, Department of Anatomy, Burdwan Medical College, Burdwan, West Bengal, India.
2. Associate Professor, Department of Community Medicine, North Bengal Medical College, Siliguri, West Bengal, India.

**NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Romy Biswas,  
Professor's Qtr No-A-6, North Bengal Medical College campus Sushrutnagar,  
Dist-Darjeeling, Pin-734012, Siliguri, West Bengal, India.  
E-mail: docbromi@rediffmail.com

Date of Submission: **Dec 18, 2016**Date of Peer Review: **Feb 10, 2017**Date of Acceptance: **Jul 09, 2017**Date of Publishing: **Sep 01, 2017****FINANCIAL OR OTHER COMPETING INTERESTS:** None.**APPENDIX 1**

Serial No.	Age	Gender	Male	Female
1. Year of MBBS studying currently	Place of Origin			

**1. Knowledge about teaching of Anatomy.**

1. Year of MBBS studying currently	Place of Origin	Male	Female
1.	Gross structure and development of human body	Good	Average
2.	Microscopic structures of organs, tissues and their functions	Good	Average
3.	Basic structure of CNS and their gross lesions	Good	Average
4.	Different developmental anomalies and its anatomical explanation	Good	Average

**2. Teaching learning aids used to deliver knowledge in Gross structure and development of human body (responses may be more than one) and your opinion regarding usefulness of the TL aids.**

1	Chalk and board	Good	Average	Poor
2	Overhead projector	Good	Average	Poor
3	LCD projector	Good	Average	Poor
4	Viscera & specimens	Good	Average	Poor
5	Models	Good	Average	Poor
6	Plasticines	Good	Average	Poor
7	Other aids (specify)	Good	Average	Poor

**3. Teaching learning aids used to deliver knowledge in microscopic structure of organs, tissues and their functions (responses may be more than one) and your opinion regarding usefulness of the TL aids.**

1	Chalk and board	Good	Average	Poor
2	Overhead projector	Good	Average	Poor
3	LCD projector	Good	Average	Poor
4	Viscera & specimens	Good	Average	Poor
5	Models	Good	Average	Poor
6	Plasticines	Good	Average	Poor
7	Other aids (specify)	Good	Average	Poor

**4. Teaching learning aids used to deliver knowledge in Basic structure of CNS and their gross lesions (responses may be more than one) and your opinion regarding usefulness of the TL aids.**

1	Chalk and board	Good	Average	Poor
2	Overhead projector	Good	Average	Poor
3	LCD projector	Good	Average	Poor
4	Viscera & specimens	Good	Average	Poor
5	Models	Good	Average	Poor
6	Plasticines	Good	Average	Poor
7	Other aids (specify)	Good	Average	Poor

**5. Teaching learning aids used to deliver knowledge in Different developmental anomalies and its anatomical explanation (responses may be more than one) and your opinion regarding usefulness of the TL aids.**

1	Chalk and board	Good	Average	Poor
2	Overhead projector	Good	Average	Poor
3	LCD projector	Good	Average	Poor
4	Viscera & specimens	Good	Average	Poor
5	Models	Good	Average	Poor
6	Plasticines	Good	Average	Poor
7	Other aids (specify)	Good	Average	Poor

**6. Acquired the skill in respective fields of Anatomy.**

1	Identify and locate gross anatomical structures of the body	Good	Average	Poor
2	Identify the organs and tissues under the microscope	Good	Average	Poor
3	Mark the topography of the living anatomy(Surface Marking)	Good	Average	Poor
4	Can read and explain normal radiological anatomy	Good	Average	Poor

#### 7. Opinion regarding early clinical exposure from first year of Medical teaching.

1.	Horizontal Integration between first prof subjects in related topics like CVS anatomy with CVS physiology and Biochemical profile	Agree	Neutral (No comments)	Disagree
2	Vertical integration between other subjects like Pathology, Medicine, Surgery, Gynaecology, Paediatrics, Pharmacology, Microbiology etc. With relevant topic in Anatomy	Agree	Neutral	Disagree
3	Early clinical exposure in Wards bedside teaching in anatomy is necessary.	Agree	Neutral	Disagree
4	Early introduction in minor surgical procedures (Suturing, Injection, drawing blood etc.) will be helpful.	Agree	Neutral	Disagree
5	Exposure to Mannequins/simulators for practicing minor surgical procedure is needed.	Agree	Neutral	Disagree
6	Introduction of e-learning/multimedia (video etc.) for anatomy teaching in Bedside classes is necessary.	Agree	Neutral	Disagree