

Role of Anatomy Dissection in This Digital Era: A Cross Sectional Study on Medical Students Perceptions

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Abstract

Introduction: Human cadaveric dissection is most routinely practiced method of learning anatomy for medical students since many years. With the use of technological advancements in teaching and learning methods, there has a high risk of reduction in human cadaveric dissection as a method of learning in this modern digital era. **Aims & Objectives:** The present study was done to analyse the medical student's preferences regarding the teaching and learning methods of human anatomy and to analyze the perceptions regarding anatomy dissection. **Material and Methods:** The sample constituted 346 randomly selected medical students from the medical institute of Navi Mumbai, Maharashtra. The present cross sectional study was conducted using a simple random sampling. **Result:** Total 346 students were participated in the present study. The mean age of the participants was 19.54 (± 1.24) years. Males & females constituted 45.7% & 54.3% respectively of total study population. Dissection was ranked as the most preferred method by 246 (71.1%) by the students, followed by lectures 44 (12.7%) and textbooks 30 (8.7%) over the least preferred methods such as demonstrations 20 (5.8%) and computer assisted learning 6 (1.7%). Strong positive agreement was displayed by the students for items describing that dissection still the best method of learning anatomy 334 (96.5%) and dissection helps in feeling more comfortable with patients subsequently 332 (96%). Strong negative agreement was displayed by the students for items describing that dissection is boring and less informative method 282 (81.5%) and there are other better methods as dissection is outdated 268 (77.5%). **Conclusion:** This study has revealed that medical students still rated anatomy dissection as a most preferred method of learning anatomy, despite technological advancements.

Keywords: Anatomy Dissection; Medical Students; Perceptions; Questionnaire.

Introduction

The word anatomy is derived from the Greek word 'anatomē' means cutting up. Anatomy, the study of the structures of the human body is one of the first, most basic and important subjects studied by medical students when they begin their medical education career [1]. Anatomical knowledge is of critical necessity in clinical examination of patients, diagnosis of diseases and consultation with other medical personnel [2]. Anatomy has been taught by using different learning methods such as didactic lectures, demonstrations, cadaveric dissection and

living anatomy, as well as newer methods such as problem-based learning, computer based learning, 3D models, plastinated models, body painting, holograms.

The Anatomy dissection has remained an important part of medical curricula across all over the world. All professional anatomical associations and societies clearly mention that human cadaveric dissection is a backbone of medical knowledge for medical students. The practice of cadaveric dissection allows students grasp the three dimensional anatomy and concept of biological variability [3]. In addition it also plays important role in shaping the medical students attitudes to life and death [4].

Anatomy teaching in medical colleges has been traditionally based on the use of human complete cadaveric dissection or as prosected specimens [5]. There is little debate on the best mode of teaching and learning method in anatomy, some authors states that prosected specimens can impart similar knowledge as traditional dissection [6], while others

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state that traditional dissection has great advantage [7]. Moreover, the cadaveric dissection has been identified by some scholars as expensive, time consuming and potentially hazardous [8].

Unfortunately, with reduced time available for anatomy teaching and advancements of newer technologies in teaching & learning methods, there has been significant reduction in cadaveric dissection as a method of anatomical learning. There is no much data from India on perceptions of anatomy dissection from the student's perspective. The present study is aimed to assess the student preferences regarding the learning methods of human anatomy and to analyze the perceptions of the medical students on human anatomy dissection

Materials and Methods

Study Design

The study was a cross sectional study.

Study Site

The study was conducted in the medical institute of Navi Mumbai, Maharashtra, India.

Study Population

The population of this study consisted of first year completed medical students who were selected by random sampling method.

Sample Size

Total 346 medical students selected from the medical institute were included in the study.

Study Tools

This study was conducted by using predesigned valid questionnaire. The questionnaire was based on review of literature and similar studies conducted elsewhere. The predesigned questionnaire included three broad categories with six items evaluating positive perception, six items evaluating negative perception and a question comparing dissection with other modes of teaching. The purpose of the study was explained and consent was obtained from the students.

Ethical Approval

Considering the observational nature of the study and no likelihood of any potential harm to the

subjects, no formal ethical approval was taken from institutional ethics committee. Informed written consent was obtained from all the participants. Confidentiality of the study participants was maintained throughout the study.

Statistical Analysis

The IBM SPSS statistics version 21 was used for analysis of data. Socio-demographic parameters of the students such as male-female ratio, internet usage pattern, medium of education etc. were considered as primary explanatory variables. The perceptions regarding teaching and learning methods of human anatomy were taken as primary explanatory variables. Categorical variables were presented as frequencies and percentages. Quantitative variables were presented as mean and standard deviation.

Result

A five-level Likert scale was used to collect data from participants. Positive-key items are items that are phrased such that an agreement with the item represents a relatively high level of the measured attribute. Each item was rated on a five-level scale (SA=5, A=4, NAND=3, D=4 and SD=5).

Negative-key items are also phrased items so that an agreement with the item represents a relatively low level of the measured attribute. Reverse scoring was applied to the negative items. For positive perceptions, strongly agree and agree levels were taken as correct responses while for negative perceptions, strongly disagree and disagree were taken as correct responses by medical students.

A total of 346 medical students were included in the present study. The mean age of the participants was 19.54 (± 1.24) years. Males constituted 45.7% of the study population while females constituted 54.3% of study population. The medium of education was English in majority (97.1%) of the study population, with only 10 (2.9%) of the subjects were from local language i.e. Marathi.

Majority 212 (61.3%) of the participants, reported to be moderate user of internet, another 108 (31.2%) of participants reported high use. Only 26 (7.5%) participants reported occasional low use. The proportion of students, included from second year, third first year and third second year were 34.7%, 32.4% and 32.9% respectively in study population (Table 1).

Dissection was ranked as the most preferred method by 246 (71.1%) of the students, followed by lectures 44 (12.7%) and text books 30 (8.7%). Demonstrations and computer assisted learning were ranked as the preferred methods by very few students 20 (5.8%) and 6 (1.7%) respectively (Table 2).

Strong positive agreement was displayed by the students for items describing that dissection still the best method of learning anatomy 334 (96.5%) and

dissection helps in feeling more comfortable with patients subsequently 332 (96%). The agreement was moderate for items describing dissection gives overall perspective of human anatomy 318 (91.9%) and dissection is exciting and interesting method 306 (88.4%). The agreement was poor for items describing dissection feels different from other non medical peers 290 (83.8%) and it provides more opportunities to develop professional skill 288 (83.2%) (Table 3).

Table 1: Socio-demographic parameters of study population (N=346)

Parameters	Frequency and percentage
Mean Age (mean ± SD)	19.54 ± 1.24
Gender	
Male	158 (45.7%)
Female	188 (54.3%)
Medium of Education	
Marathi	10 (2.9%)
English	336 (97.1%)
Self-reported internet use	
Low users	26 (7.5%)
Moderate users	212 (61.3%)
High users	108 (31.2%)
Year of Study	
Second year	120 (34.7%)
Third I year	112 (32.4%)
Third II year	114 (32.9%)

Table 2: Most preferred learning method of human anatomy (N=346)

Learning Method	Frequency	Percentage
Dissection	246	71.1
Lectures	44	12.7
Demonstrations	20	5.8
Text books	30	8.7
Computer assisted learning	6	1.7

Table 3: Positive perceptions of medical students regarding human dissection

Parameters	SA	A	NAND	D	SD	Overall correct perception	Overall wrong perception
Positive Perceptions							
1. Dissection still best method of learning anatomy	242 (69.9%)	92 (26.6%)	4 (1.2%)	8 (2.3%)	0 (0.0%)	334 (96.5%)	12 (3.5%)
2. It is exciting and interesting method	200 (57.8%)	106 (30.6%)	24 (6.9%)	10 (2.9%)	6 (1.7%)	306 (88.4%)	40 (11.6%)
3. It helps in feeling more comfortable with patients subsequently	214 (61.8%)	118 (34.1%)	12 (3.5%)	2 (0.6%)	0 (0.0%)	332 (96.0%)	14 (4.0%)
4. It provides more opportunities to develop professional skills.	182 (52.6%)	106 (30.6%)	48 (13.9%)	8 (2.3%)	2 (0.6%)	288 (83.2%)	58 (16.8%)
5. It gives overall perspective of human anatomy	202 (58.4%)	116 (33.5%)	26 (7.5%)	2 (0.6%)	0 (0.0%)	318 (91.9%)	28 (8.1%)
6. It feels me different from other non medical peers	168 (48.6%)	122 (35.3%)	40 (11.6%)	12 (3.5%)	4 (1.2%)	290 (83.8%)	56 (16.2%)

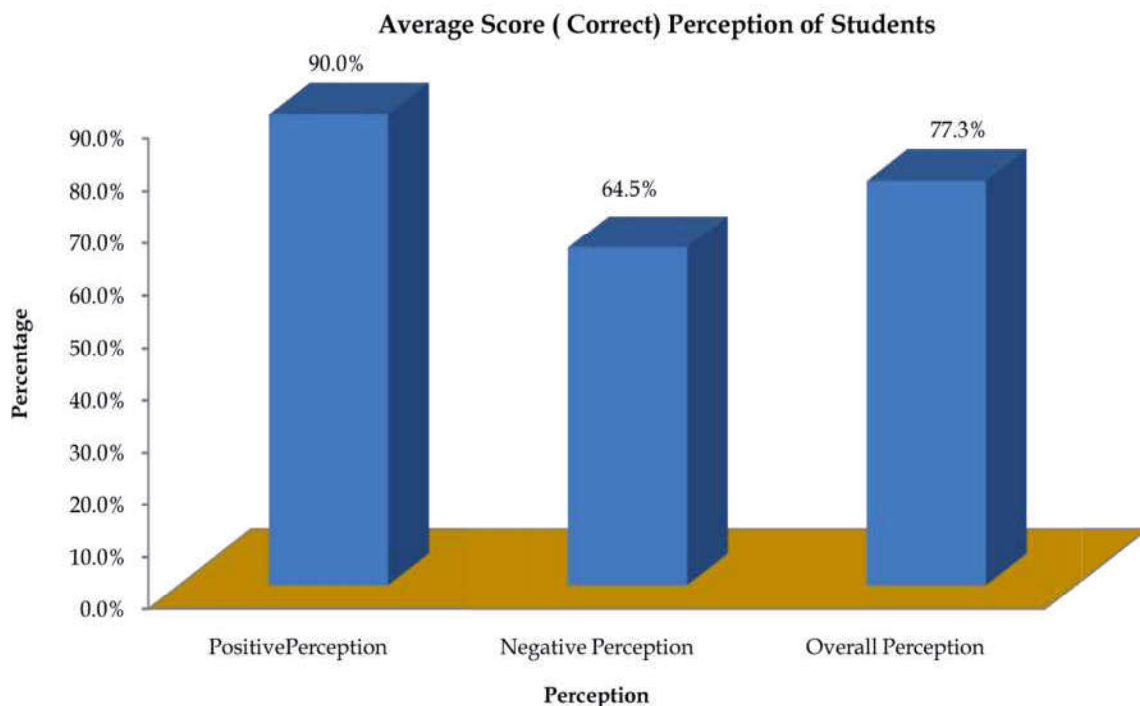
Table 4: Negative perceptions of medical students regarding human dissection

Parameters	SA	A	NAND	D	SD	Overall correct perception	Overall wrong perception
Negative Perceptions							
1. There are other better methods as dissection is outdated	0 (0.0%)	30 (8.7%)	48 (13.9%)	116 (33.5%)	152 (43.9%)	268 (77.5%)	78 (22.5%)
2. Dissection is boring and less informative method	2 (0.6%)	26 (7.5%)	36 (10.4%)	136 (39.3%)	146 (42.2%)	282 (81.5%)	64 (18.5%)
3. It does not give overall perspective of human anatomy	26 (7.5%)	118 (34.1%)	76 (22.0%)	84 (24.3%)	42 (12.1%)	126 (36.4%)	220 (63.6%)
4. It is nauseating and anxiety provoking method	14 (4.0%)	80 (23.1%)	100 (28.9%)	82 (23.7%)	70 (20.2%)	152 (43.9%)	194 (56.1%)
5. Tissue demarcation is very poor	8 (2.3%)	30 (8.7%)	42 (12.1%)	144 (41.6%)	122 (35.3%)	266 (76.9%)	80 (23.1%)
6. It does not help how to deal with patients	8 (2.3%)	28 (8.1%)	64 (18.5%)	118 (34.1%)	128 (37%)	246 (71.1%)	100 (28.9%)

As far as the negative attitude towards dissection is concerned, Strong negative agreement was displayed by the students for items describing that dissection is boring and less informative method 282 (81.5%) and there are other better methods as dissection is outdated 268(77.5%). The disagreement was moderate for items describing tissue demarcation is very poor in dissection 266 (76.9%) and it does not help how to deal with patients 246

(71.1%). The disagreement was poor for items describing dissection is nauseating and anxiety provoking method 152 (43.9%) and it does not give overall perspective of human anatomy 126 (36.4%) (Table 4).

The average of correct responses for positive and negative perceptions was 90% and 64.5% respectively (Figure 1).

**Fig. 1:** Graph showing average score of correct perceptions of students

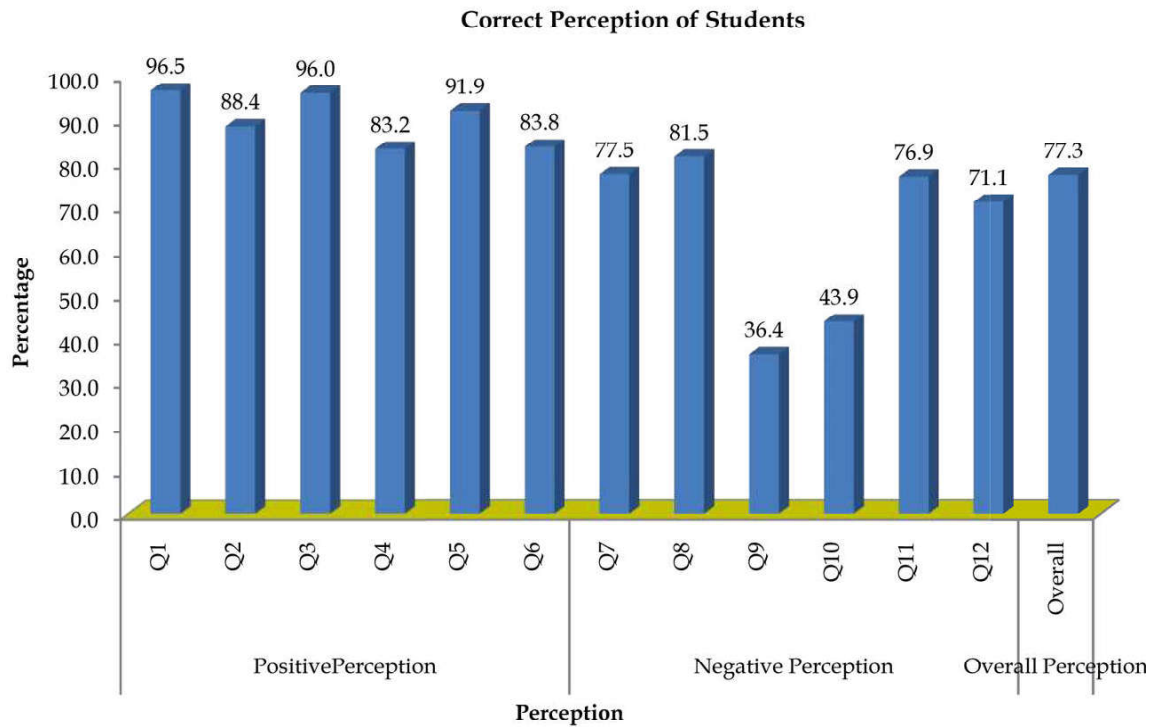


Figure 2: Graph showing question wise correct perception of students

Discussion

The present study revealed a favourable outlook for traditional human cadaveric dissection and its further usefulness in the development of medical professionalism. The present study showed that a vast majority of the students identify dissection (71.1%) as a preferred method of learning anatomy followed by lectures (12.7%) and textbooks (8.7%). Demonstrations (5.8%) and computer assisted learning (1.7%) were least preferred methods by medical students. The similar higher percentage of students (52.7%) chose that dissection as a most preferred method of learning anatomy while 14% of them preferred computer assisted learning (14%) over lectures (3.2%) by Anandhi P G, et al [9]. The another similar study by Azer, et al [10] showed that dissection as a most preferred method (44%) over textbooks (23%) and computer assisted learning (10%). Similar other studies also showed that dissection of human cadaver is still preferred method of learning anatomy [11-13].

In present study 96.5% of the students agreed that dissection is the best method for learning anatomy. The similar study by Bhaskar Patel et al showed

that 80% of the students also agreed for the dissection as the best method of learning anatomy [14]. This finding is also consistent with previous studies by Izunya A M and Rajkumari [15,16]. While the study by RE Elizondo-Omana et al showed that average final grade was more in students (58) using traditional learning methods supported by computer assisted learning than in students (68) using only traditional learning methods [17].

In present study 22.5% of the students viewed that dissection is outdated and there are other better methods to learn anatomy. The previous similar studies also agreed that there is need to modify traditional cadaveric human dissection into other teaching modalities [18-21]. Hence the debate on whether to continue with traditional dissection method in learning anatomy or to replace it with other methods in this modern digital era has been going on.

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