Original Research Article

Is Anatomy Dissection still relevant in this digital age? - The perceptions of first year medical students: A cross sectional study

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Abstract

Introduction: With the advancement of technology and development of new teaching and training methods, the role of age old teaching methods like anatomy dissection is being increasingly debated. Many western universities have increased the curriculum space for these new teaching methods, at the cost of dissection. There are no data from India on perceptions and utility of anatomy dissection from the student's perspective. The current 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: The study was a cross sectional study of 480 randomly selected medical students, conducted across six medical institutions in Tamil Nadu. The sampling method used was multistage simple random sampling.

Results: Out of 480, 463 students consented to participate in the study, with a response rate of 96.45%. The mean age of the participants was 17.79 (±0.83) years. Males constituted 49.02% of the study population. Dissection was ranked as the most preferred method by 244 (52.7%) of the students, followed by computer assisted learning 65 (14.0%) and Demonstration (9.7%). Strong positive agreement was displayed by the students for items describing that dissection may help in dealing with

patients comfortably in future (51.40%) and dissection makes them feel different and special from other peers (64.14%).

Conclusions: Human anatomy dissection is still the preferred method of anatomy learning among the medical students. Human touch, perceptions and aura associated in the family members and friends in other specialties are the most important factors fostering positive attitude towards dissection.

Key words

Anatomy dissection, Digital age, Perceptions, Medical students.

Introduction

Human anatomy has been taught to medical students by dissection of conserved, bequeathed cadavers for many centuries [1]. Across the globe dissection occupied the central role in teaching and learning till recently, but with the advent of new technologies and the evolution of new teaching and learning methods, many medical schools have been implementing major reforms in anatomy teaching. A concept called problem-based learning (PBL) has garnered a lot of attention in some of the universities in developed countries [2-5]. It consists of teaching the subject using PBL lectures, pre-dissected specimens, practical classes, and learning using multimedia including few dissection classes.

Even with the evolution of new teaching and training methods, advancement of technology the medical education reforms in India are rather slow paced. Hence dissection still occupies central role in anatomy teaching in India. Holla SJ, et al., assessed two different teaching durations for anatomy among two groups of Indian medical students and concluded that better understanding of the gross anatomy was gained from a course of longer duration (18 months with 915 contact hr vs 12 months with 671 contract hour) [6]. The basic medical sciences like Anatomy, physiology, biochemistry among others are taught in the Medical colleges in India as part of the main curriculum. Such teaching mechanism has been the sacrament path of learning for the students that enabled them acquire the basic relational, local and topographical anatomical knowledge [7] along with sense of feel of different tissues in the form of tactile gnosis [8] and the nuances of handling

the dissection for identification of delicate parts. The debate on whether to continue with existing method of teaching the subject or to adopt other methods has been going on. Hence the present study was conducted with the following objectives.

Objectives

- To assess the student preferences regarding the learning methods of human anatomy.
- 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 across three medical institutions in the Tamilnadu state, south India

Study population: The study population had included a randomly selected sample of medical students, who have completed their first year (anatomy) in last three years and not yet entered their Internship.

Sample size: A total of 480 medical students selected from 6 medical institutions were included in the study

Sampling method: The participants were selected in to the study by multistage sampling. In the first stage 6 colleges were selected by convenient sampling. 80 students from each institute were selected by simple random sampling, after acquiring the list of students from the college administration.

Study tools

A semi structured questionnaire specially designed for the purpose was used. The tools were distributed to five experts in the field to assess the face validity of the items and also for consensus validity. The items which were finalized by at least 3 experts were included in the study, to achieve consensus validity. Pilot testing of the tool was done to further fine-tune it by removing redundant and ambiguous areas. Pilot testing was done on 30 students, in a setting other than those selected in to the final study.

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

Socio demographic parameters of the students, their mobile and internet usage pattern, parent's educational background etc. were considered as primary explanatory variables. The perceptions regarding teaching and learning methods of human anatomy, anatomy dissection in particular were taken as primary explanatory variables. Categorical variables were presented as frequencies and percentages. Quantitative variables were presented as mean and standard deviation. Key word analysis was performed for the open ended questions about the perceptions. IBM SPSS version 21 was used for statistical analysis.

Results

A total of 480 participants were sampled into the study, out of which 463 students consented to participate in the study, hence the response rate in the study was 96.45%.

A total of 463 participants were included in the study. The mean age of the participants was 17.79 (±0.83) years. Males constituted 49.02% of the study population, females constituted 50.08% of study population. The medium of education was English in majority (89.4%) of the study population, with only 49 (10.6%) of the subjects were from local language i.e. Tamil. Majority (69.3%) of the participants, reported to be moderate regular users of internet, another 109 (23.54%) of participants reported high end, and regular use. Only 33 (7.12%) participants reported occasional use. The proportion of students, included from second year, third year and final year were 42.76%, 30.02% and 27.21% respectively in study population (**Table - 1**).

Dissection was ranked as the most preferred method by 244 (52.7%) of the students, followed by computer assisted learning 65(14.0%) and Demonstration (9.7%). Reading Text book/ lectures were ranked as the preferred methods by very few students (5.6% and 3.25) respectively (**Table - 2**).

Strong positive agreement was displayed by the students for items describing that dissection may help in dealing with patients comfortably in future (51.40%) and dissection makes them feel different and special from other peers (64.14%). The agreement was moderate for dissection as the most efficient method of learning anatomy (49%) and dissection is exciting (40.82%). The agreement was poor for items describing dissection as the method providing overall perspective of human anatomy (28.94%), and helps in making more responsible doctor in future (22.03%). As per the negative attitude towards dissection is concerned, the only item with high level of agreement was that the tissue demarcation is very poor in cadaver and may not be same in live human beings (50.97%). All other items had poor agreement (**Table - 3**).

When asked about whether to continue dissection and what can be done to improve learning of anatomy, 74.08% of students wanted to continue dissection as it is. Increased dissection time was suggested by 7.78% of students and 13.39% of the subjects felt that dissection should be

continued, but time should be reduced. The most common suggestion by majority of the students (81.64%) was bedside integrated teaching with other clinical departments (**Figure - 1**).

Table - 1: Sociodemographic profile of study population (n=463).

Parameter	Summary
Mean Age (mean ±SD)	17.79±0.83
Gender	
• Male {Frequency (%)}	227 (49.02%)
• Female {Frequency (%)}	236 (50.08%)
Medium of education	
• Tamil {Frequency (%)}	49 (10.6%)
• English {Frequency (%)}	414 (89.4%)
Self-reported Internet use	
• Low end, occasional user	33 (7.12%)
• Moderate, regular user	321 (69.33%)
• High end , regular user	109 (23.54%)
Year of study	
• Second year	198 (42.76%)
• Pre final year	139 (30.02%)
• Final Year	126 (27.21%)

Table - 2: Most preferred learning method of human anatomy (n=436).

Learning method	Frequency	percentage
Dissection	244	52.7%
Computer Assisted Learning (CAL)	65	14.0%
Demonstrations using models	45	9.7%
Text books/manuals (Self reading)	26	5.6%
Lectures	15	3.2%

Discussion

Some of the anatomy curricula writers do not fully acknowledge the relevance of teaching the knowledge of anatomy especially via a longer duration, clinically oriented dissection methods. But abundant evidence is countering their view, where in the consumers of the knowledge, the medical students perceive otherwise, appreciating such method which is necessary for innocuous and comprehensive medical practice [2, 6, 9-12].

More than half of the students in the study (52.7%) preferred the clinical dissection as the method to make them understand the topographical human anatomy while a minor portion of them (14% each) preferred either computer assisted learning (CAL) or problem based learning (PBL). A similar higher percentage of students (44%) chose dissection as the primary method of learning in a study by Azer, et al. [2], while 23% of them preferred textbooks over CAL (10%) as the desired method. Recently the western methods of teaching anatomy have undergone considerable modifications. Many of them advocating reduction in the overall teaching duration of the long held traditional method of dissection for imparting the knowledge and understanding of

the subject of anatomy to medical students towards the modern methods like CAL or PBL. However, the success of such methods seem to be farfetched as the students still prefer the former to a larger extent than the latter types [10, 13-16]. In fact many of the subject experts have commented that there is a need to reintroduce the currently deficient dissection into the mainstream teaching of the subject [17-20].

Table - 3: Perceptions of students regarding human dissection.

Parameter	SA	A	NAND	D	SD
I. Positive perceptions					
Dissection still the most efficient method of learning anatomy	227 (49.0%)	101 (21.81%)	63 (13.60%)	50 (10.79%)	22 (4.75%)
Dissection provides better overall perspective	134 (28.94%)	148 (31.96%)	56 (12.09%)	112 (24.19)	13 (2.80%)
Will help in feeling more comfortable with patients subsequently	238 (51.40%)	96 (20.73%)	38 (8.20%)	79 (17.06%)	12 (2.59%)
Will make me more responsible doctor in future	102 (22.03%)	118 (22.48%)	164 (35.42%)	45 (9.71%)	34 (7.34%)
It makes me feel different and better from other non-medical peers	297 (64.14%)	113 24.40%)	34 (7.34%)	12 (2.59%)	7 (1.51%)
Generates lot of interest and excitement	189 (40.82%)	154 (33.26%)	27 (5.83%)	46 (9.93%)	47 (10.15%)
II. Negative perceptions					
Dissections is outdated, there are other better methods	76 (16.4%)	43 (9.28%)	48 (10.36%)	134 (28.94%)	162 (34.98%)
Dissection is boring and the process of learning is slow	39 (8.42%)	74 (15.98%)	135 (29.15%)	135 (29.15%)	80 (17.27%)
I don't like the smell and feel of the cadaver	63 (13.60%)	112 (24.19%)	35 (7.55%)	116 (25.04%)	137 (29.58%)
It never gives me overall perspective of human anatomy	158 (34.12%)	123 (26.56%)	73 (15.16%)	77 (16.63%)	32 (6.91%)
Tissue demarcation is very poor and may not be same in live human beings	236 (50.97%)	123 (26.56%)	46 (9.93%)	36 (7.77%)	22 (4.75%)
May not make any significant impact on how I deal with patients	74 (15.98%)	132 (28.50%)	133 (28.72%)	85 (18.35%)	39 (8.42%)

(SA = Strongly agree, A = Agree, NAND = neither agree nor degree, D = disagree, SD = strongly disagree)

Figure - 1: Students attitude towards the continuing role of dissection in human anatomy (n=463).
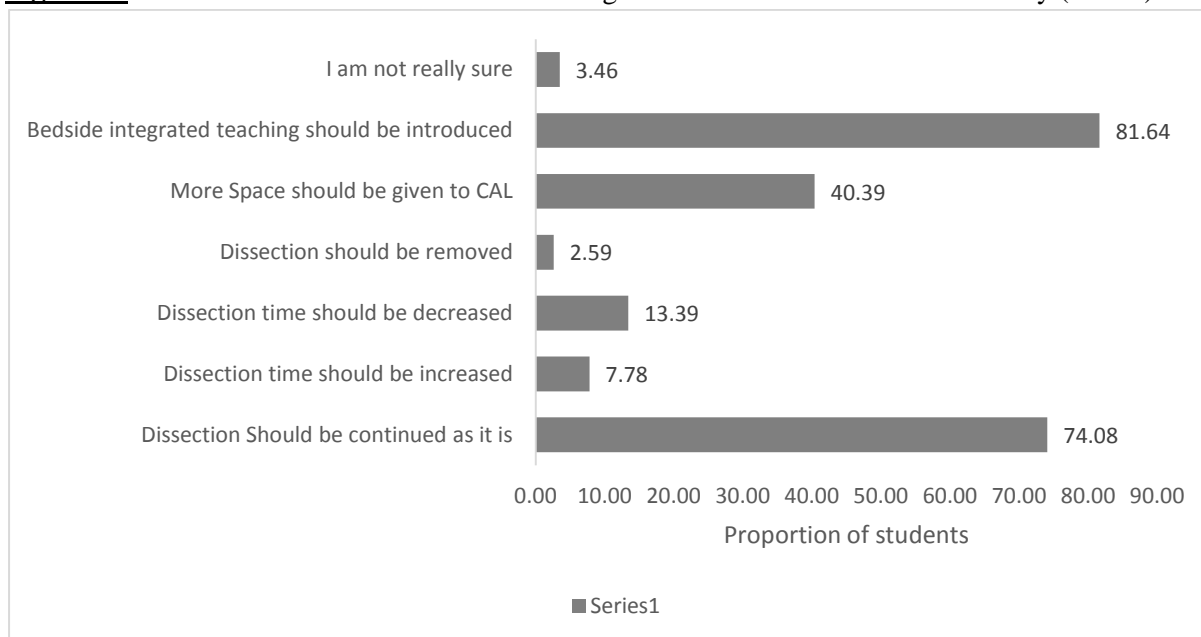
In India where, clinical dissection is primary method of teaching the subject, a study by Holla SJ, et al. [6], that tested impact of two different durations of teaching concluded that the students had a better understanding of gross anatomy in the longer duration group (915 contact hours) than those in the shorter duration one (671 hours). Also the former group in that study had better appreciation of the need for clinically concerned anatomy teaching method and dissection. This finding is in line with our study where 74% of them opined that the present emphasis on dissection should be continued unchanged. Such methods enhance the lucidity of understanding the three-dimensional relational mind map of the regions of the human body among the students [21, 22]. The resultant inadequate medical knowledge among those who had lesser exposure to the subject have been found to have prone to committing surgical errors in the form of damage to adjacent structures [23-25]. Such medico legal errors beg the question, for a safe and sound medical practice, how much anatomical knowledge is necessary.

Conclusion

Human anatomy dissection is still the preferred method of anatomy learning among the medical students. Other new methods of teaching like problem based, integrated learning, learning through digital media are equally preferred by majority of the students. Human touch, perceptions and aura associated in the family members and friends in other specialties are the most important factors fostering positive attitude towards dissection.

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