A Study on Experience of Human Cadaveric Dissection

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ABSTRACT

BACKGROUND

The objectives of the present study were to evaluate first- year medical student's behaviours, experiences, and emotions regarding cadaver dissection. The evaluation was performed during the 2017-2018 academic year, six months after starting the dissection course.

METHODS

A questionnaire was administered to a group of 150 first-year medical students at Bangalore Medical College, Bangalore. For each question the students responded "Yes," "No", or "Undecided". Statistical analysis was performed after collection of the questionnaire responses.

RESULTS

The results showed 95% students agreed that cadaver dissection provided the best and easiest way to study anatomy. Also, 90% were excited during their first visit to the dissection hall, and 79% were satisfied that dissection of a cadaver was ethically acceptable. The majority of the students around 90% declared that dissection of a cadaver was the best one.

CONCLUSIONS

Dissection is still considered by several doctors as a valuable source of learning anatomy. However, the future of teaching anatomy does not depend on any single method. It is, in fact, the right combination of all available resources and using them in an interactive way that maximizes outcomes.

KEY WORDS

Behaviours; Cadaveric Dissection; Medical Students; Ethical.

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BACKGROUND

Anatomy is a cornerstone of health professional's education from which clinicians develop their clinical skills. Cadaveric dissection is considered the "gold standard". It is strongly recommended that students learn anatomy using dissection, which provides hands-on experience with three-dimensional (3D) view of complex anatomical structures and relationships, which would provide the basis for understanding pathology and clinical aspects. Nevertheless, as described by recent research, the field of anatomical study currently retains its status as a basic science in various medical schools.^{1,2}

A study by Peterson et al.³ offered comparative analysis of the effect of a traditional curriculum versus a three-dimensional software-augmented curriculum on anatomical learning outcomes. The results indicated that students performed comparatively better on assessments.

Cadaveric dissection is still an important tool for teaching human anatomy to medical students. However, the method remains subject to notable drawbacks such as being expensive, time consuming, and potentially hazardous.⁴

A 2013 study conducted on Saudi females, first-year under graduate medical students at the College of Medicine, KAU have positive attitudes towards cadaver dissection in the learning of human anatomy.

A majority of the students are of the view that dissection is vital and consider it to be the best method for the study of human anatomy. Most of the students found their first visit to the dissection room was exciting. Majority of the students agreed that they would prefer to perform dissection with the assistance of their professor.

A study performed by Franklin et al.⁵ indicates that the majority of students (71%) perceived the real dissection experience to be more useful than the virtual dissection experience (47%) in developing co-operative learning skills. However, more students (64%) perceived the virtual experience as useful in developing an independent approach to learning as the real experience (51%). This difference is to be expected as students work in peer groups of 4-5 for the real dissection, while the most of them (78%) reported using the virtual dissection materials alone.

Alternative teaching methods are now more commonly deployed in teaching gross anatomy. This issue will become even more common with the passage of time. The longstanding debate of 'to dissect, or not to dissect' still rages on.

Most of medical students don't do cadaveric dissection presently. Does this mean these medical students won't become better physicians?

Is cadaveric dissection simply a rite of passage or is it a necessity? The purpose of our study was to determine whether cadaveric dissection is a necessity in medical education and can it be replaced by newer alternative techniques. Another purpose was to assess the attitude and perception of consultants, residents, and fellows about cadaveric dissection and whether it helped them in their medical practices.

METHODS

The present work is quantitative and investigatory study. The participants for this study were 150 first-year medical students at the Bangalore Medical College of Medicine, Bangalore, chosen randomly from cohort of 250 first year MBBS students in the 2017-2018 academic years. The student-to-cadaver ratio was 25:1. This work has been approved by the Department of Anatomy and informed consent was taken by all the students who participated in the present study.

Data Collection

All 150 first-year preclinical medical students were involved in this investigatory study. The students personally had performed the dissections. The overall objectives were described to all students, and a questionnaire composing of 13 questions was distributed to each of them upon formal receipt of participatory approval. For each question, the student was presented with the option of choosing between one of the three possible responses: "Yes", "No," or "Undecided". The questionnaire provided students with the opportunity to provide information about their first visit to a dissection room. It asked whether the student experienced emotional shock and other feelings, including anxiety and stress, upon initial exposure to the cadaver. It asked whether students engaged in mental preparation before the dissection; or whether they felt sympathy for the deceased and respect for the cadaver. It also asked whether students had prior experience with a dead body, and whether the dissection had an impact on their coping mechanism. It asked whether student's favoured possible alternatives to cadaver dissection, such as replacing that methodology with one involving manipulation of plastic models or virtual dissection using a computer-assisted training program. All of the questions in the questionnaire were answered by students. Questionnaire responses were then collected for subsequent data analysis.

Statistical Analysis

Data analysis and statistical description of replies to each question was conducted using SPSS (Statistical Package for the Social Sciences) version 20.0. The results were discussed in light of the available literature.

RESULTS

150 students answered the questions out of 250 students in a class. Thus, only 150 questionnaires were analysed. The questionnaire is shown in Table 1. Respondents were all the students of Bangalore Medical College. The students' mean age was 20±2 years. The responses of students' attitudes towards cadaver dissection are shown in Table 1. Total 13 questions were mentioned in questionnaire scale shown in Figure 1.

The results obtained after the data analysis demonstrate that 95% of the student respondents agreed that the dissection of a cadaver provides the best and most direct means of studying anatomy. 90% showed excitement during their first visit to the dissection room, and 79% said that the dissection of a cadaver is acceptable from an ethical point of view. A vast percentage of the students (over 90%) certified that the dissection of a cadaver is one of the best and most indispensable methods of studying human anatomy. Also, 80% declared that they need a professor to help with dissection. Based on all of the data, and according to the Likert Scale Index, we can acceptably conclude that our experimental hypothesis, "Bangalore medical college, first year students have a significantly positive attitude towards the dissection of a cadaver in the learning of human anatomy".

Sl. No.	Item Particular Question	No. of Responses	Undecided	Yes	No
1.	Did you find your first visit to the dissection room to be exciting?	95	3	2	
2.	Did you experience any stress at the beginning of the dissection?	20	79	1	
3.	Did you experience emotional shock upon first being exposed to the cadaver?	40	53	7	
4.	Did you have any fear of touching the cadaver directly?	13	70	17	
5.	Did you complain of excessive stress and anxiety immediately before and during dissection?	10	85	5	
6.	Did you ever experience any kind-heartedness and regard for the cadaver you dissected?	12	78	10	
7.	Did you ever think that the cadaver you dissected was once a living human being similar to yourself?	80	0	20	
8.	Did you believe that you could perform the dissection with the help of your professor?	80	5	15	
9.	Did you think that the dissection of a cadaver is ethically acceptable?	79	0	21	
10.	Did you believe that dissection potentiates thinking skills in an orderly manner?	92	0	8	
11.	Did you believe that plastic models, computer-based training programs, etc. can substitute for dissection of cadavers in future?	50	50	0	
12.	Did you find that participating in cadaver dissection provides more opportunities to develop professional skills than does the observation of prosected specimens or demonstrations of professional dissections?	80	18	2	
13.	Did you think dissection is still a valid means of studying anatomy?	86	4	10	

Table 1. Questionnaire Items to Determine Respondents' Attitudes towards Cadaver Dissection.

DISCUSSION

The present research was conducted to evaluate the attitudes of first-year medical students towards cadaver dissection during their course of study in human anatomy.

An analysis of the questionnaires revealed that a vast majority of the students (95%) identify dissection of a cadaver as being of critical importance in the learning of human anatomy. Similar results have previously been reported by other investigators in other medical schools, in studies addressing the relationship between medical students and cadaver dissection.⁶ In addition in another study regarding the best method for teaching anatomy, 91% of students agreed that dissection of a cadaver is still the preferred way for studying human anatomy.⁷ This finding replicated those of other studies. In present study, only a minority of the respondent students (50%) agreed that "dissection of cadaver can be substituted by plastic models, computer-based training programs, etc. in the future." (Future research might investigate whether this percentage might be altered if the students had already been exposed to or provided with access to plastic models and computer-based training programs for learning anatomy, and whether they felt they had garnered practical knowledge from each.) The students' exposure to cadaver dissection remains an important component of medical education.

Most of the students (80%) agreed that actually dissecting the cadaver as part of their training results in a more favourable outcome than would merely viewing demonstrations of prosected specimens and potentiates their understanding of essential content.

A unique advantage of utilizing cadavers is that dissection is often students' first encounter with death, reminds the students of the reality of disease, and that medical professionals cannot save everyone. Cadavers have the ability to teach students to respect their patient, even after death. Depth perception can also best be appreciated when dissecting on a cadaver. This spatial orientation and visualization of relationships between structures is a commonly cited advantage to cadaveric dissection.^{7,8} This is especially important in the education of health professionals who will be working with patients where competency in human anatomy is most vital.

The format of our Integrated labs is consistent with student preferences for combined anatomy/radiology education.⁹ A study by Murphy et al. determined that students at a single institution benefitted from learning radiology with the anatomy content but preferred that radiology be an adjunct rather than primary method of instruction. This model was utilized in our curriculum where students spent only 10–15% of their time in the lab learning through virtual dissection. However, there were still comments from students that they would have liked to have more exposure to virtual dissection during this time, which may account for why only 73.8% of students felt that the VDT was an effective use of laboratory time. If it is not possible to expand anatomy curricula to include virtual dissection due to time constraints, this tool could also be integrated into other parts of the medical curriculum, such as clinical skills or dedicated radiology sessions. It is important for educators to be aware that, while virtual dissection incorporates radiology

images and introduces students to imaging concepts, it does not replace a dedicated radiology curriculum which includes concepts beyond anatomy (e.g., imaging appropriateness, radiation risks).

The survey response rate was 69.2% (n = 202/292). Most (78.7%) students reported that virtual dissection enhanced their understanding of the cadaveric anatomy and the clinical applications of anatomy. Most (73.8%) students also felt that the VDT was an effective use of the laboratory time. Thirteen narrative comments were collected, most of which (61.5%) identified strengths of the curriculum.¹⁰

The present study also showed that 95% of the responding students found their first visit to dissection room to be very exciting, while the minority (20%) suffered very little or no stress during dissection. In consistency with this result, many researchers have reported that a majority of first-year preclinical medical student respondents showed excitement and interest during their first visit to the dissection hall. I conclude that overall, the students reported positive learning experience with cadaver dissection, feeling that it was an effective use of their time and improved their understanding of clinical relevance of anatomy as well as cadaveric anatomy. Further evaluation on a larger population of study is warranted. Additionally, medical schools' curricula should place great emphasis on the importance of cadaver dissection in the learning of anatomy.

CONCLUSIONS

Dissection is still considered by several doctors as a valuable source of learning anatomy. However, the future of teaching anatomy does not depend on any single method. It is, in fact, the right combination of all available resources and using them in an interactive way that maximizes outcomes.

Combination of cadaveric and virtual dissections seems to be a likely solution. Application of different strategies to understand a subject is common as blending of methodologies is beneficial for students.

Data sharing statement provided by the authors is available with the full text of this article at jemds.com.

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