

Students' Perception in Learning Human Anatomy Towards Dissection or Prosection

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ABSTRACT:

Introduction: Cadaveric dissection has been used as a traditional method of teaching and learning for many years. With time, changes in medical curriculum has reduced the time for anatomy learning and seeking alternative methodology moving away from traditional learning. With the introduction of new methodology and technology the question arises whether it is still effective enough to follow the old traditional mode of teaching and learning. With ever changing medical education it is important to recognize students' perception and attitudes toward the learning different method. Therefore, this study aimed to determine students' perception towards prosection and dissection in learning anatomy. **Methods:** The first year medical students were included in the study. The study was carried after the series of lecture as per curriculum. The students were divided into four groups. Each group dissected the cadaver followed by observation of the prosected cadaver explained by the faculty. Questionnaires were prepared related to dissection and prosection and sent to the students using google form. The students' perception towards dissection and prosection was recorded. The results were tabulated and subjected to statistical analysis. Percentage of students opting for dissection and prosection was calculated. **Results:** The majority of students (82.5%) preferred dissection over prosection, 2.6% opted for prosection over dissection and 14.9% were still not sure which method of teaching and learning is favorable. **Conclusion:** The study reflected the traditional method of dissection was more favorable to students while alternative methods can also provide better insight to learning.

Keywords: Cadaver, Dissection, Prosection.

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INTRODUCTION:

For decades, cadaveric dissection has been used as a core teaching tool in delivering anatomy curriculum in medical schools.[1,2,3] Traditional cadaveric dissection facilitates several educational benefits especially obtaining a three-dimensional perspective of human body structures and appreciation of anatomical variations.[4,5,6,7]

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Cadaveric dissection aids in improving students' manual practicing skills including touch mediated perception of the body, use of basic instruments and hand-eye coordination relevant to a variety of basic clinical procedures, create ethical awareness and promote professionalism.[8,9,10,11] Over the past decades, with considerable medical curriculum reform, conducting extensive cadaveric dissection has been debated due to its slow and tedious approach, limited availability of cadavers, the difficulties imposed by the ethical issues for their use, high costs, time intensity, requirement for highly skilled teachers and the emotionally challenging nature of cadaveric dissection.[2,10,12,13] With considerable transformation in anatomical teaching over the past decade, need for developing alternative methods of learning gross anatomy is clearly evident.[12,14] Another alternative method is combination of dissection and prosection or prosection alone.[15,16,17] Prosection is a preserved specimen of cadaver after part of it is dissected by the demonstrator.[6] Prosection requires less time and less financial burden.[6,7] With curriculum reform, the question of which method is better to teach gross anatomy remains to be addressed.[18] Hence, the present study was conducted to address the students' perception towards dissection and prosection in learning gross anatomy.

METHODS:

A cross-sectional descriptive study was conducted among the first year bachelor of medicine and bachelor of surgery (MBBS) students of B.P. Koirala Institute of Health Sciences from September to November 2021. The total number of students in the first year was hundred. All of the hundred respondents were included in the study after obtaining a written consent. A prior approval of Institutional Ethics committee was taken before commencement of the study (Code No.: IRC/2137/021). The respondents were

briefed about the study and all those students who volunteered for study were included. The study was done after routine anatomy program lectures and practical class of upper and lower limbs. All the students were exposed to identical series of lecture. All students followed the same syllabus according to the curriculum of the institution. Each series of lectures was followed by practical dissection class. Practical classes were coordinated and conducted by anatomy faculties and staffs. During practical, students were divided into four subgroups and were exposed to dissection mainly followed by additional prosection in each table. Each group was assigned to one cadaver for dissection and prosection. Following dissection of body by students, dissected structures were demonstrated by the table teacher. In prosection method, students were asked to observe the cadaver while the table teacher dissected the body and demonstrated to the students. Eleven questionnaires were designed for evaluation of the study program by Likert style survey from previously published study.[6] Structured questionnaire was based on multiple choice questions. Google form was created for the questions and was distributed to the students through their respective email address during the period. Response was taken from the students for the structured questionnaire prepared using Google form. Students were asked to response the listed questionnaire A-K shown in Table1 using the five point Likert scale.

Responses: **1** strongly disagree, **2**-disagree, **3**-not sure, **4**-agree, and **5**-strongly agree. The results were analyzed statistically using the SPSS 16.0 software. Frequency and percentage were calculated.

RESULTS:

The questionnaire was responded by a total of 74 students. No prior experience with cadaveric specimens or dissection was experienced by the students before attending

the sessions. The majority of the respondents (82.5%) ranked dissection based learning very high in terms of their anatomical learning when comparing with prosection, 2.6% students also favored prosection based learning while 14.9% of respondents were not sure which methodology to prefer. More than two-thirds (82.5%) of respondents stated their preference in prosection because of time management is better in comparison to dissection. The majority of respondents (>45%) disagreed or strongly disagreed with questionnaire that reflected positive perceptions of cadaveric prosection:

- Knowledge gained from prosection is more
- Interest generated towards subject is more with prosection
- With prosection there is more scope for application of knowledge in future than with dissection
- With prosection, there is better understanding of spatial orientation of body than with dissection

Majority of the students (69%) also agreed with the equal opportunity for everyone participation in prosection. Comparing structural details better witnessed with prosection than with dissection, student agrees/strongly agrees (52.6%) better structural details in prosection.

The frequency and percentage of students responded to each statement is shown in [Table 1] Figure 1 shows most common responses to each question and their respective frequency

DISCUSSION:

The current study showed relevant findings about student perceptions with regard to positive and negative aspects of prosection and dissection in learning anatomy. Student's assessment and feedback about different methodology of learning is useful in changing and improving medical education curriculum

as changes is taking place globally to improve standards of education.[17] A change in methodology of teaching and learning modalities develops in response to student's requirement and institution.

Majority of participants held positive perceptions about the effectiveness of cadaveric dissections in better understanding of anatomical structures and knowledge. Our study also showed that student's perception towards time management and equal opportunity is better in prosection as compared to dissection. Our findings correlate with the previous study done by Dissabandara et al. which showed that students perception towards dissection is time consuming, difficult in finding correct structures as compared to other forms of learning anatomy.[2] Time consuming may be due to difficulty in finding structure at once during cutting the body. Equal opportunity is not received by all the students in dissection may be due to students ratio is higher in comparison to inadequate availability of cadaver for dissection.

A previous study done by Topp et al. found that prosection provides greater insight into anatomical variations than dissection.[15] Our study showed mixed perception of students towards different anatomical learning methods providing greater insight to anatomical variations. This may be due to different populations targets used in different studies. These study findings differed from the study conducted by Rizzolo et al. which included student's perception towards prosection helps more than dissection to reinforce and apply concepts learned from lectures.[19] Our study demonstrated that about forty percent of students agree dissection can help them to reinforce and apply concepts learned from lecture. This difference in findings may be due to different setting used in the study.

Table 1: Showing frequencies and percentage of students rating to questionnaire (N = 74)

| | Statements | Strongly Agree n (%) | Agree n (%) | Not Sure n (%) | Disagree n (%) | Strongly Disagree n (%) |
|----------|----------------------------------------------------------------------------------------------------|-------------------------|----------------|-------------------|-------------------|----------------------------|
| A | Knowledge gained from prosection is more compared to dissection | 2 (2.7%) | 12 (16.2%) | 26 (35.2%) | 30 (40.5%) | 4 (5.4%) |
| B | Time management is good with prosection compared to dissection | 12 (16.2%) | 49 (66.3%) | 11 (14.9%) | 1 (1.3%) | 1 (1.3%) |
| C | Interest generated towards subject is more with prosection compared to dissection | 2 (2.7%) | 12 (16.2%) | 14 (19.0%) | 40 (54%) | 6 (8.1%) |
| D | With prosection there is more scope for application of knowledge in future than with dissection | 0 (0%) | 8 (10.8%) | 23 (31.1%) | 35 (47.3%) | 8 (10.8%) |
| E | Prosection helps more than dissection to reinforce and apply concepts learned from lectures | 0 (0%) | 15 (20.3%) | 28 (37.9%) | 30 (40.5%) | 1 (1.3%) |
| F | With prosection, there is better understanding of spatial orientation of body than with dissection | 1 (1.3%) | 27 (36.5%) | 19 (25.8%) | 25 (33.7%) | 2 (2.7%) |
| G | Everyone gets equal opportunity for participation in prosection | 9 (12.2%) | 42 (56.8%) | 13 (17.6%) | 8 (10.7%) | 2 (2.7%) |
| H | With prosection, systems interrelation in the body is better understood | 1 (1.3%) | 26 (35.2%) | 27 (36.5%) | 17 (22.9%) | 3 (4.1%) |
| I | Prosection provides greater insight into anatomical variations than dissection | 3 (4.1%) | 26 (35.1%) | 17 (22.9%) | 24 (32.5%) | 4 (5.4%) |
| J | Structural details better witnessed with prosection than with dissection | 4 (5.4%) | 35 (47.2%) | 15 (20.3%) | 15 (20.3%) | 5 (6.8%) |
| K | I prefer dissection over other forms of learning cadaver | 24 (32.5%) | 37 (50.0%) | 11 (14.9%) | 1 (1.3%) | 1 (1.3%) |

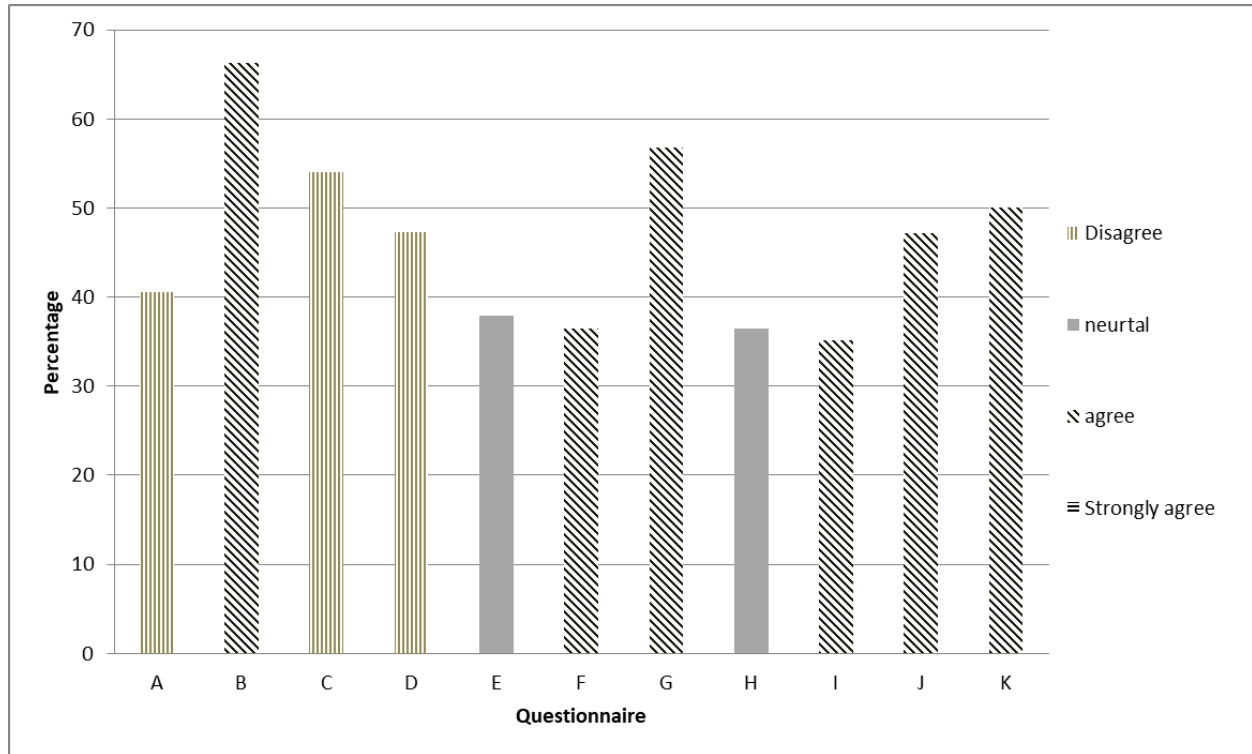


Figure 1. Most common responses to each question and their respective frequency

In our study, 82.5% of students preferring dissection over prosection for learning anatomy whereas study conducted by Dinsmore et al. showed only 8.5% of the responding students preferred traditional dissection; 78.8% chose examination of prosected materials with faculty.[16] This difference might be due to students not getting equal opportunity to dissect the cadaver. The study conducted by J.O. Nnodim et al. showed that structures imprinted better on dissector's mind, one learns to dissect- a skill useful later in surgery while prosection is effective, very time-economical and all important structures are seen.[20] Our study also showed similar results as students (55.8%) favoring prosection as there is more scope for application of knowledge in future than with dissection and 82.5% of students opting prosection as time management is good while learning with prosected cadaver compared to dissection. Our findings correlates with the study conducted by Smith

et al. which demonstrated that majority of students agreed prosection helped them appreciate relationships between structures.[21] Moreover, in our study 52.6% of students agreed that structural details is better witnessed with prosection than with dissection. Study conducted by Whelan et al. showed majority of students valued the ability to improve three dimensional and spatial knowledge of anatomy during the course of dissection.[22] Our study also showed that nearly two-thirds of the students agreed that there is better understanding of spatial orientation of body in prosected body than with dissection, nearly two-thirds of participants disagreed with above statements whereas nearly one-fourth of participants were neutral to the statements. Limitation of the study includes, BDS students as well as second year MBBS students could have been included in the study.

CONCLUSION:

Use of traditional cadaveric dissection to facilitate teaching and learning is becoming difficult because of limited availability of cadaver, ethical issues, and students to cadaveric ratio. Our study showed majority of student's opted dissection over prosection as it is efficient in acquiring surgical skills and good clinical practice. Although majority of participants sought the importance of dissection in many ways but students also disagreed towards sole method of delivering anatomy practical as prosection provided good insight to anatomical variation and time management was better than with other forms of methodology used in learning. Therefore the introduction of diverse method is required to facilitate learning technique in laboratory.

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