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Indian Journal of Clinical Anatomy and Physiology

Journal homepage: www.innovativepublication.com

Original Research Article

Importance of the human cadaveric dissection for learning anatomy by the first year MBBS students – An observational study

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ARTICLE INFO

Article history:
Received 21-05-2020
Accepted 28-05-2020
Available online 27-06-2020

Keywords:
Anatomy curriculum
Cadavers
Dissection
First year MBBS

ABSTRACT

Introduction: Medical as well as paramedical students are first exposed to the subject of Anatomy and cadaveric dissection during commencement of their studies. The cadaveric dissection is said to be an essential component to the anatomy curriculum. In recent times, with advancing technologies newer methods of learning anatomy have also been introduced.
Objective: The objective of the present study was to evaluate and understand the approach, understanding and views of the first year medical students towards the cadaveric dissection as well as its impact.
Materials and Methods: This study was conducted on a cohort of the first year medical student, where a total of 324 students of first year MBBS were recruited and circulated a preset proforma of questions in the form of two separate questionnaires. The responses of the students were recorded and analyzed.
Observations and Results: It was observed that 97% of the students considered the cadaveric dissection an integral part of the anatomy curriculum. Majority of them were of the view that newer technologies are not superior to the traditional dissection. Various symptoms were found to be less prevalent amongst the students which could be the result of prior counseling.
Conclusion: Cadaveric dissection remains an inseparable part of the first year anatomy curriculum. Students are of view that it is the best method to learn anatomy. Newer methods to learn anatomy could be additional aids to facilitate the anatomy learning, but cannot replace cadaveric dissection. Practice of counseling of the students before the first exposure to cadavers eases the emotional and physical impact up to a great extent.

1. Introduction

The medical students are first exposed to the anatomy during their undergraduate studies in India. The same is true for the other paramedical courses. Learning anatomy is said to be the basic pillar of the learning of all the medical sciences.[1] A Greek word meaning "to cut up" is the derivation of the modern term anatomy. In ancient times, the word anatomize was commonly used than the word dissect.[2] The cadaveric dissection is said to be an essential component to the anatomy curriculum. It provides a hands – on view to understand the various parts and system of the human body and also makes the medical students familiar to it.[3] A meticulous knowledge of human body architecture is considered to be a base for a successful medical or surgical practice. The human cadaveric dissection plays a pivotal role for this.[4] The basic purpose of studying anatomy is to get accustomed to the normal body architecture and structures so that when they are disrupted or altered by any disease, injury or syndrome, the knowledge of these alterations can be used for taking important clinical judgments.[5]

The first year medical students are exposed to the human cadavers during the dissection classes of anatomy subject for the first time ever. This contributes to a huge psychological and emotional shift to many of the students.[3] The experience of the very first confrontation of the human cadaver and its effects on the physic, psyche and emotions

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https://doi.org/10.18231/j.ijcap.2020.036

of the students have been studied by multiple workers previously.[6–10]

Learning anatomy has evolved currently in to two gross perspective, learning anatomy through traditional dissection of the human cadaver method[11] and second, learning anatomy via various newer modalities like prosected specimens, plastinated specimen and multiple virtual reality software.[12] This is recently been a point of debate about the suitability and applicability of various methods as well as their effectiveness for learning anatomy.[13]

The present study was conducted with the aim to evaluate and understand the approach, understanding and views of the first year medical students towards the cadaveric dissection as well as its impact.

2. Materials and Methods

This study was conducted on a cohort of the first year medical student. A well formed proforma of various questions for the evaluation of various aspects was prepared. The consent of participation was duely taken form the participating students at Zydus Medical College, Dahod. A comprehensive list of questionnaires was designed to cover multiple aspects related to the demography of the participants as well as their views about the topic in discussion, their experience of first exposure to the cadavers in dissection hall as well as its impact on their psyche, physic and emotions. The proforma was circulated to a total of 324 first year MBBS students. Before the filling of the proforma, the participants were well briefed about the nature and background of the study, format of the questions and the procedure of filling the appropriate answers for respective questions.

3. Observations and Results

The present study was conducted on the group of 324 first year MBBS student comprising of participants of both the genders, male and female. There were a total of 149 (45.99%) female participants and 175 (54.01%) male participants in the cohort. The responses received from the participants are depicted in the Tables 1 and 2.

It was observed in the present study, that the exposure to the dead body was not the first time while going in a dissection hall for 40.1% of the participants. Whereas there were 50.9% of the students who were visiting a dead body for the very first time. 45.1% of the participants agreed that it made them apprehended while entering in the dissection hall initially whereas 54.9% of them did not experience any anxiety or apprehension while doing so. This actually coincided with the response of another question about the unpleasant feeling while entering the dissection hall. 52.2% of the students agreed that they were having the unpleasant feeling on entering the hall. This experience though was not bad enough to create stress or fear in them. Only 10.5% of the participants agreed on having the experience of stress of fear. 23.5% of them were found to experience recurrent thought even when being away from the dissection hall after their first encounter. The 40.7% of the participant reported the experience of the odor of formalin even while away from the college. The experience of the osteology demonstration was not found to be so hesitating amongst the students. Only 5.2% of the participants reported to have unpleasant feeling while holding the bones during the demonstration classes. In 6.8% of the participants the experience of the first encounter of the dissection hall was strong enough to make them think of leaving the medical course. Interestingly, 93.8% of the students were finding the dissection classes to be enjoyable and fascinating.

Majority of the students (96.9%) felt gratitude towards the cadavers who donated their bodies for learning purposes of the students. A total of 90.4% of the students were of opinion that dissection of the human body for learning anatomy is ethically right and should be continued. 97.5% of the participants were agreeing that dissection is an integral part of the anatomy curriculum and should remain such. A traditional thought that dissecting without gloves would make you understand the body structures comparatively better was seemingly not so popular amongst the participants. 55.6% of the participants reported to feel hesitant while dissecting without the gloves. Dissecting with the instrument set is a risky affair and 37.7% of the students reported to have inflicted injury while dissecting.

Newer methods of learning anatomy were found to be not so popular amongst the cohort. Only 9.9% of the students were found to be in agreement with the use of alternative methodology like use of plastic models, plastinated specimens and virtual reality based learning over cadaveric dissection. Same was the view of 5.2% of the participants for the use of prosected specimens for learning anatomy. 89.2% of the students agreed that cadaveric dissection enhances the thinking in a logical manner.

It was a practice acquired in the department of the anatomy at Zydus Medical College to council the student before the first encounter of the dissection hall about various aspects of it which actually resulted in positive outcomes. 73.8% of the students agreed that prior interaction with the departmental staff actually reduced the emotional impact on them.

The exposure of dissection lab did have a physical toll on the students. We observed that 8.6% of the students complained of feeling nausea and weakness. Approximately 4% of the students felt vomiting. Another 8% participants reported feeling fear and restlessness. 6% of the students complained of feeling dizzy after the first exposure of dissection hall. Sleep disturbances and nightmares were not found to be so big issue with students after the first exposure. Only approximately 2% of the participants complained of this. Exposure to formalin as well as it pungent smell

Table 1: Responses of the participants to the questionnaires 1

No	Questions	Yes (%)	No (%)
1	Are the other alternative teaching methodology like plastic models, plastinated specimens and virtual reality based learning better than cadaveric dissection?	9.9	90.1
2	Are the prosected specimens better than cadaveric dissection for understanding of anatomy?	5.2	94.8
3	Did the exposure of cadaver make you think about leaving the medical course?	6.8	93.2
4	Did you have any apprehension or hesitation while handling the cadavers during dissection classes?	45.1	54.9
5	Do you feel any sense of gratitude to people who donated their bodies?	96.9	3.1
6	Do you find dissection enjoyable/ fascinating / interesting?	93.8	6.2
7	Do you think dissecting the human body for learning is ethically right?	90.4	9.6
8	Do you think that the dissection enhances the thinking in a logical manner?	89.2	10.8
9	During the demonstration of bones, did you ever have the unpleasant feeling?	5.2	94.8
10	Entering the dissection hall gave you unpleasant feeling?	52.2	47.8
11	Have you even been injured by the dissecting instruments?	37.7	62.3
12	Have you ever encountered the dead body earlier?	40.1	59.9
13	Have you ever felt any stress or fear while in the dissection hall?	10.5	89.5
14	Not using gloves for dissection makes you hesitant?	55.6	44.4
15	Prior interaction with the faculties of the department eases the emotional impact of the encounter of the dead body?	73.8	26.2
16	Should the cadaveric dissection be continued as an integral part of the anatomy curriculum?	97.5	2.5
17	The first encounter with the dead body ever resulted in recurrent thoughts about it?	23.5	76.5
18	When away from the college, did you ever experience the unpleasant odor of formalin?	40.7	59.3

Table 2: Responses of the participants to the questionnaires 2

No	Symptomatology	Yes (%)	No (%)
1	Nausea	8.6	91.4
2	Vomiting	3.7	96.3
3	Headache	16.7	83.3
4	Weakness	8.6	91.4
5	Dizziness	5.9	94.1
6	Fear	8.0	92.0
7	Restlessness	8.0	92.0
8	Lack of concentration	12.7	87.3
9	Nightmare	2.2	97.8
10	Shivering of hands (tremors)	10.5	89.5
11	Influence on routine activities	6.8	93.2
12	Difficulty in consuming food	19.8	80.2
13	Sleep disturbances	2.5	97.5
14	Difficulty in breathing	17.6	82.4

has got its effects on the person. 16.7% of the students reported headache whereas 17.6% complained of difficulty in breathing. 10.5% of students reported the tremor of hands. Formalin smell did interfere with consumption of food in 19.8% of the participants. Lack of concentration was seen in 12.7% of the participants. Only 6.8% of them thought the exposure of dissection hall was strong enough to interfere with the routine activities.

4. Discussion

The dissection of the cadavers during the medical studies has been an integral part of the curriculum. This is the first exposure of the medical students to the human body and this would help the students to develop the skilled procedures. Formalin is a basic ingredient of the embalming fluid which is a pungent chemical. During the dissection of cadavers preserved by formalin there is exposure to the formaldehyde fumes which is having effects on the medical students.

97.5% of the participants of the present study agreed the dissection to be an integral part of the undergraduate medical curriculum. Agnihotri and Sagoo et al.,[14] Mishra P et al.[15] and Khan AS et al.[16] reported that approximately 80% of the students agreed for this statement. Dubhashi et al[17] found only 67% of the students thinking dissection to be an integral part of the medical curriculum. This observation of the present study closely coincided with that of Singroha R et al.[18]

Somnath D et al.[19] reported the 94% of the students to be of opinion that prosected specimens are not as useful as cadaveric dissection. Which is closely correlated with the findings of the present study. We found 94.8% of the participants to be of the same opinion. Indeed, prosected specimen would not give the similar orientation as the firsthand experience of cadaveric dissection. Agnihotri & Sagoo et al.[14] and Rajeh NA et al.[20] reported the similar opinion to be 83.66% and 81% respectively. Similar observation was seen for the opinion of participants about the usage of alternative teaching methodology like plastic models, plastinated specimens and virtual reality based learning for studying human anatomy. 90% of the participants disagreed on comparative usefulness of these modalities. This result was contradictory to the findings documented by Rajeh NA et al.,[20] who reported only 59% of the student not in favor of using newer technologies.

89% of the students in the present study believed that cadaveric dissection enhances their thinking in a logical manner which is closely coinciding with the findings reported by Agnihotri G & Sagoo MG[14] (90%) and slightly lesser than the observations of Saha N et al.[21] (98%).

We found that there were only 10.5% of the participants who experienced stress or fear during the first encounter of the dissection hall which was contradictory to the observations of Agnihotri G and Sagoo MG[14] (86.66%). This again would be the result of the prior counselling practiced by the teaching staff of the department. This is thought to prepare the students for the cadaveric dissection and remove the possible inhibition.

Using formalin for embalming of the dead bodies has got its own disadvantages. It imparts a peculiar smell to the cadaver as well as the fumes of formalin is also documented to create health impacts.[22] 8.6% of participants complained of nausea in the present study whereas 3.7% complained of vomiting. This was in agreement with the results documented by Singroha R et al.[18] (6.63%), Vinay kumar V et al[23] (3.3%) & Saha N et al.[21] (8.1%). Hemlatha NR et al.[24] reported 24% of the students complaining of symptoms of nausea which is contradictory to the findings of the present study. Headache was one of a common problem observed in the present study. 16.7% of the students reported the same in the present study. Which Hemlatha NR et al.[24] documented to be 26.8% in their study.

First exposure of cadaveric dissection does make a strong impact on the psyche of the students. Symptoms like fear, restlessness, nightmares and sleep disturbances are sometimes observed in the students of first MBBS after the dissection class start. Fear and restlessness was observed in 8% of the participants in the present study whereas nightmares and sleep disturbances was observed in 2% of the students. This was comparable to the findings of Singroha R et al.[18] (3.87%) while Naz S et al.[25] reported nightmares to be present in 7.4% of the students. Dubhashi S et al.[17] reported 45% participants to experience horrifying dreams in their studies.

As already established, human cadaveric dissection would always remain the most impactful method of studying human anatomy. This was agreed upon by the students of the medicine studying anatomy. With advancing technologies newer modalities of learning anatomy are gaining popularity. These definitely can make learning anatomy more palatable and easy but as we could establish, cannot replace the human cadaveric dissection.

5. Conclusion

It was concluded in the present study that in the current times of advancing technologies and newer teaching modalities, the traditional human cadaveric dissection continues to be the method of choice to study human anatomy. Though it was observed in the present study that first exposure of cadavers did produce some physical, emotional and psychological problems in some of the students, majority of the participants endorse the dissection. The prior interaction of the students with the departmental staff actually reduces the psychological and emotional impacts on the students and we endorse this practice. It can be concluded that the human cadaveric dissection was and remains the unreplaceable modality for learning human anatomy.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Turney BW. Anatomy in a modern medical curriculum. *Ann R Coll Surg*. 2007;89(2):104–7.
2. Graaff KVD. Human Anatomy, 6th Edition. The McGraw−Hill Companies; 2001.
3. Trivedi PN, Changani MV, Rathwa AJ, Lakhani CJ. Cadaveric dissection- An integral part of first year MBBS anatomy teaching (students' perspective). *Indian Journal of Clinical Anatomy and Physiology*. 2018;5(2):229–232.
4. Cahill KC, Ettarh RR. Attitudes to anatomy dissection in an Irish medical school. *Clin Anat*. 2009;22(3):386–91.
5. Moxham BJ, Plaisant O. Perception of medical students towards the clinical relevance of anatomy. *Clin Anat*. 2007;20(5):560–4.
6. Parker LM. What's wrong with the dead body? Use of the human cadaver in medical education. *Med J Aust*. 2002;176(2):74–6.
7. Older J. Anatomy: A must for teaching the next generation. *Surg*. 2004;2(2):79–90.
8. Patel KM, Moxham BJ. The relationships between learning outcomes and methods of teaching anatomy as perceived by professional anatomists. *Clin Anat*. 2008;21(2):182–9.
9. Mulu N, Tegabu D. Medical Students' Attitudinal Changes Towards Cadaver Dissection: A Longitudinal Study. *Ethiop J Health Sci*. 2012;22(1):51–8.
10. Mishra P, Ksheersagar DD, Mishra D. Attitude of first year medical students towards dissection. *J Cont Med A Dent*. 2015;3(1):45–9.
11. Aziz MA, Mckenzie JC, Wilson JS, Cowie RJ, Ayeni SA, Dunn BK. The human cadaver in the age of biomedical informatics. *Anat Rec*. 2002;269(1):20–32.
12. McLachlan JC, Patten D. Anatomy teaching: ghosts of the past, present and future. *Med Educ*. 2006;40(3):243–53.
13. Wyk JV, Rennie CO. Learning Anatomy Through Dissection: Perceptions of a Diverse Medical Student Cohort. *Int J Morphol* . 2015;33(1):89–95.
14. Agnihotri G, Sagoo MS. Reactions of first year Indian medical students to the dissection hall experience. *NJIRM*. 2010;1(4):4–9.
15. Mishra P, Ksheersagar DD, Mishra D. Attitude of first year medical students towards dissection. *J Cont Med A Dent*. 2015;3(1):45–9.
16. Khan AN, Baig S, Zian S. Importance off cadaveric dissection in learning gross anatomy. *Pak J Med Dent*. 2014;3(4):31–5.
17. Dubhashi S, Dubhashi U, Singh A, Trinath T. Medical students react to cadaveric dissections. *Rec Res Sci Tech*. 2011;3(1):135–8.
18. Singroha R, Verma U, Chhbra S. Introduction to cadavers - A student's perspective. *IAIM*. 2015;2(3):134–41.
19. Somanath D, Srivastava S, Rajasekar SS. Experience in anatomy lab - an analysis in preclinical students. *Int J Healthc Biomed Res*. 2015;3(2):117–21.
20. Rajeh NA, Badroun LE, Alqarni AK, Alzhrani BA, Alallah SB, Almghrabi SA, et al. Cadaver dissection: A positive experience among Saudi female medical students. *J Taibah Univ Med Sci*. 2017;12(3):268–72.
21. Saha N, Chaudhuri S, Mm S. Attitude of first year medical students in dissection hall. *IOSR-JDMS*. 2015;14(5):74–8.
22. Brenner E. Human body preservation - old and new techniques. *J Anat*. 2014;224(3):316–44.
23. Kumar VV, Lucas AM, Kumar V, Kulal P. Attitude of first year Indian medical students towards cadaver dissection. *Int J Anat Res*;2015(3):1255–8.
24. Hemalath NR, Samaga MP. Acute symptoms experienced by medical students on first exposure to formalin in dissection hall. *IJSRE*. 2015;3(4):3205–9.
25. Naz S, Nazir G, Iram S, Mohammad M, Umair, Qari IH, et al. perceptions of cadaveric dissection in anatomy teaching. *J Ayub Med Coll Abottabad*. 2011;23(3):145–8.

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Cite this article: Chaudhari G, Sonawane M, Singel TC. Importance of the human cadaveric dissection for learning anatomy by the first year MBBS students – An observational study. *Indian J Clin Anat Physiol* 2020;7(2):177-181.