

## ORIGINAL ARTICLE

# Cadaver Dissection: Attitude and Perception of Its Importance Among Medical and Health Science Students in Learning Anatomy

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## ABSTRACT

**Introduction:** Anatomy continues to be an important basic subject in medicine and other related health sciences which is delivered by method of either through lectures or demonstration. Thus, having a gross anatomy practical with cadaver is a crucial phase for the students to have a deep understanding about anatomy of human body. The objective of this study is to explore the attitude and perception of medical and health science students in the importance of cadaver dissection in learning anatomy. **Methods:** A cross-sectional study was conducted by distributing closed structured questionnaires to 270 respondents consisting of socio-demographic in part one, frequency on practical with dissected cadaver in part two, the attitude of student towards the dissected cadaver in part three, suggestion for improvement during practical with cadaver in part four and the value of cadavers during practical in part five. The collected data were processed by using Statistical Package for Social Sciences (SPSS) version 23.0. **Result:** Descriptive statistical evaluation shows majority of the students perform practical with cadavers. They find cadaveric dissection exciting with no feeling of stress and anxiety. Many of them never had an emotional shock when exposing themselves to the cadavers for the first time accepting the cadaveric dissection ethically. The students recommended keeping cadaveric dissection in the health science curriculum. **Conclusion:** The cadaveric dissection helps in grounded understanding of anatomy. It promotes and develops psychomotor skills in students. The findings of the study discovered dissection to be a motivating tool in learning anatomy.

**Keywords:** Cadaver, Dissection, Students, Practical, Curriculum

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## INTRODUCTION

Cadaveric dissection is widely used in medical education to grasp the knowledge about the gross anatomy. Anatomy has been a vital basic subject in medicine and other related health sciences and is taught by method either through lectures or demonstration (1). Thus, having a gross anatomy practical with cadaver is important part of the method for the students to have a deep understanding of human body. The trend in learning anatomy is seen to be transforming. It is observed that understanding anatomy through cadaveric dissection is not any more enhancing self-development professionally (2). There are students with anatomical knowledge who have learnt by using other techniques such as learning through diagrams and computer-

aided program (3). Many countries have shortened the duration of learning anatomy from 18 months to 12 months in their first year of MBBS curriculum (4). The cadaveric dissection as a part anatomy teaching method has been omitted from many medical schools. This is mainly due to high cost of the cadavers or humanitarian consideration (5). Considering the above reasons, a need is felt to investigate the cadaveric dissection as a significant way to obtain in-depth anatomical knowledge by the students in medical education teaching program. The purpose of this study is to explore the student's perspective or responses towards the cadaveric dissection in understanding human body.

## MATERIALS AND METHODS

This is a quantitative cross-sectional study conducted with convenience sampling method. The responses comprised of the MBBS and others health science students in Medical school of Klang Valley, Selangor, Malaysia.

Ethical approval was taken from research management centre of the University. The sample size is calculated by using single population proportion formula  $n = \frac{z^2 p(1-p)}{d^2}$ .

A total sample of 270 students participated in this study.

For the collection of data closed structured questionnaires were distributed to preclinical and clinical year MBBS and other health science students in a medical school of a private university in Malaysia. The questionnaire was designed based on extensive literature review (6, 7). The respondents were requested to sign a consent form before proceeding for the actual measuring items. The questionnaires consist of five sections. It included the demographic data, the frequency in practical related to dissected cadaver, student's attitude towards the dissected cadaver, suggestions for improvement in their practical training with dissected cadaver and student's consideration on the importance of dissected cadaver used in learning anatomy and health science teaching. A Descriptive and inferential statistics was used to analyze the data. Significance value of 0.05 was fixed to investigate the relation of feedback of the students and cadaveric dissection significance by employing Chi-square test. For items expected to have small frequencies, Fisher's exact test, is applied. The Windows statistical Package for Social Sciences (SPSS) version 23.0 was used to analyse the results.

**RESULTS**

In this study a total of 270 respondents were involved. More than half of the respondents (57%) were from other program compared to MBBS students (43%). Other health science student includes bachelor of medical science (BMS), diploma medical assistant (DMA) and diploma medical science (DMS) (Fig 1). Table I represents frequency of practical by students with cadavers. The analysis showed a high frequency of practical (more than 10 times) with dissected cadaver among MBBS students (63.2%) than the other health science stream students (14.4). Table II depicts the attitude of students towards cadavers. The evaluation shows same percentage of MBBS and health science

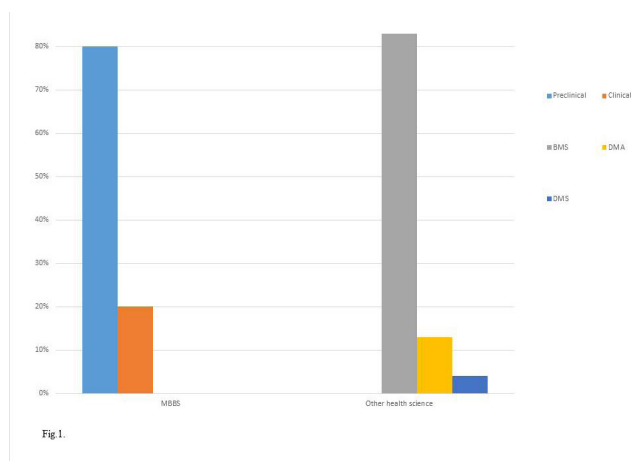


Figure 1 : Bar graph showing percentage of students involve in study.

Table I : Frequency of practical with cadaver

Practical with cadaver	MBBS		Health Science	
	N	(%)	N	(%)
Practice with dissected cadaver				
Yes	106	90.6	114	74.5
No	11	9.4	39	25.5
Undecided	0	0	0	0
Frequency of perform practical with cadaver				
NIL	11	9.4	39	25.5
<10 times	20	17.1	71	46.4
>10 times	74	63.2	22	14.4
Not sure	12	10.3	21	13.7

Table II : Attitude of student towards dissected cadaver

Attitude of the student	MBBS		Health Science	
	N	%	N	(%)
First visit is exciting				
Yes	99	84.6	125	81.7
No	3	2.6	4	2.6
Undecided	15	12.8	24	15.7
Experience emotional shock				
Yes	20	17.1	35	22.9
No	77	65.8	91	59.5
Undecided	20	17.1	27	17.6
Fear of touching the cadaver directly				
Yes	9	7.7	25	16.3
No	94	80.3	101	66.0
Undecided	14	12.0	27	17.6
Experience anxiety and stress				
Yes	11	9.4	17	11.1
No	85	72.6	117	76.5
Undecided	21	17.9	19	12.4
Have any sympathy and respect for the dissected cadaver				
Yes	77	65.8	102	66.7
No	13	11.1	22	14.8
Undecided	27	23.1	29	19.0
Have prior experience of a dead body				
Yes	43	36.8	64	41.8
No	68	58.1	79	51.6
Undecided	6	5.1	10	6.5
Feel haunted after the day of dissection				
Yes	2	1.7	14	9.2
No	108	92.3	124	81.0
Undecided	7	6.0	15	9.8
Get irritated with the smell of formalin				
Yes	81	69.2	98	64.1
No	18	15.4	25	16.3
Undecided	18	15.4	30	19.6
Dissection is ethically acceptable				
Yes	94	80.3	117	76.5
No	5	4.3	10	6.5
Undecided	18	15.4	26	17.0
Avoid to religious belief				
Yes	18	15.4	37	24.2
No	65	55.6	67	43.8
Undecided	34	29.1	49	32.0

student feels cadaveric dissection exciting when they are exposed to cadavers for the first time. The emotional shock is not a concern for both medical and other health science students during cadaveric dissection as most of the students feel negative on this statement (MBBS: 65.8% and other health science students:59.5%). Majority of the students from both categories (MBBS: 80%, other health science student: 66%) do not fear in touching the cadaver in practical nor they are stress and have any anxiety. Almost equal percentage of MBBS and health science students shows sympathy to the dissected cadaver even though many of them are not exposed to a dead body. Majority of students do not feel haunted in

**Table III : Suggestion for improvement in learning anatomy with cadaver**

Improvement in learning anatomy	MBBS		HealthScience	
	N	(%)	N	(%)
Provide more cadaver during practical	106	90.6	124	81.0
Yes	1	0.9	2	1.3
No	10	8.5	27	17.6
Undecided				
Conducive learning environment and employing more demonstrators	97	82.9	128	83.7
Yes	2	1.7	3	2.0
No	18	15.4	22	14.4
Undecided				
Use of models and Computer assisted learning (CAL)	89	76.1	107	69.9
Yes	9	7.7	11	7.2
No	19	16.2	35	22.9
Undecided				

**Table IV : Importance of cadaveric dissection in learning anatomy**

Importance of cadaveric dissection	MBBS		Health science	
	N	(%)	N	(%)
Importance to be continued in the syllabus	112	95.7	137	89.5
Yes	1	0.9	3	2.0
No	4	3.4	13	8.5
Undecided				
Importance to help in deepens understanding of anatomy.	111	94.9	142	92.8
Yes	2	1.7	5	3.3
No	4	3.4	6	3.9
Undecided				
Importance to help in promotes the development of psychomotor skills in preparation for clinical work.	108	92.3	130	85.0
Yes	5	4.3	5	3.3
No	4	3.4	18	11.8
Undecided				
Gives the best method for learning anatomy.	105	89.7	136	88.9
Yes	4	3.4	7	4.6
No	8	6.8	10	6.5
Undecided				
Gives actual hands on training that can enhance combination theory and practice.	108	92.3	142	92.8
Yes	4	3.4	4	2.6
No	8	6.8	7	4.6
Undecided				

their practical with cadavers but they feel irritated with the smell of formalin. Many students from MBBS and health sciences accept cadaveric dissection ethically and do not avoid it based on their religious beliefs. Table III is showing analysis of suggestion for improvement in learning anatomy with cadavers. In this a very high percentage of MBBS students (90.6%) and also other health science student (81%) suggested more cadavers in their practical with good number of demonstrator for a proper conducive environment of learning. They have also suggested use of models and computer assisted learning (CAL) to understand anatomy. Table IV contains result of evaluation on importance of learning anatomy. Majority of the MBBS and other health science

students recommended keeping cadaveric dissection in the syllabus. They feel that it deepens the understanding of anatomy. Most of the students from MBBS (92.3%) and health science (85%) also believe that cadaveric dissection promotes development of psychomotor skills in preparation of clinical work. Majority of the students agrees that it is the best method to learn anatomy and provides hands on training that enhances both theory and practice.

## DISCUSSION

The outcome of the study certified that most students learn anatomy from the cadaver. There are many respondents who have verified attitude, emotional changes and opinion on cadaveric dissection based on the previous research. Anatomy education requires more research to balance between emotional arguments regarding dissection and scientific evidence. The preclinical medical student during their first year of study passes through diverse emotional phases (8). This may be in the form of insufficient and bad standard cadavers in practical, inadequate anatomy models for teaching, inappropriate demonstration prior to practical and lack of experienced or unskilled staff (9). The students need motivation towards dissection in learning anatomy from peer and lecturer.

This research explores high proportion of MBBS students (90.6%) performing practical with dissected cadaver compared to other health science student which is 75.5%. Even though, cadaveric dissection is important for MBBS students, 9.4% of the students prefer to learn anatomy by other means using models and museum specimens. The difference is due to the MBBS syllabus which requires in-depth knowledge and understanding on anatomy in order for them to improve their skill of treating patients. It is established by their frequency of practical with dissected cadaver which is about 63.2% whereas other health science is only 14.4%. This is supported by a study which reported that cadaveric dissection is of critical importance in learning anatomy (10). Majority of the medical and health science students are enthusiastic on their first and introductory visit to the dissecting room. More than half of the students feel relaxed and not anxious or stress on exposure to cadavers during their practical session. In a similar study conducted on first year preclinical medical students majority of them felt excited during first day of the cadaveric study (11, 12). The students were surprise and disturb when they are exposed to cadavers for the first time. In this study 17.1% of MBBS and 35% of Health science students had experience this incident in dissection hall. The other studies also supported the finding where 55% of the students have encountered the same effect during their exposure to cadavers (13).

Sometimes moments of anxiety and consciousness helps to prepare them in performing their duties ethically

towards community with a sense of responsibility. However, less number of students feels hesitant to carry out learning with the cadavers. On the issue of apprehension towards initial exposure to cadaver, it was observed that less than 10% of MBBS student and 16% of the other health science students expressed fear to touch cadaver directly. For many students the malodour of preserved cadaver and its disarticulated parts makes them unendurable with psychological stress encountering nightmares infusing phobia towards holding the cadavers during practical. The students The findings showed that 36% to 41% of the MBBS and other health science students with prior exposure to dead bodies have stronger determination in getting along with the cadavers in dissection. The students with previous exposure to cadavers are able to effectively handle an incident involving death, which will help them to become a well-organized clinician (14). In this study over 80% students agree they do not feel tormented after the cadaveric dissection. The findings contrast with a previous study in which phobia of cadaveric exercise was observed in 46.5% of students (15). About 66% out of 270 students agree that formalin smell make them feel irritated. Contact with formaldehyde leads to issues in health like asthma diagnosed with changes during their practical workouts with cadavers. The use of chemicals for embalming is hazardous (16, 17). This is supported by 9.4% of students in their study. There are questions commented on by students with ethical issues about cadaveric dissection and who spend less time actively in anatomy practical (18).

In this study 80% of students agreed that cadaveric dissection is ethically acceptable only 16% didn't accept. The finding goes line with the results of a study where majority (81%) of the first year medical students agreed cadaveric dissection ethically (19). A more than half of the student population showed a feeling of respect to the cadaver. About 80% of medical and health science students agree with the proposal on increase motivation towards cadaveric dissection by demonstrators, who can reduce and help students overcome obstacles. Moreover, more cadavers will improve student participation in practical with the dissected cadaver. The computer-aided learning (CAL) can also be included as a supplement, giving students the opportunity to see before undergoing cadaver dissection (20). The student's opinion has not changed on cadaveric dissection even though interactive multimedia, models and specimens are some of the tools which have changed the way of teaching anatomy. Learning anatomy is incomplete without cadaveric dissection. In addition, three dimensional mapping of human body is best understood through cadaveric dissection. (21). Effective instruction and coaching with cadaver dissection contribute high quality outcomes since it remarkably augments the concept of the course objectives. The cadaveric

dissection triggered psychomotor development and their analytical intelligence assist them sensible way (22). The cadaver dissection is the best method of learning anatomy which is agreed by majority of students. According to student's cognizance, they are confident and positive in learning anatomy by cadavers.

## CONCLUSION

This study was motivated by the importance of the cadaveric dissection in learning anatomy in undergraduate medical and health science teaching. It has reflected that practical in anatomy with cadaveric dissection has a positive impact on undergraduate teaching of medical and health science students. There are various issues students confront while performing cadaveric dissection. To overcome these challenges, the dissection hall should be environment friendly and favourable. The importance of CAL should be emphasised to enhance good command in cadaveric dissection. There is a limitation in this study. The numbers of students from health science are more than MBBS students. The MBBS students are exposed more to dissection than health science students. Hence, further research is recommended including more MBBS students. Since cadaveric dissection is a fading method in teaching and learning anatomy, medical school should look back in their curriculum and put priority in cadaveric dissection. The overall result of the study agrees that cadaveric dissection has a significance and value in learning anatomy.

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