

# Deciphering Medicolegal Autopsy from the Perspective of Undergraduate Students in a Medical University in Karnataka

Priya M Narayankar<sup>1</sup>, Janani Adiaman<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Forensic Medicine and Toxicology, Shri Dharmasthala Manjunatheshwara College of Medical Sciences and Hospital, Shri Dharmasthala Manjunatheshwara University, Sattur, Dharwad. <sup>2</sup>Assistant Professor, Department of Forensic Medicine and Toxicology, Velammal Medical College Hospital and Research Institute, Madurai.

**How to cite this article:** Priya M Narayankar, Janani Adiaman. Deciphering Medicolegal Autopsy from the Perspective of Undergraduate Students in a Medical University in Karnataka. Indian Journal of Forensic Medicine and Toxicology/Volume 18 No. 2, April-June 2024.

## Abstract

**Background:** Autopsy or postmortem examination is an important aspect of medicolegal investigation and an integral part of medical education. It is of paramount importance in ascertaining the cause of death, time since death, manner of death, collection of evidence and also in establishing a positive identification in case of unclaimed dead bodies. As part of medical curriculum, medical students are required to witness as well as perform a certain number of autopsies.

**Methods:** To understand autopsy from the perspective of medical undergraduate students, a questionnaire was prepared which contained questions to assess knowledge and to understand attitudes of students towards autopsy.

**Conclusion:** Almost all students opined that autopsies are an essential part of medical education. Most students opined that autopsy helped them in understanding basic anatomy of the human body as well as common pathological conditions. Few students expressed discomfort towards watching an autopsy. A good number of students showed interest in encouraging kin of the deceased to donate cornea. In conclusion, autopsy holds the potential in shaping students to competently opine about the cause of death, engage in research as well as to send a social message in the form of donating eyes after death.

**Key words:** autopsy, cornea, death, research

## Introduction

Autopsy is an important research tool and investigative procedure which has played a significant role in the acquisition of medical knowledge. It helps in identifying the illness that the person suffered

from leading to death i.e. cause of death, time since death, medico-legal issues surrounding death, etc. Many studies show that autopsy is central to medical education, since it teaches students about the underlying pathology, cause of death, death certification and statistics.<sup>1</sup>

**Corresponding Author:** Priya M Narayankar, Assistant Professor, Department of Forensic Medicine and Toxicology, Shri Dharmasthala Manjunatheshwara College of Medical Sciences and Hospital, Shri Dharmasthala Manjunatheshwara University, Sattur, Dharwad.

**Email:** drpriyamn3012@gmail.com

**Mobile:** 7353885577

**Submission date:** December 4, 2023

**Revision date:** Dec 15, 2023

**Published date:** April 27, 2024

Number of autopsies witnessed by undergraduate medical students is gradually decreasing, which is of concern as students might have to perform an autopsy by themselves once they are medical practitioners.<sup>2</sup>

For medical students, autopsy is useful in understanding the anatomy of organs, pathological conditions and related medico-legal issues. The advantages of autopsy are many, but for some students, it is difficult to cope with the emotional aspects.<sup>3</sup> The present study was undertaken to know the perception and attitude of medical undergraduates towards autopsy.

The knowledge of viewing medicolegal autopsies, if not performing them, can broaden the knowledge, skills and attitude of the student, and it will also help the legal system to provide quick justice in criminal cases.<sup>4</sup> It is important for medical undergraduate students to develop a positive attitude towards autopsies and acquire the appropriate skills required for the procedure, otherwise chances of increase of necropsies are feeble.

The objective of the present study is to determine approach and perception of undergraduate medical students towards autopsies, specifically medicolegal autopsies.

## Materials and Methods

This study aims at determining the attitude towards and perception of medico-legal autopsy among medical undergraduates. The study was carried out among the undergraduate second and third year medical students of SDM Medical University in Karnataka, India during the year 2023 using a self-administered questionnaire which was prepared after going through existing literature on the subject. Students were explained about the purpose of the study and were requested to fill up the questionnaires with their consent. They were informed about the confidentiality of information collected and participation of the students in the study was voluntary.

A detailed questionnaire was given to the students to fill out for the purpose of finding out usefulness and importance of autopsy as a teaching tool in undergraduate medical education; medical students' knowledge about post-mortem examinations; their personal experience of witnessing the post-mortem examination; whether attendance at autopsy should remain as a mandatory part of medical education and questions regarding their opinions of autopsies in general.

A total of 94 students participated in the current study. The data collected was compiled into tables and statistically analyzed.

**Table 1: Questionnaire assessing responses of students with regards to medicolegal autopsy**

Sl. No.	Question	Responses
1.	Are autopsies an essential part of medical education?	Yes (n=93, 98.94%) No (n=01, 1.06%)
2.	Autopsy is conducted in case of	Natural deaths (n= 00, 0%) Unnatural deaths (n= 87, 92.55%) Apparent deaths (n= 01, 1.06%) All deaths (n= 05, 5.32%) Not answered (n= 01, 1.06%)
3.	Does watching autopsies help you understand the basic anatomy of the human body?	Yes (n= 89, 94.68%) No (n= 05, 5.32%)
4.	Does watching autopsies help you understand common pathological conditions?	Yes (n= 88, 93.62%) No (n= 05, 5.32%) Not answered (n= 01, 1.06%)

Continue.....

5.	Autopsy consists of	External examination (n= 00, 0%) Internal examination (n= 00, 0%) Both (n= 93, 98.94%) Not answered (n= 01, 1.06%)
6.	Given a choice, would you opt to not watch an autopsy?	Yes (n= 17, 18.09%) No (n = 69, 73.40%) Not answered (n= 08, 8.51%)
7.	What type of autopsy would you prefer viewing?	Actual autopsy in mortuary (n= 90, 95.74%) Simulated autopsy in skill lab (n= 03, 3.19%) Not answered (n= 01, 1.06%)
8.	What was your opinion on watching autopsy for the first time?	I learnt a lot from it (n= 75, 79.79%) It did not help me much (n= 11, 11.70%) I disliked it (n= 06, 6.38%) Not answered (n= 02, 2.13%)
9.	What are your general feelings towards watching an autopsy?	Comfortable (n= 69, 73.40%) Uncomfortable (n= 11, 11.70%) Intolerable (n= 01, 1.06%) Indifferent (n= 12, 12.77%) Not answered (n= 01 , 1.06%)
10.	In order to make autopsy viewing more beneficial for the students, how many students do you think should be allowed in the mortuary per case?	10 (n= 16, 17.02%) 15 (n= 21, 22.34%) 20 (n= 17, 18.08%) 25 (n= 38, 40.43%) Not answered (n= 02, 2.13%)
11.	What according to you is the best arrangement for students in order to facilitate viewing of the autopsy better?	Standing around autopsy table (n= 71, 75.53%) Seating tiers (n= 13, 13.83%) Viewing gallery separated by glass panes (n= 05, 5.32%) Watching live feed (n = 03, 3.19%) Not answered (n= 02, 2.13%)
12.	Estimating postmortem interval i.e. time since death by autopsies is	Accurate(n = 09, 9.57%) Approximate (n= 82, 87.23%) Erroneous (n= 00, 0%) Impossible (n= 00, 0%) Not answered (n= 03, 3.19%)

Continue.....

13.	Which of these is not particularly helpful in finding out the cause of death?	History from relatives of the deceased (n= 49, 52.13%) Visit to scene of crime (n= 17, 18.09%) Histopathological examination (n= 11, 11.70%) Chemical analysis (n= 02, 2.13%) Not answered (n= 15, 15.96%)
14.	Do you think subjecting a dead body to autopsy is distressing to the relatives of the deceased?	Yes (n= 69, 73.40%) No (n= 21, 22.34%) Not answered (n= 04, 4.26%)
15.	Should virtual autopsy replace conventional autopsy?	Yes (n= 18, 19.15%) No (n= 74, 78.72%) Not answered (n= 02, 2.13%)
16.	Virtual autopsy is best suited in deaths due to which of the following?	Multiple injuries (n= 45, 47.87%) Poisoning (n= 20, 21.28%) Smothering (n= 05, 5.32%) Electrocution (n= 17, 18.09%) Not answered (n= 07, 7.45%)
17.	Conventional autopsy is superior to virtual autopsy in deaths due to which of the following?	Poisoning (n= 44, 46.81%) Firearm injury (n= 16, 17.02%) Head injury (n= 17, 18.09%) Multiple injuries (n= 10, 10.64%) Not answered (n= 07, 7.45%)
18.	Does assisting the autopsy surgeon enhance knowledge and skills of students?	Yes (n= 82, 87.23%) No (n= 12, 12.77%)
19.	Do you find it repulsive smelling the stomach contents at autopsy in case of deaths due to poisoning/intoxication?	Yes (n= 75, 79.79%) No (n= 17, 18.09%) Not answered (n= 02, 2.13%)
20.	Which of these is a good practice regarding autopsy?	Revealing case details to the media (n= 06, 6.38%) Allowing the family members to watch the autopsy in the mortuary (n= 06, 6.38%) Encouraging kin of deceased to donate cornea (n= 76, 80.85%) Discussing postmortem findings in public (n= 01, 1.06%) Not answered (n= 05, 5.32%)

## Results and Discussion

Out of a total number of 94 students, almost all students opined that autopsies are an essential part of medical education (n=93, 98.94%). The findings of the present study were consistent with those of a study conducted by Patil A, Tasgaonkar VN, Dileep Kumar R et al<sup>5</sup> in which most of the students (96.66%) opined that post-mortem examination is useful in medical education. Similar results were observed in studies conducted by Aman Kumar et al<sup>6</sup> in which 96.81% of the students agreed that autopsy is necessary in medical education and Ballur MS<sup>7</sup> in which 95% of the students opined in favour of utility of postmortem examination in medical education. In a study conducted by Kakkeri SR, Ahmed KM, Ahmad SR et al<sup>8</sup> it was observed that 9.5% of the students opined that witnessing autopsy should be scrapped from the UG curriculum. Similar results were obtained in a study conducted by Ekanem VJ and Akhigbe KO<sup>9</sup> in which, only 7% of the students opined that autopsy should be scrapped from the curriculum in medical school. Slightly alarmingly, in a study conducted by Rao GV and Prasad SK<sup>10</sup>, 25.33% of the students were of the opinion that autopsy should be scrapped from the medical curriculum. In the present study, 92.55% of the students opined that autopsy is conducted in case of unnatural deaths and 98.94% of the students opined that autopsy consists of both external and internal examination which shows that majority of the students possessed good knowledge and understanding of autopsy protocol. Majority of the students (94.68%) opined that watching autopsies helped them understand basic anatomy of human body and 93.62% of the students found watching autopsies helpful in understanding common pathological conditions. Similar results were obtained in a study conducted by Khoo JJ<sup>11</sup> in which 70.5% of the students believed that autopsy experience improved their understanding of anatomy and pathology. In a study conducted by Pakanen L, Tikka J, Kuvaja P et al<sup>12</sup>, it was reported that autopsy teaching was found most beneficial in learning anatomy (4.18 +/- 1.1; mean usefulness score +/- standard deviation). In a survey study conducted by He MX, Wang JJ, Zhu Z et al<sup>13</sup> it was observed that many students took autopsies as one of the very important aspects for continuing study of anatomy and to learn the gross appearances of diseases in

pathology. In the current study, given a choice to opt out of watching an autopsy, a small portion of students (n= 17, 18.09%) answered in the affirmative whereas majority of the students (n = 69, 73.40%) opined that they would prefer to watch an autopsy and a minority of students (n= 08, 8.51%) remained undivided as they did not answer this question. Similar results were obtained in various studies<sup>7, 9, 10</sup> however in one particular study<sup>5</sup> shockingly, given a chance, 93.33% of the students chose not to watch post-mortem examination at all perhaps pointing to an aversion to autopsy among students. In the present study, majority of the students (n= 90, 95.74%) opted to watch actual autopsy in mortuary rather than simulated autopsy. This question was included in the questionnaire with a view to find out whether autopsy teaching with the help of mannequins in skill labs is a feasible alternative as the number of actual autopsies conducted in the mortuary is inadequate since NMC requires each MBBS undergraduate to perform atleast 15 autopsies as per new curriculum. However, only a minority of students (n=3, 3.19%) were in favour of watching simulated autopsy in skill lab. In a study conducted by Flossel U, Clas S, Willemer M et al<sup>14</sup>, majority of the students (91.6%) regarded the practical and professional relevance of using simulation mannequins in training for external post-mortem examination as high. In the current study most of the students (n= 69, 73.40%) were comfortable on first exposure to autopsy. However in various studies<sup>6, 7, 8, 9, 10, 15</sup>, most of the students expressed that they were slightly uncomfortable on first exposure to autopsy. In the current study, majority of the students (n=71, 75.53%) opined that standing around the autopsy table is the best way to view an autopsy with few students opting for seating tiers and viewing gallery separated by glass panes (n=13, 13.83% & n=5, 5.32% respectively). This question was asked with a view to determine if the modernization of several mortuaries in the country where some are equipped with viewing galleries positively influences students in viewing autopsies. From this study, it can be concluded that students still prefer the good old method of viewing autopsies by standing around the autopsy table possibly indicating that students gain more information by this. Most of the students correctly opined that time since death can be estimated approximately by autopsies (n=82,

87.23%) and a good number of students (n=49, 52.13%) opined history from relatives of the deceased may not be particularly helpful in finding out cause of death which shows that students are knowledgeable about postmortem examination. Majority of the students (n=69, 73.40%) felt that subjecting a dead body to autopsy is distressing to the relatives of the deceased. In contrast, in a study<sup>10</sup>, only a minority of the students (n=12, 4%) opined that autopsy causes harassment to the relatives of the deceased. However, in some studies<sup>11,16</sup>, it was observed that more than half of the family members of the deceased (n=117, 58.5%) refused consent to autopsy due to reasons of body disfigurement in autopsy, removal of visceral organs for chemical analysis and also due to delay in their religious funeral arrangements. In the present study, majority of the students (n=74, 78.72%) opined that virtual autopsy should not replace conventional autopsy. This is in contrast to the finding of a study<sup>8</sup> where majority of the students (n=106, 92.1%) preferred virtual autopsy over conventional autopsy. In the present study, fairly good number of students correctly opined that virtual autopsy is best suited in deaths due to multiple injuries (n=45, 47.87%) as opposed to deaths due to poisoning, smothering and electrocution and that conventional autopsy is superior to virtual autopsy in deaths due to poisoning (n=44, 46%) as opposed to deaths due to firearm injuries, head injuries and multiple injuries which shows that many students have adequate basic understanding of virtual autopsy procedure.

### Conclusion

From the present study, it can be concluded that students possess good knowledge of autopsy procedures – both conventional and virtual as well as positive attitude towards viewing autopsies since it enhances their understanding of human anatomy and common pathological conditions. Few students experienced discomfort while watching an autopsy and many students found it repulsive to smell the stomach contents during autopsy. Despite emotional and unpleasant reactions, most of the students expressed a positive interest in observing actual autopsy at close quarters as opposed to simulated autopsy or viewing autopsy from galleries or seating tiers situated away from the autopsy table and in assisting the autopsy surgeon which is a favourable

sign, given that, as per NMC curriculum, each student is required to perform atleast fifteen autopsies during their undergraduate studies. Most students also agreed that encouraging kin of deceased to donate cornea is good practice. Even with the advent of virtual autopsy, most of the students still preferred conventional autopsy. However, there is scope of training students in virtual autopsy and enhancing their knowledge. It is advisable to allot teaching hours for autopsy separately, in addition to theory and practical teaching hours which will have the effect of honing the skills of students interested in autopsy which might, in effect, encourage students to pursue a career in forensic medicine. Dedicated autopsy training also enables students to accurately document findings and draw logical conclusions which are the need of the hour with regards to medicolegal duties.

**Acknowledgement:** The authors acknowledge the undergraduate students of SDM College of medical sciences and hospital without whom this study would not have been possible.

**Ethical clearance:** The study proposal was presented before the institutional ethics committee prior to conducting the study and ethical clearance was obtained for the same. Ref: SDMIEC:52: 2020 Date: 06-03-2020

**Source of funding:** Self

**Conflict of interest:** None

### References

1. Brooks JP, Dempsey J. How can hospital autopsy rates be increased? Arch Pathol Lab Med 1991 ; 115: 1107-11.
2. Anderson RE, Hill RB. The current status of the autopsy in academic medical centres in the United States. Am J Clin. Pathology 1989 ; 531-7
3. Weurlander M, Scheja M, Hult H, Wernerson A. Emotionally challenging learning situations: medical students' experiences of autopsies. Int J Med Educ. 2012; 3: 63-70
4. Rautji R, Kumar A, Behera C. Attitudes of medical students towards medico-legal/clinical autopsy. J Indian Acad Forensic Med. October-December 2013; 35(4): 358-361
5. Patil A, Tasgaonkar VN, Dileep Kumar R, Myageri R, Magdum SV. Knowledge, Attitude and Awareness of Medical Students towards Medico-Legal Autopsy in

- Sangli, Maharashtra. Medico-legal Update. April-June 2021; 21(2): 1315-1318.
6. Kumar A, Kumar S, Goel N, Ranjan SK, Prasad M, Kumari P. Attitude of Undergraduate Medical Students towards Medico-Legal Autopsies at I.G.I.M.S., Patna, Bihar. *Int J Med Res Prof.* 2018 Nov; 4(6): 132-135.
  7. Ballur MS. Knowledge and Attitude of Medical Students Towards Forensic Autopsy. *JKAMLS*, Jul-Dec 2019; 28(2): 25- 29.
  8. Kakkeri SR, Ahmed KM, Ahmad SR, Khan R. Knowledge and attitude of medical students toward medico-legal autopsy. *IP International Journal of Forensic Medicine and Toxicological Sciences*, January-March 2018; 3(1): 8-11.
  9. Ekanem VJ, Akhigbe KO. Attitudes of Nigerian Medical Students Towards Autopsy. *Turk J Med Sci.* 2006; 36: 51-56.
  10. Rao GV, Prasad SK. Autopsy - Perception and Attitudes of Undergraduate Medical Students in South India: A Questionnaire Survey. *IAIM*, 2016; 3(10): 204-211.
  11. Khoo JJ. Perceptions of medical students towards autopsy as an educational tool. *J Contemp Med Edu* 2014; 2(1): 57-62.
  12. Pakanen L, Tikka J, Kuvaja P, Lunetta P. Autopsy-Based Learning is Essential But Underutilized in Medical Education: A Questionnaire Study. *Anat Sci Educ*, March/April 2022; 15: 341-351.
  13. He MX, Wang JJ, Zhu Z, Wang Y, Li L, Zhang P, Zheng JM. A survey study of military medical students to autopsy in modern medical education. *Sci Res Essays.* December 2011; 6(32): 6666-6670.
  14. Flossel U, Clas M, Willemer M, Sommer M, Poweleit G, Schulze R, Heide S. Using simulation mannequins and actors in training for external post-mortem examinations - experiences from use in medical students and police officers. *Journal of Forensic and Legal Medicine* 77 (2021) 102102.
  15. Chawla H, Tyagi A, Kumar R, Malhotra R, Kumar N, Shankar S. A study evaluating effectual of knowledge, attitude and perception of undergraduate medical students towards medico-legal autopsy. *Indian Journal of Forensic and Community Medicine*, July-September, 2019; 6(3): 138-143.
  16. Moorthy TN, Thenmoli R. Study of knowledge, attitude and perception regarding medicolegal autopsy among Malaysian Hindus: A focus on Hinduism. *J. Bio. Innov*, 2016; 5(6): 890-899.