



Original Article



Autopsy as a Teaching Methodology In Forensic Medicine: Students' Perspective

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ABSTRACT

Autopsy as a teaching tool has been historically accepted as a valued method for medical students but its usage has been reduced due to newer technologies being available. **Objective:** To assess the students' opinions on autopsy as a learning tool and their views on alternative teaching methods. **Methods:** A cross-sectional questionnaire-based study was conducted in 2024 at Rashid Latif Medical College. Prevalidated questionnaires were distributed among the third year MBBS students and participation was voluntary. 115 complete questionnaires were analyzed by SPSS version 25.0. **Results:** All participants demonstrated an understanding of autopsy and considered its significance in medical education as a learning tool. 36.52% and 47.83% of the students considered videos and printed materials respectively as viable alternatives. However, 80.87% of students agreed that medical students should observe more autopsies for better understanding and appreciate their role in forensic and clinical correlation. **Conclusions:** Although students are aware of the potential benefits of autopsy, there is still a need to further emphasize its importance in this modern medical training. Without firsthand exposure, future doctors may struggle to explain procedures that have never been witnessed.

INTRODUCTION

The word "autopsy" originates from the Greek *autopsia*, meaning "the act of seeing for oneself". It can be simply defined as the examination of a deceased body, including its organs and structures. Autopsies are categorized into various types, but the medicolegal autopsy holds the most significance in forensic medicine. It involves a detailed examination of a dead body to determine the cause and manner of death [1]. Medicolegal autopsies play a crucial role in the administration of justice and are typically conducted in cases of suspicious or unexplained deaths as mandated by state laws and authorized legal authorities. Determination of the cause of death is not always

straightforward upon opening the body. It is not a clearly defined physical entity but rather a concept subject to interpretations. A medico-legal autopsy requires meticulous descriptions, precise measurements and thorough documentation. Beyond its importance in the field of forensic medicine, the role of autopsy has evolved as a valuable teaching tool in medical education. It helps students understand the natural history of diseases and how they relate to clinical signs and symptoms [2]. For medical students it provides a unique opportunity to study human anatomy, observe disease processes and connect pathological findings with clinical scenarios. Autopsies

also offer critical insights into diagnostic errors and often uncover previously undiagnosed conditions that contributed to a patient's death. Globally, autopsy is recognized as a valuable teaching tool for both undergraduate and postgraduate medical students. With a rich historical background, it has evolved into an essential component of medical education. By observing autopsies, students develop a deeper understanding of pathophysiological principles and enhance their ability to integrate pathology, physiology, and clinical findings. Additionally, forensic medicine remains the only subject that systemically investigates causes of natural deaths linking medical findings with legal considerations to aid in the pursuit of justice [3]. An autopsy is an important part of the forensic medicine curricula, offering students unparalleled opportunities to expand their understanding of human anatomy and pathology. It enables them to correlate findings with different manners of death—homicidal, suicidal, or accidental [4, 5]. Since medical students may end up working as forensic specialists and physicians, exposure to autopsies is crucial in preventing misinterpretations of autopsy findings [5]. However, recent discussions have questioned the effectiveness of autopsy as a teaching modality [4]. Digital resources and virtual simulations have been shown to be just as effective as traditional autopsies in imparting the necessary technical skills and anatomical knowledge. Nonetheless, autopsy remains essential for identifying errors, defining new diseases and pathological patterns, and guiding future research. When conducted meticulously, autopsies provide early insights into epidemics and disease causing agents [3]. Despite its advantages, the number of autopsies performed worldwide during medical school training has significantly declined. This decline may be attributed to the advancement of modern diagnostic techniques and the reluctance of families to consent to autopsies. The decreasing medical school autopsy rates pose a threat to the role of autopsy in medical education [6, 7]. Autopsy remains a cornerstone of problem-based learning and an essential method for correlating data from many sources helpful for imparting justice. However, it is often regarded as physically unpleasant and emotionally distressing, making it a challenging yet indispensable component of medical education [6]. In Pakistan, limited research has been conducted on medical students' perception of autopsy. The primary objective of this study is to evaluate how medical students who have studied forensic medicine perceive autopsy as a teaching modality. The current literature on the subject reviewed above generally favors students in support of the dissection process and acknowledges the value of technology-based learning, noting its capacity to foster professionalism, cooperation, and emotional resilience.

METHODS

A descriptive cross sectional study was conducted at Rashid Latif Medical College, Lahore, Pakistan involving 3rd year MBBS students during the academic year 2024 from March 2024 to September 2024. Ethical approval for this study was obtained from the Ethical Review Board of Rashid Latif Medical College (Reference no: IRB/2024/428). The participants had completed their 6-week rotation at Lahore General Hospital mortuary where they observed autopsies. A prevalidated questionnaire was distributed to the participants to assess their experience and opinions regarding autopsies. A prevalidated questionnaire was chosen to ensure the reliability and consistency of the data collected. Using a prevalidated tool offers several advantages—it minimizes measurement errors, ensures that the questions are interpreted uniformly by all respondents, and enhances the credibility of the study findings. Additionally, it allows for easier comparison with similar studies and saves time in the design and piloting phase, ensuring the focus remains on data collection and analysis. A sample size of 115 participants was calculated with a 90% confidence level ($z=1.645$), 7.7% margin of error, and by taking the prevalence of expected knowledge regarding medical should witness autopsies at 51.9% [8]. The following formula was used to calculate sample size $n = \frac{Z^2 \cdot P(1-P)}{d^2}$. Third year MBBS students who had completed their six week forensic medicine rotation were included in the study. Students who did not complete the full rotation or declined to participate were excluded from the study. A convenience sampling technique was used involving all eligible third year MBBS students who had completed their forensic medicine rotation during the academic year. Ethical considerations were carefully addressed in this study. Approval was obtained from the Institutional Review Board (IRB) of Rashid Latif Medical College before data collection. Participation in the study was entirely voluntary, and informed consent was obtained from all respondents. To maintain participant confidentiality, no personal identifiers were collected, and the questionnaires were anonymized. The data were securely stored and only accessible to the research team, ensuring that privacy and confidentiality were fully maintained throughout the study. Data entry and analysis were performed using SPSS version 25.0 with findings presented in tables and figures. Chi-square tests and Fisher's exact tests were used to assess correlations where needed with gender and the number of autopsies observed by the students. P values ≤ 0.05 was considered statistically significant.

RESULTS

A total of 120 third year MBBS students were invited to participate in the study, and 115 students (response rate 95.83%) completed the questionnaires. The cohort consisted of 65 females (56.52%) and 50 males (43.48%).

The age distribution ranged from 20 to 25 years of age. The majority of the participants (59.13%) were age group of 22-23. The detailed age and gender distribution of the participants is presented in Table 1.

Table 1: Age and Gender distribution among students analyzed using Chi-square test

Age (Years)	Male Frequency (%)	Female Frequency (%)	Total Frequency (%)
20-21	17 (14.78%)	17 (14.78%)	41 (35.65%)
22-23	28 (24.35%)	28 (24.35%)	68 (59.13%)
24-25	5 (4.35%)	5 (4.35%)	6 (5.22%)
Total	50 (43.48%)	50 (43.48%)	115 (100%)

Among the study participants, 63 students (55%) of the respondents observed two autopsies while only 16 students (14%) attended more than three autopsies. Notably, 7 students (6%) did not witness any autopsy during their rotation as illustrated in the form of a graph. (Figure 1).

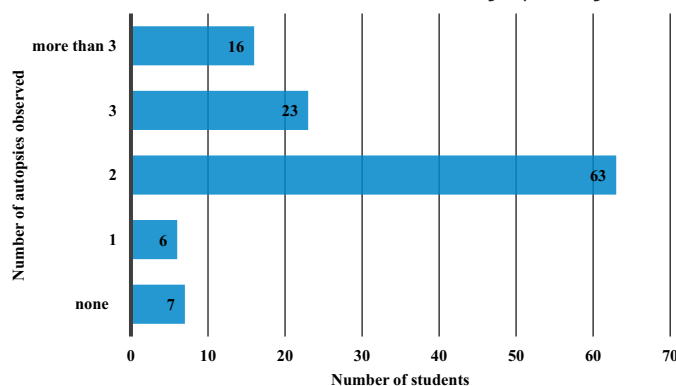


Figure 1: Number of Autopsies Observed by Students

Table 2: Overall Perception of Medical Students on Autopsy Visits and Their Educational Impact using Fisher's Exact Test

S.No.	Demographics	Yes Frequency (%)	No Frequency (%)
Q1	Do you understand the meaning of the word Autopsy?	115 (100%)	0 (0%)
Q2	Do you think that autopsy visits are practical learning tool?	107 (93.04%)	8 (6.96%)
Q3	Does your understanding of the subject get better after these visits?	106 (92.17%)	9 (7.83%)
Q4	Do you personally find these visit a valuable and fulfilling experience?	95 (82.61%)	20 (17.39%)
Q5	Do you think that these visits influence you to take interest in the subject as a career option?	37 (32.17%)	78 (67.83%)
Q6	Do the demonstrations at the autopsy supported your learning process?	98 (85.22%)	17 (14.78%)
Q7	Can you learn this topic from book without this exercise?	55 (47.83%)	60 (52.17%)
Q8	Do you think that videos can be a better alternative?	42 (36.52%)	73 (63.48%)
Q9	Was your time at these visits used effectively?	83 (72.17%)	32 (27.83%)
Q10	Would you suggest that medical students should watch more autopsies?	93 (80.87%)	22 (19.13%)
Q11	Is there any role of autopsy in health care system?	103 (89.57%)	12 (10.43%)
Q12	Do you think that objectives and outcomes of these visits are auspiciously achieved?	89 (77.39%)	26 (22.61%)

The responses in Table 3 indicate that both male and female students recognize the importance of autopsy visits as an effective learning tool, with over 90% agreeing with their practicality. However, fewer students believed these visits significantly influenced their career choices in forensic medicine. Notably a statistically significant difference ($p=0.009$) was observed in the suggestions that medical students should watch more autopsies with male students being more supportive of increased exposure compared to females. While most students acknowledge the role of autopsy in the health care system, opinions vary on whether videos could serve as an effective alternative.

Most participants ($n=107$, 93.04%) agreed that autopsy visits are effective and practical learning tools whereas 8 students (7%) disagreed. Similarly, 106 participants (92.17%) reported that their understanding of forensic medicine improved after attending the autopsy sessions. When asked about the overall experience, 95 students (82.61%) found these visits valuable and fulfilling, whereas 20 students (17.39%) did not share this sentiment. However, only 37 students (32.17%) indicated that these visits enhanced their interest in forensic medicine as a career option. Regarding alternative learning methods, 16 students (13.91%) considered autopsy visits a waste of time, and 55 students (47.83%) believed that forensic medicine could be effectively learned through textbooks. Additionally, 42 students (36.52%) suggested that video demonstrations could serve as a better alternative. A majority of participants (93 students, 80.87%) recommended that medical students should observe more autopsies as part of their curriculum. Additionally, 103 students (89.57%) recognized the importance of autopsy in the healthcare system and 89 students believed that the objectives and outcomes of autopsy-based learning were successfully achieved. Table 2 students suggest that medical students should watch more autopsies which helps the objective of this study.

Table 3: Perceptions of Medical Students on Autopsy Visits: A Gender-Based Comparison using Fisher's Exact Test

S.No.	Questions	Genders	Yes Frequency (%)	No Frequency (%)	p-Value
Q1	Do you understand the meaning of the word Autopsy?	Male	50 (100%)	0	-
		Female	65 (100%)	0	
Q2	Do you think that autopsy visits are practical learning tool?	Male	46 (92%)	4 (8%)	0.726
		Female	61 (93.8%)	4 (6.2%)	
Q3	Does your understanding of the subject get better after these visits?	Male	46 (92%)	4 (8%)	1.000
		Female	60 (92.3%)	5 (7.7%)	
Q4	Do you personally find these visit a valuable and fulfilling experience?	Male	45 (90%)	5 (10%)	0.084
		Female	50 (76.9%)	15 (23.1%)	
Q5	Do you think that these visits influence you to take interest in the subject as a career option?	Male	20 (40%)	30 (60%)	0.158
		Female	17 (26.2%)	48 (73.8%)	
Q6	Do the demonstrations at the autopsy supported your learning process?	Male	46 (92%)	4 (8%)	0.111
		Female	52 (80%)	13 (20%)	
Q7	Can you learn this topic from book without this exercise?	Male	21 (42%)	29 (58%)	0.347
		Female	34 (52.3%)	31 (47.7%)	
Q8	Do you think that videos can be a better alternative?	Male	15 (30%)	35 (70%)	0.243
		Female	27 (41.5%)	38 (58.5%)	
Q9	Was your time at these visits used effectively?	Male	38 (76%)	12 (24%)	0.530
		Female	45 (69.2%)	20 (30.8%)	
Q10	Would you suggest that medical students should watch more autopsies?	Male	46 (92%)	4 (8%)	0.009
		Female	47 (72.3%)	18 (27.7%)	
Q11	Is there any role of autopsy in health care system?	Male	47 (94%)	3 (6%)	0.226
		Female	56 (86.2%)	9 (13.8%)	
Q12	Do you think that objectives and outcomes of these visits are auspiciously achieved?	Male	42 (84%)	8 (16%)	0.179
		Female	47 (72.3%)	18 (27.7%)	

DISCUSSION

Autopsies have long been recognized as the most reliable method for confirmation of diagnoses, playing an important role in medical education, legal and judicial proceedings, epidemiological studies, and understanding medical ambiguities and fallibilities. Their value in training medical students by providing hands-on experience, fostering critical thinking, and developing empathy has been well documented. Autopsies have been a vital component of medical education offering medical students valuable insights, abilities, and opportunities to cultivate compassion, understanding, and respect [3, 9]. Despite their historical significance, the prominence of autopsies in medical education has declined in recent decades. This decline can be attributed to several factors, including the lack of mortuary facilities in many private and public medical institutes resulting in limited student exposure [10]. Additionally, factors such as the constrained duration of forensic curricula, the decreasing number of hospital autopsies, advancement in diagnostic technology, and societal reservations regarding post-mortem examinations have contributed to this decline [3, 11]. The declining number of hospital autopsies largely driven by improved diagnostics technologies and logistical barriers has significantly impacted hands-on learning opportunities for students. In addition to curricular change, the introduction of technological substitutes like movies and CD-ROMs, as well as current laws, have all led to a

decrease in the use of autopsies as teaching tools. Similar trends have been reported in England, Wales, Canada, France, China, and Zambia, where postmortem examination rates have steadily declined [12, 13]. To counteract these, many institutions have adopted alternative teaching strategies such as virtual simulations, video demonstrations and case-based discussions to provide similar learning benefits in the absence of direct autopsy experience. In this study, all respondents demonstrated an understanding of the term "autopsy" which is essential for medical students. A clear comprehension of autopsy procedures not only strengthens their forensic knowledge but also equips future doctors to request postmortem examinations when necessary and to better address the concerns of bereaved families [3]. However, the limited exposure to autopsies may compromise students' depth of understanding in forensic medicine and reduce their preparedness to handle real-world medicolegal responsibilities. These findings revealed that approximately 54.78% of students observed two autopsies during their third year forensic medicine course while 14% had seen more than three autopsies. Only 6% of the students had not witnessed any autopsies. A plausible explanation for this limited exposure is the current curriculum structure, which allocates only 100 credit hours to the subject [14]. Encouragingly the majority of students recognized the significance of autopsies in the

medical curriculum. In this study 93.04% of students suggested that medical students should observe more autopsies, a sentiment echoed in previous research by Ahmad *et al.*, where 87% of participants felt that more autopsies should be observed to have a sound knowledge of the subject [15]. Students who witnessed more autopsies reported feeling more competent in forensic medicine, suggesting a positive correlation between exposure and self-assessed competence. Furthermore, in the present study, 32.17% of students believed witnessing an autopsy enhanced the chance of pursuing forensic medicine as a career choice. While this was not a primary focus of the study, it raises an interesting question about whether early exposure to autopsies during preclinical years could positively influence career choices in forensic medicine. The component of the prompt does put into question the notion that witnessing an autopsy enhances the chance of pursuing forensic medicine as a career option. This supports the idea that the students' perception of autopsies as meaningful learning tools may influence their interest in forensic careers. These findings are consistent with prior studies that medical students recognize the importance of autopsies in their education [8, 16]. Medical students widely recognize the usefulness of post-mortem examinations as a valuable educational tool. Several studies have reported similar sentiments among undergraduate students reinforcing the importance of incorporating autopsy-based learning into medical curricula [17, 18]. A survey conducted in Ohio found that 85% of participants believed autopsies should be an essential component of undergraduate medical education [19]. Teaching forensic medicine through autopsies is not only cost-effective but also enhances students' clinical and pathological understanding across various medical specialties [20]. Despite the decline in autopsy-based learning, forensic medicine students can refresh their clinical knowledge and pathological findings on the necessary steps in postmortem examination procedures through autopsy, which offers valuable learning opportunities [16, 17]. The findings of this study validate that students at Rashid Latif Medical College observed autopsies as an integral part of their education. To enhance medical students' understanding of autopsy and its clinical significance structured autopsy sessions should be integrated into a modular curriculum. This will bridge the gap between theoretical and practical applications. While this study does provide valuable insight but has a few limitations. Future studies with larger sample sizes and objective assessments of learning outcomes to better understand the educational impact of autopsy will be more helpful. Given this consensus, further research should explore the long-term impact of autopsy exposure and should be made to reintegrate autopsy participation as a standard teaching method in medical curricula to maximize its educational benefits.

CONCLUSIONS

Despite the challenges facing autopsy education, its value as a teaching tool remains widely recognized. Integrating autopsies into medical curricula while addressing students' emotional and educational needs can enhance learning and prepare future doctors to navigate the complexities of death and disease. In countries like Pakistan, where violent fatalities are common, strengthening medicolegal frameworks and ensuring proper case referrals are important not only for delivering justice but also for accurate cause of death documentation. Improved collaboration between the medical and legal sectors can significantly enhance the effectiveness of forensic investigations and medical education alike.

Authors Contribution

Conceptualization: NY, SA

Methodology: NY, SA, HM

Formal analysis: NY, MAA, HM, KHS, RA

Writing, review and editing: MAA, MM, RA

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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REFERENCES

- [1] Srivastava JV. The value of autopsy-believe it or not. *African Journal of Biomedical Research*. 2024;24(4S): 10525-8. doi:10.53555/ajbr.v27i4s.5694.
- [2] autji R, Kumar A, Behera C. Attitudes of medical students towards medico-legal/clinical autopsy. *Journal of Indian Academy of Forensic Medicine*. 2013 Dec;35(4): 358-61. doi: 10.1177/0971097320130417.
- [3] Liana N, Femi AI, Mulia R, Hatta M. The Role Of Forensic Autopsy In Proof Of The Crime Of Planning Murder. *International Journal of Law, Social Science, and Humanities*. 2024 Nov;1(2):91-9. doi:10.70193/ijlsh.v1i2.161.
- [4] Waithaka M, Kipkorir V, Munguti J, Olabu B. A review of modern anatomy teaching practices. *Anatomy Journal of Africa*. 2023 Aug;12(2):2337-9. doi:10.4314/aja.v12i2.1.
- [5] Narayankar PM and Adiaman J. Deciphering Medicolegal Autopsy from the Perspective of Undergraduate Students in a Medical University in Karnataka. *Indian Journal of Forensic Medicine & Toxicology*. 2024 Apr;18(2). doi:10.37506/d9mxbp71.
- [6] Mussabekova S, Abdikadyrova K, Mkhitarian X, Muldasheva BS. Autopsy as an Indicator of Efficiency and a Tool of Learning. *Journal of Health Development*. 2024 Aug;2:45-51. doi:10.32921/2225-9929-2024-2-56-45-51.

- [7] Hagen ES, Quintanilla-Arteaga A, Lilley CM, Mirza KM. The Informative & Virtuous Role of Autopsy Observation Experiences in Medical Student Education. *American Journal of Clinical Pathology*. 2023Nov;160(Supplement_1):S2-.doi:10.1093/ajcp/aqad150.003.
- [8] Hearle P, Wong WF, Chan J. Undergraduate medical student perspectives on the role of autopsy in medical education. *Academic Pathology*. 2023Jan;10(1):100068. doi: 10.1016/j.acpath.2022.100068.
- [9] Cezillo MVB, Uwagoya R, Lima HG de. The Use of Autopsy as a Teaching Tool in Medicine. *Acta Scientific Gastrointestinal Disorders*. 2023;41-4. doi:10.31080/asgis.2023.06.0584.
- [10] Ameer YA, Maria G, Sonomal AM, Ali ML, Wajeelha W. Medical students' perceptions regarding autopsy as an educational tool. *Pakistan Journal of Medical & Health Sciences*. 2019 Apr-Jun; 13(2): 361-4.
- [11] Waheed G, Mengal MA, Sapru ZZ, Sheikh AW. Autopsy as a part of curriculum: student's perceptive. *Journal of Ayub Medical College Abbottabad*. 2011Sep;23(3):105-9.
- [12] Start RD, Firth JA, Macgillivray F, Cross SS. Have declining clinical necropsy rates reduced the contribution of necropsy to medical research?. *Journal of Clinical Pathology*. 1995May;48(5):402-4. doi:10.1136/jcp.48.5.402.
- [13] Schwarz CS, Kramer S, Germerott T, Walz C, Elsner K. The use of an educational video on forensic autopsy in curricular teaching for medical students-is it worth the effort? A field report from lecturers and a survey among students. *International Journal of Legal Medicine*. 2024Mar;138(2):651-8. doi:10.1007/s00414-023-03113-y.
- [14] Naz R, Fatima M, Zameer S, Tariq S, Rubeen R, Ahmed A *et al.* AUTOPSY: Knowledge and Perception of undergraduate medical students in current teaching system. *Jubilee Mission Medical College and Research Institute*. 2017 Jun; 8(1): 1-4. doi: 10.62118/jmmc.v8i1.16.
- [15] Ahmad N, Mohammad F, Shivkumar BC, Akram MF, Mateen A, Pawar A. Attitude and knowledge of medical students on practical aspects of forensic medicine. *Journal of Evidence based Medicine and Healthcare*. 2015 Jul;2(27):4002-8. doi:10.18410/jebmh/2015/569.
- [16] Pakanen L, Tikka J, Kuvaja P, Lunetta P. Autopsy-based learning is essential but underutilized in medical education: A questionnaire study. *Anatomical Sciences Education*. 2022Mar;15(2):341-51. doi:10.1002/ase.2073.
- [17] Keiser MM and Murray-Wright M. Autopsy observation as experiential learning for nurse practitioner students in an online advanced pathophysiology course. *Nurse Educator*. 2020Mar;45(2):111-3. doi:10.1097/NNE.0000000000000684.
- [18] du Toit-Prinsloo L, Pickworth G, Saayman G. The forensic autopsy as a teaching tool: Attitudes and perceptions of undergraduate medical students at the University of Pretoria, South Africa. *African Journal of Health Professions Education*. 2016May;8(1):77-80. doi:10.7196/AJHPE.2016.v8i1.589.
- [19] Conran P, Nowacek G, Adams T, Smith L. Medical students' attitudes toward the autopsy. *Academic Medicine*. 1996Jun;71(6):681-3. doi:10.1097/00001888-199606000-00026.
- [20] Qasim AP and Hashmi KU. The value of autopsy in medical education: Student's attitudes & opinion. *Journal of University Medical & Dental College*. 2015 Sep;6(3):17-25.