

Knowledge, Attitude and Perception of Undergraduate Medical Students on Medico-Legal Autopsies

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Abstract

A descriptive, cross-sectional study was conducted in the Department of Forensic Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from September 2023 to February 2025, to evaluate the knowledge, attitudes, and perceptions of undergraduate medical students regarding medico-legal autopsies, exploring the impact of forensic medicine education on their understanding and appreciation of autopsies in future medical practices. A total of 105 students from third to fifth year of the MBBS program were selected through convenient sampling. Before data collection consent was taken and confidentiality was strictly maintained. Data was collected through a semi-structured, pre-tested questionnaire. The mean age of participants was 22.26 ± 1.12 years, with most in the 21–22 years age group (68.6%). Gender distribution was nearly balanced (51.4% male and 48.6% female). A significant portion of respondents (73.3%) demonstrated knowledge of the purpose of autopsies, while 88.6% recognized the necessity of postmortem examinations in all unnatural deaths ($P < 0.001$). 73.3% students know the aims of autopsy which is to determination of cause and circumstance of death. 35.2% students think that autopsy is indicated in suicidal death. 84.8% of students have an idea about the laboratory for chemical analysis but they have (69.5%) wrong idea about the preservatives of viscera which they think is formalin. 63.8% of students have knowledge that stomach, liver and kidney are preserved for chemical analysis ($P < 0.001$). 79% of students recognize that an inquest report is necessary before conductive medico-legal autopsy. 78.1% know the classification of postmortem and they (67.6%) also know that virtual autopsy new form of postmortem examination. Comfort with autopsy exposure was reported by 75.2% of students, 97% students do not think autopsy as a harassment to the victim's family and 78% endorsed the inclusion of autopsies in the curriculum. 67.6% strongly agreed that autopsy helped in improving students anatomy. However, 80% expressed dissatisfaction with the limited number of autopsies observed ($P < 0.001$). Overall, undergraduate medical students exhibit positive attitudes and awareness towards medico-legal autopsies; however, some gaps in practical exposure/training and emotional preparedness were identified by them.

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Introduction

Forensic medicine is a specialized branch of medicine that attracts few medical graduates. Therefore, most of the medico-legal work are conducted by general medical practitioners. It is presumed that the autopsies will be demonstrated to them in their MBBS course.¹ Postmortem is an extremely valuable resource to legal system, medicine and society. It is the gold standard of untangling the mysteries of suspicious death. It involves the extended systemic examination of the dead body exclusively for medico-legal reasons. Since ancient times, the information obtained from conducting autopsies has assisted in advancing scientific knowledge and understanding anatomy to identify the pathologies cause of the death.² Postmortem examination, also known as medico-legal autopsy (MLA), is a detailed forensic examination of a deceased individual, mandated by state law in cases where the death is abrupt, suspicious, unexplained, or occurred without medical supervision. This comprehensive procedure involves the opening of all body cavities and a thorough examination of all organs to uncover potential evidence that may indicate the cause of death, which can often involve multiple organs.³ Observation of forensic autopsies specifically provides an opportunity for students, so that they can learn about autopsy procedure, as well as the medico-legal and ethical issues concerned with death. By observing autopsies they become able cope with medico-legal issues properly when they enter into their professional life.^{4,5} Moreover, MLA serves as a fundamental source of evidence in legal proceedings. The accuracy and integrity of MLA is essential not only for delivering justice but also for upholding public health and safety by monitoring trends in death causes, which can inform policy and prevention strategies. It is

favourable for the acquisition of expertise as a research tool and also helps to develop the emotional fortitude of individuals and empathy towards the victims and relatives.⁶ Despite their importance, MLA is often associated with negative perceptions, including fear, disgust, and ethical concerns. These attitudes can act as barriers to students' engagement and learning in this field. Understanding the knowledge, attitudes, and perceptions (KAP) of undergraduate medical students towards MLAs is vital for designing effective educational interventions and fostering a positive learning environment.⁷ In the present undergraduate medical curriculum (MBBS) in Bangladesh, Forensic Medicine & Toxicology is taught in the Phase-II (Year 3). After third year, students might fail to remember some of the very basic theoretical topics that are taught in curriculum; hence, it is needed to be replenish on a regular basis.⁴ As autopsy plays a vital role and can make an important contribution to medical education, it is now much needed to reveal understanding and knowledge of the medical students regarding autopsy who had gone through the course of Forensic Medicine and their perception of its teaching and learning pattern in current educational system.^{4,8} Therefore, this study aimed to evaluate how medical students' knowledge, attitudes, and perceptions about autopsies evolve after completing a Forensic Medicine & Toxicology course.

Methods

This descriptive, cross-sectional study was conducted in the Department of Forensic Medicine of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, from September 2023 to February 2025. In this study, the sampling technique was convenient sampling. Students were selected as per selection criteria from third, fourth and fifth year of

MBBS program under Shaheed Suhrawardy Medical College (public) and Ibrahim Medical College (private), Dhaka, Bangladesh. However, students who had prior professional or extensive academic experience in forensic medicine beyond the standard curriculum, and who were unwilling or unable to provide informed consent for participation in the study. A total of 105 students were purposively and conveniently selected to complete an anonymous questionnaire that has been pretested for validity and reliability. The questionnaire covered students' knowledge of autopsy procedures, their attitudes towards the practice, and their perceptions of its ethical, cultural, and practical implications. The development of the questionnaire was aided by previous literature.⁷⁻⁹ Knowledge, attitude and perception were measured using a semi-structured, pre-tested questionnaire. Data collection was conducted in a single session. The designed questionnaire was pretested or piloted, translated and simplified. We also used responses ranging from strongly agree to strongly disagree or similar types (both open and closed). Data was checked and rechecked for validity and reliability. Data was expressed as frequency and percentage. In inferential statistics, for percentage data Z test was conducted, while gender difference was estimated using Fisher's Exact test. P-value less than 0.05 was considered significant. Analysis was done using Statistical Package for Social Sciences (SPSS) version 23.0 for Windows. Ethical approval for this study was taken from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.

Results

The mean age of the participants is 22.26 ± 1.12 years. The age group 21-22 years constitutes the majority (68.6%), the rest were in the 23-24 age

group accounts for 31.4% ($P<0.001$). 48.6% were female, while 51.4% were male ($P>0.05$) (Table-I). Regarding knowledge, the majority of respondents (73.3%) agreed that an autopsy is a medical procedure conducted to determine the cause and circumstances of death ($P<0.001$). A substantial 88.6% acknowledged that postmortem examination is required in all unnatural deaths ($P<0.001$). Similarly, 78.1% recognized that postmortem examinations can be classified into medico-legal and clinical types ($P<0.001$). Regarding the primary purpose of a medico-legal autopsy, 66.7% indicated that it is to determine the cause of death ($P<0.001$). For histopathological analysis, the heart was the most commonly selected organ (61.0%), followed by the liver (25.7%) and kidney (12.4%) ($P<0.001$). When asked where specimens for chemical analysis should be sent, 84.8% of participants chose the Chief Chemical Examiner ($P<0.001$). In terms of preservatives used for viscera sample collection, 69.5% selected a saturated solution of common salt, compared to 29.5% who selected formalin ($P<0.001$). Regarding organs preserved for chemical analysis, the stomach, liver and kidney were the most frequently indicated ($P<0.001$). In addition, 92.4% of respondents acknowledged that an autopsy requires dissection of the body ($P<0.001$). When questioned about who covers the expenses for a medico-legal autopsy, 68.6% identified the government ($P<0.001$), while 25.7% believed the expenses are covered by relatives. Before conducting a medico-legal autopsy, 79.0% of practitioners indicated that an inquest report from an investigating officer is necessary ($P<0.001$). Responses were distributed more evenly regarding the indication for autopsy in different types of deaths (suicidal, sudden, and homicidal) ($P>0.05$). 67.6% of respondents could identify that virtual autopsy as a new form of postmortem examination ($P<0.001$)

(Table-II). About 73.3% of students correctly identified autopsy as a medical procedure performed to determine the cause and circumstances of death, which was statistically highly significant ($p<0.001$). Furthermore, 88.6% acknowledged that postmortem examination is mandatory in all unnatural deaths ($p<0.001$), reflecting strong awareness of medico-legal requirements. Knowledge regarding the classification of postmortem examinations into medico-legal and clinical types was observed in 78.1% of students ($p<0.001$). When asked about the primary purpose of a medico-legal autopsy, most respondents (66.7%) correctly identified determining the cause of death as the main objective, followed by determining the manner of death (27.6%), with the difference being statistically significant ($p<0.001$). Regarding technical aspects, 61.0% of students correctly identified the heart as the commonly sent organ for histopathological examination, while 84.8% knew that specimens for chemical analysis are sent to the Chief Chemical Examiner. Additionally, 63.8% of respondents correctly stated that the stomach, liver, and kidney are preserved for chemical analysis, which was statistically significant ($p < 0.001$). A substantial proportion (92.4%) were aware that autopsy involves dissection of the body. Concerning the financial aspect, 68.6% correctly reported that medico-legal autopsy expenses are borne by the government. Most participants (79.0%) also knew that an inquest report from the investigating officer is mandatory before conducting a medico-legal autopsy ($p<0.001$). Although knowledge regarding the indications of autopsy—including suicidal, homicidal, and sudden suspicious deaths—was relatively evenly distributed, the difference was not statistically significant ($p = 0.69$). Finally, 67.6% of students were aware of virtual autopsy as a modern form of postmortem examination, highlighting emerging

awareness of advanced forensic techniques ($p<0.001$) (Table III). On role of autopsies in enhancing anatomical knowledge, 67.6% of participants strongly agreed that autopsies helped refresh and improve their understanding of anatomy, while 24.8% agreed, while 7.6% disagreed ($P<0.001$). The majority of participants (77.1%) strongly agreed that medical students should witness more hands-on autopsies, while 15.2% agreed and 7.6% disagreed ($P<0.001$). When asked about their comfort with the concept of medico-legal autopsies, 81.9% reported being comfortable, while 8.6% indicated they were confused, 8.6% reported feeling very comfortable ($P<0.001$). Participants were also asked about the importance of medico-legal autopsies for public health; 83.8% agreed, 11.4% strongly agreed, and 3.8% were neutral ($P<0.001$). Regarding how often autopsies reveal crucial information not apparent before death, 76.2% responded "often," 12.4% said "always," and 10.5% answered "sometimes" ($P<0.001$). A large proportion (75.2%) expressed interest in receiving more education and training on medico-legal autopsies during their medical studies, while 23.8% responded "maybe" ($P<0.001$). Finally, when asked whether postmortem examinations are perceived as harassment to the victim's family, 97.1% responded "no," while only 1.9% answered "yes" ($P<0.001$) (Table-IV).

Table-I: Age group and gender distribution of the participants (N=105)

Variables	Frequency	Percentage	P-value
Age group			
21-22 years	72	68.6	<0.001
23-24 years	33	31.4	
Gender			
Male	54	51.4	>0.05
Female	51	48.6	

Z test (age group) and Fisher's Exact test (gender) were applied.

Table-II: Knowledge on medicolegal autopsy among participants (N=105)

Question	Frequency	Percentage	Z value	P-value
An autopsy is a medical procedure conducted on a deceased body to determine the cause and circumstances of death.				
Yes	77	73.3	7.19	<0.001
No	14	13.3		
Not Sure	14	13.3		
Does postmortem examination is required in all unnatural death?				
Yes	93	88.6	9.91	<0.001
Not Sure	7	6.7		
No	5	4.8		
Do you know that postmortem examinations can be classified into medico-legal and clinical types?				
Yes	82	78.1	8.04	<0.001
No	21	20.0		
Not Sure	2	1.9		
What is the primary purpose of a medico-legal autopsy?				
Determine the cause of death	70	66.7	7.10	<0.001
Determine the manner of death	29	27.6		
Determine the time of death	6	5.7		
For histopathological analysis which organs are sent to the laboratory?				
Heart	64	61.0	5.87	<0.001
Liver	27	25.7		
Kidney	13	12.4		
Specimens for chemical analysis where to send?				
Chief Chemical Examiner	89	84.8	6.96	<0.001
Not Sure	16	15.2		
Do you know which preservatives are used for collection of viscera samples?				
Saturated Solution of Common Salt	31	29.5	3.90	<0.001
Formalin	74	69.5		
Which organs are preserved for chemical analysis?				
Stomach, liver and Kidney	67	63.8	6.46	<0.001
Liver	34	32.4		
Heart and Kidney	4	3.8		
An autopsy requires the dissection of the body to be carried out.				
Yes	97	92.4	8.48	<0.001
Not Sure	8	7.6		
The expenses for a medico-legal autopsy are covered by				
Government	72	68.6	7.48	<0.001
Not Sure	6	5.7		
Relatives	27	25.7		
Before conducting medico-legal autopsy following is necessary				
Inquest report from investigating officer	83	79.0	5.80	<0.001
Requisition letter from investigating officer	22	21.0		
Autopsy is indicated in:				
Suicidal deaths	37	35.2	0.40	>0.05
Sudden and suspicious deaths	36	34.3		
Homicidal deaths	32	30.5		
Virtual autopsy is a new form of postmortem examination				
Yes	71	67.6	7.27	<0.001
Not Sure	20	19.0		
No	14	13.3		
Total	105	100.0		

Table-III: Attitude of participants on medicolegal autopsy (N=105)

Question	Frequency	Percentage	Z value	P-value
An autopsy is a medical procedure conducted on a deceased body to determine the cause and circumstances of death.				
Yes	77	73.3	7.19	<0.001
No	14	13.3		
Not Sure	14	13.3		
Does postmortem examination is required in all unnatural death?				
Yes	93	88.6	9.91	<0.001
Not Sure	7	6.7		
No	5	4.8		
Do you know that postmortem examinations can be classified into medico-legal and clinical types?				
Yes	82	78.1	8.04	<0.001
No	21	20.0		
Not Sure	2	1.9		
What is the primary purpose of a medico-legal autopsy?				
Determine the cause of death	70	66.7	7.10	<0.001
Determine the manner of death	29	27.6		
Determine the time of death	6	5.7		
For histopathological analysis which organs are sent to the laboratory?				
Heart	64	61.0	5.87	<0.001
Liver	27	25.7		
Kidney	13	12.4		
Specimens for chemical analysis where to send?				
Chief Chemical Examiner	89	84.8	6.96	<0.001
Not Sure	16	15.2		
Do you know which preservatives are used for collection of viscera samples?				
Saturated Solution of Common Salt	31	29.5	3.90	<0.001
Formalin	74	69.5		
Which organs are preserved for chemical analysis?				
Stomach, liver and Kidney	67	63.8	6.46	<0.001
Liver	34	32.4		
Heart and Kidney	4	3.8		
An autopsy requires the dissection of the body to be carried out.				
Yes	97	92.4	8.48	<0.001
Not Sure	8	7.6		
The expenses for a medico-legal autopsy are covered by				
Government	72	68.6	7.48	<0.001
Not Sure	6	5.7		
Relatives	27	25.7		
Before conducting medico-legal autopsy following is necessary				
Inquest Report from investigating officer	83	79.0	5.80	<0.001
Requisition letter from investigating officer	22	21.0		
Autopsy is indicated in:				
Suicidal deaths	37	35.2	0.40	>0.05
Sudden and suspicious deaths	36	34.3		
Homicidal deaths	32	30.5		
Virtual autopsy is a new form of postmortem examination				
Yes	71	67.6	7.27	<0.001
Not Sure	20	19.0		
No	14	13.3		
Total	105	100.0		

Table-IV: Perception of participants on medicolegal autopsy (N=105)

Question	Response	Frequency	Percentage	Z value	P-value
Autopsy helped to refresh and improve students' anatomy	Strongly Agree	71	67.6	6.09	<0.001
	Agree	26	24.8		
	Disagree	8	7.6		
Medical students should witness more hands-on autopsies	Strongly Agree	81	77.1	7.78	<0.001
	Agree	16	15.2		
	Disagree	8	7.6		
How comfortable are you with the concept of medico-legal autopsies?	Comfortable	86	81.9	8.72	<0.001
	Confused	9	8.6		
	Very comfortable	9	8.6		
Do you believe that medico-legal autopsies are important for public health?	Agree	88	83.8	9.06	<0.001
	Neutral	4	3.8		
	Strongly agree	12	11.4		
How often do medico-legal autopsies reveal important information not apparent before death?	Often	81	76.2	9.74	<0.001
	Always	13	12.4		
	Sometimes	11	10.5		
Would you like to receive more education and training on medico-legal autopsies during your medical studies?	Yes	80	75.2	7.78	<0.001
	Maybe	25	23.8		
Do you think postmortem examination is harassment to victim's family?	No	102	97.1	6.83	<0.001
	Yes	3	1.9		

Discussion

The age distribution of participants in this study on Medico-legal Autopsies reveals a mean age of 22.26 ± 1.12 years, with participants' ages ranging narrowly from 21 to 24 years. This indicates a relatively homogenous age group, potentially leading to consistent perspectives and experiences across the cohort. Similar age groups were reported previous studies done in Bangladesh, India and Nigeria.^{4,7-9,10} Our results are aligned with a previous study conducted by Yousaf *et al.*,¹¹ while Hearle *et al.*¹² reported a female predominance in their study.

In the present study, the majority of respondents (73.3%) agreed that an autopsy is a medical procedure conducted to determine the cause and circumstances of death, and 88.6% acknowledged

that postmortem examination is required in all unnatural deaths, while 78.1% could classify its medico-legal and clinical types. These results mirror the findings of Yousaf *et al.*,¹¹ as they found 75% of the students correctly identified medico-legal autopsies as essential for forensic investigations and Hearle *et al.*,¹² as 80% medical students demonstrated accurate knowledge regarding the necessity of postmortem examinations in unnatural deaths. Regarding histopathological analysis, 61% of the respondents selected the heart as the most commonly examined organ, aligning with findings by Kakkeri *et al.*,⁹ where 63% preference for cardiac tissue in autopsy procedure was reported. This attributes to the high incidence of cardiovascular-related deaths. 84.8% of the participants indicated

that specimens for chemical analysis should be sent to the Chief Chemical Examiner, underscoring the centralized role of this institution in forensic investigations in Bangladesh. This result parallels the finding of Munir *et al.*,¹³ which highlighted the predominant reliance on centralized forensic facilities for forensic chemical analysis. Our data revealed that 75.2% of the students reported feeling comfortable during their initial exposure to postmortem examinations reflecting a positive attitude towards this essential aspect of medical training. This finding aligns with the finding of Jones *et al.*,¹⁴ where 70% of medical students felt comfortable with autopsy exposure. Conversely, 15.2% reported feeling uncomfortable, while 9.5% described their experience as very uncomfortable in the present study. Similarly, Edussuriya *et al.*¹⁵ found that 18% of the students experienced discomfort highlighting the need for psychological preparation and support including structured debriefing sessions. Additionally, 78% of students supported the inclusion of postmortem examinations as a mandatory component of their curriculum, which is supported by the findings of several previous studies.^{7-12,14,15} However, the lack of sufficient autopsy exposure remains a concern (as we observed in 80% students' opinion), which mirrors the findings of previous studies highlighting the need for increased autopsy exposure to enhance diagnostic skills and forensic competences.¹⁵⁻¹⁷

Our study showed that 67.6% of participants strongly agreed that autopsies enhanced their anatomical knowledge mirroring results from several previous studies.¹⁴⁻¹⁸ Additionally, 77.1% of students in our cohort expressed strong support for exposure more postmortem examination during academic year aligning with the findings from many other studies in this sub-continent.^{4,7-9,17-19} The diagnostic value of autopsies was highlighted by 76.2% of respondents in

this study, which aligns with the findings of several studies done across the globe.^{4,6-12,15-19} Moreover, 75.2% of the students expressed their desire for more educational opportunities and further training in Forensic Medicine, which is supported by the findings of other studies, where students advocated for enhanced autopsy-related training as part of their medical curriculum.^{6-12,15,20,21} Overall, a positive attitude and perception on autopsies among undergraduate medical students highlights the enduring educational value of postmortem examinations.

Conclusion

The findings of this study highlight the essential role medico-legal autopsies (MLAs) play in medical education, enhancing students' knowledge of pathology, forensic science, and public health. The results demonstrate that while most undergraduate medical students possess a positive attitude and awareness regarding the importance of MLAs, there are notable gaps in practical exposure and psychological readiness. These gaps may hinder the development of essential competencies required for handling medico-legal cases in future clinical practice. Addressing these barriers through enhanced forensic curricula, increased autopsy observation opportunities, and emotional support mechanisms is crucial for fostering a generation of well-rounded medical professionals capable of contributing to both healthcare and legal systems.

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