

Clinical Forensic Medicine in Medical Education: Assessing the Current and Future Needs

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Abstract

Background: Clinical forensic medicine bridges the gap between medicine and law, focusing on the application of medical knowledge to legal issues. Though not a separate entity theoretical Clinical Forensic Medicine is already incorporated into existing undergraduate MBBS curriculum for third year students. This study aimed to assess the need for Clinical Forensic Medicine (CFM) training for undergraduate medical students of 3rd, 4th and 5th year.

Materials and methods: A descriptive cross-sectional study was conducted among 300 medical students who answered a survey on Clinical Forensic Medicine in Medical Education in Chattogram Maa O Shishu Hospital Medical College. The questionnaire assessed participants' perceptions on medical and legal issues encountered in clinical practice and their views on the necessity of CFM training in their undergraduate medical curriculum under BMDC.

Results: 90.7% students accepted that their medical curriculum must inculcate CFM training in their curriculum. 40.33% students reported having inadequate time to complete their curriculum. 47.67% students acknowledged that practical classes could be an effective method for training in CFM. 53.4% felt that learning CFM in the third year was too early for them. 64.7% of students felt that hands on training in CFM should be included in their undergraduate medical curriculum.

Conclusion: Theoretical knowledge with practical and bedside training can broaden students understanding of CFM.

Key words: Clinical Forensic Medicine (CFM); Medical aspects; Legal aspects.

Introduction

Clinical Forensic Medicine (CFM) a specialized branch of forensic medicine, plays a crucial role within the justice system. It is that branch of medicine that deals with both the provision of

clinical services (i.e diagnosis, treatment, and management) to patients and the medicolegal aspects of patient care. Training is essential to ensure that practitioners have the knowledge and skills to work in a potentially coercive environment.¹ It encompasses the evaluation and documentation of patients involved in a range of incidents, including assault, road traffic and industrial accidents, sexual assault, abuse (Elder, spousal and child) neglect and starvation, torture, self-inflicted injuries, criminal abortion, criminal poisoning, and in toxication by alcohol or other substances. Accurate assessment in these areas often necessitates highly specialized skills to ensure thorough examination and expert testimony.

Today, the term "Forensic physician" is increasingly recognized and accepted. Forensic services in Bangladesh are provided partly by the academic staff of the forensic medicine departments at government medical colleges, with the remainder handled by civil surgeons, who serve as district health administrators. Civil surgeons over see postmortem procedures conducted by doctors in district hospitals, many of whom lack specialized forensic qualifications. In India, autopsy can be conducted by any forensic medicine expert, a pathologist assigned to the Forensic Medicine Department or any government medical officer with experience in performing post-mortem examinations.²

To meet the forensic needs of victims who have survived violent crimes and trauma, it is crucial to have these individuals examined by professionals specifically trained in medico-legal issues, such as clinical forensic physicians.³

At the undergraduate level in Bangladesh, the standard curriculum typically includes five years of coursework followed by 12 months of mandatory practical training (Internship) culminating in the awarding of the MBBS (Bachelor of Medicine and Bachelor of Surgery) degree. Recently, there have been significant

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changes to the undergraduate curriculum, including an earlier introduction to clinical settings, a practice now also adopted in Western countries.⁴

A theme highlighted that the experience of the Forensic Medical Examiner (FME) can be traumatic, underscoring the necessity for specialized training for practitioners. While there was a preference for women practitioners, the focus was on the behavior and skills of the examiner. It was essential for their practice to be both trauma-informed and patient-centered.⁵ A FME can take between one to three hours to complete and is often experienced as uncomfortable at best and traumatic at worst.⁶⁻⁹

The MBBS students should gain an understanding of the legal aspects related to medical practice, including medical negligence and ethical codes. Additionally, they should be able to diagnose and manage both common acute and chronic poisonings, as well as recognize and effectively address the related medico-legal challenges.

Students are required to complete twelve days of compulsory training in forensic medicine during their third year MBBS. Students are gaining both theoretical and practical knowledge, along with skill development (Where applicable) in managing various types of CFM cases, including injured patients, sexual assault cases, poisoning incidents, impotency cases and more. Additionally, through practical classes in the current curriculum, students are equipped to prepare injury certificates, sexual assault reports, death certificates, and other documents in accordance with ICD-10 guidelines.

This training helps them understand various medico-legal responsibilities, identify medico-legal issues, prepare comprehensive medico-legal reports, conduct thorough post-mortem examinations, and diagnose and treat common poisoning cases through supervised learning.⁴

Though there are clear voids in forensic medicine skills among medical practitioners, new graduates are struggling with critical social issues like domestic violence, child and adult sexual abuse, traffic medicine, and custodial medicine. They are frequently posted as medical officers after their BCS (Bangladesh Cadre Services) postings to different districts while doing government jobs without sufficient oversight.

This study aimed to assess the need for Clinical Forensic Medicine (CFM) training for undergraduate medical students of 3rd, 4th and 5th year.

Materials and methods

This descriptive cross-sectional study was conducted among the third, fourth and fifth year MBBS students of Chattagram Maa O Shishu Hospital Medical College in the month of August 2024. Before the commencement of the study ethical clearance was obtained from the Institutional Review Board.

Inclusion criteria:

- MBBS students of 3rd, 4th, 5th year were included in this study.
- Those students who gave consent were included under the study.

Exclusion criteria:

- Those who were absent during data collection were excluded from this study.
- Those students who refused to give consent were excluded from the study.
- The students of 1st, 2nd year and intern doctors were excluded from this study.

Census sampling technique was applied in this research as all the students of 3rd, 4th and 5th year were included in this study. The ethical clearance of the study was taken from Institutional Ethical Review Board of Chattagram Maa-O-Shishu Hospital Medical College. Verbal Consent was taken from the participants prior to data collection. A total of 300 MBBS students answered the structured pre tested questionnaire. The data collectors distributed the questionnaire to the students during class and asked them to complete it. Once the students had finished filling out the questionnaire, the data collectors collected the completed forms.

The questionnaire assessed participants' perceptions of medical and legal issues encountered in clinical practice and their views on the necessity of CFM training. The approach for developing the questionnaire was inspired by Shirigiriwar M et al.¹⁰ The table consisting medical and legal aspects of CFM consisted of 11 and 12 questions respectively. The questionnaire's validity was ensured through expert reviews by forensic medicine experts. Responses were collected

using a Likert scale ranging from strongly agree to strongly disagree. Quantitative data from the questionnaires were analyzed statistically in terms of percentages. In this research, pie charts, bar diagrams, percentages and frequencies were utilized for data representation and analysis. Data were analyzed using computer based on statistical package for social science (SPSS) 24 version.

Results

The study involved 300 MBBS students, with 100 participants from each of the 3rd, 4th, and 5th year. 125 (41.67%) were male and 175 (58.34%) were female students.

272 (90.7%) of students accepted that their medical curriculum must inculcate CFM in their curriculum.

According to the data, 40.33% of students reported having inadequate time to complete their curriculum. Additionally, 24.33% cited resource limitations in CFM, as illustrated in Figure 1 below.

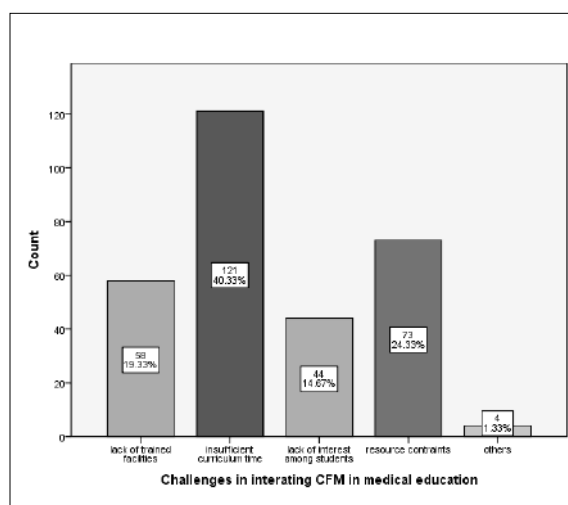


Figure 1 Challenges foreseen in integrating Clinical Forensic Medicine in medical education

*Others refers to Inadequate Funding., Poor Curriculum Design, Lack of Practical Experience, Instructor Availability, Student Motivation, Administrative Support, Technological Barriers, Class Size, Learning Environment.

47.67% of students acknowledged that practical classes could be an effective method for training and 22% suggested workshops, for improving the understanding of CFM shown in Figure 2 below.

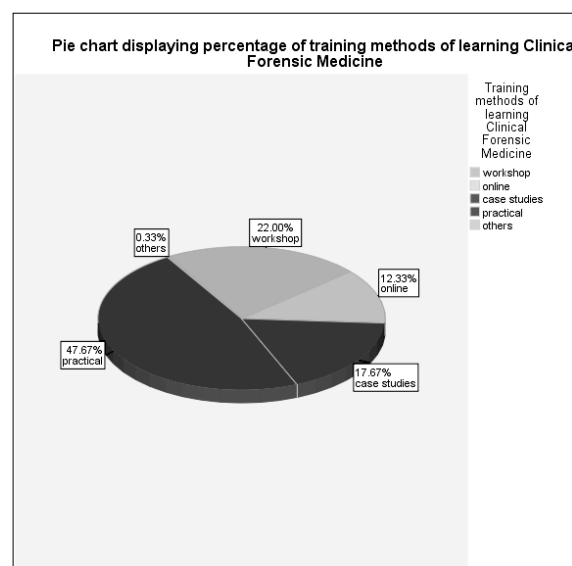


Figure 2 Training approaches to enhance Clinical Forensic Medicine in medical education

• Others refers to Simulation-Based Learning, Fieldwork, Research Projects, Peer Learning, Clinical Rotations, Virtual Reality (VR) and Augmented Reality (AR).

Regarding students' opinions on the medical aspects (CFM, 86.3% agreed that forensic medicine is relevant to CFM. Additionally, 64.7% of students agreed that formal training in CFM should be included in their undergraduate medical curriculum.

79.6% agreed that incorporating CFM into the curriculum could enhance their diagnostic skills, and 75.7% agreed that CFM contributes positively to the overall quality of medical practice. 79% of students agreed that examining doctors often hesitate to sign medicolegal reports due to fear shown in Table I.

Table I The medical aspects of integrating Clinical Forensic Medicine in Medical education

Sl.no	Medical aspects of	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
i)	Forensic medicine has relevance in clinical practice	126 (42)	133 (44.3)	18 (6)	21 (7)	2 (0.7)
ii)	CFM taught in 3 rd year is too early	53 (17.7)	107 (35.7)	61 (20.3)	54 (18)	25 (8.3)
iii)	CFM training is important for medical undergraduates	87 (29)	150 (50)	56 (18.7)	3 (1)	4 (1.3)
iv)	I am familiar with the concepts of CFM	57 (19)	153 (51)	78 (26)	10 (3.3)	2 (0.7)
v)	I must receive hands on training in CFM as part of my undergraduate medical curriculum	90 (30)	104 (34.7)	56 (18.7)	48 (16)	2 (0.7)

Sl.no	Medical aspects of	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
		n (%)	n (%)	n (%)	n (%)	n (%)
vi)	CFM in curriculum can improve my diagnostic skills	70 (23.3)	169 (56.3)	58 (19.3)	2 (0.7)	1 (0.3)
vii)	CFM contributes to the overall quality of medical practice	53 (17.7)	174 (58)	70 (23.3)	2 (0.7)	1 (0.3)
viii)	CFM improves the decision-making process in complex medical cases	82 (27.3)	151 (50.3)	64 (21.3)	2 (0.7)	1 (0.3)
ix)	Knowledge on CFM impacts patient outcome in cases involving legal or ethical considerations	76 (25.3)	192 (64)	28 (9.3)	3 (1.0)	1 (0.3)
x)	Integrating CFM into undergraduate training would reduce the need for specialized forensic training later in a medical career	64 (21.3)	142 (47.3)	63 (21.0)	12 (4.0)	19 (6.3)

Regarding the legal aspects of integrating Clinical Forensic Medicine (CFM) 50% of students felt confident that they could manage medicolegal cases as intern doctors. Meanwhile, 66.7% agreed they would be able to issue injury certificates by the end of their MBBS curriculum. Additionally, 71.4% agreed they would be capable of assessing individuals detained in police custody as medical officers.

A significant majority, 91.3%, supported the creation of a specialized department to handle victims of sexual assault, and 88.7% agreed that specific qualifications are essential for examining such victims.

Additionally, 73.7% felt they could certify a victim's age, while 57.3% were confident in their ability to examine weapon injury cases. Furthermore, 70.6% felt they could confidently opine on cases involving alcohol consumption, if they had training in CFM in undergraduate level as detailed in Table II.

Table II The legal aspects of integrating Clinical Forensic Medicine in Medical education

Sl.no	Legal aspects of Clinical Forensic Medicine	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
		n (%)	n (%)	n (%)	n (%)	n (%)
i)	As an Intern I can handle Medicolegal cases	50 (16.7)	100 (33.3)	92 (30.7)	56 (18.7)	2 (0.7)
ii)	At the end of MBBS I can issue injury certificates	72 (24)	128 (42.7)	62 (21)	36 (12)	1 (0.3)
iii)	As a Medical officer I can assess individuals detained in police custody	65 (21.7)	149 (49.7)	73 (24.3)	13 (4.3)	0
iv)	Do you think there should be a specialized department where victims of sexual assault can be handled?	148 (49.3)	126 (42)	25 (8.3)	1 (0.3)	0

Sl.no	Legal aspects of Clinical Forensic Medicine	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
		n (%)	n (%)	n (%)	n (%)	n (%)
v)	Specific qualification is necessary for sexual assault victim examination	131 (43.7)	135 (45)	33 (11)	1 (0.3)	0
vi)	CFM can improve better understanding of legal aspects	102 (34)	168 (56)	30 (10)	0	0
vii)	CFM training has an inter-professional collaboration in cases involving legal aspects	72 (24)	127 (42.3)	63 (21)	40 (13.3)	0
viii)	I can certify age of an individual at the end of MBBS	80 (26.7)	141 (47)	35 (11.7)	36 (12)	8 (2.7)
ix)	Can you examine a case of weapon injury confidently?	72 (25)	97 (32.3)	86 (28.7)	38 (12.7)	4 (1.3)
x)	Can you give opinion of an alcoholic victim confidently?	70 (23.3)	142 (47.3)	59 (19.7)	16 (5.3)	13 (4.3)
xi)	Can you give opinion of a suicide case?	130 (43.3)	122 (40.7)	25 (8.3)	2 (0.7)	21 (7.0)

In this research, the majority of students agreed that forensic medicine is relevant to clinical practice. Forensic medicine is the application of facts and knowledge of Medical Science for the purpose of law.¹¹

Majority of students accepted that teaching CFM was too early in the MBBS curriculum of Bangladesh and CFM training was important for medical undergraduates. In contrast, CFM was taught in 2nd year in India. Rojas IEE, Cabrera MVL et al. found that 88.9% of students reported that, experience in the crime scene investigation lab broadened their perspective on forensic sciences.¹²⁻¹³

About 2/3rd of them believed they would be able to issue injury certificates by the end of their MBBS curriculum. Medico-legal certificates are formal documents created by registered medical practitioners for use in legal proceedings. These certificates are issued by doctors in response to requests from police investigators or magistrates.¹⁴

Above 1/5th of them supported the concept of creation of a specialized department to handle victims of sexual assault, and specific qualifications are essential for examining such victims. In January 2001, the Metropolitan Police established a specialized Sapphire Unit in each London borough, staffed by officers with advanced training and expertise in rape investigations using the Sexual Offences Investigative Technique (SOIT).¹⁵

Additionally, 73.7% agreed that they could certify a victim's age if they get trained in CFM. Under Section 53 CrPC, when the accused has either committed or is suspected of committing an act, and the police have reasonable grounds to believe that a medical examination could provide evidence of the offense, they can request a registered medical practitioner to perform the examination.¹¹

More than half of the students were confident in their ability to examine weapon injury cases. In a research in India, 95% of the medical students possessed basic knowledge and awareness of various types of injuries and their forensic implications, as they were able to classify forensic injuries from medical, legal, and medico-legal perspectives.¹⁶

Discussion

Around 70% of the students, felt they could confidently opine on cases involving alcohol consumption if they were trained in CFM. After an examination by a medicolegal officer (MLO), which may include chemical analysis of blood and urine, a report is produced to determine whether the person has consumed alcohol.¹⁷

>4/5th students believed that they could opine an attempted suicide is a medicolegal case, if they had training in CFM in undergraduate level. Training to manage patients with suicidal ideation, thoughts, and attempts enhances overall medical skills, however, participants indicated that they felt insufficiently prepared for this during their undergraduate studies.¹⁸

Limitations

The study's limitations included a small sample size from a single medical college. Conducting a larger-scale study that encompasses multiple medical colleges could provide more definitive conclusion.

Conclusion

CFM plays a crucial role in forensic medicine, particularly in understanding and managing cases involving sexual assault, weapon injuries, poisoning, alcoholism, and attempted suicide. It is essential to have specialized departments for examining sexual assault victims in all tertiary hospitals which is present in government medical colleges, but not in non-government medical colleges.

While One Stop Crisis Centres (OCC) are available in government tertiary medical colleges and hospitals, they are often lacking in non-government tertiary medical institutions. Comprehensive CFM training is essential for improving the overall quality of medical practice.

Recommendation

Incorporating training on CFM into the MBBS curriculum would significantly improve medical students' understanding of legal aspects. Training on dealing with sexual assault victims, like rape, sodomy and impotency, drunken cases, practical injured victims are essential to prevent legal disputes and effectively manage court summons. Such training in CFM is likely to enhance patient outcomes in cases with legal or ethical considerations.

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Contributions of authors

HRB-Design, conception, data acquisition, manuscript writing, drafting & final approval.

HB-Data acquisition, data analysis, interpretation of data, critical revision & final approval.

TB-Data analysis, drafting & final approval.

Disclosure

All the authors declared no conflict of interest.

References

1. M.M. Stark. Medical Malpractice: Clinical Forensic Medicine. Encyclopedia of Forensic and Legal Medicine (Second Edition). 2016
2. RI James, M Delight, D Manoj, LR Johnson. Medicolegal autopsies in private medical colleges in India: An urgent need. J Postgrad Med. 2022;69(3):159–161.
3. Marc B, Calomme C. Professional Bodies: France – Forensic, Medical and Scientific Training. Encyclopedia of Forensic and Legal Medicine. 2016. DOI:10.1016/B978-0-12-800034-2.00317-7.
4. MBBS curriculum of Bangladesh. 2021. <https://www.bmdc.org.bd/curriculum-2020>.
5. Manning S, Rattray H. Health and Justice: Experiences of the forensic medical examination after sexual assault. Forensic Science International: Reports. 2022; 6: 100297. <https://doi.org/10.1016/j.fsir.2022.100297>.

6. O. Brooks-Hay, M. Burman, L. Bradley, Justice journeys: Informing policy and practice through lived experience of victim-survivors of rape and serious sexual assault, The Scottish Centre for Crime & Justice Research, Scotland. 2019.
7. S. Kummerer, 'I felt like my body was numb': Victims reflect on crucial decisions after being raped, WMBF news, Sect. Investigate. 2019.
8. S.L. Maier "I have heard horrible stories.": rape victim advocates' perceptions of the revictimization of rape victims by the police and medical system. Violence Women. 2018; 14 (7):786-808.
9. J. Du Mont, D. Kosa, S. Macdonald, A. Benoit, T. Forte. A comparison of Indigenous and non-Indigenous survivors of sexual assault and their receipt of and satisfaction with specialized health care services. PLoS One. 2017; 2(11): e0188253.
10. Shrigiriwar M, Thube H R. Assessing the Need for Clinical Forensic Medicine Training in the Medical Undergraduate Curriculum. Cureus. 2024;16(5): e59545. doi:10.7759/cureus.59545.
11. KS Narayan Reddy, OP Murty. The essentials of Forensic Medicine & Toxicology. 34th Ed. Jaypee. The Health Science Publisher. New Delhi. 2017.
12. Rojas IEE, Cabrera MVL, Barrientos EL, Hernández JM.A challenge based learning experience in forensic medicine. Journal of Forensic and Legal Medicine. 2019; 68: 101873.
13. Syllabus MBBS at the AIIMS. All India Institute of Medical Sciences Ansari Nagar, New Delhi-. <https://www.aiims.edu/aiims/academic/aiims-syllabus/Syllabus%20-%20MBBS.pdf>.
14. Aladia N. Medical Certificate & Its Value in Court Of Law under Forensic Science. International Journal of Creative Research Thoughts (IJCRT). 2017; 5(2): 17-22.
15. Metropolitan Police. Sapphire. www.met.police/sapphire/sapphire-sexualassault.htm.
16. Naresh S. Knowledge and Awareness of Medical Students about Injuries in Forensic Perspective. Indian Journal of Forensic Medicine & Toxicology. 2020; 14(2):139-145.
17. Wilmington Police Department Crime Laboratory. Forensic Alcohol Analysis Standard Operating Procedure (Technical Procedure TP101). Revision #5. Issued by: Quality Manager. 2014.
18. Rocha GDP, Filho GMDA, Ávila LA. Attitudes of doctors and medical students toward patients with suicidal ideation. Rev. bioét. (Impr.). 2020; 28 (2): 344-355.