

A study evaluating effectual of knowledge, attitude and perception of undergraduate medical students towards medico-legal autopsy

Hitesh Chawla^{1*}, Ashish Tyagi², Rajeev Kumar³, Ranjana Malhotra⁴, Naresh Kumar⁵, Shiv Shankar⁶

^{1,5}Associate Professor, ²Assistant Professor, ³Professor and Head, ⁴Medical Officer, ⁶Post Graduate Resident, ^{1-3,6}Dept. of Forensic Medicine, ⁴Dept. of Microbiology, ⁵Dept. of Physiology, ^{1-3,5,6}SHKM Government Medical College, Nalhar, Nuh, Haryana, ⁴Civil Hospital, Gurugram, Haryana, India

Abstract

Introduction: Ideally, the medico-legal autopsies have to be conducted by doctors specialized in the branch of Forensic Medicine. However, there is limited availability of forensic medicine specialists in India as compared to the number required. The bulk of the medico-legal autopsies are usually carried out by graduate doctors and not by forensic medicine specialists. This study was contemplated to know the attitude of the undergraduate medical students, about the medico-legal autopsy and to ascertain the change in their perception and attitude for autopsy, if any, after passing the Forensic Medicine subject as per their medical curriculum.

Materials and Methods: Study was carried out on first, second and third-year undergraduate medical students. Questionnaires to be answered were administered to the participating medical students in physical form. SPSS statistical software was used for comparing the mean among three groups using ANOVA test. Chi-square and Fischer exact test was also used.

Results: 249 undergraduate medical students took part in the study. Significant increase in knowledge for medico-legal autopsy was observed among 3rd-year medical students. On comparing mean among all the three groups regarding the knowledge, perception, experience and change in attitude for medico-legal autopsy, it was found to be statistically highly significant (p-value <0.001).

Conclusion: The undergraduate medical students should be encouraged to observe more autopsies during their study course. Problem-based learning during practical training of autopsy must be incorporated, as a part of the medical curriculum and instead of elective, compulsory rotatory internship training should be there for Forensic Medicine.

Keywords: Autopsy, Postmortem examination, Students, Attitude.

Introduction

Forensic medicine is a rare specialised branch that charms few medical graduates in India.¹ Therefore, the burden of medico-legal work is on the shoulders of general medical practitioners. It is assumed that the autopsies will be demonstrated to them in their graduation course. However, many medical students graduate without seeing an autopsy.²

This study was undertaken to know the knowledge of the future doctors, that is the undergraduate medical students, about the medico-legal autopsy and to ascertain the change in their attitude and perception for autopsy, if any, after passing the Forensic Medicine subject as per their medical curriculum.

Material and Methods

This study was carried out on undergraduate medical students of a Government Medical College of Southern Haryana. First, second and third-year undergraduate medical students were included in this study.

The objectives of the study were explained to them in detail. Written informed consent was taken before proceeding further. A questionnaire adapted to the study requirements from the published research was designed to know the knowledge, attitude and perception of medical students toward autopsy.^{3,4} The questionnaires were pretested on a sample of fifteen undergraduate students (5

students from each group) and finalized after being thoroughly tested for clarity of the questions as well as time period required for response. These questionnaires were not incorporated in the final evaluation. The questionnaire comprises of structured questions with regard to demographic data, the knowledge, perception, experience and attitude of medical students related to medico-legal autopsy. Questionnaires were administered to the participating medical students in physical form. Students were asked to indicate their responses as a tick mark in appropriate columns and were instructed to give their own answers and discussion with peers was not permitted. Multiple responses to questions were permitted if required. A time period of 15 minutes for completion of the questionnaire was given to each student.

The data obtained from the answer sheet was evaluated and incorporated on Microsoft Excel sheet and descriptive analysis in terms of mean, standard deviation and the percentage was carried out. SPSS (Statistical Package for the Social Sciences) statistical software, version 24 (IBM Chicago) was used for comparing the mean among three groups using ANOVA test. Chi-square and Fischer exact test was also used. A p-value less than 0.05 was considered significant and less than 0.001 was considered highly significant.

*Corresponding Author: Hitesh Chawla, Dept. of Forensic Medicine, SHKM Government Medical College, Nalhar, Nuh, Haryana, India
Email: drhiteshchawla@gmail.com
<http://doi.org/10.18231/J.IJFCM.2019.032>

Results

A total of 249 undergraduate medical students (185 males and 64 females) took part in the study. The demographic data of the students from 1st, 2nd and 3rd year is depicted in Table 1.

Significant increase in knowledge for medico-legal autopsy was observed among 3rd-year medical students. 98.73% of 3rd-year students understood that autopsy plays an important role in the administration of justice, while only 78.38% of first-year students were aware of the same, which was found to be statistically highly significant ($p < 0.001$). (Table 2) 56.96% third-year students felt the experience of exposure to post-mortem examination was slightly uncomfortable and only 35.44% were comfortable on

viewing autopsy. Even after the exposure to autopsy in their medical curriculum, 36.70% of third-year students still felt that they are incapable of performing autopsy independently if given opportunity in future after completion of graduation and all of them (100%) were of opinion that they should watch more autopsies. 37.97% of students of 3rd year feel that autopsy causes disfigurement of the dead body. (Table 3)

On comparing mean among all the three groups regarding the knowledge, perception, experience and change in attitude for medico-legal autopsy, it was found to be statistically highly significant (p -value < 0.001).

Table 1: Demographic data

	1 st Year	2 nd Year	3 rd Year
Total	74	96	79
M	50	76	59
F	24	20	20
Age Range	18 - 22	18-23	20-23
Mean Age \pm SD	19.47 \pm 1	20.44 \pm 1.09	21.32 \pm 0.98

Table 2: Knowledge of medico-legal autopsy among the participants

Item Studied	1 st Year	2 nd Year	3 rd Year	p-value
A medicolegal autopsy is mandatory in all unnatural and sudden deaths				
a. Yes	39(52.70%)	63(65.63%)	68(86.08%)	<0.001
b. No	13(17.57%)	21(21.88%)	10(12.66%)	
c. Can't say	22(29.73%)	12(12.5%)	01(1.27%)	
Medicolegal autopsy plays an important role in the administration of justice by providing significant information about the cause of death				
a. Yes	58(78.38%)	91(94.79%)	78(98.73%)	<0.001
b. No	00	00	00	
c. Can't say	16(21.62%)	05(5.21%)	01(1.27%)	
Postmortem examination is done*				
a. To know the cause of death	59(79.73%)	82(85.42%)	72(91.14%)	>0.05
b. Mere legal formality	06(8.1%)	05(5.21%)	03(3.8%)	
c. Harassment to relatives of the deceased	02(2.7%)	03(3.13%)	01(1.27%)	
d. Helpful in reaching culprit of the crime	14(18.92%)	27(28.13%)	16(20.25%)	
During medicolegal autopsy following procedure is involved:				
a. External examination only	01(1.35%)	00	00	<0.001
b. Internal examination only	01(1.35%)	02(2.08%)	00	
c. Both external & internal examination	60(81.08%)	91(94.79%)	79(100%)	
d. Not sure	12(16.22%)	03(3.13%)	00	
Before autopsy following is a must				
a. Consent of relatives	45(60.81%)	24(25%)	14(17.72%)	<0.001
b. Inquest report	08(10.81%)	53(55.21%)	54(68.35%)	
c. Both	00	09(9.38%)	10(12.66%)	
d. Don't know	19(25.68%)	05(5.21%)	01(1.27%)	
e. No answer	02(2.7%)	05(5.21%)	00	
Source of information about autopsy:*				
a. Lectures & books	39(52.7%)	89(92.71%)	73(92.41%)	
b. Newspapers	17(22.97%)	10(10.42%)	03(3.8%)	

c. Books only	01(1.35%)	10(10.42%)	03(3.8%)	<0.001
d. Internet	20(27.03%)	14(14.58%)	04(5.06%)	
e. No answer	05(6.76%)	01(1.04%)	01(1.26%)	

*- Multiple responses were permitted

Table 3: Perceptions, experience and change in the attitude of medical students with regard to medico-legal autopsy

Item Studied	1 st Year	2 nd Year	3 rd Year	p-value
Experience regarding demonstration of autopsies				
a. Learning	51(68.92%)	84(87.5%)	72(91.14%)	<0.001
b. Uncomfortable	05(6.76%)	01(1.04%)	04(5.06%)	
c. Useless	08(10.81%)	02(2.08%)	00	
d. No answer	10(13.51%)	09(9.38%)	03(3.8%)	
Demonstration of autopsy in 2nd year compliments didactic teaching and provides an opportunity for students to discuss the issues related to autopsy:				
a. Strongly agree	28(37.84%)	52(54.17%)	43(54.43%)	<0.001
b. Agree	21(28.38%)	28(29.17%)	30(37.97%)	
c. Not sure	15(20.27%)	08(8.33%)	04(5.06%)	
d. No answer	10(13.51%)	08(8.33%)	02(2.53%)	
Do you think you are capable of performing autopsy independently if given opportunity in future after completion of graduation				
a. Strongly agree	15(20.27%)	18(18.75%)	22(27.85%)	>0.05
b. Agree	20(27.03%)	30(31.25%)	28(35.44%)	
c. Not sure	31(41.89%)	40(41.67%)	25(31.65%)	
d. Disagree	01(1.35%)	03(3.13%)	03(3.8%)	
e. No answer	07(9.46%)	05(5.21%)	01(1.26%)	
PME causes disfigurement of the body				
a. Yes	11(14.86%)	14(14.58%)	30(37.97%)	<0.001
b. No	10(13.51%)	08(8.33%)	35(44.3%)	
c. Can't say	53(71.62%)	74(77.08%)	14(17.72%)	
PME is disrespect to the human body				
a. Yes	02(2.7%)	04 (4.17%)	03(3.8%)	<0.001
b. No	30(40.54%)	36 (37.50%)	67(84.81%)	
c. Can't say	42(56.76%)	56 (58.33%)	09(11.39%)	
The reaction of students on exposure to PME				
a. Comfortable	00	07(7.29%)	28(35.44%)	-
b. Slightly uncomfortable	21(28.38%)	23(23.96%)	45(56.96%)	
c. Highly uncomfortable	03(4.05%)	03(3.13%)	03(3.8%)	
d. No exposure yet	33(44.59%)	39(40.63%)	01(1.27%)	
e. No idea	17(22.97%)	16(16.67%)	00	
Students should watch autopsies:				
a. Yes	53(71.62%)	81 (84.38%)	79(100%)	-
b. No	01(1.35%)	04 (4.17%)	00	
c. Can't say	20(27.03%)	11 (11.46%)	00	
Given a chance would you wish to watch autopsy or not				
a. Yes	60(81.08%)	86(89.58%)	79(100%)	-
b. No	04(5.41%)	03(3.13%)	00	
c. Can't say	10(13.51%)	07(7.29%)	00	

Discussion

The autopsy has customarily been taught in undergraduate medical education. As per Medical Council of India (a statutory body with the responsibility of establishing and maintaining high standards of medical education and recognition of medical qualifications in India) regulations

on graduate medical education, 1997 (amended up to May, 2018), a medical student should witness medicolegal autopsies in the second year so that they can describe the medico-legal aspects and findings of post-mortem examination in case of death due to common unnatural

conditions & poisonings, so as to observe and interpret various findings at post-mortem examination.⁵

The current study was undertaken in the Department of Forensic Medicine of a Government Medical College of a northern state of India, where the first, second and third-year medical students (total of 249 students) voluntarily completed a questionnaire. The first year students were those who have just started their medical education and not being taught the subject of forensic medicine along with no exposure to autopsy. Second-year students were those who had been taught the chapter of a medico-legal autopsy but still doesn't look out a postmortem examination. The third-year students have passed the subject of forensic medicine and have been demonstrated more than 10 autopsies in their 2nd year when forensic medicine was taught to them. Therefore, the objective of whether practical demonstration and teaching changed the perception and attitude of students towards medico-legal autopsy to a significant value was obtained from this study.

A medico-legal autopsy is mandatory in all cases of sudden, unnatural and suspicious deaths.⁶ 86.08% of third-year medical students were aware of the same in our study, the percentage gradually increased from the first year (52.7%) which was statistically highly significant. 98.73% of third and 94.79% of second-year students were of opinion that medico-legal autopsy plays an important role in the administration of justice by providing significant information about the cause of death which was significantly higher than first-year students (78.38%). Majority of students in all three groups believe that the autopsy is conducted to know the cause of death and helpful in reaching culprit of a crime. No statistically significant difference in the knowledge of students among the three groups in this regard has been observed. However, it is often wrongly presumed that the objective of a postmortem examination is only to determine the cause of death, which is merely a general belief.⁶ In many of the cases brought for post-mortem examination, the cause of death is already known, especially where the deceased was hospitalized before the death. Yet autopsy is being ordered and conducted in such cases. Besides determining or confirming the cause of death, the objectives of post-mortem examination is to find out the manner and time since death; identify the deceased, if unknown; documenting the injuries in detail, determining whether the injuries and their distribution are consistent with a given history; to find out any other underlying cause or disease that has contributed to the death and to gather the trace evidences from the victim which may assist to solve a crime.⁷

Post-mortem examination involves both external and internal examination of the body in detail. It should be thorough and complete. All the three cavities (cranial, thoracic and abdominal) and the organs contained should be carefully examined.^{7,8} In our study, 100% of third-year students were aware of the same while only 81.08% of first-year students were aware.

Law provides the consent for medico-legal autopsy. An inquest is required for medico-legal autopsy and consent of relatives is not required as in cases of clinical autopsies.^{6,7} 60.81% of first-year students were of opinion that consent of relatives is required for autopsy, while 68.35% of 3rd-year students know that inquest is prerequisite for post-mortem examination. Majority of 3rd-year students (24/96) still felt that the consent of relatives is also required for autopsy. However, the majority of first-year students (25.68%) didn't know the prerequisite of medico-legal autopsy, which is evident from the fact that they still have not undergone their training on this subject. Lecture and books were the major sources of information for 2nd and 3rd year students (92.71% & 92.41%), which was significantly higher than 1st year students (52.7%). For 27.03% of first-year medical students, the Internet was the source of information for medico-legal autopsy.

On the experience of students regarding demonstration of autopsies, 91.14% 3rd-year students found it as a learning experience and 5.06% feel it as uncomfortable. Despite not having the practical experience of the autopsy, the majority of 1st (68.92%) and 2nd year students (87.5%) contemplates that demonstration of an autopsy will be of a learning experience for them. 54.43% of 3rd year students strongly agree and 37.97% agreed that demonstrations of autopsy in 2nd year compliments didactic teaching and provides an opportunity for students to discuss the issues related to autopsy. Majority of 1st year (60%) and 2nd year (83.33%) students also sense the same. In a study conducted by Ekanem & Akhigbe where two hundred and forty 5th and 6th-year medical students who had completed their postings in Anatomical and forensic pathology were evaluated, 232 students (97%) agreed on the importance of autopsy in medical education. They also contemplated that the exposure of students to autopsy is important since those who are not exposed will not be able to perform the same in their following years of clinical practice.⁹ We have observed in our study that 31.65% 3rd year students are still not sure if they are capable of performing autopsy independently if given opportunity in future after completion of their graduation. This percentage can only be improved by extensive practical training during their course so as to raise their self-confidence to perform medico-legal autopsies in their future professional career if required. 37.97% of third-year students, who had experienced autopsies, sensed that postmortem causes disfigurement of the body but the majority (84.81%) didn't feel that it is disrespect to the human body. As the first and second-year students don't have practical experience, that's why the majority can't say about disfigurement or disrespect caused by PME to the human body. In realism, it is the duty of the autopsy surgeon to restore the dead body to the best possible cosmetic condition before its release to the relatives.⁷ We have observed in our study that the majority of third-year students (56.96%) felt slightly uncomfortable on first exposure to postmortem examination and only 35.44% were comfortable. Ekanem & Akhigbe in their study perceived

that the majority of students identified autopsy as a significant learning tool in their undergraduate medical education. However, sixty-three per cent of the students were uncomfortable on the first day in the autopsy room compared to 10% who were comfortable.⁹ Anders S et al in their study on 150 medical students in Hamburg, Germany regarding teaching post-mortem external examination in undergraduate medical education concluded that the majority of students did not feel that the dignity of the deceased was offended by the post-mortem examination. After the course, more than 70% of the students felt that they are able to perform an external examination in future and issue death certificates.¹⁰ In a similar study undertaken in Turkey where 6th-year students in the Medical Schools located in Istanbul have participated in a questionnaire; it was observed that most of the participants who had attended an autopsy felt uncomfortable and inadequate on performing the autopsy.¹¹

Two-hundred thirteen out of 249 study subjects (85.54%) were of the opinion that students should watch autopsies in their medical curriculum. 90.36% wish to watch autopsy if given a chance. Even first year (81.08%) and second year (89.58%) students wished to watch autopsy in future. Sanner et al observed in their study that 75% of respondents had a high appreciation of the autopsy and 90% of them acknowledged for being autopsied themselves. The majority was of opinion that the autopsies were respectfully accomplished. Immediately after the course, the utility of autopsies stands out clearly, but it appeared that this mindset changes when students become qualified doctors and feelings of discomfort take over.¹² In a study on the utility of autopsies in medical education, contemplated by Ioan et al on 219 medical students, most of them considered that autopsy is beneficial to society, medical practice and medical education. On average, accomplices felt "moderately uncomfortable" on exposure to the first autopsy.¹³ The current study was similar to international studies with regard to students' response in reference to attending autopsies.

A survey of pathology training programs about current operations and attitudes carried out by Horowitz & Naitoku exposed that the autopsy is underused in the teaching of medical students and often does not have a dedicated faculty. The autopsy has to be recognized as a credible and prized procedure. They sensed that the autopsy must then be funded and in pay-for-performance initiatives, must be solicited for the pathologists, clinicians, and health care administrators.¹⁴

In the current scenario in India, due to the scarcity of forensic medicine specialist, the burden of medic-legal work including autopsies is on the shoulders of general medical practitioners. To improve the quality of medico-legal work in the prevailing picture, undergraduate level teaching should be strengthened. The need to expose the students to autopsy cannot be underlined because eventually, these students may have to perform the autopsies in future. The knowledge and practical experience of the autopsy will

expand the students' horizon and will help the legal system in delivering justice in criminal cases. At present, after passing medical graduation course, students have to undergo one-year compulsory rotatory internship training wherein a graduate is expected to conduct actual practice of medical and health care and acquire skills under supervision so that he/she may become capable of functioning independently. Under the internship-training programme, Forensic Medicine is considered as elective posting for 15 days wherein a student has to opt for two elective postings of 15 days each from a total of eight streams, in which Forensic Medicine is also a part.⁵ Being an optional and elective subject, very few graduates opt for Forensic Medicine subject in their internship-training programme. Instead of an elective posting, compulsory rotatory internship postings in the subject of Forensic Medicine should be there for graduates, so as to enable them to visualize more autopsies and they could acquaint themselves with medico-legal work, which they may be asked to do in their future professional endeavour.

To encourage the students and doctors to become more interested in observing and performing autopsies, the working environment for autopsy work should be upgraded, as most of the mortuaries in India are still in a primitive state.

Conclusion

Education is the only mean to elaborate one's knowledge and it can bring the change in perception and attitude of a person. The undergraduate medical students should be encouraged to observe more autopsies during their study course. It will help them to conduct autopsies in a better way if required in future, once they complete the graduation and posted in Government hospitals. It is suggested that problem-based learning during practical training of autopsy must be incorporated, as a part of the medical curriculum and instead of an elective, a compulsory rotatory internship should be there for Forensic Medicine. Further, to curb the deficiency of Forensic Medicine specialists, measures should be taken at the state level to make this branch a lucrative one, so that more medical aspirants opt this speciality for their post-graduation course.

Source of Support

None.

Conflicts of Interest

None.

References

1. Sujatha R. Few takers for forensic medicine? The Hindu [Internet]. 2012 Sep 3 [cited 2019 Apr 2]; Available from: <https://www.thehindu.com/features/education/careers/few-takers-for-forensic-medicine/article3854489.ece>
2. Verma SK. Teaching students the value of autopsies. *Acad Med* 1999;74(8):855.

3. Singh VP, Biswas G. Knowledge and attitude of medical students and interns toward forensic autopsy. *J Indian Acad Forensic Med* 2014;36(1):9-12.
4. Jadav JC, Patel BN, Tandon RN. Knowledge and attitude of medical students on forensic autopsy in Ahmedabad city. *J Indian Acad Forensic Med* 2013;35(1):26-8.
5. GME_REGULATIONS-1.pdf [Internet]. [cited 2019 Apr 5]. Available from: https://www.mciindia.org/CMS/wp-content/uploads/2017/10/GME_REGULATIONS-1.pdf
6. Nadesan K. The importance of the medico-legal autopsy. *Malaysian J Pathol* 1997;19(2):105-9.
7. Saukko P, Knight B. Knight's Forensic Pathology. 3rd ed. London: Arnold; 2004;1-52.
8. Mathiharan K, Patnaik AK. Modi's Medical jurisprudence and toxicology. 23rd ed. LexisNexis Butterworths Wadhwa; New Delhi: 2009;357-75.
9. Ekanem VJ, Akhigbe KO. Attitudes of Nigerian medical students towards autopsy. *Turkish J Med Sci* 2006;27;36(1):51-6.
10. Anders S, Fischer-Bruegge D, Fabian M, Raupach T, Petersen-Ewert C, Harendza S et al. Teaching post-mortem external examination in undergraduate medical education—the formal and the informal curriculum. *Forensic Sci Int* 2011;15;210(1-3):87-90.
11. İnanıcı MA, Sözen MŞ, Alkan N, Arıcan N, Aksoy ME. The attitudes of medical students to autopsy. *Forensic Sci Int* 2000;113(1-3):303-8.
12. Sanner MA. Medical students' attitudes toward autopsy. How does experience with autopsies influence opinion?. *Arch Pathol Lab Med* 1995;119(9):851-8.
13. Beatrice IO, Neagu M, Manoilescu I, Plaiesu T, Damian S. Utility of autopsy in medical education-students' opinions and attitudes. *Med-Surg J* 2014;118(3):801-7.
14. Horowitz RE, Naritoku WY. The autopsy as a performance measure and teaching tool. *Human Pathol* 2007;38(5):688-95.

How to cite this article: 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 J Forensic Community Med* 2019;6(3):138-143.