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Perceptions of medical students on autopsy and its significance as a teaching-learning method

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Abstract

Background: Performance of autopsies as a learning experience for undergraduate medical students is declining in most developed countries. Sri Lankan universities continue to employ autopsies for teaching purposes. Perceptions of medical students towards this exercise has not been explored in the recent past.

Objectives: To determine perceptions of medical students towards autopsy and its significance as a learning experience.

Methods: An online questionnaire to determine the perceptions of 4th year medical students who had completed the clerkship in Forensic Medicine on autopsy and its significance as a teaching-learning method was administered to students of two faculties of medicine in Sri Lanka.

Results; Medical students considered the autopsy as a positive learning experience in terms of learning anatomy and pathology. They felt that they should witness more autopsies and assist in dissections during autopsy. However, a significant proportion was not sensitive to the emotional nature of the experience and a majority were not comfortable in the autopsy environment and process and stated that they would not consent to an autopsy of someone close to them if the need arose.

Conclusion: It is necessary to make the best use of the undergraduate autopsy experience by increasing exposure to autopsy, allowing students to assist at autopsy and drawing the attention of students to the emotional aspect during the experience and promoting the specialty while highlighting the role of the Forensic Pathologist in ensuring justice.

Keywords: Medical Students, Autopsy Perception, Learning Tool

INTRODUCTION

In Sri Lanka all medical officers are required to be able to attend to medico-legal work independently including the conduct of autopsies. Therefore, Forensic Medicine is a compulsory component in

the MBBS program in Sri Lanka. It is taught in the para-clinical years with a compulsory clinical appointment with autopsy exposure.

The benefits of autopsy exposure during the undergraduate period are many and go beyond the



development of skills of dissection. It is accepted that exposure to autopsies is advantageous in the undergraduate period as it helps in learning anatomy, pathology and gaining emotional confidence as a career skill. Furthermore, it is beneficial for the advancement of the discipline as a research tool and helps to develop the emotional strength of individuals and empathy towards the victims and relatives.

Studies done on perceptions and attitudes of medical students towards autopsy revealed that autopsy is a very useful study tool. Exposure to post-mortem examinations was seen to have positive impacts on diagnostic and communication skills, potentially enhancing future patient care. [1] Although, the primary aim of these autopsies was to teach Forensic Medicine, most students found them helpful for learning anatomy. [2] However, in countries like UK the number of autopsies taking place has declined dramatically over the last 50 years. [1] Furthermore, there is a tendency worldwide towards making Forensic Medicine a postgraduate discipline with minimal exposure to autopsies during the undergraduate period.

In the Faculty of Medicine, University of Peradeniya, the clinical appointment in Forensic Medicine is of four-weeks duration and students are expected to observe, assist in post mortems and document Medico-legal examination forms (MLEF), Medico-legal report (MLR) and Cause of death forms. The Intended Learning Outcomes of the clinical appointment indicate that conducting a post-mortem examination under supervision, performing relevant investigations and referrals, describing procedures in dissection and preparing a post mortem report for submission to court as essential skills that need to be acquired. An Objective Structured Practical Examination is conducted at the end of the clinical appointment and overall clinical knowledge regarding Forensic Medicine including autopsy related knowledge is evaluated.

In the Faculty of Medicine, University of Kelaniya, students are able to observe and assist post-mortem examinations during the Forensic Medicine clinical appointment. Students are expected to observe a minimum of 5 different post-mortem examinations. Moreover, they

should assist and clerk at least one post-mortem examination and they are encouraged to witness as many medico-legal autopsies as possible, preferably of different varieties which will improve skills of compiling a report which include a brief history, examination findings, cause of death, samples taken for further examination and relevant opinion. It is considered compulsory for the successful completion of the two-week clerkship.

A study done by Bamber et al in 2015, revealed that teachers and students are in agreement that autopsy based teaching has many potential benefits including a deeper understanding of end-of-life issues, medical fallibility and clinical knowledge. This study emphasises that students gain most benefits from repeated attendance at autopsies being taught by enthusiastic teachers. Currently in UK the autopsy as a teaching resource is declining and it has become uncommon for medical students to attend more than a handful of autopsies during their training, while some may never see an autopsy. Degrees to which autopsies are used for the teaching of medical students appear variable and the focus is fast diminishing due to overcrowded medical curricula. [1]

A review done by Dr Shetty Charan Kishor, Forensic Medicine Curriculum in Medical Schools of Malaysia, revealed that changes should be made to Forensic Medicine curricula of undergraduate medical students as many of the graduates have not been exposed to basic autopsies during their undergraduate period. They propose at least one week's exposure to post mortem examinations. [3] A study done by Naz et al revealed that 64% of students preferred observing a live autopsy while 33% appreciated videos and only 3% favoured books. About 87% of students stated that the autopsy is mandatory in all unsuspected deaths, 89% agreed that it is useful in medical education but 58% found it disrespectful to the dead body. The study concluded that students were aware of the value of autopsy but they felt that adequate time must be allocated for viewing autopsies to improve the teaching learning experience. [4]

Toit-Prinsloo and Pickworth revealed that 82% of undergraduate medical students of a University in South Africa rated the practical rotation as useful.

It identified that, record keeping, legislation review and traumatology description as strengths and emotional trauma and nightmares as weaknesses of autopsy exposure. Accordingly, the autopsy remained a valuable teaching tool for undergraduate students. Furthermore, it concluded that the provision of emotional support should be made to all the students to assist them in overcoming their fear of attending forensic autopsy sessions. [5]

In some medical courses in India, Forensic Medicine is a subject that is taught during the second year of the MBBS program and undergraduate students are expected to witness a minimum of ten autopsies during the third to fifth semesters. Research conducted in a medical institution in India on the perception of medical students towards medico-legal autopsy teaching, revealed that the majority of students agreed that autopsy helped to refresh their knowledge as well as made them emotionally stronger and 60% of them affirmed that it helped to understand clinical- pathological correlations and become familiar with death certification. In Pakistan, students are exposed to autopsy observations in the third year. A study done by Ameer Y et al (2019) revealed that 93% either agreed that, the autopsy is an essential technique in medico - legal as well as in medical education. Fifty nine percent agreed that, without an autopsy, understanding of the subject would be difficult [6]

Literature review revealed evidence of many studies on the perception and attitudes of undergraduate medical students regarding autopsy. One such study published in the reputed journal of medicine, science and law revealed more than 75% of students agreed that they could appreciate the actual morphology and pathological changes in the human organs. (7) However, similar studies have not been published on a Sri Lankan student population. Student perception of their autopsy experience will not only help in maximising the student autopsy experience but also could lead to curriculum reform.

OBJECTIVE

To determine the perceptions of medical students on autopsy and its significance as a teaching-learning method.

METHODOLOGY

Data was collected from a group of medical undergraduates of the Faculties of Medicine University of Peradeniya and University of Kelaniya, Sri Lanka. A questionnaire on their perception of the autopsy was administered online through google forms to medical students who had completed the Forensic Medicine clinical appointment. Data were analysed using SPSS version 26 where student's' perceptions were divided into four main categories; Cognitive, Emotional, Societal and General.

The study was granted exemption from ethics approval by the ethics review committee of the Faculty of Medicine, University of Peradeniya.

RESULTS

The response rate was 39%. Of the 305 students who responded to the questionnaire, 206 (67.5%) are from the Faculty of Medicine, University of Peradeniya while 99 (32.5%) are from the University of Kelaniya. Hundred and eighty-nine (62%) were female and 116 (38%) male. All students were over the age of 24 years, while a majority (58%) were between 26-27 years of age. Ninety-two percent were Sinhalese, while (5%) were Muslim, (2%) Tamil and (1%) other ethnicities. Two hundred and sixty-three (86%) students were Buddhist, 19 (6%) were Christian, 16 (5%) were Islamic, and 1% considered themselves as not having a religion.

Cognitive aspect

Overall, the students had a positive perception on the cognitive impact of autopsy. A majority of students 260 (85%) either agreed or strongly agreed that autopsy helped refresh anatomy knowledge while 36 (12%) were neutral. Over 95% either agreed or strongly agreed that they appreciated the actual morphology and

pathological changes of human organs after autopsy exposure. Eighty-six percent appreciated the fact that they gained an understanding of clinico-pathological correlations while 84% said that they became familiar with death certification

during the process. Eighty-six percent of students thought that the visual and emotional nature of the autopsy makes it a memorable learning experience. (Data table included)

Table 1: Responses to the question ‘Autopsy helped to refresh and improve my anatomy knowledge

Cognitive_Q1				
	Frequency	Percent %	Valid Percent	Cumulative Percent
strongly disagree	2	0.7	0.7	0.7
disagree	7	2.3	2.3	3.0
neutral	36	11.8	11.8	14.8
agree	160	52.5	52.5	67.2
strongly agree	100	32.8	32.8	100.0
Total	305	100.0	100.0	

Emotional aspect

Sixty-four percent (n=195) of students felt saddened by the death and empathized with the family, while 94 (31%) were neutral and 15 (15%)

was not saddened nor empathized with the bereaved family. Of those who were neutral or did not empathize majority, 62 students (56%) were male (Table 2).

Table 2: Responses to the question ‘I felt saddened by death and empathised with the bereaved family’

Emotional_Q8											
Gender	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Total
		%		%		%		%		%	
Female	0	0	4	1.311	44	14.43	107	35.08	34	11.15	189
Male	1	0.328	11	3.607	50	16.39	48	15.74	6	1.967	116
Total	1	0.328	15	4.918	94	30.82	155	50.82	40	13.12	305

Even though 73% of students felt uncomfortable with the nauseating smell at autopsy, majority (77%) did not feel uncomfortable about seeing

blood and only 23% of students were distressed with the dissection of bodies. (Data tables included)

Table 3: Responses to the question 'I felt uncomfortable due to the nauseating smell'

Emotional_Q9				
	Frequency	Percent %	Valid Percent	Cumulative Percent
Strongly disagree	2	0.7	0.7	0.7
disagree	26	8.5	8.5	9.2
neutral	53	17.4	17.4	26.6
agree	137	44.9	44.9	71.5
strongly agree	87	28.5	28.5	100.0
Total	305	100.0	100.0	

Table 4: Responses to the question 'I felt uncomfortable on seeing blood'

Emotional_Q10				
	Frequency	Percent %	Valid Percent	Cumulative Percent
Strongly disagree	84	27.5	27.5	27.5
disagree	151	49.5	49.5	77.0
neutral	39	12.8	12.8	89.8
agree	24	7.9	7.9	97.7
strongly agree	7	2.3	2.3	100.0
Total	305	100.0	100.0	

The students were divided on their opinion regarding fear of exposure to autopsy and the mortuary before the experience, where 48% (n =

146) disagreed/disagreed strongly and 36% (n = 108) agreed/agreed strongly.

Table 5: Responses to the question 'Before exposure to the autopsy, I was scared of the mortuary'

Emotional_Q17				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	34	11.1	11.1	11.1
Disagree	112	36.7	36.7	47.9
Neutral	51	16.7	16.7	64.6
Agree	81	26.6	26.6	91.1
Strongly agree	27	8.9	8.9	100
Total	305	100	100	

28% (n = 85) of students who agreed/strongly agreed that they were scared before exposure

were female. (Table 6).

Table 6: Responses to the question 'Before exposure to the autopsy, I was scared of the mortuary' according to the Gender

Emotional_Q17												
Gender	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Total	
		%		%		%		%		%		
Female	13	4.252	61	20	30	9.836	64	20.98	21	6.885	189	
Male	21	6.885	51	16.72	21	6.885	17	5.574	6	1.967	116	
Total	34	11.15	112	36.72	51	16.72	81	26.56	27	8.853	305	

Societal aspect

Fifty-three percent of students were not comfortable in the first postmortem exposure. However, a slightly higher percentage (57%) agreed that exposure to autopsy made them mentally and emotionally stronger.

The majority 229 (75%) of students disagreed that autopsy is disrespectful. However only 45% stated that they would consent to an autopsy of a friend/relative if the need arises.

Table 7: Response to the question 'Autopsy is disrespectful to the human body' according to the ethnicity

Societal_Q16												
Ethnicity	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Total	
		%		%		%		%		%		
Bhutanese	0	0	0	0	1	0	0	0	0	0	1	
Muslim	1	0.328	5	1.639	9	2.951	1	0.328	0	0	16	
Other	1	0.328	0	0	1	0.328	1	0.328	0	0	3	
Sinhalese	93	30.49	124	40.33	45	14.75	14	4.59	4	1.312	280	
Tamil	1	0.328	4	1.312	0	0	0	0	0	0	5	
Total	96	31.48	133	43.61	56	18.36	16	5.246	4	1.312	305	

General

Sixty-eight percent of medical students agreed that they should witness more autopsies while 77% agreed that students should assist in dissections at autopsy. Only 12% of students felt that they would not watch an autopsy if given the choice.

Thirty percent 30% (n=91) of students were neutral and only 33.1% (n = 101) (Table modified) agreed that they would not mind performing autopsies as medical officers (Table 8).

Table 8: Responses to the question 'I will not mind performing autopsies as a medical officer'

General_Q20					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Strongly agree	23	7.5	7.5	7.5	
Agree	78	25.6	25.6	33.1	
Neutral	91	29.8	29.8	63	
Disagree	93	30.5	30.5	93.4	
Strongly disagree	20	6.6	6.6	100	
Total	305	100	100		

DISCUSSION

There is no doubt that the autopsy is a positive teaching learning experience for medical students and it helps to advance the different learning styles and maximize all the dimensions such as the cognitive, emotional, societal and general aspects. A study done in a military medical university in Shanghai, China revealed that the military medical students also prefers autopsy as an important training event that furthers medical training and future profession. (8). A survey done among 150 medical students in Hamburg, Germany identified post-mortem external examination as an important learning objective and also highlighted that the dignity of the deceased was not compromised by the autopsy procedures. (9) Another study done in Hamburg, Germany by Sven Anders and team highlighted that attendance of a series of autopsies encourages learning and understanding of important issues in medical education and stressed the need to be part of the medical education and to be incorporated in the medical curricula. (10)

In Nebraska, USA less prominence is given to autopsy related curricula at. A survey done among preclinical Pathology educators revealed that most medical students do not view autopsies voluntarily. (11)

This study showed that medical students appreciate the medico-legal autopsy demonstration as a positive learning experience due to its visual and emotional nature. Although

the primary aim of these autopsies was to teach forensic medicine, most students found them helpful for learning anatomy and for clinical and pathological correlation. However, the lack of empathy or the neutral attitude of a significant proportion of students towards the next of kin highlights an important aspect that is being neglected during this teaching learning experience. The emotional aspect of this process must be emphasized by the teachers not only to enhance the learning experience but also to develop skills such as empathy, communication, breaking bad news etc. A study done in India among 450 medical students revealed that 75% of students emphasized the value in identifying morphological and pathological changes. Around 55% of students affirmed that autopsy helped improve anatomical knowledge (12).

The fact that a significant proportion claimed that exposure to autopsy made them mentally and emotionally stronger and the fact that a significant proportion still felt uncomfortable due to blood, smell and dissection during the process highlights the fact that more autopsy exposure maybe required. This was further confirmed by a study by Beatrice Loan and team among 212 medical students which revealed that they felt moderately uncomfortable at the first exposure to an autopsy. (13)

Furthermore, it is interesting to note that even though a majority of students disagreed that autopsy is disrespectful only 45% would consent to an autopsy of a friend/relative if the need arises. It

is necessary to explore reasons for this reluctance in order to create an environment where autopsies maybe performed freely which would not only bring closure to the relatives and ensure justice but would also help in the advancement of the discipline. A survey done by Sanner at the medical school, Uppsala university, Sweden among three cohorts of third year medical students with 129 respondents and a response rate of 75% revealed that they had a high appreciation of the autopsy and 90% accepted being autopsied themselves. A larger number of students felt uncomfortable when facing an autopsy or the thought of subjecting themselves to an autopsy. (14)

The majority not only agreed that they should witness more autopsies but they also thought that students should assist in dissections at autopsy. Despite a majority considering autopsy as a positive learning experience only about one third thought that they would not mind performing autopsies as medical officers. It is important to explore the reasons for this reluctance as it may have a negative impact on the advancement of the discipline and on ensuring justice. However many of the factors that influence covert learning are beyond the control of teachers, such as prior learning, life experience, cultural or religious beliefs, conceptualizations of learning, interests, and psychological predispositions [2]. A study done at the Ohio medical College, USA concluded that that the autopsy elective had a positive influence on the student's attitudes. Further 85% of students indicated that autopsy should be mandatory for all students. (15). Another study done in National and Kapodistrian University of Athens, Greece among sixth year medical students found the sole independent risk factor for physical symptoms was a less cognitive and more emotional approach for dissection. (16). A study done in Turkey revealed that most 6th year medical students felt uncomfortable in their first exposure to an autopsy. (17)

It is also necessary to explore reasons as to why they would not consent to an autopsy of a friend or relative if the need arises. Several studies have highlighted the role of autopsy in undergraduate medical education as following, attending autopsies promotes learning and helps organise information in the context of self-directed

learning, covering cognitive, emotional and societal issues, dealing with one's own emotions related to death, learning cause-effect relationships of diseases and traumas, learning about differences between clinical and medicolegal death investigation and asking for the consent of relatives. (18,19,20)

CONCLUSION

Medical students considered that the visual and emotional nature of autopsy makes it a positive learning experience in terms of learning anatomy and pathology. They felt that they should witness more autopsies and should assist in dissections at autopsy. However, a significant proportion was not sensitive to the emotional nature of the experience. The majority of students were not comfortable in the autopsy environment and process and stated that they would not consent to an autopsy of someone close to them if the need arises.

Recommendations

Enhance the undergraduate autopsy experience by increasing exposure to the autopsy, allowing students to assist at autopsy and drawing the attention of students to the emotional aspect during the experience.

It is also important to promote the specialty while highlighting the role of the Forensic Pathologist in ensuring justice to encourage students to perform autopsies as medical officers if needed

Limitations

Researchers consider that there could be an effect of non-responders' bias.

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None

Author Contributions

Edussuriya DH - Initial conception, editing the manuscript

Paranitharan P - Data collection, editing the manuscript

Perera WNS - Data collection

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Nanayakkara C - Data collection

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None

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