National Board of Examinations - Journal of Medical Sciences
Volume 4, Issue 7, Pages 1035–1043, July 2026
DOI 10.61770/NBEJMS.2026.v04.i07.004

**ORIGINAL ARTICLE**

# Knowing but Not Doing: A Study on the Knowledge–Practice Gap in Autopsy Training Among Undergraduate Students in a Tertiary Care Institution

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Accepted: 15-June-2026 / Published Online: 2-July-2026

## Abstract

**Background:** Autopsy is an important part of medical education and clinical audit to enhance accuracy of diagnosis and comprehension of disease processes. But, the decreasing rates of autopsy and exposure in students can have an impact on competency. **Aim:** To evaluate the knowledge, attitude and practice of autopsy among students of allied health sciences in a tertiary care teaching institution. **Methods:** A cross-sectional study design was adopted to study the 200 students of allied health sciences in a tertiary care institution in Puducherry over a period of 6 months. Systematic random sampling was made to select the participants. The questionnaire was pre-tested and administered through Google Forms to gather data, which was analyzed with the help of descriptive and inferential statistics. **Results:** A total of 200 subjects found that 69.0% of participants were well informed and 62.0% positively oriented toward autopsy but just 36.0% were well exposed. The knowledge and year of study were statistically significantly correlated ($p < 0.001$). The logistic regression analysis revealed that academic year and previous experience with autopsy were big predictors of proper knowledge. **Conclusion:** Knowledge and attitude towards autopsy were satisfactory; however, practical exposure was not satisfactory, which underscores the importance of using better experiential learning strategies.

**Keywords:** Autopsy, Knowledge–Practice Gap

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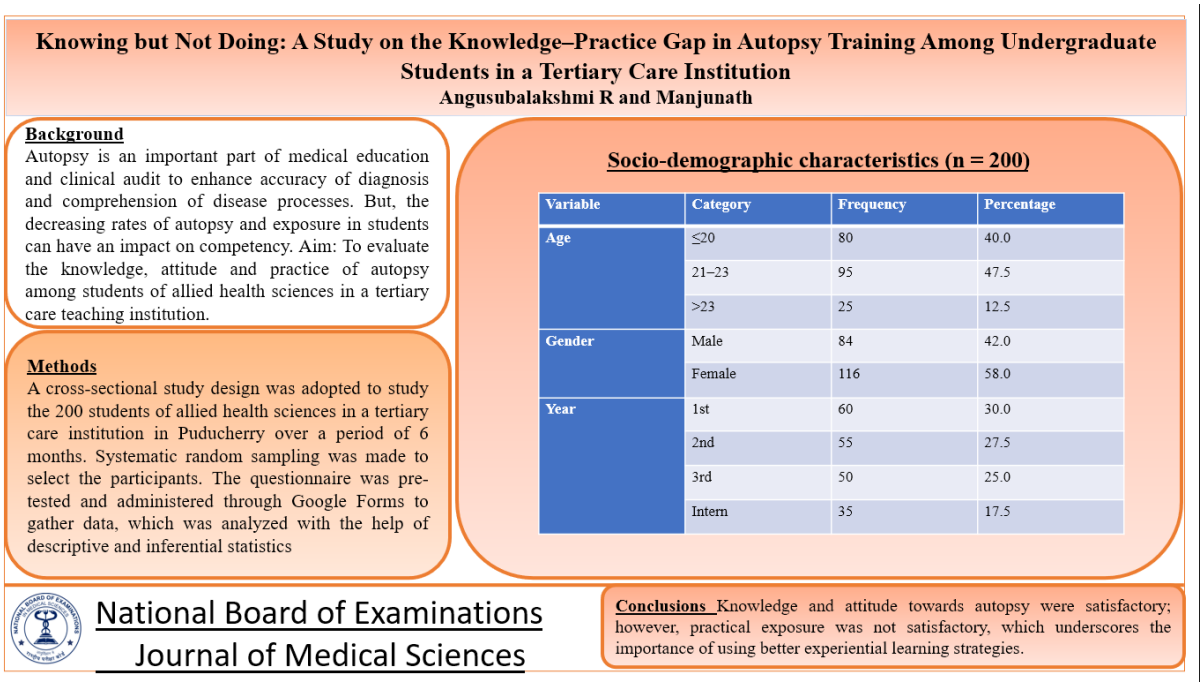
## Graphical Abstract




## Introduction

The gold standard of establishing the cause of death and developing an improved insight on the mechanisms of diseases has long been attributed to autopsy [1]. It is central to the medical education process since it helps to bridge the gap between theoretical and clinical knowledge by allowing students to directly observe pathological changes and relate them to clinical findings, thus, leading to a better quality of care and improved diagnostic accuracy [2]. It is also invaluable in medico-legal investigations, epidemiological surveillance and medical research [3].

Exposure to autopsy is an indispensable aspect of the training of students of health sciences, especially in such fields as pathology and forensic medicine. It promotes critical thinking, clinical reasoning and understanding of anatomical and pathological concepts, but the world has witnessed a clear drop in the rate of autopsy, which has consequences on medical education and quality of healthcare [4]. This drop has been blamed on a number of reasons such as ignorance, insufficient exposure, emotional uneasiness and sociocultural or religious convictions [5].

It is important to assess knowledge, attitude, and practice (KAP) of autopsy amongst the students to help reveal the existing gaps and barriers. The knowledge indicates the awareness of the purpose, procedures, and importance of the autopsy and the attitude is the perceptions, beliefs, and readiness to participate in the activities associated with autopsy and practice is the actual exposure and involvement in the autopsy procedure. Past research has shown that despite students having a rudimentary background concerning autopsy, their hands-on experience is usually restricted, and they tend to be fearful, ethically sensitive and culturally biased [6].

The KAP of students towards autopsy is crucial in designing specific educational interventions and enhancing curriculum delivery. Improving exposure

and dealing with myths can lead to a more favorable attitude and improved involvement with the practice of autopsy. Thus, the purpose of the study was to evaluate the knowledge, attitude and practice of autopsy among the students of the allied health sciences in a tertiary care teaching hospital.

**Objectives**

1. To determine the level of knowledge, attitude and practice of autopsy among allied health sciences students.
2. To determine the factors that affect knowledge and attitude towards autopsy among the study participants.

**Methodology**

The study was descriptive cross-sectional in nature, where the study participants were students of allied health sciences in a tertiary care teaching institution in Puducherry covering a period of 6 months.

**Study Population**

The population used in the study was the students in the allied health sciences at the institution during the study period.

**Sample Size and Sampling Technique**

A previous Indian study that indicated that about 70% percent of the students were well informed about autopsy [7] was used to determine the sample size; a final sample size of 200 study participants was used in the study to be representative and to maintain a reasonable non-response bias.

The sampling frame was the total number of eligible students in the institution, which was about 500. The systematic random sampling method was used. The sampling frame consists of all eligible students; all second students were chosen based on the first two students, but a random starting point was chosen. This was repeated until a sample of 200 people had been reached.

The systematic random sampling method was used to select study participants. A complete list of eligible students served as the sampling frame. After selecting a random starting point, every kth student was recruited until the required sample size was achieved. This approach reduced selection bias and ensured adequate representation of students across different academic years, thereby improving the representativeness of the study population.

**Inclusion Criteria**

- Allied health science students who were willing to participate
- Students who gave informed consent

**Exclusion Criteria**

- Students who did not agree to participate
- Questionnaire that was not filled to completion was not analyzed

**Study Tool**

A semi-structured questionnaire was pre-designed based on a review of the literature available and used to gather data. The questionnaire had sections on the knowledge, attitude and practice of autopsy.

Subject experts in community medicine and forensic medicine were consulted and verified the tool. It was also tested in a small number of students who did not belong to the final study population and appropriate adjustments were made so as to make it clear and understandable.

**Data Collection Procedure**

The questionnaire was turned into Google Forms and distributed to participants via institutional communication, including email and messaging. Participation was voluntary. The questionnaire contained an informed consent form at the start and only the people who agreed were allowed to continue. During the research, confidentiality and anonymity of responses were ensured.

**Data Analysis**

The responses of the Google Forms were exported to Microsoft Excel and processed in Statistical Package of the Social Sciences (SPSS 31.0 version) software. The data were summarized by descriptive statistics, which included frequency, percentage, mean and standard deviation.

The Chi-square test of inferential statistics was used to evaluate relationships between categorical variables. The knowledge was analyzed using multivariate logistic regression analysis to determine the independent predictors. The p-value of below 0.05 was deemed to be significant.

**Results**

A total of *200 students* participated in the study.

**Socio-demographic characteristics (Table 1)**

The majority of participants were in the 21–23 years age group (47.5%), followed by ≤20 years (40.0%) and >23 years (12.5%). The percentage of females (58.0%) was higher than males (42.0%). Regarding academic distribution, first-year students made 30.0%, second-year (27.5%), third-year (25.0%), and interns (17.5%). This shows a relatively even spread of the years.

Table 1. Socio-demographic characteristics (n = 200)

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Age | ≤20 | 80 | 40.0 |
| | 21–23 | 95 | 47.5 |
| | >23 | 25 | 12.5 |
| Gender | Male | 84 | 42.0 |
| | Female | 116 | 58.0 |
| Year | 1st | 60 | 30.0 |
| | 2nd | 55 | 27.5 |
| | 3rd | 50 | 25.0 |
| | Intern | 35 | 17.5 |

**Knowledge, Attitude, and Practice (Table 2)**

Of the participants, 69.0% exhibited sufficient knowledge with only 31.0% exhibiting insufficient knowledge. On attitude, 62.0% indicated a positive attitude with 38.0% indicating a negative attitude towards autopsy. Nevertheless, the proportion of individuals who were adequately exposed to autopsy practices was only 36.0% demonstrating a huge disparity between theory and practice.

Table 2. Knowledge, Attitude, and Practice levels

| Domain | Category | Frequency | Percentage |
|---|---|---|---|
| Knowledge | Adequate | 138 | 69.0 |
| | Inadequate | 62 | 31.0 |
| Attitude | Positive | 124 | 62.0 |
| | Negative | 76 | 38.0 |
| Practice | Adequate | 72 | 36.0 |
| | Inadequate | 128 | 64.0 |

**Association between year of study and knowledge (Table 3)**

The knowledge level and academic year were statistically significantly correlated ($p<0.001$). The proportion of students with sufficient knowledge rose with academic progressively, with 50.0% in first-year students and 84.0% in third-year students, which demonstrates the importance of clinical exposure.

The p-value of less than 0.001 indicates a highly statistically significant association between academic year and knowledge level. This suggests that the observed increase in knowledge across academic years is unlikely to have occurred by chance and reflects the positive impact of academic progression and clinical exposure on autopsy-related knowledge.

Table 3. Association between year of study and knowledge

| Year | Adequate | Inadequate | p-value |
|---|---|---|---|
| First | 30 | 30 | |
| Second | 38 | 17 | |
| Third | 42 | 8 | <0.001 |
| Intern | 28 | 7 | |
| Total | 138 | 62 | |

**Factors associated with knowledge (Table 4)**

The multivariate logistic regression analysis identified academic year and previous autopsy exposure as significant independent predictors of adequate knowledge. Third-year students demonstrated the highest likelihood of adequate knowledge (AOR = 4.50; 95% CI: 1.95–10.38; $p < 0.001$). Students with previous autopsy exposure had 3.25 times higher odds of possessing adequate knowledge compared to those without exposure (AOR = 3.25; 95% CI: 1.75–6.02; $p < 0.001$). Since the 95% confidence intervals did not include the null value of 1, these predictors were considered statistically significant.

Table 4. Multivariate logistic regression analysis

| Variable | Category | AOR | 95% CI | p-value |
|---|---|---|---|---|
| Gender | Female | 1.42 | 0.78–2.58 | 0.24 |
| Year | 2nd | 2.10 | 1.02–4.32 | 0.04 |
| | 3rd | 4.50 | 1.95–10.38 | <0.001 |
| | Intern | 3.80 | 1.55–9.28 | 0.003 |
| Exposure | Yes | 3.25 | 1.75–6.02 | <0.001 |

**Discussion**

The current study evaluated the levels of knowledge, attitude, and practice among students of allied health sciences and revealed that 69% of the respondents were well informed, which is comparable with the results of recent Indian studies [3,7]. The same levels of awareness have been observed in other more recent studies showing that the knowledge among the students in as far as autopsy is concerned is relatively well established [8,9].

In the recent literature, the significance of autopsy in medical education has been highlighted especially with the advent of newer modalities in teaching that include post-mortem imaging and virtual autopsy that supplement the traditional instructional mode and enhance learning outcomes [10,11]. These approaches may help bridge the gap between theoretical knowledge and practical exposure among students.

Autopsy remains an indispensable component of medical education because it provides direct clinicopathological correlation, enhances diagnostic reasoning, and strengthens understanding of disease processes. It also serves as an important quality assurance tool by identifying discrepancies between clinical diagnoses and pathological findings, thereby contributing to improved patient care and medical training.

The positive attitude towards autopsy was noted in 62% of the respondents, which is in line with other past and recent research reports that found that students understood the educational and medico-legal significance of autopsy [4,5]. A significant number of the respondents however had negative attitude towards autopsy, which could be attributed to emotional discomfort, cultural beliefs and fear of being exposed to dead bodies as reported in the past literature [12,13].

Autopsy is still essential in revealing cases of discrepancies between clinical and pathological diagnoses and thus enhancing the quality of care and diagnostic accuracy [14]; hence, its persistence in the face of modern diagnostic methods [15,16].

The significant disparity between knowledge and practice is one of the most significant results of the current study as only 36% of the participants were properly exposed to autopsy. This result is in line with multiple recent studies that point to the decreasing trend in autopsy rates and inaccessibility to practical training that can potentially impact the competency of future medical workers [16-18].

The relevance of autopsy in medical training has also been highlighted in the recent literature that has indicated its contribution to improving clinical competence, diagnostic reasoning and disease process knowledge [19,20]. This gap between knowledge and practice may also be explained by the lack of direct exposure, logistical issues and lower rates of autopsy in teaching hospitals. The implications of this gap are significant because, without sufficient practice training, the development of key clinical and medico-legal competencies in future healthcare providers can be hindered.

The study also found out that academic year and knowledge had significant association, with higher-year students having a higher level of knowledge. This result is consistent with the earlier literature, which demonstrated that more clinical practice and academic advancement help to enhance knowledge [7].

Multivariate logistic regression demonstrated that previous autopsy exposure was a strong independent predictor of adequate knowledge. Students who had prior exposure were more than three times as likely to demonstrate adequate knowledge compared with unexposed students (AOR = 3.25; 95% CI: 1.75–6.02; $p < 0.001$). This finding highlights the importance of experiential learning and suggests that direct participation or observation of autopsy procedures substantially improves understanding of autopsy-related concepts [10,11].

There was no significant difference in gender and knowledge levels as it was found to be related with other studies, which argue that exposure to education is a more critical factor than demographic factors [16].

On the whole, the conclusions of the current research point to the fact that despite the rather high level of knowledge and attitude towards autopsy, the level of practical exposure is still insufficient and requires the redesign of the curriculum and new approaches to teaching to improve the learning process.

## Conclusion and Recommendations

The current study has shown that most students of the allied health sciences had sufficient knowledge and a positive attitude towards autopsy. Practical experience on the process of autopsy was, however, found to be very wanting. Knowledge of progression in academics and previous exposure emerged as the determinants of knowledge. The results reveal a crucial gap between theoretical knowledge and practical exposure in medical education. Although most students demonstrated adequate knowledge and a positive attitude towards autopsy, only a minority reported adequate practical exposure, highlighting the need for

enhanced experiential learning opportunities.

To address the identified knowledge–practice gap, structured autopsy-based teaching sessions should be incorporated into undergraduate training. Increased opportunities for supervised autopsy observation and clinical postings should be provided wherever feasible. In settings where direct exposure is limited, simulation-based learning, virtual autopsy platforms, and video-assisted demonstrations may serve as effective alternatives. In addition, sensitization programmes addressing emotional, ethical, and cultural concerns related to autopsy should be conducted to improve student acceptance and participation. These strategies may strengthen experiential learning and enhance competency among future healthcare professionals.

**Statements and Declarations**

**Conflicts of interest**

The authors declare that they do not have conflict of interest.

**Funding**

No funding was received for conducting this study.

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