



Research

Forensic Cases in the Operating Room: Knowledge and Practices of Physicians and Nurses



Esmâ Ozsaker, PhD^a, Ahsen Kaya, MD^b, Aliye Okgun Alcan, PhD^{c,*},
Meryem Yavuz van Giersbergen, PhD^a, Ekin Ozgur Aktas, MD^b

^a Surgical Nursing Department, Ege University Faculty of Nursing, Izmir, Turkey

^b Department of Forensic Medicine, Ege University Faculty of Medicine, Izmir, Turkey

^c Nursing Department, Izmir Bakırçay University Faculty of Health Sciences, Izmir, Turkey

A B S T R A C T

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Purpose: The purpose of this study was to investigate physicians' and nurses' knowledge and practices regarding forensic cases in the operating room.

Design: This is a descriptive study.

Methods: The sample consisted of 139 physicians and 59 nurses working in the operating rooms of a university hospital. Data were collected via a question form prepared by the researchers.

Findings: Approximately half of the physicians and nurses did not know whether a patient brought to the operating room was a forensic case. Most of the physicians and nurses working in the operating room felt their knowledge and practice regarding the preservation and storage of evidence in forensic cases was inadequate.

Conclusions: The results of this study highlight the necessity of an increased focus on forensic case process.

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If an individual has a role in the disruption of the health of another individual, a claim or suspicion of such a situation is taken as a “forensic incident,” and the injured person as a “forensic case”.¹ Some cases of physical injuries caused by gunshots, hacks, blasting agents, assaults, and burns; traffic, occupational, or other unnatural accident cases causing severe hurt; criminal abortion; intoxication; suspected self-infliction of injuries, or suicide attempts are considered as a forensic case that may require surgical treatment.^{2,3} Owing to this wide range, health care workers working in operating rooms (ORs) encounter forensic events frequently.^{2,4} Generally, forensic cases require rapid intervention.³ Because of the judicial aspect of forensic cases, it is necessary to preserve and provide security for all material which could have value as evidence while promptly applying treatment and care.^{1,5}

Materials only have value as evidence in a forensic investigation if they are collected, preserved, stored, and transferred in a suitable

way.⁶ Thus, important deficiencies and errors can occur in the determination, collection, storage, and transfer processes in forensic cases in the event of a lack or deficiency in training. For this reason, materials, documents, data, and findings which could be evidence must be suitably preserved.⁴ However, in a medical emergency or when a life is in danger, health care workers may forget or overlook the potential of material as evidence.⁵ This can make the forensic investigation more difficult and can delay the forensic process or prevent it from reaching a conclusion.^{6,7}

Item 280 of the Turkish Penal Code states that a health care worker who encounters evidence that a crime has been committed while performing his or her duties and who nevertheless fails to report this to the authorities or who is late in this regard shall be sentenced to up to 1 year in prison.⁸ Here, the responsibility of the health care worker is, while providing the necessary medical assistance, to determine whether this is a forensic case, and in the event of a forensic case to make the necessary reports without delay.⁹ In the forensic process, the possibility of delay or omission in the process of identifying, collecting, storing, transferring, and recording material which may stand as evidence places a great responsibility on all health workers and in particular physicians and nurses.^{4,10,11} When physicians and nurses are performing

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* Address correspondence to Aliye Okgun Alcan, Bakırçay University Faculty of Health Sciences, Nursing Department, Gazi Mustafa Kemal Mahallesi, Kaynaklar Caddesi Seyrek, Menemen, Izmir, Turkey.

E-mail address: aliyeokgun@gmail.com (A. Okgun Alcan).

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duties relating to forensic cases, they must use their knowledge and skills to assess the patient forensically and must carry out interdisciplinary work together with forensic medicine specialists and the police.⁶

Background

It has been reported that even though encountering forensic events is nothing new in healthcare, physicians and nurses with insufficient knowledge and experience do not have the necessary preparedness to provide care for such events.^{4,6} It is reported that most nurses have encountered forensic cases but that they were deficient in evaluating them and in collecting, storing, and passing on to the relevant authorities material which might be used as evidence, and that their training and approach regarding forensic cases was insufficient.^{12,13}

Some forensic cases presenting to emergency services are directed to the OR for emergency surgery according to the seriousness of the injuries with the legal processes continuing in the OR.^{3,14,15} Emergency services mostly brings these patients to the OR in their clothes and without preparation in accordance with the seriousness of their condition. Foreign bodies that are often removed during surgery might be evidence.^{3,14-16} At this stage, forensic surgery, which encompasses the removal of ballistic objects such as bullets, sharp weapons, etc., comes into prominence.¹⁷ This specialty describes special procedures for removing, preserving, storing, and transferring these forensic specimens.¹⁷ Health care professionals in the OR should have training on these subjects.

In addition, clothing may be very important for some police investigations in finding out the offender and/or victim information.³ Therefore, the identification, preservation for the forensic process, storage, and later the transfer of materials which may be used as evidence are important in the OR as well. It is emphasized that OR nurses must ensure the secure collection and preservation of evidence to further this process.^{15,16}

For this reason, physicians and nurses working in the OR must be aware of legal procedures and act according to those procedures and regulations to ensure that forensic procedures are implemented correctly. It is important that records are correct and complete and for health care workers to have the basic knowledge of what must be done to preserve the chain of evidence.^{1,6,15}

Generally, most studies have been conducted with emergency service workers because of the forensic cases are encountered in emergency services most frequently.^{3,13,18} Studies conducted with OR workers are lacking. With these reasons in mind, the purpose of this study was to (A) determine the level of knowledge and practices regarding the preservation and storage of evidence in forensic cases by physicians and nurses working in ORs; (B) assess rates of knowledge and practices regarding the preservation and storage of evidence in forensic cases by sociodemographic characteristics and profession; and finally, (C) determine the attitudes of physicians and nurses working in the OR toward forensic cases.

Materials and Methods

Design

This study was a descriptive study.

Sample and Setting

This study was conducted in December 2015, in ORs of a Turkish university hospital in Izmir, Turkey. Written permission to conduct the research was obtained from the institution in which the research would be conducted after obtaining ethical approval.

Permission to administer the survey was gained from hospital management after evaluating the survey and the study. This approval was adequate to carry out the study and no additional approval was required. The purpose and details of the study were explained to the physicians and nurses, and verbal consent was provided by all participants.

Surgical departments at this hospital were included in the study. The surgical departments included pediatric surgery, general surgery, thoracic surgery, ophthalmology, obstetrics and gynecology, cardiovascular surgery, otorhinolaryngology, neurosurgery, orthopedics and traumatology, plastic and reconstructive surgery, urology, and organ transplantation departments. A convenience sampling method was used; all physicians and nurses working in the OR and willing to participate were included in the study. Physicians and nurses who took annual leave, were on pass, or refused to participate were excluded from the study. A total of 198 health care professionals (139 physicians and 59 nurses) working in the OR participated in the study.

Data Collection

A survey developed specifically for this study by the researchers was used to gather the data. The survey form consisted of 35 multiple-choice questions aimed at determining sociodemographic data as well as knowledge, practices, and attitudes of physicians and nurses about forensic cases. The first five questions identified sociodemographic characteristics (age, gender, occupation, practice area, and the length of service in the OR) of the participants, whereas the following 30 questions pertained to situations related to knowledge, practices, and attitudes about forensic cases. The survey form was not a scale, validity and reliability were not analyzed, and each question in the survey was evaluated separately. The employees were informed that their participation was voluntary and that results would be used only for a scientific study. After the physicians and nurses were informed about the scope of the study and guaranteed anonymity, the researchers handed the printed survey out directly to the volunteer participants. The participants were asked to respond to the survey questions at a convenient time. A suitable place in each OR was shown to participants to leave the surveys once completed. ORs were visited at regular intervals, and the researchers collected the completed surveys. Completing the survey took approximately 3-5 minutes.

Ethical Issues

Written permission to conduct the research was obtained from the Ege University Faculty of Nursing Ethics Committee and the institution in which the research would be conducted. The purpose and details of the study were explained to the physicians and nurses, and verbal consent was obtained from all participants by the researchers. Full anonymity of the participants was maintained.

Data Analysis

The data were evaluated using SPSS for Windows, version 16.0 (SPSS Inc., Chicago, IL). Descriptive statistics regarding the sociodemographic characteristics of the participants were analyzed through frequencies and percentages, and χ^2 test was used for analysis. The resulting *P*-value at $<.05$ was considered statistically significant.

Results

It was found that the mean age of the physicians and nurses included in the study was 36.27 ± 9.70 years (min: 24 years, max:

66 years); 111 (56.1%) were male, and 87 (43.9%) were female; 139 (70.2%) were physicians, and 59 (29.8%) were nurses; and their average length of work in the OR was 10.95 ± 9.97 years (min: 1, max: 43).

One hundred and four (52.5%) participants had not received any training on forensic cases. Also, 110 (55.6%) participants considered themselves inadequate on forensic case management, and 159 (80.3%) wished to receive training on this topic.

Our findings showed that 109 (55.1%) physicians and nurses stated that they did not know whether there is an arrangement or procedure in their institution for preserving and storing evidence in forensic cases. In this study, 85 (42.9%) participants also stated that they were able to decide whether a patient brought to the OR was a forensic case. In addition, 162 (81.8%) health care workers stated that they knew that it was necessary to report a forensic case to the forensic authorities. Furthermore, 103 (52%) physicians and nurses did not know where in the institution they had to report a forensic case.

Only 77 (38.9%) participants stated that they knew that the hands and body of a forensic case should not be wiped until evidence has been obtained. Moreover, 112 (56.7%) said that they did not know how to collect evidence in a suitable way. In addition, 111 (56.6%) indicated that they did not know how to package and store evidence in a suitable way, besides 121 (61.1%) saying that they did not know how to transfer or hand over evidence in accordance with the chain of evidence.

Our results showed that 140 (70.7%) participants had previously encountered a forensic case in the OR. Distribution of forensic case practices and knowledge among participants is provided in Table 1.

Physicians' and nurses' attitudes toward forensic case management process are given in Table 2.

Table 3 shows the approach to forensic cases by physicians and nurses in the ORs according to their state of training in forensic cases. The knowledge and application rates of those who had received training were statistically higher than those of the ones who had not received training. Educated OR workers were able to decide whether a patient brought to the OR is a forensic case better than uneducated ones ($\chi^2 = 4.6, P = .0001$). Also, educated personnel had better knowledge about knowing to report forensic cases to the forensic authorities than uneducated personnel ($\chi^2 = 11.353, P = .003$).

Discussion

The health care workers who are most likely to encounter forensic cases in the health field are those who work in emergency services. Accordingly, most studies in the literature have been conducted with emergency service workers.^{3,13,18} However, forensic cases may sometimes be sent directly from the emergency service to the OR, according to the seriousness of their injuries,^{3,14,15} but there are few studies conducted with health care workers in the OR. This research demonstrates that most (70.7%) of the physicians and nurses had encountered forensic cases in the OR. In line with the results of this study, forensic cases are also frequently encountered in the OR. Therefore, research conducted with OR workers is necessary.

In the forensic process, knowledge and sensitivity of health care workers will ensure the correct collection and preservation of evidence.^{1,6,7} There are various data about health care professionals' forensic case training in the literature. Eldredge¹⁹ stated that 58% of the trauma nurses had some education about forensic nursing. Ilce et al¹³ mentioned that majority (65.9%) of the health care staff working in the emergency service had no training on forensic cases. More recently, Alsaif et al²⁰ demonstrated that 77% of the health care professionals have not undergone any forensic case training.

Table 1
Distribution of Forensic Case Practices and Knowledge

Forensic Case Practices and Knowledge	n (%)
Encountered a forensic case in the OR before	
Yes	140 (70.7)
No	58 (29.3)
Making a report when a forensic case is encountered in the OR	
Yes	129 (65.2)
No	69 (34.8)
People responsible for preparing reports on forensic cases*	
Head of the department	32 (15.4)
Treating physician	64 (30.8)
Emergency physician	14 (6.7)
Other	16 (7.7)
Unknowning	82 (39.4)
The person in charge for reporting forensic cases in the OR	
Physician	105 (53)
Nurse	4 (2)
Other health care personnel	4 (2)
Unknowning	85 (43)
The unit where forensic cases in the OR are reported	
Hospital police	96 (48.5)
Chief physician	9 (4.5)
Other	3 (1.5)
Unknowning	90 (45.5)
Separate place in the clinic for storing forensic evidence	
Existing	22 (11.1)
Not existing	62 (31.3)
Unknowning	114 (57.6)
Forensic case archive in the institution	
Existing	36 (18.2)
Not existing	28 (14.1)
Unknowning	134 (67.7)
Easily accessible evidence collection kit in the OR	
Existing	2 (1)
Not existing	87 (43.9)
Unknowning	109 (55.1)
Prejudice discomfort, anger, or fear toward the patient is experienced when a forensic case is encountered	
Yes	24 (12.1)
No	133 (67.2)
Sometimes	41 (20.7)

OR, operating room.

* More than one response.

Asci et al²¹ stated that 15.6% of health care workers in the emergency department were trained about forensic case management. This research also shows more than half (52.5%) of the OR physicians and nurses had no training regarding forensic cases. These findings demonstrated that health care professionals are in need of training on forensic cases.

The results of this study demonstrate that very few (7.6%) participants felt adequate about their knowledge level on forensic case management. Gökdoğan and Erkol¹² stated that 84% of clinical nurses and educators had little or no knowledge concerning forensic cases. Alsaif et al²⁰ demonstrated that a majority of the nurses showed a big deficit about forensic knowledge. Asci et al²¹ indicated that only 20.6% of health care professionals felt themselves sufficient in forensic case management. These findings are thought to be due to a lack of education. These results showed that forensic case knowledge is crucial for health care professionals who care for forensic cases frequently.

Most of the physicians and nurses included in this study (80.9%) wished to be educated on forensic cases. This result shows that there is a perceived need for training. Training on forensic cases is necessary starting with the undergraduate education of health care workers on the preservation of evidence in forensic cases. It is known that classes on forensic medicine are included in the educational curricula of medical faculties. Similarly, forensic cases and the approach to forensic cases should be included in the basic courses of the curricula of nursing schools.

Table 2
Attitudes Toward Forensic Case Management Process in the OR

Physicians' and Nurses' Attitudes	n (%)
Removal of the clothing of a forensic case in a suitable way	
Yes	18 (9.1)
No	28 (14.1)
Sometimes	55 (27.8)
Unknowing	97 (49)
Labeling and preserving all materials which could be evidence in a forensic investigation	
Yes	24 (12.1)
No	30 (15.2)
Sometimes	47 (23.7)
Unknowing	97 (49)
Allowing damp or wet material to dry before packaging	
Yes	7 (3.5)
No	50 (25.3)
Sometimes	18 (9.1)
Unknowing	123 (62.1)
Placing all evidence materials separately in paper packaging or envelopes, etc.	
Yes	35 (17.7)
No	33 (16.7)
Sometimes	24 (12.1)
Unknowing	106 (53.5)
Suitably recording any kind of material which could be evidence before handing it over to the forensic authorities	
Yes	49 (24.7)
No	16 (8.1)
Sometimes	28 (14.1)
Unknowing	105 (53)
Sending to the forensic authorities all kinds of material which could be evidence	
Yes	61 (30.8)
No	5 (2.5)
Sometimes	24 (12.1)
Unknowing	108 (54.5)
Making a visual record such as a photograph, a drawing, a body map, or a diagram of the existence of any kind of injury (eg, bruises, abrasions, or cuts)	
Yes	41 (20.7)
No	30 (15.2)
Sometimes	36 (18.2)
Unknowing	91 (46)
Obtaining permission from the patient or his or her relatives when any visual recording is made	
Yes	23 (11.6)
No	36 (18.2)
Sometimes	23 (11.6)
Unknowing	116 (58.6)
Handing over to the patient the original films (fluoroscopy printout, photograph, etc.) of any imaging methods used on the patient	
Yes	10 (5.0)
No	75 (37.9)
Sometimes	22 (11.1)
Unknowing	91 (46)

OR, operating room.

The importance of preserving biological material that may be useful as evidence is emphasized during emergency treatment after a person's vital signs have stabilized.¹ In a forensic examination, the sensitivity of health care personnel and their knowledge on the topic are important for the preservation and correct collection of material that might be used as evidence.^{1,6} It was found in this study that half (56.7%) of the physicians and nurses did not know how to obtain probable evidence material in a suitable way in forensic cases.

It is critical to remove the victim's clothes in health care facilities. Health care professionals must be very careful about preserving probable evidence.²² Nevertheless, the results of this study demonstrate that nearly half of the health care professionals did not know the suitable way of removing clothes in a forensic case.

Table 3
Distribution of Knowledge and Practices on Forensic Cases by Physicians and Nurses According to the Status of Education for Forensic Cases

Practices	Educated (%)	Uneducated (%)	χ^2	P*
Deciding whether a patient brought to the operating theater is a forensic case	60.7	28.4	34.6	.0001
Knowing that a forensic case must be reported to the forensic authorities	91.0	74.3	11.353	.003
Knowing where in the institution a forensic case must be reported	48.3	21.1	19.036	.0001
Knowing that the hands and body of a forensic case must not be wiped until evidence has been determined	48.3	31.2	6.991	.030
Knowing to take evidence suitably	29.2	17.4	9.837	.007
Knowing to package and store evidence	27.0	16.5	8.889	.012
Knowing to transfer and hand over in accordance with the chain of evidence	22.5	10.1	10.043	.007
Suitably recording in the operating theater any kind of material which could be evidence before handing it over to the forensic authorities	40.4	11.9	25.293	.0001
Sending to the forensic authorities all kinds of material in the operating theater which could be evidence	43.8	20.2	16.624	.001

* χ^2 test was performed.

Damp or wet parts should be allowed to dry before packaging in a restricted secure location.²² In this study, most of the physicians and nurses did not know that they should allow damp or wet material to dry before packaging.

Another critical practice is packaging each evidence material in individual paper bags, container, or envelopes by avoiding cross-contamination.^{1,6,22,23} More than half (53.5%) of the participants indicated that they did not know placing each evidence material separate in paper packaging or envelopes. Current studies identified that most health care professionals do not have adequate knowledge regarding evidence protection.^{3,5,11}

Although it is recommended in forensic cases to obtain visual record of lesions or objects whenever possible, our results demonstrated that nearly half (46%) of the respondents did not know this.²²

According to the Turkish Criminal Law Article 280, "any health care professional, who, while performing his or her task, faces any signs of a crime but fails to inform or delays in informing the relevant authorities shall be sentenced up to 1 year imprisonment."⁶ Thus, health care workers who encounter "an indication that a crime has been committed" have the responsibility to report a forensic case.^{8,24} An important result of this study is that a great majority (81.8%) of the participants knew that a forensic case must be reported to the forensic authorities.

It is known that health care workers who do not have adequate knowledge and experience regarding forensic cases do not show the correct approaches in reporting forensic cases.^{4,6} For reporting forensic cases in a suitable manner, health care professionals primarily decide whether a case is a forensic case. Our results

demonstrated that less than half (42.9%) of the physicians and nurses were able to decide whether a patient brought to the OR was a forensic case.

Our results indicated that half (52%) of the physicians and nurses working in the OR did not know where in the institution a forensic case should be reported. In addition, some (39.4%) of the participants stated that they did not know who prepared reports on forensic cases. This difficulty on the part of OR workers in deciding whether a patient is a forensic case and their inadequacy concerning who should report a forensic case and to whom the report should be made is thought to stem from a lack of knowledge. For this reason, a need is felt for in-service training for health care workers to increase their knowledge regarding the approach to forensic cases.

It is reported that having evidence collection kits easily accessible in institutions will help to make the process easier.²³ In this study, nearly half (43.9%) of the physicians and nurses stated that there were no easily accessible evidence collection kits in the OR. In an OR, any material on a forensic case which might be used as evidence must be extracted without damage, and its suitable preservation must be secured by easily accessible evidence collection kits.

When performing the duties of collecting, storing, and preserving evidence and passing it on to the relevant authorities in places such as an OR, health care workers must display behavior in accordance with their professional principles, as in all cases. Most of the physicians and nurses in this study (67.2%) stated that they did not experience prejudice, discomfort, anger, or fear toward patients when they encountered forensic cases. This attitude of the workers suggests that they can perform their roles and responsibilities in full when providing care for forensic cases.

The results of this study demonstrated that health care workers implemented the procedures necessary in forensic cases at a low level, or it was not clear whether they had implemented them. In addition, the knowledge and practice about forensic cases of those who had received training were found to be statistically significantly higher than those who had not received any training ($P < .05$). Similarly, Ilce et al¹³ reported that those who had received training related to forensic cases were more successful in keeping evidence. Çilingir and Hintistan reported that even when nurses were not encountering forensic cases for the first time, they did not have the right approach to forensic cases because they did not have sufficient knowledge and experience on the topic of forensic medicine.⁴

Evidence is of critical importance in the reconstruction of illegal activities or criminal events, and all material that might be used as evidence must be preserved according to institutional policies and procedures. Our results showed that more than half (55.1%) of the physicians and nurses did not know whether there was an institutional arrangement or a procedure for the preservation and storage of evidence, and very few (35.4%) stated that these existed. In general, it is thought that a lack of institutional policies and procedures related to forensic cases or the lack of easy access and visibility of existing procedures by workers are among the factors resulting in delays and errors in the forensic process. For this reason, it is important to carry out actions which will create awareness of forensic cases at an institutional level.

Limitations

The fact that this study only included physicians and nurses from one university hospital was a limitation. In addition, a further limitation of the present study is that convenience sampling was used to collect data. Therefore, the results may not be generalized

to the population. Future studies should focus on a larger number of diverse health institutions.

Conclusion

In conclusion, it was found that most physicians and nurses working in the OR did not have adequate knowledge about preserving and storing evidence when they encountered forensic cases, that the knowledge and practices on this topic of those who had had training in forensic cases were more successful, and that workers wished for training in this area. Considering these results, it is recommended that OR workers would gain knowledge and practice in forensic cases by means of in-service training, that protocols should be created for forensic cases in ORs, that these should be visible and accessible to all, that courses on forensic cases should be added to the degree programs of health workers, and that postgraduate education programs should be extended in this area.

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