

Opinions of Operating Room Nurses Regarding Patient and Staff Safety in Operating Room

Ameliyathanede Hasta ve Çalışan Güvenliğine İlişkin Ameliyathane Hemşirelerinin Görüşleri

Çiğdem Canbolat Seyman¹, Sultan Ayaz²

ABSTRACT

Objectives: Patient and staff safety is a crucial issue for the health agenda of all countries. Patient safety involves promoting the measures which ensure that mistakes are noted, reported and corrected before they affect patients and health workers. This descriptive study was conducted to determine the opinions of operating room nurses regarding patient and staff safety, as well as the factors that affect these opinions.

Methods: This descriptive study was conducted in 2010 in the operating rooms of nine quality-certified public hospitals in Ankara. This study was applied to 100 operating room nurses. Data was collected through questionnaires.

Results: Operating room nurses report that the operating room engenders many risks towards patient and staff safety. The study shows that the three most frequent factors which threaten patient safety are: risk of infection (50%), problems with the transport of patients (50%), and wrong-patient/wrong-side/wrong-operation (35%). This study also revealed that the threats to staff safety are: sharp and penetrating injuries (44%), exposure to diseases that spread through contact with blood, body fluid, or respiration (41%).

Conclusion: Nurses reported a multitude of risks that affect patient and staff safety in the operating room. The most important of these are risk of infection and sharp, penetrating injuries.

Key words: Operating room, patient and staff safety, nursing

ÖZET

Amaç: Hasta ve çalışan güvenliği dünya sağlık gündeminde yer tutan önemli bir konudur. Hasta güvenliği, hataların hasta ve çalışanları etkilemeden önce belirlenmesini, rapor edilmesini ve önlenmesini kapsamaktadır. Bu tanımlayıcı çalışma hasta ve çalışan güvenliğine ilişkin ameliyathane hemşirelerinin görüşlerini ve bu görüşleri etkileyen faktörleri belirlemek amacıyla yapılmıştır.

Yöntemler: Bu tanımlayıcı çalışma, Ankara'da kalite belgesi olan dokuz devlet hastanesinde 2010 yılında gerçekleştirilmiştir. Çalışmaya 100 ameliyathane hemşiresi katılmıştır. Veriler anket formu yoluyla toplanmıştır.

Bulgular: Ameliyathane hemşireleri, ameliyathanede hasta ve çalışan güvenliğini pek çok faktörün etkilediğini belirtmişlerdir. Ameliyathanede hasta güvenliğini tehdit eden en önemli faktörlerin; enfeksiyon riski (%50), hastanın taşınmasıyla ilgili aksaklıklar (%50) ve doğru hasta, doğru taraf, doğru cerrahinin sağlanamaması (%35) olduğu belirlenmiştir. Ayrıca çalışan güvenliğini tehdit eden en önemli faktörlerin ise; kesici-delici-yakıcı alet yaralanmaları (iğne ucu, bistüri, koter v.b) (%44), kanla/ vücut sıvılarıyla/ solunum yoluyla bulaşan hastalıklara maruziyet (%41), olduğu belirlenmiştir.

Sonuç: Ameliyathane hemşireleri, ameliyathanede hasta ve çalışan güvenliğini pek çok faktörün etkilediğini, bu faktörlerden en önemlilerinin ise enfeksiyon riski ve kesici/delici alet yaralanmaları olduğunu belirtmişlerdir.

Anahtar kelimeler: Ameliyathane, hasta ve çalışan güvenliği, hemşirelik

INTRODUCTION

Patient and staff safety is a crucial issue in the health agenda of all countries. Threats in the operating room (OR) include work environment problems

(traffic, unplanned or complicated physical structures in the OR, etc.), fatigue and concentration difficulties, and lack of adequate staffing (doctors, nurses, auxiliary personnel) [1]. Christian et al.'s study

¹ Hacettepe University, Faculty of Nursing, Surgical Nursing Department, Ankara, Turkey

² Gazi University, Faculty of Health Sciences, Department of Nursing, Ankara, Turkey

Yazışma Adresi /Correspondence: Çiğdem Canbolat Seyman,
Hacettepe University, Faculty of Nursing, Surgical Nursing Department, Ankara, Turkey Email: cigdem_canbolat@hotmail.com

Geliş Tarihi / Received: 15.08.2015, Kabul Tarihi / Accepted: 12.01.2016

Copyright © Dicle Tıp Dergisi 2016, Her hakkı saklıdır / All rights reserved

shows many reasons for wrong-site surgery, such as lack of communication (79%), failure to follow procedures (60%) and lack of information between OR staff (25%). Additional reasons were lack of communication between OR staff, 35% between surgeons and 19% among nurses [2]. Patient safety involves promoting measures to ensure that mistakes are noted, reported and corrected before they affect patients and health professionals [3].

In the OR, both staff and patient safety should be taken into consideration, because of the many things that can affect staff safety, such as chemical agents and medical waste in the OR, working in shifts, fatigue and distraction, lack of equipment or a shortage of staff [4]. Such factors that threaten staff safety should be identified and eliminated.

Patient safety should be an area of focus in basic nursing care. Informing patients of risks and ways of minimising them, advocating patient safety and reporting adverse events should be among the responsibilities of nurses. From this perspective, safety practices in nursing are an important part of patient care [5]. Although patient and staff safety issues have been investigated in numerous studies, those conducted in Turkey to assess patient and staff safety in the OR are limited. The limited number of studies that do exist focus on nurse safety, occupational diseases (varicose veins, backaches, etc.), sharp and penetrating injuries, chemical risks and medication errors [6,7]. Although there are studies pursuant of patient safety in Turkish hospitals as part of accreditation efforts, structured patient and staff safety systems are not yet well-constructed. This study was conducted to identify the views of OR nurses regarding patient and staff safety, as well as the factors that affect these views.

METHODS

The population for this descriptive study was 140 OR nurses working in 9 quality-certified public hospitals in Ankara (the capital city of Turkey). Nurses who agreed to participate were included in the study, thus the sample comprised 100 nurses. Those who were on annual or maternity leave on the questionnaire completion days and those who did not agree to take part in the study were excluded. The questionnaire was tested through a pilot sample consisting

of fifteen nurses working in the operating room at Gazi University Hospital in Ankara, Turkey. Some modifications were made to the questionnaire after the pilot study. Data was collected using a questionnaire designed by the researchers. The questionnaire consisted of two parts. The first part included twelve questions recording sociodemographic data about the nurses (name, surname, education level, working time in OR, status in-service training, etc.) and the second part included another thirteen open-ended questions aiming to identify the factors that threaten patient and staff safety in the OR. Some examples of these questions were as follows: "What are the factors threatening patient safety in the OR?", "What are the factors threatening staff safety in the OR?", "What factors threatening patient safety originate in the OR?", "What precautions should be taken to ensure patient safety?". During data collection, the open ended questions were asked in a confidential environment, and the average time for the interviews was 20 minutes. Data was collected from January to May 2010.

The approval of Ankara Clinical Studies Ethics Commission No 1 was obtained on 11.01.2010, number 2010/01-155. Prior to the study, the written consent of the chief doctors was obtained. The informed consent form was given to the nurses, and their written and oral consent was obtained. The data was analysed using SPSS (Statistical Package of Social Sciences) version 15. Frequency, percentages and chi-square tests were used for data analysis. Descriptive characteristics and views regarding the patient and staff safety were given in numbers and percentages. A chi-square test was used to analyse significance among views regarding patient and staff safety, and variables such as age, education level, total years of employment, total years in the OR and the status of in-service training. The confidence interval was set at 95% and p value at 0.05.

RESULTS

Among the OR nurses, 61% were aged between 31 to 40 years old, 89% were female, 58% had graduated from two-year colleges, 22% were four-year university graduates and 56% were working at hospitals in the city center, 48% had been working in the OR for 4 to 10 years. 75% of OR nurses engaged

in between 1 and 4 operations each day on average. 65% had received in-service training (Table 1).

Table 2 show us opinions of operation room nurses on threats to patient safety in the operating room; risk of infections (50%), problems with transporting the patient (50%) and failing to ensure the process of the right patient, right site and the right operation (35%) (Table 2).

Table 1. Socio-demographic characteristics of operating room nurses (n=100)

Socio-demographic characteristics	n	%
Age		
20 - 30 years	28	28.0
31- 40 years	61	61.0
41 - 50 years	11	11.0
Gender		
Female	89	89.0
Male	11	11.0
Educational level		
Vocational HHS graduate	20	20.0
Two-year college graduate	58	58.0
Four-year university graduate	22	22.0
Place of employment		
Hospitals in city centers	56	56.0
Hospitals in towns	44	44.0
Total years of service		
≤ 10 years	34	34.0
11 -20 years	49	49.0
21 years ≥	17	17.0
Years spent in operating room		
≤ 3 years	20	20.0
4 -10 years	48	48.0
11 years ≥	32	32.0
Number of operations/daily		
1 – 4 operations	75	75.0
5 – 8 operations	25	25.0
Inservice training		
Yes	65	65.0
No	35	35.0
Total	100	100.0

HHS: Health high school

Nurses were asked about the precautions that should be taken to ensure patient safety, they stressed the proper sterilization and disinfection of

surgical and medical tools (60%), creating standard hand-washing instructions (31%) and controlling entry to the OR (22%) in order to minimize the risk of infections.

Table 2. Opinions of operation room nurses on threats to patient safety in the operating room (n=100)

Threats to patient safety in the operating room*	n	%
Infection risk	50	50.0
Difficulties in transporting patients	50	50.0
Wrong-patient, -site, -surgery	35	35.0
Failure in confirmation of patient ID	18	18.0
Overbooked operating room	17	17.0
No training as auxiliary personnel	13	13.0
Communication problems within the team	7.0	7.0

* More than one response was given, ID: Identity

In order to provide the right-patient, right-site, right-operation process, 56% of OR nurses reported that the surgical site should be confirmed by the patient and the team, 34% suggested that a standard form should be used, and 31% reported that the surgical site should be marked as part of the right-patient, right-side, right-operation process. In order to confirm patient identity, 58% of nurses suggested that a wrist identification band or card should be used, 45% stated that accurate and complete records should be kept and 44% reported that the informed consent of the patient should be obtained.

Table 3 indicate us that patient safety may also threatened by the factors for originating from the OR like unfavorable temperature, air circulation and lighting conditions (48.0%).

Table 4 show us that staff safety were most frequently threatened by sharp-penetrating injuries (44.0%). "Fatigue and distraction due to overworking" as a factor threatening staff safety was stated by significantly more nurses who had worked in the OR for 1-3 years ($p<0.05$). Another threat reported as seriously influencing patient safety in the OR was the issue of transporting patients, which may cause them to fall down and suffer severe harm. Nurses who had received in-service training highlighted the issue of "transporting patients" ($p<0.05$). It was found that sociodemographic features such as age, education level, length of employment did not have a significant effect on the views ($p>0.05$).

Table 3. Opinions of operating room nurses on threats to patient safety originated from the operating room (n=100)

Threats to patient safety originated from the operating room*	n	%
Unfavorable temperature, air quality and lighting in the operating room	48	48.0
Uncomfortable and improper operating room for the surgical team	36	36.0
Operating room corridors not allowing patient and equipment transfer	27	27.0
Prolonged repairs and maintenance work in the operating room	12	12.0
Hazards in the surgical environment (fire, gas explosion, etc.)	11	11.0

* More than one response was given

Table 4. Opinions of operating room nurses on threats to staff safety in the operating room (n=100)

Threats to staff safety in the operating room*	n	%
Sharp and penetrating injuries (needles, cautery, etc)	44	44.0
Exposure to illnesses spread through body fluids	41	41.0
Fatigue and distraction due to overworking	41	41.0
Exposure to chemical agents (soap, disinfectants, anesthesia gases)	25	25.0
Lack of adequate and qualified personnel and equipment	12	12.0
Lack of communication within the team	8.0	8.0

* More than one response was given

DISCUSSION

The Joint Commission International's "National Patient Safety Goals" report is based on the following principles: wrong-person, wrong-site, and wrong-procedure surgery can and must be prevented. Active involvement and the use of effective methods to improve communication among all members of the procedure team are important for success [8].

Surgical procedures cause stress for patients, destruction of their skin integrity, leads to trauma, and threatens patient [9, 10, 11]. In the present study, 50% of nurses believed that the risk of infection threatens patient safety in ORs, however the fact that %50 of nurses didn't feel it was risk suggests that they may not be aware of the importance of the issue.

Another threat that seriously influences patient safety in the OR is the issue of transporting patients, which may cause them to fall down and suffer severe harm. 50% of the nurses in this study mentioned this threat; however, most those who had received in-service training relating to this issue. In-service training may increase nurse awareness. There are different rates of patient falls in different units of hospitals, and it is estimated that 40% of the patients in acute care services were subjected to a fall, and that 3 to 6 of every 1,000 hospitalized patients suffered falls [11].

Another threat in operating rooms is the wrong-patient, wrong-side, wrong-operation process. In environments such as operating rooms, where different health professionals (anesthetists, surgeons, nurses, auxiliary personnel, etc.) work together in crowded teams with many patients, identifying patient identity becomes particularly important [12, 13]. A total of 70 wrong-site operations were reported in the USA in 2007 [14]. Wrong-patient and wrong-side surgeries are an unacceptable medical error, resulting from a lack of communication and orientation within the team [15, 16].

Another OR threat that is not typically listed in the literature is lack of training for auxiliary personnel (persons responsible for transporting patients or equipment). In the hospitals studied here, the need for auxiliary personnel is mostly met through purchasing service from private companies which employ individuals with low levels of education for low wages. As the education level of auxiliary personnel is not valued and they are not given any pre-service training by the hospital committees, these people may have problems in adapting to the work environment and job, which may increase the risk of errors. It is believed that equipping auxiliary personnel with information will improve patient safety.

Factors that are present in the OR also threaten the patient safety. The environmental factor is

particularly important for surgical site [17]. In this study too, 48% of the nurses stated that temperature, air circulation and lighting conditions in the OR may affect patient safety. In a previous study, Humphreys and Taylor concluded that ultra clean air circulation or airing the OR with a HEPA filter reduced postoperative infection rates from 3.4% to 1.6% [18].

Another threat to patient safety, which is not mentioned in the literature is prolonged maintenance processes in the OR (12%) (Table 3). This finding is thought to be because there are not enough technical personnel to undertake repairs and maintenance in the hospitals studied. Increased traffic in the OR due to prolonged repairs and maintenance may cause infections, just as noise and increased circulation may cause distraction on the part of the surgical team.

In the OR, the safety of the entire surgical team, particularly that of nurses, is at risk. In the present study, 44% of the nurses mentioned that sharp and penetrating injuries (needles, scalpel, cautery, etc.) threaten staff safety. Altok et al. found in their study that 79.1% of all health professionals had experienced at least one sharp and penetrating injury during their work life and that nurses comprise the highest group experiencing injuries (83%) [19]. Percutaneous injuries have recently been significantly reduced due to measures such as the use of disposable medical equipment (injectors, scalpel, lancet, etc.), drawing blood with a vacuum tube, and disposing of sharps in an impenetrable waste bin [20, 21].

Using sharp and penetrating tools frequently during operations increases the risk of diseases that spread through blood or body fluids [22, 23]. In this study too, nurses stated that diseases that spread through exposure to blood, body fluids and respiration threaten staff safety (41%). Similarly, Fry, also concluded that the surgical team is at risk of such diseases, which is a hazard for their safety [24]. OR staff should thus be checked and monitored by hospitals, and standard measures should be taken against blood borne infections such as HIV/AIDS, hepatitis B and C.

Another factor that threatens staff safety in the OR is fatigue and distraction [25, 26]. The nurses in the present study reported that fatigue and distraction

due to overwork threatens staff safety (41%). This view was stated significantly more by nurses who had worked in the OR for 1-3 years ($p < 0.05$). This may be attributed to the fact that new nurses generally work on evening and night shifts, and have long weekly working hours due to the shortage of the nursing staff. Admi's study also shows correlation between overworking and nurse safety [25].

In conclusion, nurses report that the OR possesses many threats to patient and staff safety. It is recommended that in-service training on patient and staff safety issues should be increased, measures should be taken against threats in the OR (such as unfavorable heating, airing, or lighting conditions); and the number of OR nurses and assistants should be increased. It would also be beneficial to replicate the present study in quality-certified university hospitals and private hospitals.

Declaration of Conflicting Interests: The authors declare that they have no conflict of interest.

Financial Disclosure: No financial support was received.

REFERENCES

1. Alfredsdottir H, Bjornsdottir K. Nursing and patient safety in the operating room. *J Adv Nurs* 2007;61:29-37.
2. Christian CK, Gustafson ML, Roth EM, et al. A prospective study of patient safety in the operating room. *Surgery* 2006;139:159-173.
3. Singh R, Singh A, Fish R, et al. Patient safety objective structured clinical examination. *J Patient Saf* 2009;5:55-60.
4. Carroll VS. Is patient safety synonymous with quality nursing care? Should it be? A brief discourse. *Qual Manag in Health Care* 2005;14:229-233.
5. Çırpı F, Merih YD, Kocabey MY. Nursing practices that are aims to patient safe and determining the nurses point view of this topic. *Journal of Maltepe University Nursing Science and Art* 2009;2:26-34.
6. Ergüney S, Tan M, Sivrikaya S, et al. Occupational risks that nurses face. *Journal of Ataturk University Nursing School* 2001;4:63-73.
7. Özkan Ö, Emiroğlu N. Occupational health and safety services towards hospital health employees. *Journal of Cumhuriyet University Nursing School* 2006;10:43-51.
8. Al-Awa B, De Wever A, Melot C, Devreux I. An overview of patient safety and accreditation: A literature review study. *Research Journal of Medical Sciences* 2011;5:200-223.
9. Warren A, Ellsworth IV, Iverson RE. Patient safety in the operating room. *Semin Plast Surg* 2006;20:214-218.

10. Özata M, Altunkan H. Frequency of medical errors in hospitals, determination of medical error types and medical errors: Konya sample. *Journal of Medical Research* 2010;8:100-111.
11. Hitcho EB, Krauss M, Brige S, et al. Characteristics and circumstances of falls in a hospital setting: A prospective analysis. *J Gen Intern Med* 2004;19:732-739.
12. Bodur S, Filiz E. Validity and reliability of turkish version of 'hospital survey on patient safety culture' and perception of patient safety in public hospitals in Turkey. *BMC Health Serv Res* 2010;10:28.
13. McCafferty MH, Polk HC. Patient safety and quality in surgery. *Surg Clin North Am* 2007;87:867-881.
14. Zohar E, Noga Y, Davidson E, et al. Perioperative patient safety: correct patient, correct surgery, correct side-a multifaceted, cross-organizational, interventional study. *Anesth Analg* 2007;105:443-447.
15. Gibbs VC. Patient safety practices in the operating room: correct - site surgery and nothing left behind. *Surg Clin North Am* 2005;85:1307-1319.
16. Makary MA, Mukherjee A, Sexton B, et al. Operating room briefings and wrong-site surgery. *J Am Coll Surg* 2007;204:236-243.
17. Lynch RJ, Englesbe MJ, Sturm L, et al. Measurement of foot traffic in the operating room: implications for infection control. *American J Med Quality* 2009;24:45-52.
18. Humphreys H, Taylor EW. Operating theatre ventilation standarts and the risk of postoperative infection. *J Hosp Infect* 2002;50:85-90.
19. Altıok M, Kuyurtar F, Karaçorlu S, et al. Healthcare workers experiences with sharps and needlestick injuries and precautions they took when injuring. *Journal of Maltepe University Nursing Science and Art* 2009;3:70-79.
20. Moloughney BW. Transmission and postexposure management of bloodborne virus infections in the health care setting: where are we now? *CMAJ* 2001;165:445-451.
21. Ayrancı U, Kosgeroğlu N. Needlestick and sharps injuries among nurses in the healthcare sector in a city of western Turkey. *J Hosp Infect* 2004;58:216-223.
22. Baskan S. Prevention of surgical site infections: how should be operating conditions?. *Turkish Journal of Hospital Infections* 2003;7:161-167.
23. Uzunköy A. The role of operating room on surgical site infections. *Journal of Harran University Faculty of Medicine* 2004;1:38-47.
24. Fry DE. Occupational risks of blood exposure in the operating room. *Am Surg* 2007;73:637-646.
25. Admi H, Tzischinsky O, Epstein R, Herer P, Lavie P. Shift work in nursing: is it really a risk factor for nurses' health and patients' safety? *Nurs Econ* 2008;26:250-257.
26. Berger AM, Barbara HB. Impact of shift work on the health and safety of nurses and patients. *Clin J Oncol Nurs* 2006;10:465-471.