



Research Article/Özgün Araştırma

Operating room nurses' knowledge on evidence-based practices

Ameliyathane hemşirelerinin kanıta dayalı uygulamalar hakkındaki bilgileri

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Abstract

Aim: This descriptive study was conducted to determine operating room nurses' knowledge on evidence-based practices.

Materials and Methods: This study was done with operating room nurses. The data were collected by using a form designed especially for this study which consisted 32 questions.

Results: The majority of the nurses were female (89.7%) and had an undergraduate degree in nursing (59.8%) and the work experience were 16.11 years. Gender, age, educational status and the institution of employment did not have any influence on operating room nurses' knowledge on evidence-based practices ($p>0,05$); while working experience, receiving training on this issue found to influence nurses' knowledge ($p<0,05$).

Conclusion: Working experience in the nursing profession and as an operating room nurse, receiving training are important determinants on knowledge of operating room nurses related to evidence-based practices.

Keywords: Evidence-based practice; Operating room; Nurse.

Öz

Amaç: Bu çalışma, ameliyathane hemşirelerinin kanıta dayalı uygulamalar hakkındaki bilgilerini belirlemek amacıyla tanımlayıcı olarak yapıldı.

Gereç ve Yöntem: Çalışmanın örneklemini ameliyathane hemşireleri oluşturdu. Veriler bu çalışma için özel olarak tasarlanan ve 32 sorudan oluşan bir form aracılığı ile toplandı.

Bulgular: Araştırmaya katılan hemşirelerin çoğunluğunun kadın (%89,7) ve hemşirelik alanında lisans derecesine sahip olduğu (%59,8). Hemşirelerin ortalama iş tecrübeleri 16,11 yıldır. Cinsiyet, yaş, eğitim durumu ve çalıştıkları kurumun hemşirelerin kanıta dayalı uygulamalar hakkındaki bilgilerini etkilemediği ($p>0,05$); ancak çalışma deneyimi, bu konuda eğitim almalarının kanıta dayalı uygulamalar hakkındaki bilgilerini etkilediği belirlendi ($p<0,05$).

Sonuç: Hemşirelik mesleğinde ve ameliyathanede deneyim sahibi olmak, kanıta dayalı uygulamalar hakkında eğitim almak ameliyathane hemşirelerinin konu hakkındaki bilgilerinde önemli bir belirleyicidir.

Anahtar Kelimeler: Kanıta dayalı uygulama; Ameliyathane; Hemşire.

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Introduction

Health care preferences are changing with the social structure of the community. These preferences oblige the use of effective cost policies and evidence-based practices (EBP). The demand for EBPs is increasing under the expectations of patients and professionals as well.¹

This is an approach that has been adopted to provide information-based health care.² EBP involves the selection of research results on a particular subject, evaluation of them, and preparation of these results for clinical practice decisions.³ The “Future for Turkish Health Sector Under 21 Aims” report prepared by the Ministry of Health in 2007 also included the provision of evidence-based health service.⁴

The origin of EBPs dates back to over times; however, their conceptualization and use in today’s sense has taken place in the late 19th century.⁵ Related scientific articles have started to gain importance in our country after the 2000s. In recent years, nursing studies offering evidence-based recommendations have begun to increase and have been examining the problems in nursing care.⁶ In nursing, EBPs refers to the decision-making process in which the best evidence is used and clinical experiences of nurses and patient preferences are taken into account.⁷ Evidence-based nursing practices are effective in increasing the quality of care, improving patient care outcomes, standardizing care, and increasing job satisfaction in nurses. It is inevitable for the nursing profession to follow scientific developments to meet the health care needs of society more quickly and safely. Nurses, who have an essential role in health care organizations, should understand evidence-based practices to know and evaluate the best information and adapt them to practices.⁷ EBPs are included in the Nursing Regulation published in Turkey as “Nurses plan, implement, evaluate, and monitor nursing care based on the evidence.⁸” Evidence-based nursing practices also create an opportunity for the development of the profession.⁶

Approximately 234 million major surgical procedures are performed worldwide every year.¹ They are involving EBPs in practices of operating room nursing, which is a vital field in both surgical nursing and providing patient safety. It allows providing a professional approach in applications and standard care practices, as well. Operating rooms are one of the settings in which high-technology equipment is used, various surgical methods are performed, and effective teamwork is critical. Operating rooms, it is highly essential to make correct decisions quickly and transform them into practice. Surgical nurses should perform all their practices during perioperative care of the patient based on evidence, which includes the preoperative, intraoperative, and postoperative care of the patient. In the previous studies conducted, it has been reported that the most common surgical site infections (SSI) seen in hospitalized patients could be reduced if every surgical patient evaluated in terms of risk factors and if necessary precautions are taken.⁹ Intraoperative evidence-based practices can be examined under the titles of skin preparation, surgical hand antisepsis, asepsis and surgical technique, surgical hand antisepsis, equipment sterilization, environmental disinfection.^{1,9} These practices are vital in facilitating patient safety in the operating room. Nurses have an important responsibility to ensure the practices on skin preparation of the patient,¹⁰ hand hygiene, gloving and aseptic procedures done by OR staff,¹¹ environmental measures to prevent infection^{1,9,12} and positioning the patient correctly.¹³ This study aimed to determine operating room nurses’ knowledge level regarding EBP in the intraoperative period. OR nurses should be educated related to SSI, their attendance at scientific meetings should be supported. In-service education on topics eg. aseptic technique, disinfection methods, and patient safety should be implemented for newly graduated nurses and their knowledge of evidence-based practices should be updated.

Materials and Methods

Type of research

The study conducted as a cross-sectional

and descriptive study and the data collected between July-August 2017.

Place and time of research

The data were collected from nurses who employed at the ORs' of a university hospital and three public hospitals in the city of Bursa.

Data collection and participants

The researchers prepared the data collection form according to relevant literature.^{1,4,9,10,12-15} The questionnaire consisted of 32 questions in total, seven questions about the demographic data of the nurses, and 25 statements that were responded as true/false to assess the knowledge of nurses on intraoperative evidence-based practices. Following the preparation of the form, opinions of 4 instructors in the nursing field were taken. The form was organized based on the suggestions taken from the experts. The internal consistency of the questionnaire was calculated as 0.82 (Cronbach's alpha). In the evaluation, each statement responded correctly by the nurses was scored as "1" point and each wrong answer was scored as "0" point. The score range of the form was between 0-25 (min-max) points. Correct responses were given to the statements by 80% (minimum of 20 points) accepted as adequate knowledge on EBP. One hundred forty (N=140) OR nurses were eligible for the study, the response rate was 62.14% (n=87) for this study. All nurses who voluntarily participated in the study and who were not on vacation or not on sick leave between the dates specified included in to study. The nurses were informed about the research and that participation in the survey was voluntary, and written and oral consent obtained from them. The data collection forms were delivered to the nurses in closed envelopes to protect their confidentiality and were collected back from them in the same manner after one week. The average time to answer questions was 15-20 minutes.

The ethical aspect of research

Ethics committee approval was obtained from the Ethics Board from the related institution (approval no: 2017.14/68).

Data analysis

SPSS 22.00 program was used in the evaluation of the data. Findings were given a number, percentage, means, and standard deviations (SD). Normality distribution, independent sample t-test, and one-way ANOVA test were used for statistical analyses.

Results

It was determined that the mean age of the nurses who participated in the study was 37.88 ± 6.54 and that the mean working experience was 16.11 ± 7.78 years. Of the nurses, 89.7% were female, and more than half (59.8%) had a bachelor of science in nursing (BSN). The ratio of the nurses who worked in operating rooms of the public hospital was calculated as 67.8%. Approximately half of the nurses (42.5%) had an experience of 16 years and over of operating room nursing and 52.9% did not receive training on evidence-based practices (Table 1). The distribution of the responses to the statements about EBP is presented in Table 2. Their total score from the statements about EBP was calculated as 20.29 ± 1.99 (Range:14-24 points). It was seen that the nurses responded 100% (n=87) correctly to the statements of "At the beginning or during the operation, a mask that completely covers the mouth and nose should be worn" and "Tissues should be treated nicely, effective hemostasis should be ensured, dead spaces and foreign body residues should be avoided." 94.3% of the nurses (n=82) gave the wrong answer to the statement of "The cleaning of the operating room between two operations is not required if there is no visible contamination in the equipment and on the surfaces (Table 2). There was no statistically significant difference found in the comparisons regarding gender, age, institution, and educational status of the nurses ($p > 0.05$). Nurses' experience in the profession and OR experience, and receiving training on EBP affected their score obtained from EBPs ($p < 0.05$) (Table 3).

Table 1. Variables related to the OR nurses (n=87).

	Number (n)	Percentage (%)
Age		
20-29 years	12	13.8
30- 39 years	42	48.3
40 years and over	33	37.9
Gender		
Female	78	89.7
Male	9	10.3
Education Level		
Community College	24	27.6
BSN	52	59.8
Msc+PhD	11	12.6
Place of employment		
University Medical Hospital	28	37.2
Government Hospital	59	67.8
Experience in the nursing profession		
0-5 years	6	6.9
6-10 years	18	20.7
11-15 years	13	14.9
16 years and over	50	57.5
Working experience in OR		
0-5 years	17	19.5
6-10 years	19	21.8
11-15 years	14	16.1
16 years and over	37	42.5
Receiving training related to EBPs		
Yes	40	46.0
No	46	52.9
Unanswered	1	1.1
Place of training received related to EBPs		
School	14	16.1
Seminar	15	17.2
Other (Congress, in the service training)	15	17.2
Unanswered	43	49.4
TOTAL	87	100.0

Discussion

The effect of some variables on nurses' EBP scores

Scientific evidence is highly essential in nursing care and in improving the quality of nursing care.¹⁰ For this reason, the development of EBP is important. The most critical problems regarding the use of the EBPs in nursing practice are that nurses/nursing students, participation in scientific meetings, reading research results limited,^{7,9} do not have sufficient knowledge about the research process, consider the studies conducted as irrelevant to clinical facts.¹⁶ In our study, it was found that of the nurses, 89.7% were female, that 48.3% were in the 30-39 age group, and that more than half (59.8%) had an undergraduate degree. According to Pala's study⁹, 38.2% of the

nurses had an undergraduate degree which is lower than our study.

In this study, it was determined that of the nurses, 67.8% worked in public hospitals and that 37.2% worked in a university hospital. More than half of the nurses had 16 years of working experience in the profession (57.5%) and in the operating room (42.5%). In the study conducted by Karayurt¹⁷, it was found that nurses' experience in the profession was below 20.8% and that OR experience was below 13.5%. In one study, it is indicated that nurses have training requirements in EBP.¹⁸ In this study, 52.9% of the nurses reported that they did not receive training on EBP, and 46.0% of those who received training on EBP reported that they heard about this concept in different events (e.g. seminars, congresses, and in-service training). EBP scores of the nurses who worked in the OR did not differ

according to their gender, age, educational status, and the institution they work ($p>0.05$). It was seen that the increasing age is not a sufficient factor in increasing the level of knowledge and that it does not influence attitudes towards EB nursing.¹⁵

The higher educational level leads to a more positive attitude towards the use of

EBP.^{19,20} In this study, no significant difference was found between the total scores of the nurses from EBP in terms of their educational level. Also, working as a nurse in a university hospital or a public hospital doesnot affect the scores obtained from the EBP. One study has been shown that institutional policies hinder EBP.²¹

Table 2. Answers are given by OR nurses related to EBPs in the operating room (n=87).

	True (n, %)	False (n, %)
1. Shaving the surgical area is not recommended unless it is mandatory (True)	74 (85.1)	13 (14.9)
2. If shaving is required single use, electric shaver or clipper should be used (True)	86 (98.1)	1(1.1)
3. OR nurses should never have long fingernails and they should not use artificial nails (True)	86 (98.1)	1(1.1)
4. Before surgical scrubbing accessories such as rings, watches and bracelets should be removed (True)	86(98.1)	1(1.1)
5. Surgical masks should cover both mouth and nose entirely during surgery (True)	87(100)	0(0.0)
6. Strings of surgical masks should be unfastened by hands and should be dispensed (True)	63(72.4)	24(27.6)
7. Surgical antiseptic liquids should be used for surgical scrubbing according to instructions of a product company for 2-6 minutes, and drying should be done with sterile towels (True)	84(96.6)	3(3.4)
8. Double gloving is recommended for preventing perforations on gloves (True)	76(87.4)	11(12.6)
9. OR clothes should be removed after use and after getting contaminated as soon as possible (True)	85(97.7)	2(2.3)
10. Sterile appliances and sterile liquids should be open right before use (True)	85(97.7)	2(2.3)
11. Flash sterilization can be used to save time or to save money by not buying new appliances (False)	53(60.9)	34(39.1)
12. Skin preparation should be done wide enough to include space for drain insertion (True)	79(90,8)	8(9.2)
13. All visible dirt on and around the surgical area should be washed and cleaned by using antiseptic solutions (True)	84(96.6)	3(3.4)
14. Routine administration of Vancomycin for antibiotic prophylaxis should be preferred (False)	79(90.8)	8(9.2)
15. Tissues should be treated gently; effective hemostasis should be ensured, dead space/ foreign object residues should be prevented (True)	87(100)	0(0.0)
16. If the surgical area is contaminated critically, the skin should be left open to facilitate primary or secondary closure (True)	70(80.5)	17(19.5)
17. To prevent surgical area infections, ultraviolet radiation should not be used in operating rooms (True)	42(48.3)	45(51.7)
18. As staff presenting in OR increases SSI tend to increase (True)	85(97.7)	2(2.3)
19. OR should be closed if contamination occurs or special cleaning should be done (False)	10(11.5)	77(88.5)
20. Sticky mats should not be used at the entrance of OR (True)	62(71.3)	25(28.2)
21. Regular microbiological samples should be taken from ORs (False)	11(12.6)	76 (87.4)
22. Dirt under nails should be cleaned with special nail cleaners under running water before the first case of the day (True)	72(82.8)	15(17.2)
23. Hypotensive and hypothermic situations increase the risk of developing pressure ulcers (True)	65(74.7)	22(25.3)
24. Pressure-relieving devices should be used for patients who are under the risk of developing pressure ulcers (True)	83(95.4)	4(4.6)
25. Cleaning the operating room is not required and if there is no visible dirt on accessories and surfaces (True)	5(5.7)	82(94.3)
The total score obtained from EBPs (Mean ± SD)	20.29±1.99 (range 14-24)	

Table 3. Influence of some variables related to the OR nurses on their score obtained from EBPs in the operating room.

Variables related to the nurses	n	Mean±SD	Significance
Gender			
Female	78	20.31 ± 1.99	t=0.279,df=85, p>0.05
Male	9	20.11 ± 2.08	
Age			
20-29 years	12	20.33 ± 1.70	F=1.310, p>0.05
30-39 years	42	19.95 ± 2.09	
40 years and over	33	20.07 ± 1.91	
Education Level			
Community College (2-year degree)	24	20.13 ± 1.60	F=0.118, p>0.05
BSN	52	20.37 ± 2.14	
MSc + PhD	11	20.27 ± 2.15	
Place of employment			
University Medical Hospital	28	20.17 ± 1.83	t=.350, df=84, p>0.05
Government Hospital	59	20.34 ± 2.07	
Experience in the nursing profession			
0-5 years	6	20.83 ± 1.83	F=3.487, p<0.05
6-10 years	18	19.00 ± 1.53	
11-15 years	13	20.69 ± 1.93	
16 years and over	50	20.29 ± 2.02	
Working experience in OR			
0-5 years	17	19.47 ± 2.40	F=6.020, p<0.005
6-10 years	19	19.21 ± 1.75	
11-15 years	14	21.42 ± 1.60	
16 years and over	37	20.78 ± 1.65	
Receiving training related to EBP's			
Yes	40	20.75±1.99	t=2.078, df=84, p<0.05
No	47	19.87±1.93	
TOTAL	87		

t: independent sample t-test

F: One Way ANOVA

The fact that operating room nurses have experience in working in the profession and in the operating room increases the level of knowledge on EBPs. In a study conducted in the UK, it has been determined that experienced nurses were more self-confident in reaching and using evidence that newly graduated nurses.²² EBP scores of the nurses with less experience in the profession were found to be high.¹⁵ In other studies, it has been found that nurses who have attended scientific meetings had higher knowledge levels on EBP than those who have not.^{7,23} Rojjanasrirat and Rice²⁴ determined that the EBP scores of the students who received training on EBP increased. In our study, nurses who received training on EBPs had a higher score, and the difference was significant ($p<0.05$) and it was similar to those previous studies. This finding suggests that it is beneficial to repeat the scientific knowledge gained and support it with scientific meetings. It is reported that administrative support will be able to facilitate to learn EBPs and reflect on patient

care practices for nurses. In the study conducted by Yılmaz and Gürler¹⁸, 97% of the nurses stated that institutional support was essential for EBP, and 54.4% of the nurses indicated that they were satisfied with this institutional support. It has been found that there is a significant correlation between nurses' belief in EBP and organizational culture.^{25,26} In this study, the nurses were not asked whether their institution supported scientific activities on EBP; therefore, the contribution of the institution was not evaluated.

The answers of the nurses to the statements on EBPs in the operating room

Skin preparation

When the operating room nurses' responses to the skin preparation were examined in our study, it was determined that 85.1% answered the question about shaving the operation site correctly, and 98.1% stated that a shaving machine should be used instead of a razor for hair removal on the operation

site. According to these results, it was thought that most of the nurses know the practices regarding skin preparation correctly. Aytaç et al.²⁷ reported that 83.8% of the nurses gave false answers related to question on hair removal on the operation site. The finding in this study is different than that in our research. If hair removal is required, a method that will not traumatize the skin just before the operation should be preferred.²⁸ In studies conducted, the ratio of surgical site infection (SSI) is 1-2% if shaving is performed just before the operation, and it increases to 3-5% if shaving is performed a night before the surgery. The ratio of SSI increases 7-times in those who are shaved 24 hours before the procedure.²⁹ In the same study, it was determined that the shaving before 24 hours increased the ratio of SSI by 20%.²⁹

Hand antisepsis and surgical clothes

Nurses' knowledge of hand antisepsis was appropriate, and their answers on relevant questions were correct but still had some shortcomings. Surgical scrub with appropriate antiseptics before sterile gowning and wearing gloves reduces the number of microorganisms that may be present on the skin. Experimental evidence indicates that 5 minutes are sufficient for the first surgical handwashing and 3 minutes is acceptable for second surgical scrub.¹¹

Since accessories such as rings, watches, and bracelets prevent the elimination of pathogenic microorganisms before surgical scrub, they should be removed.¹⁴ In the AORN Guidelines for Perioperative Standards and Recommended Practices, it is stated that the fingernails should have a length that does not exceed the fingertips (2mm). Artificial hand nails have been associated with hand contamination as well.²⁸ In our study, 87.4% of the nurses stated that wearing double gloves were recommended preventing glove perforation. The use of double gloves has been shown to protect the patient's blood and body fluids better than a single glove.¹² Most of the nurses (97.7%) agreed that contaminated surgical clothes should be changed as soon as possible. Impermeable clothes with a plastic site should be preferred by staff during surgery. Surgical clothes

should be replaced when they are visibly contaminated with potentially infectious material such as blood, urine, and when they are perforated.²⁹ Surgical masks are used to prevent transmission of microorganisms to incision sites in operation. It is mandatory to wear a mask to protect the nose and mouth from blood and other body fluids.¹² In the study, all nurses answered the question regarding the use of masks correctly.

Aseptic technique

Flash sterilization techniques can be used when an instrument requires sterilization immediately. This method should be used carefully and also needs to be recorded promptly. It can be preferred only in urgent cases where there is no chance to replace the surgical instrument;¹² however, it is not among the methods for routine sterilization. In this study, it was thought that 39.1% of the nurses did not have sufficient knowledge of flash sterilization practice and related procedures and that they require training on this subject.

Environmental and floor cleaning, ventilation

In our study, almost all of the nurses (94.3%) stated that the operating room should be cleaned anyway if there is no visible contamination. Based on this finding, it was thought that the operating room nurses' knowledge of the relevant subject was insufficient. In the literature, the surface disinfection is not recommended between the operations if there is no contamination.¹² There is no evidence showing that the use of ultraviolet radiation in the operating room is effective in reducing SSI.¹⁴ More than half of the nurses (51.7%) gave the wrong answer to the question that "ultraviolet radiation should be used in the operation rooms to prevent SSI." in this study. A vast majority of the nurses (88.5%) emphasized that special cleaning should be performed after the contaminated surgery and that the operating room should be closed. However, new evidence suggests routine cleaning and disinfection after operations classified as "contaminated" or "contaminated-infected" (including gaseous gangrene) according to surgical wound classification and after

surgeries of patients infected by Hepatitis B, Hepatitis C, or HIV. There is no requirement to close the operating room.³⁰ Similarly, the collection of microbiological samples on regular bases from the operating room is not recommended. It was seen that the nurses (87.4%) had insufficient knowledge about taking biological samples from the OR.

Implementation of antibiotic prophylaxis

Cases such as perforated appendicitis, biliary surgery, and foreign body implantation require prophylaxis; however, antibiotic prophylaxis is not required before endoscopy, percutaneous abscess drainage, chest tube placement for pneumothorax.¹¹ If elective interventions last 2 hours or less, a single-dose prophylactic antibiotic is sufficient. After wound closure, the implementation of antibiotics is not appropriate practice since it does not have a proven benefit and it leads to the development of resistant bacteria.¹¹ Contamination may occur at the incision site even in the operations performed under the ideal conditions. To minimize infection, antibiotic prophylaxis is recommended in sterile-contaminated and contaminated procedures. Antibiotics should be used for infected wounds. In sterile procedures, on the other hand, antibiotic prophylaxis is appropriate only in case of the use of a prosthesis. In this study, a large number of the nurses (90.8%) answered correctly the question related to prophylaxis, and this result was interpreted as that the nurse's knowledge is sufficient on this issue.

Positioning the patient

Positioning the patient in the operating room provides comfortable intervention to surgeons and anesthesiologists during surgery.¹¹ It is reported that the intraoperative risks for the development of pressure injuries caused by surgical interventions, including the patient's position and suitability of the positioning equipment, friction and corrosion, excessive moistness created by liquids used preoperatively for antisepsis of incision site, and patient-related factors.¹³ In our study, the majority of the nurses (95.4%) responded correctly to the statement about positioning; however, it should not be forgotten that

patient positioning requires teamwork, and the necessary precautions should be taken.

Results of this specific study can not be generalized to all OR nurses, since the study was conducted in one region of Turkey.

Conclusion

Experience in the profession and the operating room, receiving training are important determinants of knowledge of OR nurses related to EBPs. Conducting different studies with larger samples to determine the understanding of OR nurses related to evidence-based practices is essential.

Ethics Committee Approval

Ethics Committee approval was obtained from Ethics Board (approval no: 2017.14/68). This study was continued in accordance with the Helsinki Principles Declaration.

Informed Consent

All nurses who participated in to this study were informed both verbally and in written. Informed consent was signed by all participants.

Author Contributions

Study design: N.A, I.Y, E.G.K; Data collection: I.Y, E.G.K; Data analysis: N.A, I.Y; Manuscript preparation: I.Y, E.G.K, N.A.

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Conflict of Interest

The authors declare that there are no conflicts of interest in this study.

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Statements

This study has not been presented in any National or International Meeting

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