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Analysis of the Training Needs of Nurses Working in a Cardiovascular Surgery Intensive Care Unit

Kalp ve Damar Cerrahisi Yoğun Bakım Ünitesinde Çalışan Hemşirelerin Eğitim İhtiyaçlarının Analizi

Berrin PAZAR[1]
Hafize SAVAŞ[1]
Belma AY KILIÇASLAN[2]
Kaan KAYA[3]

[1]Lokman Hekim University, Faculty of Health Sciences, Ankara, Turkey
[2]Lokman Hekim University, Vocational School of Health Services, Ankara, Turkey
[3]Lokman Hekim University, School of Medicine, Ankara, Turkey

ABSTRACT

Objective: To identify the training needs of nurses working in a cardiovascular surgery intensive care unit.

Methods: This descriptive qualitative-phenomenological study was conducted with 8 nurses working in the cardiovascular surgery intensive care unit of a private hospital in Ankara. The data were collected through face-to-face interviews with 7 semi-structured open-ended questions created to determine the training needs of nurses between March and June 2022. The obtained data were analyzed using content analysis by 3 researchers using Colaizzi's phenomenological method, and themes were created.

Results: After the data analysis, 3 main themes emerged: skills required for cardiovascular intensive care unit nurses, difficulties experienced by cardiovascular intensive care unit nurses, and training needs.

Conclusion: IThe study found that there were no standard training programs about nursing care provided to cardiovascular intensive care unit nurses. Development of up-to-date and evidence-based training programs in this field may be helpful to maintain high-quality nursing care.

Keywords: Education, cardiovascular nursing, critical care nursing, intensive care units, qualitative research

ÖZ

Amaç: Kardiyovasküler cerrahi yoğun bakım ünitesinde çalışan hemşirelerin eğitim ihtiyaçlarını belirlemektir.

Yöntemler: Bu nitel-fenomenolojik tanımlayıcı çalışma, Ankara'da özel bir hastanenin kalp ve damar cerrahisi yoğun bakım ünitesinde çalışan 8 hemşire ile yapılmıştır. Veriler, Mart-Haziran 2022 tarihleri arasında hemşirelerin eğitim ihtiyaçlarını belirlemek amacıyla oluşturulan yedi adet yarı yapılandırılmış açık uçlu soru ile yüz yüze görüşme yoluyla toplanmıştır. Elde edilen veriler üç araştırmacı tarafından Colaizzi'nin fenomenolojik yöntemi kullanılarak içerik analizi kullanılarak analiz edilmiş ve temalar oluşturulmuştur.

Bulgular: Veri analizi sonrasında, kardiyovasküler Yoğun Bakım Ünitesi hemşireleri için gerekli beceriler, kardiyovasküler Yoğun Bakım Ünitesi hemşirelerinin yaşadığı zorluklar ve eğitim ihtiyaçları olmak üzere üç ana tema ortaya çıkmıştır.

Sonuç: Çalışmada, kardiyovasküler yoğun bakım hemşirelerine verilen hemşirelik bakımı ile ilgili standart bir eğitim programı olmadığı saptanmıştır. Bu alanda güncel ve kanıta dayalı eğitim programlarının geliştirilmesi kaliteli hemşirelik bakımının sürdürülmesine yardımcı olabilir.

Anahtar Kelimeler: Eğitim, kardiyovasküler hemşirelik, yoğun bakım hemşireliği, yoğun bakım üniteleri, niteleyici araştırma

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Corresponding Author/Sorumlu Yazar: Berrin PAZAR
E-mail: berrin.pazar@lokmanhekim.edu.tr

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INTRODUCTION

Nurses working in the intensive care units (ICUs) require continuous training to cope with the complexity of patient needs and rapid advances in technology. The ICU nurses are expected to manage medical support devices, such as mechanical ventilators, intra-aortic balloon pump, extracorporeal membrane oxygenation, and external pacemaker. Management of these complex systems requires high skills and immediate decision-making. Nurses working in the cardiovascular ICUs should meet the needs of sedated cardiovascular surgery patients dependent upon mechanical support devices and provide high-quality care in critical situations.[1,2]

While giving care to cardiovascular surgery patients, ICU nurses have important responsibilities, such as maintaining hemodynamic stability, evaluating pulmonary parameters, checking fluid volume and drainage, preventing complications, and managing pain. Within this context, constant observation and early diagnosis of complications by the nurses are highly important to improve the quality of postoperative care. As such, nurses contribute to improve patient outcomes and reduce complications, morbidity, mortality, and healthcare costs.[3]

The ICU nurses should integrate their knowledge to healthcare, function under stressful conditions, and make immediate decisions.[2] However, they experience stress, fear, and uncertainty in postoperative care.[4] Due to this reason, the characteristics of the nursing team and daily difficulties experienced during postoperative care should be taken into account. It has been stated that ICU nurses need support for accessing source materials, continuing education programs in a practical setting, and a philosophy that is compatible with research and evidence-based practices.[3] The study of Reisdorfer et al[4] found that the cardiovascular ICU nurses demanded more training on patient care. The study also underlined the need to create educational practices to meet the professional experience needs of the ICU nurses and make them feel more confident. Within this context, it is possible to argue that the team responsible for providing care to cardiovascular surgery patients should participate in postoperative care education in order to promote patient safety. Participants in the study of Reisdorfer et al[4] demanded the development of tools that standardize care for these patients, guide nursing care, and provide information to recognize the signs of complications. Due to this reason, the authors suggested the development of tools to guide the nurses to carry out care actions, which consider patient care complexity in the postoperative heart surgery period and the possible complications.[4] Such guiding tools improve the autonomy of nurses in decision-making and the standardization of healthcare.[5]

During nursing education in Turkey, intensive care nursing is given as an optional lesson in many universities. Graduated nurses receive orientation training in the institutions where they start working. In addition, intensive care certificate programs are organized for intensive care nurses.[6] However, all these trainings provide a general perspective on intensive care nursing in our country, and there are no specific trainings for cardiovascular surgery intensive care nursing.

In the study by Kocaman and Arslan Yurumezoglu,[7] in which they conducted the Situation Analysis of Nursing Education in Turkey between 1996-2015, it was reported that although the number of undergraduate students increased rapidly, the increase in the number of educators continued to lag this. It is recommended to take encouraging measures to eliminate the imbalances of faculty members. It has been determined that nurses working in ICUs after graduation also participate in continuing education activities, certificate programs, in-service trainings, and clinical orientation programs to improve themselves.[8,9] However, it is seen that there are no studies on the training needs of nurses working in cardiovascular ICUs. Therefore, in this study, it was aimed to determine the training needs of cardiovascular intensive care nurses.

METHODS

Study Design

This study employed a descriptive design and was conducted at a private hospital in Ankara between March and June 2022. Ten nurses who had been working in the cardiovascular surgery ICU of the hospital constituted the population of the study. The study was concluded with 8 nurses who agreed to participate. As a result, 80% of the universe has been reached.

Characteristics of the Hospital

Lokman Hekim Akay Hospital started to provide health services on August 1, 2016 in the Çankaya district of Ankara. The hospital has 101 patient beds, including 3-Bed Internal Intensive Care, 3-Bed Coronary Intensive Care, 3-Bed Surgical Intensive Care, 4-Incubator Neonatal Intensive Care, 7-Bed Cardiovascular Surgery ICU, and has a total bed capacity of 121. In 2021, 516 patients were treated in the ICU for surgery.

Although 10 nurses work in the cardiovascular surgery ICU of Lokman Hekim Akay Hospital, an average of 3-6 patients undergo cardiac surgery on weekdays. Nurses work in shifts of 7:30 AM-7:30 PM and 7:30 PM-7:30 AM. A nurse cares for 2 patients. The patients are followed up in the cardiovascular surgery Clinic before the operation and are followed up in the Cardiovascular Surgery (CVS) ICU after the operation. After the operation, the patients are connected to the ventilator and sedated from the operating room to the cardiovascular ICU with monitoring. Patients have postoperative invasive arterial catheters, central venous catheters, peripheral catheters, chest tubes, and urinary catheters. After the bleeding control and hemodynamic stability are ensured, the patients are separated from the ventilator by the responsible physician. Patients who do not need to be followed in the ICU are transferred to the cardiovascular surgery clinic and followed up here. No training is given to cardiovascular intensive care nurses in the hospital where the research was conducted.

Research Team

Three of the researchers are women and academics, and 1 is a male doctor. The first researcher is a doctoral faculty member in the department of surgical diseases nursing. Two of the researchers are in the thesis period of the surgical diseases nursing doctoral program. The fourth researcher is a specialist physician in cardiovascular surgery. All the researchers had previous training or experience in qualitative research methods. In-depth qualitative interviews were conducted by the second and third authors. Participants have general knowledge (professional experience, educational background, etc.) about researchers.

Data Collection Tools

A descriptive information form and a semi-structured questionnaire were used for data collection. The descriptive information form was developed by the researchers and included 5 questions on age, gender, education level, marital status, and length of ICU

Table 1. Semi-Structured Questionnaire

1.	What do you think about working in the cardiovascular ICU?
2.	What are the skills that a cardiovascular ICU nurse should possess?
3.	Did you receive any training before starting to work in the cardiovascular ICU?
4.	If you had received any training, what type of information was provided? What were the effects of this information on patient care in the cardiovascular ICU?
5.	Have you ever received in-service training programs? If yes, then what were the subjects of these programs?
6.	What are the difficulties you have experienced in the cardiovascular ICU?
7.	If you would receive any training to develop your knowledge, attitudes, and skills, what would you like to learn? (For example, critical patient care, mechanical ventilation, pulmonary support, resuscitation, etc.)

ICU, intensive care unit.

experience. The semi-structured questionnaire was developed by the researchers in line with the existing literature[4,10-14] and included 7 questions on the length of cardiovascular ICU experience, difficulties experienced during patient care, and training needs (Table 1). Researchers have experience working in the cardiovascular surgery ICU. Questions were formed by using these clinical experiences and literature.

Data Collection

Data were collected during face-to-face interviews. Interviews were conducted in Turkish. After obtaining written informed consent, participants were asked to complete the descriptive information form. Next, in-depth interviews were conducted. The interviews were audio-recorded and lasted approximately 30-45 minutes. Participants did not know the researchers conducting the interview. Interviews were conducted only in the nurse's room in the ICU, where the nurse and the researcher were present. Each participant was interviewed once, and after the interviews were written on the transcripts, the participant was asked to read and approve. Researchers are trained in qualitative research.

Ethical Approval

Approval was obtained from the ethical committee of the Lokman Hekim University (No. 2022/28, dated February 2, 2022). Participation was on a voluntary basis. Personal information of the participants was kept confidential, and any information that could identify the participants was excluded from the report. Written informed consent was obtained from all the participants.

Statistical Analysis

Number, percentage, mean ± standard deviation, and minimum and maximum values were used for descriptive statistics. Qualitative data were transcribed within 24 hours after each interview and analyzed using Colaizzi's phenomenological method.[15] Interview data were independently analyzed by 3 researchers to reveal meaningful expressions and formulate the main themes. In case of disagreement, the researchers debated the problem and reached to common theme. Besides, some of the expressions of the nurses were quoted.

RESULTS

Table 2 presented the descriptive characteristics of 8 participants. Accordingly, 87.5% were female, 75% were married, and 75% were graduates of the vocational school of health. The mean age was 29.62 ± 6.63 years, and the mean length of cardiovascular ICU experience was 7.00 ± 4.13 years.

Three themes were derived from the analysis of qualitative data, including the skills required for cardiovascular ICU nurses, difficulties experienced by cardiovascular ICU nurses, and training needs (Figure 1).

Theme 1. Skills Required for Cardiovascular Intensive Care Unit Nurses

Participants expressed that cardiovascular ICU nurses should be knowledgeable, rapid, careful, dynamic, innovative, critical, and self-confident. They should be able to manage crises and have a strong sense of communication. Besides, all participants were satisfied with working in the cardiovascular surgery ICU and believed that working in this unit was a privilege that brought professional contributions.

> "Nurses should be able to control monitorization. They should have the knowledge to immediately notice the changes in patient's health and should act immediately to perform the required interventions" (P2).

> "Nurses should have the observation skills since they constantly observe the patients. They should be critical and innovative" (P4).

> "They should manage anger and stress; they should act calm towards the patients" (P5).

Table 2. Descriptive Characteristics of the Participants (n = 8)

	Age	Gender	Marital Status	Education Level	Length of Cardiovascular ICU Experience (Years)
Participant 1	33	Female	Married	Vocational school of health	13
Participant 2	31	Female	Married	Vocational school of health	8
Participant 3	25	Female	Single	Associate degree	1.6
Participant 4	28	Female	Married	Associate degree	6
Participant 5	27	Female	Married	Vocational school of health	7
Participant 6	23	Female	Married	Vocational school of health	3
Participant 7	44	Female	Married	Vocational school of health	13
Participant 8	26	Female	Single	Vocational school of health	7

ICU, intensive care unit.

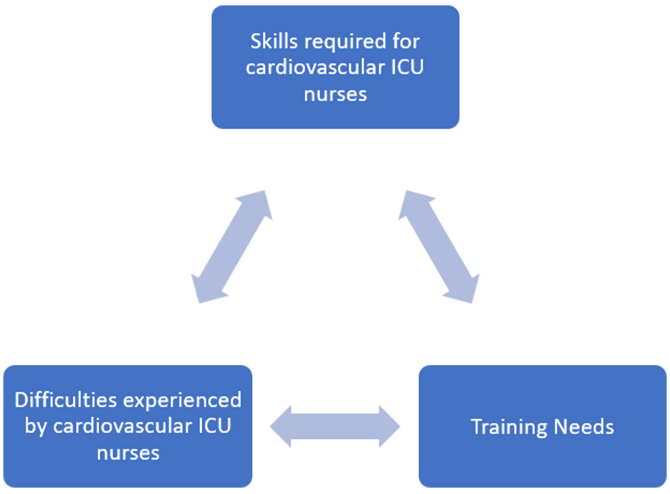

Figure 1. Themes Obtained from the Analysis of Educational Needs of Nurses Working in Cardiovascular Surgery Intensive Care Unit.

> "Nurses should be knowledgeable, practical, and rapid; they should decide and act rapidly, but their decisions should also be correct" (P8).

Theme 2. Difficulties Experienced by Cardiovascular Intensive Care Unit Nurses

Difficulties experienced by the participants included inadequate orientation, non-routine patients, physical weakness, lack of health personnel, and the management of patients experiencing delirium.

> "The number of personnel is not sufficient; generally, there are two nurses working here. There are instances we cannot be sufficient. Mobilization of patients using inotropic medications, overweight patients, patients with low threshold of pain, and the patients experiencing delirium (they may try to stand up, remove the drains, pull the ventilator, or even use violence) are the main difficulties I experienced" (P1).

> "Circulation is high; agitations during patient's wake-up are compelling. It seems as if drainage tubes will be removed while milking" (P5).

> "Patients that extubate themselves and the cases of arrest are really difficult to handle" (P6).

> "I experience difficulties when cardiac arrest occurs after the admission of the patient to the ICU, extubation or mobilization, or in cases of sudden bleeding, sudden hypotension, postperfusion or delirium" (P7).

> "We experience communication problems since there are patients over the age of 60 years. We have difficulties in maintaining their participation in treatment. We ask them to perform pulmonary exercises, or we explain certain rules about nutrition; however, I may argue that we experience difficulties in maintaining their adaptation to the circumstances" (P8).

Theme 3. Training Needs

All participating nurses working in the ICU have not received any training that includes written information specific to the ICU; rather, they were given clinical training and worked with mentors for 2 months. The nurses expressed that they could reacquire information or find the answers to their problems if written material was provided. They demanded to receive information on the physiology of the cardiovascular system, surgical methods, monitorization, hemodynamic stability, physical examination, complication management, wound care, delirium patient care, mechanical ventilation, weaning process, intra-aortic balloon pump, and blood gas analyzers.

> "Training on the types of patients in cardiovascular ICUS, delirium patients, pressure ulcer care, bleeding, shock, intubated patient care, and arrhythmia tendency may be provided" (P3).

> "For example, valvular heart disease patients should not consume much liquid but it is different for the coronary disease patients. So, what is valvular surgery? What is bypass surgery? What are the differences between these two types of surgeries? What should be paid attention in nursing care? What are the differences of care in abdominal endovascular aneurysm repair and thoracic endovascular aneurysm repair? Training should be provided on these issues" (P4).

> "Fluid-electrolyte balance monitoring, anastomosis sites of bypassed veins (it may be videos of surgery), chest tube insertion, electrocardiogram monitoring, observing the patients with pacemaker, medications, cardiac valves, Benthall procedure (if there is aortic intervention or bleeding risk), patient care after cardiac bypass surgery, peripheral pulse, tamponade monitoring, and medical dressing are the important issues. Training may be given on these subjects" (P5).

> "I would like to learn the names of the pharmaceutically equivalent drugs, the mechanisms of anticoagulants, the difference between healthcare provided after valvular and coronary bypass surgeries, intra-aortic balloon pump, and the healthcare provided to mechanical ventilation assisted patients" (P6).

> "I would like to receive training on mechanical ventilation; this is the issue that I find difficult. Since the physician is not in the field, nurses should take care of ventilator. I would also like to receive training on some equipment, such as intra-aortic balloon pump and blood gas analyzers. That is because we learn about these instruments by trial-and-error method" (P8).

DISCUSSION

The incidence of heart diseases is increasing parallel to the aging population. Consequently, the number of patients undergoing cardiovascular surgery and receiving postoperative care is rapidly increasing. The importance of postoperative nursing care during the ICU stay of these patients is undeniable. Postoperative nursing care after cardiovascular surgery is highly complex and requires proper planning and implementation. Up-to-date knowledge is vital for sustainable and high-quality nursing care.[16,17]

Participants of this study expressed that cardiovascular ICU nurses should be knowledgeable, rapid, careful, dynamic, innovative, critical, self-confident, able to manage crises, and have a strong sense of communication. Other studies also reported that ICU nurses should make rapid and effective decisions, use their knowledge even under stress, act immediately, and effectively meet the demands of patients on time.[2,18] The ICU nurses should have the skills to evaluate invasive treatment methods, such as ventilators, arterial line, pulmonary artery catheter, and intracranial pressure monitor.[1] Lack of skills and inadequate education are

among the main causes of nursing errors in ICUs.[19] Following the cardiovascular surgery, ICU nurses should continuously observe the patients, identify complications, and decide and act immediately to prevent these complications.[4] Bringsvor et al[11] underlined the importance of professional experiences of the ICU nurses. Santana-Padilla et al[20] also noted that the nurses should have sufficient experience, knowledge, and the capacity to use them in clinical practice. These features that nurses should have will also contribute positively to care and patient safety.[21] Due to this reason, hospital administrators should support and empower the ICU nurses.[10]

Patients in cardiovascular ICUs may experience immobility, thirst, insomnia, pain, and noise due to invasive equipment, changes in consciousness because of sedative agents, or anxiety, discomfort, and adaptation problems caused by endotracheal intubation.[22] Nurses responsible for healthcare may find it difficult to manage pain and anxiety and provide care to nonadaptive patients.[23] In our case, the participants expressed that they had difficulties with "non-routine" patients, such as the delirium patients, and complained about the lack of personnel and work overload, which increased stress. LeBlanc et al[12] reported that ICU nurses felt mentally and emotionally exhausted by their efforts to care for patients with symptoms of disorientation and agitation and were inadequate to manage agitation. For this reason, it can be suggested that the management of patients with disorientation and agitation symptoms should be explained in more detail in undergraduate nursing education and that nurses' awareness of burnout should be improved through in-service training.

One of the fundamental problems of ICU nurses is the inadequate number of nurses.[13] Darawad et al[14] reported that most of the nurses had 1:2 patient–nurse ratio and some had 1:3, indicating work overload. A study in Turkey also reported that the ICU nurses experienced problems caused by inadequate number of health personnel.[24] Similarly, participants in our study experienced various problems due to shortage of health staff. A suitable working environment with reduced workloads also positively affects care and patient safety results.[25] Developing new strategies to reduce the exhaustion of ICU nurses and improve their health status is crucial to improve patient outcomes.[10] Besides, nurses should be educated on effective coping strategies.[26] Inadequate use of these strategies may cause a high level of stress. Due to this reason, more flexible work schedules and employment of adequate number of nurses may be suggested to reduce work stress. It can be suggested that in-service training should be given to increase nurses' knowledge, skills, and communication skills, to motivate them, and to enable them to find the job attractive. The concept of care, which constitutes the basis of nursing, should be emphasized, popularized, and integrated into the nursing curriculum. Continuous training and in-service training programs should include special training programs to improve the healthcare performance of the ICU nurses.[14] Comprehensive education is required for ICU nurses to cope with the difficulties they experience during daily healthcare.[20] Participants did not receive any training on post-graduate intensive care. They provided care to the patients under the guidance of a mentor for 2 months only by being oriented by the training nurse in the ICU. However, they demanded educational materials so that they could reacquire information or find the answers to their problems. The participants also demanded to receive further information on the physiology of the cardiovascular system, surgical methods, monitorization, hemodynamic stability, physical examination, complication management, wound care, delirium patient care, mechanical ventilation, weaning process, intra-aortic balloon pump, and blood gas analyzers. The ICU nurses in the study of Santana-Padilla et al[20] underlined the importance of continuous training and expressed that undergraduate training only provided the basic skills and abilities for ICU, so further training and specialization were required to work safely.[20] Similarly, Marshall et al[27] reported that the ICU nurses should be more knowledgeable since they provide critical care. Supporting the ICU nurses with continuous training programs is crucial for the development of critical thinking skills, meeting the needs of critical care patients, and adaptation to constantly changing technology and treatment procedures. Our study found that the absence of any training plans on ICU education is an important problem to be solved. Due to this reason, each unit should identify their needs to provide specific training programs, and comprehensive training programs should be provided to overcome healthcare difficulties.[20] Clinical orientation training, in-service training, and course and certificate programs should be promoted. However, Balık and Öztürk[28] reported that more than half of the ICU nurses do not participate in educational programs and meetings. Due to this reason, hospital administrators may promote the participation of the ICU nurses to in-service training and scientific events, such as workshops, congresses, conferences, and symposiums so that the self-confidence of these nurses may improve and their professional development may be maintained.

Study Limitations

The findings of the study are limited to the experiences of 8 cardiovascular ICU nurses and single center so that they may not be generalizable. The fact that the majority of the participants are graduates of the vocational school of health may cause educational deficiencies. The third limitation is that the interviews are conducted during the working hours of the participants, which may negatively affect them.

The study found that cardiovascular ICU nurses needed knowledge and skills to provide effective healthcare. Within this context, in addition to undergraduate education, continuous training on patient care in the field of cardiovascular ICU is required. Education will also contribute to the development of care and patient safety culture. Besides, hospital administrators should develop strategies to manage personnel and workload. They should also promote the participation of cardiovascular ICU nurses to in-service training and scientific events, such as workshops, congresses, conferences, and symposiums. Based on these findings, we may suggest that the issues that the cardiovascular ICU nurses demand to learn may be identified and a standard training program may be developed. Up-to-date and evidence-based training programs in this field are crucial to provide high-quality nursing care. For nurses working in the cardiovascular surgery ICU, it may be recommended to develop a training plan by establishing synergy with the hospital management and other ICUs.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Lokman Hekim University (Date: February 2, 2022, Number: 2022/28).

Informed Consent: Written and verbal consent were obtained from nurses in the study.

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