

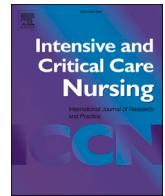


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## Research Article

# Cardiovascular nurses' experiences of working in the COVID-19 intensive care unit: A qualitative study

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### ABSTRACT

**Background:** Cardiovascular nurses' skills and experiences of cardiac critical care, management of cardiovascular emergencies, and mechanical circulatory support have been considered vital in providing nursing care for COVID-19 patients in intensive care units during the COVID-19 pandemic. To our knowledge, there are no studies have focused on the contribution and experiences of cardiovascular nurses in the critical care of COVID-19 patients.

**Objectives:** To explore the experiences of cardiovascular nurses working in a COVID-19 intensive care unit during the pandemic.

**Methods:** The study was conducted as a qualitative study with phenomenological approach in June-December 2020. Study data were gathered from ten cardiovascular nurses through semi-structured interviews.

**Results:** Six themes emerged from the interview data: the duties and responsibilities in a COVID-19 intensive care unit; the differences of COVID-19 intensive care unit practices from cardiovascular practices; the transferrable skills of cardiovascular nurses in a COVID-19 intensive care unit; the difficulties encountered working in a COVID-19 intensive care unit; the difficulty of working with personal protective equipment; and the psychosocial effects of working in a COVID-19 intensive care unit.

**Conclusion:** Cardiovascular nurses made an important contribution to the management of nursing services with their experiences and skills in the COVID-19 pandemic.

### Implications for clinical practice

- Cardiovascular nurses are one of the most suitable types of nurses for the dynamic nature of COVID-19 intensive care units.
- The skills of cardiovascular nurses, such as recognising changes in heart rhythm, predicting clinical changes in patient, responding quickly to emergency situations and treating patients with extracorporeal membrane oxygenation, can make significant contributions to the management of COVID-19 patients' critical care.
- The results of this study can be useful in drawing comparisons in future studies to explore the experiences of nurses from different fields during the COVID-19 pandemic.

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## Introduction

The coronavirus disease (COVID-19), caused by the SARS-Cov-2 virus, is an infectious disease considered to be one of the largest global pandemics facing humanity (Huang et al., 2020). The World Health Organisation declared the COVID-19 outbreak to be an international public health emergency on 30 January 2020 and a global pandemic on 11 March 2020 (Lauermann et al., 2020).

The pathophysiology of COVID-19 is complex. Although the respiratory system is the principal target of COVID-19, the virus can affect other major organ systems such as the gastrointestinal, hepatobiliary, renal, central nervous and cardiovascular systems. However, cardiovascular complications are frequent in COVID-19, and the disease may cause myocardial injury, cardiomyopathy, ventricular arrhythmias, acute coronary syndrome, cardiogenic shock and venous and arterial thromboembolic events (Casella et al., 2021; Hajjar et al., 2021; Wiersinga et al., 2020; Costa et al., 2020; Fraissé et al., 2020; Klok et al., 2020). There is no specific antiviral treatment for the disease and optimised support is essential in the treatment and care of patients. While 81% of COVID-19 cases present with mild symptoms, 14% develop a severe form of the disease, and 5% require hospitalisation and critical care (Wu & McGoogan, 2020). An average of 25% of hospitalised patients were treated in intensive care units (range of 5–32% dependent on the institution and the country) (Phua et al., 2020; Halacli et al., 2020). Critical care of the COVID-19 patients typically includes conventional oxygen therapy, high-flow nasal canula oxygen, non-invasive and invasive ventilation, conventional acute respiratory distress syndrome procedures and mechanical circulation support, such as extracorporeal membrane oxygenation (ECMO) (Phua et al., 2020; Zhu et al., 2020). In many countries, the need for critical care exceeded the capacity of the hospitals (Phua et al., 2020; Zangrillo et al., 2020). To accommodate the critical care needs, non-emergency surgical procedures and treatments were postponed, and departments in hospitals were converted to provide critical care for COVID-19 patients with health professionals being removed from their departments and assigned to COVID-19 intensive care units (Phua et al., 2020; Qiu et al., 2020; Raurell-Torredà, 2020; Chen et al., 2020; Stucky et al., 2020). In Turkey, some hospitals with intensive care units became 'COVID-19 pandemic hospitals' to meet the critical care needs. In these hospitals, nurses and doctors from different hospitals and departments formed COVID-19 response teams in which cardiovascular nurses played a vital role as critical care, management of cardiovascular emergencies and complication/mechanical circulatory support were required (Raurell-Torredà, 2020; Chen et al., 2020; Stucky et al., 2020; Koken et al., 2020).

Cardiovascular nurses specialise in cardiovascular health and provide critical care to those in cardiovascular intensive care units. In order to care for patients, cardiovascular nurses use a variety of skills, including monitoring haemodynamic parameters, recording and interpreting findings from an electrocardiogram, management of mechanical circulation support devices, initiating and providing cardiopulmonary resuscitation and rapid management of arrhythmias. Additionally, they may be required to use their skills of assessment to refer patients for consultation and further investigation. Therefore, these skills require cardiovascular nurses to demonstrate high levels of clinical judgement, clinical inquiry and caring practices to effectively manage patients and optimise outcomes (Linden, 2020; Hardin & Kaplow, 2010; Riley et al., 2005). All these skills and experiences have been considered vital in providing nursing care for COVID-19 patients in intensive care units during the pandemic. In Turkey, many cardiovascular nurses are working in COVID-19 pandemic hospitals to meet critical care needs. Exploring the experiences of these nurses can contribute to the management of nursing services during the ongoing COVID-19 pandemic. To our knowledge, no studies have focused on the contribution and experiences of cardiovascular nurses in the critical care of COVID-19 patients. This study, therefore, aims to document the experiences of cardiovascular nurses working in a COVID-19 intensive care unit during

the pandemic.

## Methodology

The study was conducted as a qualitative study with phenomenological approach and adopted Colaizzi's phenomenological data analysis method (Colaizzi, 1978). The study was conducted through semi-structured in-depth interviews. Phenomenological studies aim to gain a deeper understanding of the meaning of people's everyday experiences, revealing the essence or essential structure of any phenomenon under investigation whilst providing insight into reality (Polit & Beck, 2008; Van Manen, 1990). Therefore, a phenomenological approach was used to reveal and understand cardiovascular nurses' experiences in depth regarding the management of COVID-19. Colaizzi's phenomenological data analysis method was used to analyse the findings of the study. This method follows seven data analysis steps to identify meaningful information and organise the information into themes and sub-themes. The method offers a clear, systematic approach and provides rigorous analysis with each step (Colaizzi, 1978).

## Participants

Our research population was cardiovascular nurses who were assigned to a COVID-19 intensive care unit during the pandemic in Turkey. Cardiovascular nurses provide care in cardiac intensive care units to critically ill patients who have undergone cardiac surgery or have a cardiac problem. Cardiovascular nurses who have been working in the level 3 cardiac intensive care unit for at least one year, as well as those who have worked in the COVID-19 intensive care unit during the pandemic, were included in this study. Participants in this study were determined via snowball sampling, which is one of the purposive sampling methods (Merriam, 2013). The first participant was randomly invited to the study from one of the pandemic hospitals located in Ankara, Turkey. Each participant provided the contact information (phone number and email address) of one or two colleagues to the researchers. The researchers invited these nurses who met the inclusion criteria to the study via telephone. The interview date was determined with the participants and the interviews were held online via the ZOOM™ video conferencing platform. Participants were interviewed from a room in their home in which they were alone and felt comfortable. The interviewer and reporter participated in the interview from their personal office rooms. For the current study, ten nurses over the age of 18 volunteered to participate. They came from four different pandemic hospitals in Turkey. The sample size was based on data saturation (Merriam, 2013; Glesne, 2012). In the sixth interview, the data started to become repetitive. Then, four more interviews were conducted before it was determined that data saturation had been reached at the 10th interview.

## Data collection

Data were collected in July 2020. Participants were contacted via phone, informed about the aim of the study and invited to take part. An informed consent form was sent to the participants to sign and then returned via e-mail. Once the consent was received, an appropriate time and date was set for the in-depth interview. Since face-to-face interviews were ill-advised during the pandemic, detailed personal interviews, recommended as a data collection method for qualitative studies (Saarijärvi and Bratt, 2021; Farooq and De Villiers, 2017), were conducted via remote online calls in computer applications (ZOOM™). Video support was utilised during the interviews to monitor the responses and the mood of the participants. Two researchers were present in each interview, one leading the interview (ZOK; faculty, PhD, female, experienced in qualitative studies & SG; faculty, PhD, female, experienced in qualitative studies) and the other reporting (HS; research assistant, PhD candidate, female, experienced in qualitative studies). The

**Table 1**  
Semi-structured questionnaire.

Questions
1 What were your duties/responsibilities and nursing practices in the COVID-19 intensive care unit? Would you explain?
2 What were the differences between working in this unit and in the cardiovascular care unit?
3 Would you explain the effect of being a cardiovascular nurse in the COVID-19 intensive care unit?
4 How do you think cardiovascular nurses contribute to the nursing services in the pandemic?
5 What were your personal or occupational needs during this pandemic as a cardiovascular nurse?
6 What were the difficulties you faced when caring for COVID-19 patients? How did you handle these difficulties?

detailed interviews were recorded with computer-based chat software. The descriptive data were collected from the participants at the beginning of the interview by means of a questionnaire followed by a 40-to-60-minute detailed interview using semi-structured questions. The participants were labelled one to ten to maintain anonymity e.g. the first participant is Nurse 1 and is coded N1. The interviews were held in Turkish so that participants could express themselves easily.

**Demographic information:** Demographic data were collected using the descriptive information form that had been prepared by the researchers. The form contained questions about age, gender, education, job experience and experience as a cardiovascular nurse.

**Qualitative interviews:** Semi-structured interview questions were developed by the researchers. The questionnaire included seven open-ended questions evaluating a cardiovascular nurse's duties, responsibilities, experiences, requirements and problems faced in the pandemic clinic (Table 1).

*Data analysis*

Colaizzi's phenomenological interpretation method (Colaizzi, 1978) was used to analyse the data (Table 2). In this approach, data analysis is focused on experience and its context and was analysed by three researchers independently. Recorded interviews were transcribed by an external research assistant. The transcription of the interviews was done in Turkish. The expressions of the participants were translated into

**Table 2**  
Data analysis process according to Colaizzi's phenomenological method

Step	Description
1.	The recorded interviews were transcribed, and each transcription was read several times to gain a sense of the whole content. The transcripts were read by three researchers independently.
2.	Significant statements that pertain to the phenomenon were extracted from each of the transcripts by three researchers. These statements were combined into a single form by the researchers.
3.	Meanings were formulated and grouped from these significant statements. The researchers carefully examined the meanings in order to theorise themes and sub-themes.
4.	The formulated meanings were sorted into themes and sub-themes. Three researchers independently identified the themes and sub-themes.
5.	All emergent themes were defined into an exhaustive description. Following discussion and an exchange of opinions, the themes and sub-themes were then categorised based on similarities and differences. An external expert reviewed the findings in terms of richness and completeness in order to provide a sufficient description and to confirm that the exhaustive descriptions reflect the phenomenon accurately.
6.	The fundamental structure of the phenomenon was described. Theme and sub-theme were revised by the researchers and redundant, misused or overestimated descriptions were eradicated from the overall structure. The consensus themes were used in the final structure of the study.
7.	Validation of the findings was provided with the feedback from the participants. The participants were asked to compare the researchers' descriptive results with their own experiences. Participants' views on the study results were obtained via email.

English by an expert fluent in both Turkish and English. Each transcript was read several times by the researchers to gain a sense of the whole content. The transcripts were reviewed by three researchers independently to avoid errors. Meaningful sentences and statements were highlighted and analysed contextually. Contextually important statements were chosen, and the content was formulated. With mutual discussion and an exchange of opinions, the themes and sub-themes were then categorised based on similarities and differences. An external expert with experience in qualitative studies and data analysis reviewed the findings in terms of their richness and completeness in order to provide sufficient descriptions and to confirm that the exhaustive descriptions reflect the phenomenon accurately. Theme and sub-theme were revised by the researchers and the consensus themes were used in the final structure of the study. Validation of the findings was provided with the feedback from participants.

*Rigor and trustworthiness*

Credibility, transferability and confirmability, the trilogy proposed by Lincoln and Guba (1985), were paramount in attaining rigor and trustworthiness in this study. Credibility was obtained by maintaining transparency with the participants regarding the study, recording the interviews and notes being taken during the interview. The consistent thematisation by three specialist researchers with similar approaches, detailed sub-themes of participants' direct quotes and the sample variability from four different health institutions, added to the credibility of the study. Transferability was ensured by inviting participants from different institutions with different job experiences who were given a detailed explanation of whole study process, and findings were based on everyone's personal statements. Confirmability was ensured through the use of the consolidated criteria for reporting qualitative research checklist (COREQ) (Tong et al., 2007), as well as through the consistent sharing of data and communication within the research team throughout the data collection and analysis process (Sutantri et al., 2019).

*Ethical Considerations*

The study was approved by the Non-Interventional Clinical Research Ethics Board (decision no: GO 2020/058; date: 26th June 2020). Written consent was obtained from the participants.

**Results**

The mean age of participants was 26.80 ± 2.04, and more than half had undergraduate degrees. The participants' experiences in working in a cardiovascular surgery unit was between one and six years (Table 3).

Six themes emerged from the interview data: the duties and responsibilities in a COVID-19 intensive care unit; the differences of

**Table 3**  
Descriptive statistics for the cardiovascular nurses (n=10)

	Mean ± SD	Min-Max
Age	26.8 ± 2.04	23–30
	<b>n</b>	<b>%</b>
Sex		
Male	2	20
Female	8	80
Education		
Vocational High School of Health	2	20
Undergraduate	7	70
Graduate	1	10
Work experience as nurse		
1–3 years	2	20
4–6 years	7	70
7–9 years	1	10
Work experience as cardiovascular nurse		
1–3 years	7	70
4–6 years	3	30

SD: standard deviation, min: minimum, max: maximum.

**Table 4**  
Overview of the study themes and sub-themes

THEMES	SUB-THEMES
Duties and responsibilities in a COVID-19 intensive care unit	<ul style="list-style-type: none"> <li>- Physical care</li> <li>• Mechanical ventilation care</li> <li>• Closed circuit aspiration</li> <li>• General hygiene care</li> <li>• Drug administration</li> <li>• Chronic wound care</li> <li>• Feeding the patient</li> <li>• Collecting cultures</li> <li>• Monitoring blood gas and other lab findings</li> </ul>
Differences of COVID-19 intensive care unit practices from cardiovascular practices	<ul style="list-style-type: none"> <li>- Psychological care</li> <li>- Suctioning method and frequency</li> <li>- Caring for the patient in the prone position</li> <li>- Intubation technique</li> <li>- Long intubation durations</li> <li>- Long recovery periods</li> <li>- Being required to use personal protective equipment in the care of the patients</li> </ul>
Transferrable skills of cardiovascular nurses in COVID-19 intensive care unit	<ul style="list-style-type: none"> <li>- Care of patients with ECMO</li> <li>- Prediction and early recognition of clinical changes in patient</li> <li>- Early recognition of changes in heart rhythm</li> <li>- A fast response to emergency situations</li> <li>- Fast and critical decision making</li> <li>- Programmed/systematic working</li> <li>- Being ready to work in difficult clinical conditions</li> <li>- Promoting a team spirit</li> </ul>
Difficulties encountered working in COVID-19 intensive care unit	<ul style="list-style-type: none"> <li>- Fear of infection</li> <li>- Working with an inexperienced team</li> <li>- Working with a constantly changing team</li> <li>- Monitoring the patient from a distance</li> <li>- Working with personal protective equipment</li> </ul>
Difficulty of working with personal protective equipment	<ul style="list-style-type: none"> <li>- Physical discomfort</li> <li>• Difficulty in vision</li> <li>• Movement restriction</li> <li>• Difficulty in breathing</li> <li>• Sense of tiredness</li> <li>• Headache</li> <li>• Over sweating</li> <li>- Difficulty in communication</li> <li>• Difficulty in hearing and being heard</li> <li>• Being unable to communicate nonverbally</li> <li>• Poor communication with the team</li> <li>• Fear in patients caused by protective equipment</li> <li>• Difficulty in being recognised</li> </ul>
Psychosocial effects of working in a COVID-19 intensive care unit	<ul style="list-style-type: none"> <li>- Feeling guilt</li> <li>- Unable to have a normal social life</li> <li>- Anxiety of the unknown aspects of the disease</li> <li>- Feeling the need to continually be unselfish</li> <li>- Fear of losing the patient</li> <li>- Feeling of loneliness</li> </ul>

COVID-19 intensive care unit practices from cardiovascular practices; the transferrable skills of cardiovascular nurses in a COVID-19 intensive care unit; the difficulties encountered working in a COVID-19 intensive care unit; the difficulty of working with personal protective equipment (PPE); and the psychosocial effects of working in a COVID-19 intensive care unit (Table 4).

#### Duties and responsibilities in a COVID-19 intensive care unit

The duties and responsibilities of cardiovascular nurses in a COVID-

19 intensive care unit included both physical and psychological care practices. Most of the participants stated that they provided physical care to the patients.

*'We provided care of intubated patients, positioning, suctioning, taking blood samples, vascular access, drug administration, hygiene care in these units.'* (N7)

Closed circuit suctioning was preferred in ensuring the airway patency of intubated patients to reduce the risk of COVID-19 transmission in the intensive care units. One of the nurses summarised their opinions on closed circuit suctioning with these words:

*'...suctioning needs were high, and because they were hospitalised due to pneumonia, one of the most common nursing practices was closed circuit suctioning'* (N6).

Nurses indicated that their patient care included psychological support. One of the nurses commented:

*'We were providing psychological counselling in order to provide moral support for the patients. Since patients were isolated, they were feeling even worse, especially intubated ones. Intubated patients were always agitated. We were talking a lot to them, again to calm them down psychologically...'* (N1)

#### Differences of COVID-19 intensive care unit practices from cardiovascular practices

The sub-themes that emerged from this theme were suctioning method and frequency, caring for the patient in the prone position, intubation technique, long intubation periods, long recovery periods and being required to use PPE in the care of the patients. Most of the nurses spoke of the difficulty of getting the patient into the prone position and caring for them in this position, as this was not common practice in cardiovascular units.

One nurse stated:

*'I think this is the biggest problem cardiovascular nurses faced since prone position seemed to us as too extreme. Patient is connected to the ventilator, honestly I didn't know how to provide care to a patient in prone position.'* (N8)

*'Putting patients in the prone position with so much equipment seemed a little different at first; we didn't know it very well. We don't even turn the patients left and right because they have incisions in the sternum. So it's a different intervention for us.'* (N2)

One of the participants stated that they encountered differences in the intubation period and technique such as using an intubation cabin and clamp to minimise infection risk.

*'In COVID-19 intensive care unit, we had to clamp the intubation tube until we connected it to the mechanical ventilator. This was a little interesting for me.'* (N8)

*'[...] specially developed intubation bells for these patients, clamping of the intubation tube [...] these were things I had not heard of before.'* (N6)

#### Transferrable skills of cardiovascular nurses in COVID-19 intensive care unit

The sub-themes defined under this theme were care of patients with ECMO, prediction and early recognition of clinical changes in the patient, early recognition of changes in heart rhythm, a fast response to emergency situations, fast and critical decision making, programmed/systematic working, being ready to work in difficult clinical conditions



and promoting a team spirit.

Most of the participants agreed that being a cardiovascular nurse had advantages in prediction and early recognition of clinical changes in patients due to the dynamic nature of cardiovascular units. One of the best statements exemplifying this situation is as follows:

*'Cardiovascular nurses knows where the patient is headed very well, whether the patient is going to arrest, fibrillation, asystole; since they can predict those because of their knowledge and experience, cardiovascular nurses are very skilled on this matter.'* (N1)

Early recognition of the differences in heart rhythm and a fast response to emergency situations were among the transferrable skills that cardiovascular nurses emphasised:

*'We could recognise arrhythmias easily in the COVID-19 intensive care unit. We encounter such things very often in the cardiac intensive care unit. We know very well what we have to do in arrhythmias.'* (N10)

The sudden changes in the clinical status of COVID-19 patients who need critical care require nurses to make quick decisions. The participants stated that these skills contributed to the management of COVID-19 patients. One example of a fast response:

*'You know, most of the time we are in a race against time in the cardiovascular unit, there is such a situation that everything has to be very fast. We needed it there (in the COVID-19 unit), we were able to intervene faster, for example we did emergency intubation.'* (N2)

The participants stated that working with a constantly changing team in the COVID-19 intensive care units made it difficult to work with team spirit. One of the participants indicated the importance of the team spirit while working in a cardiovascular unit, which they were able to reproduce in the COVID-19 intensive care unit.

*'...team spirit was established (in covid-19 intensive care unit) ... that is something cardiovascular unit added to us ... being a team is very important in cardiovascular unit because most of the times, you cannot handle the work yourself ... you definitely want a colleague with you.'* (N3)

Nurses emphasised that being ready to work in difficult clinical conditions like the pandemic was one of the cardiovascular nurses' transferrable skills:

*'Actually we cardiovascular nurses are always ready for extraordinary situations. I witnessed that again when we went to COVID-19 intensive care unit.'* (N8)

*'Cardiovascular nurses are turning into systematic working robots.'* (N9)

#### *Difficulties encountered working in a COVID-19 intensive care unit*

Difficulties that cardiovascular nurses faced in the COVID-19 intensive care unit were grouped in the following sub-themes: fear of infection, working with an inexperienced team, working with a constantly changing team, monitoring the patient from a distance and working with personal protective equipment.

Fear of infection was determined to be the greatest difficulty indicated by the participants. One of the nurses stated this fear in the following way:

*'Frightening thing was this being an infectious disease. That was so exhausting. You want to be done and leave the patient room as quickly as possible, but you can't for the patient needs you. So, it was psychologically challenging.'* (N1)

One participant indicated the difficulties of working with nurses with no critical care experience as follows:

*'Operating room nurses were especially hit hard; they even had an operating room nurse with 15 years of experience. They don't know about critical care so much; they don't know the drugs so much. We supported them.'* (N5)

The participants stated that in order to prevent transmission, patients are not followed at a close range in the COVID-19 intensive care unit, unlike in the cardiac intensive care unit. Cardiovascular nurses experienced difficulty monitoring the patient from a distance, with one of the statements by the nurses representing their opinion in this matter as follows:

*'When working in cardiovascular unit, we are always with the patients (to be close to patients). This was not possible in patients with COVID-19. We couldn't be around them all the time and couldn't be so close to them ... Of course this was a problem for us.'* (N4)

#### *Difficulties of working with PPE*

Working with PPE in COVID-19 intensive care units was physically uncomfortable and had caused difficulties in communication. Some of the statements on these difficulties are as follows:

*'Patients could not tell when we were smiling; they didn't know us, and they were terrified of us. When we enter their rooms with PPE, they had concerns like, "why are you behaving like that, is my health situation that bad, why are you so meticulous"'* (N5)

*'Sometimes the glasses fog up, you try to look from the one side and you cannot see. The visor you wear on your head causes a headache after a while. You're out of breath. We were sweating excessively.'* (N4)

*'Eye contact was not possible with the patient. Steamy glass and you don't know where you're walking in the room.'* (N9)

#### *Psychosocial effects of working in a COVID-19 intensive care unit*

Psychosocial effects of working in a COVID-19 intensive care unit were grouped as follows: feeling guilty, unable to have a normal social life, anxiety of the unknown aspects of the disease, fear of losing the patient, feeling the need to continually be unselfish and, a feeling of loneliness.

One of the nurses expressed her feeling of guilt as follows:

*'I have a 3-and-a-half-year-old son, I was feeling guilty when kissing him. In a way, I was blamed as a mom when I kissed my child, that affected me very bad.'* (N5)

One nurse stated that they could not normalise their social life:

*'I think I forgot what normal was. I can't remember as if I never experienced how to go outdoors without a mask or working without a mask.'* (N6)

The severe prognosis of the disease in patients who needed critical care caused the nurses to fear losing the patient. In addition, despite the difficult working conditions in the intensive care units and the fact that COVID-19 is a highly contagious disease, the cardiovascular nurses stated that they unselfishly put the care of their patients first. The cardiovascular nurses isolated themselves from their families and friends to prevent the transmission of the disease while working in the COVID-19 intensive care unit. The nurses reported that this isolation caused them to feel lonely.

#### **Discussion**

Because of their skills and the increasing need for critical care during

the pandemic, cardiovascular nurses were mostly assigned to the COVID-19 intensive care units. They have important roles in cardiovascular care units such as hemodynamic monitoring, invasive monitoring, management of mechanical circulation support devices, cardiopulmonary resuscitation and the management of cardiac emergencies (Morrow et al., 2012; Merkouris et al., 2003). According to our study of COVID-19 intensive care units, the cardiovascular nurses performed critical care similar to a cardiovascular unit. Schroeder et al. (2020) reports that caring for COVID-19 patients is like caring for any other patient apart from the isolation measures. Besides the time spent putting on PPE and the need for another nurse to supply material from outside the patient's room, nursing practices do not change. Our study reported that the patient care in the COVID-19 intensive care units had several different practices compared to the cardiovascular unit. Cardiovascular nurses indicated differences on giving and caring for a patient in prone position, aspiration method and frequency, intubation technique, the use of PPE and the long intubation periods. Cardiovascular patients have early extubation, mobilisation and short intensive care periods, no prone position care due to the sternotomy and a lack of the need for closed-circuit suctioning (Stephens & Whitman, 2015; Martin & Turkelson, 2006).

Studies have indicated that intensive care, anaesthesia and surgical nurses with their skills and knowledge are the most appropriate for the dynamic structure of pandemic clinics (Crowe et al., 2021; Raurell-Torredà, 2020; Chen et al., 2020). Stucky et al. (2020) reports that perioperative nurses assigned to a pandemic intensive care unit were able to give drugs, monitor laboratory results, perform enteral feeding and manage patients in need of mechanical ventilation and ECMO (Stucky et al., 2020). Chen et al. (2020) mentions the advantage of anaesthesia nurses as they are experienced in hypoxemia, cardiopulmonary resuscitation and setting respiration parameters in a mechanical ventilator. Our study emphasised cardiovascular nurses' early recognition of changes in heart rhythm, prediction of clinical changes in a patient, fast response to emergency situations and skills in treating patients with ECMO. Our study also revealed that cardiovascular nurses provided systematic work in tough conditions, fast and critical decision making and acted in a team spirit. Chen et al. (2020) reports that nurses without critical care experience were prone to exhaustion in the pandemic intensive care units. Our study revealed that the cardiac critical care experience of cardiovascular nurses enabled them to manage the COVID-19 patients with greater ease.

This study not only revealed the contributions of the cardiovascular nurses, but also the difficulties they faced during the pandemic. They found it difficult to work with an inexperienced and constantly changing team as intensive care units require frequent dynamic and emergency responses (Lord et al., 2021; Eftekhari Ardebili et al., 2021; Stucky et al., 2020). This is one of the major problems of patient management in these units. Monitoring the patients, from a distance, in isolated rooms in the intensive care unit hampered patient management and communication (Schroeder et al., 2020). This was particularly challenging, as patients monitored in the cardiovascular care unit are always monitored at close range.

This study showed that fear of personal infection and potential infection of the nurses' families was a significant challenge and resulted in them having to remain in isolation. Recent literature shows similar fears among all nurses (Fernandez et al., 2020; Liu et al., Sun et al., 2020). The use of PPE proved to be challenging for the cardiovascular nurses, as it resulted in restricted movement, difficulty breathing, sweating, headaches and tiredness. Other studies have reported similar findings to our study (Lord et al., 2021; Liu et al., 2020). Sun et al. (2020) also reported that working with PPE for a prolonged time can cause headaches, tightness of the chest and tachycardia, marks from the prolonged use of masks and sweating and tiredness from the overalls (Sun et al., 2020). Our study showed using PPE caused difficulties in hearing, being heard, seeing, being recognised, nonverbal communication, communicating with patients and the team and instilled fear among the patients. Similar communication problems due to PPE have

been reported in recent studies (Hoernke et al., 2021; Hampton et al., 2020).

Our study emphasised the psychological effects of the pandemic on cardiovascular nurses' occupational and social lives. According to the study results, working in COVID-19 intensive care units caused a fear of the unknown aspects of the disease, the fear of losing a patient, an inability to normalise their social life, a feeling of loneliness and a feeling of guilt. These results show a similarity with current literature (Crowe et al., 2021; Fernandez et al., 2020). Fernandez et al. (2020) reported that nurses suffer from psychological problems like anxiety, fear and fragility, as well as facing the ethical dilemma between their commitment to their patients and occupation, and their responsibility to their families. Crowe et al. (2021) reported that nurses feel alone due to isolation and they become stigmatised by their friends and families.

## Limitations

There are some limitations to the current study. There may be unreported views and uncovered themes that the participants did not think of during the interview. The remote online meetings may have resulted in a limited view of participants' body language. The possibility of encountering technical problems during online meetings may have caused participants to give shorter explanations. The findings may not be generalised to all cardiovascular nurses because the results were based on individual qualitative interviews.

## Conclusion

This study is thought to be the first presenting the experiences of cardiovascular nurses during the COVID-19 pandemic. The study revealed the transferrable skills of cardiovascular nurses in the critical care of COVID-19 patients. Although cardiovascular nurses experienced some difficulties, they made an important contribution to the management of nursing services with their experience and skills. The results of this study may be useful in drawing comparisons in future studies to explore the experiences of nurses from different fields during the COVID-19 pandemic. It is also recommended to conduct future studies on the COVID-19 experiences of cardiovascular nurses from different countries.

## Ethical Statement

The study was approved by the Non-Interventional Clinical Research Ethics Board of Lokman Hekim University (decision no: GO 2020/058; date: 26th June 2020).

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## Authors contributions

**Zeliha Ozdemir Koken:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Hafize Savas:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft. **Senay Gul:** Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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