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INTENSIVE CARE NURSES' EXPERIENCES WITH PERSONAL PROTECTIVE EQUIPMENT DURING THE COVID-19 PANDEMIC IN TURKEY: A PHENOMENOLOGICAL STUDY

Covid-19 Pandemisi Sirasinda Türkiye'de Yoğun Bakim Hemşirelerinin Kişisel Koruyucu Ekipmanlarla Deneyimleri: Fenomolojik Bir Çalişma

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Abstract

Objective: This study aimed to investigate the experiences of intensive care nurses working with personal protective equipment (PPE) during the COVID-19 epidemic.

Materials and Methods: The study group of the descriptive phenomenological study included 12 intensive care nurses selected with the purposeful sampling method. Collected through the semi-structured interviews, the data were coded with the MAXQDA program and evaluated with the content analysis method. The COREQ checklist was followed.

Results: As a result of the research, two main themes emerged "What will happen to me" and "Me in PPE". Nurses primarily faced difficulties in accessing PPEs that would protect them.

They experienced ambivalent feelings of anxiety, fear, and confidence regarding the protection of PPE. Some participants felt inadequate due to inadequate education regarding COVID-19 in the early stages of the pandemic. They failed to meet many physiological needs while using PPE. The hardships they endured made them feel angry with other people, and they perceived strict institutional rules on the use of PPE as pressure.

Conclusion: This study provided information on the experiences of intensive care nurses who first started using PPEs and used them the longest. Intensive care nurses have been adversely affected physiologically and psychologically due to working with PPE for a long time and without adequate training. It should be evaluated whether the well-being of nurses is affected by the pandemic process, and psychological support should be provided accordingly. Strategies should be prepared and implemented to provide nurses with adequate equipment and guidance in a similar situation.

Key words: COVID-19, personal protective equipment, qualitative research, pandemic, intensive care nursing.

Özet

Amaç: Bu çalışma, COVID-19 salgını sırasında yoğun bakım hemşirelerin kişisel koruyucu ekipmanla (KKE) çalışmaya ilişkin deneyimlerini araştırmayı amaçladı.

Gereç ve Yöntem: Tanımlayıcı fenomenolojik tasarımda olan araştırmanın çalışma grubunu amaçlı örneklem yöntemine göre seçilmiş 12 yoğun bakım hemşiresi oluşturdu. Yarı yapılandırılmış görüşme ile elde edilen veriler MAXQDA programı vasıtasıyla kodlandı ve içerik analiz yöntemi ile değerlendirildi.

Bulgular: Araştırmanın sonucunda "bana ne olacak" ve "KKE içindeki ben" olmak üzere iki ana tema oluşturuldu. Hemşireler öncelikle kendilerini, koruyacak KKE'a erişememenin sıkıntısını yaşadılar. KKE'nın koruyuculuğuna ilişkin kaygı ve korku yanında, KKE'a güven gibi çelişkili duygular yaşadıklarını belirttiler. Katılımcılardan bazıları pandeminin ilk dönemlerinde COVID-19'a ilişkin yeterli eğitim almamış olmaya bağlı yetersizlik hissettiklerini ifade ettiler. KKE kullanırken birçok fizyolojik gereksinimleri karşılayamadılar. Yaşadıkları güçlükler diğer insanlara öfke duymalarına neden oldu. KKE ile ilgili katı kurum kurallarını baskı olarak algıladılar.

Sonuç: Bu çalışma, KKE ile en erken karşılaşan, en uzun süre çalışan yoğun bakım hemşirelerinin bu süreçteki deneyimlerine ilişkin bilgi sağladı. Yoğun bakım hemşireleri yeterli eğitim olmadan ve uzun süreli KKE ile çalışmaya bağlı fizyolojik ve psikolojik olarak önemli ölçüde olumsuz etkilenmişlerdir. Bu nedenle hemşirelerin iyilik halinin bu süreçten etkilenimi değerlendirilmeli ve psikolojik destek sağlanmalıdır. Benzer bir durumda hemşirelere yeterli ekipman ve rehberlik sağlanması için stratejiler hazırlanmalı ve uygulanmalıdır.

Anahtar Kelimeler: COVID-19, kişisel koruyucu ekipman, nitel çalışma, pandemi, yoğun bakım hemşireliği.

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INTRODUCTION

COVID-19 disease was declared a pandemic by the World Health Organization on 12 March 2020 (WHO). As in the whole world, many precautions have been taken against the pandemic in our country (Kaçak-Yıldız, 2020). These measures are protective measures to be applied at the appropriate place and time (Karaoğlu et al., 2020), and using personal protective equipment (PPE) is one of the essential measures (McCarthy et al., 2020; Lauer et al., 2020). Medical masks, gloves, protective glasses, aprons, visors, overalls, and respirator masks (N95 or FFP3 and FFP2) used during applications are among the personal protective equipment (Kalkancı et al., 2020).

During the COVID-19 pandemic, an infectious disease, it is essential to use personal protective equipment while caring for patients, as in other previous coronaviruses (SARS and MERS). The most frequent users of personal protective equipment are intensive care nurses (Türkmen, 2020; Moradi et al., 2021). Intensive care units are places where patients with high mortality rates and severe physical conditions, mostly in the terminal period, are monitored and their life functions are supported and treated by a special treatment and care team (Balık-Öztürk, 2016). Intensive care nurses, who are supposed to have special goals and skills, are health personnel who work fast, intensely and have a heavy workload and many responsibilities (Esin-Sezgin, 2013).

Various studies show that intensive care nurses' workload has increased considerably to struggle with COVID-19 (Yuxia et al., 2020; Tabah et al., 2020; Moreno-Mulet et al., 2021). However, to the best of our knowledge, few qualitative studies have been conducted on the perceptions and experiences of intensive care nurses regarding the use of PPE. Defining the perceptions and experiences of intensive care nurses on the use of PPE may contribute to the preparation of improvement programs on the subject. In this direction, the study was conducted to determine the experiences of intensive care nurses working with personal protective equipment during the pandemic.

Research Question

What did ICU nurses experience while working with PPE during the COVID-19 pandemic?

MATERIAL AND METHOD

Type of Research

In this phenomenological study, the criterion sampling method was used. Newly graduated nurses either surrender to the behaviors and values of the working environment or integrate the values and behaviors of the professional and bureaucratic working system. With the resolution of the conflict between professional and bureaucratic values, new nurses are socialized into nursing. This process takes place in the first third month of working life (reality shock), and adaptation is mostly completed in six months (Deppoliti, 2008).

The research was conducted between May and June 2021 in the intensive care unit of a hospital reserved for COVID-19 patients. The study group consisted of 12 of 35 nurses who had at least 3 months of COVID-19 intensive care nursing experience. When concepts and processes discovered in qualitative research start to repeat each other, the sample is deemed adequate (Baltacı, 2018). To answer the research question, concepts and processes had to be repeated, so data collection continued until 12 nurses were included. The guidelines for Consolidated Criteria For Reporting Qualitative Research (COREQ) checklist (Tong et al., 2007) was followed (Supplementary File 1).

Ethical Dimension of the Study

Permission was obtained from the Clinical Research Ethics Committee of the Faculty of Medicine of the city where the study was conducted (Decision No: 2021/80). In addition, each participant was informed about the purpose of the study and that the interview would be recorded with a voice recorder, and their informed consent was obtained.

Data Collection

The data were collected through semi-structured interviews. In the interview, the following 4 basic questions were asked, but further questions were also used when necessary.

Question 1: How did you feel when you wore PPE for the first time?

Question 2: How did working with PPE make you feel?

Question 3: How do you feel when you use PPE now?

Question 4: What are your experiences with the use of PPE?

Both verbal and written consent was obtained from the participants. Individual interviews were conducted on the phone with each of the participants. The researcher informed the participants about the purpose of the study and the audio recording of the interviews. The open-ended questions previously created by the researchers were asked by the first researcher and the interview was recorded with a voice recorder. The duration of the interviews varied based on the participant, but they lasted an average of 26 minutes (Min: 23 minutes; max: 36 minutes).

Data Analysis

Content analysis can be used deductively or inductively, depending on the purpose of the research. In our study, inductive content analysis was used. The audio recordings of the interviews were transcribed verbatim and summarized by the first researcher. Summarizing is the most widely used term and indicates the creation of codes, categories, or themes at different levels (Kızıltepe, 2017). All the written content and the titles in the text were read many times, and the comments of the participants were received and uploaded to the MAXQDA program. Categories were created independently by the first and second researchers for the similar or different titles of the expressions loaded into the program in question, and the resulting categories were compared. 22 coding was done by focusing on these categories. Then, similar codes were revised, and 2 main themes were created. Finally, the research findings were written with more specific descriptions and quotations from the participants.

Reliability of the Research

The triangulation technique was employed in this study to achieve reliability. The data were coded, examined, and interpreted independently by two authors. The authors then compared their viewpoints until they agreed on the best interpretation. This method reduced the likelihood of researcher bias (Korstjens&Moser, 2018). To accurately and meaningfully represent the data, the themes and subthemes were finalized after being read by the research team numerous times. Finally, transparency was achieved using reflexivity (Nowell et al., 2017).

RESULTS

The mean age of the participants was 29.0 (SD±5.02), and they had an average working experience of 5.91 (SD±4.67) years. 58.3% (n=7) of the participants were female, 83.3% were undergraduate graduates, and 58.3% (n=7) were married (Table 1). Before the pandemic, the participants used only gloves, masks, and box shirts as personal protective equipment.

Table 1. All characteristics of nurses

		Number	%
Age, Mean±SD		29.0±5.02	
Average Working Experience		5.91±4.67	
Gender	Male	5	41.7
	Female	7	58.3
Marital Status	Married	7	58.3
	Single	5	41.7
Education Status	Undergraduate	10	83.3
	High school	2	16.7

The code cloud created by the MAXQDA program with the words in the coding is shown in Figure-1.

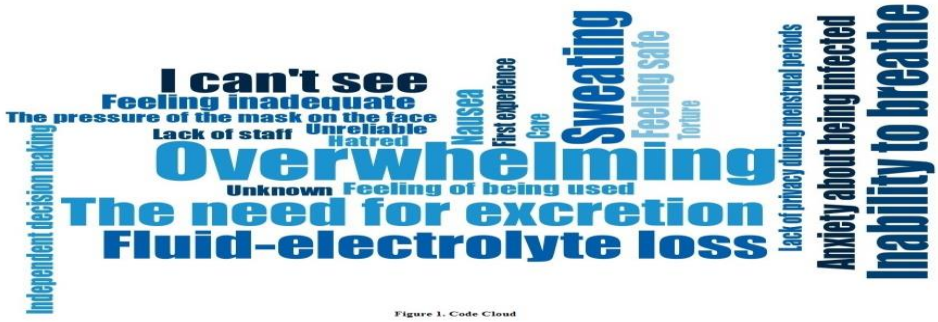

Figure 1. Code Cloud

In Figure 2 the two main and six sub-themes created as a result of the research are as follows:

What will happen to me?	Me in the PPE
• *I'm having a conflict* • *I will wear it, but it is not available* • *I don't know what to do*	• *I'm human too* • *I'm angry* • *I'm under pressure*

Figure 2. Main and Sub-themes

What Will Happen to Me?

The sub-themes of "*I am in a conflict", "I will wear it, but it is not available" and "I don't know what to do"* emerged from the perceptions of the participants regarding the use of PPE.

I'm having a conflict

Participants expressed that a situation requiring wearing personal protective equipment felt like staying in a closed box. They were afraid of being infected because COVID-19 was a novice disease about which little is known. Working with the PPE greatly overwhelmed them. However, the fear they had was far beyond the feeling of being overwhelmed (n=9).

> *"I felt like I was drowning in a closed box, I can never forget that moment" (Participant 1).*

> *"I was very overwhelmed, it was very depressing, but the fear of the unknown was more dominant" (Participant 4).*

> *"Like desperate, what if it infects me, or what happens if it infects the people around me? We always had this concern" (Participant 8).*

> *"You think you're going to get COVID-19 too… I'm sure I will get, too. I was afraid of getting sick." (Participant 11).*

On the other hand, some nurses believed that they felt safe in PPE (n=7) and that PPE protected them. Nurses experienced ambivalent feelings like fear, hesitation, and trust.

> *"Although it overwhelms me, I feel more confident in the equipment" (Participant 2)*

> *"Of course, I have very, very big protectors in my eyes. They need to be used. No matter how depressed I am inside, at least I feel comfortable that nothing will happen to me. I think it keeps me safe" (Participant 9).*

One participant stated that she first, saw PPE as a reason to stay away from her family and hated PPE, but later saw PPE as a friend.

> *"The equipment had become an object of hate for me. Because it distanced me from my family. But over time I realized that it is our friend" (Participant 12).*

I will wear it, but it is not available

Some participants (n=5) experienced difficulties due to a lack of equipment in the early stages of the pandemic and did not feel safe. However, these issues were resolved in the later stages.

> *"At first, the equipment was insufficient. When we went out, we had to wear new equipment to re-enter, so if I went out, my next friend wouldn't be able to get dressed…" (Participant 7).*

> *"At first, the size of the overalls was a problem. For example, my size is small, the equipment was short for me, because I am tall. When I put on the hood of the overalls, I*

had to stand a little hunched… I was saying that my hunch would come out eventually. Thank God, everything is fine with the equipment now" (Participant 5).

I do not know what to do

Some of the participants (n=4) felt inadequate because they did not receive adequate training on COVID-19 in the early stages of the pandemic, which upset and depressed them.

"*We worked without knowing what to do and without any training on this subject. It made me very sad" (Participant 9)*

"We did not receive any training like orientation: neither intensive care training nor protective equipment training. We didn't know anything. We learned what those before us were doing by working with them" (Participant 3).

Me in the PPE

The experiences of the participants regarding the use of PPE were gathered under the sub-themes *"I am human too", "I am angry" and "I am under pressure*".

I am human too

It was observed that the participants could not meet their physiological needs in PPE. All the participants reported that they lost a lot of fluid due to sweating in PPE, could not see and hear because of the fogging on their glasses, and that long-term use of masks created pressure on the facial and nasal bones (n=12).

"We are sweating heavily, we are in the mood to finish our work as soon as possible. We sweat, sweat drips from our face, and our arms, face, and eyes become itchy. In short, it was a difficult time, we had a lot of difficulties at first" (Participant 12).

"As soon as we entered the room with our glasses, they were fogging. We were trying to see in front of us with them for 4 hours, we were trying to read the drugs, it was very difficult to work" (Participant 6).

"The month of Ramadan was very difficult for me. While fasting, I was losing extra water in overalls. We were sweating so much that we had to take off our uniform and everything we wore inside before we went out" (Participant 5).

"You are constantly smelling your sweat, and you hate yourself. You are inside for 4 hours, you are in a rush, and you cannot eat or drink in any way. Your body is losing water, but you can't put it back in, and your stomach is incredibly nauseous. I fainted 3 times inside" (Participant 10).

Most of the participants (n=8) had excretion problems, and some of them (n=4) had to wear diapers.

"At first, the equipment was scarce, so a friend of ours used diapers to avoid going out, and that's how she met her toilet needs" (Participant 7).

"We were going to the toilet 2 minutes before we put on the overalls and went inside, and we went straight to the toilet as soon as we got out. We had limited the water we drank so that we wouldn't need to go to the toilet. We couldn't eat or drink anything inside anyway. Some of my teammates used diapers because they were afraid…" (Participant 6)

One participant stated that they did not have the opportunity to take a shower at first, they sweated a lot in PPE, so they felt cold while taking the PPE out, and they heated the room beforehand to prevent this.

"At first, we did not have the opportunity to take a shower. We had the opportunity to take a shower afterward. It was also very upsetting for me that each of my friends who came out was sweaty and cold. They informed us before they went out, and we were preheating the dressing room" (Participant 6).

One participant reported that they exerted too much effort, had difficulty breathing, and almost fainted and felt nauseous because of this.

> *"When we intervened in the patient, we were making a lot of effort because of the heat. I had to constantly re-breathe my breath. I nearly fainted a few times from the heat and overalls, and a few times I felt nauseous" (Participation 4).*

It was determined that a few female participants had physical difficulties during their menstrual periods, they also felt more tired during their menstrual periods and experienced nausea. In addition, one participant stated that their privacy was damaged when they were with male staff.

> *"Once I was in my period, I couldn't move anymore, I was extremely nauseous, and I remember vomiting a lot next to the tap, it was very bad" (Participant 12).*

> *"The menstrual periods were very bad for us. Especially for those who bleed heavily, like me. You're already losing fluid inside, and since you've lost it as blood, you come out extra tired. You come out with your face pale. Sometimes the male staff is on duty with us, you go in with him, you take off those overalls by looking face to face when you go out, so your privacy is shaken when you go out" (Participant 10).*

I am angry

Some participants (n=5) emphasized the importance of awareness of their struggle against COVID-19. However, some participants (n=4) experienced anger because society did not care about the sacrifices made by the health professionals and obey the precautions.

> *"I was excited when I first wore it because we thought we could be useful to humanity. As healthcare professionals, we should stand against this disease, but I realized that our feelings were all in vain. Because when I work in sweat and then go out and realize that people don't care at all, even my family, it feels difficult" (Participant 8).*

> *"I felt being used. I didn't think we were useful. Our patients were mostly dying anyway. Overalls looked like a prison to me" (Participant 3).*

One participant stated that health workers cannot be supported by the public's applause of the public in the evening and that this is not a method that will provide sufficient support.

> *"COVID-19 could have been prevented with very simple measures, but the people did not comply with the rules. Applauding for a few days does not mean being with the healthcare staff" (Participant 7).*

I am under pressure

Some participants (n=3) stated that they know how to use PPE and are confident about it, but there are strict rules regarding the use of PPE. They perceived this as pressure on them.

> *"I don't want to wear an overall unless I'm giving care and touching the patient. For example, I only get the balance and write while looking at the monitor, I do not touch the patient. But we must take the necessary precautions while aspirating while maintaining it. I think that the nurse may have a little more authority in this matter" (Participant 11).*

> *"There was a lot of pressure on us about overalls. Even after the patients became negative, we were insisted on wearing overalls. Let's not wear overalls and box aprons. I believe we can protect ourselves, we think we can protect ourselves" (Participant 10).*

DISCUSSION

Nurses, who make up much of the global health force, are working with other health professionals with high performance during the pandemic (Cengiz et al., 2021). However, the pandemic period has brought along some risks for the safety of nurses and the maintenance of their general health and well-being (Palandöken, 2020). The use of PPE by nurses and other healthcare staff at high risk of infection to prevent the infection is among the major preventive measures. The pandemic has caused many

negativities in the working environment of nurses such as overtime, inability to take leave, not being able to go home, and the feeling of burnout (Littzen-Brown et al., 2023). Nurses sometimes worked with PPE before, but only for short-term and previously known health problems. Constant wearing of PPE during the pandemic was a new experience added to aforementioned adverse working conditions. This study aimed to investigate nurses' experiences of working with personal protective equipment.

Providing care and treatment during the pandemic causes nurses to experience serious stress and negatively affects both their physical and psychosocial health (Hiçdurmaz-Üzarözçetin, 2020). The nurses had ambivalent feelings and thoughts about the use of PPE. They were afraid of being infected with this disease, which they encountered for the first time and did not know exactly what it was. In the study by Sun et al. (2020), nurses reported being afraid of getting infected with COVID-19 when they first gave care (Sun et al., 2020). In Anderson's study (2020), some participants stated that the lack of information about COVID-19 scared them (Anderson, 2020). Most nurses also had concerns about how much PPE would protect them. However, nearly half of them felt safe while using PPE and believed that PPE was protective enough. In the study of Tabah et al. (2020), nearly half of the healthcare professionals believed that PPE was protective (Tabah et al., 2020).

During the pandemic, which the management systems of societies and countries were caught unprepared, health personnel had a lack of protective materials at first (Karasu-Çopur, 2020). In our study, some participants had a lack of equipment and experienced difficulties in the early stages of the pandemic, and they did not feel safe, but there are no such problems now. Since there was not enough PPE to change frequently, the participants had to postpone some of their physiological needs (not drinking water, not eating) or solve them in different ways (napping), which is consistent with the literature (Delgado et al., 2020; Arnetz et al., 2020; Rathnayake et al., 2021).

Caring for COVID-19 patients normally requires training, but nurses had to provide care without adequate training (Sun et al., 2020; Liu et al., 2020). Supporting this information, some participants felt inadequate due to not having received adequate training on COVID-19 in the early stages of the pandemic in our study. They stated that these feelings upset and depressed them. García-Fernández et al. (2020) found that among the risk factors associated with the psychosocial exposure of nurses to COVID-19 is not having enough knowledge about COVID-19 (García-Fernández et al., 2020). Sugg et al. (2021) found in their study that lack of knowledge about COVID-19 is among the barriers to nursing care (Sugg et al., 2021).

It has been understood that PPEs, which significantly reduce the risk of viral transmission when used correctly, together with all other precautions, are very important during the COVID-19 pandemic (Karaoğlu et al., 2020). However, the long-term use of PPE disturbs health workers. Most of the nurses complained of not being able to meet their most basic daily physiological needs such as drinking water, eating, and going to the toilet in PPE. What they complained about most was sweating in PPE. Some participants had to find solutions that could affect their perception of adult identity, like using diapers to avoid going to the toilet. Various studies show that they experience problems caused by protective equipment while providing care and treatment (Rathnayake et al., 2021; Fırat et al., 2021; Jose et al., 2021).

In the study by Sun et al. (2020), most respondents stated that professional responsibilities encourage them to participate in the mission to control the pandemic (Sun et al., 2020). However, the fact that some individuals in the society did not comply with the pandemic rules (social distance, mask, etc.) caused anger in the participants, because they expected the society to behave more sensitively in return for the sacrifices of working with diapers and without drinking water. Billings et al. (2021) stated that the support offered to health professionals by the public felt valuable and they appreciated it, but this support was usually short-lived and often useless (Billings et al., 2021).

Kang et al. (2020) emphasized that healthcare workers face more intense psychological problems due to loneliness and being separated from their families during the pandemic (Kang et al., 2021). Being away from family affects psychology. However, only one participant in this study stated that she initially saw PPE as a reason to stay away from her family and that she hated it at first, but later perceived it as a friend. This is a noteworthy result for us because nurses mostly voiced the problems associated with working in PPE.

In our study, some participants knew how to use PPE and are confident about it, but they perceived it as pressure due to strict usage rules. In the study of Hoernke et al., some participants stated that their

voices were not heard in the decision-making processes of guidance and provision regarding the use of PPE (Hoernke et al., 2021).

Limitations

The main limitation of the study was that we could not determine the implicit messages of the participants through their body language, as the data were collected over the phone. Participants were intensive care nurses who cared for patients in the most critical condition during the period when there was little information about the pandemic. If the study is carried out under today's conditions, the results of the study may differ due to factors like increased knowledge of COVID-19, mastery of patient care management, completion of missing equipment, and compliance with the pandemic.

CONCLUSION

The research provides comprehensive data on the experiences and difficulties faced by intensive care nurses using PPE during the pandemic. During a crisis, it is important to immediately and periodically assess the psychological health of those affected by the crisis most. Our study revealed that this stage was unfortunately ignored. To ensure continuity in health services during the pandemic, the protection of the physiological and psychological health of the providers of this service is at least as urgent as the pandemic measures. Otherwise, nurses who are already insufficient in numbers may leave the job or continue to work as those with impaired health. Understanding nurses' experiences in this period will help to implement methods that will support them. The results demonstrate that nurses experience significant problems in this period. The effects of some of these problems may appear years later. Therefore, nurses working during the pandemic period should undergo comprehensive and regular psychological screenings and receive training to understand and define themselves and cope with stress. Psychiatric or social support systems can be established only for healthcare professionals in each hospital. In addition, rewarding nurses for their efforts in different ways by their institutions will increase their lost motivation. COVID-19 is a novice pandemic, but there were many previous outbreaks, like SARS. For this reason, in case of an epidemic, health institutions should have pre-prepared strategies to protect the health of their employees and ensure the continuity of work. Considering the difficulties experienced by healthcare workers in providing care in protective equipment, it may be considered to make changes in the design of this equipment.

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