RESEARCH ARTICLE / *Araştırma Makalesi*

A Qualitative Research on Identifying the Exposure and Risk Perceptions of Healthcare Workers who are Diagnosed with COVID-19

Covid-19 Tanılı Sağlık Çalışanlarının Maruziyet ve Risk Algılarının Belirlenmesine Yönelik Nitel Bir Araştırma

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Abstract

Objective: In this study, it's aimed to examine biological and psychosocial risk perceptions and expectations of life after treatment of the healthcare personnel who were diagnosed as COVID-19 (Coronavirus Disease 2019) positive while working at the pandemic hospital and resumed after their treatments.

Materials and Methods: A case study method was adopted in the qualitative research approach. Among the purposive sampling methods, maximum diversity sampling is used for the sample of the study which is 13 healthcare workers working in different units and levels who have worked during the pandemic period. As the data collection tool, a semi-structured form was used, and the data obtained through interview questions were transcribed and content analyzed by using the Maxqda program.

Results: The most common theme during the pandemic is "worry" which is a subcode of "negative feelings" under the "psychological factors" theme and the second most common dimension is the "family" code under the theme of "social factors".

Conclusion: The most striking issue in the research process was the belief of some workers that the risk of being infected with COVID-19 was low. This situation has been examined from the perspective of unrealistic optimism theory assuming that information processing errors are made about the risks of the work or the tendency to deny the risk to reduce anxiety. Although the studies carried out in both aspects provide temporary relief for individuals, we think that the increase in this situation may reduce the behavior of taking measures against risks in individuals.

Keywords: COVID-19; case study; healthcare workers; risk; perception

Öz

Amaç: Bu araştırmada, pandemi hastanesinde görevli, COVID-19 (Koronavirüs Hastalığı 2019) pozitif tanısı olan ve tedavi sonrası tekrar göreve başlayan sağlık çalışanlarının, biyolojik ve psikososyal risk algılarını ve tedavi sonrası yaşama dair beklentilerini incelenmesi amaçlanmıştır.

Gereç ve Yöntemler: Nitel araştırma yaklaşımında, örnek olay yöntemi benimsenmiştir. Çalışmanın örneklemi, amaçlı örnekleme yöntemleri arasında, maksimum çeşitlilik örneklemesi ile pandemi sırasında görev almış farklı birim ve kademelerde görevli 13 sağlık çalışanıdır. Veri toplama aracı olarak yarı yapılandırılmış form kullanılmış ve yüz yüze görüşme sorularından elde edilen veriler, kelimesi kelimesine transkripte edilerek Maxqda Programı kullanılarak içerik analizi tekniği ile incelenmiştir.

Bulgular: Pandemi sürecinde en sık geçen temanın "psikolojik faktörler" teması altında "olumsuz duygular" alt kodu olan "kaygı", ikinci en sık geçen boyutun "sosyal faktörler" teması altında "aile" kodu olduğu görülmektedir.

Sonuç: Araştırma sürecinde en dikkat çeken konu çalışanların bir kısmının kendisine COVID-19 bulaşma riski olasılığının düşük olduğuna inanmaları olmuştur. Bu durum, gerçekçi olmayan iyimserlik kuramı perspektifinden ele alınmıştır. İşin riskleri konusunda bilgi işleme hataları yapıldığı varsayımına veya kaygıyı azaltmak için riski inkar etme yoluna başvurulması şeklinde açıklanmaktadır. Her iki yönde yapılan çalışmalar bireylerde sürece dair geçici rahatlamalar sağlasa da, bu durumdaki artışın bireylerde risklere karşı tedbir alınması davranışını azaltabileceği düşünülmektedir.

Anahtar Kelimeler: COVID-19; vaka çalışması; sağlık çalışanı; risk; algı

INTRODUCTION

The COVID-19 epidemic, which spreads rapidly when the course of incidence rate is considered, poses a great risk for the health personnel who are a part of the society at risk and in direct contact with the factor.[1,2] Although the success of healthcare services continues in parallel with health technology solutions, the feasibility and success of all strategies in a pandemic process is possible by protecting health workers from factors. Otherwise, the delivery rate of health services will be adversely affected, and the incidence rate will increase uncontrollably. In this process of combating coronavirus, this study aims at reaching the essence of these problems from the perspective of the actors in the system. We sought some answers to the questions of "how" and "why" in order to fully understand the health workers' exposure source and psychosocial risk perceptions within the framework of our health system.

Conceptual Framework

It is thought that the Systems Engineering Initiative for Patient Safety (SEIPS) model, which has been developed as a conceptual framework in the context of patient and employee safety, will serve as a basis for this study. SEIPS model can explain the tools and technologies used by an employee in a work system to fulfill their duties, organizational conditions, and how they interact with the physical environment (fig. 1).[3] The SEIPS model which is based on the systems approach logic puts human factors (healthcare workers and patients) at the center of analysis of the healthcare services in order to understand the impact of a working system and processes on outcomes.[4,5] It explains how to work system design can impact not only patient safety but also employee safety and organizational outcomes.[3] Employee outputs include safety, health, satisfaction, stress, and burnout; organizational outputs include staff turnover, injury and illness rates, and organizational health.[4]

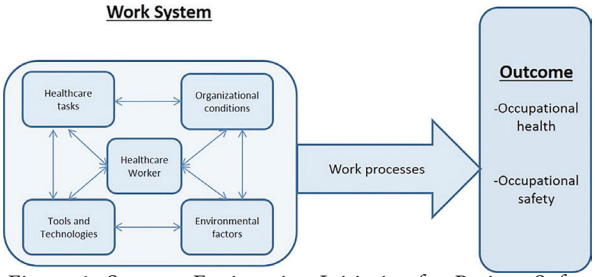

Figure 1. Systems Engineering Initiative for Patient Safety (SEIPS) Model[3]

The four dimensions to be covered in this model are explained in Table 1.

Table 1- Explanations of the Dimensions in the SEIPS Model[5]

Category	Explanation
Organizational Conditions	Structural, cultural, and political characteristics of the organization. Leader features, regulations, policies, level of hierarchy and indicators based on speed, quality, security, and performance.
Environmental Factors	Environmental factors are generally ergonomic factors related to the business environment in which service providers work. Order, light, sound, noise and physical space are among these elements.
Tools and Technology	It includes the presence of necessary equipment, ease of use of equipment, quality of video surveillance for endoscopy, design of technology and integration with other elements, structure designs related to technology and tools factors.
Healthcare Task	It includes elements related to job descriptions. These elements can be classified in terms of variables such as workflow, time pressure, work controls, workload, patient rooms visited, number of drug treatments applied.

MATERIALS and METHODS

A case study pattern was used, which is one of the qualitative research, patterns that allow it to be revealed in a realistic and holistic way in the natural environment.6 The sample of the study has been selected from the healthcare workers in the xxx province. The xxx province is chosen for two reasons. First, it was among the risky provinces in Turkey in the early stages of the pandemic, but later on, it was listed among the successful provinces for

its successful struggle model in combating the pandemic process. Second, two of the researchers have been working in the pandemic hospital in this province. In this study, for the sampling purpose, we have preferred a purposive sampling method in order to provide diversity (in terms of socioeconomic status, different cognitive and perceptual perceptions, regional variations, occupational status, etc.) in the sample with the intention of enhancing sampling representativeness for the study of interest.[7] For sampling, maximum diversity sampling, which is one of the purposive sampling methods is used. The sample of the study was made up of 13 volunteered healthcare workers working in different units and levels in a pandemic hospital in xxx, who were diagnosed with COVID-19 positive and started to work again after treatment. The study was approved by the Sakarya University Ethics Committee (71522473/050.01.04/399) and performed in accordance with the ethical standards of the Helsinki Declaration.

Participants

Some relevant information about the participants is summarized in Table 2.

Table 2. Socio-demographic Characteristics of The Participants (Healthcare workers)

P*	Occupational Group	Working Unit	Gender	Age	Professional Experience	Marital Status	No of child
P1	Attending Physician	Intensive Care Unit	F	39	12	M*	1
P2	Physician Associate	InternalMed. Unit	M	31	4	M*	1
P3	Nurse	Intensive Care Unit	F	45	27	M*	2
P4	Midwife	Medical home	F	39	17	M*	2
P5	Health Officer	Blood transfusion center	M	45	25	M*	2
P6	Health Officer	Covid/ Data entry	M	41	19	M*	2
P7	Health Officer	Emergency service	M	48	27	M*	2
P8	Medical Secretary	Pathology report	F	35	8	M*	3
P9	Medical Secretary	Blood-letting unit	F	33	7	M*	2
P10	Security Guard	Intensive Care Unit	M	40	12	M*	2
P11	Security Guard	Emergency service	M	34	8	M*	0
P12	Cleaning Staff	Intensive Care Unit	M	48	13	M*	1
P13	Clinical Support Staff	Intensive Care Unit	F	24	3	M*	0

P*: Participant M*: Married F*: Female M*: Male

Reliability and Validity

In qualitative research, validity and reliability are handled differently from quantitative research.[7] It can be stated that the trustworthiness assumption proposed by Guba (1981) as well as Lincoln and Guba (1986) in parallel with the certainty assumption of positivism is generally accepted. For this reason, the methods developed by Guba and Lincoln to ensure validity and reliability were used in the research. Credibility refers to the extent to which the findings are compatible with reality.[8] In order to ensure internal validity (credibility) in the research: (i) Prolonged engagement: Since the researchers completed the process by sharing with the people at different levels and in different units, they were free from prejudices and observation conditions were provided for the study. (ii) In-depth data acquisition: Researchers analyzed the interview texts in depth and relate them to the concepts in the texts. (iii) Triangulation: After the researcher's triangulation was made and the consensus was reached on the codes, the data coding, and data interpretation sections were completed. (iv) Expert Review: The researchers opted for opinions from other experts during the agreed code and themes phase. (v) Interviewer Corroboration: After discussing the purpose of the study and the questions in the interview, the people who were willing to participate were interviewed and the data were collected.[8]

Data Collection and Analysis

In the research, the face-to-face interview method was used to collect data. As the data collection tool, a semi-structured interview form was used. For the purpose of the research, we have developed several questions in light of the current literature and carried out two pilot studies on these questions in order to eliminate the likely problems and improve the quality of the final questions. The final version of the questions is presented in Table 3. Considering the sensitivity of the subject and the situation, utmost attention has been shown to conducting the interviews by keeping the interview duration within an average of 25 minutes. All replies were recorded word-by-word with the participants' permission. The data collected through face-to-face interviews were analyzed using the content analysis technique of the Maxqda program.

Research Findings and Sub Codes

The fact of believing that she/he is less likely to be infected with the coronavirus, even though they work in a pandemic hospital, is included in the analysis with the code of "optimism bias". It is also referred to as the "unrealistic optimism" theory in the literature.[9]

Optimism Bias Frequency[7]

- It was so bad when I first learned. I thought it would never happen to me. (Participant3)
- I accepted it later, but I thought it wouldn't happen to me. (p5)
- I insisted that I was not infected. In ten days, I had nausea, I could not eat, I was cold or something, and maybe my fever was rising too I didn't realize it at that time, but I said, "I am not COVID-19". I didn't want to believe it. -First, I didn't want to accept by saying things like "No I can't be, I'm just exaggerating, it must be just the flu because the window is open while I'm working, I tired too much because of hard work, I work very hard". I always said to my spouse, "I won't be diagnosed positive." while having a computed to-

Table 3. Interview Questions

Q1- From where might this disease (COVID-19) be transmitted to you?
Q2- What did you feel when you first learned? Have you encountered various difficulties in the process after the diagnosis? If you have encountered them, what are these? Can you explain?
Q3- You are infected with this disease and recovered from it and started your job again. What are your feelings about starting again?
Q4- What did you think about the treatment methods used in your treatment process? What do you think about the likely risk of spreading to other employees, prevention, and treatment methods related to this disease?
Q5- What are your thoughts about the future after the pandemic process and what kind of topics you think mostly?

Table 4- Codes of All Themes in the Study According to Research Findings and Sub Codes

Reference Model		Theme /Code / Sub Code	Sample expression examples from the participants
SEIPS	Organizational Conditions	Disagreement	- First, the Covid intensive care unit had been opened. I was walking through the chest intensive care unit to inform a patient relative. One of the nurses intercepted me and said to me "You shall not pass." She said, "You're infected." People were refraining just because we were walking through there. This was the level of unrest. I was so mad, so upset. It was not just my patient. They thought that those patients wouldn't be their patients too. The seriousness of the situation was not realized by not only that nurse but the majority. P*1, L* 24
		Team Spirit	-In addition, during the period that I didn't work for two weeks, I was upset to leave my friends. After getting over my first worries about myself, I felt guilty. P1, L18
		Leaderships Perception	-I extend gratitude to them. A lot of my colleagues from hospital asked after me, they were concerned. My friends, my chief and my manager called me. I felt happy at those moments. P9, L15
	Environmental Factors	Social Domains	-My colleagues have been tested. I felt so guilty at that time but then I was supported a lot by them. They said, "Maybe you got infected from us." We were resting at the same place in the end. P4, L 29
		Physical Conditions	-The masks of the patients were not properly worn. I may be got infected from them too. There was nothing like a glass wall between us. We direct them to bloodletting room, restroom. Their masks are not covering their mouth properly, they are not careful. P9, L 8
		External Environment	-On March 13 Friday evening, which was 10 days before I got sick, I had stopped by a union. I think that I had it there. P8, L 3
	Tools and Technology	PPE	-We never take our masks off. Before, we were not using equipment while we were with patients, after this situation, we are changing our equipment after each patient. P4, L 15
		Communication Technology	-We use walkie-talkies on the duty. One delivers to the other. P11, L 6
	Healthcare Task	Tasks	-This happened in the working environment, we have no contact with outside. P3, L 5
		Work Overload	-I wish the burden of the intensive care patients were not only on some specific branches so there wouldn't be a lot of people who were passive. This didn't have to be like that, we could share it. P1, L29
New Themes	**Psychological Factors**/ Negative Emotions	Anger	-I've seen those who were not standing by me in my hard times. Those who used to call me when they need my help for appointments, clinical examinations, didn't call me. P11, L 14
		Guilt	-I felt guilty because it was so early, I had to work with my colleagues, fight together with them but I was one of those who got infected. P8, L 22
		Worry	-Life will not return to normal. Shall we always be on guard? Is that so? How long people will live under lockdown? I'm worried about these things. P2, L 16
		Fear	-Frankly, I felt fear first. After high numbers of mass deaths that we hear from tv, professors made a statement. They said, "The disease will arrive at Turkey but since our healthcare system is better than other countries not the same problems will be experienced." When I first learned that I was diagnosed Covid positive, a shiver went up my spine. The name of this feeling was fear but if I get infected again now, I don't get scared. P12, L 15

	Psychological Factors/ Positive Emotions		-My only motivation was the calls and messages I got from my family and close friends, my neighbors. P3, L 15
	Social Factors	Religion	-In the period that I was isolated, I tranquilized myself by reading the Koran. I didn't let myself feel misgivings. P9, L12
		Friends	-Until I got transferred to patients' department from the emergency department, my phone never stopped ringing and I said to myself "I'm glad that I'm working here, with these people." One day, I thought "Oh, I'm so lucky. No one has visitors, nobody is coming for them, but my friends are always visiting me, standing with me." P8, L3
		Family	-Of course, I felt worried at first, my wife, with whom I was in close contact, came to my mind. P12, L 13
	Treatment		-There is not a normal treatment procedure, I haven't seen a prominent treatment. I've been told that treatment was not definite, and my family physician would follow up. Nobody knows a thing. Uncertainty prevailed everywhere. P5, L16
	Protection		-Unless there is a vaccine, no real protection is possible. P9, L13
	Risk		-I was the one who went into intensive care unit most. It was not an intermittent work; I went there every day. I think that increased the risk of infection. P1, L 3
	Optimism Bias		-It was like a joke to me. I thought I would not get contaminated or infected and It would not happen to me. P 11, L 13
P*: Participant L*: Location PPE*: Personal Protective Equipment			

mography scan. (p8)

- We didn't believe that we would be diagnosed positive. We thought "It's there but it won't infect us." (p10)
- When we realized that we are in a social domain, we took precautions. We were relaxed since we thought it wouldn't infect us anyway. (p12)
- If you are a healthcare professional, you get infected in any case. It will infect those who work in the intensive care unit, that's obvious but I still thought I wouldn't get infected. This disease was being talked about, but I always thought it wouldn't spread to Turkey. Even if it would, not to xxx, and if it spreads to xxx, not to our hospital. And even if it spreads in our hospital, I thought I wouldn't get infected. (p13)
- It was like a joke to me. I thought I wouldn't get contaminated or infected and It wouldn't happen to me. (p11)

The Theory of Unrealistic Optimism

It is a thought that can be expressed in words such as "It won't happen to me." It refers to the underestimation of the probability of experiencing a negative event. There are some mechanisms that are assumed to be determinants of unrealistic optimism.[10] They can be described in two basic categories: cognitive and motivational. Its cognitive descriptions are based on the assumption that people make systematic information-processing errors when making relative risk assessments. Its motivational descriptions are

based on the knowledge that accepting the possibility of negative life events is provoking anxiety. People use deceptive coping strategies (for example, to deny or distort the presence of danger) to reduce anxiety. Peretti-Watel (2003) says that some people who do risky behaviors use denial of risk in order to reduce the anxiety they may experience due to these behaviors.[10]

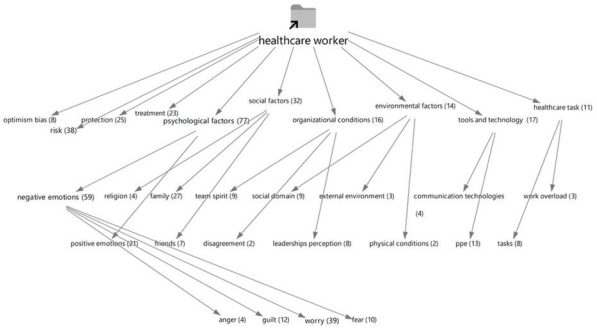

Figure 2- Study Model- Single-Case Model (Code Hierarchy)

The themes taken from the SEIPS model, the new theme added after the interviews with the participants, and the codes and subcodes of these themes are seen as hierarchical (In Figure 2). In the figure, the numerical expressions next to the dimensions indicate the frequency of use of the dimensions by the participants (for example, PPE*: Personal Protective Equipment; ppe [13]).

RESULTS

In this study, in which a qualitative process for the realization of perceptions and events in a realistic and holistic manner in the natural environment was followed, the necessary preparations were made before the observation-based interview and the data collection procedures were completed in May, June, and July 2020. The participants in Table 1 consist of six women and seven men. Work experience times were found to be x = 14 ± 8.38 years and ages x = 38.6 ± 7.08 years. The content analysis of the answers given by the participants yielded the coding structure presented in Figure 3. We can also observe the relations between the codes given in the figure below.

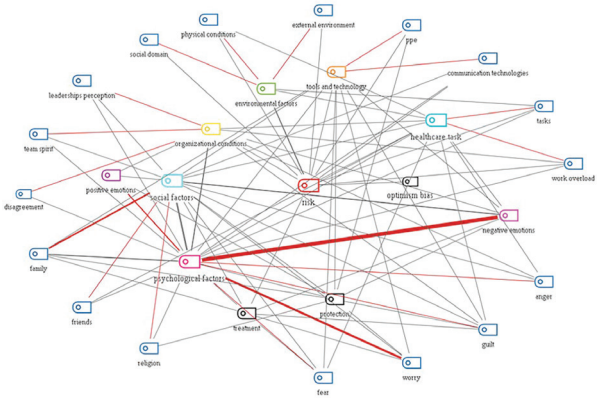

Figure 3- Dimensions and Sub-Dimensions of the Work System Structure of Healthcare Workers Within the Scope of the Research- Code Coexistence Analysis (Overlapping Codes)

DISCUSSION

Even though some of the employees were working at the pandemic hospital, the belief that the risk of coronavirus infection was low to them was the most striking subject in the research process. This situation has been examined from the perspective of unrealistic optimism theory. It is explained by the assumption that information processing errors are made about the risks of the work or the tendency to deny the risk to reduce anxiety. 10 Although the studies carried out on both aspects provide temporary relief for individuals, we think that the increase in this situation may reduce the behavior of taking measures against risks in individuals.

Studies show that increased exposure of healthcare workers who have long-term contact with infected patients is a risk. 11-18 However, within the scope of the research, although the healthcare workers who participated in the study saw the main source as the patients coming to the hospital, they introduced new definitions of risk for transmission. The first of these is the resting areas in the hospital where the healthcare personnel in need of rest sit side by side with their colleagues, eat something or drink tea and coffee. The second is the common means of transportation to go home or come to the workplace due to chan-

ging working hours during the pandemic process. These common areas have been described as important reasons for cross-contamination. The most vulnerable condition of the healthcare workers who are wearing all kinds of personal protective equipment (scrubs and surgical mask or N95 mask when necessary, protective glasses, exposure suit, and gloves) while going to the patients is the moments of rest with their colleagues in the social rest area.

An important result obtained in this study is that health workers make self-criticism about the use of personal protective equipment, and it is revealed that the deficiencies can be seen by the employees. Some participants stated that at the beginning of the pandemic period, healthcare workers did not pay enough attention to the use of personal protective equipment until they turned out to be sick (COVID-19 positive), but they used it diligently after learning that they were sick. It is seen in the interviews made with the healthcare workers within the scope of the research that the most dominant feelings in this period were negative feelings. Employees stated that they were more anxious about transmitting the disease to their families rather than themselves and that they had a feeling of guilt during the period after they were diagnosed with COVID19 positive. For this reason, it is critical that healthcare workers are informed at the beginning of the epidemic about what might happen when they are infected in terms of the risks of the epidemic and that they are trained on what to do or not. However, in spite of all these training and precaution measures, if a healthcare worker becomes infected, it is important for the management of the process that the institutions make the necessary arrangements and provide support in order to make all kinds of preparations in order to provide psychological support to the patient besides medical support and medical treatments.

Healthcare workers who had the infection stated that the patients in the treatment process had anxiety about the disease and its treatment as they knew their experiences in this process. For this reason, informing these patients about the negative effects of the treatment while performing the treatment, and informing them clearly about what to consider in the next step, or what alternatives await them if the treatment goes negative, will help to reduce anxiety.

The COVID-19 pandemic also causes physical and mental burnout in all healthcare workers globally due to longer working hours, increased workload, and stress.12,15,19 During this period, it is highly valuable in terms of motivation for colleagues and unit supervisors to call especially the sick employees over the phone and to support their treatment within the possible conditions.

Conflict of interest statement

The Authors declare that there is no conflict of interest.

Ethics Committee Approval

The study was approved by Sakarya University Faculty of Medicine, Ethics Committee; Date: 10.07.2020 Number: 71522473/050.01.04/399.

Authors' Contributions

Conception: OK, EY; Study Design: EY, RA; Supervision: OK, RA; Data collection, and Writing: OK, EY, RA; Analysis and Data Interpretation: OK, EY, RA; Literature Review: OK, EY, RA; Critical Review: OK, RA.

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