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Original Article

Exploring Psychological Consequences of COVID-19 Pandemic on Nurses Caring Patients with COVID-19: A Qualitative Study

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Abstract
Introduction: COVID-19 is a new disease infecting a large number of people, and undoubtedly have psychological impacts on healthcare workers. Among healthcare staff, nurses are the most involved ones in fighting against COVID-19. Therefore, this study aimed to explore nurses' experiences of psychological consequences during caring patients with COVID-19.
Methods: The present qualitative study was conducted using the conventional content analysis approach (Graneheim and Lundman) Iran. Participants in this study included 15 nurses working with patients with COVID-19, selected by purposive sampling. Data were collected using in-depth interviews. The rigor of data was assessed using the criteria proposed by Guba and Lincoln.
Results: Nurses reported the four following psychological consequences of COVID-19 pandemic on caring patients with COVID-19: post-traumatic stress disorder, depression, physical exhaustion, and aggressive behaviors.
Conclusion: The data showed that nurses experienced a variety of psychological consequences during caring patients with COVID-19. Therefore, it is necessary to monitor nurses' psychological problems and implement interventions to improve their mental health.

Introduction

COVID-19, a newly emerged infectious disease, was first identified in Wuhan, China on December 31, 2019.[1] In January 2020, the World Health Organization (WHO) declared the outbreak of a new coronavirus disease (COVID-19) as a public health emergency of international concern. In March 2020, the WHO made the assessment that COVID-19 would be characterized as a pandemic.[2] In Iran, the number of people contracting the virus was 6 051 642 with the death toll standing on 128 406 until November 17, 2021.[3]

The literature indicates continuously increasing numbers of COVID-19 patients, increased workload, and limited availability of personal protective equipment. Positive cases and death news in the media also get around rapidly, and lack of specific treatment and support may increase mental health burdens in healthcare workers.[4]

The pandemic brought not only risk of death from the viral infection but also unbearable psychological effects to individuals in Iran and the rest of the world. There have been reports on the psychological effects of COVID-19 pandemic on the general public, patients, medical staff, children, and older adults.[5,6] Among healthcare staff, nurses are the most involved ones in fighting against COVID-19. Nurses, as a major population of healthcare professionals in the COVID-19 pandemic, have worked in diagnosis, treatment and caring patients with limited resources for weeks. Therefore, nurses are highly exposed to psychological effects compared to other healthcare workers during the COVID-19 pandemic.[7]

It has been reported that nurses providing intensive health services during pandemic experience the highest level of job stress and mental issues compared to other health personnel.[8] Nurses are exposed to a range of psychosocial stressors because of these risks, and it may also be said that nurses diagnosing, treating and caring for COVID-19 patients in Iran will experience similar risks, problems and concerns. The psychological effects on nurses caring for patients with COVID-19 have also negative consequences for organizations. The extreme pressures experienced by nurses during the COVID-19 pandemic may increase risk of burnout, which has adverse outcomes not only for nurse's wellbeing, but also for patient care and the healthcare system.[9]

The present study, which is among the first studies conducted in Iran, aims to expand the scope of the available information on the topic at hand by contributing results from a different geography and culture. However, quantitative studies might fail to do so, as they might, in such cases, be incapable of creating rich data, which is often the result of deep understanding of the phenomenon.[10] Consequently, it is important to have comprehensive understanding through qualitative research of the experiences of clinical nurses during the COVID-19 outbreak. On the other hand, the most comprehensive and complete approach to exploring psychosocial consequences is qualitative approach in which participants share their experiences.[11] Such information may guide non-governmental organizations and the state in establishing necessary policies via psychosocial support studies to increase the mental well-being of nurses caring for COVID-19 patients.

The aim of this qualitative research is to explore nurses' experiences of psychological consequences in caring for COVID-19 patients.

Materials and Methods

This qualitative study was carried out using the conventional content analysis in 2021. The content analysis is used for describing a phenomenon, when there is few idea, or fragmented knowledge is available.[12] In this qualitative approach, codes and categories were directly extracted from the interviews.[13] The themes were extracted irrespective of preconceived themes of data.

Fifteen nurses working in the hospitals affiliated to Jahrom University of Medical Sciences (Iran) participated in the study. Three of them were male, and twelve were female. Nurses were selected using purposive sampling. Inclusion criteria were (*a*) at least 1 year experience in caring for patients with COVID-19 (*b*) willingness to participate in the study.

Data Collection and Analysis

Data collection was continued until saturation which occurred when a new category did not appear. The data were collected through deep semi-structured face to face interviews. Each interview lasted on average 40 to 60 minutes based on convenience, tolerance, and working experience. All interviews were conducted by the first researcher and author with prior agreement of the participants and their workplace. An electronic device was used to record all the interviews with the permission of the participants. The participants were asked some key questions as "Please describe a day of taking care of hospitalized patients with COVID-19", "What unpleasant experiences have you had in caring COVID-19 patients?", "What psychological problems did you experience during your care of COVID-19 patients?", "What psychological consequences do you think might affects nurses working in COVID-19?". Also, based on participants answers, more in-depth questions like "what do you mean?", and "please explain more about this" were asked.

The data were analyzed using Graneheim and Lundman's content analysis approach. The interviews were transcribed verbatim in Microsoft Office Word. We listened to the interviews and read the transcripts for several times to reach general perception. The units of meaning were groups of sentences which gave an identical meaning or were relevant to the same concept in some ways. Accordingly, this units were condensed and coded. The codes were compared with each other and classified into more abstract categories according to their resemblances. Finally, the categories were compared with each other and sorted into higher level main categories.[14]

Trustworthiness

Credibility, dependability, confirmability, and transferability were used to determine the rigor and reliability of the data according to Lincoln and Goba criteria.[15] The researcher and spent a long time in the field searching for data and enough time to gather and analyze the data for credibility of data. Member check was used after the formation of primary codes. The authors emailed the coded interviews to the participants and asked them to determine whether or not the extracted codes were consistent with their viewpoints and experiences. Peer check and constant comparison were used for dependability. Furthermore, codes and categories were given to two faculty members who were also competent in qualitative research for the external validation of the selection and classification of codes. Sampling mode, questions development, the method of coding and category extraction and modification were recorded to obtain sufficient conformability. Transferability was obtained by description of data-rich.

Results

A total of 15 nurses participated in this study, whose demographic characteristics are presented in Table 1. Based on content analysis, four main themes were revealed: (1) post-traumatic stress disorder, (2) depression, (3) physical exhaustion, and (4) aggressive behaviors (Table 2).

Post-traumatic Stress Disorder

Data analysis showed that one of the consequences of caring for COVID-19 patients is post-traumatic stress disorder, so that most participants are constantly exposed to stressful factors after COVID-19. Nurses mentioned they thought had the coronavirus with appearance of slightest symptoms. This stress is constant during shift work or rest time. A participant addressing this issue mentioned that: "*Most of the time, negative thoughts come to me, for example, I think that I or my family members will get this disease in the near future*" (P2). Another participant says: "*One of the important effects of the*

Table 1. Demographic characteristics of the study participants

No.	Age (y)	Gender	Educational level	Clinical work experience (y)
1	44	Female	Master's degree	21
2	38	Female	Bachelor's degree	11
3	45	Female	Bachelor's degree	21
4	42	Female	Bachelor's degree	18
5	25	Female	Bachelor's degree	2
6	31	Male	Bachelor's degree	2
7	35	Female	Bachelor's degree	10
8	29	Female	Bachelor's degree	1
9	24	Female	Bachelor's degree	3
10	33	Female	Bachelor's degree	4
11	30	Male	Master's degree	4
12	28	Female	Bachelor's degree	4
13	36	Female	Bachelor's degree	15
14	33	Female	Bachelor's degree	9
15	27	Male	Bachelor's degree	4

COVID -19 pandemic was the reduction of communication and isolation. I don't like to communicate with others like before and I prefer to be alone" (P3). Another participant mentioned: "*we had 7 deaths due to COVID-19 in one night. I've been repeatedly thinking about it. Those days remain in nurses the minds of and are constantly reminded and this issue has a negative effect on their spirit*" (P8).

Depression

Depression was one of the most important psychological consequences of coronavirus in nurses working in the COVID-19 ward. The nurses said they were depressed, and no longer the happy former people. They said that high mortality of patients in multiple waves of COVID-19 was terrible. A participant addressing this issue mentioned that: "*The fact is that when I see that my efforts are fruitless and I can't help the patients much, I no longer have the interest to continue working and I feel depressed.*" (P15). Another participant mentioned: "*It is very sad to see the illness and death of one's fellow man, and I feel emptiness and helpless that I cannot prevent their disease severity or death with my efforts*" (P7). Another participant says: "*My appetite has changed since covid-19 came, when I face the severity of the disease at work, I either don't feel like eating anymore or on the contrary, I overeat*" (P5).

Physical exhaustion

One of the most common psychological consequences of coronavirus on nurses working in the COVID-19 ward was the physical exhaustion. The nurses were physically exhausted due to consecutive working shifts, and the fact that they had to spend a long time in the form of standing up in the care of patients. A participant addressing this issue mentioned that: "*Symptoms such as fatigue, back pain, and knee pain due to insufficient rest, standing for a long time and etc. arising from multiple and consecutive work shifts, it has caused physical problems in nurses*" (P1). Another participant mentioned: "*As nurses, due to our high activity and the fact that we have to wear special clothing in order not to get sick, for example, we wear masks and gowns, etc. This causes us to suffer from shortness of breath and lack of oxygen, which automatically leads to physical fatigue and other psychological injuries in the nurses*" (P9). Another participant says: "*The heaviness of personal protective covers and gears reduces our abilities. It is very hard to focus on work with these covers*" (P2).

Table 2. The theme and sub-theme extracted from the data

Theme	Sub-theme
Post-traumatic stress disorder	Negative thoughts and feelings
	Social isolation
	Recalling unpleasant experiences from COVID–19
Depression	Uninterested to do everything
	Sense of emptiness
	Appetite disorder
Physical exhaustion	Emergence of physical problems
	Exhausting protective covers
Aggressive behaviors	Aggression
	Being impatient

Aggressive Behaviors

Another important psychological consequences of COVID-19 in nurses is the appearance of aggressive behaviors. The nurses expressed that multiple work shifts, crowded wards, lack of time for rest, being away from families, etc., caused aggressive behaviors. A participant addressing this issue mentioned that: "*I feel that I am very more aggressive than the time before COVID-19, I'm sensitive to the slightest thing and get me angry very quickly*" (P12). Another participant mentioned: "*I do not patience anyone anymore, I like to be alone. I feel I have to be away from work and nursing for a while to be able to get back to normal condition*" (P5).

Discussion

According to the results of this study, psychological consequences of COVID-19 pandemic on nurses are explored in four themes of post-traumatic stress disorder, depression, physical exhaustion, and aggressive behaviors. In line with the results of present study, some studies showed high level of psychological consequences among nurses during outbreaks.[16-18] Also, a systematic review and meta-analysis has shown a high prevalence of psychological disturbances like stress and depression among nurses during the COVID-19 pandemic.[8]

In this study, nurses experienced post-traumatic stress disorder resulting from negative thoughts and feelings, social isolation, recalling unpleasant experiences from COVID-19 and etc. In the current study, nurses reported

stress of being separated from their children and parents and were worried about to be isolated. The results were consistent with the findings of previous similar studies.[19-20] In this study, nurses also reported fear of being infected with COVID-19, which was consistent with similar previous studies.[6,21] Death of these patients can negatively affect mental health in nurses. In line with the results of the present study, other studies have shown that nurses may not be prepared to communicate with dying patients and their families,[22,23] and they may become stressed and fear observing dying patients.[24] Studies conducted during previous pandemic consistently highlight that a relevant proportion of nurses is at risk for developing post-traumatic stress disorder symptoms.[25] The development of post-traumatic stress distress among nurses represents a crucial issue, since the impact of traumatic experiences may have significant long-lasting effects.[26] Lasalvia et al found that 53.8% from healthcare workers have symptoms of post-traumatic distress.[27] Similarly, in another study in previous pandemic, post-traumatic stress disorder and depressive disorders have been identified as the most common psychological consequences.[28] Xu and Zhang conducted a psychological questionnaire survey of 41 first-line clinical nurses with pneumonia who participated in the fight against COVID-19 and found that 92.68% of nurses developed psychological problems within 2 weeks, mainly manifested as fear and anxiety.[29] Their findings are similar to ours. Hence, psychological nursing and appropriate psychological interventions are important during public health emergencies.

Another psychological consequence of COVID-19 on nurses was depression. Also, in process affecting with COVID-19, some nurses due to receiving negative feedback from families or friends or uninterested to do things, may have increased their depression. The prevalence of depression in healthcare workers during COVID-19 pandemic in China was reported 44.37%.[30] Similarly, Lasalvia et al reported that 26.6% of healthcare workers have symptoms of moderate depression.[27] Approximately one-third to half of the nurses reported symptoms of anxiety and depression in the pandemic.[30] Indeed, it might be necessary to develop a mechanism that protects first-line nurses from psychological distress to relieve the pressure they face. In the same direction, Liu et al recommended setting up a psychological counselling line and providing online and offline psychological clinics that can offer psychological counselling to medical staff.[31]

Physical exhaustion was another psychological consequence experienced by nurses during COVID-19. Personal protective equipment against disease has led to physical exhaustion of nurses. Personal protective equipment was reported to be unpleasant, hard, and tedious for the nurses. It seems that these issues can be resolved by considering rest intervals during shifts, shortening working hours and increasing the number of nurses. Such experiences affect the care that can be offered to patients, as well as the physical well-being of nurses. In a study by Kim, nurses described heavy perspiration due to unbearable body heat caused by personal protective gear and fog on protective goggles caused by respirators as the main causes of physical tiredness.[32] The results of Sun et al also showed the nurses caring for COVID-19 patients felt extreme physical fatigue and discomfort caused by the outbreak, intense work, large number of patients, and personal protective equipment,[21] which was consistent with the findings of present study. One of the categories extracted in the study of Moradi et al was "physical exhaustion" which is consistent with the results of the present study.[33] In a study by San et al nurses, providing care for COVID-19 patients, felt severe physical tiredness and discomfort due to the spread of the disease.[34]

Another psychological effects faced by nurses was aggressive behaviors such as aggression and being inpatient. Some studies have shown that the outbreak of a pandemic disease can put psychological burden on nurses.[35,36] The incidence of behavioral problems such as irritability, aggression, anger and other maladaptive behaviors in nurses and their family's anxiety and concern, and generally reduced quality of interpersonal relationships in the family can lead to aggressive behaviors. In this regard, two of the themes extracted in the study of Moradi et al was "aggression" and "lack of peace in life" which is consistent with the results of the present study.[33]

About the limitations of this research, it can be said that a qualitative study should be conducted through relatively long face to face interviews for obtain a stronger rigor of data, but in this research, the data was collected in a short time. Besides, as the study participants were exclusively from hospitals affiliated with Jahrom University of Medical Sciences, we did not account for potential regional variations in the risk perceptions towards COVID-19. Future studies should involve a larger research with several sites and geographical locations for a more comprehensive understanding of the topic.

Conclusion

The present study revealed clear and comprehensive understanding of psychological consequences faced by nurses during COVID-19 pandemic based on their experiences. Nurses caring for COVID-19 patients have experienced high level of psychological problems during the pandemic. Therefore, it is recommended to monitor nurses' psychological problems and implement professional psychological counselling and strengthened crisis support systems.

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Authors' Contribution

Conceptualization: Ali Dehghani.
Data curation: Ali Dehghani, Afrooz Rahmanian, Somaye

Research Highlights

What is the current knowledge?

- COVID-19 is a newly emerged infectious disease which was first identified in Wuhan, China on December 31, 2019.
- There have been reports on the psychological effects of the COVID-19 pandemic on the general public, patients, medical staff, children, and older adults.
- Among health staff, nurses are among the most involved in fighting against the COVID-19.

What is new here?

- The nurses reported the four following psychological effects the COVID-19 pandemic of care for COVID-19 patients: post-traumatic stress disorder, depression, physical and mental exhaustion, and behavioral disorders.
- The nurses were physically and mentally exhausted due to consecutive work shifts and the fact that they had to spend a long time in the form of standing up in the care of COVID-19 patients.

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Competing Interests

There was no conflict of interest in this study.

Data Availability Statement

Data is not and will not be made available elsewhere. Further data set could be obtained on request if required through corresponding author with email: ali.dehghani2000@ gmail.com.

Ethical Approval

The present research was approved by the ethics committee of Jahrom University of Medical Sciences (Code of Ethics IR.Jums.Rec.1400.029). Before data collection, the researchers obtained the oral and written informed consent to ensure the confidentiality of the names of people, privacy and an emphasis on voluntary participation. At the beginning of the interviews, research goals and method were explained to the participants and they were assured of confidentiality of information.

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