Lived Experiences of Iranian ICU Nurses In The Care of Patients With Covid-19: A Phenomenological Study

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Abstract

Background: Covid-19 pandemic with its sudden and widespread global outbreak has stunned health care systems. Nurses are at the forefront of fight against this pandemic, and Intensive care unit (ICU) nurses are more at risk of infection as they have a greater interaction with infected patients. Therefore, the present study was conducted to explore the lived experiences of Iranian ICU nurses in the care of patients with covid-19.

Methods: This is an interpretive phenomenological study in which, 15 ICU nurses were purposefully selected. Semi-structured in-depth interviews were used to collect data. The transcripts of the interviews were recorded and then analyzed by Diekelmann (1989) method with hermeneutic approach.

Results: Ten of the samples were female and five were male. The mean age of participants was 32 years and their average work experience in the intensive care unit was 6 years. Three main themes were obtained from data analysis, including beyond usual care, the emergence of a new image of nursing and the Realization of professional challenges.

Conclusion: Working in difficult and unknown conditions with many challenges caused mental and physical depreciation of nurses in the intensive care unit. However, the nurses showed a spirit of self-sacrifice and did not give up their relentless efforts to fight this unknown enemy, and fulfilled their professional responsibilities to provide the best care to patients. By doing so, the nurses showed a new image of nursing to the society. Therefore, full support should be provided to healthcare workers, especially nurses by the authorities in order to prepare them to respond to unwanted crises.

Background

All across the world, the potential for emerging new infectious diseases is an important global health issue (1). Exposure to previous epidemics such as Middle East respiratory syndrome coronavirus (MERS-CoV) and Ebola has shown that no country in the world is safe from these threats (2). On December 29, 2019, hospital physicians in Wuhan, China, noticed unusual cases of patients with pneumonia. An unusual outbreak of pneumonia was subsequently reported to the World Health Organization (WHO) on 31 December 2019. On January 9, 2020, a new coronavirus called Ncov-19 was announced that was responsible for the disease (3, 4). Following the increase in the global incidence and spread of coronavirus, the WHO issued a statement on January 30, 2020, declaring the new coronavirus to be the sixth leading cause of public health emergency in the world (5). Patients infected with the coronavirus may develop acute respiratory distress syndrome (ARDS), which is likely to require admission to intensive care units (6). It has been shown that in times of crisis, employees in the intensive care unit become more distressed if there is an incompatible increase in demands for resources (7).

Healthcare workers, especially nurses, are always at the forefront of fight against any epidemic, and they risk their own life to perform their duties. Since they are likely to be in close contact with covid-19 patients, they are particularly vulnerable to infection and spread of the virus among colleagues and

family members (8, 9). In addition to physical stress, nurses face risks such as pathogens, long working hours, fatigue, and burnout due to work condition, which put them at risk of infection (8, 9). According to the International Council of Nurses (ICN), at least 90,000 health care workers worldwide have been infected with covid-19 (10), and more than 600 nurses have died from the disease (11). In Iran, according to the report of Medical Council of the Islamic Republic of Iran, more than 150 health care workers have died so far due to covid-19 (12).

Nurses' experiences can never be understood by conducting surveys and quantitative studies. To do so, one has to immerse oneself in their real world and be in personal contact with the nurses and learn about their experiences. Often, the lived experiences of staff dealing with dangerous patient care are underreported. Therefore, exploring the experiences of nurses who are at the forefront of fight against this pandemic is of great importance and priority. For this reason, the present study was conducted to explore the lived experiences of ICU nurses in the care of patients with covid-19, in Iran. It is hoped that the findings of this study will provide valuable insights into nurses' experiences and help to make appropriate plan for possible future epidemics.

Methods

Study design and settings

This is an interpretive phenomenological study that was conducted in 2020. In order to access complete and rich information, the research field covered a wide range and the participants consisted of ICU nurses from 8 teaching, private and public hospitals in 7 provinces of Iran that had a high prevalence of covid-19.

Study Participants

The participants were ICU nurses who were caring for patients with covid-19 in intensive care units. The purpose-based method was the main sampling method. In order to achieve maximum variation and obtain rich information, people with various characteristics in terms of age, gender, education, and employment history were selected. Finally, data were collected and analyzed simultaneously over 3 months. The inclusion criteria were; being interested in communicating and expressing personal experiences, and being an intensive care unit nurse from the beginning of the outbreak of covid-19 and have the experience of caring for patients with covid-19.

Data collection procedures

In order to collect data and access valid and real information, semi-structured in-depth interviews were used. The interviews were conducted in person and in accordance with the basic principles of personal hygiene. In some cases when there was a possibility of crass contamination, interview was carried out by telephone.

In each interview, participants were first asked about their personal details for introduction and to establish communication, and then more specific questions related to the purpose of the research were asked. Some of the questions included; "How was your experience of caring for patients with covid-19?" "What does this experience mean to you?", "What was your experience like?", and "How would you describe it?". Then exploratory questions such as "Can you explain more about this?" and "What do you mean by that?" were asked and at the end of the interview, open-ended questions, such as "Is there anything else you would like to explain?" were asked. The questions were asked based on the interview guide and the participants' answers. The duration of each interview varied from 45 to 90 minutes depending on the participants' circumstances and patience.

Ethical Considerations:

The proposal of this study was approved by the Ethics Committee of Research Council of Tehran University of Medical Sciences (TUMS) with the code: TUMS. VCR. REC. 1399. 014. To participate in the study, informed written consent was obtained from the participants. At the beginning of the interviews, the participants were explained about the purpose of the research, the interview method, the confidentiality of their information, and the freedom to withdraw from the study at any time. The participants were asked for give permission for recording of the interview, and the time and place of the interview were coordinated with them.

Data analysis:

Data analysis was performed by hermeneutic approach using Diekelmann method (1989). This method is a seven-step process based on Heidegger's phenomenology and has a team nature. The steps of this method are as follows: Read the interviews and get a general understanding, Write interpretive summaries and encode possible themes, Analyze selected versions as a group to identify themes, Return to texts or contributors to classify disagreements in interpretation and write a composite analysis of each text, Compare and contrast the texts to identify and describe common functions and meanings, Identify structural patterns that connect the themes, Extract the answers and suggestions of the interpreting team or those who are familiar with the content of the work or the method of study for the final version (13).

According to the above method, after each interview, the text was first written down on a piece of paper and reviewed several times to get a general understanding of it. An interpretive summary was written for each of the interview and its semantic units were extracted. Team members exchanged views on extracting topics and themes. As other interviews continued, previous topics became clearer or more evolving, and sometimes new themes were extracted. This was done by talking to team members. MAXQDA10 software was used to manage large volume of data.

In order to explain, clarify, classify and resolve any discrepancies and inconsistencies in the interpretations, the process of returning to the texts or referring to the participants was continued regularly in a frequent manner. At each stage, as the work progressed and interpretive summaries were

combined, a more general analysis was performed that resulted in the emergence of the subthemes and main themes.

Trustworthiness:

In order to achieve the trustworthiness of the data, the Guba and Lincoln criteria (1985), including credibility, dependability, transferability and confirmability, were considered and used by the research group (14). The trustworthiness of the study was ensured by emphasizing on choosing the right field, using eligible participants, having close and long-term interaction with covide-19 patients and adopting a team approach using the collective opinions of the research team.

Results

The participants consisted of 15 ICU nurses who had been selected from 8 hospitals in 7 different provinces of Iran that had high prevalence of covid-19 in 2019. All demographic characteristics of the participants are presented in Table 1.

Table 1
Demographic characteristics of the participants

Demographic characteristics		Frequency
Gender	Male	5
	Female	10
Marital status	Single	6
	Married	9
Education level	BSc	10
	MSc student	3
	MSc	2
Type of hospital	Teaching	13
	Private	1
	Public	1
Type of activity	Volunteer	7
	Non-volunteer	8
Children	Yes	5
	No	10
Total work experience	Mean ± SD	8.35 ± 5.44
ICU work experience	Mean ± SD	6.86 ± 4.98
Age	Mean ± SD	32.20 ± 4.98

During the data analysis process, three main themes were emerged, including beyond usual care, the emergence of a new image of nursing, and the Realization of professional challenges. Each of these themes had several sub-themes (Table 2).

Table 2
Main themes and sub-themes

Main themes	Subthemes
Beyond usual care	Sense of uncertainty
	Altruism
	Caring as an opportunity
	Comprehensive care
	Receiving unusual reactions
The emergence of a new image of nursing	Receive appreciation from the people
	Receive appreciation from the authorities
	Receive appreciation from your family
Realization of professional challenges	Take a leap in the dark
	Strong & Steady

1) Beyond Usual Care

This theme refers to the experience of different emotions, and includes sub-themes of sense of uncertainty, altruism, caring as an opportunity, Comprehensive care, and receiving unusual reactions.

Most of the nurses stated that, they had different and sometimes contradictory emotions while providing care to covid-19 patients. Early in the illness, the nurses experienced emotions such as fear, anxiety, strange sense of preparation for death, patients' experience of fear of death, especially young people, and the unpleasant experience of uncertainty about the patients' treatment due to the lack of clear treatment. But gradually they developed emotions such as the humanitarian nature of working in crisis, and sense of self-sacrifice, altruism, satisfaction, self-confidence and happiness, especially when seeing patients recover from the disease and get discharged.

"I feel sorry for these patients. We take care of these patients in a situation where I can safely say that their own parents do not take care of them, so this feeling is indescribable and it is a very complex feeling" (Third interview).

"It's very upsetting. The experience of patient death is really upsetting; the patient we were talking to until yesterday. For example, patients who were saying to us; I'm cold or I'm short of breath; they were talking to co-workers and nurses and the next day you see a decrease in their saturation and their level of consciousness and no matter what we did, their level of consciousness are not improving and they have a sense of suffocation. You know, they have a really painful death"(Fourth interview).

"It is like humanity for me and I am happy to do this from a human point of view. I mean, apart from religious issues and everything else about human beings, it gives me a sense of humanity that I am working in this crisis"(Fourteenth interview).

The nurses expressed their gratitude to their countrymen in times of need, and welcomed death in their holy clothes to save the lives of their countrymen. They compared the experience of working in this crisis to war condition, a jihad and fighting an unwanted enemy.

"Working in these conditions is like war, it is a big crisis, a crisis that comes unintentionally and affects everyone. It is like an unwanted war that Iran had for 8 years. I have a feeling that maybe I can prevent big blows and more injuries"(Fifth interview)

By working in this situation, some nurses acknowledged that their lifestyles have changed over time, in a way that they have realized the value of many things, and there is even an opportunity to care for patients in an unpredictable way. They also believed that, they could update and get acquainted with new drugs, their side effects and new treatments. Some nurses stated that in this situation, there is a sense of interaction and cooperation between colleagues more than before. In fact, this disease has provided a good opportunity to show a better face of nursing, and has provided a better definition of nursing in society.

"It's a good experience, at least for me. I can say that it's a good experience that working with these patients has made me read every day, and every day I read everything I can find about this disease in the internet and hospital wards, which may be useful. I read for myself and for patients I care for"(First interview).

"... There is really more interaction and cooperation between staff. For example, I say if a colleague finishes his/her work late, a colleague will get up to help her/him, our sense of cooperation has been strengthened" (Fifth interview).

"There are a lot of changes in my daily life right now. First of all, because I have a sick mother, I live in quarantine at home away from family in a room on a separate floor. In general, the lifestyle before and after coronavirus, is completely different" (First interview).

According to the experience of participants in this study, nurses should have a holistic view on providing care to these patients, in other words, they should take a Comprehensive care of them. Nursing care such as oxygen therapy, fluid therapy, change of position, respiratory physiotherapy and control of blood oxygen levels and fever of patients are greatly important. Due to the lack of specific drugs in the treatment of these patients, the effect of nursing care is more pronounced and evident in these patients.

In addition to the need for physical care, patients with covid-19 also need psychological care. The nurses assured the patients that they were always nearby and available to them.

Due to concerns about their illness and their families, the nurses took a series of preventive measures after working upon their return to their home, and in fact, this has caused the ICU staff to observe more protective measures and the principles of quarantine more than staff of other wards and other members of society.

"My experience is that these people, who are separated from the ventilator, often need a nurse to cheer them up and lift their spirit so that, they began to hope for a cure and recovery. The nurse should also try to joke with these patients and keep them healthy, especially emotionally"(Third interview).

"Now, I take a shower, put my clothes in the hallway, turn off my phone and clean it with alcohol and then put it away for an hour every day when I go home. I don't let children to touch me"(Eighth interview).

Nurses' experience showed that, they believe covid-19 is a strange, different and dangerous disease. It also showed that, among other things, covid-19 patients were more alert and had higher stress, and especially in patients with a positive test, there was a fear of death, and death was possible at any age and in any condition, even without the underlying disease. Nurses with extensive experience working in intensive care unit stated that, sometimes death from the disease is unpredictable, and many patients with relatively good general condition can soon become ill and die within a short period of time.

"I talked to the patient whose level of consciousness was high and gave him his medication and then, I went to the next room to give medication to the next patient, and upon my return to the previous room I saw a flat line and found out that, the patient has died in few minutes. It is so painful for patients and for nurses"(Second interview).

"Well, in general, patients who have heard the name of coronavirus and have respiratory problems are very stressed and afraid. Will they be treated or not if they get infected, because they have already heard that whoever gets infected will die"(Ninth interview).

2) The Emergence Of A New Image Of Nursing

The participants stated that at this time, people's trust in the medical staff has increased, and nursing work and its value are better understood. Patients also do not have high expectation as before, and understand and respect nurses. On the other hand, in general, attitudes and views of people towards nursing have changed in a positive direction. Due to the circumstances, salaries and benefits are paid on time, which could be an incentive to endure hardships. The nurses in this study considered family support and gradual coping and understanding of their families with the issue of working in these difficult conditions as a source of encouragement to continue working. On the other hand, they believed that this situation is the best time for officials to defend and support nursing. They also referred to the officials' support as important factors to raise the moral of employees to work in this condition.

"You know, maybe we have provided a better definition of ourselves during this time. Perhaps a better definition of nursing was not so well known before, because most of the treatment process is done by

nurses"(Tenth interview).

"The view of outside world has changed about nursing and has become relatively better. People know that nurses provide care to them"(Third interview).

"For example, under normal circumstances, many patients are really demanding and insult us some times. In these circumstances, it seems that everything has changed. People are more grateful and it seems that our special position and condition has improved"(Tenth interview).

*"This coronavirus has made people aware of who is really working in health care field, and I have come to the conclusion that I should continue my work, whether the authorities acknowledge it or not"(*sixth interview).

3) Realization Of Professional Challenges

One of the challenges of working in covid-19 intensive care unit is the psychological challenge of the stress or death of young people or the painful and sudden death of patients. We found that, psychological stress is higher in high-risk nurses early in the illness, and in inexperienced nurses. The nurses felt severe physical and mental fatigue and burnout in the covid-19 wards due to high workload.

"The stress of caring for covid-19 patients has its own difficulties compared to the wards that we used to work on. The clothes we wear are more tiring than normal wards, and the challenges are more stressful" (Ninth interview).

Most nurses repeatedly stated that working with personal protective equipment (PPE) for long hours is a major and very tedious challenge. Working with the PPE causes excessive sweating and prevents nurses from taking fluid and food. Some nurses also referred to the lack of knowledge about how to use PPE and the contradictory information about its use as challenge.

"In the beginning, we did not know what clothes we should wear to have a lower risk of getting the disease. We also searched to find out what kind of clothing do the CDC or WHO suggest. For example, whether we need to wear head to toe uniform or just gown, or do we need to war hat or not. This was a primary issue for us. For instance, someone said we should wear foot cover, another said we do not want to wear it. Then we tried to wear everything ..."(Eleventh interview).

"The situation here is that, the clothes we wear do not allow us to go to the bathroom. We have to reduce our food and fluid intake. Many nurses do not eat in the shifts, so that they wouldn't have to go to bathroom. I don't drink as much in my shift and if I damage my clothes, I won't get a replacement. Wearing the face mask causes hypoxia, and we have these nutritional and health issues"(Fourth interview).

Social challenge was another challenge, which referred to the inappropriate perspective of people in society and avoidance from nurses who work in the covid-19 units. Limited relationship in the family and with close relatives was one of the challenges that the vast majority of nurses experienced. Many of them referred to the quarantine and the challenge of being away from family, the annoying quarantine condition for children, the loss of life, the boredom of life and the disruption of daily life to the point that in some cases they were pressured by family and spouses to leave their job.

"... Now, it is a little better, but in the beginning, the atmosphere was not good at all. People could not accept those who work in the hospital. There was something in the family, because I heard some people said that anyone who works in hospital is infected, and a number of other things. Friends and relatives' behavior was different, which was very annoying"(Twelfth interview).

"Often many of our colleagues separate their living space at home, even in their own rooms and live completely away from other family members. I have a colleague who works with me, and now when she goes home, she cannot see her own children, because they live with her mom. She lives alone in her home"(Tenth interview).

"Our shift was so intense that sometimes we could not go home. Maybe we were carriers and we did not know about it. It was a difficult time and it is still a nightmare. I do not think it is going to leave us" Twelfth interview).

"I mean, I can say one hundred percent that life is closed and if we do not take care, we will be certainly infected. Life is very, very closed, and I can safely say that this is not a life that we leave" (Eighth interview).

Since global and national statistics on the incidence and even death of health care workers are published every day, nurses were concerned about the possibility of contaminating society, the possibility of cross contamination while serving food, and the possibility of infecting family and community members. They were very worried about the possibility of infecting their own family. Some of these nurses became infected.

"... Our staffs have been infected with coronavirus. One of our emergency physicians died from it. Another doctor nearly died, but fortunately he got back to work. Then, 10 nurses who were working in ICU, emergency department and other wards became infected"(Thirteenth interview).

"... Some shifts really bothered us, especially the night shifts. We cannot drink anything during the shifts for the fear of contamination, not even water. When we go home we cannot replace the lost fluids. Everyone who sees me will notice that I have lost a lot of weight. During these shifts, I feel my brain has frozen in these clothes"(Fourth interview).

The nurses stated that despite the difficult situation and facing many and sometimes unbearable challenges mentioned above, they tried to provide the best possible care to patients and support their patients with love and affection. They considered it their professional duty to do everything they can, and

they did not spare any effort to save the lives of patients. They also did not leave their posts under any circumstances, even in cases where they themselves had an underlying illness.

"Early on, this disease was so frightening because it was an unknown disease. Staffs were scared and did not know whether they become ill or not. But we came to work anyway at the front line and we still fight" (Fifteenth interview).

"My colleagues and I have been working hard all these times. It was a scary thing, but this fear was not something that would make us give up working. I worked all days, and with my heart and soul" (Fourth interview).

"... But still, in spite of all these difficulties, we continue to do our duty, and in these critical circumstances we will not leave our stronghold (with tears in the eye). Until the last day that this coronavirus exists, we will serve the people"(Thirteenth interview).

Discussion

The ICU nurses' experiences in caring for patients with covid-19 indicated a sense of responsibility and relentless effort to combat this unknown enemy in order to reduce the suffering and problems of patients and provide comprehensive physical and mental care to them. They tried to show a spirit of self-sacrifice, fulfill their professional responsibilities, and provide the best care to patients in difficult situations.

While providing uninterrupted care to patients with covid-19, nurses experienced a variety of negative, positive, new, strange, and frightening emotions. Sometimes these feelings were different and even contradictory in a particular person at different times. For example, in the early stages of Pandemic, the nurses mainly experienced emotions, such as the need to fight against an unknown enemy, fear, panic, stress, and anxiety. During the Severe Acute Respiratory Syndrome (SARS) and MERS-COV epidemics, health care workers also experienced emotions such as fear, anxiety, and frustration and were at higher risk of mental health problems such as post-traumatic stress disorder (15–17). In a qualitative study that explored the psychological experiences of nurses caring for patients with covid-19, Sun et al (2020) reported positive and negative emotions such as fatigue, discomfort, fear, anxiety, and concern. In the beginning, negative emotions prevailed and gradually positive emotions appeared (18), which is consistent with the results of present study. Also, during a survey study in 2020 regarding covid-19 Pandemic, health care workers had more psychological symptoms such as obsessive-compulsive disorder, insomnia, anxiety, and depression than others (19). The results of Wong's study (2004), which examined the experiences of intensive care unit nurses in caring for SARS patients during the SARS outbreak in Hong Kong, showed that intensive care unit nurses suffered from a great level of fear and stress in caring for SARS patients. Feelings of social isolation and stigma were among the negative feelings of nurses in this study. These findings suggest that managers should pay more attention to supporting health care workers (20).

Some participants acknowledged that, the situation was such that every morning they thought they may get infected today. In the Kim et al (2018) phenomenological study aimed at determining the experiences of nurses in caring for patients with MERS-CoV, one of the main themes was going to the dangerous field (21). A qualitative study that investigated how nurses perceive the risk of infectious diseases showed that, nurses considered occupational risk caused by infectious diseases to be unavoidable due to the nature of nursing that requires close interaction with patients, colleagues and members of society (22).

Respect and appreciation of patients and the community was satisfactory for nurses. Receiving appreciation in the form of social support was crucial. Family support of nurses was encouraging them to provide care to patients. Support of the authorities was an important factor in the sustainability of care delivery. Given the essential role of nurses in the recovery of patients with covid-19, the WHO's Director General has referred to nurses as the backbone of health system (23).

Like many infectious epidemics such as Ebola, SARS and MERS-COV, there is currently no effective and well-known cure for covid-19, and nursing care plays an important role in patients' recovery. Therefore, nurses have a heavy responsibility, which includes providing comprehensive care and psychological support to patients, prevent possible complications of the disease and drug side effects, establish close communication with the patient and physician, evaluate and monitor patients, make diagnosis and provide rapid response to clinical symptoms. According to a guideline on preventing the spread of disease in isolated patients, family members are not allowed to accompany patients, which increases the responsibility of nurses in providing primary care. Liu et al (2020) also stated that due to the isolation policy during the outbreak of covid-19, family members could not accompany patients and nurses were responsible for all primary care (24).

According to the WHO, nurses and other healthcare professionals are at the forefront of the fight against covid-19. They have also shown their compassion, courage and bravery in the face of this pandemic around the world, and their value have never been revealed like this before (23).

One of the major challenges in providing comprehensive patient care was the wearing of PPE for long hours, which in itself caused physical and mental discomfort for nurses, especially during long shifts. They also did not have adequate knowledge on how to use PPE and had conflicting knowledge about the use of PPE, especially at the beginning of the outbreak. Kong et al (2018) in their study during the outbreak of MERS epidemic achieved similar results to the present study, including confusion due to unclear and constantly changing instructions, burnout due to high workload and concerns about the possibility of getting infection (25). Joker et al (2017) in a qualitative study with a descriptive phenomenological approach concluded that nurses, who are at the forefront of the fight against epidemics, have concerns about their safety, and also the lack of strategy in infection management and control as well as training intensifies their fears and confusion (2).

Occupational safety and health of nurses and all health care workers, including unimpeded access to personal protective equipment to provide reliable care and reduce infections in health care centers are at the focus of WHO (26). Overall, fighting infectious diseases in hospitals relies on the availability of

personal protective equipment, infection control training, organizational support of staffs' health and safety, good communication practices, and the proper use of infection control methods by health care workers (27).

In the face of this unknown disease and the unpredictable dangers associated with it, nurses were terrified of the disease and even death of themselves and their families. Therefore, nurses' concerns in this regard should be considered. In the qualitative study of Lam et al (2013), nurses' concern about their health and health of their family was one of the main themes (28). In this regard, a study showed that supportive conversations and recommendations, such as separating the living space, changing clothes and taking shower immediately after work, may help o reduce nurses' concern and anxiety (29).

According to a survey study, health care workers feel compelled to perform their duties during epidemics despite personal risks. However, in some cases this sense of duty may be jeopardized by the sense of duty towards their families and the perception of not being appreciated by their employers (30).

To help health care workers, especially nurses in the intensive care unit, and reduce their fear and anxiety, in addition to improving infection prevention knowledge and personal protective measures, hospitals must provide a safe working environment, right protective equipment, and adequate staffing. Concerns about transmission of transmissible respiratory illness are not new in the healthcare sector, as the prevalence of tuberculosis, varicella zoster (chickenpox) and influenza among health care workers is well documented (31). Health care workers have an important role to play as a major force in the fight against epidemics. Unfortunately, many front-line personnel have sacrificed their health and became ill or died, and this has increased their stress (18). At the time of MERS-CoV outbreak in South Korea, not only ordinary people, but also health care workers were very scared. In particular, nurses who interacted closely with infected patients were concerned about the transmission of MERS-CoV to themselves and their families (21). Nurses caring for MERS-CoV patients in Saudi Arabia were also worried about the lack of information about MERS-CoV, the psychological damage caused by infection and death of their patients (32).

Amanda Corley et al (2009) conducted a qualitative study with phenomenological approach to document and describe the lived experiences of nurses and medical staffs that cared for patients in the intensive care unit during Influenza a virus subtype H1N1 (H1N1) epidemics. Wearing personal protective equipment, infection control methods, fear of disease transmission, adequate staffing in the intensive care unit, new role of staffs, morale level, training of advanced therapies such as extracorporeal membrane oxygenation (ECMO) and challenges of caring for patient were mentioned as the main themes in above study (33). In another qualitative study, creating a supportive and safe work environment by providing adequate nursing staff, providing quality personal protective equipment, and improving communication in the event of infection outbreak were found to be essential (25).

The experience of nurses showed that despite all their bitterness and misfortunes, they did not leave the stronghold of service and did what they could with sincerity. Despite the difficult conditions and

challenges, most nurses had a positive feeling towards fighting against this unknown enemy, and helping and supporting their patients and colleagues.

Karen Hammad (2016) in a qualitative study with a hermeneutic phenomenological approach concluded that nurses, despite facing various challenges such as emotional challenges, did not give up altruistic efforts and helped colleagues and injured people, and even in some cases sacrificed their needs to help others(34).

Liu et al (2020) in a qualitative study to describe the experiences of health care providers during the early stages of covid-19 crisis in China concluded that, health care workers, despite the challenges of working in the covid-19 units such as physical and mental exhaustion, did their best to provide patient care, and also showed the resilience and self-sacrificing spirit of their profession to overcome difficulties (24). Previous studies have shown that during sudden natural disasters and infectious diseases, nurses risk their health to actively participate in the fight against the epidemic and provide assistance due to their moral and professional responsibility (35). They also could not refuse the hospital's request because they were aware of the shortage of staff and felt a serious responsibility as a nurse (21). Wang et al (2012) in their qualitative study concluded that health care workers, despite concerns about frequent policy changes, possible staff shortages, and the side effects of vaccination during H1N1 flu outbreak, exercised professional responsibility and performed their duties properly (36).

The present study was conducted with a qualitative approach in which, a limited number of participants were purposefully selected. Therefore, its results cannot be generalized to the whole nurse's society. Also, due to the mental condition of nurses in such circumstances caused by the covid-19 crisis, some nurses who probably had very valuable experiences refused to participate in the interview. Due to the fact that some of the interviews were conducted by telephone, it was difficult to get the non-verbal reactions of the participants.

Conclusion

Working in difficult and unknown conditions with many challenges caused mental and physical depreciation of nurses in the intensive care unit. However, the nurses showed a spirit of self-sacrifice and did not give up their relentless efforts in providing real care. They experienced different positive and negative emotions and sense of humanitarianism in the coronavirus crisis. Participants saw patient care in this crisis as an opportunity. They performed their professional responsibilities by providing comprehensive care. By doing so, the nurses showed a new image of nursing to the community, and the care of these patients was accompanied by the emergence of new images of nursing. Therefore, full support should be provided to healthcare workers, especially nurses by the authorities in order to prepare them to respond to unwanted crises.

Abbreviations

COVID-19
Coronavirus Disease 2019
ICU
Intensive care unit
MERS-CoV
Middle East respiratory syndrome coronavirus
WHO
World Health Organization
ARDS
Acute respiratory distress syndrome
ICN
International Council of Nurses
TUMS
Tehran University of Medical Sciences
PPE
Personal protective equipment
CDC
Centers for Disease Control and Prevention
SARS
Severe Acute Respiratory Syndrome
H1N1
Influenza A virus subtype H1N1
ECMO
Extracorporeal membrane oxygenation

Declarations

Ethics approval and consent to participate

The proposal of this study was approved by the Ethics Committee of Research Council of Tehran University of Medical Sciences (TUMS) with the code: TUMS. VCR. REC. 1399. 014. To participate in the study, informed written consent was obtained from the participants.

Consent for publication

Not Applicable.

Availability of data and materials

Data available by contacting the corresponding author.

Competing interests

The authors declare there is no financial and non-financial conflict of interests.

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Authors 'contributions

MSh, AN and AGh, made the designing of study, MSh and AGh participated in data collection, and data analyzed by MSh, AN and AGh. The final report and article were written by MSh, AN and AGh, and were read and approved by all the authors.

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