Health Problems and Reasons for Stress of Intensive Care Nurses During COVID-19

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Abstract

AIM: This study aimed to examine health problems and related reasons for stress including physiological, psychological, and patient-care-related stressors among intensive care unit (ICU) nurses during COVID-19 in Turkey.

METHOD: This study was designed as a cross-sectional study. Data were collected between June and July 2020 and from 1140 ICU nurses who were actively working in the pandemic process from 65 provinces in Turkey. An online questionnaire was used consisting of questions regarding nurses’ health problems, reasons for psychological, physiological, and patient-care-related stress during the pandemic. Descriptive data were presented in mean, median, or number and percentage.

RESULTS: Only 15.6% of ICU nurses experienced health problems. Nurses had psychological symptoms such as anxiety, insomnia, and physiological symptoms such as respiratory, musculoskeletal symptoms. The majority of nurses experienced the following psychological stressors: fear of being a COVID-19 carrier and infecting loved ones, and getting sick with COVID-19. Reasons for physiological stress were mostly due to working with personal protective equipment (PPE), skipping toilet breaks, and inadequate hydration. Reasons for patient-care-related stress included excessive sweating in PPE, fogging of goggles, and inability to select a venipuncture site with double gloves.

CONCLUSION: The findings of this study indicate that almost one-fifth of ICU nurses experience various health problems although most of them experience intense psychological, physiological, and patient-care-related stress.

Keywords: COVID-19, health problems, intensive care unit, nurses, stress

Introduction

COVID-19 infection caused by acute respiratory distress syndrome (ARDS) has dramatically increased the requirement of intensive care unit (ICU) in immunocompromised patients, elderly, and individuals with chronic comorbidities (Ma et al., 2020; Murthy et al., 2020). However, the limitation of hospital beds and mechanical ventilators in the ICU, low nursing workforce, and difficulty in reaching personal protective equipment (PPE) are the main stressors for nurses in the fight against this infection (Lai et al., 2019; Liu et al., 2020; Murthy et al., 2020; Shanafelt et al., 2020; Spoorthy et al., 2020). In addition, uncertainty regarding the duration of the COVID-19 pandemic, fear of being a COVID-19 carrier and infecting loved ones, relatively high number of healthcare workers (HCWs) who died from COVID-19 during pandemic lead to psychological stress, while the prolonged duration of working, increased workload, donning/doffing of PPE, and unmet physical needs trigger physical and patient care-related stresses (Adams & Walls, 2020; Cai et al., 2020; Chen et al., 2020; Chew et al., 2020; Du et al., 2020; Lai et al., 2019; Pappa et al., 2020; Shanafelt et al., 2020; Sun et al., 2020, Xiong & Peng, 2020).

Recent studies have demonstrated that frontline nurses experience psychological stress such as anxiety, depression, insomnia (Du et al., 2020; Lai et al., 2019; Liu et al., 2020; Ma et al., 2020; Shen et al., 2020) and ICU nurses are more likely to suffer from this type of stress (Ma et al., 2020). Frontline ICU nurses are at a higher risk of infection as they are exposed to prolonged duration of patient care with more frequent and closer contact in patients with COVID-19 (Lai et al., 2019; Ma et al., 2020; Pappa et al., 2020). Therefore, they become more stressed with a higher level of fear of infecting their loved ones and the other HCWs (Cai et al., 2020; Chew et al., 2020; Ma et al., 2020; Pappa et al., 2020; Shen et al., 2020; Spoorthy et al., 2020; Sun et al., 2020, Xiong & Peng, 2020).
COVID-19 pandemic has spread at an alarming speed and become a global crisis. Several factors such as fear of being infected, increased workload, being exhausted, and stigmatization may cause physical symptoms among HCWs. In a stressful pandemic atmosphere, many HCWs suffer from somatic symptoms associated with cardiovascular, respiratory, neurological, and gastrointestinal systems. In a previous study, in addition to psychological symptoms, physical symptoms such as headache, sore throat, cough, myalgia, and lethargy were reported among HCWs during the pandemic and those with physical symptoms experienced depression, anxiety, and stress more frequently (Chew et al., 2020). Of note, there are some difficulties in working with PPE (Ong et al., 2020; Sun et al., 2020). In a study, headache was more commonly reported in HCWs specifically using the N95 face mask combined with protective eyewear (Ong et al., 2020). Additionally, nurses are unable to meet their own physical needs due to PPE (Liu et al., 2020; Ong et al., 2020).

Although there are many studies regarding the psychological distress and related symptoms of HCWs during COVID-19 (Cai et al., 2020; Du et al., 2020; Lai et al., 2019; Liu et al., 2020; Ma et al., 2020; Pappa et al., 2020; Shen et al., 2020), the number of studies evaluating physical difficulties is limited (Chew et al., 2020; Liu et al., 2020; Ong et al., 2020), and possible challenges related to the patient care were investigated in only one quantitative study (Liu et al., 2020). In the literature, there is no large-scale study available focusing on the health problems and reasons for stress among ICU nurses during the pandemic. Securing the physical and psychological well-being of nurses is of utmost importance to maintain appropriate patient care and to keep the outbreak under control (Chang et al., 2020; Liu et al., 2020).

The aim of this study was to examine health problems and related reasons for stress including physiological, psychological, and patient-care-related stressors among the ICU nurses during COVID-19.

Research Questions
1. Are ICU nurses experiencing health problems in the COVID-19 pandemic?
2. What stressors do ICU nurses experience in the COVID-19 pandemic related to physiological, psychological, and patient care?

Methods

Study Design
This study was designed as a cross-sectional study. The study conforms to STROBE cross-sectional reporting guidelines (Von-Elm et al., 2014).

Sample
This study was conducted among ICU nurses who care for adult patients with COVID-19 in Turkey. Nurses who were unwilling to participate in the study were excluded. The number of ICU nurses caring for adult patients with a diagnosis of COVID-19 is not known therefore a sample size could not calculated. Between June and July 2020, 1140 ICU nurses from 65 provinces of Turkey were included in the study with snowball sampling method.

Data Collection
Data were collected between June and July 2020 using an online questionnaire which was developed by the researchers based on the literature review (Chew et al., 2020; Lai et al., 2020; Liu et al., 2020; Ma et al., 2020; Shanafelt et al., 2020; Xiong & Peng, 2020) and the final draft was prepared considering the opinions of seven nurses who were actively working in ICU during the pandemic, but were not included in the study.

The questionnaire has three parts. (Chew et al., 2020; Lai et al., 2020; Liu et al., 2020; Ma et al., 2020; Shanafelt et al., 2020; Xiong & Peng, 2020). The first part of the questionnaire contains eight items about characteristic, work-life of nurses, and training for COVID-19 patient care and donning/doffing of PPE, and having psychological support during the pandemic. The second part of the questionnaire contains two items including the health problems experienced during the COVID-19 and physical and psychological symptoms. The third part of the questionnaire contains questions regarding the reasons for stress and possible stressors for physical, psychological, and patient care-related distress.

The open survey was filled in online with Google Documents applications through graduate nursing students and social media. Before the questionnaire is submitted, it has done consistency or completeness checks. Participants were given the right to answer the survey once.

Statistical Analysis
Statistical analysis were performed using E-picos software (www.e-picos.com, NY, New York, USA). Descriptive data were presented in mean, median, or number and percentage, where applicable. A p value of <.05 was considered statistically significant.

Ethical Considerations
This study was approved by the Clinical Research Mersin University Ethics Committee (Date: May 27, 2020/No. 405) and the Republic of Turkey, Ministry of Health, Scientific Research Portal. It was a voluntary survey. Each participant via online form before the research questions start to answered was obtained. The study was conducted in accordance with the principles of the Declaration of Helsinki (World Medical Association, 2013). In addition, any incentives didn’t offer to the participants for including in the survey (eg, monetary, prizes, or non-monetary incentives).

Results
Of all participants, 77.5% were females and the mean age was 29.7 ± 6.75 (ranged, 20–58) years. A total of 70.6% of nurses had a bachelor’s degree and 66.3% were working for 1 to 6 years. The majority of the nurses (60.1%) were trained on COVID-19 patient care, while 79.2% of the nurses were trained on the donning/doffing of PPE during the pandemic. Only 3.5% of the nurses were given psychological support (Table 1).
Health Problems of ICU Nurses
Of the ICU nurses, only 15.6% experienced health problems during the pandemic. The most common psychological complaints were anxiety (3.0%), insomnia (1.1%), and depression (0.4%). The most common physical complaints were respiratory symptoms (4.2%), muscle and joint symptoms (3.3%), COVID-19 (2.4%), skin symptoms (1.9%), headache (1.8%), gastrointestinal symptoms (1.3%), fever (1.1%), and cardiovascular symptoms (0.8%) (Table 2).

Reasons for Psychological Stress of ICU Nurses
Of all participants, 92.3% had a fear of being a COVID-19 carrier and infecting loved ones, 78.9% had a fear of being separated from loved ones, 74.4% had a fear of getting sick with COVID-19, 73.4% had anxiety about the lack of curative treatment for the disease, and 71.8% had anxiety about the possible second and third waves of the pandemic (Table 3).

Reasons for Physiological Stress of ICU Nurses
Of all ICU nurses, 80.0% had difficulty in patient care with PPE, 70.8% tended to skip toilet breaks, 68.8% had inadequate hydration, 68.1% had to skip lunch while working, and 64.8% were anxious about the appropriate use of antiseptics and disinfectants (Table 3).

Reasons for Patient Care-Related Stress of ICU Nurses
Of all participants, 85.1% experienced excessive sweating using PPE, 80.6% had a blurry vision due to fogging of the goggles, 70.3% had difficulty in establishing an intravenous line with double gloves, 63.3% were unable to communicate clearly in a way that the patient could understand due to the use of PPE, and 55.4% had difficulty in patient positioning (Table 3).

Table 1.
Sociodemographic Characteristic of Nurses (N=1140)

| Variable                     | Mean  | SD   |
|------------------------------|-------|------|
| Age, years                   | 29.79 | 6.75 |
| Sex                          |       |      |
| Female                       | 883   | 77.5 |
| Male                         | 257   | 22.5 |
| Marital status               |       |      |
| Married                      | 522   | 45.8 |
| Single                       | 618   | 54.2 |
| Education status             |       |      |
| High school                  | 87    | 7.6  |
| Associate degree             | 105   | 9.2  |
| Undergraduate                | 805   | 70.6 |
| Graduate/Postgraduate        | 143   | 12.6 |
| Duration of working life     |       |      |
| ≤6 months                    | 115   | 10.1 |
| 7-11 months                  | 27    | 2.4  |
| 1-6 years                    | 756   | 66.3 |
| ≥7 years                     | 242   | 21.2 |
| Training on COVID-19 patient care |   |      |
| Yes                          | 685   | 60.1 |
| No                           | 455   | 39.9 |
| Training on donning/doffing of PPE |       |      |
| Yes                          | 903   | 79.2 |
| No                           | 237   | 20.8 |
| Psychological counseling during COVID-19 pandemic | | |
| Yes                         | 40    | 3.5  |
| No                          | 1100  | 96.5 |

Note: Data are given in mean ± SD or number and percentage unless otherwise stated. *Psychological counseling was given by the counseling psychologist in their own workplace (n=29), from a psychiatrist in an external center (n=6), or via telephone or online counseling platforms of the Republic of Turkey, Ministry of Health (n=5). SD =standard deviation; PPE =personal protective equipment.

Table 2.
Health Problems of ICU Nurses

| Health problems during COVID-19 pandemic | N   | %  |
|-----------------------------------------|-----|----|
| No                                      | 962 | 84.4|
| Yes                                     | 178 | 15.6|
| Psychological symptoms*                 |     |    |
| Anxiety                                 | 34  | 3.0 |
| Insomnia                                | 13  | 1.1 |
| Depression                              | 4   | 0.4 |
| Physiological symptoms*                 |     |    |
| Respiratory symptoms (cough, respiratory distress, sore throat) | 48  | 4.2 |
| Muscle-joint symptoms (neck, back, and low back pain and fatigue) | 37  | 3.3 |
| COVID-19                                 | 27  | 2.4 |
| Skin diseases (PPE-related injuries, dermatitis) | 22  | 1.9 |
| Headache                                | 20  | 1.8 |
| Gastrointestinal symptoms (stomach ache, nausea/vomiting, loss of appetite, constipation, diarrhea) | 15  | 1.3 |
| Fever                                   | 13  | 1.1 |
| Cardiovascular symptoms (palpitation, chest pain, hypertension, hypotension, arrhythmia) | 9   | 0.8 |

Note: Data are given in number and percentage unless otherwise stated. *Multiple choice questions. The percentage was calculated based on the total number of nurses (n=178) who experienced health problems. ICU = intensive care unit.
Discussion

In the current study was evaluated health problems and related reasons for stress including physiological, psychological, and patient-care-related stressors among the ICU nurses during COVID-19 in Turkey.

Health Problems of ICU Nurses

In this study, only a small number of ICU nurses reported anxiety, insomnia, and depression and were given psychological support. However, almost all of the nurses experienced psychological stress due to different reasons during the pandemic. Consistent with previous studies, many HCWs...
had severe psychological problems due to their fears (Cai et al., 2020; Chew et al., 2020; Ma et al., 2020; Shen et al., 2020; Turkish Psychiatric Association, 2020; Xiong & Peng, 2020). A meta-analysis including 33,602 participants revealed that the prevalence of anxiety, depression, and insomnia among HCWs were 23.3%, 22.8%, and 38.9%, respectively with a higher rate of symptoms in female HCWs and nurses (Pappa et al., 2020). Similarly, previous studies reported psychological symptoms such as reduced quality of sleep and insomnia (34.0%), distress (71.5%), stress (5.2% to 59%), anxiety (15.7% to 44.6%), and depression (10.6% to 50.4%) in HCWs (Chew et al., 2020; Du et al., 2020; Lai et al., 2020; Ma et al., 2020). In addition, anxiety (5.8%), depression (7.1%), and insomnia (1.7%) were more frequently reported in nurses (Lai et al., 2020). In another study, the level of stress was found to be higher in the ICU staff among all HCWs (Ma et al., 2020). However, the number of ICU nurses experiencing psychological stress was relatively lower than the previous studies. Unlike past studies (Chew et al., 2020; Du et al., 2020; Lai et al., 2020; Ma et al., 2020; Pappa et al., 2020) the utilization of rating scales for the evaluation of anxiety, depression, and stress may have led to an overestimation of these symptoms including mild symptoms among HCWs in these studies. Supporting this view, a meta-analysis revealed that most of the HCWs experienced mild depression and anxiety, while a few number of HCWs had moderate or severe symptoms (Pappa et al., 2020). Of note, except for the study of Chew et al. (2020) all the aforementioned studies were conducted in China, where COVID-19 originated, and many HCWs were unprepared and unequipped and had to work under both physical and psychological pressure. In addition, the fast-spread nature of the disease and overload on the healthcare systems made HCWs more vulnerable to have psychological symptoms.

In the present study, only a very small number of the ICU nurses were given psychological support by a counseling psychologist and/or psychiatrist. During COVID-19, a telephone/online psychosocial health support line was established by the Ministry of Health in Turkey (Turkish Republic, Ministry of Health, 2020). However, many of the nurses were given psychological support from the counseling psychologist in their hospital. Similarly, in a study conducted in China, only 3.7% of the participants with high acute stress applied to mental health service (Yao et al., 2020). These findings indicate that nurses should be informed about the easily accessible counseling platforms to reduce anxiety (Turkish Republic, Ministry of Health, 2020).

In addition to psychological stress, physical symptoms such as headache, musculoskeletal disorders, or gastrointestinal and cardiovascular symptoms, which are all the physiological stress responses to the human body, were common among nurses during COVID-19. These symptoms may sometimes overlap with COVID-19 itself and ICU nurses without COVID-19 infection may present symptoms such as fever and cough followed subsequently by dyspnea, fatigue, headache, and diarrhea (Chen et al., 2020), suggesting the presence of COVID-19 symptoms in these non-infected nurses according to the negative test results. However, these symptoms can be caused by the disease itself or long working hours with the PPE. Wearing PPE during long working shifts may result in musculoskeletal disorders, exposure to carbon dioxide inhalation, and increased pressure to the pericranial soft tissues due to the use of helmets, leading to headache or cheek and ear injuries. In a previous study, 81% of the HCWs suffered from headache due to the use of PPE during COVID-19 (Ong et al., 2020). In the same study, the rate of headache was only 29.1% before the outbreak, indicating that the use of PPE was the most important factor for headache, and the use of PPE for more than 4 hours daily increased the risk of headache. In addition, the majority of the HCWs experienced headache within 60 minutes after PPE donning with an N95 mask and protective eyewear which resolved within 30 minutes after PPE doffing (Ong et al., 2020). In another study including 906 HCWs from Singapore and India, the most common complaints were headache (31.9%) and sore throat (33.6%) within the previous month (Chew et al., 2020). Similar to present study findings, Chew et al. (2020) also reported physical complaints among ICU nurses.

### Reasons for Psychological Stress among ICU Nurses

During COVID-19, many HCWs have a fear of infecting loved ones and feel anxious due to the uncertainty about their health status (Adams & Walls, 2020; Shanafelt et al., 2020; Turkish Psychiatric Association, 2020). Although some of these concerns are based on true risks, some of them originate from poor knowledge, misleading information, and ever-spread rumors (Thapa et al., 2020; Turkish Psychiatric Association, 2020). Identifying stressors that trigger such fears is critical to maintain the mental health of nurses (Sun et al., 2020) and to take necessary precautions against psychological stressors (Shanafelt et al., 2020). In this study, almost all ICU nurses had a fear of being a COVID-19 carrier and infecting loved ones and becoming infected with COVID-19 while 44.4% of the nurses had a fear of dying from COVID-19. These findings are consistent with previous reports (Du et al., 2020; Liu et al., 2020; Pappa et al., 2020; Xiong & Peng, 2020). According to the International Council of Nurses (ICN), more than 1500 nurses have died from the virus worldwide (ICN, 2020). On 16 July 2020, The Centers for Disease Control and Prevention (CDC) announced that a total of 100,570 HCWs were infected with COVID-19 in the United States and 641 of them died (CDC, 2020). Until 17 April 2020, a total of 119 physicians and 34 nurses died from COVID-19 in Italy, which is one of the worst-hit countries by the virus across Europe. In addition, 43.3% of COVID-19 deaths among HCWs were aged between 60 and 69 years, and 26.7% were aged between 50 and 59 years, while two nurses infected with the virus committed suicide (Lapolla et al., 2020). In Turkey, 40,000 HCWs were infected and 107 of them died by the date of 17 October 2020 (Sözcü, 2020). All these findings showed that the fear of being infected or a COVID-19 carrier among the ICU nurses is based on the facts collected all over the world and the risk of being infected with the virus is higher among the HCWs. Furthermore, less than half of the nurses had a fear of dying from COVID-19 while the majority of the nurses considered this infection as a non-fatal disease. This can be attributed to the relatively young age of this study population and the fact that disease mostly affects older individuals and those with comorbidities. This opinion is also supported by the study of Cai et al. (2020) which showed that HCWs aged between 31 and 40 years were more worried...
about infecting their families and HCWs aged between 41 and 50 years were concerned about their safety.

In the current study, the majority of the ICU nurses experienced psychological stress due to the separation from their families during the pandemic. Similarly, Sun et al. (2020) reported that many nurses felt helpless and guilty after separation from their families, and nurses with the elderly and children at home were particularly worried about their families. In present study, the closure of the schools and restriction from leaving home for individuals over 65 years increased the burden of housework of the nurses. In addition, some of the nurses had to stay at hospitals or guesthouses for self-isolation and limited their visits to their older family members. All these social life changes may have led to increased stress among the nurses due to frustration about fulfilling their responsibilities in daily life.

Furthermore, nearly three-quarters of the ICU nurses experienced psychological stress due to the lack of curative treatment for the disease and possible second-third waves of the pandemic. On the contrary, these stressors for psychosocial stress were not reported in previous studies. The discrepancy between the studies can be attributed to the fact that many previous studies were conducted in the first months of the pandemic (Liu et al. 2020; Ma et al. 2020; Sun et al., 2020; Xiong & Peng, 2020) and that there is still no curative treatment for the virus, as we are only 5 months into the outbreak, and it seems to be last for a while.

In a qualitative study, HCWs were worried about the limited number of PPE in the early stages of the pandemic (Liu et al., 2020). Similarly, in this study, more than half of the ICU nurses were concerned about the availability of sufficient protective supplies in their workplace. This concern can be attributed to the fact that many healthcare facilities had difficulty in supplying PPE in the early stages of the pandemic in Turkey (Turkish Medical Association, 2020; Turkish Nurses Association, 2020). In addition, the inadequate knowledge of the nurses on how to use PPE and on COVID-19 patient care may be other reasons. Similarly, Du et al. (2020) reported that HCWs without sufficient knowledge of COVID-19 experienced anxiety symptoms more frequently. It is, therefore, of paramount importance to deliver the latest information about the use of PPE to HCWs and to maintain workforce safety and calm during the pandemic (Adams & Walls, 2020; Chen et al., 2020).

In the present study, about half of the ICU nurses also reported psychological stress due to the fear of excessive admission to the hospital and inadequate patient care associated with the transmission risk. This seems to be reasonable since HCWs experienced this despair in many countries such as China, Spain, and Italy during the early stages of the pandemic. In addition, among the countries of the Organisation for Economic Co-operation and Development (OECD), Turkey has one of the lowest hospital bed capacity and nurse/physician ratio per 1000 population ( Organisation for Economic Co-operation and Development, 2020a, 2020b, 2020c), which may lead to psychological stress. According to the Ministry of Health data, however, Turkey has 25,466 adult ICU beds of which 13,211 are Level 3, and has 40 beds per 100,000 individuals, indicating a relatively high number of bed capacity compared to the OECD and many other countries (Deutsche Welle, 2020). Additionally, Turkey declared all hospitals, as COVID-19 pandemic hospitals during the first months of the pandemic, which considerably decreased the number of hospital admissions for other conditions. Compared to most European countries, the relatively low number of individuals aged 60 years and older in Turkey prevented any unmet need for ICU beds (Turkish Medical Association, 2020). Only 10 days after the first case was reported in Turkey, a curfew was imposed for individuals ≥65 years and risky people (chronic obstructive pulmonary disease or malignancy, etc.) ( Turkish Republic, Ministry of Interior, 2020a). Fortunately, wise decisions and precautions such as the new assignment of HCWs to the healthcare facilities (Turkish Republic, Ministry of Interior, 2020b) prevented capacity overload of the bed occupancy and eliminated the feared scenario in Turkey.

**Reasons for Physiological Stress**

It is critical to recognize the physical stress and fulfill the unmet needs of nurses. The basic needs include adequate nutrition and hydration, and accommodation for those who have a fear of infecting the family members (Adams & Walls, 2020; Shanafelt et al., 2020). However, the majority of the ICU nurses in present study were likely to skip a meal, hydration, and toilet breaks due to the use of PPE. In a previous study, nurses were urged to work for long hours (about 6 hours), as the number of HCWs working in the isolation wards was limited by the hospital managers to save time and protective supplies (Liu et al., 2020). In this study, working with PPE for long hours without a meal or toilet breaks and inadequate hydration was the major physical and professional challenge and reason for exhaustion for many HCWs (Liu et al., 2020). In another qualitative study, many nurses felt physical and psychological stress caused by the use of PPE during patient care and working without drinking water or eating food for about 8 hours and they had to wear adult diapers for urination (Sun et al., 2020). In Turkey, the majority of the ICU nurses worked in PPE for long hours on 24-hour shifts and experienced difficulties in fulfilling their own physical needs, consistent with previous studies.

**Reasons for Patient Care-Related Stress**

The health status of COVID-19 patients in the ICU has dramatically deteriorated and serious complications frequently with multiple organ failure can occur (Liu et al., 2020). As no cure is available yet, supportive nursing is critical for survival. Nurses have main responsibilities including performing a careful evaluation and follow-up of the patients, identifying patients whose health status becomes worsened and providing supportive care for these patients, coordinating care with the treating physician and other HCWs, providing symptomatic care and counseling, and prevent possible complications (Liu et al., 2020; Sun et al., 2020).

Meanwhile, it is important to protect nurses themselves from possible infections to both HCW and patient safety. The PPE which is used to HCW and patient safety, however, can cause excessive sweating, fogging of the goggles, movement
Nurses should be provided physical and psychological support for struggling with the stress of the pandemic and related health problems.

To minimize health problems of nurses
- Related problems of nursing managers, administrators, and frontline ICU nurses should be identified.
- Medical and social support should be given to nurses.
- Direct support programs or webinars to fulfill the unmet psychological and physical needs of ICU nurses including coping with anxiety, insomnia, and maintaining self-care should be developed.
- Individual support should be provided, if necessary (Adams & Walls, 2020; Du et al., 2020; Shanafelt et al., 2020; Shen et al., 2020; Sun et al., 2020; Thapa et al., 2020).

To minimize psychological stress of nurses
- Fears leading to psychological stress and possible stressors should be recognized.
- Misinformation on COVID-19 should be eliminated and nurses should be trained on necessary skills such as infection control.
- Psychosocial support teams should be included in each facility.
- A working schedule should be developed by the nursing managers to engage nurses with these psychosocial support programs.
- Nurses should be informed about the support services and encouraged to use these services (Liu et al., 2020).

To minimize physiological stress of nurses
- An adequate number of PPE should be provided to frontline ICU nurses.
- The duration of working with PPE should be shortened (<4 h/day).
- Duration of working with PPE should be limited for each patient (<60 minutes) (Ong et al., 2020).
- Work shifts should be designed to allow nurses to rest.

To minimize patient care-related stress of nurses
- Duration of working with PPE should be limited for each patient and a team consisting of three or four nurses should be considered for tasks requiring more than one nurse such as patient positioning.
- Rationale PPE use should be instructed for aerosol-generating procedures which pose a higher risk of transmission, including closed endotracheal aspiration systems and a high-quality PPE should be supplied.
- Phone calls should be answered by a single staff or a time schedule should be set for incoming calls from the patients’ relatives.

Conclusion and Recommendations

In conclusion, this study results suggest that some ICU nurses experience health problems during COVID-19. In addition, frontline ICU nurses suffer from psychological stress due to a variety of fears, physiological stress due to working for long hours with PPE, inability to fulfill her/his own physical needs, and patient care-related stress due to the use of PPE.

Nurses should be provided physical and psychological support for struggling with the stress of the pandemic and related health problems.

Study Limitations
The main strength of the present study is its large sample size from 65 provinces across the country. Nonetheless, there are some limitations to this study. First, the exact number of nurses caring for patients with COVID-19 could not be reached. This may have prevented the generalization of the results. Secondly, the study was relatively short (about 4-5 months), and the long-term results are unknown.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Mersin University (Date: May 27, 2020, No: 405).

Informed Consent: A written informed consent was obtained from each participant. The study was conducted in accordance with the principles of the Declaration of Helsinki.

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