Burnout, posttraumatic stress disorder, and sleep quality among nurses during the COVID-19 pandemic: a systematic review

Farzin Bagheri Sheykhangafshe, Fereshteh Rezaeinasab, Soofia Heidari Kamrody, Yasaman Larijani, Mostafa Asgaris

Introduction

Coronavirus disease 2019 (COVID-19) was first diagnosed in December 17, 2019, in Wuhan, China. The World Health Organization announced COVID-19 as a pandemic in March 11, 2020 (1) and the pandemic rapidly changed into the biggest public health threat in 2020 (2). Coronavirus infection has different types, the most important of them were the severe acute respiratory syndrome in China in 2003 and the Middle Eastern respiratory syndrome in Saudi Arabia in 2012 (3). COVID-19 has a wide variety of symptoms such as high fever, dry cough, myalgia, and shortness of breath. Moreover, COVID-19 has been associated with many different problems such as rumors and misleading information about its origin, treatment failure, and high transmission rate (4). In response to the pandemic, many countries imposed quarantine, physical distancing, travel restrictions, closure of schools and universities, suspension of unessential jobs, and restriction of many non-emergency medical services in hospitals (5).

The COVID-19 pandemic has been associated with high hospital bed occupation rate which put heavy workload on hospital staff, particularly nurses (6). Meanwhile, fear over affliction by COVID-19, fear over transmitting the infection to family members, reluctance to be quarantined in hospital, concern about the lack of personal protective equipment, and lack of vaccine and effective treatment caused many nurses varying levels of burnout (7,8), posttraumatic stress disorder (PTSD) (9,10), poor sleep quality (SQ) (11,12), and stress (13).

The difficulty and tediousness of patient care and patients’ high emotional expectations put nurses at high risk for burnout (14). The major factors contributing to burnout among nurses are heavy workload, long working hours, nursing staff shortage, constant contact with ill patients, witnessing patient deaths, working in rotating shifts, and problems in interpersonal relationships with colleagues.
Burnout causes behavioral changes among nurses and negatively affects their professional efficiency, care quality, patient recovery, and patient satisfaction (16). Burnout is characterized by emotional exhaustion, depersonalization, and decreased personal accomplishment. Emotional exhaustion is the main symptom of burnout and occurs when employees are under heavy strain and experience the depletion of their emotional resources. Depersonalization refers to negative reaction to people who receive care services, while decreased personal accomplishment occurs when employees’ senses of competence and engagement with people decrease (17). Studies conducted during the COVID-19 pandemic showed increase in burnout among nurses during the pandemic. For example, a study during the pandemic showed that the prevalence rates of burnout and depression, anxiety, depression, and fear among nurses were 60.5%, 14.3%, 10.7%, and 9.2%, respectively (18).

PTSD is another psychological problem with increasing prevalence among nurses during the COVID-19 pandemic. Employees in some jobs face unavoidable or unendurable stressful situations and hence, experience considerable mental strain and become vulnerable to PTSD (10). By definition, PTSD is a mental disorder which occurs after experiencing or witnessing a traumatic event or due to a threat to life or serious injury. The main symptoms of PTSD are disturbing thoughts or memories of the traumatic event, anxiety, restlessness, and hyper-reactivity to war or flight and usually persist for more than a month after the event (19). Medical and nursing staff are at high risk for PTSD (20). The COVID-19 pandemic caused considerable stress and anxiety for hospital staff, particularly nurses. A study during the COVID-19 pandemic reported that PTSD was affected by gender and job satisfaction and its prevalence among nurses was 16.86% (21). Another study during the COVID-19 pandemic showed that PTSD reduced sense of security among nurses (22).

Hospital staff also suffer from varying levels of sleep disorders, particularly due to their shift work (23,24), sleep deprivation, anxiety, and high occupational stress (24). Sleep disorders affect many nurses in different care settings and cause them different problems such as poor physical and mental health, gastrointestinal disorders, heart problems, mental fatigue, poor concentration, inappropriate behaviors, hallucinations, ineffective emotional coping, and aggression (25). Accordingly, sleep disorders can significantly affect the health and safety of patients and healthcare providers. The COVID-19 pandemic significantly increased nurses’ workload and aggravated nursing staff shortage and hence, required nurses to work different work shifts which in turn reduced the SQ (26). A study during the COVID-19 pandemic reported that the average duration of nurses’ sleep was 5.71 hours per day and the prevalence of sleep disorders among them was 86% for difficulty falling asleep, 81% for limited sleep continuity, 45% for nightmares, and 19% for using sleeping pills, while the prevalence rates of poor SQ, depression, and anxiety were 60%, 46%, and 40%, respectively (27). Another study during the COVID-19 pandemic reported that 38.5% of nurses had poor SQ and the prevalence of poor SQ was higher among nurses with work experience more than sixteen years (28). Moreover, a study on nurses during the COVID-19 pandemic showed that 61% of them had fear over COVID-19 affliction, 35.3% of them had obsessive-compulsive disorder, and 14.2% of them had insomnia (29).

Given the key role of nurses in healthcare systems, effective strategies are needed to assess and improve their psychological status (30,31) in order to improve the quality of their services. A key step to improve their psychological status is its assessment. Therefore, the present study was conducted to evaluate burnout, PTSD, and SQ among nurses during the COVID-19 pandemic.

**Methods**

**Design**

This review study was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (32).

**Search strategy**

An online search was conducted in the Google Scholar, PubMed, ISI, Scopus, EMBASE, and Psych INFO databases to find relevant articles published in English between May 2020 to July 2021. Search keywords were “posttraumatic stress disorder”, “burnout”, “sleep quality”, “nurse”, “mental health”, and “coronavirus disease 2019”. These keywords were searched in the title and abstract of the articles. The Boolean operators “AND” and “OR” were used to combine search results. The reference lists of the retrieved articles were also searched to find any potentially relevant study.

**Inclusion and exclusion criteria**

Sampling was performed purposively. Inclusion criteria were relevance to the aim of the present study, structured research framework, publication in peer-reviewed journals, and available full-text. Letters to the editor and articles with no abstract were not included.

**Data extraction**

Initially, 182 articles about burnout, PTSD, and SQ of nurses during the COVID-19 pandemic were retrieved. Irrelevant and duplicated records were omitted and 23 articles were included in the final analysis (Figure 1).

**Quality assessment**

The quality of the articles was assessed using the PRISMA statement and the criteria proposed by Gifford et al (33). The items of the PRISMA statement are on the study aims, study population, sampling, process, inclusion and exclusion criteria, data collection tools, data analysis, ethical considerations, presentation of the findings based on the study aims, congruence of the article structure with study type, and discussion of the findings. The criteria
proposed by Gifford et al are for the assessment of the quality of quantitative studies (six items), qualitative studies (eleven items), quasi-experimental studies (eight items), and experimental studies (seven items). Items were scored on a two-point scale. The minimum acceptable score for inclusion in the final analysis was 4 for quantitative studies, 6 for quasi-experimental and experimental studies, and 8 for qualitative studies. Five authors independently read and analyzed each included article, extracted relevant data from it, and entered them into a content analysis form (33).

**Results**
A total of 23 articles from peer-reviewed journals were included in this study (Table 1). These articles were the reports of studies conducted on 2196 nurses in nine countries, namely China, Brazil, Korea, Poland, Turkey, Italy, Spain, Egypt, and the Philippines. Sixty percent of the studies had been published in 2020 and 40% of them had been published in 2021. Studies had reported high prevalence of burnout (25%–60%), PTSD (16%–68%), and low SQ (18%–38%) among nurses during the COVID-19 pandemic. Burnout prevalence was higher among female nurses, married nurses, nurses aged above 36 years, nurses with smoking and alcohol consumption, nurses with overtime work and greater work experience, and nurses with higher stress and anxiety. Moreover, PTSD had significant relationship with nurses’ gender, job satisfaction, affiliated hospital ward, and levels of stress and anxiety. In terms of SQ, studies had reported lower SQ among nurses with greater work experience, nurses in intensive care unit, nurses in the frontline of COVID-19 care provision, and nurses with poor psychological status.

**Discussion**
This review evaluated burnout, PTSD, and SQ among nurses during the COVID-19 pandemic. Findings showed increase in the prevalence of burnout among nurses during the COVID-19 pandemic and revealed that their burnout was affected by gender, age, and work experience. Two previous studies also reported the same finding (34,35). Burnout is currently a common problem among healthcare providers so that one seventh of them feel burnout at the end of their workdays (23). Studies during the COVID-19 pandemic also showed significant increase in burnout among nurses (17,18). A study on critical care nurses during the COVID-19 pandemic reported that 25.5% of them had burnout and their burnout had significant relationship with their age, smoking, alcohol consumption, overtime work, and work experience (7). Burnout among nurses is associated with different negative consequences such as low patient care quality, patient deprivation of adequate individualized care, violation of patient rights (15), frequent absences from work, and economic losses (14).

Our findings also indicated high level of PTSD among nurses during the COVID-19 pandemic, which is in agreement with the findings of two previous studies (21,22). The prevalence of PTSD is affected by the severity, duration, and proximity of the afflicting trauma (9,10). Management of serious health events such as the severe acute respiratory syndrome and influenza epidemics needs experienced nursing staff with sufficient knowledge, great communication skills, positive attitudes,
Anxiety had positive correlation with PTSD and the prevalence of stress. PTSD was associated with low sense of security among nurses, while first-year nursing students had the greatest fear over COVID-19. Novice nurses had lower SQ and higher irritability. From insomnia and nurses with more than sixteen years of work experience had lower SQ. From insomnia and nurses with more than sixteen years of work experience had lower SQ.

The prevalence of low SQ was 18.4% and its contributing factors were old age, being a nurse, and work as an emergency staff. Studies showed that 25.59% and 18.15% of nurses respectively had high levels of emotional exhaustion and depersonalization and 29.76% of them had low levels of personal accomplishment. The prevalence of burnout and depression among nurses was 60.5%. Moreover, 14.3%, 10.7%, and 9.2% of nurses respectively reported high levels of anxiety, depression, and fear, and 86.8% of them announced their readiness to serve in the frontline of COVID-19 care provision. The prevalence of PTSD among nurses was 16.86% and PTSD affliction was affected by gender and job satisfaction. The use of avoidance and emotion-oriented coping strategies was associated with higher PTSD among nurses.

Breathing relaxation training significantly improved SQ and sleep duration and reduced difficulty falling asleep but had no significant effects on depression and use of sleeping pills. The mean score of PTSD was 68.20 and 36.7% of nurses were at high risk for PTSD. Female nurses with low work experience were at greater risk for PTSD.

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and close adherence to ethical and legal issues (19,20). During emergency conditions, such as epidemics, significant increase in the number of patients in hospitals significantly changes care provision and necessitates the use of qualified hospital staff for quality care provision (20). A study reported that during the COVID-19 pandemic, PTSD among nurses had significant positive correlation with their anxiety and affiliated ward so that critical care nurses had higher levels of PTSD (10).

Study findings also revealed the significant negative effects of the COVID-19 pandemic on nurses’ SQ. Significant increase in the number of patients and high bed occupation rate during the pandemic put heavy strain on healthcare providers, particularly nurses, altered their lifestyle, and reduced their SQ (27,28). Shift work, particularly in the morning and night shifts, significantly changes nurses’ SQ. Normally, the level of cortisol increases in the late stage of sleep in order to prepare the body for wake up. Stress can increase the level of cortisol and thereby, alter SQ, and lead to sleep disorders (29). Low SQ and sleep disorders can in turn negatively affect nurses’ performance, increase the risk of medication errors, and endanger patient safety (25). A study reported that negative thoughts and cognitive problems caused occupational stress and reduced SQ among nurses during the COVID-19 pandemic (11).

Study limitations
One of the limitations of the present study was the inaccessibility of the full-texts of some potentially eligible articles. Moreover, as some of the reviewed studies were descriptive, the findings of the present study should cautiously be generalized.

Conclusion
This study shows the high prevalence of burnout, PTSD, and low SQ among nurses during the COVID-19 pandemic and reveals care provision in the frontline of COVID-19 care, great work experience, femininity, old age, stress, depression, and anxiety as their most important contributing factors. Large-scale descriptive studies are needed to identify nurses vulnerable to burnout, PTSD, and low SQ during the COVID-19 pandemic. Moreover, effective strategies are needed to reduce these problems among nurses and improve their psychological status.

Conflict of Interest
Authors declare no conflict of interest.

Ethical Approval
As a review, this study needed no approval by a university-affiliated ethics committee. This article was written based on the instructions of the National Ethics Committee and the COPE regulations.

Acknowledgement
We are thankful to all authors whose studies were reviewed in this study.

References

Table 1. Continued

<table>
<thead>
<tr>
<th>Authors</th>
<th>Purpose and Sample</th>
<th>Country</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metwally Elsayed et al</td>
<td>Purpose: Investigation of obsessive-compulsive disorder, SQ, and fear of COVID-19 among nurses Sample size: 275</td>
<td>Egypt</td>
<td>Findings showed that 61% of nurses had fear of COVID-19 and this fear had negative effects on their SQ. Moreover, 35.3% and 14.2% of nurses had obsessive-compulsive disorder and insomnia, respectively.</td>
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<tr>
<td>Wu et al (30)</td>
<td>Purpose: Comparison of burnout among nurses in coronary care units and general hospital wards Sample size: 220</td>
<td>China</td>
<td>Nurses in COVID-19 care wards experienced more burnout than nurses in general hospital wards.</td>
</tr>
<tr>
<td>Murat et al (31)</td>
<td>Purpose: Stress, depression, and burnout among nurses in COVID-19 care wards Sample size: 705</td>
<td>Turkey</td>
<td>Findings of this study showed that female nurses and nurses with more stress and depression experienced higher burnout.</td>
</tr>
<tr>
<td>Yorük and Güler (34)</td>
<td>Purpose: The relationship of psychological resilience, depression, and social factors with burnout among nurses and midwives during the COVID-19 pandemic Sample size:137</td>
<td>Turkey</td>
<td>The prevalence of depression among nurses and midwives was 31.8% and was higher among midwives. Psychological resilience and social support reduced burnout.</td>
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<tr>
<td>Martínez-López et al (35)</td>
<td>Purpose: Investigation of burnout among nurses in COVID-19 care wards Sample size: 296</td>
<td>Spain</td>
<td>Results showed that 53.8% of nurses had emotional fatigue, 35.1% of them had depersonalization, and 6.6% of them had low personal accomplishment.</td>
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What does this paper contribute to the wider global clinical community?

- Many nurses suffer from burnout, PTSD, and low SQ during the COVID-19 pandemic.
- The most important factors contributing to nurses’ burnout, PTSD, and low SQ during the COVID-19 pandemic are care provision in the frontline of COVID-19 care, great work experience, femininity, old age, stress, depression, and anxiety.
- Psychological counseling centers in hospitals need to provide nurses with training and counseling about the management of their mental health problems.


