Journal of Multidisciplinary Care (JMDC)
doi: 10.34172/jmdc.2021.33 2021;10(4):173-179 http://jmdc.skums.ac.ir

Systematic Review

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

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Abstract

Background and aims: Nurses are in direct contact with healthcare clients. Infectious diseases epidemics, such as the coronavirus disease 2019 (COVID-19) pandemic, cause high levels of stress for nurses. The aim of this study was to evaluate burnout, posttraumatic stress disorder (PTSD), and sleep quality (SQ) among nurses during the COVID-19 pandemic.

Methods: In this review, the Google Scholar, PubMed, ISI, Scopus, EMBASE, and Psych INFO databases were searched using the keywords "posttraumatic stress disorder", "burnout", "sleep quality", "nurse", "mental health", and "coronavirus disease 2019" to find relevant studies published in English between May 2020 to July 2021. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was used to appraise the quality of the retrieved studies.

Results: The prevalence rates of burnout, PTSD, and low SQ were 25%–60%, 16%–68%, and 18%–38%, respectively. Nurses' gender, job satisfaction, affiliated hospital ward, work experience, levels of stress and anxiety, and care provision in the frontline of COVID-19 care affected the prevalence of burnout, PTSD, and low SQ.

Conclusion: Burnout, PTSD, and low SQ are highly prevalent among nurses during the COVID-19 pandemic. Psychological counseling centers in hospitals need to provide nurses with training and counseling about the management of their mental health problems.

Keywords: Coronavirus disease 2019, Burnout, Posttraumatic stress disorder, Sleep quality, Nurse

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Received: 13 May 2021
Accepted: 13 December 2021
ePublished: 30 December 2021

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

(15). 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

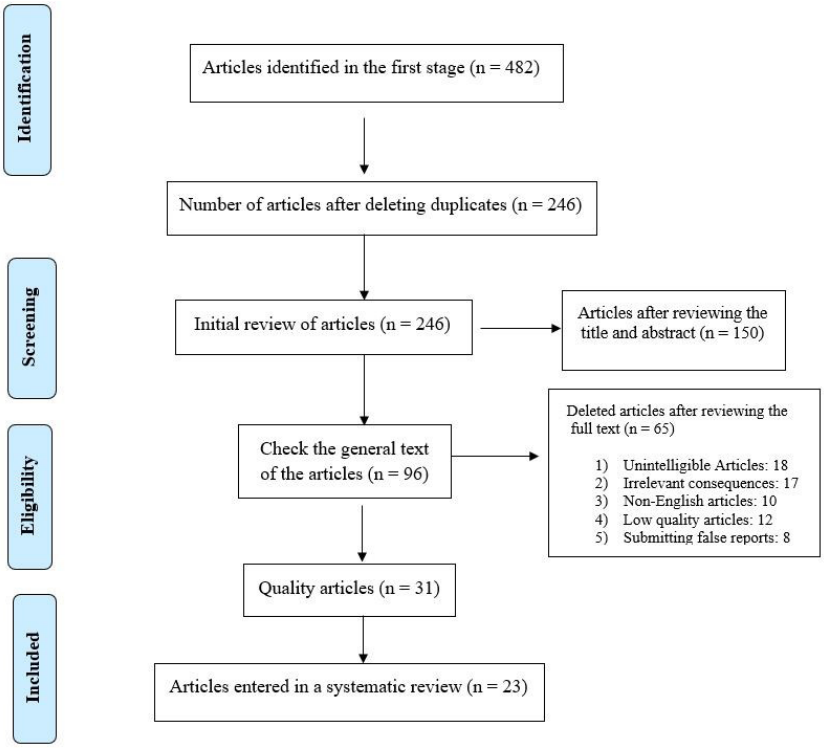

Figure 1. The flow diagram of the study.

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 0,1 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,

Table 1. The characteristics of the reviewed studies

Authors	Purpose and Sample	Country	Results
Freitas et al (7)	Purpose: Prediction of burnout among critical care nurses in the COVID-19 pandemic Sample size: 94	Brazil	Burnout was observed in 25.5% of nurses. Age over 36, smoking, alcohol consumption, overtime work, and high work experience were the significant factors contributing to burnout.
Guixia and Hui (8)	Purpose: Investigation of burnout among nurses during the COVID-19 pandemic Sample size: 92	China	Burnout had significant correlation with anxiety and depression and nurses with more work experience suffered from more burnout.
Moon et al (9)	Purpose: PTSD and its related factors among nurses in COVID-19 care wards Sample size: 300	Korea	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.
Ranieri et al (10)	Purpose: Investigation of the predictors of PTSD among nurses during the COVID-19 pandemic Sample size: 36	Italy	Anxiety had positive correlation with PTSD and the prevalence of stress was more among nurses in coronary care unit.
Zhang et al (11)	Purpose: Investigation of occupational stress, SQ, and mental health among nurses during the COVID-19 pandemic Sample size: 323	China	Negative thoughts and cognitive problems caused occupational stress and reduced nurses' SQ. Nurses with higher occupational stress had significantly lower mental health status.
De Los Santos et al (12)	Purpose: Investigation of SQ and fear over COVID-19 among nursing students Sample size: 261	Philippines	First-year nursing students had the greatest fear over COVID-19. Novice nurses had lower SQ and higher irritability.
Zhang et al (14)	Purpose: Investigation of nurses' burnout during the COVID-19 pandemic Sample size: 336	China	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.
Chen et al (16)	Purpose: Investigation of burnout, PTSD, and trauma among nurses during the COVID-19 pandemic Sample size: 12596	China	Around 52.3% of nurses worked in COVID-19 care wards, 13.33% of them reported some levels of trauma, half of them had burnout, and 39.3% of them had post-traumatic growth.
Zhang et al (17)	Purpose: Investigation of stress, coping strategies, and burnout among nurses during the COVID-19 pandemic Sample size: 110	China	Distance from family was considered a stressor for nurses, 48.6% of nurses reported limited personal accomplishment, 78.5% of them reported emotional exhaustion, and 92.5% of them reported depersonalization.
Hu et al (18)	Purpose: Investigation of burnout, depression, and anxiety among nurses during the COVID-19 pandemic Sample size: 2014	China	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 96.8% of them announced their readiness to serve in the frontline of COVID-19 care provision.
Wang et al (21)	Purpose: Factors associated with PTSD among nurses during the COVID-19 pandemic Sample size: 211	China	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.
Nowicki et al (22)	Purpose: Investigation of PTSD, sense of security, and meaning in life among nurses during the COVID-19 pandemic Sample size: 325	Poland	PTSD was associated with low sense of security among nurses, while nurses with meaning in life achieved adequate post-traumatic growth.
Aydin Sayilan et al (23)	Purpose: Burnout and SQ among nurses during the COVID-19 pandemic Sample size: 267	Turkey	Emotional exhaustion and depersonalization among female and married participants were higher than male and single participants. Moreover, participants with higher burnout had lower SQ.
Liu et al (24)	Purpose: Investigation of the effectiveness of breathing relaxation treatment in improving SQ among nurses during the COVID-19 pandemic Sample size: 140	China	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.
Zhou et al (25)	Purpose: Investigation of the factors related to SQ decline among hospital medical staff during the COVID-19 pandemic Sample size: 1931	China	The prevalence of low SQ was 18.4% and its contributing factors were old age, being a nurse, and work as an emergency staff.
Huang et al (26)	Purpose: Investigation of nurses' SQ during the COVID-19 pandemic Sample size: 966	China	The SQ of nurses was 6.77%, while 40.6% of them had an SQ score of 1–5, 44.2% of them had an SQ score of 6–10, and 15.1% of them had an SQ score of 11–20.
Tu et al (27)	Purpose: Investigation of SQ and mood symptoms among nurses during the COVID-19 pandemic Sample size: 100	China	The average sleep duration of nurses was 5.71 hours per 24 hours and the prevalence rates of difficulty falling asleep, sleep continuity, nightmares. and using sleeping pills were 86%, 81%, 45%, and 19%, respectively. Moreover, 60% of nurses had poor SQ and 46% and 40% of them respectively had symptoms of depression and anxiety.
Zhuo et al (28)	Purpose: Investigation of the relationship between stress and SQ among nurses during the COVID-19 pandemic Sample size: 26	China	The prevalence of low SQ was 38.5%. Nurses with high stress suffered from insomnia and nurses with more than sixteen years of work experience had lower SQ.

Table 1. Continued

Authors	Purpose and Sample	Country	Results
Metwally Elsayed et al (29)	Purpose: Investigation of obsessive-compulsive disorder, SQ, and fear of COVID-19 among nurses Sample size: 275	Egypt	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.
Wu et al (30)	Purpose: Comparison of burnout among nurses in coronary care units and general hospital wards Sample size: 220	China	Nurses in COVID-19 care wards experienced more burnout than nurses in general hospital wards.
Murat et al (31)	Purpose: Stress, depression, and burnout among nurses in COVID-19 care wards Sample size: 705	Turkey	Findings of this study showed that female nurses and nurses with more stress and depression experienced higher burnout.
Yörük and Güler (34)	Purpose: The relationship of psychological resilience, depression, and social factors with burnout among nurses and midwives during the COVID-19 pandemic Sample size:337	Turkey	The prevalence of depression among nurses and midwives was 31.8% and was higher among midwives. Psychological resilience and social support reduced burnout.
Martínez-López et al (35)	Purpose: Investigation of burnout among nurses in COVID-19 care wards Sample size: 296	Spain	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.

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.

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.

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.

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Cite this article as: Bagheri Sheykhangafshe F, Rezaeinasab F, Heidari Kamrody S, Larijani Y, Asgari M. Burnout, posttraumatic stress disorder, and sleep quality among nurses during the covid-19 pandemic: a systematic review. Journal of Multidisciplinary Care. 2021;10(4):173–179. doi: 10.34172/jmdc.2021.33.