Psychological Challenges of Nurses in Pandemic Covid-19

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ABSTRACT

Background: COVID-19 epidemic as a public health emergency, which can lead to significant losses and disruption of the economic and social situation, has caused a great deal of concern and stress in communities and can significantly affect the mental health of health care workers who are at the forefront of this crisis. Nurses play a key role in responding to public health in the face of this crisis. The purpose of this study is to consolidate the available evidence on the effects and psychological problems of nurses during the outbreak of Covid-19.
Methods: A systematic search was performed on the databases of Web of Science, PubMed, Google Scholar, Cochrane Library, ProQuest, and Science Direct. All studies that addressed the "psychological challenges of nurses in the face of the Covid 19 pandemic" from different perspectives were included in the study.
Results: Fourteen studies were reviewed. The most common psychological disorders in nurses exposed to the Covid-19 pandemic were anxiety and depression. Female nurses showed more psychological effects than male nurses and physicians, respectively. Nurses working in the emergency, infectious and intensive care units also experience more psychological challenges.
Conclusion: Evidence suggests that a significant proportion of nurses in this outbreak suffer from a kind of psychological disorders; and these symptoms emphasize the need to find ways to reduce mental health risks and adjust their workload in the event of a serious infectious disease epidemic.
Keyword: Coronavirus, Covid 19, Nurses, Mental Health, Psychological Problems.

INTRODUCTION

Epidemics are the global transmission of emerging or re-emerging infectious diseases that affect large populations and often lead to significant mortality and social and economic disruptions[1]. In recent years, the prevalence of infectious diseases such as severe acute respiratory syndrome (SARS) in 2003, New influenza A / H1N1 (swine flu) in 2009, and Middle East Respiratory Syndrome (MERS) in 2012, showed potentially dangerous global epidemics[2]. Also, in December 2019, a severe acute infectious respiratory syndrome caused by a new Coronavirus (SARS-CoV-2) emerged in Wuhan, China. On January 30, 2020, the World Health Organization announced the new Coronavirus outbreak, dubbed COVID 2019 because of its release year, as a state of emergency for the entire world; And on March 11, 2020, COVID-19 was declared a pandemic[3]. Compared to SARS and Ebola, COVID-19 is highly infectious during the incubation period, and there are asymptomatic infections. It can be transmitted through respiratory droplets, contact, and airborne particles; The result is widespread COVID-19 infection worldwide. There are still many doubts about how and to what extent it is transmitted; and despite the prevalence of this disease in such a broad and unique range, there is still no definitive cure for it. Thus, the spread of fear among people exposed to the virus is a widespread phenomenon that affects every person and every gender and can have different psychological effects (4).
The spread of the virus, in addition to the physical, psychological, social, and economic consequences on infected people, has left many psychological effects on health care providers as the most at risk (5). According to

previous studies on SARS or Ebola epidemic, the occurrence of a sudden and life-threatening illness can put a lot of pressure on health care workers. Increased workload, burnout, inadequate personal protective equipment, hospital transfers, and the need for difficult ethical decisions about care rationing, and the like, can have significant effects on their physical and mental health[2].

Nurses, as the largest group of health professionals, are at the forefront of the health care system's response to epidemics[6]. Nurses care for patients directly in close physical contact and are, therefore, at high risk for disease[7]. Due to the widespread and rapid prevalence of COVID-19, which is highly contagious and in severe cases can be fatal and no specific drugs are available, it is a significant threat to nurses' lives and health. It has a significant impact on emotional and coping responses[3]. Whereas the most significant focus of public health officials and the media during an epidemic is usually on the biological and physical consequences of the outbreak, and they pay less attention to mental health; increased psychological burden during the COVID-19 outbreak, requests for mental health support grew, and the National Health Commission of China issued its first comprehensive guideline for emergency psychological intervention for COVID-19 patients and people at risk, which emphasized the need for multi-purpose mental health teams to provide psychological support to individuals. The World Health Organization has also formally recognized these risks for health care workers and predicted that health care professionals and social care workers are at particular risk for psychological symptoms. Therefore, more research and interventions should be done to manage anxiety and stress

in this group to prevent burnout, depression, and post-traumatic stress in the long run[8]. Given that very few reported studies specifically on nurses differ from other health care professionals and their experiences of involvement in the epidemic, and this issue needs further research; previous systematic reviews have examined the prevalence and factors associated with psychological consequences in health care providers during the prevalence of past infectious diseases, or in the current crisis have dealt with its psychological effects on the general population. The impact of the current unprecedented crisis on the psychological well-being of treatment team members, especially nurses, is not specified comprehensively. Therefore, this study aimed to thoroughly and systematically review the available evidence on the effect of the prevalence of COVID-19 on nurses' mental health and the factors that change these effects.

MATERIALS AND METHODS

This study is descriptive and is considered a systematic review according to the implementation method, which deals with the secondary study and analysis of previous studies in a structured manner and based on predetermined rules and regulations. The statistical population of this study includes all research articles resulting from quantitative and qualitative studies on the psychological challenges of nurses during the coronavirus epidemic that were published from 2019 to August 2020. The electronic databases of Web of Science, PubMed, Scopus, Google Scholar, and Science Direct were searched. Besides, snowball sampling was performed by searching the resource list and tracking citations in each article. The following terms were searched in English and their Persian equivalents: "("healthcare workers" OR "nurses" OR "healthcare professionals") AND ("coronavirus" OR "COVID-19") AND ("mental health" OR "psychological problems" OR "psychological distress"). The study group included nurses working in the corona treatment line in COVID-19 treatment centers. Studies that focused only on other treatment groups and did not have nurses in the study were excluded from the systematic review. Review studies and letters to the editor were also omitted. Only studies that assessed the incidence and prevalence of psychological challenges or mental disorders in this group of individuals using valid assessment methods were eligible for inclusion. The PRISMA diagram shows the details of the study recovery process (Figure 1).

Figure 1: Flowchart of the study selection process
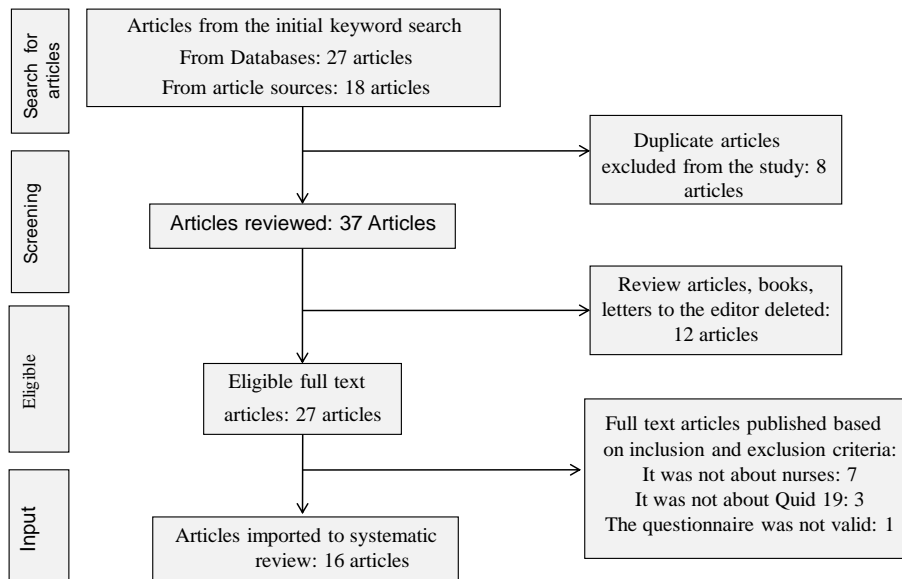
The data of each article were extracted independently by the researcher. The following areas were examined: Study IDs, study type, the total number of participants, participation rate, country and region of study, percentage of physicians, nurses and other participants in the survey, number of male and female participants, assessment methods used as well as number and percentage of people involved in a variety of psychological problems. Finally, the consequences of these effects on the health system and the health team were investigated and extracted, and interventions and solutions were extracted. Independent data extraction was completed, unrelated data were deleted, then the data were merged and discussed.

RESULTS

After screening, sixteen studies with a total of 30,341 participants were included in the study. There were 14 cross-sectional studies and two qualitative studies. All studies reported the prevalence of psychological problems in the medical staff; In general, studies of the activities of different people in the health team have been considered (Physician, nurse, laboratory and radiology technician, pharmacist, physiotherapist, unprofessional health care

worker) and in all studies reviewed, nurses were among the participants in the survey. The average number of nurses in the study was 63.16%. Twelve studies were conducted in China; the main center of COVID-19, two in Singapore, and two in Iran. Out of 16 studies, five studies were conducted at the national level, and eleven studies were conducted at several medical centers. Assessments were often conducted by telephone or electronic questionnaires provided to health personnel. A summary of each study's characteristics, including study method, number of participants in each study, percentage of participation of each group, country or region, and prevalence of each mental disorder or mental health status, is given in Table 1. Also, according to the results of studies, the prevalence of psychological effects from general psychological reactions such as anxiety, fear, insomnia to mental disorders such as post-traumatic stress disorder, panic disorder, cognitive disorders, and depression is shown in the table.

Prevalence of anxiety, sadness, and fear: Anxiety was estimated in 13 studies. The prevalence of anxiety among nurses in a study was higher than nursing students[9]. In four studies, the prevalence of anxiety among nurses was higher than physicians and other health personnel[5,11,13,14]. Four studies reported the prevalence of anxiety mixed with sadness, grief, fear, and anger in nurses[9,12,15,16]. Only one study reported a low risk of anxiety in nurses[5], and other studies have reported moderate to severe anxiety[9,11,14,17,18]. Regarding nurses' work environment, five studies showed a relationship between work in emergency departments, intensive care units, and primary care wards due to more contact with infected patients with severe anxiety in nurses[10,12,13,14,16]. Regarding gender, in six studies, anxiety was higher in female nurses than in male nurses[5,12,13,14,16,19]. In terms of age and work experience, in five cases, younger age and having less work experience were directly related to more anxiety[10,11,14,19]. Regarding anxiety assessment methods, two studies used the Self-Assessment Anxiety Scale (SAS) with a combined prevalence[5,14], and three studies used the (GAD-7) scale[13,18,20]. All eight remaining studies used different questionnaires.

Prevalence of depression: Ten studies examined depression. In five studies, the prevalence of depression was higher in women than in men[17,19,21,23]. In one study, being single and living alone was associated with an exacerbation of depressive symptoms during the COVID-19 epidemic[18]. In 7 of the 10 studies mentioned, the severity of depressive symptoms was higher in less experienced nurses than in other nurses[11,12,17,18,20,22]. In terms of evaluation, two studies used the (SCL-90) scale[10,16], four studies used the (IES-R) scale[13,15,18,19], Two studies used the (DASS-21) scale[15,18] and two other studies used different scales[11,14,17].

The prevalence of a mixture of insomnia, anxiety, and depression in nurses was shown in 4 studies, which were associated with long working hours, few protective pieces of equipment**,** and fear of transmission of infection to the family [17,20,21,23]. In one study, the prevalence of these symptoms was higher in nurses than physicians[17], and in one study, this rate was higher in the professional staff of the treatment team than in non-professional staff[20]. In

terms of evaluation, three studies used the (ISI-7) scale[17,20,23], and one study used a different scale[21].

Prevalence of post-traumatic stress disorder, cognitive disorders, somatization, obsessive-compulsive disorder Three studies reported the prevalence of post-traumatic stress disorder and panic disorder in medical staff, which was significantly higher among nurses than physicians and considerably higher among medical professionals (physicians and nurses) than other health care workers[5,20,24]. In one study, the prevalence of cognitive disorders such as amnesia, lack of concentration, sensory error, and delirium was reported among nurses[25]. In another study, the prevalence of obsessive-compulsive disorder and somatization was found in front-line nurses, which was higher in women than men and higher in people working in rural health centers due to less access to health facilities[21].

DISCUSSION AND CONCLUSION

In this review, 16 studies with a sample size of 16,904 nurses that examined the psychological problems of nurses in the COVID-19 pandemic were systematically reviewed. The results showed that a large proportion of nurses experienced significant levels of anxiety, depression, and even mental disorders such as cognitive disorders, post-traumatic stress disorder, somatization, and obsessive-compulsive disorder during the COVID-19 epidemic. Exposure to this highly transmissible disease can lead to stress and induce PTSD for nurses at the forefront of fighting this pandemic[25]. Studies have shown that high PTSD is often found in nurses working in hospitals involved in COVID-19 treatment as the most crucial risk group who face high hospitalization and mortality[5,20]. In contrast, other studies have reported that PTSD is present only in patients who have recovered from the disease[26].

The results of various studies have shown that the longer the presence and number of shifts of medical staff in quarantine (isolated wards of the hospital such as the infectious ward), the higher the prevalence of post-traumatic stress disorder in them and following post-traumatic stress disorder, patients also experience depression[17,19,25]. Although there was a risk of depression in most medical staff, it was higher among nurses[12,17,19]. Contacting patients with COVID-19 for whom no cure has yet been found and observing mortality in these patients can affect nurses' mental health and makes them prone to depression. On the other hand, the lack of nursing staff and high workload leads to increased psychological pressure[13]. Nurses working in the infectious wards, emergency departments, and intensive care units experienced more mood disorders than nurses in other wards[14,17,19,21,25]. It seems that the duration of presence in these wards increases the risk of mental problems. These findings are consistent with studies in the SARS-CoV-1 epidemic, in which symptoms of anxiety and depression were more prevalent among longer-serving caregivers[6,7].

Also, the severity of mood symptoms in the present pandemic was higher than during the SARS-CoV-1 epidemic period. This higher risk could be due to the different nature of the Coronavirus, which in infected individuals affects the brain directly or indirectly by inducing

a broad cytokine response and in people at risk, it affects because of fear of infection and the unknown nature of the disease[3]. In general, health care providers who are at the forefront of treating patients with COVID-19 are at greater risk for mental health problems such as anxiety, depression, insomnia, and stress. It takes longer for medical staff who have no experience working in the infectious ward to adapt to a new work environment full of stress[17,25].

Depression and anxiety rate was higher in single nurses than in married nurses and higher in staff working in rural areas than in urban areas[14,19]. Studies have reported that due to limited protection and support measures in rural areas and a lack of psychological support in single people compared to married people, these people were at greater risk for developing psychiatric symptoms. Medical personnel who already had a history of psychological problems experienced a higher recurrence rate and exacerbation of the disease during this period[23].

Healthcare workers should be considered as the group most at risk for psychological disorders in the COVID-19 pandemic. Factors related to leaving work and absenteeism in work shifts, including lack of protective equipment, long shifts, and working in the front line, should be considered. The highest incidence of psychological disorders, especially depression and anxiety in medical staff were related to nurses[5,12,17,19,22], female staff[5,14,17,19,21,23], and staff with a history of psychiatric disorders in the past[23]. Also, working in quarantine wards due to isolation and changing living and working conditions of staff and working with seriously infected patients in these wards, medical staff were more at risk of psychological disorders[25]. Other factors associated with the development of psychological disorders in medical personnel include their concern about transmitting the infection from work to family, friends, and acquaintances; there was also a fear of getting COVID-19 infection[14,16].

This review showed that gender and occupational differences are potentially significant in the development of psychological disorders. Female and nursing staff showed higher prevalence estimates, both in terms of anxiety and depression than physicians. The reason for these results may be misinterpreted as the fact that because most nurses are female, the average prevalence of psychological disorders during the COVID-19 pandemic is higher in them. In contrast, the reason can be attributed to the fact that due to the nature of the nursing profession and spending more time in hospital wards to care for patients with COVID-19 as well as the responsibility of collecting sputum to diagnose the virus, they are at greater risk for infection and consequently, have a higher level of fear and anxiety[19]. Also, due to the close contact of nurses with patients, they experience more moral distress and psychological damage related to the suffering and death of patients[28,29]. Nurses, as those at the center of this situation, show even more intense anxiety, fear, sadness, and anger than nursing students[13]. They become anxious when they see the suffering and death of patients, and even if they do their best, they feel psychologically weak and unhappy until they can save the patient's life[15]. On the other hand, they are worried about becoming infected due to close contact with patients, unfamiliarity with environments and special work procedures; This threat, along with the physical discomfort of prolonged use of personal protective equipment and the emotional distress of prolonged separation from family members and daily living with infected patients, causes specific psychological reactions in them[16]. In another recent systematic review of the effects of the COVID-19 pandemic on community mental health, lack of social and communication support, maladaptive coping, and lack of education were among the risk factors for psychological complications[30]. Other findings of this study include the relationship between anxiety and stress with the level of social support, self-efficacy, and optimal sleep quality[23,25]. Accordingly, providing comprehensive support can effectively reduce the psychological distress of medical staff[31]. In the current situation, virtual clinics, by providing psychotherapy and risk management methods, in addition to patients and medical staff, can provide psychological support to their families and friends and quarantined patients[27,28,33]. Chronic anxiety and work in quarantine wards, due to isolation and lack of sensory stimuli in these environments, led to delirium and even suicidal thoughts[23,34]. The results of the study by West et al. (2018) also showed that the treatment team is more at risk of suicide than the general population[35].

One of the limitations of this study is that the number of studies reviewed in it is small because in the early stages of the epidemic, more attention is paid to the physical effects of the disease, including clinical symptoms, prevalence, diagnosis and treatment, and the course of the disease and less attention is paid to mental health and the psychological effects of the epidemic and studies in this area are still relatively few. Still, most of the studies reviewed, made up a significant number of participants, that with subgroup analyzes based on the type of disorder, the severity of the condition, gender, occupational group and place of work, a great deal of valuable information on potential specific vulnerabilities are provided in the present review. Besides, the studies available for the current systematic review were all cross-sectional or qualitative, so the long-term consequences of the COVID-19 epidemic on the mental health of medical personnel require further research and longitudinal studies.

Overall, the present systematic review provides a comprehensive combination of the available evidence, which indicates a high prevalence of anxiety and depression in health care workers and shows that nurses are the most at risk for burnout, anxiety, and mental fatigue. The findings of this study can help identify the needs of health workers and provide regular and appropriate interventions in epidemic conditions that increase their resilience and reduce their vulnerability.

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Table 1: Specifications of selected articles

Author, year, country	Purpose of the study	Methodology		The most important findings
		Research sample	Study design, data collection method	
Cai W, et al (2020) China	Assessing the mental health of health care workers during the 2019 Corona Virus outbreak	1521 health care workers (41% of respondents were nurses, 35% physicians, and other health care workers)	A cross-sectional study Data collection method: Completion of three standard self-report scales, including the standard full-size psychiatric symptom checklist (SCL-90) (With subscales: Psychosomatic disorders, obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, anger, fear, paranoid, psychosis and additional symptoms); Connor-Davidson Resilience Scale (CD-	- The prevalence of mental disorders among health care workers since the COVID-19 epidemic was 14.1%. - There was a significant relationship between the length of service and the prevalence of mental disorders. - The prevalence of mental disorders was significantly different between the novice group and the experienced group over 30 years of age. - There was a significant relationship between work experience in public health emergencies and the prevalence of psychological disorders (χ2= 3.471, P = 0.062).

				RISC) (With subscales: stress coping, stubbornness, optimism); And Social Support Rating Scale (SSRS) (By subscales: objective support, subjective support, and availability of emergency support).	- There was a significant difference in interpersonal sensitivity, anxiety, fear, and obsession between novice and experienced groups (P=0.05) - Compared to experienced staff, novice staff had significantly lower resilience levels at all three levels: toughness, strength, optimism. - Novice staff experienced significantly lower scores in objective and subjective support than experienced staff (P>0.05). But there was no significant difference in assessing the availability of support resources between groups.
Guo J, et al (2020) China	Evaluation of psychological effects of COVID-19 on hospital staff	11118 medical staff of Chinese hospitals		A cross-sectional survey study Cluster sampling Data collection method: Self-report with the technique of recording information in an online questionnaire made by researcher	- About 98.4% of respondents reported moderate to high anxiety levels. - About 47.13% of respondents reported moderate to severe depression since the outbreak of COVID-19. - Nurses, front-line medical staff exposed to COVID-19, and the young medical staff were more anxious and depressed than non-primary medical staff and older medical staff, respectively.
Huang L, Liu H (2020) China	Emotional Responses and Coping Strategies of Nurses and Nursing Students in the COVID-19 outbreak	374 nurses and 430 nursing students in infected cities in China		A cross-sectional survey study, Data collection method: Self-report with information recording technique in two standard online questionnaires: modified short-term coping scale and emotional response scale.	-The nurses, as those at the heart of this event, showed more anxiety, fear, sadness, and anger than the nursing students. - Participants in cities showed more anxiety and fear than participants in rural areas, but participants in rural areas were sadder than participants in cities. -The closer COVID-19 is to participants, the stronger the anxiety and anger.
Cullen W, et al (2020) China	Evaluation of the effect of COVID-19 on the mental status of emergency nurses	A survey of 453 emergency nurses in hospitals in Jiangsu province		A cross-sectional survey study, Data collection method: Self-report with the technique of recording information in an online questionnaire made by researcher	- Nurses working in public health, primary care, emergency medical services, emergency departments, and emergency care units are at risk for psychological symptoms. -Factors and working conditions affecting perceived anxiety and stress include gender, having children, fear of family members being infected, confidence in fighting the spread of the disease, rest time, professional attitudes, attending infection prevention training, and the number of night shifts.
Liu Q, et al (2020) China	Experiences of healthcare providers during the COVID-19 crisis	9 Nurses and 4 Physicians from 5 COVID-19 hospitals in Hubei province, China, using targeted sampling and snowball sampling		A qualitative study with a phenomenological approach Data collection method: Semi-structured and in-depth telephone interviews, which were analyzed using the Colaizzi method.	- The main categories include integrating conscience in care, exhausting fatigue due to heavy workload and unbearable protective coverings, uncertainty and fear of getting infected and contaminating others, objective evidence of challenging experiences, trying to intervene amid chaos, achieving excellence. - Subcategories include risk of death due to fighting a specific infectious disease, stressful work, lack of sleep, low freedom, heavy responsibility and high cooperation, lack of medical staff, physical, mental and environmental stimuli.
Sun N, et al (2020) China	The psychological experience of caregivers of patients with COVID-19	20 nurses caring for COVID-19 patients in hospitals affiliated to Henan university of science and technology, China		A qualitative study with a phenomenological approach Data collection method: Interviews were conducted face-to-face or by telephone and analyzed using the 7-step Colaizzi method.	-The main categories include negative feelings in the early stages, fatigue, discomfort, and disability due to hard work and self-protection, fear, and viral infection anxiety. -Main subcategories include an unprecedented number of patients, concerns about lack of access to appropriate personal protective equipment, worries about patients, worries about their families, difficult moral situations, distress, and possible harm.
Lai J, et al (2020) China	Evaluation of mental health outcomes and related factors in health care workers at risk for coronavirus 2019	1257 front-line staff from 34 hospitals in China (60.8% of respondents were nurses and 39.2% were physicians)		A cross-sectional study, survey type Cluster sampling Data collection method: Using standard tools: Patient Health Questionnaire (PHQ-9), General Anxiety Disorder Scale (GAD-7), Insomnia Intensity Index (ISI-7), and Impact of Event Scale (IES-R-22) to assess the presence and severity of symptoms of depression, anxiety, were used, respectively. Cluster sampling of hospitals in Wuhan province (20 hospitals), Hubei province (7 hospitals), and	- A significant proportion of health care workers reported experiencing symptoms of depression, anxiety, insomnia, and distress, especially female nurses. -Front-line nurses who treat patients with COVID-19 are at the highest risk of infection due to frequent and close contact with patients and longer than usual working hours. - Nurses have more anxiety and distress and have used more job exemptions than doctors.

			surrounding provinces (7 hospitals).	
Liu Zh, et al (2020) China	Evaluation of the mental status of physicians and nurses during the COVID-19 epidemic	4679 physicians and nurses from 348 hospitals in 31 major provinces of China (60.4% of respondents were nurses and 39.6% were physicians)	Cross-sectional study available sampling Data collection method: Health problems during the past week including mental distress, anxiety symptoms, and depression using three standard self-report questionnaires (SAS), (SDS) and (SRQ-20) were evaluated.	-The prevalence of psychological distress, anxiety symptoms, and depression were present in 15.9%, 16%, and 34.6% of staff, respectively. -Female nurses are more likely to have emotional symptoms than male staff and physicians, respectively. - Being single or widowed, being a woman, living alone, being a nurse, being inexperienced, and working in stressful wards were among the risk factors for the higher prevalence of psychological disorders.
Huang JZ, et al (2020) China	Evaluation of mental health of first-line medical personnel in the COVID-19 epidemic and presentation of theoretical foundations for psychological intervention	246 medical and nursing staff (69.9% nurses and 30.4% physicians)	Cross-sectional study Cluster sampling Data collection method: The mental health status of front-line personnel was assessed using the Self-Assessment Anxiety Scale (SAS) and the Post-Traumatic Stress Disorder Self-Assessment Scale (PTSD-SS).	- The prevalence of anxiety in medical staff was 23.23%, and the SAS score was (89.10%± 9.42%) - Severe anxiety, moderate anxiety, and mild anxiety were 2.17%, 4.78%, and 16.09%, respectively. - The level of anxiety in female medical staff was higher than in men (25.67% vs. 11.63%) (Z= -2.008, P=0.045). - The prevalence of anxiety in nurses was higher than in physicians (26.88% vs. 14.29%) (Z= -2.066, P= 0.039) - The prevalence of post-traumatic stress disorder in medical staff was 27.39%, and the PTSD-SS score was (8/17 92 92/42). PTSD-SS score was higher in female medical staff than men (44.30 vs. 36.9) (t = -2.472‹P = 0.014)
Tan, B.Y.Q, et al (2020) Singapore	Evaluation of the psychological effects of COVID-19 epidemic on health care workers	470 health care workers from the two main corona care centers (34.3% of the respondents were nurses, 28.7% were physicians, and 37.0% were other health care workers)	Cross-sectional study available sampling Data collection method: Self-report with information recording technique in two standard electronic questionnaires: Depression, Anxiety and Stress Scale (DASS-21) and Modified Impact Event Scale (IES-R)	- Depression, stress, anxiety, cognitive disorders, and post-traumatic stress disorder (PTSD) were prevalent among health care workers. - 68 patients (14.5%) showed positive anxiety, 42 patients (8.9%) showed depression, 31 patients (6.6%) showed stress, 38 patients showed cognitive disorders (8.1%), and 36 patients (7.7%) Showed clinical concern or PTSD. -The prevalence of anxiety among specialized medical staff (physicians and nurses) was significantly higher than other health care workers. (20.7% vs. 10.10%; P = 0.011)
Zhang W, et al (2020) China	Mental health and psychological problems of health care workers during the COVID-19 epidemic	2182 participants (62.9% nurses, 29.0% physicians, and 7.9% other health care workers)	Cross-sectional study available sampling Data collection method: Mental health variables were assessed through online self-report using Insomnia Severity Index (ISI), Modified Symptom Checklist (SCL-90-R), and Patient Health Questionnaire (PHQ-4).	- The prevalence of insomnia among specialized medical staff (physicians and nurses) was higher than other health care workers (38.4% vs. 30.5%; P <0.01) - Anxiety (13.0 vs. 8.5%, P <0.01), depression (12.2 vs. 9.5; P <0.04), somatization (1.6 vs. 0.4, P <0.01), obsessive-compulsive symptoms and obsessive-compulsive disorder (5.3 vs. 2.2٪ , p <0.01) and the overall scores of ISI, GAD-2, PHQ-2 and SCL-90-R were also higher (P = 0.01). - Working in rural areas, being a woman, and being at risk of contact with COVID-19 patients were the most critical risk factors for insomnia, anxiety, obsessive-compulsive disorder, and depression (P <0.01 or 0.05)
Ho CS, et al (2020) Singapore	Investigating the psychological effects of COVID-19 and coping strategies	512 participants (57.5% nurses, 31.2% physicians, and 11.3% other health care workers)	Cross-sectional study available sampling Data collection method: Self-report with the technique of recording information in an online questionnaire made by a researcher.	- 53.8% of respondents rated the psychological impact of the disease as moderate or severe. 16.5% reported moderate to severe depression symptoms, 28.8% reported moderate to severe anxiety symptoms, and 8.1% reported moderate to severe stress symptoms.
Zhu Z, et al (2020) China	Evaluation of the immediate psychological effects of COVID-19 outbreak on healthcare workers	5062 participants (67.5% nurses, 19.8% physicians, and 12.7% other health care workers)	Cross-sectional study available sampling Data collection method: Online self-report; Stress, depression, and anxiety were assessed using the Modified Impact Event Scale (IES-R), the Patient Health Questionnaire (PHQ-9), and the Generalized Anxiety Disorder Questionnaire (GAD-7). A questionnaire was also designed to assess the effect of psychological protective measures performed by the hospital.	-1509 people (29.8%), 681 people (13.5%), and 1218 people (24.1%) reported symptoms of stress, depression, and anxiety, respectively. - Women (HR Hazard Ratio, 1.31; P = 0.032), work experience> 10 years (HR, 2.02; P <0.001), chronic illnesses (HR, 1.51; P <0.001), history of mental disorders (HR, 3.27; P <0.001) and family members or relatives with or suspected of having COVID (HR, 1.23; P = 0.030) were risk factors for stress. - Care provided by the hospital and ward managers (Odds Ratio OR, 0.76; P = 0.244) and complete coverage of all wards with protective measures (OR, P = 0.69. 0.69) were protective factors.

Zhang C, et al (2020) China	Prevalence of insomnia and confirmation of related psychosocial factors among medical staff of hospitals during the COVID-19 outbreak	1563 participants (11.3% nurses, 31.2% physicians, and 57.5% other health care workers)	Cross-sectional study Cluster sampling Data collection method: Online; Using Insomnia Intensity Index (ISI), Patient Mental Health Questionnaire (PHQ-9), General Anxiety Disorder Scale (GAD), and Modified Impact Event Scale (IES-R) to assess trauma-related psychological response.	- The prevalence of depression, anxiety, and stress-related symptoms in the medical staff was 50.7%, 44.7%, and 73.4%, respectively. - More than a third of medical staff developed symptoms of insomnia during the COVID-19 outbreak. Related factors included the amount of psychological help and support, the quarantine environment, psychological concerns about the prevalence of COVID-19, and being part of the treatment team.
Sarbozi Hossein abadi T, et al (2020) Iran	Nurses' depression, stress, and anxiety in the COVID-19 pandemic	125 nurses working in COVID-19 involved wards in 9-e Dey hospital, Torbat Heydariyeh	A cross-sectional study Available sampling using the DASS-21 questionnaire	- Depression, anxiety, and stress of nurses were moderate; and were directly related to the age and amount of personal protective equipment.
Dolabi Nejad Sh, et al (2020) Iran	Evaluation of post-traumatic stress disorder in nursing staff involved in the care of patients with COVID-19	311 nursing staff of Masih Daneshvari Hospital in Tehran	A cross-sectional study Available online sampling using the Mississippi PTSD Scale	- 69.3% of the subjects were nurses, and 30.7% of them were unprofessional health care workers. In 13.3% of them, COVID-19 was reported in themselves or their first-degree family members. The mean PTSD score was severe in all sample members, and there was no significant difference in the severity of PTSD symptoms between participants with a history of 19-COVID and those without it.