

The effect of the COVID-19 pandemic on the psychological state of healthcare workers around the world: A review

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic has negative effects in many areas around the world, as well as causing psychological effects on healthcare workers to a great extent. We want to draw attention to this effect on healthcare workers, who play the largest part in the fight against the pandemic, by compiling surveys about the mental health of healthcare workers during the COVID-19 pandemic. Worldwide we analyzed and interpreted the causes of psycho-social and psycho-biological effects on healthcare workers by collating the existing studies from certain countries. These nine countries include China, USA, Brazil, Italy, Russia, Spain, India, Turkey, and Iran. The reason these countries were chosen is that the numbers of cases were high. Generally, surveys about the psychosocial status of healthcare workers were sorted and carefully analyzed. A comprehensive, systematic database search for manuscripts was performed in Medline, PubMed Central, ScienceDirect, Scopus, Google Scholar and Web of Science using key words. Psychological problems such as anxiety, depression, post-traumatic stress disorder, and insomnia increased significantly in healthcare workers with the prolongation of the pandemic. This data was interpreted by finding national-scale survey-based studies with the literature review method and statistical analysis is presented for a total of nine countries (China, USA, Brazil, Italy, Russia, Spain, India, Turkey, Iran). Healthcare workers need urgent psychological support, and if necessary pharmacological support, and pandemic management requires specific attention for job optimization and personal protective equipment. When the existing studies are examined carefully, the effects and assistance of healthcare professionals are incredibly vital, especially in extraordinary health conditions such as pandemics. Since the breakdown of this mechanism may lead to disaster, it is vital that their psycho-social status is constantly checked and kept stable.

Keywords: COVID-19, healthcare workers, psychological state, pandemic, mental health

INTRODUCTION

In the world, pandemic, epidemic, microorganism, parasite, and infection have had many positive and negative effects on medicine, technology and other many disciplines in human history from past to present (1). SARS-CoV-2 (severe acute respiratory failure syndrome), which emerged recently and had serious effects throughout the world, caused these impacts to come to light and be examined again. The Novel Coronavirus-2019 (COVID-19), which first appeared in Wuhan, China in December 2019, poses a serious health hazard worldwide, and the cyclical values of humanity and countries were seriously damaged after the announcement of the pandemic by the World Health Organization (WHO) (2). Obviously, the most affected discipline was the healthcare system consisting of multiple components. The psychological effects of the process experienced by doctors, nurses and healthcare workers (HCWs) lead the secondary actions resulting from this impact (3). Considering that HCWs have most effect on the progression of COVID-19, as in the SARS, Ebola, MERS-CoV, and influenza pandemics in the recent past, their psychosocial state must not be forgotten. It is one of the most important factors and topics. In this context, the steps to be taken and studies to be done in order to improve the current psycho-social state of HCWs are of great importance. Our review of this issue is a biological, psychological and social examination of HCWs who worked actively during the pandemic. The focus is on several countries, including US, India, Brazil, Russia, Spain, Iran, Turkey, Iran, and China, which were severely affected by the pandemic. Published studies including questionnaires and surveys about topics such as depression, anxiety, acute stress disorder, post-traumatic stress disorder (PTSD), and insomnia among medical staff in these countries were investigated to determine the current status of HCWs. The main purpose of our study was to compensate for the lack of a cumulative general review in the literature and the general focus on one country in other studies.

Biological effects of SARS-CoV-2

The high transmission rate of COVID-19 and its transmission from person to person caused HCWs responsible for treating the patients to be the group of workers most at risk in this pandemic. This virus manifests intense symptoms: fever, dry cough, tachypnea and shortness of breath. Although approximately 20-25% of patients with MERS-CoV or SARS-CoV infection had diarrhea, intestinal symptoms are rarely seen in COVID-19 patients. Confusion, thorax pain, vomiting, and nausea were also reported as symptoms of COVID-19. Other symptoms include sore throat, sneezing, nasal congestion, sputum production, anosmia and dyspepsia, skin rash or discoloration of the fingers or toes, and viral conjunctivitis. In addition, many studies showed that the virus has a direct-indirect effect on the increase or decrease of more than one value and component biochemically (4,5). We will evaluate the psychosocial situation of HCWs and touch on many parameters in this approach. Based on the conclusions drawn from this approach, attention will be given to the protection and support of HCWs, who are actively struggling with a widespread global pandemic, by monitoring their psychosocial symptoms and needs.

Psycho-social status of HCWs during the pandemic

With the current workload created by the virus around the world, HCWs have a high risk of infection during the diagnosis, treatment and care of COVID-19 patients. While the transmission rate is high, HCWs working in certain units in hospitals have higher risk of becoming infected (emergency services, intensive care units, clinical microbiology and infectious diseases, family physicians). The ever-increasing numbers of confirmed and suspected cases, the overwhelming workload, the depletion of personal protective equipment, media coverage, lack of certain medications, stigmatization, and feelings of inadequate support all add to the mental and physical burden on HCWs. Studies show that HCWs are afraid of getting infected and transmitting viruses to their families and friends (6). An increase in uncertainty, hopelessness and resignation demands were observed among HCWs (7). Long-term permanent psychological problems may arise in individuals who report experiencing

high levels of stress, anxiety and depression symptoms. Similar concerns about mental health, lack of psychological adaptation, and infection of HCWs who treat and care for infected patients are clearly shown to cause more severe burnout among HCWs. Considering all these factors, burnout and accompanying psycho-social symptoms in HCWs may cause disruption of work routines and delays in the treatment of patients in hospitals. In particular, it is also important that observations be made by unit chiefs during this period, that unit employees be aware of spiritual and physical forms of support and that the necessary support be provided.

METHOD

Worldwide we analyzed and interpreted the causes of psycho-social and psycho-biological effects on healthcare workers by collating the existing studies from various countries. A comprehensive, systematic database search for manuscripts was performed in Medline, PubMed Central, ScienceDirect, Scopus, Google Scholar and Web of Science using key words. Generally, surveys about the psychosocial status of healthcare workers were classified and carefully analyzed. The articles were examined in detail and classified based on country. An entry was made for the current case numbers under the heading of countries. We transferred information from articles that were previously reviewed and classified from databases.

CURRENT PSYCHOLOGICAL STATUS OF HCWs IN COUNTRIES

We will examine the psychosocial status of HCWs in countries where the pandemic hit hardest under this heading.

1.China

According to WHO data, as of December 6, 2020, the total number of confirmed COVID-19 cases in China was "94,160", and the total number of confirmed deaths was "4753" (8). According to the latest Amnesty International report dated 13 July 2020, the number of deaths of HCWs from COVID-19 in China was 29 (9). Factors such as being caught off guard during the initial stages of the pandemic, insufficient protective equipment, inexperience in approaching the rapidly increasing number of cases, inadequate diagnostic kits, and insufficient knowledge about coronavirus seriously affected China, mostly Wuhan city (10). Therefore, the psycho-social situation of HCWs here is more interesting compared to many other countries. In this context, a quantitative-observational cross-sectional survey with 1257 participants (60.8% nurses, 39.2% doctors) was conducted in Wuhan. This study provides clues about the psychological state of HCWs who worked devotedly on the front line (11). On the Patient Health Questionnaire (PHQ-9) depression scale, 50.4% of the participants showed symptoms with a depressive course; according to General Anxiety Disorder-7 (GAD-7) general anxiety scale, 44.6% of participants had anxiety symptoms; and according to the Insomnia Severity Index (ISI) sleep quality scale, 34.0% of the participants suffered from insomnia and 71.5% of them had acute stress disorder at significant statistical levels (11). It is also noteworthy that the findings show more severe symptoms of anxiety and depression in women. The strikingly high rates indicate that it is necessary to focus on this issue; necessary mental support should be given to HCWs through materials, media or individual therapy. After a major event, mental impact is more common than physical exposure. Despite this determination, there are few studies about this subject. The lack of planning, resources and personnel related to mental health is also one of the points to be considered. Again, the data obtained in a survey study with 994 participants conducted in Wuhan, China are statistically consistent with the previous study (12). In this study, 18.4% of the participants were doctors, 81.6% were nurses, and 85.5% were female workers. Demographic characteristics of the participants are not homogeneous in terms of profession and sex. Using the PHQ-9, GAD-7, ISI, and Impact of Event Scale-Revised (IES-R) scales, the aim was to investigate depression, anxiety, sleep, and stress levels of the participants through quantitative-observation studies and serious results were revealed by clustering with Ward's

method. Before sharing and interpreting the results, let's briefly examine the psychological scale tools mentioned above and look at their normal values, as they are frequently encountered in studies in other countries. The IES-R scale is graded on a 5-point scale ranging from 0 ("none") to 4 ("severe") and gives the IES-R total score (between 0 and 88) (13). Outcome values of the ISI scale of sleep quality are "0-7 no clinically significant insomnia", "8-14 insomnia clinical symptoms", "15-21 clinically moderate insomnia symptoms" and "22-28 severe clinical insomnia" subclassified as "showing symptoms" (14). The outcome values of the PHQ-9 depression scale are classified as "0-4 none or minimal", "5-9 mild", "10-14 moderate", "15-19 moderate" and "20-27 severe" depression (15). The outcome values of the GAD-7 general anxiety scale are classified as "0-5 none or minimal", "6-10 mild", "11-15 moderate-moderate" and "16-21 severe" anxiety (16). In this study, 36% of the participants had subthreshold mental health disorders (average PHQ-9: 2.4, GAD-7: 1.5, ISI: 2.8, IES-R: 6.1), 34.4% had mild mental health diseases (average PHQ-9: 5.4, GAD-7: 4.6, ISI: 6.0, IES-R: 22.9) and 22.4% had moderate illness (mean PHQ-9: 9.0, GAD-7: 8.2, ISI: 10.4, IES-R: 39.9). It was found that 6.2% of the participants had serious illness (mean PHQ-9: 15.1, GAD-7: 15.1, ISI: 15.6, IES-R: 60.0). The results were analyzed statistically and were significant (12). Based on these results, it was statistically demonstrated that 62 (6.2%) HCWs experienced serious mental distress, illness and depression. An argument is proposed to support the essential point of our study, which is that the necessary units do not provide adequate psychiatric support to HCWs. As the first place where the pandemic hit, many methods such as supporting HCWs with necessary materials, therapy, and media-based products were ignored in the city of Wuhan, which underwent the first test. This negligence is understood from the answers given to questions under the heading "Resources for Mental Health". In the results of this study, 63.7% of participants could not access the necessary psychological material, 49.6% were not able to access the necessary psychological support through the media, and 82.5% (820 people) stated that they did not receive psychotherapy. HCWs could not find enough psychological materials and support during this process and experienced mental distress caused by this. In addition, 40.2% of the HCWs stated that they preferred to be supported by a psychiatrist-psychotherapist. The conclusion is that HCWs accept mental depression and find it appropriate to organize both individual and collective psychotherapy sessions. Although the majority of the participants being women and nurses raises doubts about the homogeneity of the studies, it provides support about the issue we are emphasizing (12). Although China was the first country to be affected by the pandemic, it is an interesting subject of research that the number of deaths among healthcare workers is low compared to many other countries (11). Although all these studies provide information about the psychosocial status of HCWs and their work, there are some doubts in the scientific world about the accuracy of the confirmed cases and death numbers due to the fact that Chinese bureaucracy prioritizes state interests, especially economic. Although we can say that China reacted well during the pandemic, the Chinese government should not ignore the psychological impact of transparency for HCWs and the public (17).

2.USA

According to WHO data, as of December 6, 2020, the total number of confirmed COVID-19 cases in the USA was "14,191,298", and the total number of confirmed deaths was "276,503" (8). With these official statistics, the USA ranks first in the list of both cumulative case numbers and cumulative deaths worldwide. According to the latest report by Amnesty International dated 13 July 2020, the number of deaths of HCWs from COVID-19 in the USA was 1,077 (9). According to this report, the USA is second after Mexico for HCW deaths worldwide. According to an article, the number of infected and dead HCWs were 114,529, and 574, respectively (51). USA is one of countries in the world that was most affected during the pandemic. The rapidly increasing number of cases created serious chaos in the country. Diabetes, obesity, and metabolic disorders, common in the USA, also played a serious role in worsening this picture (18, 19). The results of a cross-sectional

COVID-19 pandemic and healthcare workers survey study, consisting of 523 frontline HCWs, 153 of whom were in New York city, are parallel to previous studies (20). “Cohen Veterans Network America” Mental Health Frontline Survey yielded many results that need to be interpreted for the mental health effects of the pandemic (20). In brief, many HCW’s both in the national sample and in the New York city (NYC) sample stated that they experienced sleep and anxiety, difficulties in parenting, increased frequency of feeling sad or depressed, eating too much or too little food, feeling socially isolated (stigma), headache, stomach ache, and other body aches (20). Of the participating HCWs, 47% nationwide and 54% in NYC stated they were "worried", 46% nationwide and 58% in NYC stated they were "worn", and 19% nationwide and 29% in NYC defined themselves as "scared" (20). They stated that 55% of first responders and frontline HCWs were not healthy in terms of general mental and mental health. Nine out of ten (95%) participants said they thought it was important for all Americans to access necessary mental health services as a result of the coronavirus pandemic. Two out of three (61%) of the respondents stated that the coronavirus pandemic made it difficult to access mental health services. NYC was affected more by the pandemic in the early days and was an epicenter so this study was conducted in the national and NYC contexts (21). However, it can be concluded that this study does not apply to the whole of the United States and definite conclusions cannot be made. The results allow some estimates to be made about the urgency for facilitating the working conditions of HCWs and providing the necessary physical and mental support for this sample. The high number of people with metabolic diseases such as obesity, diabetes, and hyperlipidemia in the United States and the comorbidity of these diseases for COVID-19 make the work of HCWs more difficult than in many countries (18). According to data transferred to the "New York State Department of Health", the mortality rates due to comorbidity and the list of comorbidities are presented in Table I (22).

Table I: Mortality in COVID-19 and comorbidity²²

COMORBIDITY	DEATH RATES RELATED TO COMORBIDITY
Hypertension	55.4%
Diabetes	37.3%
Hyperlipidemia	18.5%
Coronary Artery Disorders	12.4%
Nephrological Disorders	11%
Dementia	9.1%
Chronic obstructive pulmonary disease (COPD)	8.3%
Cancer	8.1%
Atrial Fibrillation (AF)	7.1%
Heart failure	7.1%

If these are taken as a basis, Cohen Veterans Network America's cross-sectional survey partially indicates that HCWs are still under a heavy burden in the American health department (20). In the WHO's last published situation report, observations of serious increases in the supply of personal protective equipment is a positive step, but the lack of an approved protocol for psychological assistance fuels the disruption of the whole system. One of the primary emergency implementations in health departments should be that HCWs receive physical and psychological support, as well as providing all kinds of assistance to improve working conditions. The fact that USA is currently ranked first in the number of confirmed cases and deaths globally according to the latest WHO official figures indicates that the pandemic is likely to be longer in the USA and more difficult than other countries. In this process, psychological scale tools should be applied to HCWs regularly and the organization of group psychotherapy sessions should be implemented as soon as possible. Otherwise, the health and insurance systems in America will have a very difficult time under a burden that they cannot handle.

3. Brazil

According to WHO data, as of December 6, 2020, the total number of confirmed COVID-19 cases in Brazil was "6,533,968", and the total number of confirmed deaths was "175,964" (8). According to the latest Amnesty International report dated 13 July 2020, the number of deaths of HCWs from COVID-19 in Brazil was 634 (9). Although Brazil is one of the countries that was not very affected in the early days of the pandemic, a serious increase in the number of daily cases was observed from the end of March to the beginning of May (9). The number of cases reached fifty-sixty thousand a day and led to serious problems across the country. One of these problems is the burden placed on the health system and the difficulty of HCWs in working to overcome this burden. This responsibility also created some psychological problems among HCWs. A cross-sectional study with 700 physicians working in the head and neck surgery department in Brazil provides information about this issue (23). The study, conducted between May 14 and May 31, 2020, is interesting in terms of the temporal-spatial cause and effect relationship, coinciding with the explosion in the number of cases with a daily increase of 7%. GAD-7, PHQ-2, Mini-Z, and IES-R psychological self-assessment scales were used to observe and correlate levels of anxiety, depression, burnout, and acute stress with symptoms, respectively (13, 16, 24). Of the participants, 74.2% were men showing that the participants are not homogeneous in terms of sex distribution. According to the GAD-7 anxiety scale, 45.5% had anxiety symptoms, 8% of which were severe; clinically significant post-traumatic stress disorder symptoms were present in 26.3%, of which 14.7% were severe according to the IES-R acute stress (PTSD) scale; according to the PHQ-2 depression scale 16% of doctors had depression symptoms; and the Mini-Z burnout level found burnout symptoms at a rate of 14.7% (23). In addition, the results section stated that female doctors had significant PTSD compared to men. As in other studies, it is also noteworthy that women differ significantly from men in some psychological scales (23). The number of doctors participating in the study is satisfactory. However, it should be considered that neck and head surgery has less contact with pandemic patients and risk of infection compared to other frontline HCWs. In another study with more participants in Brazil, sleep disorders, anxiety and burnout levels were investigated in professional HCWs. A total of 4,384 HCWs nationally participated in this study (25). Demographic characteristics found 76% of participants were women, 24% were men, and 53.8% worked as doctors. In addition, 55.7% worked in positions that are in primary contact with COVID-19 and 9.2% of HCWs were infected before. Some self-assessment scales were implemented for the psychological status and symptoms of HCWs in the study (25) including the GAD-2 and "Stanford Sleepiness Scale". Additionally, questions regarding burnout were also asked. The results of the study, which searched for a significant relationship between sleep quality and anxiety levels in general, suggest that 41.4% of participating HCWs had worsening or new symptoms of previous insomnia. Parallel to this, 13% (n=572) received pharmacological treatment for insomnia (especially nurse technicians and nurses), 44.2% of them had anxiety symptoms, and

burnout levels were observed in 21%. Sleep quality and duration were observed to be seriously impaired due to the pandemic. The number of participants in the study and the occupational demographic homogeneity are satisfactory (25). Although there was no equal distribution of sex, it is a remarkable publication considering the lack of studies conducted in Latin America. Given the potential impact of insomnia on job performance/healthcare decisions and the potential long-term dependence on pharmacological treatments for insomnia, this study highlights the need for specialized sleep and mental health programs for HCWs. Considering publications showing that anxiety causes disturbances in sleep patterns, it is of great importance to publish the protocols and regulations required for the resolution of anxiety and other mental disorders in HCWs (26). In the present review, the shortage of studies conducted in Latin American countries to determine the psychosocial status of HCWs during the pandemic is acute. Specifically, according to Amnesty International data, Brazil is in 4th place in the ranking for the number of HCWs who were infected and died. The lack of detailed studies about HCWs in Brazil indicates the authorities do not fully grasp the seriousness of the situation.

4.Iran

According to WHO data, as of December 6, 2020, the total number of confirmed COVID-19 cases in Iran was "1,028,986", while the total number of confirmed deaths was "50,016" (8). According to the latest Amnesty International report dated 13 July 2020, the number of deaths of HCWs from COVID-19 in Iran was 164 (9). According to an article, the number of infected and dead HCWs are >12,000 and 164, respectively (51). Iran is one of the countries with the highest number of HCW deaths during the pandemic. Despite being faced with the second wave of the current coronavirus pandemic, political, economic and cyclical reasons such as the relaxation of restrictions and the fact that the authorities did not realize the seriousness in the early days of the pandemic caused the pandemic to accelerate in Iran. While stability was observed in the number of partially approved daily cases in August, it increased again since September. The prolongation of the pandemic increased the burden on the health system and infrastructure of the country, and accordingly, some mental and physical disorders and problems emerged among HCWs. In a study conducted with the participation of 892 HCWs in Iran using self-assessment scales of Depression, Anxiety and Stress Scale-21 (DASS-21), Perception of Stigma Questionnaire and Perceived Stress Scale (PSS), depression was found in 41.7% of HCWs, anxiety prevalence was 51.2%, and post-traumatic stress prevalence was 33.9% (27). However, the lack of comprehensive statistical analysis of study results is a deficient feature of this publication. The lack of information about the demographic characteristics of the participants indicates that it will not be accurate to link the results to all Iranian HCWs. However, this study is valuable for use because it provides arguments that support our topic and our theme, and due to the lack of other studies about this subject in the country. The scale results for the HCWs were significant, indicating that the HCWs had a hard time in psycho-social terms during the pandemic. It is of great importance to take the necessary wishes and desires of HCWs seriously and to provide the necessary support for their physical and psychological health. Otherwise, it is obvious that in Iran, where the second wave is expected, HCWs will be crushed under this serious burden and the health system will suffer serious damage.

5.Italy

According to WHO data, as of December 6, 2020, the total number of confirmed cases of COVID-19 in Italy was "1,709,991", and the total number of confirmed deaths was "59,514" (8). According to the latest Amnesty International report dated 13 July 2020, the number of deaths of HCWs from COVID-19 in Italy was 188 (9). According to an article, the number of infected and dead HCWs were 28,896 and 214, respectively (51). Italy became one of the first epicenters of the coronavirus in Europe. The rapidly increasing number of cases attracted attention both from the media and academic world and needed to be addressed. In

April 2020, when the number of beds and intensive care units were at maximum occupancy, the country's health system was under serious pressure, which was already hampered due to political and cyclical reasons and decisions (28). In Italy, which was caught in a vulnerable and unprepared situation like many European countries, the lack of many products, especially the increased need for mechanical ventilators due to the Acute Respiratory Distress Syndrome (ARDS) developing linked to coronavirus, left patients and HCWs desperate (5, 28). In line with these results, another important issue that needed to be addressed is the psychological health status of HCWs who feel this burden heavily. However, there is a protocol in Italy that was different from other countries about this subject: PsicoCOVID-19 (29). This protocol has the potential to be a role model. The protocol starts with the identification of HCWs first by 3 psychology experts and 1 psychiatrist assigned by the Occupational Health Department. Rapid and effective identification of emotional and stress problems of individuals is an important basis for psychological intervention, and the protocol took this into account (30). Anamnestic quick self-assessment questionnaires (State-Trait Anxiety Inventory [STAI-Y1], STAI Y2, Beck's Depression Inventory [BDI]) (31,32) were used to detect the presence and severity of current psychological symptoms. In case of a patient with previous psychiatric diagnosis or using psycho-pharmacological medication, psychologists directed them to a psychiatrist. After the triage process was completed, the information about the first assessment was sent to a psychiatrist or psychologist, and the survey process was completed. It was applied to 106 people, 79 women and 27 men. Their average ages were 51 ± 9.8 and 45.7 ± 10.1 years, respectively. If it is examined together with the statistical analysis in this study (30), analysis revealed that most employees experienced mild to moderate psychological distress. The BDI depression scale mean score of the participants was 9.7 ± 2.1 , STAI-Y1 mean score was 41.6 ± 11.4 and STAI-Y2 mean score was 6.8 ± 8.7 . Female HCWs had significantly higher scores for STAIY1 (state anxiety) and about 81% of them were already monitored by the team before the pandemic. It was determined that 81% were previously followed up psychologically, 61% of them received psychiatric treatment, 14% of them received psychological treatment and 6% of them already received combined treatment. It was recommended to reshape treatments according to the PsicoCOVID-19 protocol. The majority of the total sample complained about difficulties, they seriously stated that they had anxiety, panic attacks and sleep problems, and some reported that their previous psychiatric disorders were worsening due to the psycho-sociality of COVID-19. The scales also indicated that employees experienced fear of contamination (62%), anger (22%), exhaustion (66%), anger (67%), and cognitive dysfunction (19%) as reported in the statistical data. Considering that the minimum anxiety value in the STAI score is 20 and the maximum value is 80, and the 0-9 range in the BDI score indicates minimal depression, the STAI value was 41.6 and the BDI value was 9.7. These results show that it was not late to provide psychological support and necessary equipment to HCWs. However, the fact that the study was conducted in January and the number of participants was low may mean that the result can have a completely different dimension if it is updated in September. The number of deaths compared to the number of cases is higher than in many countries, partially supporting this argument. In light of the results, the Italian health system should consider the psychological situation of HCWs, who are candidates for serious depression, and create a protocol accordingly. This may be a model that other countries can take as an example. Establishing the protocol more comprehensively, and increasing the personnel and financing required for protocol management will increase positive outcomes. The results also showed that there is a need to improve the psychoeducational strategies of hospital staff (seminars, videos, etc.) (30). Another study showing the pressure and severity of the pandemic for HCWs was conducted at a pediatric hospital in Italy (33). Conditions such as depression, acute stress disorder, and anxiety were examined using various psychological self-assessment scales. According to results, 67.4% had sleep disorders. They found a significant positive relationship between sleep disorders and stress and anxiety. Of participants, 19.4% felt anxious and 53% reported being at risk of developing acute stress disorder (33). The results section showed that all these are inversely proportional to receiving social and psychological support. Seeing that HCWs suffer from

psychological disorders even in a unit such as a pediatric hospital where there is less risk and contact and not many front-line workers, once again revealed the importance of the study. In Italy, tragically sequential suicides of nurses also proved the negative effects on mental and mental health of HCWs, along with extenuating parameters such as inadequacy of equipment and intense working conditions (34).

6. Russia

According to WHO data, as of December 6, 2020, the total number of confirmed cases of COVID-19 in Russia was "2,460,770", and the total number of confirmed deaths was "43,141" (8). According to the latest Amnesty International report dated 13 July 2020, the number of deaths of HCWs due to COVID-19 in Russia was 631 (9). Russia was one of the epicenter countries negatively affected by the pandemic. As a country policy, irregular and inconsistent behavior caused late acceptance of the seriousness of the pandemic and the number of cases peaked (35). With the increase in cases, the health departments in the country were under a serious burden and the HCWs, especially those at the front line of medical support and treatment, were most affected. Many surveys related to this situation were also implemented. Self-psychological assessment scales were applied in a cross-sectional questionnaire for personal psychological status determination in Russia (PHQ-9, GAD-7 etc.) (15, 16). A total of 812 participants participated in the survey. The demographic characteristics of the 812 respondents comprised 641 (79%) doctors, 138 (17%) nurses, 7 (0.9%) technical nurses and 25 (3.1%) non-medical workers. Most of the participants were between the ages of 20 and 49 years. In the anxiety-related results from the survey, 48.7% of the participants had anxiety disorder, moderate and high level of anxiety was characteristic of young people (between the ages of 20-39), and participants over the age of 50 had minimal anxiety. Again, in terms of depression, 57.6% of the participants had depressive symptoms according to the PHQ scale. Age, duration and quantity of work, anxiety and depressive disorders were independent determinants in regions where the risk of infection increased according to this study. Also, results found young workers working in high-risk areas for direct infection had a higher risk of developing symptoms of anxiety and depression (36). A very good cause-and-effect relationship was found regarding what methods should be used to reduce psychological depression such as anxiety and depression in HCWs. They stated that the psycho-emotional crisis during the pandemic can be overcome with the provision of personal protective equipment (69.2%), work and rest optimization (58%), management support (52.7%) and relationship support (51.1%). The need to implement methods such as group or individual therapy by psychiatrist-psychologists and self-therapy by providing the necessary materials was revealed. Although the study does not seem very suitable in terms of homogeneity, it is different from other studies due to the high number of physician participants compared to many studies conducted during the COVID-19 pandemic, and how the study was applied to the participants. In addition, the large number of participants makes the study worthwhile. In light of the results of the study, the fact that young people had more depressive behaviors and symptoms reveals the necessity of emphasizing and applying an urgent psychological protocol. If it is ignored, the emergence of severe post-traumatic stress disorder and related secondary psychiatric disorders in young HCWs will cause chronic, deep wounds in the Russian health system and in the social lives of HCWs. Studies such as working hour optimization, pandemic management, organization of psychotherapy sessions, and especially providing common personal protective equipment in all countries, will have positive results both physically and psychologically.

7. Spain

According to WHO data, as of December 6, 2020, the total number of confirmed "COVID-19" cases in Spain was "1,684,647". The total number of confirmed deaths was "46,252" (8). According to the latest Amnesty International report dated 13 July 2020, the number of deaths of HCWs from COVID-19 in Spain was 63 (9). According to an article, the number of infected and

dead MDs were 52,746 and 76, respectively (51). Spain, another European country, was also severely affected by the pandemic in many areas. Although there were no complaints about the lack of equipment and required material at first in the country, dissatisfaction with this issue became more pronounced with the increasing number of cases (37). In this context, it is a necessity to investigate the psychological status of HCWs, to interpret it and give necessary advice. A study obtained information about the mental and mental health of HCWs in Spain during the pandemic using the Hamilton Anxiety Rating Scale (HARS) (38), anxiety self-assessment scale, Beck Depression Inventory (BDI) (31) depression scale, and Acute Stress Disorder Inventory (39). The study as a different position from other studies by focusing on employees who were infected or suspected of having COVID-19. The average HARS score ($p < 0.001$), BDI score ($p = 0.001$) and ASDI score ($p = 0.015$) increased in employees with a diagnosis of disease, compared to the presence of suspected disease. For protection measures, HCWs who deemed protection insufficient had increased HARS ($p = 0.001$), BDI ($p = 0.001$) and ASDI ($p = 0.001$) mean scores compared to who those thought there was enough equipment. Also participating HCWs who think that protection, protective equipment and necessary protection management are insufficient had increased BDI scores compared to those who thought they were sufficient ($p = 0.029$). All of these results were published with statistical studies (39).

In the studies, it was statistically shown that not taking the necessary precautions for HCWs and management failures in managing the process not only causes physiological injury, but also a serious psychological crisis. It is obvious that taking necessary measures (physical, psychological) for the good management of health and the pandemic is an issue that should not be ignored. The high significance of HARS and BDI results for employees who consider protection insufficient ($p = 0.001$) proves that one of the most effective cause-effects in the psychosocial situation of HCWs is the supply of personal protective equipment and logistics. Correct information transfer (transparency), provision of personal protective equipment and outbreak management are the most important building blocks for the psychological health of HCWs (40).

8.India

According to the WHO data, as of December 6, 2020, the total number of confirmed cases of COVID-19 in India was "9,644,222". The total number of confirmed deaths was "140,182" (8). According to the latest Amnesty International report dated July 13, 2020, the number of HCWs who died from COVID-19 in India was 573 (9). According to an article, the number of infected and dead HCWs were 1,313 and 110, respectively (51). Many factors such as socio-cultural and economic life in India, which is the second most populous country in the world, and the partial deficiency of hygiene compared to other countries, caused the number of cases and deaths in the country to increase rapidly. Mass spread accelerated due to close contact in social life. Health inequalities, increasing economic and social inequalities, and different cultural values create unique challenges in India, as well as the difficulty of implementing public health measures in places where living conditions involve inadequate hygiene and sanitation (41). The heavy burden on HCWs and the still increasing number of cases caused psychological and physiological distress in HCWs. In a study conducted about the solution and importance of this problem, the level of anxiety and depression in HCWs was measured and its severity was demonstrated (42). PHQ-9 depression scaling, GAD-7 anxiety scaling, PSS-10 stress disorder and severity level scales were used for this (15, 16, 50). Results obtained from a cross-sectional survey study in which 350 HCWs from 98 different institutions participated (84.3% ($n = 295$) of the 350 participants were doctors, 15.7% ($n = 55$) nurses) (42), the prevalence of HCWs with seriously high stress was 3.7%. The rates of HCWs with depressive symptoms that required treatment and anxiety symptoms that required further evaluation were 11.4% and 17.7%, respectively. A proportion of 78% ($n = 273/350$) had serious concerns about transmitting and spreading the infection to friends or family members. Also when participants were asked "Do you find the institutional support satisfactory?" 43% answered "No, I find it unsatisfactory/not enough". In answer to the question "Are studies about accessibility of personal

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protective equipment satisfactory for you?", 50% responded they were low/insufficient. In an analysis aimed at identifying the determinants of moderate and high level stress, the significance between female gender and stress ($p=0.019$) was observed as the only factor in this context (42). Although the study was not very satisfactory in terms of homogeneity, it provided new arguments in support of topics that emerged in all studies. Most studies found a significant difference between female HCWs and symptoms of psychosocial illness, the inadequacy of equipment and institutional support, and fear of infecting relatives emerged in parallel in this study. HCWs working at the frontline in the country complained of anxiety, depression, burnout, insomnia and stress-related ailments. This is largely mediated by the bio-psychological sensitivities of individuals; socio-environmental factors such as risk of exposure to infection, risky communication of HCWs, availability of personal protective equipment, work-related stress, stigmatization and other psychological factors played important roles. In India, one of the countries with the highest number of HCW deaths, it is urgent that protocols and studies based on serious psychology-psychiatry disciplines be completed.

9. Turkey

According to WHO data, as of December 6, 2020, Turkey had a total number of COVID-19 cases of "533,198". The total number of confirmed deaths was "14,705" (8). An Amnesty International dated July 13, 2020, the number of HCW deaths due to COVID-19 in Turkey was 41 (9). In addition, according to the data announced by the Ministry of Health in Turkey on October 14, the number of positive HCWs based on the COVID-19 test exceeded 40,000 and the number of HCWs who died due to COVID-19 reached 107. HCWs developed serious loneliness, despair, stress, and nervousness, and Turkey is one country where HCWs exhibit emotional behavior and psychological symptoms such as physical and mental fatigue. There are many studies showing the psychological status of HCWs in Turkey. One of these is a study in which 1,121 (52%) HCWs were evaluated for levels of anxiety, hopelessness and the factors affecting them using the Beck Hopelessness Scale (43) and State-Trait Anxiety Inventory (STAI) (32) scales. The study had remarkable results ($n=2156$) (7). The hopelessness and anxiety levels of HCWs were higher than those who were not HCWs. Hopelessness levels of nurses were higher than doctors, and their anxiety levels were higher than both doctors and other HCWs. For female participants, those who live at home with individuals at high risk of infection, those who had difficulties in taking care of their children and those whose income decreased had higher levels of anxiety and despair. The increase in anxiety level is parallel with the increase in working hours and nurses were affected more than other HCWs. All of these results are presented with statistical analysis (7). Another study using Spielberger's State-Trait Anxiety Inventory scale presented the anxiety levels for 123 service and intensive care unit nurses and a significant relationship was demonstrated (44). Participants included 91 women and 32 men; 76 were married, 47 were single; 48 had children, 75 did not; and 63 participants worked in the pandemic ward and 33 participants worked in the intensive care unit. In the results of the survey of participants including these characteristic demographic features (44), 66 nurses had low level of anxiety (53.7%) and 57 nurses had high level of anxiety (46.3%). It was statistically proven that advancing age, having children, and working experience were closely related to anxiety in nurses working in the pandemic ward ($p<0.05$). Due to the small number of participants and lack of homogeneous professional attributes, the study makes it difficult to generalize about the country in general. A study about the peak number of cases in Turkey from 10-20 April 2020 reveals more valuable aspects compared to other publications. In Turkey, study of 331 nurses about pressure on HCWs allows us to understand the process of the pandemic. In the study, BDI (31) and BAI scaling tools were used, and attempts were made to determine depression and anxiety levels. Of participants, 184 were women, 147 were men; and 149 were single and 176 were married. In the study results, women had significantly higher anxiety levels than men ($p=0.017$). Values for nurses with family members with chronic diseases were higher. Depression and anxiety scores of nurses with elderly family members were

COVID-19 pandemic and healthcare workers significantly higher than nurses without elderly family member ($p=0.008$). There was a significant difference in depression values for nurses who provided COVID-19 care compared to those who did not ($p=0.002$). As can be seen, while HCWs have difficulty in maintaining their psychological state due to their heavy workload, the fear and anxiety of possibly transmitting viruses to their loved ones in their close social network pushed people into mental depression. The study has homogeneity on the basis of sex and marital status. Although the study was conducted on nurses alone and does not support generalization to all HCWs, it specifically raised serious questions about nurses (45).

DISCUSSION

This review was performed to draw attention to the psycho-social effects of the COVID-19 pandemic, which affects the whole world and has radically affected many disciplines and departments, especially health. The dimensions of mental health problems among HCWs is enormous including burnout, anxiety, depression, stress-related disorders etc. In addition, these problems are mediated by various biological, psycho-pathological and socio-environmental factors. Lack of effective communication, lack of acceptable support from higher authorities, false information, lack of personal protective equipment, stigmatization, and work-related stress are some of the main factors that fuel these psychological symptoms. Among these topics when the current psycho-social status of HCWs is examined in our study, we concluded that the simultaneous provision of personal protective equipment is very important. We know that procurement of equipment causes positive results for stress management of HCWs during the pandemic⁴⁰. In most studies, the emergence of significant differences between female HCWs and psychological distress symptoms led to the conclusion that women - especially women with children - need to have their working hours optimized (7, 23, 30, 44, 45). We know that as quality sleep reduces, stress in social and business life increases, but unfortunately we learned that HCWs experience serious psychological consequences due to the lack of optimization in work (46).

Considering that access to correct information and transparency reduce fear and anxiety, we recommend that the team responsible for pandemic management act accordingly (17). The prolongation of the pandemic and the lack of vaccines increase the burden on HCWs every day. In this context, it is important to encourage HCWs to strengthen their emotional state. Giving psychological training to HCWs in coordination with clinical treatment methods will be a good step to updating traditional treatment. It is inevitable that studies be conducted on this subject similar to the "PsicoCOVID-19" protocol in Italy or with different themes (29, 47). We know that social stigmatization and inappropriate behaviors toward infected patients and HCWs also negatively affect HCW psychology.

We also recommend that healthcare units find a solution to this issue by taking patient privacy into account (48, 49). Continuous checks of the psychosocial status of HCWs, as well as infected patients, is extremely important for a healthier rotation of the health service. This should be one of the primary goals of health administrations, otherwise the health system and order will pay for the outcomes very heavily. While the high number of studies conducted in China about this subject satisfies academics in terms of compilation, the failure of the Chinese government to give full confidence to the public and academic community about the data will have a negative psychological effect on HCWs and the public (17). The shortage of studies in Brazil and other Latin American countries about our subject is a striking issue that needs to be resolved. The fact that there is a lack of studies about the psychological condition of HCWs on the basis of countries during the pandemic indicates that the academic world should focus on this issue. Although the countries in our study are generally developed countries, it should be kept in mind that there may be many erroneous parameters responsible for the fact that these countries had the

highest number of cases-deaths and present an unsuccessful picture in combating the pandemic, as well as for emotional behaviors such as burnout and hopelessness due to psycho-social symptoms in HCWs.

Limitations

This study has some limitations. We were only able to reflect the situation in countries where articles were published investigating the psychological impact of the COVID-19 pandemic on health workers. The other limitation is that we only included the countries with most cases in the study.

CONCLUSION

When the pre-existing studies conducted by others are carefully examined, we observed that serious consequences emerged. The COVID-19 pandemic has caused problems in some areas of our lives, especially health units are most negatively affected, and these problems have serious psychological effects specifically on HCWs. HCWs are the backbone of health departments, and we concluded their physical and psychological status should not be ignored. It is striking that the number of infections and deaths among HCWs is high, especially in countries where the number of cases is high and bureaucracy exhibits a reckless attitude. Considering the continuation of the pandemic and the possible outbreaks around the world in future years, it is of great importance to establish protocols, units and funding that will be offered to HCWs in all countries. The significant observation of at least one psychological problem, such as anxiety, depression, PTSD, insomnia, and burnout, among HCWs in all the publications we examined illustrates the striking chronic injury due to pandemic management. Just as WHO and countries care about the health of infected people, they should not ignore the HCWs who provide them with care. Both the psychological and physical needs and problems of HCWs should be taken into consideration immediately. Improving the psychological status of HCWs globally will be an important factor in combating the pandemic and necessary steps should be taken in this direction.

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