Volume 05, Issue 06 (November-December 2022), PP 67-86 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

The psychological health of health care workers (HCWs) responding to the Covid-19 pandemic across the Middle East and Europe: A literature review

Mohammed Hamoud O. ALHarbi [1], Bander Hamoud A. ALHarbi[2], Naifaha Ammash O. ALHarbi[3], Abdulaziz Bander H. ALMutairi[3], Awadh Aedh D. ALMutairi[4], Salman Mohammad Y. ALHarbi[5], Nahed Mansour A. ALMutairi[5], Shabib Saad S. ALSahla[6], Majed Abdulrahman F. ALSowaigi[3] & Shajaa Khalf F. ALMohlsy[3]

[1] *Infection control department, King Khalid hospital, ALMajmaah, Riyadh, Saudi Arabia*
[2]*Medical record department, King Khalid hospital, ALMajmaah, Riyadh, Saudi Arabia*
[3]*Nursing department, King Khalid hospital, ALMajmaah, Riyadh, Saudi Arabia*
[4]*Laboratory department, AlMajmaah university, ALMajmaah, Riyadh, Saudi Arabia*
[5]*Nursing department, AlMajmaah university, ALMajmaah, Riyadh, Saudi Arabia*
[6]*Public health department, King Khalid hospital, ALMajmaah, Riyadh, Saudi Arabia*

Abstract
The global outbreak of the COVID-19 pandemic has led to an increased risk of psychological distress among health care workers (HCWs). As this global crisis continues with minimal signs of abatement, this study aims to investigate and compare the psychosocial health of health care workers (HCWs) responding to the Covid-19 pandemic in the Middle East and Europe. This study adopted a literature review approach to analyse and compare the psychological health of HCWs in the Middle East and Europe. This study utilised 42 peer-reviewed research articles, examined their findings and then drew comparisons between the Middle East and Europe. The results indicate that anxiety, depression, PTSD, sleep disorder and distress are the most common psychological effects that HCWs experienced. The results clearly demonstrate that the HCWs in the Middle East are more psychologically affected compared to HCWs in Europe. Furthermore, female staff appear to be more vulnerable and more psychologically affected by responding to the Covid-19 epidemic. From an occupational perspective, nursing staff were found to be more psychologically affected compared to doctors and other HCWs.

Keywords Psychology, health workers, covid-19, middle east, Europe

I. Introduction and Background

In December 2019, the outbreak of a novel infectious disease of the coronavirus family was identified in Wuhan, China. In January 2020, human-to-human transmission was confirmed, and the outbreak was categorised as an epidemic (Sharma et al., 2020). The virus soon spread through other cities in China, and the World Health Organisation (WHO) declared a world health emergency on 30th January 2020 (Muhammed et al., 2020). The epidemic then became a pandemic as the virus spread to more countries around the world in mid-February. As of 04 March, 2021, the total number of Covid-19 cases worldwide surpassed 115 million, and the total number of deaths was over 2.5 million (John Hopkins University of Medicine, 2021).

The presentation of Covid-19 may vary from asymptomatic to fatal, including symptoms such as respiratory problems, accompanied by shortness of breath, lung infection, etc. (Ruiz-Fernández et al., 2020). Health care workers (HCWs) are the most at risk of exposure because they work on the front line to take care of patients. Health care workers include doctors, nurses and other medical personnel who work in the same environment to treat patients. Studies suggest that health workers who work on the front line to fight Covid-19 experience numerous psychological effects, primarily including emotional exhaustion, sleep disorder, loss of appetite, work-related dread, anxiety, physical exhaustion, head and stomach pain, and doubts regarding their career path (Varani et al., 2021).

Research shows that workers in the health care system can be psychologically affected in several ways due to their profession. The most common types of psychological effects are stress, work pressure, exhaustion, anxiety and sleep disorder. However, they also include adverse effects such as depression, violence, insomnia, loss of appetite and bad temper (Jiménez et al., 2019).

The global coronavirus pandemic has heavily burdened, and in many cases overwhelmed, healthcare systems and healthcare workers (Xie et al., 2020). The World Health Organisation (WHO) has highlighted the extreme pressure on health care systems and workers. It has called for immediate action to address how HCWs can avoid mental problems and how to improve the health system to save more lives (Muller et al., 2020).

Previous infectious pandemics proved that front-line workers, particularly health care workers, are always at higher risk of disease and of other mental issues; in fact, they are considered the most vulnerable group (Xiao et al., 2020). In addition, HCWs report mental problems related to their medical profession both during and after epidemics. Those mental health problems include symptoms of post-traumatic stress, depression and anxiety, sleep disorder, loss of appetite and insomnia (Maunder et al., 2006). Similarly, reports of mental health issues related to health care workers have persistently surfaced during the current Covid-19 pandemic (Q. Liu et al., 2020).

Numerous studies have already investigated the psychological health of healthcare workers during the current Covid-19 pandemic. Pappa et al. (2020) identified t13 studies in a search on 17 April 2020 and then calculated the pooled prevalence rates. They reported that more than one of every five healthcare workers suffered from anxiety and/or depression, and nearly two in five reported insomnia. Vindegaard and Benros's (2020) review identified 20 studies of healthcare workers in a subgroup analysis, and their narrative summary concluded that healthcare workers generally reported more anxiety, depression and sleep problems compared with the general population.

1.1 Aim and objectives

The purpose of this study is to analyse and compare the psychological health of HCWs during COVID-19 in the Middle East and Europe. This study follows the literature review process of existing studies to discuss their results and delineate their findings to compare the outcomes using different parameters.

i. This study aims to answer the following research questions.
ii. How has the Covid-19 pandemic affected the HCWs psychologically?
iii. What types of psychological effects have affected the HCWs the most?
iv. Are the psychological health experiences of HCWs in Europe different from those of HCWs in the Middle East?
v. How do the psychological health issues of HCWs responding to Covid-19 vary across different job types, and with gender and age?

II. Methodology

This study adopts a literature review methodology to review the existing studies related to the psychological effects of Covid-19 on HCWs.

2.1 Literature search strategy

This study examines studies concerning any type of HCW during the Covid-19 pandemic, as well as outcomes relating to their mental and psychological health. Numerous libraries were utilised to search for papers related to this topic, including PubMed, ScienceDirect, Web of Science, Google Scholar and other databases. Numerous key words were used to search for the relevant research articles. The following key words were used to find research papers:

- (2019 novel coronavirus disease) OR (COVID-19 pandemic) OR (SARS-CoV-2 infection) OR (COVID-19 virus disease) OR (2019 novel coronavirus infection)
- (COVID-19 burnout) OR (COVID-19 health care workers) OR (COVID-19 psychological effect HCWs)
- (Anxiety) OR (anxiety disorder) OR (mental health disorder) OR (psychiatric disorder)
- (Depression) OR (depressive symptom) OR (emotional depression)
- (Health personnel) OR (health care provider) OR (health care worker)
- (Mental health) OR (mental disorder) OR (illness)

2.2 Inclusion criteria

Every type of study was included initially if it was related to the psychological health of HCWs responding to the ongoing Covid19 epidemic. Both qualitative and quantitative studies were incorporated. During the selection of studies, there were no restrictions in terms of study methodology, study design, types of health care workers, or whether the study focused on professional burnout, methodology, quality or language. However, studies were excluded if they met any of the following criteria:

i The studies were focused exclusively on the psychological health of HCWs across the Middle East and Europe. Studies focusing on countries other than the Middle East and Europe were excluded.
ii Letter to editor publications not providing original findings.
iii Studies exploring the psychological effects on HCWs due to quarantine.
iv Duplicate publications.

Figure 1 presents a flowchart diagram of study selections.

2.3 Data extraction and quality assessment of selected studies

Data was extracted from various online libraries using variables such as time (year/month), region (country), target population, health care worker type, gender proportion, type of psychosocial effect, sample size, type of professional burnout and participation ratio. Research papers were extracted on the basis of these variables, and in every paper this information was provided. Papers which did not have the above information were eliminated from the sample.

The quality of selected articles was confirmed using a checklist of quality assurance criteria:

i. Clearly specified and identified population sample.
ii. Sample size of at least 100 participants.
iii. The outcome and results are clearly explained and identified.
iv. Outcome measures defined clearly, valid, reliable, and implemented consistently across all study participants.

III. Results

3.1 Search results

Using the key words initially yielded 108 research articles. However, not all of the articles were relevant to our study; therefore, after filtering the research papers, removing duplicate studies, removing studies which were not related to the Middle East or Europe and applying other filters (discussed in the methodology section), 42 studies were available for analysis. The flow chart in Fig. 1 elucidates the identification, screening and selection of studies employed for this research.

It is important to note the inherent time restriction caused by the duration of the outbreak (post January 2020) and hence the period available for the execution, peer review and publication of studies in the time elapsed.

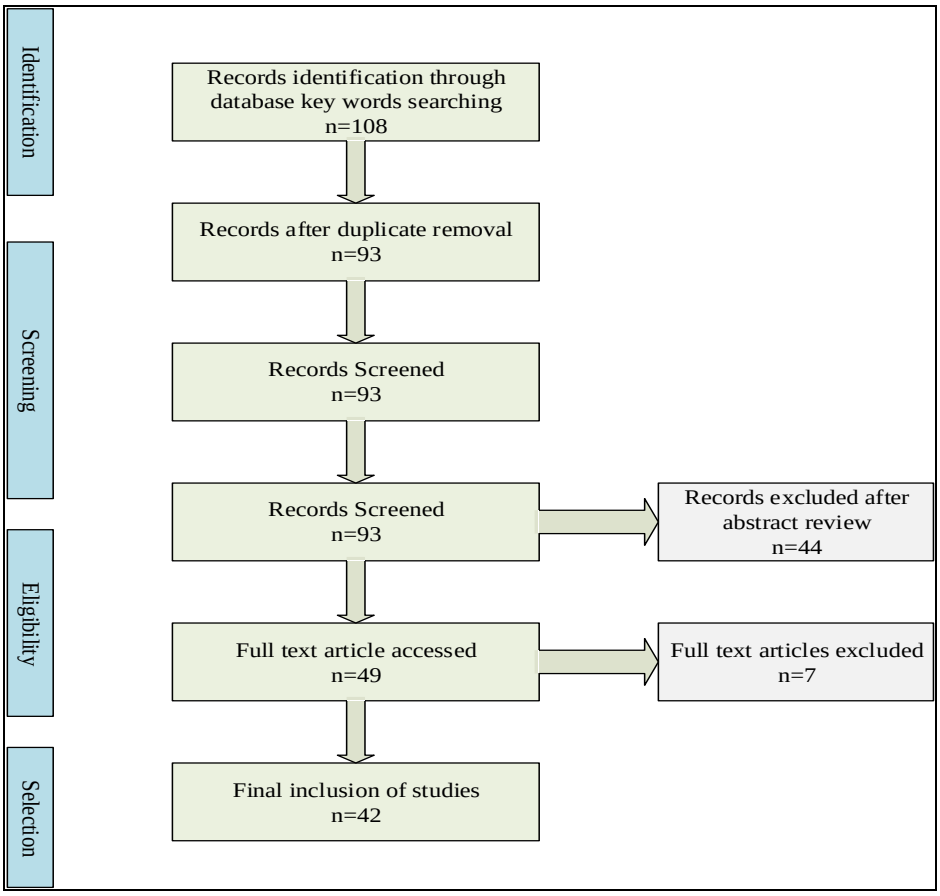

Fig 1. Flowchart diagram for research article identification, screening and selection.

3.2 Characteristics of selected sample

In total, this study utilised 42 research articles related to the psychosocial health of HCWs responding to the Covid-19 epidemic across the Middle East and Europe (Table 1.). The 42 studies included a total of 48,616 participants. All the studies included in this research are listed in Table The articles involve seven Middle Eastern countries, namely, Saudi Arabia, Egypt, Libya, Jordan, UAE, Bahrain and Israel in the Middle East. The European articles encompass 10 countries, namely, France, Italy, Portugal, Germany, Spain, UK, Ireland, Belgium and Norway. The respondents in the studies include doctors, nurses and other medical staff. In the majority of the studies, more than 50% of respondents were female staff. The major psychological effects noted across these studies are anxiety, depression, PTSD, distress and sleep disorder.

S. N	Country & date (Month of 2020)	No of participants	HCW type	Gender (Female %)	Type of psychological effect						Reference
					Anxiety	Depression	PTSD	Sleep disorder	Distress	Other	
1	Egypt and Saudi Arabia (April)	426	Doctors, Nurses	49.8%	58.9%	69%	-	-	55.9%	-	(Arafa, Mohammed , et al., 2021)
2	Saudi Arabia (March)	502	Doctors, Nurses, Others	31.9%	51.4%	55.2%	-	57.9%	-	-	(AlAteeq et al., 2020)
3	France (April/May)	1,058	Doctors, Nurses, Others	71%	50.4%	30.4%	-	-	-	-	(Azoulay et al., 2020)
4	Libya	745	Doctors, Nurses, Others	51.9%	46.7%	56.3%	-	-	-	-	(Elhadi et al., 2020)
5	Italy (March/April)	145	Doctors, Nurses,	72%	71%	31%	26.2%	-	-	-	(Di Tella et al., 2020)
6	Egypt (April/May)	502	Doctors, Nurses,	50%	76.4%	77.2%	-	67.7%	80.8%	-	(Elkholy et al., 2020)
7	Bahrain (April)	257	Doctors, Nurses, Others	70%	-	-	-	75.2%	84%	-	(Jahrami et al., 2021)
8	Portugal (April)	29	Doctors	62%	-	28%	-	-	-	-	(Sanghavi et al., 2020)
9	Germany (March	2,224	Doctors, Nurses, Others	76%	9.5%	-	-	-	-	-	(Skoda et al., 2020)
10	UK	207	Doctors	81.1%	24.6%	15.9%	-	-	-	-	(Shah et al., 2020)

S. N	Country & date (Month of 2020)	No of participants	HCW type	Gender (Female %)	Type of psychological effect						Reference
					Anxiety	Depression	PTSD	Sleep disorder	Distress	Other	
11	Spain (May – Sep)	9,138	Doctors, Nurses, Others	N/A	22.5%	28.1%	22.2%	-	-	24%	(Alonso et al., 2021)
12	Italy	653	Doctors Nurses, Others	N/A	-	-	39.8%	-	-	-	(Bassi et al., 2021)
13	Italy	167	Doctors, Nurses, Others	79.6%	3.15%	5.06%	-	-	6.50%	-	(Simione & Gnagnarella, 2020)
14	Ireland	472	Doctors Nurses, Others	N/A	-	45.1%	41.3%	-	-	-	(Ali et al., 2020)
15	Argentina	234	Doctors Nurses, Others	70.9%	-	-	-	-	-	12%	(Ibar et al., 2021)
16	Spain	346	Doctors Nurses, Others	N/A	67.55%	55.89%	-	-	-	-	(Odriozola-González et al., 2020)
17	Belgium	1,135	Nurses	N/A	-	-	-	-	-	68%	(Bruyneel et al., 2021)
18	Saudi Arabia (April – May)	122	Doctors, Nurses, Others	64.5%	35.6%	27.9%	-	-	-	-	(Surrati et al., 2020)
19	Italy (April – May)	2,195	Doctors, Nurses, Others	75%	50.1%	26.6%	53.8%	-	-	-	(Lasalvia et al., 2020)
20	Middle East (May – June)	6,142	Doctors, Nurses, Others	67.3%	-	-	-	-	40%	62%	(Al Dhaheri et al., 2021)

S. N	Country & date (Month of 2020)	No of participants	HCW type	Gender (Female %)	Type of psychological effect						Reference
					Anxiety	Depression	PTSD	Sleep disorder	Distress	Other	
21	Cyprus (May)	425	Doctors, Nurses, Others	58%	-	18.6%	14.6%	-	-	-	(Chatzittofis et al., 2021)
22	Saudi Arabia (April – May)	176	Nurses	76.1%	24.8%	17.5%	-	-	-	-	(Pasay-an, 2020)
23	Switzerland (April)	1,409	Doctors, Nurses, Others	66.1%	25.9%	20.6%	-	-	-	-	(Weilenmann et al., 2021)
24	Italy (March)	1,379	Doctors, Nurses, Others	63.4%	19.8%	24.73%	49.3%	8.27%	21.9%	-	(Rossi et al., 2020)
25	Turkey (April)	920	Doctors, Nurses, Others	59.2%	-	-	-	-	-	80.8%	(Şahin et al., 2020)
26	Jordan (March)	405	Nurses	71.4%	42.4%	57.8%	44.7%	-	50.1%	-	(Al-Amer et al., 2021)
27	Jordan (March)	4,126	Doctors, Nurses, Others	59%	13.1%	-	-	-	23.8%	-	(Naser et al., 2020)
28	Egypt (April)	374	Nurses	67.4%	-	-	-	-	52.1%	-	(Hendy et al., 2021)
29	Spain (March April)	781	Doctors, Nurses, Others	N/A	34%	68%	-	-	-	-	(García-Fernández et al., 2020)
30	Poland	123	Doctors, Nurses, Others	78.3%	45%	29.2%	-	-	-	-	(Szepietowski et al., 2020)

S. N	Country & date (Month of 2020)	No of participants	HCW type	Gender (Female %)	Type of psychological effect						Reference
					Anxiety	Depression	PTSD	Sleep disorder	Distress	Other	
31	UAE	2,184	Doctors, Nurses, Others	69.9%	63%	66%	-	-	72.1%	-	(Ahmed H & S, 2020)
32	Germany (April)	110	Doctors, Nurses, Others	70%	27%	28%	-	-	33%	-	(Zerbini et al., 2020)
33	Kosovo (April)	592	Doctors, Nurses Others	61.3%	44.6%	38.7%	-	-	-	-	(Gallopeni et al., 2020)
34	Croatia (March/April)	124	Doctors, Nurses Others	N/A	17%	11%	-	-	10%	-	(Salopek-Žiha et al., 2020)
35	Italy (May)	214	Doctors, Nurses Others	N/A	36.4%	30.8%	-	-	58.1%	-	(Gorini et al., 2020)
36	Spain (April)	348	Doctors, Nurses Others	N/A	-	-	-	-	76.1%	-	(Ruiz-Fernández et al., 2020)
37	8 European Countries	609	Doctors, Nurses, Others	75.2%	63%	18%	-	-	59%	-	(Hummel et al., 2021)
38	Portugal (March/April)	767	Nurses	80.7%	9%	53%	-	-	17%	-	(Sampaio et al., 2020)
39	Germany	3,678	Doctors, Nurses, Others	60.2%	17–21%	17–19%	-	-	-	-	(Morawa et al., 2021)

S. N	Country & date (Month of 2020)	No of participants	HCW type	Gender (Female %)	Type of psychological effect						Reference
					Anxiety	Depression	PTSD	Sleep disorder	Distress	Other	
40	Norway	1,773	Doctors, Nurses, Others	84.7 %	54.3 %	43.7 %	71.1 %	-	-	-	(Johnson et al., 2020)
41	Saudi Arabia (February)	582	Doctors, Nurses, Others	75 %	20.8 %	-	-	-	-	-	(Temsah et al., 2020)
42	Israel (April)	828	Doctors, Nurses, Others	67.2 %	32.9 %	19.3 %	-	-	-	-	(Mosheva et al., 2021)

Table 1. The important findings from the 42 studies identified.

3.3 Anxiety

Healthcare clinicians involved in the care of COVID19 patients are prone to developing symptoms related to post-traumatic stress disorder and mental distress. Anxiety, recorded in around 76% of total studies, is the most common psychological effect (*See* fig. 2). The prevalence of anxiety is almost identical across the Middle East and Europe. Anxiety has been recorded in 78.6% of studies conducted in the Middle East and 75% in Europe. The results further indicate that on average in the Middle East, 42.4% of healthcare workers experienced anxiety due to COVID-19. In Europe, around 36.3% of healthcare workers experienced anxiety due to COVID-19 (*See* Fig. 3). The most significant impacts were in Egypt (76.4%) (Elkholy et al., 2020) and Italy (71%) (Di Tella et al., 2020) across March, April and May of 2020. The lowest incidences of anxiety were in Germany (9.5%) (Skoda et al., 2020) and Portugal (9%) (Sampaio et al., 2020) in March and April 2020. Moreover, the incidences were higher in females than in males

In a study by Elkholy et al. (2020), the HCWs' anxiety was attributed to feeling vulnerable, losing control, worrying about viral infection spreading to colleagues and others, and the health and wellbeing of their families, as well as that of the elderly and children. They were also concerned about the uncertainty of employment due to lockdowns, financial woes, lengthy stretches of work in exposed environments, isolation, frequent exposure to Covid-19 deaths, shortages of protective equipment and the anticipation of overwhelming numbers of actual cases and suspected positive cases (Elkholy et al., 2020). Viral transmission rates and modes of transmission were also listed as causes of distress in addition to anxiety (Elkholy et al., 2020). At the time, there was no effective treatment nor any vaccine to provide immunity. This ensured that healthcare workers were constantly concerned about getting infected and testing positive for the virus, especially when working in chest and fever hospitals that were mainly involved in diagnoses as opposed to quarantine hospitals that were more involved in treatments (Elkholy et al., 2020).

In the low incidence case of Italy, the diminished anxiety was attributed to increased risk perception, safe Covid-19-related behaviours and protocols to contain the virus by the hospitals and authorities, as well as strategies for communicating information concerning Covid-19 (Simione & Gnagnarella, 2020).

3.4 Depression

Depression was the second highest psychological effect recorded in almost 73.8% of total studies conducted across the Middle East and Europe. About 64.3% of studies conducted in the Middle East recorded depression among healthcare workers. By comparison, 78.6% of studies conducted in Europe reported depression in healthcare workers. In addition, the results demonstrate that in the Middle East, around 49.6% of healthcare workers are affected by depression while working with COVID-19-related duties. In contrast, 30.3% of health care workers in Europe have experienced depression due to COVID-19-related jobs. The highest incidences of depression were in Egypt and Saudi Arabia (69%) (Arafa, Mohammed, et al., 2021), Spain (68%) (Priede et al., 2021) and the UAE (66%). The lowest incidences of depression were in Italy (5,06%) (Simione & Gnagnarella, 2020) and Croatia (11%) (Salopek-Žiha et al., 2020).

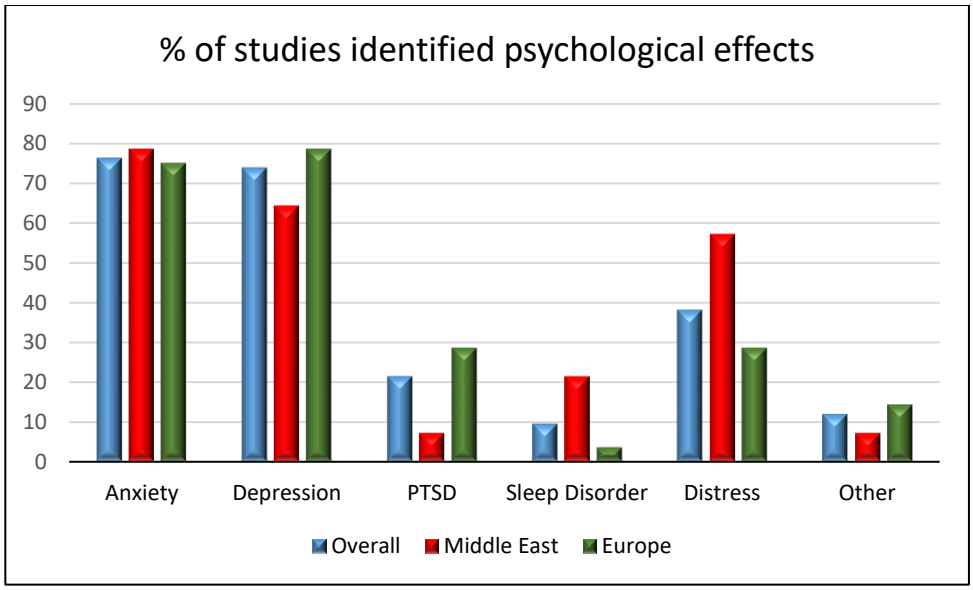

Fig 2. Average number (%) of studies identifying different types of psychological effects.

The high incidence of depression in Egypt is attributable to the constrained health services there compared to countries such as China and Italy. It is also due to a high reliance on mainstream media for Covid-19-related information and relentless media coverage, best described as headline stress syndrome (Arafa, Mohammed, et al., 2021). The high incidence may also be due to the lack of emotional support from society and family (Arafa, Mohamed, et al., 2021). In Spain, the high incidence of depression may be associated with the fact that the country had the highest proportion of healthcare workers infected with the virus (García-Fernández et al., 2020). Moreover, the high incidence in depression mostly affected nurses rather than doctors and other hospital personnel. The low incidence in Italy was attributed to a heightened perception of risk, which reduced the stress levels (Simione & Gnagnarella, 2020). In the eight European studies by Hummel et al. (2021), it was found that the decreased incidence of depression among healthcare workers could be attributed to strategies used for coping. For instance, it could be due to prevention measures and active knowledge and information seeking habits to remain informed of the risks, regular video calls with family, recreation, engaging in behaviours that promote health such as diet, rest and exercise, maintaining positive attitudes, limiting TV bulletin bombardment, distraction behaviours such as staying busy, and suppression, emotional venting (screaming, crying, breaking things), relaxation techniques (meditation, yoga), and usage of drugs and alcohol (Hummel et al., 2021).

3.5 PTSD

Post-traumatic stress disorder (PTSD) is one of the five major psychological effects which has been recorded. In total, around 21.42% of studies have recorded PTSD across the Middle East and Europe. About 7.1% of studies conducted in the Middle East have recorded PTSD among healthcare workers, while 28.56% of studies conducted in Europe have recorded PTSD among healthcare workers. Regarding the average percentage of healthcare workers affected, the results indicate that 44.7% of healthcare workers in the Middle East and 39.8% of healthcare workers in Europe have been affected by PTSD while working in COVID-19-related jobs. The highest incidence of PTSD was recorded in Norway (71%) (Johnson et al., 2020), while the lowest incidence of PTSD was in Cyprus (14.6%) (Chatzittofis et al., 2021). PTSD was commonly unreported in most of the other countries aside from Italy, Spain, Ireland and Jordan. Moreover, three studies reported PTSD in Italy, particularly between March and May 2020.

The study by Johnson et al. (2020) revealed that the high incidence of PTSD among health workers was due to psychiatric conditions that already existed prior to PTSD. Additionally, increased levels of anxiety and depression were predictors and contributors which increased susceptibility to PTSD. Other contributors to high levels of PTSD were concerns about finances and job-related stress, anxiety about one's own health, burnout and negativity (Johnson et al., 2020). The low incidence of PTSD was attributed to the timing of the study by Chatzittofis et al. (2021) in Cyprus, which was conducted well after the pandemic had subsided and after already having reached its summit. It was also believed that the lowered incidence in Cyprus could be due to Covid-19 being the first outbreak of a transmissible disease in the country (Chatzittofis et al., 2021).

3.5 Sleep disorder

Sleep disorder was the least common psychological effect recorded, with only 9.5% of overall studies recording sleep disorder among HCWs. About 21.4% of studies in the Middle East and 3.6% of studies in Europe recorded sleep disorders. The results suggest that in the Middle East, 66.9% of medical healthcare workers had experienced sleep disorder; in Europe, 8.3% had experienced them. Sleep disorders resulting from Covid-19 among healthcare workers was not a common occurrence, with no incidences in most countries except in Egypt, Bahrain and Saudi Arabia. The highest rate was in Bahrain (75.2%), and the lowest was in Saudi Arabia (57.9%) in March, April and May of 2020. By contrast, Italy was the only European country with a rate of 8.27% in March of 2020. Sleep disorders were thus more markedly observed in the Middle East than in Europe.

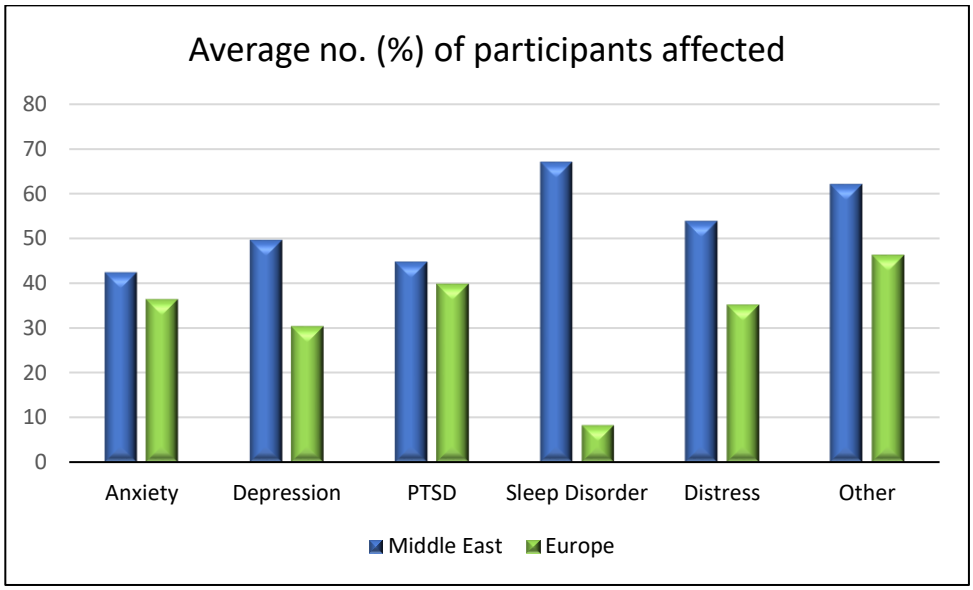

Fig 3. Average number (%) of healthcare workers affected by different types of psychological problems.

The high incidence of sleep disorders in healthcare workers in Bahrain demonstrated that the cause may be related to the high stress of the nursing profession as well as the disproportionate number of women in that field (Jahrami et al., 2021). Moreover, there appeared to be a correlation between sleep disorders and higher exposure to patients who tested positive for Covid-19. High levels of stress, anxiety and depression also may have aggravated the sleep deprivation (Jahrami et al., 2021). In addition, sleep disorders were related to a lack of social support, especially during the 14-day imposition of periods of home self-isolation (Jahrami et al., 2021).

3.6 Distress

Depression was the third most common psychological effect, recorded in almost 39.1% of the studies conducted across the Middle East and Europe. About 57.1% of studies conducted in the Middle East revealed distress among healthcare workers, while 28.6% of studied conducted in Europe recorded distress among healthcare workers. In addition, the results indicate that in the Middle East, around 53.8% of healthcare workers are affected by distress, while 35.1% of health care workers in Europe experienced distress due to COVID-19-related jobs. The highest incidences of distress were recorded in Bahrain (84%) (Jahrami et al., 2021), Spain (76.1%) (Ruiz-Fernández et al., 2020), UAE (72.1%) and Egypt (80.8%) (Elkholy et al., 2020), whereas the lowest incidences were in Italy (6.5%) (Simione & Gnagnarella, 2020). Conversely, most other countries did not record any distress.

The high distress rate in Spain was related to burnout (BO), compassion fatigue (CF) (feelings of dread and fear during patient care) and perceived stress (PS) in direct relation to Covid-19 (Ruiz-Fernández et al., 2020). Key contributors to these conditions of distress may have been perceived and actual infection risk, along with higher demands for intensive care and shortages of personal protective equipment (Ruiz-Fernández et al., 2020).

3.7 Occupational factors and demographic analysis

The results also revealed a difference between the psychological health of men, women, doctors, nurses and other health care workers. The results clearly illustrate that female healthcare workers are psychologically more affected by COVID-19 compared to their male colleagues (Arafa et al., 2021; Azoulay et al., 2020). Regarding different occupations, the results suggest that nurses are the most heavily affected among all healthcare workers, followed by doctors and other healthcare workers (Temsah et al., 2020; Garciá-Fernández et al., 2020).

IV. Discussion

This study involved a literature review analysis of the impact of COVID-19 on the psychological health of healthcare workers across the Middle East and Europe.

The existing literature showed that there is a significant difference between the psychological effects of healthcare workers across the Middle East and Europe. According to the existing literature, the healthcare workers in the Middle East are more psychologically affected than their counterparts in Europe. In this study, we focused on five major psychological effects experienced by HCWs across the world. The results suggest that the healthcare workers in the Middle East suffered more from each psychological effect, including anxiety, distress, depression, PTSD and sleep disorders (Al Dhaheri et al., 2021; Hummel et al., 2021). The reasons for these exacerbated negative effects among HCWs in the Middle East may be social, personal and professional.

According to several studies, most healthcare workers in Middle Eastern countries such as Saudi Arabia, UAE, Bahrain, Qatar and Oman are foreign workers from middle and lower-income countries (L. Liu et al., 2020). Therefore, during the struggle against the pandemic, they felt the most insecure because they were removed from their homes, family members and relatives. They were also worried about their friends and families at home, which made them more vulnerable to psychological effects (Alkhamees et al., 2020). Depression, distress and sleeping disorders were significantly higher among all Middle Eastern health care workers.

Another potential reason why the health care workers in Europe were relatively less affected than their counterparts in Middle East may be because of mental health interventions and programs implemented by several European countries (Zaçe et al., 2021). These mental health interventions in Europe involved mental therapy for health care workers, which included one-on-one interactions, group sessions or online therapy sessions (Ransing et al., 2020). These initiatives were launched by the government to stabilise the mental health of healthcare workers. Studies revealed that these mental health interventions exerted a positive impact on the mental well-being of healthcare

workers in Europe and helped them to cope with the situation in a calm and relatively stress-free manner (Priede et al., 2021).

The literature review analysis also explored the idea that female healthcare workers and nursing staff were more likely to be psychologically affected compared to their male counterparts, doctors and other clinicians. Woman are perceived as more emotional and sensitive, which makes them more vulnerable compared to their male colleagues (Vo, 2020). In addition, nurses are more psychologically affected because they interact with the patients the most during blood samples, injections and medicine administration (Mekonen et al.). The results section demonstrated that nurses are more psychologically affected compared to doctors and other healthcare workers and that they are more likely to suffer from burnout, compassion fatigue and perceived stress.

V. Limitations

This study also has several limitations. The first was the unavailability of sufficient data to make a detailed and thorough comparison. Limited studies were available regarding health systems (whether private or public) or the presence or absence of occupational safety controls and protocols. In addition, not many studies were available concerning the Middle East, and even a country-to-country comparison was difficult to find due to differential conditions for healthcare workers.

References

[1] Al-Amer, R. M., Malak, M. Z., Aburumman, G., Darwish, M., Nassar, M. S., Darwish, M., & Randall, S. (2021). Prevalence and predictors of depression, anxiety, and stress among Jordanian nurses during the coronavirus disease 2019 pandemic. *International journal of mental health, 1*(1), 1-12. https://doi.org/10.1080/00207411.2021.1916701

[2] Al Dhaheri, A. S., Bataineh, M. a. F., Mohamad, M. N., Ajab, A., Al Marzouqi, A., Jarrar, A. H., Habib-Mourad, C., Abu Jamous, D. O., Ali, H. I., Al Sabbah, H., Hasan, H., Stojanovska, L., Hashim, M., Abd Elhameed, O. A., Shaker Obaid, R. R., ElFeky, S., Saleh, S. T., Osaili, T. M., & Cheikh Ismail, L. (2021). Impact of COVID-19 on mental health and quality of life: Is there any effect? A cross-sectional study of the MENA region. *PLoS One, 16*(3), 1-17. https://doi.org/10.1371/journal.pone.0249107

[3] AlAteeq, D. A., Aljhani, S., Althiyabi, I., & Majzoub, S. (2020). Mental health among healthcare providers during coronavirus disease (COVID-19) outbreak in Saudi Arabia. *J Infect Public Health, 13*(10), 1432-1437. https://doi.org/10.1016/j.jiph.2020.08.013

[4] Ali, S., Maguire, S., Marks, E., Doyle, M., & Sheehy, C. (2020). Psychological impact of the COVID-19 pandemic on healthcare workers at acute hospital settings in the South-East of Ireland: an observational cohort multicentre study. *BMJ Open, 10*(12), 1-6. https://doi.org/10.1136/bmjopen-2020-042930

[5] Alkhamees, A. A., Alrashed, S. A., Alzunaydi, A. A., Almohimeed, A. S., & Aljohani, M. S. (2020). The psychological impact of COVID-19 pandemic on the general population of Saudi Arabia. *Compr Psychiatry, 102*(1), 1-9. https://doi.org/10.1016/j.comppsych.2020.152192

[6] Alonso, J., Vilagut, G., Mortier, P., Ferrer, M., Alayo, I., Aragón-Peña, A., Aragonès, E., Campos, M., Cura-González, I. D., & Emparanza, J. I. (2021). Mental health impact of the first wave of COVID-19 pandemic on Spanish healthcare workers: A large cross-sectional survey. *Revista de psiquiatria y salud mental, 14*(2), 90-105.

[7] Arafa, A., Mohamed, A., Saleh, L., & Senosy, S. (2021). Psychological impacts of the COVID-19 pandemic on the public in Egypt. *Community mental health journal, 57*(1), 64-69. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7429137/pdf/10597_2020_Article_701.pdf

[8] Arafa, A., Mohammed, Z., Mahmoud, O., Elshazley, M., & Ewis, A. (2021). Depressed, anxious, and stressed: What have healthcare workers on the frontlines in Egypt and Saudi Arabia experienced during the COVID-19 pandemic? *J Affect Disord*, *278*(1), 365-371. https://doi.org/10.1016/j.jad.2020.09.080

[9] Azoulay, E., Cariou, A., Bruneel, F., Demoule, A., Kouatchet, A., Reuter, D., Souppart, V., Combes, A., Klouche, K., & Argaud, L. (2020). Symptoms of anxiety, depression, and peritraumatic dissociation in critical care clinicians managing patients with COVID-19. A cross-sectional study. *American journal of respiratory and critical care medicine*, *202*(10), 1388-1398.

[10] Bassi, M., Negri, L., Delle Fave, A., & Accardi, R. (2021). The relationship between post-traumatic stress and positive mental health symptoms among health workers during COVID-19 pandemic in Lombardy, Italy. *Journal of affective disorders*, *280*(1), 1-6.

[11] Bruyneel, A., Smith, P., Tack, J., & Pirson, M. (2021). Prevalence of burnout risk and factors associated with burnout risk among ICU nurses during the COVID-19 outbreak in French speaking Belgium. *Intensive Crit Care Nurs*, *1*(1), 1-7. https://doi.org/10.1016/j.iccn.2021.103059

[12] Chatzittofis, A., Karanikola, M., Michailidou, K., & Constantinidou, A. (2021). Impact of the COVID-19 Pandemic on the Mental Health of Healthcare Workers. *International Journal of Environmental Research and Public Health*, *18*(4), 1435-1442. https://res.mdpi.com/d_attachment/ijerph/ijerph-18-01435/article_deploy/ijerph-18-01435-v2.pdf

[13] Di Tella, M., Romeo, A., Benfante, A., & Castelli, L. (2020). Mental health of healthcare workers during the COVID-19 pandemic in Italy. *Journal of evaluation in clinical practice*, *26*(6), 1583-1587. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jep.13444?download=true

[14] Elhadi, M., Msherghi, A., Elgzairi, M., Alhashimi, A., Bouhuwaish, A., Biala, M., Abuelmeda, S., Khel, S., Khaled, A., & Alsoufi, A. (2020). Psychological status of healthcare workers during the civil war and COVID-19 pandemic: A cross-sectional study. *Journal of psychosomatic research*, *137*(1), 110221-110226. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7428743/pdf/main.pdf

[15] Elkholy, H., Tawfik, F., Ibrahim, I., Salah El-Din, W., Sabry, M., Mohammed, S., Hamza, M., Alaa, M., Fawzy, A. Z., & Ashmawy, R. (2020). Mental health of frontline healthcare workers exposed to COVID-19 in Egypt: A call for action. *Int J Soc Psychiatry*, *2020*(1), 1-10.

[16] Gallopeni, F., Bajraktari, I., Selmani, E., Tahirbegolli, I., Sahiti, G., Muastafa, A., Bojaj, G., Muharremi, V., & Tahirbegolli, B. (2020). Anxiety and depressive symptoms among healthcare professionals during the Covid-19 pandemic in Kosovo: A cross sectional study. *Journal of psychosomatic research*, *137*(1), 110212-110213. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7403847/pdf/main.pdf

[17] García-Fernández, L., Romero-Ferreiro, V., López-Roldán, P. D., Padilla, S., Calero-Sierra, I., Monzó-García, M., Pérez-Martín, J., & Rodriguez-Jimenez, R. (2020). Mental health impact of COVID-19 pandemic on Spanish healthcare workers. *Psychological medicine*(1), 1-3.

[18] Gorini, A., Fiabane, E., Sommaruga, M., Barbieri, S., Sottotetti, F., La Rovere, M. T., Tremoli, E., & Gabanelli, P. (2020). Mental health and risk perception among Italian healthcare workers during the second month of the Covid-19 pandemic. *Archives of Psychiatric Nursing*, *34*(6), 537-544.

[19] Hendy, A., Abozeid, A., Sallam, G., Abboud Abdel Fattah, H., & Ahmed Abdelkader Reshia, F. (2021). Predictive factors affecting stress among nurses providing care at COVID-19 isolation hospitals at Egypt. *Nursing open*, *8*(1), 498-505.

[20] Hummel, S., Oetjen, N., Du, J., Posenato, E., de Almeida, R. M. R., Losada, R., Ribeiro, O., Frisardi, V., Hopper, L., & Rashid, A. (2021). Mental health among medical professionals during the COVID-19

pandemic in eight european countries: Cross-sectional survey study. *Journal of medical Internet research, 23*(1), 24983-24993.

[21] Ibar, C., Fortuna, F., Gonzalez, D., Jamardo, J., Jacobsen, D., Pugliese, L., Giraudo, L., Ceres, V., Mendoza, C., Repetto, E. M., Reboredo, G., Iglesias, S., Azzara, S., Berg, G., Zopatti, D., & Fabre, B. (2021). Evaluation of stress, burnout and hair cortisol levels in health workers at a University Hospital during COVID-19 pandemic. *Psychoneuroendocrinology, 128*(1), 105213-105219. https://doi.org/10.1016/j.psyneuen.2021.105213

[22] Jahrami, H., BaHammam, A. S., Bragazzi, N. L., Saif, Z., Faris, M., & Vitiello, M. V. (2021). Sleep problems during the COVID-19 pandemic by population: a systematic review and meta-analysis. *Journal of Clinical Sleep Medicine, 17*(2), 299-313.

[23] Jiménez, R., Bachelet, V., Gomolán, P., Lefio, L., & Goyenechea, M. (2019). Violence and burnout in health care emergency workers in Santiago, Chile: A survey-based cross-sectional study. *International Emergency Nursing, 47*(1), 100792-100799.

[24] Johnson, S. U., Ebrahimi, O. V., & Hoffart, A. (2020). PTSD symptoms among health workers and public service providers during the COVID-19 outbreak. *PLoS One, 15*(10), 241032-241044. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7577493/pdf/pone.0241032.pdf

[25] Lasalvia, A., Bonetto, C., Porru, S., Carta, A., Tardivo, S., Bovo, C., Ruggeri, M., & Amaddeo, F. (2020). The psychological impact of the COVID-19 pandemic on health care workers in a highly burdened area of north-east Italy. *Epidemiology and psychiatric sciences, 2021*(1), 1-28.

[26] Liu, L., Gjebrea, O., Ali, F. M., & Atun, R. (2020). Determinants of healthcare utilisation by migrant workers in the State of Qatar. *Health Policy, 124*(8), 873-880.

[27] Liu, Q., Luo, D., Haase, J. E., Guo, Q., Wang, X. Q., Liu, S., Xia, L., Liu, Z., Yang, J., & Yang, B. X. (2020). The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. *The Lancet Global Health, 8*(6), 790-798.

[28] Maunder, R., Lancee, W., Balderson, K., Bennett, J., Borgundvaag, B., Evans, S., Fernandes, C., Goldbloom, D., Gupta, M., & Hunter, J. (2006). Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. *Emerging Infectious Diseases, 12*(12), 1924-1932.

[29] Medicine, J. H. U. o. (2021). *Covid Data in Motion*. Retrieved 10 June from https://coronavirus.jhu.edu/

[30] Mekonen, E., Shetie, B., & Muluneh, N. The Psychological Impact of COVID-19 Outbreak on Nurses Working in the Northwest of Amhara Regional State Referral Hospitals, Northwest Ethiopia. *Psychology Research and Behavior Management, 13*(1), 1353-1364.

[31] Morawa, E., Schug, C., Geiser, F., Beschoner, P., Jerg-Bretzke, L., Albus, C., Weidner, K., Hiebel, N., Borho, A., & Erim, Y. (2021). Psychosocial burden and working conditions during the COVID-19 pandemic in Germany: The VOICE survey among 3678 health care workers in hospitals. *Journal of psychosomatic research, 144*(1), 110415-110424. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7944879/pdf/main.pdf

[32] Mosheva, M., Gross, R., Hertz-Palmor, N., Hasson-Ohayon, I., Kaplan, R., Cleper, R., Kreiss, Y., Gothelf, D., & Pessach, I. M. (2021). The association between witnessing patient death and mental health outcomes in frontline COVID-19 healthcare workers. *Depression and anxiety, 38*(4), 468-479.

[33] Muhammed, E., Ahmed, M., Moutaz, E., Ayiman, A., Ahmad, B., Marwa, B., Seraj, A., Samer, K., Ala, K., Ahmed, A., Amna, E., Fatimah Bin, A., Bushray, A., Sarah, A., Rwanda, G., Ola, E., Tasneem Ben, H.,

Hind, A., Ahmed, Z., Ahmed, E., & Ahmed, A. (2020). Psychological status of healthcare workers during the civil war and COVID-19 pandemic: A cross-sectional study. *Journal of psychosomatic research, 137*(1), 1.

[34] Muller, A. E., Hafstad, E. V., Himmels, J. P. W., Smedslund, G., Flottorp, S., Stensland, S. Ø., Stroobants, S., Van de Velde, S., & Vist, G. E. (2020). The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: A rapid systematic review. *Psychiatry research, 293*(1), 113441-113451. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7462563/pdf/main.pdf

[35] Naser, A. Y., Dahmash, E. Z., Al-Rousan, R., Alwafi, H., Alrawashdeh, H. M., Ghoul, I., Abidine, A., Bokhary, M. A., AL-Hadithi, H. T., & Ali, D. (2020). Mental health status of the general population, healthcare professionals, and university students during 2019 coronavirus disease outbreak in Jordan: A cross-sectional study. *Brain and behavior, 10*(8), 1730-1742. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7361060/pdf/BRB3-10-e01730.pdf

[36] Odriozola-González, P., Planchuelo-Gómez, Á., Irurtia, M., & de Luis-García, R. (2020). Psychological symptoms of the outbreak of the COVID-19 confinement in Spain. *Journal of Health Psychology, 2020*(1), 1-11.

[37] Pappa, S., Ntella, V., & Giannakas, T. (2020). 1-Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *BRAIN BEHAVIOR AND IMMUNITY, 88*, 901-907.

[38] Pasay-an, E. (2020). Exploring the vulnerability of frontline nurses to COVID-19 and its impact on perceived stress. *Journal of Taibah University Medical Sciences, 15*(5), 404-409. https://doi.org/10.1016/j.jtumed.2020.07.003

[39] Priede, A., López-Álvarez, I., Carracedo-Sanchidrián, D., & González-Blanch, C. (2021, 2021/04/01/). Mental health interventions for healthcare workers during the first wave of COVID-19 pandemic in Spain. *Revista de psiquiatria y salud mental, 14*(2), 83-89. https://doi.org/https://doi.org/10.1016/j.rpsm.2021.01.005

[40] Ransing, R., Adiukwu, F., Pereira-Sanchez, V., Ramalho, R., Orsolini, L., Teixeira, A. L. S., Gonzalez-Diaz, J. M., Pinto da Costa, M., Soler-Vidal, J., Bytyçi, D. G., El Hayek, S., Larnaout, A., Shalbafan, M., Syarif, Z., Nofal, M., & Kundadak, G. K. (2020). Mental Health Interventions during the COVID-19 Pandemic: A Conceptual Framework by Early Career Psychiatrists. *Asian J Psychiatr, 51*(1), 102085-102092. https://doi.org/10.1016/j.ajp.2020.102085

[41] Rossi, R., Socci, V., Pacitti, F., Di Lorenzo, G., Di Marco, A., Siracusano, A., & Rossi, A. (2020). Mental Health Outcomes Among Frontline and Second-Line Health Care Workers During the Coronavirus Disease 2019 (COVID-19) Pandemic in Italy. *JAMA Netw Open, 3*(5), 2010185-2010188. https://doi.org/10.1001/jamanetworkopen.2020.10185

[42] Ruiz-Fernández, M. D., Ramos-Pichardo, J. D., Ibáñez-Masero, O., Cabrera-Troya, J., Carmona-Rega, M. I., & Ortega-Galán, Á. M. (2020). Compassion fatigue, burnout, compassion satisfaction and perceived stress in healthcare professionals during the COVID-19 health crisis in Spain. *J Clin Nurs, 29*(22), 4321-4330. https://doi.org/10.1111/jocn.15469

[43] Şahin, M. K., Aker, S., Şahin, G., & Karabekiroğlu, A. (2020). Prevalence of depression, anxiety, distress and insomnia and related factors in healthcare workers during COVID-19 pandemic in Turkey. *Journal of Community Health, 45*(6), 1168-1177.

[44] Salopek-Žiha, D., Hlavati, M., Gvozdanović, Z., Gašić, M., Placento, H., Jakić, H., Klapan, D., & Šimić, H. (2020). Differences in Distress and Coping with the COVID-19 Stressor in Nurses and Physicians. *Psychiatr Danub, 32*(2), 287-293. https://doi.org/10.24869/psyd.2020.287

[45] Sampaio, F., Sequeira, C., & Teixeira, L. (2020). Nurses' Mental Health During the Covid-19 Outbreak: A Cross-Sectional Study. *J Occup Environ Med*, *62*(10), 783-787. https://doi.org/10.1097/JOM.0000000000001987

[46] Sanghavi, P. B., Au Yeung, K., Sosa, C. E., Veesenmeyer, A. F., Limon, J. A., & Vijayan, V. (2020). Effect of the Coronavirus Disease 2019 (COVID-19) Pandemic on Pediatric Resident Well-Being. *Journal of medical education and curricular development*, *7*(1), 1-5. https://doi.org/10.1177/2382120520947062

[47] Shah, N., Raheem, A., Sideris, M., Velauthar, L., & Saeed, F. (2020). Mental health amongst obstetrics and gynaecology doctors during the COVID-19 pandemic: Results of a UK-wide study. *Eur J Obstet Gynecol Reprod Biol*, *253*(1), 90-94. https://doi.org/10.1016/j.ejogrb.2020.07.060

[48] Sharma, S., Zhang, M., Anshika, Gao, J., Zhang, H., & Kota, S. H. (2020). Effect of restricted emissions during COVID-19 on air quality in India. *Sci Total Environ*, *728*(1), 138878-138885. https://doi.org/10.1016/j.scitotenv.2020.138878

[49] Simione, L., & Gnagnarella, C. (2020). Differences Between Health Workers and General Population in Risk Perception, Behaviors, and Psychological Distress Related to COVID-19 Spread in Italy. *Frontiers in psychology*, *11*(1), 2166-2181. https://doi.org/10.3389/fpsyg.2020.02166

[50] Skoda, E.-M., Teufel, M., Stang, A., Jöckel, K.-H., Junne, F., Weismüller, B., Hetkamp, M., Musche, V., Kohler, H., Dörrie, N., Schweda, A., & Bäuerle, A. (2020). Psychological burden of healthcare professionals in Germany during the acute phase of the COVID-19 pandemic: differences and similarities in the international context. *J Public Health (Oxf)*, *42*(4), 688-695. https://doi.org/10.1093/pubmed/fdaa124

[51] Surrati, A. M. Q., Mansuri, F. M. A., & Alihabi, A. A. A. (2020). Psychological impact of the COVID-19 pandemic on health care workers. *Journal of Taibah University Medical Sciences*, *15*(6), 536-543.

[52] Szepietowski, J. C., Krajewski, P., Biłynicki-Birula, R., Poznański, P., Krajewska, M., Rymaszewska, J., & Matusiak, Ł. (2020). Mental health status of health care workers during the COVID-19 outbreak in Poland: One region, two different settings. *Dermatol Ther*, *33*(6), 13855-13860. https://doi.org/10.1111/dth.13855

[53] Temsah, M.-H., Al-Sohime, F., Alamro, N., Al-Eyadhy, A., Al-Hasan, K., Jamal, A., Al-Maglouth, I., Aljamaan, F., Al Amri, M., Barry, M., Al-Subaie, S., & Somily, A. M. (2020). The psychological impact of COVID-19 pandemic on health care workers in a MERS-CoV endemic country. *J Infect Public Health*, *13*(6), 877-882. https://doi.org/10.1016/j.jiph.2020.05.021

[54] Varani, S., Ostan, R., Franchini, L., Ercolani, G., Pannuti, R., Biasco, G., & Bruera, E. (2021). Caring Advanced Cancer Patients at Home During COVID-19 Outbreak: Burnout and Psychological Morbidity Among Palliative Care Professionals in Italy. *J Pain Symptom Manage*, *61*(2), 4-12. https://doi.org/10.1016/j.jpainsymman.2020.11.026

[55] Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, behavior, and immunity*, *89*, 531-542.

[56] Vo, T. (2020). A Practical Guide for Frontline Workers During COVID-19: Kolcaba's Comfort Theory. *Journal of patient experience*, *7*(5), 635-639. https://doi.org/10.1177/2374373520968392

[57] Weilenmann, S., Ernst, J., Petry, H., Pfaltz, M. C., Sazpinar, O., Gehrke, S., Paolercio, F., von Känel, R., & Spiller, T. R. (2021). Health Care Workers' Mental Health During the First Weeks of the SARS-CoV-2 Pandemic in Switzerland-A Cross-Sectional Study. *Front Psychiatry*, *12*(1), 594340-594348. https://doi.org/10.3389/fpsyt.2021.594340

[58] Xiao, J., Fang, M., Chen, Q., & He, B. (2020). SARS, MERS and COVID-19 among healthcare workers: A narrative review. *J Infect Public Health, 13*(6), 843-848. https://doi.org/10.1016/j.jiph.2020.05.019

[59] Xie, J., Tong, Z., Guan, X., Du, B., Qiu, H., & Slutsky, A. S. (2020). Critical care crisis and some recommendations during the COVID-19 epidemic in China. *Intensive Care Med, 46*(5), 837-840. https://doi.org/10.1007/s00134-020-05979-7

[60] Zaçe, D., Hoxhaj, I., Orfino, A., Viteritti, A. M., Janiri, L., & Di Pietro, M. L. (2021). Interventions to address mental health issues in healthcare workers during infectious disease outbreaks: A systematic review. *J Psychiatr Res, 136*(1), 319-333. https://doi.org/10.1016/j.jpsychires.2021.02.019

[61] Zerbini, G., Ebigbo, A., Reicherts, P., Kunz, M., & Messman, H. (2020). Psychosocial burden of healthcare professionals in times of COVID-19 - a survey conducted at the University Hospital Augsburg. *Ger Med Sci, 18*(1), 5-5. https://doi.org/10.3205/000281