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Letter to the editor. Healthcare workers on the edge of sanity due to COVID-19: Rapid review of the results of systematic reviews and *meta*-analyses



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Dear Editor,

We read with great interest the article published in your distinguished journal by Korkmaz et al. [1] “The anxiety levels, quality of sleep and life and problem-solving skills in healthcare workers employed in COVID-19 services”, where the authors evaluated anxiety levels experienced by healthcare workers employed in COVID-19 services, the effects of anxiety on sleep quality and quality of life and the level of relationship between these variables and the problem-solving skills of the healthcare workers. Although the authors found statistically significant findings regarding the prevalence of anxiety, sleep disruption, decreased quality of life, alteration in problem-solving skills, and the relationship between some socio-demographic aspects, these are mainly associated with workers who were in charge of more than one clinical department during the pandemic [1]. When contrasting these findings with high-quality literature (Table 1), it is evident that substantial changes can be observed regarding these results, not only among health workers but compared to the general population. Even, a positive correlation between risk factors for psychological morbidity, which in this study had no association (for example, living with family) with the finding.

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For this analysis, a non-systematic search of the literature was performed in PubMed, using the keywords “Mental Health”, “Healthcare Workers”, and “COVID-19”. The only criterion for inclusion was that the articles should consist of systematic reviews and *meta*-analysis; 7 articles were finally included.

When examining the results of the stated evidence, it was found that all studies converge in that health care workers have the highest prevalence of anxiety, depression, sleep disorders, distress, burnout, and post-traumatic stress syndrome, in comparison with other workgroups, except for the findings reported by Luo et al [4], where interestingly, patients and the general population exceeded the prevalence of anxiety (56% / 32% vs 26%, respectively) and depression (55% / 27% vs 25% respectively) compared to health workers [4].

The prevalence of anxiety in the evaluated groups was found to be up to 29% [7], Depression up to 50.7% [6], Insomnia up to 37.9% [7], and Post-traumatic stress syndrome up to 73.4% [6], in critical times of epidemic/pandemic; highlighting that the prevalence of post-traumatic stress syndrome has been higher in the pandemic due to COVID-19 [6]. In particular, this symptomatology was higher in doctors than in other health workers [2].

A direct relationship between mental disorders and the activation of pro-inflammatory immune pathways at the systemic level exists [8], which is strongly exacerbated during the acute phase

Table 1
Summary of objectives, methodologies, results, and conclusions of the studies included.

Author and year	Objective	Methodology	Results	Conclusions
da Silva & Neto (2020) [2]	To investigate the psychiatric impacts on health professionals in the face of the physical and psychological conditions to which they are subjected due to the high demands of the COVID-19 pandemic	An online search in the databases Pubmed, Embase, Web of Science and Scopus was carried out, consisting of articles published from December 2019 to April 2020, eight articles were finally included. The inclusion criteria were: original studies on psychiatric repercussions and measurement of behavioral actions in health workers struggling against the COVID-19.	A total of 24,523 subjects was enrolled. A correlation was found between COVID-19 and the development of mental disorders in health professionals. The linear relation was 0.72 (95% CI [0.66–0.78]) with a p-value < 0.01. In a logarithmic scale, there was a proportion higher than 70% for the selected cases. Health professionals that work to fight COVID-19 are being more severely affected by psychiatric disorders, sleep disorders, stress, and indirect traumatization, than other occupational groups.	There is a strong association between health professionals and COVID-19 in terms of psychiatric repercussions. The meta-analysis showed that health professionals have a higher level of indirect traumatization, in which the level of damage exceeds psychological and emotional tolerance, and indirectly results in psychological abnormalities
da Silva & Neto (2020) [3]	To analyze the main psychological effects caused by COVID-19 pandemic in health professionals	An online search in the databases MEDLINE, BMJ, PsycINFO, Y LILACS was carried out, through the strategy Population (P), Variables (V) and Outcomes (O), of articles published since December 2019. Seven articles were finally included. The main analyzed variables were anxiety, depression, insomnia, distress, and fear	A total of 7162 subjects was enrolled. During the outbreak period, the levels of depression and anxiety shown by surgical teams were significantly higher compared to surgical teams during the non-outbreak period (OR = 1.8491; 95% CI 0.5117 to 6.6813; p = 0.3483 and OR = 7.8750; 95% CI 2.9432 to 21.0710; p < 0.000). In general, health professionals had a higher level of anxiety (13.0 vs. 8.5%, p < 0.01, OR = 1.6152; 95% CI 1.3283 to 1.9641; p < 0.0001) and depression 12.2 vs. 9.5%; p = 0.04; OR = 1.3246; 95% CI 1.0930 to 1.6053; p = 0.0042), besides somatizations and insomnia compared to professionals from other áreas.	During the COVID-19 pandemic, health professionals, regardless of their age, showed significant levels of mental disorders, which were higher compared to other periods. It was observed that the prevalence of anxiety, depression, and insomnia were risk factors common among the evaluated studies
Luo et al. (2020) [4]	To assess the updated psychological and mental impact of the COVID-19 pandemic among healthcare workers, the general public and patients with pre-existing conditions or COVID-19	An online search was carried out using the databases Embase, PubMed, Google Scholar, also the daily update of data on COVID by WHO was used, from articles published since November 2019 to May 2020, 62 articles were finally included. The main variables analyzed were depression, anxiety and risk of psychological impact.	The overall prevalence of anxiety was 33% (28%–38%) with substantial heterogeneity ($I^2 = 99.7%$, $P < 0.001$). The prevalence of anxiety was higher among patients (56% [39%–73%]) compared to healthcare workers (26% [18%–34%]) and the general public (32% [25%–39%]). The overall prevalence of depression was 28% (23%–32%) with substantial heterogeneity ($I^2 = 99.6%$, $P < 0.001$). The prevalence of depression was higher among patients (55% [48%–62%]) compared to healthcare workers (25% [17%–33%]) and the general public (27% [22%–33%]).	The COVID-19 pandemic has caused heavy psychological impact among medical workers and the general public. Psychological interventions identifying and targeting people with heavy psychological burdens are in urgent need
Pappa et al (2020) [5]	To examine the emerging evidence of the effects of the COVID-19 outbreak on the mental health of healthcare workers and particularly in relation to the prevalence of anxiety, depression and insomnia	An online search was carried out in the MEDLINE, PubMed and Google Scholar databases, of articles published up to April 2020, where 13 articles were finally included. The prevalence of depression, anxiety and insomnia in health workers during the COVID-19 pandemic was explored.	A total of 33,062 subjects was enrolled (13 studies). Anxiety was estimated in 12 out of 13 studies, The pooled prevalence was 23.21% (95% CI 17.77–29.13, $I^2 = 99%$); Depression was assessed in 10 out of 13 studies, with a calculated pooled prevalence of 22.8% (95% CI 15.1–31.51, $I^2 = 99.62%$); Insomnia prevalence was estimated in five out of the 13 studies, the pooled prevalence was calculated as 34.32% (95% CI 27.45–41.54, $I^2 = 98%$)	The systematic review and meta-analysis provide a timely and comprehensive synthesis of the existing evidence highlighting the high prevalence rates of depression, anxiety and insomnia of healthcare professional
Preti et al (2020) [6]	To provide evidence on maladaptive psychological outcomes in healthcare workers facing epidemic/pandemic situations and to identify potential risk and protective factors for such maladaptive consequences	An online search was carried out in the PubMed, PsycINFO, and Web of Science databases, for articles published up to March 2020, where 44 articles were finally included. The prevalence of psychopathological symptoms (distress, anxiety, post-traumatic	During outbreaks, the prevalence of post-traumatic Stress Symptoms was comprised between 11 and 73.4%. Moreover, 51.5% of healthcare workers scored above the Impact of Event Scale-Revised (IESR) threshold for a post-traumatic Stress Symptoms	The study confirms that healthcare workers responding to epidemic/pandemic outbreaks show a number of negative mental health and psychological consequences. Such sequelae are particularly alarming when considering their long-lasting nature and their

Table 1 (continued)

Author and year	Objective	Methodology	Results	Conclusions
		stress syndrome, burnout, among others) was explored. Among the included studies, 27 (62%) referred to the SARS outbreak, 5 (11%) to the MERS-CoV outbreak, 5 (11%) to the COVID-19 outbreak, 3 (7%) to the A/H1N1 influenza outbreak, 3 (7%) to the EVD outbreak, and 1 (2%) to the A/H7N9 influenza outbreak.	diagnosis. Studies on the COVID-19 pandemic reported the highest prevalence rate (71.5–73%). During the acute phase of pandemic, the prevalence of depressive symptomatology was between 27.5 and 50.7% in healthcare workers with higher rates during the COVID-19 pandemic (50.4–50.7%), compared with SARS outbreak (27.6%). It was found that neuroticism, dysfunctional attachment, maladaptive coping, exposure to infection, contact with affected patients, are risk factors for psychiatric disorders or symptoms.	plausible association with impaired decision-making capacities
Salazar de Pablo et al (2020) [7]	To provide quantitative evidence synthesis of the impact of SARS/MERS/COVID-19 on physical and mental health outcomes of healthcare workers	An online search was carried out in the databases Web of Science, medRxiv, psyArXiv and bioRxiv, in addition to gray literature, of articles published up to April 2020, where 115 articles were finally included. The main physical and psychological symptoms developed by health workers, who were exposed to coronavirus infections, were evaluated. The final database for the systematic review included 115 studies: 65 (56.5%) focused on SARS, 26 (22.6%) on MERS and 24 (20.9%) on COVID-19.	A total of 60,458 subjects was enrolled. 62.5% healthcare workers exposed to SARS/MERS/COVID-19 reported general health concerns (95% CI = 57.0–67.8%, n = 2254), 43.7% fear (95% CI = 33.9–54.0%, n = 584), 37.9% insomnia (95% CI = 30.9–45.5%, n = 5067), 37.8% psychological distress (95% CI = 28.4–48.2%, n = 24,346), 34.4% burnout (95% CI = 19.3–53.5%, n = 1337), 29.0% anxiety features (95% CI = 14.2–50.3%, n = 9191), 26.3% depressive symptoms (95% CI = 12.5–47.1%, n = 9893), 20.7% post-traumatic stress disorder (PTSD) features (95% CI = 13.2–31%, n = 3826), 16.1% somatisation (95% CI = 0.2–96.0%, n = 2184) and 14.0% stigmatisation feelings (95% CI = 6.4–28.1%, n = 411); I ² = 70.2–99.7%, and sensitivity analyses revealed that PTSD features were more frequent (p < 0.001) in MERS (40.7%) than in SARS (16.7%) and COVID-19 (7.7%).	SARS/MERS/COVID-19 have a substantial impact on mental health of healthcare workers, which should become a priority for public health strategies.

of distressing events; and taking into account that Conti et al. [9] argue that the release of pro-inflammatory cytokines, including interleukin-1β and IL-6 of the respiratory tract, can be stimulated by the pathophysiological process of COVID-19, it can be inferred that the inflammatory response will be superior in this group specifically, having this in mind, and considering the high prevalence of psychiatric conditions, it can then be deduced that a health worker per se, has a risk of high lethality for COVID-19, regardless of the presence of other exacerbating factors.

In the view of the findings, it is necessary to stipulate an effective action plan for the control of risk factors that may generate or intensify psychological/psychiatric symptoms, as the outlook for health workers shortly is not very encouraging. The physical and mental integrity of the first line of care in the face of this type of emergency must remain impeccable to ensure good clinical practice, moreover, when some risk factors are feasible to mitigate, such as administrative support for workers, financial guarantees and supplies, facilitation of stay, support for the worker's family nucleus, among others; supports that can contribute to the worker's courage. Since the COVID-19 pandemic is in its second wave globally (the curve being greater than in the first epidemiological peak) [10], these findings serve as evidence for the design of public policies and organizational modifications.

It should be noted that this manuscript presents as a limitation, that several of these systematic reviews and meta-analysis, share

studies, constituting an important bias against the heterogeneity of the groups evaluated.

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Declaration of Competing Interest

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