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The impact of the COVID-19 pandemic on the mental health of healthcare workers: integrative review

O impacto da pandemia da COVID-19 na saúde mental dos profissionais de saúde: revisão integrativa

El impacto de la pandemia de COVID-19 en la salud mental de los profesionales de la salud: revisión integradora

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Abstract

Objective: To assess, based on the pertinent literature, the mental health of health workers in the COVID-19 pandemic. **Method:** This is an integrative literature review carried out in the LILACS databases via the Virtual Health Library (VHL), MEDLINE via PubMed, PubMed Central (PMC), COCHRANE, CINAHL Database, SCOPUS, SciVerse Web of Science and PsycInfo with the guiding question: How does COVID-19 affect the mental health of health workers working in the pandemic? The studies were selected considering the following inclusion criteria: experimental, semi-experimental, observational and review study methods between 2019 and May 15th, 2020. **Results:** There was a selection of 13 scientific proofs based on two categories of discussion: 1) The impact of the COVID-19 pandemic on the mental health of health professionals; 2) Possible strategies for preserving mental health in health professionals during the COVID-19 pandemic. **Conclusion:** The process of dealing directly with care of coronavirus patients, high occupational exposure and inadequate availability of personal protective equipment (PPE) generate several conditions that undermine the mental health of front-line professionals in health services, such as anxiety, stress, insomnia and depression.

Keywords: Coronavirus Infections; Mental Health; Health Personnel; Psychological Health.

Resumo

Objetivo: Avaliar, na literatura, a saúde mental dos profissionais de saúde atuantes na pandemia da COVID-19. **Método:** Trata-se de uma revisão integrativa da literatura realizada nas bases de dados LILACS via Biblioteca Virtual de Saúde (BVS), MEDLINE via PubMed, PubMed Central (PMC), COCHRANE, CINAHL *Database*, SCOPUS, *SciVerse* Web of Science e PsycInfo com a questão norteadora: Como a COVID-19 afeta a saúde mental dos profissionais de saúde atuantes na pandemia? Os estudos foram selecionados considerando-se os critérios de inclusão: evidências com desenhos experimentais, quase experimentais, observacionais e de revisão completos, com recorte temporal de 2019 a 15 de maio de 2020 e com abordagem central sobre o eixo temático do estudo. **Resultados:** Houve a seleção de 13 evidências científicas, estabelecendo-se duas categorias de discussão: 1) O impacto da pandemia da COVID-19 na saúde mental de profissionais de saúde; 2) Estratégias para a preservação da saúde mental em profissionais de saúde atuantes na pandemia. **Conclusão:** O processo de cuidado direto de pacientes com coronavírus, a alta exposição ocupacional e a disponibilidade inadequada equipamentos de proteção individual (EPI) geram quadros que

comprometem a saúde mental dos profissionais da linha de frente nos serviços de saúde, tais como ansiedade, estresse, insônia e depressão.

Palavras-chave: Infecções por Coronavírus; Saúde Mental; Pessoal de Saúde; Estresse Psicológico.

Resumen

Objetivo: Evaluar la salud mental de los profesionales de la salud que trabajan en la pandemia de COVID-19 en la literatura. **Método:** Se trata de una revisión bibliográfica integradora realizada en las bases de datos de LILACS mediante de la Biblioteca Virtual en Salud (BVS), MEDLINE a través de PubMed, PubMed Central (PMC), COCHRANE, Base de datos CINAHL, SCOPUS, SciVerse Web of Science y PsycInfo con la pregunta guía: ¿Cómo afecta COVID-19 a la salud mental de los profesionales de la salud que trabajan en la pandemia? Los estudios se seleccionaron teniendo en cuenta los criterios de inclusión: pruebas con diseños experimentales, cuasiexperimentales, observacionales y completos, con recorte de tiempo desde 2019 hasta el 15 de mayo de 2020 y con un enfoque central en el eje temático del estudio. **Resultados:** Hubo una selección de 13 pruebas científicas, estableciendo dos categorías de discusión: 1) El impacto de la pandemia COVID-19 en la salud mental de los profesionales de la salud; 2) Estrategias para la preservación de la salud mental en profesionales de la salud que trabajan en la pandemia. **Conclusión:** La atención directa a los pacientes con coronavirus, la alta exposición ocupacional y la disponibilidad inadecuada de equipos de protección personal (EPP) generan condiciones que socavan la salud mental de los profesionales de primera línea en los servicios de salud, tales como: ansiedad, estrés, insomnio y depresión.

Palabras clave: Infecciones por Coronavirus; Salud Mental; Personal de Salud; Estrés Psicológico.

1. Introduction

In November 2019, the world society experienced the first case of a disease caused by the new coronavirus (COVID-19), also known as severe acute respiratory syndrome coronavirus 2 (SARSCoV-2), starting in the city of Wuhan, China, which became the first known epicenter of this disease (Chan et al, 2020; Chew et al, 2020; Spoorthy, 2020; Yuki, Fujiogi & Koutsogiannaki, 2020). Due to its high transmissibility rate and the current

advanced globalization process, the virus has quickly reached world scales, becoming a global public health emergency.

Subsequently, in March 2020, the World Health Organization (WHO) declared a pandemic situation (Spoorthy, 2020; Who, 2020; Chew, 2020; Mo et al, 2020), culminating in a global mobilization with a view to promoting the development of stringent public health measures to reduce infection and spread of the virus (Lai et al, 2020).

Such pathology is responsible for causing several symptoms, among them respiratory and digestive, with manifestations that can vary from a mild self-limited disease to severe pneumonia, acute respiratory failure and septic shock (Lai et al, 2020). In this context, the absence of a specific and resolutive treatment, associated with the lack of a vaccine (Cai et al, 2020) and the exponential increase in the number of cases, have led to an increasing number of hospitalizations and deaths, boosting the demand of health systems with an overload of human resources.

Despite the recent onset of this disease, it is already possible to observe its negative effects on the mental health of health professionals. In this context, the workers who deal with diagnosis, treatment and assistance during the care of the patient with COVID-19 and who are in the frontline in the handling of patients are the most vulnerable to develop psychological distress and other mental health symptoms (Lia et al, 2020).

Excessive workload/working hours, inadequate availability of personal protective equipment (PPE), feeling of inadequate support, high rate of infection among workers, fear of contaminating family members, social isolation and cases of death in the health team itself have been highlighted as the main reasons for the adverse psychological results (Spoorthy, 2020; Cai et al, 2020; Wu; Connors & Junior, 2020). Accordingly, this population is identified as the most vulnerable psychologically, exposed to an increased risk of infection, disease and, consequently, mortality (Bohken, Shomig, Lemke, Pumberger & Riedel-Heller, 2020).

It is evident that, in studies conducted during the COVID-19 outbreak, the pandemic entailed a significant increase in cases of depression and anxiety, as well as exacerbation of sleep quality problems and pre-existing mental health symptoms, with an important emotional and physical impact on health professionals (Sasangohar, Jones, Masud, Vahidy & Kash, 2020; Rajkumar, 2020; Lai et al, 2020; Zhang et al, 2020).

Limited resources, longer shifts, imbalance between professional life and job, as well as occupational risks associated with high exposure to COVID-19 contribute to physical and mental fatigue, stress, anxiety and professional exhaustion (Sasangohar, Jones, Masud,

Vahidy & Kash, 2020; Rajkumar, 2020; Lai et al, 2020; Zhang et al, 2020). These psychological consequences may imply immediate or prolonged characteristics with acute and chronic somatic effects that can result in deleterious organic conditions such as cardiac arrhythmias and myocardial infarction (Cai et al, 2020).

At the international level, WHO has recently recognized the need to formally care for the mental health of health professionals in times of pandemic and the importance of establishing coping strategies for personal and professional well-being (WHO, 2020). In Brazil, the health professional's health has also been the focus of attention, the Oswaldo Cruz Foundation (FIOCRUZ) of the Ministry of Health already has recommendations for managers regarding mental health and psychosocial care in the COVID-19 pandemic for workers in health services (Fiocruz, 2020).

The encouragement to establish coping measures may promote a better experience in the way of living and exercising professional practice in the pandemic COVID-19. It is observed that crisis management by team leaders with information and training, as well as continuous organized support, thus normalizing the expression of problems faced and discussion of well-being and identification of support resources that are promising in the acquisition of resilient postures in the face of negative emotions faced (Wu, Connors & Junior, 2020).

Resilience is a phenomenon exerted from the adoption of coping strategies based on strengths that reflects the person-environment exchanges and the ability of individuals, families, groups, communities and organizations to recover from adversity (Gitterman & Knight, 2016; Beretta et al, 2020). Institutional support can promote the acquisition of strategies that soften the perception of being on the frontline of the pandemic, thus constituting a powerful protagonist in the fight against the disease.

Given the evident impact of COVID-19 on the mental health of health workers, the study aims to assess, in the pertinent literature, the mental health of health professionals working in the pandemic of COVID-19.

2. Methodology

Research protocol

This is an integrative literature review based on an electronic bibliographic survey in the following databases: LILACS (Latin American and Caribbean Literature in Health

Sciences) via Virtual Health Library (VHL), MEDLINE (Medical Literature Analysis and Retrieval Systems online) via PubMed, PubMed Central (PMC), COCHRANE (Cochrane Database of Systematic Reviews); CINAHL Database, SCOPUS, SciVerse Web of Science and PsycInfo.

The research in focus was designed in 8 stages: elaboration of the guiding research question; production of research protocol; elaboration of eligibility criteria; research and search strategy in the pertinent literature; data collection; critical analysis of the included studies; data extraction; discussion of results and presentation of the review.

The study was conducted based on the following research question: How does COVID-19 affect the mental health of health professionals working in the pandemic? In order to elaborate the guiding question, the PICO strategy was used (Santos, Pimenta & Nobre, 2007), which represents the acronym for (P = Patient or Problem, I = Intervention, C = Comparison or control, O = Outcomes or outcomes). It is noteworthy that, in this study, it was considered: P = health professionals, I = COVID-19 and O = mental health (PIO). It should be noted that the objective of the study was not to compare anything.

The search strategy was carried out through the intersections of the Health Sciences Descriptors (known as DeCs): coronavirus infections, mental health, health personnel and psychological stress; and by the Medical Subject Headings (Mesh Terms): mental health; Covid-19; health personnel; psychological health, with a random crossing among these descriptors connected by the Boolean operator AND.

The article was structured based on the PRISMA Protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes). Moreover, there was a lack of prior systematic reviews related to the mental health of health professionals during the COVID-19 pandemic under construction, indexed in the PROSPERO (International Prospective Register of Systematic Reviews). An ongoing study was found that seeks to assess risk and resilience factors for psychological distress in health professionals who worked in epidemics/ pandemics in general.

Eligibility criteria

Scientific evidence was selected based on the adoption of the eligibility criteria, the inclusion criteria were: a) full texts available online through access in the CAPES journal, b) studies with experimental, quasi-experimental, observational designs and review, being also considered pre-impressions c) time frame from 2019 to May 15th, 2020, d) addressing the

mental health of health professionals in the face of the COVID-19 pandemic in health care environments; and the exclusion criteria were: a) studies with research without a methodological outline, b) editorials, expert comments, letters from editors and previous notes, c) surveys carried out with professionals who do not work in patient care centers with COVID-19. The search in the electronic databases was performed in April and updated in May 2020.

Selection and analysis of studies

After the selection of scientific records, the texts were read and analyzed in full. A previously standardized checklist was filled out in Microsoft Word® based on the eligibility criteria for tabulation of the obtained results, and studies that did not meet the criteria, after reading titles and abstracts, were excluded from the research.

In order to enable the identification of scientific evidence, studies were characterized according to the country of research, type of study, data collection instrument, main results and conclusions. The symptoms related to the mental health of health professionals were considered, after analysis, as long as they were properly assessed or by applying validated scales or by Likert scale, as well as analyzed based on grounded theories and widely used for qualitative research. The reviews were considered with the analyzed results either descriptively or by means of meta-analysis.

In addition, a descriptive analysis of the studies and a discussion among the authors on the content of the selected studies was performed. The results were assessed and tabulated in a spreadsheet for organization and processing data.

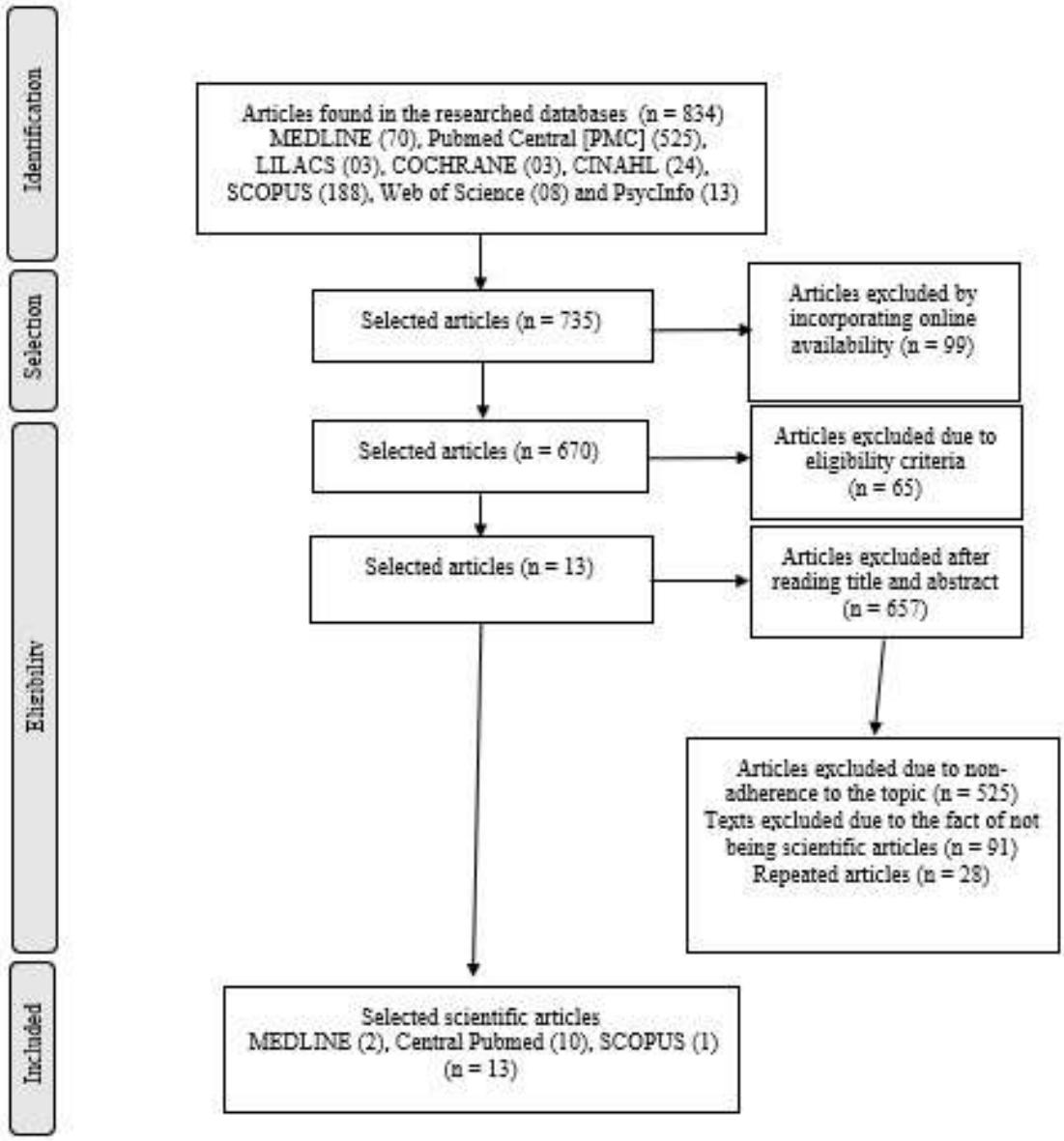
Bias risk assessment

The risk of bias analysis was performed through descriptive checking of the research results. Upon finding any inconsistency in relation to the data obtained in the research, the article was discarded from the selection. Accordingly, the data analyzed in these articles were compiled in a table, which is found in the results, in order to guide the identification of biases in the studies, as well as the identification of variables to be discussed in this paper.

3. Results

At the beginning of the research, 834 scientific articles were identified in their entirety in the database search (MEDLINE via PubMed = 70, PubMed Central = 525, LILACS = 03, CINAHL = 24, SCOPUS = 188, COCRHANE = 03, Web of Science = 08 and PsycInfo = 13). After applying the inclusion and exclusion criteria, 13 scientific proofs were selected, all in the MEDLINE database via Pubmed, Pubmed Central and SCOPUS for analysis and review, as displayed in Flowchart 1.

Flowchart 1: Details of the search for scientific articles in the database.



Source: Flowchart adapted from PRISMA.

In Flowchart 1, it is important to observe the systematic step-by-step until the selection of the articles that constitute the present study.

A total of 13 articles was included in the analysis of the integrative review – MEDLINE (2), Central Pubmed (10) and SCOPUS (1) - four of them with a literature review method, one with a systematic literature review method with meta-analysis, seven articles observational research with transversal cut and two with qualitative method of assessment, analyzed through the Theory of growth, relationship and existence and by the phenomenological method of Colaizzi, respectively. Moreover, nine articles used samples with health professionals working in the frontline in the COVID-19 pandemic in China, Wuhan province, and elsewhere in the country, with only two studies aimed exclusively at nursing and the others carried out with the general medical staff.

The professional categories of medical staff most studied in the research were medical professionals (Chew et al, 2020; Lai et al, 2020; Kang et al, 2020; Zhang et al, 2020; Xiao, Zhang, Kong, Li & Ningxi, 2020; Zhu et al, 2020) e os enfermeiros (Zeng & Yin, 2020; Sun et al, 2020; Chew et al, 2020; Lai et al, 2020; Zhang et al, 2020; Kang et al, 2020; Zhu et al, 2020). Observational surveys showed a sample between 10 and 1563 health professionals. In the review studies, the sample consisted of 04 to 14 scientific studies. Regarding the research sites, seven studies were multicentric, most carried out in China and one involving two countries (India and Singapore), as displayed in Table 1.

Table 1: Studies assessing the mental health of health professionals working in the frontline in the COVID-19 pandemic.

Authors	Title	Origin	Sample, method and statistical analysis
Rajkumar RP	COVID-19 and mental health: A review of the existing literature.	India	**Sample:** 04 studies derived from China **Method:** Narrative literature review **Statistical analysis:** none
Spoorthy MS.	Mental health problems faced by healthcare workers due to the COVID-19 pandemic – a review.	Belgium	**Sample:** 06 scientific articles **Method:** Literature review **Statistical analysis:** none
Pappa S	Prevalence of depression, anxiety, and insomnia among	England	**Sample:** 13 scientific articles with a

et al.	healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis		total of 33,062 participants **Method:** Systematic literature review with meta-analysis **Statistical analysis:** The proportions were transformed by the double arcsine method and then transformed to facilitate interpretation. The random effects model was used to extract the combined prevalence. Substantial heterogeneity defined as $I^2 > 75\%$. For the results, prevalence, confidence interval and percentage prevalence were used.
Bohlken J et al.	COVID-19 pandemic: stress experience of healthcare workers – A short current review	Germany	**Sample:** 14 scientific articles **Method:** Literature review **Statistical analysis:** none
Lai J et al.	Factors associated with mental health outcomes among healthcare workers exposed to coronavirus disease 2019.	China	**Sample:** 1,257 health professionals from 34 hospitals **Method:** Cross-sectional study **Statistical analysis:** Mann-Whitney and Kruskal-Wallis test to compare the severity of each symptom between/among two or more groups. For risk factors for depression, anxiety, insomnia and distress symptoms: multivariate logistic regression analysis. The associations between risk factors and results are presented as odds ratios (ORs) and 95% CI. P-value <0.05.
Chew NWS et al.	A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak.	India and Singapore	906 health workers from five hospitals. **Method:** Cross-sectional study **Statistical analysis:** Student's t test for the association among continuous variables and Pearson's chi-square test (or Fisher's exact

			test, when appropriate) to assess categorical variables. Multivariate logistic regression to adjust the effect of confounding factors to determine independent associations of binary results. Linear regression was used to assess associations among variables. P-value <0.05.
Yin X, Zeng L.	A study on the psychological needs of nurses caring for patients with coronavirus disease 2019 from the perspective of the existence, relatedness, and growth theory.	China	**Sample:** 10 nurses working in the care of patients with COVID-19 at a hospital in Wuhan. **Method:** ERG theory (theory of existence, relatedness and growth) Statistical analysis: none
Kang L et al.	Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study	China	**Sample:** 994 health professionals working in Wuhan **Method:** Cross-sectional study **Statistical analysis:** Chi-square test was used to compare data for different variable categories. Structural equation model to explore the relationship among knowledge, exposure, access to mental health services and mental health status. P-value <0.05.
Xiao H, Zhang Y, Kong D, Li S, Ningxi Y.	The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China.	China	**Sample:** 180 medical teams working in the COVID-19 pandemic. **Method:** Cross-sectional study. **Statistical analysis:** Chi-square test, Pearson's correlation analysis and multivariate analysis with structural equation model with trajectory analysis. P value <0.05.
Sun N et al.	A qualitative study on the psychological experience of caregivers of COVID-19 patients.	China	**Sample:** 20 nurses caring for patients with COVID-19 **Method:** Colaizzi's

			phenomenological method **Statistical analysis:** none
Cai H et al.	Psychological impact and coping strategies of frontline medical staff in human between January and March 2020 during the outbreak of coronavirus disease 2019 (COVID-19) in Hubei, China.	China	**Sample:** 534 frontline medical teams **Method:** Cross-sectional study **Statistical analysis:** Chi-square test to buy responses. Descriptive statistics (average and standard deviation). P-value <0.05.
Zhang C et al.	Survey of insomnia and related social psychological factors among medical staff involved in the 2019 novel coronavirus disease outbreak.	China	**Sample:** 1,563 employees from all hospitals in China **Method:** Cross-sectional study **Statistical analysis:** Chi-square test for descriptive analysis. *Post hoc* analysis with Bonferroni's correction for multiple categories. Binary multiple logistic regression for associating demographic data and insomnia. Regression models. P value <0.05.
Zhu J et al.	Prevalence and influencing factors of anxiety and depression symptoms in the first-line medical staff fighting against COVID-19 in Gansu.	China	**Sample:** 165 health professionals (79 doctors and 86 nurses) **Method:** Cross-sectional study **Statistical analysis:** Correlation analysis to check the relationship among SAS, SDS and SCSQ. Linear regression model to determine the factors that influence anxiety or depression. P value <0.05.

Source**:** Prepared by the authors (2020).

In Table 1, it is important for the reader to observe the profile of the studies through the description of the authors, the title and its country of origin, sample, method and statistical analysis.

In observational studies, the following scales of psychological symptoms that undermine the mental health of health professionals working in the COVID-19 pandemic

were used: Depression Anxiety and Stress Scale (DASS-21); Impact of Events Scale-Revised (IES-R); Patient Health Questionnaire-9 (PHQ-9); Generalized Anxiety Disorder 7 scale (GAD-7), Insomnia Severity Index (ISI); Self-rating anxiety scale (SAS); General Self-Efficacy Scale (GSE); Stanford Acute Stress Reaction Questionnaire (SASR); Pittsburgh Sleep Quality Index (PSQI), Social Support Rate Scale (SSRS) and Simplified Coping Style Questionnaire (SCSQ).

In turn, in review studies (other than systematic review), no instruments were used to organize and analyze data, nor criteria to assess the quality of the articles. It is worth mentioning that, in relation to the mental health of health professionals, it is evident that depression, anxiety, distress, insomnia, stress and post-traumatic disorder symptoms are the main ones mentioned and evidenced in the results of the studies, as displayed in Table 2.

Table 2: Characterization of studies on the mental health of health professionals working in the frontline in the COVID-19 pandemic and its main results.

Authors	Assessment instruments	Results	Main conclusions
Lai J et al.	PHQ-9 GAD-7 ISI IES-R	Variables present such as depression symptoms present in 50.4%, anxiety 44.6%, insomnia 34.0% and distress 71.5%. Nurses, women and front-line health professionals have more severe degrees of symptoms. Professionals involved in the diagnosis, treatment and direct care of patients with COVID-19 experienced anxiety, insomnia and distress.	Health professionals, especially nurses and women, have suffered more psychological burdens in professional practice in the frontline.
Chew NWS et al.	Self-administered questionnaire DASS-21 IES-R	5.3% with moderate to very severe depression, 8.7% with moderate to extremely severe anxiety, 2.2% with moderate anxiety to extremely severe stress and 3.8% with moderate to severe levels of psychological distress. Depression, anxiety and stress associated with the presence	Significant association between the prevalence of physical symptoms and psychological results in health professionals during the COVID-19 outbreak.

		of physical symptoms.	
Yin X, & Zeng L.	Semi-structured interview with open questions	The psychological needs are reflected: needs for physical and mental health care; need for security regarding adequate PPE and emotional stability of patients' family members; need for interpersonal and caring relationships.	The needs for existence, relationship and growth coexist in clinical nurses. Knowing them is important to establish strategies that meet the needs of these professionals.
Rajkumar RP.	None	Anxiety and depression (16-28%) symptoms and self-reported stress (8%) are common psychological reactions to the pandemic and may be associated with sleep disorders.	Mental health problems are a common response to the COVID-19 pandemic.
Kang L et al.	Questionnaire with open and closed questions PHQ-9 GAD-7 ISI IES-R	6.9% of health workers presented subliminal mental health disorders (average PHQ-9: 2.4), 34.4% presented mild disorders (average PHQ-9: 5.4), 22.4% presented moderate disorders (average PHQ-9: 9.0) and 6.2% presented severe disorders (average PHQ-9: 15.1) shortly after the viral epidemic, especially in young women. 36.3% accessed psychological materials, 50.4% had access to psychological resources available through the media and 17.5% took part in counseling or psychotherapy.	It is necessary to recognize mental health needs as an important component for a therapeutic response to crisis scenarios. Mental health professionals should be included in health care facilities during the pandemic.
Spoorthy MS.	None	Sociodemographic variables such as gender, profession, age, place of work, department of work and psychological variables: low social support and self-efficacy were associated with increased stress, anxiety,	Factors that affect the mental health of health professionals during the COVID-19 pandemic should be assessed by a specialized team.

		depression and insomnia symptoms in health professionals. COVID-19 may be an independent factor for the impairment of mental health.	
Xiao H, Zhang Y, Kong D, Li S, & Ningxi Y.	SAS GSE SASR PSQI SSRS	The social support levels of medical staff were associated with self-efficacy and sleep quality and negatively associated with the degree of anxiety and stress. Anxiety levels were associated with stress levels, which negatively impacted self-efficacy and sleep quality. Anxiety, stress and self-efficacy were mediating variables associated with social support and sleep quality.	The medical team that treated patients with COVID-19 presented anxiety, stress and self-efficacy levels that depended on the sleep quality and the social support conditions.
Sun N et al.	Semi-structured interview	The psychological experiences are: negative emotions (fatigue, discomfort and helplessness) due to the high workload. Self-coping: life and psychological adjustments, altruistic acts, support for the team. Professional growth under pressure: greater affection, gratitude, development of professional responsibilities.	During the pandemic, positive and negative emotions from front-line nurses intertwined and coexisted. In the initial stage, negative emotions were dominant and positive emotions gradually emerged. Styles of self-control and psychological growth played an important role in maintaining nurses' mental health.
Cai H et al.	4-point Likert scale questionnaire	Doctor and other workers were anxious about their security and the security of their families and reported the effects of reports of mortality from COVID-19 infection. The availability of strict infection control guidelines,	The COVID-19 outbreak entailed stress for the medical team. Continued recognition of the medical team by hospital managers and governments,

		specialized equipment, recognition of your efforts by hospital managers and governments, and the reduction of reported cases of COVID-19 have provided psychological benefits.	provision of infection control guidelines, specialized equipment and facilities for COVID-19 are factors that may encourage the medical team to work during future epidemics.
Zhang C et al.	Self-administered questionnaire ISI PHQ-9 GAD-7 IES-R	(36.1%) participants presented insomnia symptoms according to the Insomnia Severity Index (ISI) (total score ≥ 8). Insomnia symptom was associated with a high school or lower level being a doctor (OR = 0.44, p = 0.007, 95% CI = 0.2–0.8), currently working in an isolation unit (OR = 1.71, p = 0.038, 95% CI = 1.0-2.8), is concerned about being infected (OR = 2.30, p<0.001, 95% CI = 1.6–3.4), perceived lack of usefulness in terms of psychological support for news or social media with respect to COVID-19 (OR = 2.10, p = 0.001, 95% CI = 1.3–3.3) and with very strong uncertainty regarding control disease effectiveness (OR = 3.30, p = 0.013, 95% CI = 1.3–8.5).	More than a third of medical staff suffered insomnia symptoms during the COVID-19 outbreak. The related factors included educational level, an isolated environment and psychological concerns about COVID-19.

Pappa S et al.	PRISMA Meta-analyses of observational studies in epidemiology (MOOSE) Newcastle-Ottawa scale	Anxiety was assessed in 12 studies, with a prevalence of 23% and depression in 10 studies, with 22.8%. Gender and professional occupation influence psychological symptoms, where women and nurses were more susceptible to more severe forms when compared to male medical staff. In four studies, the prevalence was 38.9%.	There are a considerable number of health professionals with mood and sleep disorders during the pandemic.
Bohlken J et al.	None	PHQ-9, SAS and IES-R were the most used test instruments. The association of COVID-19 in psychological symptoms is observed, with variables such as gender, age, occupation and schooling influencing the severity of mental symptoms.	The performance of health professionals in the COVID-19 pandemic generates psychological symptoms that undermine the mental health of these agents. Further studies are necessary on the topic.
Zhu J et al.	Characterization questionnaire SAS, SDS SCSQ	Anxiety and depression symptoms among doctors were 11.4% and 45.6%. The prevalence rate of anxiety and depression symptoms among nurses was 27.9% and 43.0%. The previous history of these events and gender influenced the presence of these events.	Front-line professionals in the pandemic present anxiety and depression symptoms. In order to help to deal with negative emotions, they love positive coping.

Source: Articles analyzed in the review (2020).

In Table 2, it is important to observe the nuances of the results that the studies present, the instruments used and the main conclusions found.

It was evidenced that COVID-19 presents factors that may, individually or together, boost psychological symptoms.

Table 3: Psychological disorders and risk factors triggered by the COVID-19 pandemic in health professionals.

Psychological symptoms	**Risk factors of the COVID-19 pandemic for the mental illness of health professionals**
Anxiety; Depression; Distress; Post-traumatic stress disorder; Stress; Insomnia; Exhaustion; Feeling of helplessness	• Risk of infection by COVID-19 during professional activities; • High occupational exposure to the virus; • Fear of becoming infected and transmitting it to teammates and relatives; • Social isolation and difficulty in contact with the support network; • Long working hours during the pandemic; • Work directly in the process of care and treatment of patients with COVID-19; • Physical fatigue; • Lack of personal protective equipment; • Absence of strict infection control guidelines at the institution; • Feeling of powerlessness in relation to the cure of critically ill patients; • Lack of access to information about COVID-19; • Lack of professional recognition by superiors; • Death of patients.

Source: Designed by the authors.

Table 3 highlights the main risk factors for the impairment of the mental health of health professionals identified from the mapping of scientific evidence.

Through tabulated data, reading and in-depth analysis of the contents covered, two categories of discussion were designed to group the results and confront them with each other, namely: Category 1 – **The impact of COVID-19 on the mental health of professionals** and Category 2 – **Possible strategies for preserving mental health in health professionals during the COVID-19 pandemic**.

4. Discussion

Category 1 – The impact of the COVID-19 pandemic on the mental health of health professionals

The COVID-19 pandemic has been demonstrated as a multifactorial phenomenon of impairment of the population's mental health, especially in professionals working in services that provide direct care to patients in the field of health (Lu, Wang & Li, 2020; Wang et al, 2020; Xião et al, 2020; Bohlken, Schomig, Lemke & Pumberger, 2020). This is related to the accentuated exposure to occupational risk of contamination in long working hours, which is often accompanied by the institutional inadequate availability of PPE, fatigue and physical and psychological exhaustion (Rajkumar, 2020; Ho, Chee & Ho, 2020; Lai et al, 2020).

Qualitative studies have demonstrated these findings. For Sun et al (Sun et al, 2020), the experience, by nursing professionals, in the systematization of care of patients with COVID-19, brings negative psychological consequences such as fatigue, discomfort and abandonment, mainly triggered by the high workload and limitation of protective equipment available during the pandemic. This fact is corroborated in the study by Yin and Zeng (Yin & Zeng, 2020), where psychological aspects deal with the reflection of the needs for physical and mental health in health care, highlighting the importance of adequate availability of PPE and emotional stability with interpersonal relationship.

It is also noteworthy that the feeling of fear of acquiring the virus and exposing family members to infection have hindered contact with the support network (Sasangohar et al, 2020), thus culminating in the establishment of social isolation (Rajkumar, 2020; Kang et al, 2020), which is harmful to psychological health. The study by Xiao et al (Xiao et al, 2020) points to social support as a strategy for reducing anxiety and stress, in addition to improving self-efficacy, since friends or family members provide social interactions, emotional support and empathy, thus reducing negative emotions.

The death and infection of health professionals has stood out as a major challenge faced by several countries after the pandemic was established (Sanchez et al, 2020). Moreover, it is still possible to observe that the high mortality rate due to COVID-19 infection and the uncertainty regarding their own security and that of relatives are triggering factors for anxiety in the most diverse members of medical staff (Cai et al, 2020; Sun et al, 2020; Pappa et al, 2020).

A study conducted in China showed that the main concern of medical staff was related to security against infections, since there is a fear of being asymptomatic carriers and potential transmitters of COVID-19 to their respective families, especially children and older relatives, as well as the other members of the health team, given the perception of the high rate of transmissibility and mortality from infection with the new coronavirus (Cai et al, 2020).

Another factor that deserves attention is the fact that the location and the sector of work are variable and may influence the way in which the situation is experienced. Health professionals working in emergencies, intensive care sectors and isolation wards, due to contact with contaminated individuals and the high workload, are more likely to develop adverse psychological symptoms, as seen in past pandemics (Ho, Chee & Ho, 2020). Currently, it is observed that the front-line professionals at the different levels of the care process for patients with COVID-19 are the ones most subjected to specific stresses, psychological distress and other mental health symptoms (Lia et al, 2020).

In this regard, the symptomatological repercussions triggered by professional experience in times of pandemic are represented by stress, anxiety, distress, post-traumatic disorder and depression (Lai et al, 2020; Chew et al, 2020; Xiao et al, 2020; Spoorthy, 2020; Rajkumar, 2020; Kang et al, 2020; Pappa et al, 2020). Observational studies have been essential in terms of establishing the association between the COVID-19 pandemic and mental health in the most varied agents of the community.

A study that compared the medical staff and administrative staff showed that health professionals are about twice as likely to show high levels of fear, anxiety and depression, with these symptoms being more prevalent in teams dealing with suspected or confirmed cases of the disease in question (Lu, Wang, Lin & Li, 2020).

Corroborating these results, the multicenter observational research by Lai et al (Lai et al, 2020) performed in 34 hospitals in China during the pandemic and that assessed more than one thousand health professionals, inferred that the distress, depression and anxiety symptoms, respectively, were the most prevalent.

Female nurses working on the frontline, as well as those with technical level, were identified as having the most severe psychological symptoms. This may be attributed to the fact that they are for extended periods in the wards, providing direct assistance to patients and being responsible for collecting sputum for virus detection (Kang et al, 2020; Pappa et al, 2020). Moreover, they are also exposed to suffering related to the process of illness and death (Pappa et al, 2020).

In this scenario, sociodemographic data such as gender, age and occupational position can influence the levels of symptoms that affect the mental health of health workers in the COVID-19 pandemic. Studies indicate that, among doctors and nurses, depression symptoms were present in 29.65% for nurses and 24.5% for doctors (Pappa et al, 2020). Regarding anxiety, there was a rate of 11.4% for doctors and 27.9% for nurses (Zhu et al, 2020).

In addition, the fact that COVID-19 has symptoms that may be present in other common pathologies, such as influenza, also generates psychological repercussions. Health workers who develop these physical symptoms face the dilemma of either requesting leave or continuing to work alongside colleagues with a high workload during the outbreak. The levels of psychological suffering are exacerbated by the fear of having the virus and transmitting it among other professionals (Chew et al, 2020). Furthermore, dealing with difficult news, feeling powerlessness in the face of the lack of specific treatment for the disease and the difficulty of rehabilitation of affected patients are risk factors for the development of unsuccessful adaptive strategies by professionals, thus generating negative feelings and attitudes.

It is worth underlining that patients diagnosed with COVID-19, as well as their family members, are in a state of emotional fragility and have health professionals as a source of support in the clinical and emotional aspects. Nevertheless, it is observed that health professionals are also affected by the context, which may be reflected in the capacity for humanized care to patients.

One of the forms of manifestation of psychological distress consists of changes in the sleep pattern, either in the difficulty of starting it, or in frequent or early awakenings. A study that compared psychosocial factors in two research groups, one with insomnia (total ISI score $\geq$ 8) and the non-insomnia group (total ISI score <8), found that insomnia in the study population was associated with psychological symptoms arising from the COVID-19 pandemic outbreak. Related to this, low educational level, professional activity in an isolation environment and fear of being infected proved to be risk factors for insomnia (Zhang et al, 2020).

In turn, insomnia affects the ability to concentrate and learn, thus causing the level of productivity of these health professionals to be reduced. This set of factors further increases the stress experienced, thus negatively impacting self-efficacy, sleep quality, as well as the development of appropriate coping strategies (Xiao et al, 2020).

Stress involves increased psychological and physical activation in response to demands from the activated hypothalamic-pituitary-adrenal axis, which is incompatible with

normal sleep (Zhang, 2020). Sleep disorders resulting from the interaction among stress, anxiety and distress triggered by work in the COVID-19 outbreak by health professionals may lead to sustained increases in the axis, perpetuating the cycle of stress and insomnia.

An important factor that was not assessed in the studies and that may have psychological repercussions is the relationship between aspects of being a health professional and, at the same time, being a risk group (with comorbidities, pregnant women and elderly individuals) for the development of severe forms of COVID-19.

Working with constant awareness of vulnerability and having risk factors that enhance the chances of developing the disease can serve as a triggering factor for mental health impairment. Therefore, it should be noted that such factors are analyzed in future investigations.

Category 2 – Possible strategies for preserving mental health in health professionals during the COVID-19 pandemic

Accordingly, the promotion and recovery of the mental health of health professionals can be carried out through strategies for confronting and enhancing individual and collective protection factors, thus mitigating the negative effects of the current pandemic (Greenberg, Docherty, Gnanapragasam & Wessely, 2020). In the study by Zhu et al (2020), it was observed that the strategy adopted by health care agents was a protective factor for anxiety and depression.

In this scenario, the role of health organizations with supportive and fostering programs for employees should be observed, based on encouraging the development of individual and collective resilience, effective crisis management, communication among team members, thus strengthening interpersonal relationships, updating professional and adequate training of staff for protection (Wu, Connors & Junior, 2020; Yin & Zeng, 2020; Sun et al, 2020). For Sanchez et al (2020), continuing education is extremely important for workers, especially in times of a pandemic caused by a disease with no known specific treatment.

Another relevant issue is the concern for the security of both professionals and family members. In this regard, the institution can act in order to provide psychological and structural support to professionals, with a view to ensuring a better feeling of security in the act of work. This is also possible through the establishment of strict infection control guidelines, adequate personal protective equipment, as well as the continuous recognition of the medical team’s efforts by their superiors (Cai et al, 2020).

Adopting efficient biosecurity measures, as well as providing adequate care technologies and management, potentially, promotes improvement in physical and psychosocial well-being (Moraes et al, 2020). The training and preparation of the team influences the psychological repercussions on health workers. It is observed that, specifically, anxiety may be more common among professionals who do not have clinical training, when compared to appropriately trained personnel in the medical field (Chew et al, 2020).

Personal management strategies in the workplace can ease the pressure faced by professionals. In Wuhan, most hospitals have established a shift system to allow front-line workers to rest and take turns during their efforts. Moreover, online platforms have been provided with medical advice to share information on how to decrease the risk of transmission among patients in medical settings that eventually aim to reduce pressure on workers (Kang et al, 2020). The availability of telephone contact with mental health professionals by the institution and the provision of support materials help to reduce psychological risk (Kang et al, 2020; Rajkumar, 2020).

In the study by Sun et al (Sun et al, 2020), it appears that self-coping strategies are extremely important in promoting a good professional experience in the COVID-19 outbreak. Psychological and life adjustment such as: not thinking about the experienced stress, breathing control in adverse moments of professional practice, exposing feelings when necessary, as well as establishing altruistic means in the search for support among team members, with mutual exchange of experiences lived for encouragement in adverse moments, are methods that can prevent exposure to risk factors that undermine mental health. Adversities and coping strategies are considered to promote professional development and growth. Furthermore, the style of self-control, the fact of perceiving the professional growth that the pandemic confers and the fact that it is helping people promotes psychological growth that plays a very important role in the nurses' mental health.

Social networks have been positive regarding social support and mental health during the COVID-19 pandemic; however, the spread of *Fake News* and negative feelings have contributed to the worsening of the population's mental health. Therefore, it is necessary to use social media to disseminate reliable information that supports psychological adversities (Cruz et al, 2020; Liu et al, 2020) for both the population and health professionals.

It is also observed that the presence of mental health teams in work environments in order to listen and meet the team's demands consists of a valuable strategy (Kang et al, 2020), thus favoring assertive care in combating symptoms that can undermine mental health. Wuhan University Hospital and Wuhan Mental Health Center have created psychological

intervention teams composed of four care groups, obtaining promising results in relation to the mental care of front-line professionals (Kang et al, 2020).

In Brazil, there is already an encouragement to remove nursing professionals who belong to groups at risk of direct care to patients or under suspicion or with confirmation for COVID-19, being relocated to less vulnerable actions. In this sense, an action by the Brazilian Federal Nursing Council highlights that the composition of teams with people over the age of 60 and with risk factors for COVID-19 should be avoided, as well as encouraging the transfer of pregnant and lactating professionals to services that do not have contact with patients treated by COVID-19 (COFEN, 2020). These measures can reduce the feeling of vulnerability and rule out risk factors that trigger psychological symptoms in health professionals in the face of the current pandemic.

The government's role is also preponderant in times of outbreak. The recognition and appreciation of the performance of front-line professionals can provide psychological benefits to these agents (Cai et al, 2020). In the national scenario, such recognition by the Federal Government is still incipient, which can undermine not only the mental health of professionals, but also the population in general, thus reaping negative results in public health in terms of combating the pandemic.

Study limitations

The COVID-19 pandemic is an emerging issue that requires attention, in addition to continuous and global investments. Due to the fact that it is a new disease, the scientific community has been mobilized in order to provide adequate and evidence-based information, with a view to guiding the clinical and psychological approach to patients and health professionals.

In this context, it is necessary to conduct longitudinal studies, involving the mental health of professionals working on the frontline of the pandemic. Furthermore, the production of new investigations with this theme should be stimulated so that it is possible to understand the dynamic mental health in times of the COVID-19 outbreak and, with this, guide care strategies to be adopted.

5. Conclusion

The analysis of the results allowed to conclude that aspects associated with the current COVID-19 pandemic have an impact on the mental health of health professionals. Related to this impact, one can mention the high occupational exposure to the virus, the fear of becoming infected and becoming a potential transmitter, the inadequate availability of PPE, social isolation, besides the constant fear of dying or of being the transmitting agent of the disease, thus contributing to the death of another. Furthermore, according to studies, feelings and conditions such as stress, anxiety, depression, distress, insomnia and professional exhaustion are identified as hindering the coping process.

In light of the foregoing, the occurrence of more positive outcomes in the scope of mental health should be emphasized through the existence of institutional constructs that promote psychosocial support to health professionals. This becomes possible based on adequate working conditions, availability of personal protective equipment, support groups and continuing education, which should be offered by the very health services.

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