Burnout-related factors in health professionals during the Covid-19 pandemic: an integrative review

Fatores associados ao burnout em profissionais de saúde durante a pandemia de Covid-19: revisão integrativa

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ABSTRACT The outbreak of the new coronavirus pandemic has increased the workload on health professionals, who have been subjected to circumstances of great physical and psychological stress that can lead to the development of burnout. This study aimed to understand the effects and consequences of working during the Covid-19 pandemic on the mental health of healthcare workers and factors that may be associated with the development of burnout syndrome. This is an integrative review performed on the PubMed, Cinahl, Scopus, Embase and VHL databases, using the descriptors: "health personnel", "burnout, professional", and "Covid-19", with the Boolean operator AND. The initial search resulted in 229 articles, and after the application of inclusion and exclusion criteria, the final sample consisted of 12 articles. Through the Descending Hierarchical Classification, performed by the IRaMuTeQ, software, a dendrogram with 6 classes was obtained, named 'Nursing professionals and female gender', 'Experience in health work', 'Work overload and uncertainties about the future', 'Age of professionals', 'Fear of infection and transmission', 'Front line in the fight against the pandemic'. It was evidenced that professional experience, working conditions, financial situation, relationship between work and family, fear of contamination and transmission of the disease were the main factors associated with the development of burnout in health professionals.

KEYWORDS Burnout, psychological. Health personnel. Covid-19.

RESUMO *A explosão da pandemia do novo coronavírus aumentou a sobrecarga de trabalho, em que, os profissionais de saúde foram submetidos a circunstâncias de grande desgaste físico e psicológico que podem levar ao desenvolvimento de burnout. O estudo objetivou compreender os efeitos e consequências do trabalho durante a pandemia da Covid-19 na saúde mental dos profissionais de saúde e fatores que podem estar associados ao desenvolvimento da Síndrome de burnout. Trata-Se de revisão integrativa nas bases de dados PubMed, Cinahl, Scopus, Embase e BVS, utilizando os descritores: "health personnel", "burnout, professional", e "Covid-19", com o operador booleano AND. Resultaram-se, inicialmente, 229 artigos, e após critérios de inclusão e exclusão, a amostra final foi de 12 artigos. Por meio da Classificação Hierárquica Descendente, realizada pelo software IRaMuTeQ, obteve-se um dendrograma com 6 classes, nomeadas 'Profissionais de Enfermagem e sexo feminino', 'Vivência no trabalho em saúde', 'Sobrecarga de trabalho e incertezas com o futuro', 'Idade dos profissionais', 'Medo de infecção e transmissão', 'Linha de frente no combate à pandemia'. Evidenciou-se que experiência profissional, condições de trabalho, situação financeira, relação entre trabalho e família, medo de contaminação e transmissão da doença foram os principais fatores associados ao desenvolvimento de burnout em profissionais de saúde.*

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Introduction

The outbreak of the new coronavirus pandemic and the increasing number of new cases and deaths from the disease have resulted in social, economic, and health consequences for the population[1]. Measures such as social distancing were adopted to control the advance of the disease, affecting the population in several aspects of living and health conditions, including, significantly, mental health[2].

Changes to one's sleeping patterns, feeling on edge, sadness, depression, and anxiety were cited as the main consequences of the pandemic on people's mental health, and these were shown to be aggravated in people with a history of depression[2].

Health professionals have suffered increased work overload during the Covid-19 pandemic, and even without exact knowledge of the disease, they faced a high demand of patients, with insufficient human resources and inadequate infrastructure in the health services[3].

Besides the factors already mentioned, other challenges imposed by the pandemic, such as the high transmissibility of the virus and the lack of Personal Protective Equipment (PPE), have directly impacted on workers' mental health, contributing to the development of burnout syndrome, since professionals are in direct contact with all the determinants of this syndrome.

The consequences of health professionals falling ill due to burnout[4] include: reduced worker performance, poor quality of care, compromised patient safety, increased adverse events, medication errors, and more infections and patient falls[5].

Burnout syndrome has been described in Brazilian and foreign literature as a psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with other people in some way[6], resulting from chronic stress in the workplace that has not been successfully managed[7].

This problem is recognized as one that can affect various occupations around the world, however, scholars point out that the problem is rooted in occupations that involve the provision of services and care, which applies to the work of health professionals[8]. They often deal with complex problems and work continuously under circumstances that can lead to the development of burnout[6]. The Agency for Healthcare Research and Quality estimated that by 2015, the syndrome could affect 10% to 70% of nurses and 30% to 50% of physicians, nurse practitioners, and physician associates. This percentage may have increased over time[9].

Given the current context, we reflected on the following guiding question: what factors have been associated with the development of burnout syndrome in health care professionals during the Covid-19 pandemic, according to national and international literature?

This Integrative Review was therefore developed with the objective of understanding the effects and consequences of working during the Covid-19 pandemic on the mental health of health care workers, and factors that may be associated with the development of burnout syndrome.

Material and methods

This is an integrative review article. This type of study was chosen because it allows for results from previously developed studies, with different methodological approaches, to be synthesized, and for the provision of more extensive information about a certain matter/problem/question through scientific evidence[4].

To achieve the proposed objective, the essential steps of an integrative review were followed: identification of the topic and selection of the research question; establishment of eligibility criteria; identification of studies in the scientific databases; evaluation of the selected studies and critical analysis;

categorization of the studies; evaluation and interpretation of the results, and presentation of the data within the framework of the integrative review[4].

The guiding question was developed using the Pico/Peco strategy (acronym for Patient, Intervention/Exposure, Comparison, Outcomes), where 'P' refers to healthcare professionals, 'E' to the Covid-19 pandemic, 'C' was not applicable in this review, and 'O' refers to burnout syndrome.

To build the *corpus* of articles for the research, Internet searches were performed from September 14 to 17, 2020. Five databases were used: PubMed, Cinahl, Scopus, Embase and VHL. To ensure vocabulary control and the identification of matching words, the Medical Subject Heading Terms (MeSH Terms) were used. The following descriptors were used in the search: "health personnel", "burnout, professional", and "Covid-19", these were combined using the Boolean operator AND in all the databases. The article search did not cover databases of theses and dissertations as such documents were not submitted for peer review and because the subject matter is a recent one; considering the research period, no corresponding documents were found.

From the set of descriptors for the article search that formed this review and through the filters of the databases themselves, the following inclusion criteria were established: articles published from December 2019 onwards, the month in which the new coronavirus emerged, available in full, without any language restriction. Each reference was imported into Rayyan QCRI software, whereby repetitions between and within databases were excluded. The exclusion criteria were: being a review article and duplication within and between the databases used, not presenting descriptors in the title or abstract of the articles selected. Also excluded were the comments, reviews, and editorials of the literature. Since there are different theories of burnout, we do not restrict this definition according to any specific theory. It should be underlined that duplicate studies were considered only once.

The first stage of the evaluation of the included references consisted of reading the titles and abstracts of the articles; the second stage consisted of reading the full text of the studies; and the third and last stage consisted of evaluating the full text of the included studies. In all steps, the reading and analysis of the articles were performed by two independent researchers to avoid selection bias. Possible disagreements were discussed and evaluated jointly with a third researcher to establish a consensus. The studies considered were those that presented in their results participants with burnout syndrome regardless of the level and aspects (emotional exhaustion, depersonalization, professional accomplishment), since the instruments used in the selected studies have different ways of being analyzed.

The selected studies were systematized in a data collection instrument, adapted from an instrument already validated by URSI in 2005[10], which allowed information to be obtained for: title, journal, year of publication, objectives, sample, method, and results.

The level of evidence of the studies was classified as follows: level I – meta-analysis studies of multiple randomized controlled trials; level II – individual studies with experimental design; level III – quasi-experimental studies, time series or case-control studies; level IV – descriptive studies (non-experimental or qualitative approach); level V – case or experience reports; level VI – expert committee opinions, including interpretations of information not based on research, regulatory or legal opinions[11].

A limitation of the articles selected for this review is that they are mostly cross-sectional studies, and thus it is not possible to establish a temporal relationship between the events, since it is a direct observation of a planned number of individuals at a specific time.

Since this is an integrative review study, the method does not apply to the qualification stage of the selected (primary) studies, since this is one of the stages of systematic reviews[12]. By identifying themes in the area, therefore,

this study can help steer other types of more robust reviews, such as systematic reviews, in which the primary articles can be qualified, which cannot be done within the methodology of the present study.

Data analysis was performed with the help of the software Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires (IRaMuTeQ, version 0.7 alpha 2). IRaMuTeQ is free software for statistical analysis of text corpora. The *corpus* was composed by synthesizing the articles included in the review. In this study, we performed a Descending Hierarchical Classification (DHC), which enables the construction of classes of text segments which share similar vocabulary, and have different vocabulary to the text segments of the other classes[13].

Results

The database searches resulted in a total of 229 articles; of which, 128 were excluded for not corresponding to the study. After reading the titles and abstracts, 101 remained, of which 65 were duplicates. For the reading in full, 36 articles were selected, and after reading, 24 were excluded for not being in accordance with the theme. The final sample consisted of 12 articles included in the present review (*figure 1*).

Figure 1. Flowchart of study selection, adapted from Prism. Natal, Brazil, 2021
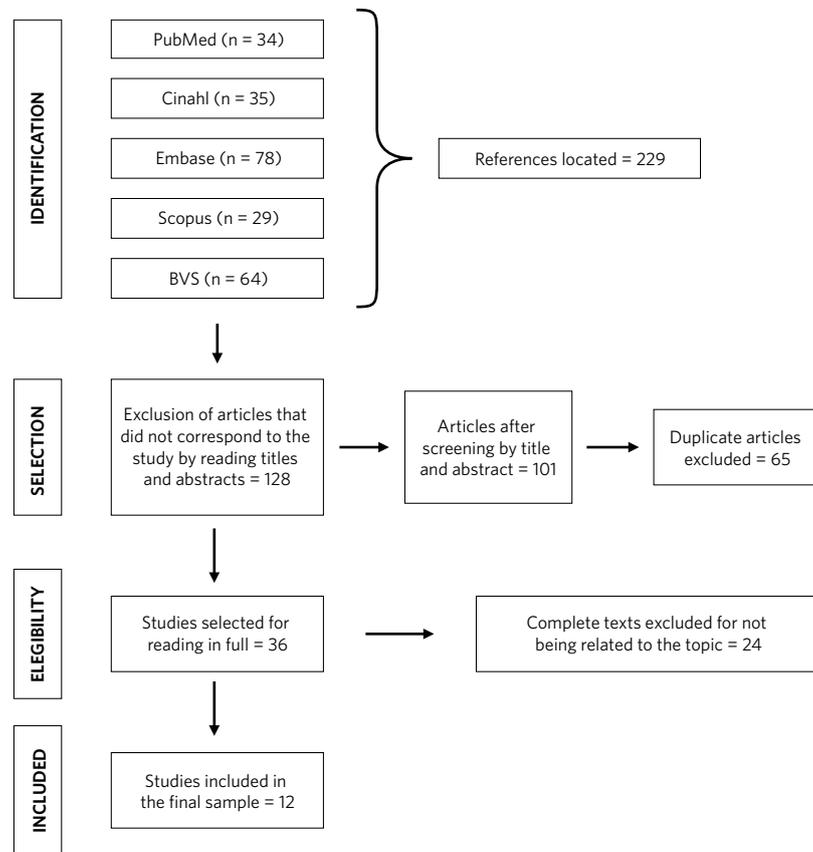
Source: developed by the authors.

All the studies that comprised the sample were in the English language and published in the year 2020. As regards the type of research design of the articles evaluated, the sample was composed of: 11 cross-sectional studies and 1 descriptive study. Thus, regarding the strength of evidence obtained in the articles, they were all classified as level of evidence IV. The data show the the studies distributed among 11 journals; with Plos One standing out with two publications (*table 1*).

Table 1. Description of the studies selected for review according to author, title, journal, year of publication, objective, method, and level of evidence. Natal, Brazil, 2021

Authors / Title / Journal / Year of Publication / Country	Objective	Method and Level of Evidence	Sample	Results
Civantos AM., et al. Mental health among head and neck surgeons in Brazil during the COVID-19 pandemic: A national study. American Journal of Otolaryngology, 2020 Brazil	Use validated studies into burnout, anxiety, depression, and distress to assess mental health outcomes among Brazilian head and neck surgeons as they approach the peak of the pandemic.	Cross-sectional, survey-based, national study conducted during the Covid-19 pandemic in Brazil from May 14, 2020 to May 31, 2020. Four self-applied instruments validated in Brazil were used. Demographics were self-reported. Respondents were also asked about a history of any psychiatric condition. Finally, they categorized their current mental health as better, worse, or the same compared to their pre-pandemic baseline. Level IV	163 physicians	774.2% of the participants were male. Symptoms of anxiety, distress, burnout, and depression were reported in 74 (45.5%), 43 (26.3%), 24 (14.7%), and 26 (16%) physicians, respectively. In the multivariable analysis, female physicians were more likely to report a positive screening for burnout compared to men (OR 2.88, CI [1.07-7.74]). Physicians aged 45 or older were less likely to experience anxiety symptoms than those younger than 45 (OR 0.40, CI [0.20-0.81]). Physicians without self-reported prior psychiatric conditions were less likely to have symptoms of distress compared to those with such a history (OR 0.11, CI [0.33-0.38]).
Jha SS., et al. The Effect of COVID-19 on Interventional Pain Management Practices: A Physician Burnout Survey. Pain Physician, 2020 United States of America	Assess the presence of Covid-19 pandemic-specific Burnout among interventional pain physicians.	Cross-sectional study, in which participants were recruited through registered e-mail addresses. They introduced the study by e-mail and provided a link to the survey (www.constant-contact.com). The instrument used consisted of 32 questions. Level IV	100 physicians	The survey data showed that 98% of medical practices were affected by Covid-19. 91% of physicians felt a significant financial impact. Roughly 67% of physicians responded that internal billing was responsible for the increased level of burnout, while 73% responded that Electronic Medical Records (EMRs) were a cause. Overall, 78% were very concerned. Almost all respondents were affected with a reduction in interventional procedures. 60% had a negative opinion about the future of their practice, while 66% were negative about the entire healthcare industry.

Table 1. (cont.)

Authors / Title / Journal / Year of Publication / Country	Objective	Method and Level of Evidence	Sample	Results
Hu D., et al. Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. Research Paper, 2020 China	To examine mental health (burnout, anxiety, depression and fear) and its associated factors in front line nurses caring for Covid-19 patients in Wuhan, China.	Descriptive study, developed with front line nurses from two hospitals in Wuhan, China. A sociodemographic questionnaire and a set of valid and reliable instruments were used to measure burnout, anxiety, depression, fear, skin injury, self-efficacy, resilience, and social support scores via the online survey in February 2020. Level IV	2,014 nurses	The participants had a moderate level of burnout and a high level of fear. About half of the nurses reported moderate and high burnout at work, evidenced in emotional exhaustion (n = 1,218, 60.5%), depersonalization (n = 853, 42.3%) and personal accomplishment (n = 1,219, 60.6%). The results showed that 288 (14.3%), 217 (10.7%) and 1,837 (91.2%) nurses reported moderate and high levels of anxiety, depression and fear, respectively. Most nurses (n = 1,910, 94.8%) had one or more skin lesions, and 1,950 (96.8%) nurses expressed their willingness to work on the front line. Mental health outcomes were statistically positively correlated with skin lesion and negatively correlated with self-efficacy, resilience, social support,and willingness to work on the front line.
Kannampallil TG., et al. Exposure to COVID-19 patients increases physician trainee stress and burnout. Plos One, 2020 United States of America	Investigate the effect of exposure of trainee physicians to Covid-19 patients in their clinical roles on their mental health and well-being outcomes.	Cross-sectional study, developed online, in which the instruments were sent by e-mail to the trainee physicians. The study was conducted during the period April 10 to 25, 2020. The instrument used consisted of questions related to sociodemographic data, clinical responsibilities, residency program, and daily stressors. Level IV	393 physicians	Compared to the unexposed group, the exposed group had a higher prevalence of stress (29.4% vs. 18.9%) and burnout (46.3% vs. 33.7%). The exposed group also had moderate to extremely high perceived stress regarding childcare and had a lower work-family balance. Multivariable models indicated that physicians who were exposed to Covid-19 patients reported significantly higher stress (10.96 [95% CI, 9.65 to 12.46] vs 8.44 [95% CI, 7.3 to 9.76]; P = 0.043) and were more likely to be exhausted (1.31 [95% CI, 1.21-1.41] vs 1.07 [95% CI, 0.96-1.19]; P = 0.002]. Female medical interns were more likely to be stressed (P = 0.043); unmarried interns were more likely to be depressed (P = 0.009) and marginally more likely to have anxiety (P = 0.051).
Barello S., et al. Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. Psychiatry Research, 2020 Italy	To describe the levels of occupational burnout and physical symptoms of Italian front line health care workers directly involved in the care of Covid-19 patients at the height of the pandemic in the country, comparing them across genders and occupational roles. It also investigated the relationship between work-related burnout and negative health symptoms.	Cross-sectional study, which used the Maslach Burnout Inventory (MBI), developed online. Participants were selected considering their risk of contracting Covid-19. Level IV	1.153 profissionais de saúde	A large percentage of health care professionals reported high scores in at least one of the MBI domains: in particular, more than a third reported high Emotional Exhaustion scores and more than a quarter reported high levels of depersonalization, while only about 15% reported lowlevels of personal accomplishment.

Table 1. (cont.)

Authors / Title / Journal / Year of Publication / Country	Objective	Method and Level of Evidence	Sample	Results
Morgantini LA., et al. Factors contributing to healthcare profession-al burnout during the COVID-19 pandemic: A rapid turnaround global survey. Plos One, 2020. United States of America	To understand the impact of Covid-19 on healthcare profession-als around the world working during the pandemic.	Cross-sectional study, de-veloped with health profes-sionals, during the period from April 6 to 16, 2020. The platforms Facebook, WhatsApp and Twitter, and e-mailwere used for recruit-ment. Socio-demographic data were collected, as well as data on exposure, perception, workloads, and emotional exhaustion. Level IV	2,707 health professionals	51% of professionals reported burnout, and it was associated with work impacting household activities (RR = 1 - 57, 95% CI = 1 - 39-1 - 78, P <0 -001), developing work beyond technical ability (RR = 1 - 32, 95% CI = 1 - 20-1 - 47, P <0 - 001), exposure to Covid-19 patients (RR = 1.18, 95% CI = 1 - 05-1 - 32, P = 0 - 005), and prioritizing personal decisions (RR = 1 - 16, 95% CI = 1 - 02-1 - 31, P = 0 - 03). Appropriate Personal Protective Equipment (PPE) was seen as a protective factor against burnout (RR = 0 - 88, 95% CI = 0 - 79-0 - 97, P = 0 - 01). Burnout was higher in high-income countries compared to low- and middle-income countries (RR = 1.18; 95% CI = 1.2-1.36, P = 0.018).
Franza F., et al. The Role of Fatigue of Compassion, Burnout and Hopelessness in Healthcare: Experi-ence in the Time of COVID-19 Outbreak. Psychiatr Danub, 2020. Italy	Investigate stress, burnout and fatigue among healthcare professionals.	Cross-sectional study de-veloped in two phases, in March and April 2020 in different rehabilitation de-partments (psychiatric and multidisciplinary). Level IV	102 health professionals	The results show a high percentage of burnout and fatigue among the professionals. Higher educa-tional level was seen as a protective factor against work-related stress.
Matsuo T., et al. Prevalence of Health CareWorker Burnout During the Corona-virus Disease 2019 (COVID-19) Pandemic in Japan. JAMA Netw Open. 2020 Japan	To assess the preva-lence of burnout among front line healthcare workers during the Covid-19 pandemic in Japan based on job catego-ries and other factors.	A cross-sectional study, developed online with healthcare professionals at St. Luke's International Hos-pital, Tokyo, Japan, during the period April 6-19, 2020. Sociodemographic charac-teristics, work history, work environment, perceived anxiety compared to before the pandemic were ana-lyzed. The primary outcome was the prevalence of burn-out syndrome. Level IV	312 health professionals	The majority of the participants were between 26 and 40 years old, 71.5% were women. The overall prevalence of burnout was 31.4% (98 of 312). Of 126 nurses, 59 (46.8%) were suffering from burnout; of 22 radiology technicians, 8 (36.4%) were suffering from burnout; and of 19 pharma-cists, 7 (36.8%) were suffering from burnout. The syndrome was more present in women (80.6%). Using physicians as a comparison group, the prev-alence of burnout was significantly higher among nurses (OR, 4.9; 95% CI, 2.2-11.2; P = 0.001), laboratory technicians (OR, 6.1; 95% CI, 2.0-18.5; P = 0.002), radiologic technicians (OR, 16.4; 95% CI, 4.3-61.6; P = 0.001), and pharmacists (OR, 4.9; 95% CI, 1.3-19.2; P = 0.02). Furthermore, burnout was more prevalent in participants with fewer years of experience (OR, 0.93; 95% CI, 0.89-0.97; P = 0.001), with high anxiety due to unfamiliar-ity with personal protective equipment (OR, 2.8; 95% CI, 1.4-5.5; P = 0.002), with reduced hours of sleep compared to the pre-pandemic period (OR, 2.0; 95% CI, 1.1-3.6; P = 0.03), with a desire for reduced workloads (OR, 3.6; 95% CI, 1.6-8.0; P = 0.002), and with a desire to expect appreciation or respect (OR, 2.2; 95% CI, 1.1-4.6; P = 0.03).

Table 1. (cont.)

Authors / Title / Journal / Year of Publication / Country	Objective	Method and Level of Evidence	Sample	Results
Luceño-Moreno L., et al. Symptoms of Post-traumatic Stress, Anxiety, Depression, Levels of Resilience and Burnout in Spanish Health Personnel during the COVID-19 Pandemic. Int J Environ Res Public Health. 2020. Spain	To assess symptoms of post-traumatic stress, anxiety, depression, levels of burnout and resilience in Spanish healthcare workers during the Covid-19 pandemic. Also aims to assess the relationship between each of the variables (demographics, job, Covid-19, burnout and resilience) and symptoms of post-traumatic stress, depression and anxiety. It is also intended to identify which variables carry the most weight in each of the three categories (post-traumatic stress, anxiety, and depression).	Cross-sectional study, which used as instruments: a sociodemographic questionnaire, post-traumatic stress scale, anxiety and depression scale, Maslach Burnout Inventory and resilience scale. The data were collected via online survey from April 1 to April 30, 2020. Level IV	1,422 health professionals	A total of 56.6% of the health care workers showed symptoms of post-traumatic stress disorder, 58.6% of anxiety disorder, 46% of depressive disorder, and 41.1% feel emotionally exhausted. The profile of a healthcare worker with greater symptoms of post-traumatic stress would be: a person who works in the Autonomous Community of Madrid, in a hospital, a woman, worries that a person with whom she lives might be infected, and thinks that she/he is very likely to be infected. The risk variables for anxiety and depression would be a person who is female, working 12- or 24-hour shifts, and worried that a family member might be infected. High scores on emotional exhaustion and depersonalization (which are dimensions of burnout) are risk factors for mental health, with resilience and personal accomplishment being protective variables.
Wu Y., et al. A Comparison of Burnout Frequency Among Oncology Physicians and Nurses Working on the Frontline and Usual Wards During the COVID-19 Epidemic in Wuhan, China. J Pain Symptom Manage. 2020. China	Compare the frequency of burnout between doctors and nurses on frontline wards (FLs) and those working on regular wards (UWs).	Cross-sectional study, developed from March 13 to 27, 2020, performing a comparison in a 1:1 ratio. The survey included 15 demographic questions and questions about the participants' status in the two previous months, and the Maslach Burnout Inventory. Burnout was defined as a high level of emotional exhaustion greater than 27 and / or a high level of depersonalization greater than 10. We separately considered the frequency of participants with a low sense of personal accomplishment (PA) of less than 31. Level IV	220 doctors and nurses	The group working on the front line had a lower frequency of burnout (13% vs. 39%; P <0.0001) and were less worried about being infected compared to the group not working on the front line.

Table 1. (cont.)

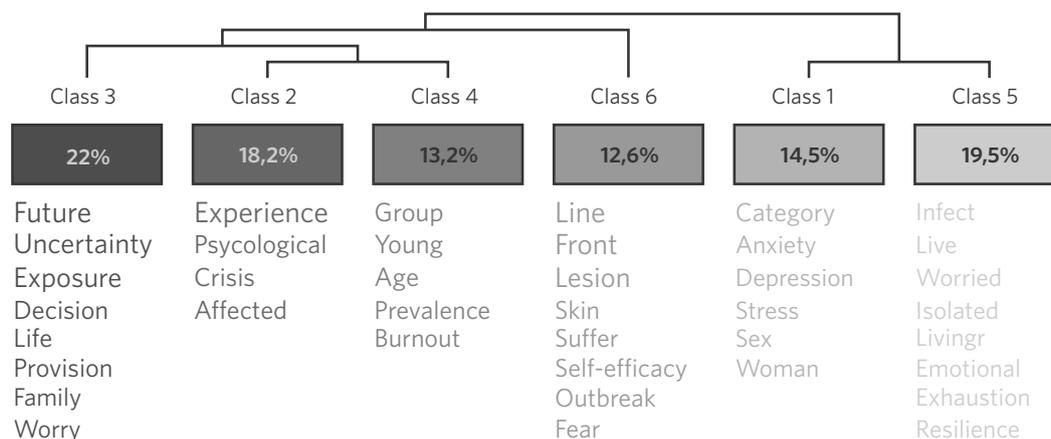| Authors / Title / Journal / Year of Publication / Country	Objective	Method and Level of Evidence	Sample	Results
Zerbini G., et al. Psychosocial burden of health care professionals in times of COVID-19– a survey conducted at the University Hospital Augsburg. Ger Med Sci. 2020. Germany	To explore whether individuals working on Covid-19 special wards are experiencing higher psychosocial strain compared to their colleagues working on regular wards, and whether different healthcare professionals (nurses vs. doctors) are affected differently by the pandemic. In addition, we used open-ended questions to explore individual reasons and perceptions of psychosocial burden and possible solutions for improving working conditions.	Cross-sectional study, with data collected between March and April 2020 at Augsburg University Hospital. The participants worked on both Covid-19 special wards and regular wards. Participants completed two standardized questionnaires (the Patient Health Questionnaire, PHQ; and the Maslach Burnout Inventory, MBI) and reported their fear of a Covid-19 infection and job stress on a 10-point Likert scale. Finally, they answered three open-ended questions about the causes of the burden, support resources, and needs during the crisis. Level IV	75 nurses 35 physicians	Nurses working on Covid-19 wards reported higher levels of stress, burnout, and depressed mood, as well as lower levels of work-related accomplishment compared to their colleagues on regular wards. Physicians reported similar scores regardless of their contact with Covid-19 patients. The most common causes of overload were work-related stress and uncertainty about the future. Psychosocial support as well as leisure time were listed as important resources and a better infrastructure setup for Covid-19 in the hospital (e.g., sufficient staffing, keeping work teams and timetables stable) as a suggestion for improvement.
Azoulay E., et al. Symptoms of burnout in intensive care unit specialists facing the COVID-19 outbreak. Ann Intensive Care, 2020. Belgium	Document the prevalence of mental health outcomes in ICU specialists facing the Covid-19 outbreak.	Cross-sectional study, data collected online from April 30 to May 25, 2020. Sociodemographic data, symptoms of severe burnout, anxiety, and depression were collected. Level IV	1,001 ICU specialists	The majority of the participants were between 39 and 53 years old and 34% were women. The prevalence of symptoms of anxiety and depression or severe burnout was 46.5%, 30.2%, and 51%, respectively, and varied significantly between regions. Factors independently associated with anxiety were female gender (HR 1.85 [1.33-2.55]), working in a university-affiliated hospital (HR 0.58 [0.42-0.80]), living in a city of >1 million inhabitants (HR 1.40 [1.01-1.94]), and clinician's rating of the ethical climate (HR 0.83 [0.77-0.90]). Independent determinants of depression included female gender (HR 1.63 [1.15-2.31]) and clinician's rating of the ethical climate (HR 0.84 [0.78-0.92]). Factors independently associated with severe burnout symptoms included age (HR 0.98 / year [0.97-0.99]) and clinician's rating of the ethical climate (HR 0.76 [0.69-0.82]).

Source: developed by the authors.

Through the DHC performed by the IRaMuTeQ software, 192 text segments were analyzed, with 82.81% (192 text segments) of the text *corpus* retained for the construction of the six classes arising from the content partitions. Each class was represented by the most significant words by means of X^2 and p-value (<0.05), with their associations according to the classes.

Figure 2 shows the dendrogram of the classes obtained, which illustrates the partitions made in the *corpus* until six final classes were obtained, showing which words were most frequent in each class.

Figure 2. Descending Hierarchical Classification dendrogram of the *corpus* about factors that are associated with the development of burnout syndrome in health care workers during the Covid-19 pandemic. Natal, Brazil, 2021

Class 3	Class 2	Class 4	Class 6	Class 1	Class 5
22%	18,2%	13,2%	12,6%	14,5%	19,5%
Future	Experience	Group	Line	Category	Infect
Uncertainty	Psycological	Young	Front	Anxiety	Live
Exposure	Crisis	Age	Lesion	Depression	Worried
Decision	Affected	Prevalence	Skin	Stress	Isolated
Life		Burnout	Suffer	Sex	Livingr
Provision			Self-efficacy	Woman	Emotional
Family			Outbreak		Exhaustion
Worry			Fear		Resilience

Source: developed by the authors.

Class 1, named 'Nursing professionals and female gender', contributed 14.5% of the total text segments; class 2, 'Experience in health work', comprised 18.2% of the segments; class 3, 'Work overload and uncertainties over the future', corresponded to 22% of the total text segments; class 4, 'Age of professionals', comprised 13.2% of the total text segments; class 5, 'Fear of infection and transmission', represented 19.5% of the segments; and, finally, class 6, which was named 'Front line in fighting the pandemic', corresponded to 12.6%.

The different percentages attributed by IRaMuTeQ to the six classes resulting from the DHC refer to the quantity of words/subjects that emerged from the analysis of the articles in each class, without any weighting of classes used.

Discussion

Several factors are associated to the development of burnout syndrome in health care workers during the Covid-19 pandemic; factors related to the worker him/herself, the work environment, and the social environment.

Class 1, 'Nursing professionals and female gender', emphasized that the nursing category showed more symptoms of anxiety and depression, and higher levels of burnout compared to the other professional categories. The results reveal specific factors related to the work of this professional category, since these carers usually work long shifts due to the scarcity of professionals, little rest, high level of tension, and closer contact with the patient, which may result in physical fatigue and emotional exhaustion, characteristic symptoms of the development of the syndrome[14,15].

In addition to the factors already mentioned, the literature shows that a low degree of flexibility in their work hours, time pressures, high pressure and psychological demands, little variety in tasks, role conflict, low autonomy, poor relationships between nurses and physicians, low management support, poor leadership, conflicting relationships with staff, and job insecurity are also factors that make nurses susceptible to burnout[5].

This class also showed that females showed more symptoms of mental disorder. Women showed higher levels of burnout, post-traumatic stress, anxiety, and depression than men.

They are more susceptible to developing burnout due to a series of factors that can occur individually or simultaneously: the double shift, split between professional, maternal, and domestic responsibilities; remuneration; relationship with patients and family members; contact with illness; death; lack of professional recognition; scarcity of human resources to provide an adequate service that results in work overload; as well as the lack of autonomy at work to make decisions[16-18].

However, Jarruche and Mucci[19] point out the need to develop more research on burnout syndrome in order to study its prevalence in the female gender and its impact, as well as studies involving other professions besides nursing and medicine, since it is necessary to clarify whether, indeed, these areas are the most affected by the syndrome or if their rates seem higher because they are the subject of most research.

In class 2, 'Health work experience', it was shown that health workers were subjected to higher levels of stress during the pandemic. Furthermore, in this class, it could be observed that burnout was more prevalent among participants with fewer years of work experience. Professional experience is seen as a factor that can contribute to greater control in dealing with situations of stress and anxiety, as well as being related to greater confidence and problem-solving ability in the work environment[20]. The less experienced professionals showed high anxiety due to lack of familiarity with PPE and reduced hours of sleep compared to the pre-pandemic period.

In class 3, 'Work overload and uncertainty about the future', it was highlighted that increased exposure of health care workers to patients with Covid-19 symptoms, with a consequent increase in the workload, has caused increased levels of burnout. The work overload of health care professionals during the pandemic, due to the increased demand of infected people, predisposes

to the development of burnout syndrome, reflected in the quality of life of these professionals[21-23].

Furthermore, healthcare workers who care for Covid-19 patients have higher levels of stress in the relationship between work and the family and childcare. The results corroborate a study that showed that the main sources of anxiety and fear during the pandemic include the concern of health professionals about access to day care centers and school closures, as well as support for personal and family demands in the face of increased work hours[24].

This class also concentrates words that emphasized that uncertainty in relation to the future caused by the pandemic is also a factor associated with burnout in health workers – misgivings about the duration of the pandemic and its short- and long-term impacts, including in the financial realm (economic crisis/fall in household incomes). Similar results were found in a study developed in Portugal, which concluded that wage cuts were considered a significant factor for the development of burnout among health professionals during the pandemic[20].

In class 4, 'Age of professionals', one can point to words that, regardless of professional experience, related the age of the health professionals to mental health problems during the pandemic, as younger professionals showed higher levels of anxiety and distress. These results are consistent with a study that showed that professionals under the age of 40 suffered from higher levels of stress, anxiety, depression, work exhaustion, and impaired general well-being[25].

Class 5, 'Fear of infection and transmission', highlighted words that show that the fear felt by health workers of being infected by Covid-19 and transmitting the disease to their family would harm their mental health, especially when the health workers lived with people in a risk group. A similar result was found in the study by Juan et

al.[26], in which the fear of going home and infecting the family was one of the main factors related to mental suffering among health professionals.

Furthermore, resilience stood out as a protective factor against burnout syndrome. An individual becomes resilient when facing adverse situations, from which he/she becomes stronger and acquires skills. Amid the adversities faced during the Covid-19 pandemic, resilience is considered a key characteristic for maintaining the mental health of health care workers[27].

Class 6, called 'Front line in fighting the pandemic', showed that front line professionals suffered from fear of infection and death. Healthcare professionals involved in the care of Covid-19 patients, such as nurses, also showed high levels of stress and burnout when compared to nurses assisting other patients not stricken by the disease[28]. However, the higher the self-efficacy and willingness to work on the front line, the lower the burnout levels found.

In this class, there were also words that demonstrate the relationship of burnout with skin lesions caused by the prolonged use of masks in nurses, insofar as the worse the lesion, the higher the levels of this grievance. Lan et al.[29] found a 97% prevalence rate of skin lesions among front line health care workers in China during the Covid-19 epidemic period, potentially generating reduced enthusiasm for work and making them anxious.

Psychosocial support from friends and family members stood out as critical to the mental health of front-line health care workers. Moreira and Lucca[30] state that, in addition to adequate working conditions, psychosocial support is very important for the preservation of the mental health of the professionals involved in the fight against Covid-19 and for the quality of the care provided.

Conclusions

Extreme work demands have been placed on health care workers due to the Covid-19 pandemic, contributing to the deterioration of their mental health. This article reports a set of findings about the factors associated with burnout syndrome in health care workers in the context of the Covid-19 pandemic. It demonstrated that the main factors associated with the development of burnout are belonging to the nursing category, being female, the worker's professional experience, working conditions, financial situation, relationship between work and family, and fear of becoming infected and transmitting the disease to others.

The impact on health systems around the world and the changes in work dynamics generated by the pandemic may last for a long time, and the health worker's exposure to this new work context may generate health consequences. It is known that burnout is not an acute condition, but rather a response to the persistent and unsolvable stress of work. Thus, the study concludes that it is of utmost importance to understand the factors that are associated with the development of burnout syndrome in health professionals in the scenario that now includes Covid-19, as this will allow for the planning and development of adequate and targeted coping strategies for health professionals in order to mitigate the risk indicators that can lead to the experience of burnout syndrome.

Collaborators

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References

1.   Freitas ARR, Napimoga M, Donalisio MR. Assessing the severity of Covid-19. Epidemiol Serv Saúde. 2020; 29(2):e2020119.

2.   Barros MBA, Lima MG, Malta DC, et al. Relato de tristeza/depressão, nervosismo/ ansiedade e problemas de sono na população adulta brasileira durante a pandemia de Covid-19. Epidemiol. Serv. Saude. 2020; 29(4):e2020427.

3.   Barroso BIL, Souza MBCA, Bregalda MM, et al. A saúde do trabalhador em tempos de Covid-19: reflexões sobre saúde, segurança e terapia ocupacional. Cad Bras Ter Ocup. 2020; 28(3):1093-1102.

4.   Whittemore R. Combining in nursing research: methods and implications. Nurs Res. 2005; 54(1):56-62.

5.   Dall'Ora C, Ball J, Reinius M, et al. Burnout em enfermagem: uma revisão teórica. Hum Resour Health. 2020; 18(1):1-17.

6.   Maslach C, Jackson SE, Leiter M. The maslach Burnout inventory manual. In: Zalaquett CP, Wood RJ. Evaluating stress: a book of resources. 3. ed. Palo Alto, CA: The Scarecrow Press; 1997. p. 191-218. [acesso em 2022 fev 7]. Disponível em: https://www.researchgate.net/publication/277816643_The_Maslach_Burnout_Inventory_Manual.

7.   World Health Organization. International Classification of Diseases for Mortality and Morbidity Statistics (ICD-11 MMS). Genebra: WHO; 2021.

8.   Maslach C, Leiter M, Schaufeli WB. Measuring Burnout. In: Cooper CL, Cartwright S. The Oxford handbook of organizational well-being. 4. ed. Oxford: Oxford University Press; 2009. cap. 5. p. 86-108.

9.   Bridgeman PJ, Bridgeman MB, Barone J. Burnout syndrome among healthcare professionals. Am J Health-Syst Pharm. 2018; 75(3):147-52.

10.   Ursi ES. Prevenção de lesões de pele no periopera-

tório: revisão integrativa da literatura. [dissertação]. Ribeirão Preto: Universidade de São Paulo; 2005.

11.   Stetler CB, Morsi D, Rucki S, et al. Utilization focused integrative reviews in a nursing service. Appl Nurs Res. 1998; 11(4):195-206.

12.   The Joanna Briggs Institute. Joanna Briggs Institute Reviewers' Manual: 2014 edition/supplement. Adelaide: Joanna Briggs Institute; 2014.

13.   Camargo BV, Justo AM. IRAMUTEQ: um software gratuito para análise de dados textuais. Temas Psicol. (Online). 2013; 21(2):513-18.

14.   Ornell F, Halpern SC, Kessler FHP, et al. The impact of the Covid-19 pandemic on the mental health of healthcare professionals. Cad. Saúde Pública. 2020; 36(4):e00063520.

15.   Silva LS, Machado EL, Oliveira HN, et al. Condições de trabalho e falta de informações sobre o impacto da Covid-19 entre trabalhadores da saúde. Rev Bras Saúde Ocup. 2020; 45:1-8.e24.

16.   Jantsch N, Costa AEK, Pssaia LF. Síndrome de Burnout: uma revisão integrativa. Research, Society Develop. 2018; 7(1):01-18.

17.   Modesto JG, Souza LM, Rodrigues TSL. Esgotamento profissional em tempos de pandemia e suas repercussões para o trabalhador. Rev Pegada. 2020; 21(2):376-91.

18.   Moreira DS, Magnago RF, Sakae TM, et al. Prevalência da síndrome de burnout em trabalhadores de enfermagem de um hospital de grande porte da Região Sul do Brasil. Cad. Saúde Pública. 2009; 25(7):1559-1568.

19.   Jarruche LT, Mucci S. Burnout syndrome in healthcare professionals: an integrative review. Rev. bioét. 2021; 29(1):162-173.

20. Duarte I, Teixeira A, Castro L, et al. Burnout among Portuguese healthcare workers during the Covid-19 pandemic. BMC Public Health. 2020; 20(1):1-10.

21. El-Hage W, Hingray C, Lemogne C, et al. Les professionnels de santé face à la pandémie de la maladie à coronavirus (Covid-19): quels risques pour leur santé mentale? Encéphale. 2020; 46(3):73-80.

22. Babamiri M, Alipour N, Heidarimoghadam R. Research on reducing burnout in health careworkers in critical situations such as the Covid-19 outbreak. Work. 2020; 66:379-380.

23. Ribeiro YSFS, Lopes RN, Brito FLT, et al. Implicações da Síndrome de Burnout em profissionais da saúde durante a pandemia de Covid-19: uma revisão integrativa. Rev Cient Multidisci Núcl Conhecimento. 2020; 1-23.

24. Shanafelt T, Ripp J, Trockel M. Understanding and address sources of anxiety among health care professionals during the Covid-19 pandemia. JAMA. 2020; 323(21):2133-2134.

25. Evanoff BA, Strickland JR, Dale AM, et al. Work-related and personal factors associated with mental well-being during the Covid-19 response: survey of health care and other workers. J Med Internet Res. 2020; 22(8):e21366.

26. Juan Y, Yuanyuan C, Qiuxiang Y, et al. Psychological distress surveillance and related impact analysis of hospital staff during the Covid-19 epidemic in Chongqing, China. Compr Psychiatry. 2020; 103:152198.

27. Schultz CC, Corrêa KID, Vaz SMC, et al. Resiliência da equipe de enfermagem no âmbito hospitalar com ênfase na pandemia Covid-19. Res Soc Dev. 2020; 9(11):e539119466.

28. Hoseinabadi TS, Kakhki S, Teimori G, et al. Burnout and its influencing factors between frontline nurses and nurses from other wards during the outbreak of Coronavirus Disease (Covid-19) in Iran. Invest Educ Enferm. 2020; 38(2):1-12.e03.

29. Lan J, Song Z, Miao X, et al. Skin damage among health care workers managing coronavirus disease-2019. J Am Acad Dermatol. 2020; 82(5):1215-1216.

30. Moreira AS, Lucca SR. Apoio psicossocial e saúde mental dos profissionais de enfermagem no combate ao covid-19. Enferm Foco. 2020; 11(1):155-161.