FACTORS ASSOCIATED WITH WORK STRESS IN HEALTH PROFESSIONALS BEFORE AND DURING THE COVID-19 PANDEMIC IN THE HOSPITAL CONTEXT: IMPACTS OF SOCIODEMOGRAPHIC, CLINICAL AND OCCUPATIONAL CONDITIONS

Henrique Andrade Barbosa[1]

Rene Ferreira da Silva Junior[2]

Túlio Teixeira Andrade[3]

Claudia Danyella Alves Leão Ribeiro[4]

Elaine Cristina Santos Alves Souto[5]

Jaqueline D`Paula Ribeiro Vieira Torres[6]

Silvânia Paiva Santos Rocha[7]

Sirlaine de Pinho[8]

Sabrina Gonçalves Silva Pereira[9]

Carla Silvana de Oliveira e Silva[10]

1 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
2 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
3 University Center of Northern Minas Gerais, Montes Claros, Minas Gerais, Brazil.
4 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
5 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
6 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
7 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
8 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
9 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros, Minas Gerais, Brazil.
10 Postgraduate Program in Health Sciences. State University of Montes Claros, Montes Claros,

Abstract: Objective: to investigate the factors associated with work-related stress in healthcare professionals in the hospital setting, before and during the COVID-19 pandemic. Methods: An integrative literature review was conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRIS) guidelines. The search for scientific publications took place from January to March 2023, and was conducted through consultation of PubMed, BVS, Cochrane, and Science. The search terms used are registered in Medical Subject Headings (MeSH), namely: "Stress" (in French), "Occupational Stress", "Health Personnel", "Hospitals". Cross-sectional and longitudinal studies with a quantitative approach; clinical trials; quasi-experimental studies; and cohort studies that assessed work-related stress in hospital professionals were included. The methodological quality of the studies was assessed using the GRADE system. Results: The sample for this review consisted of fifteen studies. According to databases, they are distributed as follows: eight (8) indexed in BVS, six (6) PubMed and one (1) from Science. Regarding research design: 14 (93.3%) studies are cross-sectional and 1 (6.7%) longitudinal study. Regarding methodological quality, seven (46.7%) studies were classified as high level of evidence; six (40.0%) as moderate and two (13.3%) defined as low level. Final considerations: Occupational stress before the pandemic was associated with labor issues, service organization, unit of operation, professional category, experiences and demographic, social and psycho-emotional factors. On the other hand, work stress in the pandemic situation was linked to the fear of contamination from direct contact with patients infected by SARS-CoV-2, the insufficiency of PPE, the overwhelming demand of patients, the absence of a vaccine and specific treatment against the disease.

Keywords: Occupational Stress. Healthcare Professionals. Hospital Care. Pandemic. COVID-19.

Minas Gerais, Brazil.

Introduction

The outbreak of a respiratory infection caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which originated in China in December 2019, forced the world to begin confronting Coronavirus Disease 2019 (COVID-19), which demonstrated an exponential epidemiological chain (transmission) capacity and was declared a public health pandemic in March 2020 by the World Health Organization (WHO) (WHO, 2020; Huang et al., 2020; Ochani et al., 2021). COVID-19 generated significant collapses in global health systems and imposed extremely exhausting work schedules and overwhelming stress situations on healthcare professionals in the workplace (Lai et al., 2020; Li et al., 2020; Keubo et al., 2021; Romero-García et al., 2022).

International studies indicate that healthcare professionals on the front lines of the fight against COVID-19, especially those providing care in hospital settings—committed to the diagnosis, treatment, evaluation of therapeutic plans, and direct rehabilitation of infected patients—constitute a population that is particularly vulnerable to contagion from the new coronavirus and exposed to risks strongly related to occupational stress (Sharma et al., 2021; Ochani et al., 2021; Danet, 2021).

Stress is a pathogenic condition caused by exposure to stressors responsible for triggering, initiating, and driving the stress state, marked by a set of clinical and psychological manifestations, such as muscle tension, headache, changes in breathing patterns, psychological disorders, sleep dysfunction, and social isolation (Sadir; Bignotto; Lipp, 2010; Korb; De Souza, 2022). In this context, work-related stress (WRS) results from the worker's inability to meet work demands or from imbalances occurring in the work environment, which act as precursors to stress and have repercussions in adverse physical and/or psychological responses (Feng et al., 2022; CDC, 2020; Mo et al., 2020).

Investigations conducted worldwide have recorded high prevalence rates of occupational stress among healthcare professionals in hospital settings during the COVID-19 pandemic (Salari et al., 2020). Data identified that the prevalence of work-related stress in Iran was 64.3% (Kazmi et al., 2020); 77.0% in Brazil (Neto; Xavier; Araújo, 2020); and 93.7% in Argentina (Appiani et al., 2021).

It is also observed that in potentially better scenarios – developed and high-income countries – the recorded stress rates were similarly high, reaching 45.3% in China (Guixia; Hui, 2020) and 70.5% in France (Geoffroy et al., 2020).

Researchers warn that relentless stress at work is a predictor of poor professional performance, dissatisfaction, disinterest, and irritability, which, in the context of healthcare, negatively impacts the quality of care offered to the population (Keubo et al., 2021; Sethi et al., 2020; Babore et al., 2020). Other studies highlight that more serious consequences such as burnout syndrome, depression, anxiety, and cardiovascular disorders have been recorded in healthcare professionals longitudinally exposed to high levels of occupational stress, consequently generating significant impairments in the quality of work, personal, and social life of individuals (Sethi et al., 2020; Pega et al., 2021; Guíxia; Hui, 2020; Feng et al., 2022).

The public health context imposed by COVID-19 demands greater adaptive capacity from professionals in the face of intense demands and the need to adapt to new safe care protocols; however, the determinants of work-related stress need to be detected and quickly addressed to ensure quality care provided to the population and the maintenance of occupational health for workers (Khan et al., 2020; Li et al., 2020; Keubo et al., 2021).

Furthermore, given this alarming, atypical, uncertain, and poorly understood scenario, it is justified to conduct studies aimed at presenting and gathering scientific evidence, which has been little explored until now, that encourages reflection and understanding regarding the mental health of healthcare professionals during the pandemic, which poses an additional and extremely new challenge to the hospital system and, consequently, to healthcare professionals (Costa; Servo; Figueredo, 2022). In this context, this study aimed to investigate the factors associated with work-related stress in healthcare professionals in the hospital setting, before and during the COVID-19 pandemic.

Materials and methods

This is an integrative, descriptive review study, guided by the path represented in the following steps: (1) designation of the guiding research question; (2) definition of inclusion and eligibility criteria for studies; (3) article search and sample selection; (4) analysis of the selected sample; and (5) synthesis of the review (Whittemore; Knafl, 2005). It should be noted that this review followed the writing recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021), and this review method makes it possible, through the synthesis of multiple studies, to produce important investigations for the execution of evidence-based scientific practice (Whittemore; Knafl, 2005).

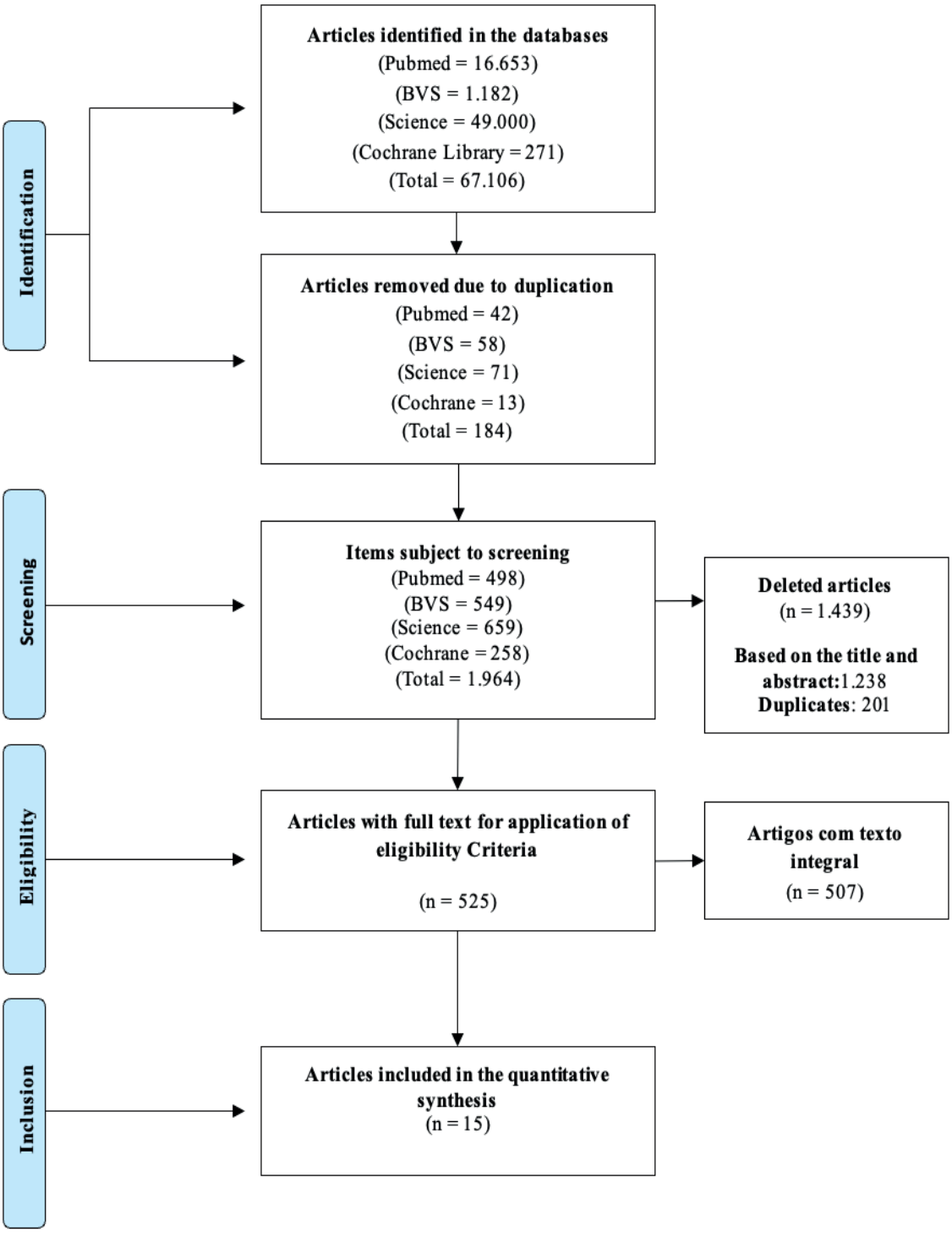
The guiding research question was defined using the PICo strategy, represented in this study by: population (P) – healthcare professionals in hospital care; phenomenon of interest (I) – associated factors; context (Co) – occupational stress before and during the COVID-19 pandemic (Butler et al., 2016). Therefore, the guiding question of this review was: what are the main factors associated with stress in healthcare professionals in the hospital setting before and during the COVID-19 pandemic?

The search for scientific publications in international and national literature, conducted between January and March 2023, was carried out by consulting PubMed, which coordinates the Medical Literature Analysis and Retrieval System Online (MEDLINE), the Cochrane Library, and the Virtual Health Library (VHL). The VHL search filters were then applied to the Latin American and Caribbean Health Sciences Literature (LILACS) and MEDLINE databases.

The search terms used are registered in the Medical Subject Headings (MeSH), namely: “Stress” (in French), “Occupational Stress”, “Health Personnel”, “Hospitals”. The descriptors were adapted to the Portuguese language, when necessary, based on consultation with the Health Sciences Descriptors (DeCS), defined as: “Occupational Stress”, “Health Professionals” and “Hospitals”. The Boolean operators “AND” and “OR” were used to associate the subjects in the advanced search for studies.

Cross-sectional and longitudinal studies with a quantitative approach; clinical trials; quasi-experimental studies; and cohort studies that assessed work-related stress in hospital professionals were included. Qualitative studies; literature reviews; monographs, theses, dissertations, and undergraduate theses; book reviews; opinion articles; abstracts; studies with incomplete text for analysis; duplicate publications; and research that did not address the thematic axis proposed in this investigation were excluded. No restrictions were established regarding the publication period or language, in order to maximize search capacity. The study selection process is detailed in the flowchart (Figure 1), according to the PRISMA recommendations (Page et al., 2021).

Figure 1. Flowchart of the study selection process.



The studies were extracted and structured using a data extraction model, developed by the authors in Microsoft Excel software, which allowed the collection of information from the studies stratified by: study title, year of publication, research design, study location, instruments (for stress investigation), sample, and factors associated with stress in healthcare professionals. Duplicate publications were identified with the aid of Rayyan software (Ouzzani et al., 2016).

The methodological quality of the studies was assessed using the Methodological Guidelines: GRADE System - a manual for grading the quality of evidence and strength of recommendation for decision-making in health. It is emphasized that the level of evidence represents the confidence in the information from the studies, being classified into four levels: (1) high; (2) moderate; (3) low; and (4) very low (BRAZIL, 2010). The assessment of the risk of bias in each study was carried out independently by two researchers. It is noteworthy that circumstances of disagreement were decided by consensus and through consultation with a third researcher.

Results

The sample for this review consisted of fifteen (15) studies. Table 1 presents the distribution of the publications selected in this review, stratified by: author; year of publication; country; journal; database; study design; investigation carried out during the COVID-19 pandemic; sample; factors associated with work stress among healthcare professionals in the hospital network and methodological classification/level of evidence. For methodological purposes and to structure the studies, the productions were arranged in Study 1 to Study 15 (E1 to E15).

The selected investigations were published between 2010 and 2022. These studies were conducted in Brazil, the Caribbean, China, South Korea, Egypt, Spain, Ethiopia, Iran, Jordan, Malaysia, Nigeria, Singapore, and Turkey, and predominantly published in international journals (93.3%). They are distributed according to databases as follows: eight (8) indexed in BVS (six from MEDLINE and two from LILACS); six (6) from PubMed and one (1) from Science. Regarding research design: 14 (93.3%) studies are cross-sectional and 1 (6.7%) is a longitudinal study. As for language, thirteen (86.7%) of the studies were in English and two (13.3%) in Portuguese. Regarding methodological quality, seven (46.7%) studies were classified as having a high level of evidence; six (40.0%) as moderate, and two (13.3%) as having a low level of evidence.

Table 1. Articles published by author/year, country, journal/database, study design, publication during or outside the COVID-19 pandemic period, sample, factors associated with work stress, and methodological classification.

Estudos selecionados								Methodological classification
N	Author/year	Country	Periodical/ database	Study design	COVID-19 pandemic	Sample (n)	Factors associated with stress at work	Nível de evidência
E1	Tsegaw et al. / 2022	Ethiopia	Psychol Res Behav Manag. / PubMed	Cross-sectional	Yes	304 nurses from public and private hospitals	Graduated nurses (AOR=0.32, 95% CI:0.13,0.76), working in surgical centers (AOR=7.89, 95% CI:1.46,9.60) and dissatisfied with their work (AOR=4.95, 95% CI: 1.94,2.61), with 5 to 10 years of work experience (AOR = 0.42, 95% CI: 0.18, 0.97) and working in intensive care units (AOR = 6.48, 95% CI:1.49, 8.18)	1 (high)
E2	Feng et al. / 2022	China	BMC Public Health / PubMed	Cross-sectional	No	3,236 General practitioners in hospitals	Working ≥ 40 hours per week (OR 2.08, 95% CI 1.56-2.78, p < 0.001) and occasionally or frequently working overtime (OR 8.89, 95% CI 4.40-16.47, p < 0.001).	1 (high)
E3	Sun et al. / 2022	China	Int Arch Occup Environ Health / BVS (MEDLINE)	Cross-sectional and multicenter	No	1,988 doctors from four target hospitals	Male sex (OR = 2.10, 95% CI 1.431–3.091), nurses (OR = 6.04, 95% CI 4.043–9.031), lack of exercise (OR = 2.02, 95% CI 1.594–2.549), trauma event experience (OR = 2.10, 95% CI 1.623–2.730), work experience duration of 1–3 years (OR = 1.71, 95% CI 0.958–3.032), work experience duration of 4–10 years (OR = 2.97, 95% CI 1.707–4.892), work experience duration of 11–19 years (OR = 3.61, 95% CI 2.104–6.322), and work experience duration of work experience of more than 20 years (OR = 3.45, 95% CI 1.932–6.732).	1 (high)

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E4	Teo et al. / 2021	Singapore	PLoS One / PubMed	Logintudinal	Yes	2,744 healthcare professionals from four hospitals	Working long hours (OR 1.95, p <0.01), anxiety (OR 2.85, p <0.01) and burnout (OR 4.12, p <0.01).	1 (high)
E5	Şanlıtürk / 2021	Türkiye	Intensive Crit Care Nurs. / PubMed	Cross-sectional	Yes	262 ICU nurses	High working hours (p = 0.000), heavy workload (p = 0.015), and patient treatment failure (0.022).	1 (high)
E6	Al-Ruzzieh et al. / 2021	Jordan	Asian Pac J Cancer Prev. / PubMed	Cross-sectional	No	446 nurses from a hospital oncology center	Poorer quality of life (r=0.121, p >0.05) and impaired coping with adversity at work (r=0.322, p < 0.05)	2 (moderate)
E7	Parizad et al. / 2021	Iran	J Nurs Manag. / BVS (MEDLINE)	Cross-sectional	No	398 ICU nurses and doctors	Impaired autonomy (p < 0.000) and work in the ICU (p = 0.024)	2 (moderate)
E8	Subhas et al. / 2021	Malaysia	Int J Environ Res Public Health / BVS (MEDLINE)	Cross-sectional	Yes	286 healthcare professionals on the front lines fighting Covid-19	Younger age, shift work (12 hours) and anxiety (F (7, 277) = 24.72, p < 0.001)	2 (moderate)
E9	Ahn et al. / 2021	South Korea	Public Health Surveill / BVS (MEDLINE)	Cross-sectional	Yes	1,783 healthcare professionals from hospitals	Working in hospitals (adjusted odds ratio [OR] 1.45, 95% CI 1.06-1.99), nursing professionals (adjusted OR 1.37, 95% CI 1.02-1.98), single workers (adjusted OR 1.51, 95% CI 1.05-2.16), higher anxiety about viral infection (high SAVE-9 score, adjusted OR 1.20, 95% CI 1.17-1.24).	1 (high)
E10	Nayak et al. / 2021	Caribbean	. BMJ Open / BVS (MEDLINE)	Cross-sectional	Yes	395 healthcare professionals from four major hospitals	Contact with patients with confirmed COVID-19, p<0.001 (95% CI 3.072 to 6.781), male sex, p<0.001 (95% CI 2.152 to 5.427) and single marital status, p<0.001 (95% CI 1.322 to 4.270).	1 (high)
E11	Carmona-Barrientos et al. / 2020	Spain	Hum Resour Health / PubMed	Cross-sectional	No	265 physiotherapists from public and private hospitals	Stress during the academic training period (p = 0.02), temporary workers (p = 0.03), and professionals with more than 10 years of professional experience (p = 0.05).	2 (moderate)
E12	Hassan et al. / 2020	Egypt	Environ Sci Pollut Res Int. / BVS (MEDLINE)	Cross-sectional	No	278 resident physicians from hospitals	Being single (p = 0.017), belonging to surgical departments (p = 0.001), and not having rest breaks at work (p = 0.001).	2 (moderate)

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E13	Faremi et al. / 2019	Nigeria	International Journal of Africa Nursing Sciences / Science (Elsevier)	Cross-sectional	No	183 nurses from two hospitals	Inadequate staffing to cover the workload (2.55); performing procedures that patients experience as painful (2.30); lack of medications and equipment needed for nursing care (2.30); death of a patient with whom you develop a close relationship (3.43).	2 (moderate)
E14	Santos et al. / 2017	Brazil	Cogit. Enferm. / BVS (LILACS)	Cross-sectional	No	105 nursing professionals from oncology specialist departments	Age between 20-40 years ($p = 0.029$) and shorter professional training time ($p = 0.043$).	3 (low)
E15	Lorenz et al. / 2010	Brazil	Rev. Latino-Am. Enfermagem / BVS (LILACS)	Cross-sectional	No	149 nurses from high-complexity hospitals	Emotional exhaustion ($r = 0.60$, $p < 0.0001$) and conflictual interpersonal relationships ($r = 0.58$, $p < 0.0001$)	3 (low)

Based on the analysis of the selected studies and synthesis of the information, two thematic dimensions (DT) emerged: DT1 - Factors associated with work-related stress among healthcare professionals in the hospital setting before the COVID-19 pandemic; and DT2 - Factors associated with work-related stress among healthcare professionals in the hospital setting during the COVID-19 pandemic.

Discussion

Factors associated with work-related stress among healthcare professionals in a hospital setting before the COVID-19 pandemic

Investigations conducted in Africa and Asia have shown that healthcare professionals involved in providing direct care to inpatients in oncology wards, surgical departments, and intensive care units (ICUs) are more prone to moderate to high levels of work-related stress (Tsegaw; Getachew; Tegegne, 2022; Al-Ruzzieh Ma; Ayaad, 2021; Parizad et al., 2021; Hassan et al., 2020). It is noteworthy that providing care in units responsible for intensive and highly complex care demands high levels of knowledge and skills to operate in these departments. Additionally, the intense need to cope with and adapt to the specific conditions of these workplaces, such as performing painful and/or urgent/emergency procedures, and the frequent negative/traumatic outcomes of patients' morbidity, are considered stressors that weaken occupational health (Hassan et al., 2020; Faremi et al., 2019; Vahedian-Azimi et al., 2019).

A study conducted in China (Sun et al., 2022) revealed that the nursing profession is associated with a high risk of work-related stress, a finding corroborated by other international studies (Parizad et al., 2021; Baye et al., 2020; Salilih; Abajobir, 2014). The authors warn that secondary determinants of this association include high demands on the nursing staff and the consequent problematic need to reduce the time available for each patient, staff shortages, insufficient equipment and medication, lack of rest periods during work, impaired autonomy, conflicting interpersonal relationships, and

ineffective psychosocial support (Parizad et al., 2021; Hassan et al., 2020; Faremi et al., 2019; Regina et al., 2010).

It is important to highlight that the increased workload – whether due to a natural increase in patients or resulting from inadequate staffing – and the impossibility of rest periods during the work shift, reverberate in physical and psychological overload for workers and, consequently, there will be an increase in the level of stress and tension in the professional context. Furthermore, the lack of resources for providing care, low autonomy, and the existence of conflicting relationships among members of the multidisciplinary team, result in difficulties in meeting the needs of patients and the operational criteria of healthcare institutions. These factors have a close impact on the low level of control over work activities and the decline in the quality of care provided, the increase in absenteeism rates, and the emergence of health problems, especially when there is psychological helplessness and a lack of intervention by institutions to address the inability of employees to meet the demands of the job (Sun et al., 2022; Parizad et al., 2021; Hassan et al., 2020; Faremi et al., 2019).

Another survey also points out that aspects such as weekly working hours ≥ 40 hours and frequent overtime are related to a greater predisposition to stress at work, due to less time for rest and return to work, and are considered important precursors to physical and psychological exhaustion, which negatively interfere with the individual's social life (Feng et al., 2022). Furthermore, temporary work is seen as a period of constant performance evaluation and generates fears about being dismissed, which often implies an excessive concern about the need to meet all the demands and goals established by the service managers, contributing to the manifestation of higher levels of anxiety and occupational stress (Carmona-Barrientos et al., 2020).

Factors such as less experience (< 20 years) and less professional training are associated with a greater susceptibility to stress in healthcare professionals, a finding consistently highlighted by studies in national and international literature (Sun et al., 2022; Carmona-Barrientos et al., 2020; Santos et al., 2017). It is understood that these workers potentially face greater difficulties in resolving complex situations during the care provided to the population, when compared to more experienced

professionals. Furthermore, a cross-sectional study conducted in Europe, measuring the level of occupational stress in physiotherapists from public and private hospitals, recorded higher stress rates among professionals who felt stressed since their academic training, demonstrating the complexity of coping with adverse circumstances in the healthcare field from the academic stage onwards (Carmona-Barrientos et al., 2020).

Demographic, social, and lifestyle-related determinants, as well as the biopsychosocial well-being of the individual, are also recognized as influencing the state of work-related stress. In this context, cross-sectional investigations carried out in Brazil, China, Egypt, and Jordan have shown that male sex, age between 20 and 40 years, being single, not practicing physical exercise, and poorer quality of life were associated with higher proportions of moderate or high stress. The causal mechanisms are not yet fully understood, but it is considered that men have worse coping and resolution skills when faced with stressful situations in the hospital care setting. The 20-40 age range is related to less time spent in training and less professional experience. Furthermore, the absence of a partner, sedentary lifestyle, and poorer quality of life are aspects stemming from the extra-work context, which impact the individual's physical and psychosocial well-being, making them vulnerable to internalizing stressors, unable to manage and dissipate them, even outside the work environment (Sun et al., 2022; Al-ruzzieh et al., 2021; Hassan et al., 2020; Santos et al., 2017).

Factors associated with work-related stress among healthcare professionals in a hospital setting during the COVID-19 pandemic

The explosion of the COVID-19 pandemic, in addition to generating significantly high morbidity and mortality rates from viral infection, also revealed high risks to the mental and occupational health of the global population, especially for healthcare professionals involved in the assessment, diagnosis, treatment, and rehabilitation of patients affected by SARS-CoV-2 (Sharma et al., 2021; Ochani et al., 2021). It is understood that the imprecision in controlling the chain of

transmission and treatment of the pandemic disease presents a substantially high potential for the development of psychological stress among workers who are directly exposed to suspected and/or confirmed cases (Danet, 2021; Keubo et al., 2021; Li et al., 2020).

A considerable body of research that has assessed the repercussions of COVID-19 on occupational illness among frontline healthcare professionals fighting the disease warns that the results are particularly worrying, given that among the negative impacts are the reduction of human resources, the compromise of the quality of care and the effectiveness of health services, and consequently, it contributes to the overload and collapse of hospital systems (Lai et al., 2020; Romero-García et al., 2022).

It is noteworthy that the emerging situation caused by coronavirus 2 has significantly aggravated and multiplied the intense physical, cognitive, psycho-emotional, and social demands already experienced by members of multidisciplinary teams, even before the pandemic. Furthermore, this scenario has led to the emergence of new determinants of work-related stress, particularly in the hospital setting (Khan et al., 2020; Li et al., 2020).

A cross-sectional study conducted in the Caribbean, investigating the impact of the pandemic on the mental and occupational health of healthcare professionals, found that exposure to and direct contact with patients infected with SARS-CoV-2 were significant predictors of anxiety and stress, a finding repeatedly recorded in other investigations in China (Nayak et al., 2021; Xião et al., 2020; Liu et al., 2020). Additionally, studies revealed that 55.1% of healthcare workers experienced elevated stress levels during the COVID-19 pandemic, with the psychological impact being greater when compared to data from studies during the 2010 SARS epidemic, which reached a rate of 39.3% of exacerbated stress among professionals (Xião et al., 2020; Lu et al., 2010).

Regarding the prevalence of stress during the COVID-19 pandemic, observational studies conducted in Australia (Abdulah; Mussa, 2020) and Turkey (Şanlitürk, 2021) recorded that 93.6% and 62.0% of healthcare workers, respectively, reported moderate to high levels of stress, compared to 30.5% (Carmona-Barrientos et al., 2020) and 37.8% (Hassan et al., 2020) observed in Spain and

Egypt, respectively, during the non-pandemic period.

It is noteworthy that during the pandemic, many healthcare providers in the hospital network suffered intensely from the fear of being infected by the new coronavirus and, consequently, transmitting it to their families. Thus, it was necessary to choose to isolate themselves from their families, since there was little knowledge about the treatment of the infection, whose spread was extremely rapid and with great potential for virulence, health complications, and mortality (Sharma et al., 2021; Liu et al., 2020; Ochani et al., 2021).

Under these circumstances, constant exposure to the risk of infection, coupled with prolonged family and social isolation, the relentless increase in morbidity and mortality rates, significant pressure on media networks, and the spread of fake news, results in various psycho-emotional conflicts, with stress, anxiety, and depression being predominantly recorded (Nayak et al., 2021; Xião et al., 2020; Liu et al., 2020).

Furthermore, these professionals faced critical situations of overload and occupational stress related to the overwhelming demand for patients – characterized by the disorderly increase in cases, incompatible with the capacity of hospitals – the high complexity of care, and the need to adapt the service to the pandemic scenario (Pinheiro et al., 2023; Xião et al., 2020; Lai et al., 2020). Another factor of extreme concern and psychological stress is asymptomatic transmission among members of the multidisciplinary team, which implies an increased risk of contamination and difficulty in breaking the chain of transmission (Chen, 2020; Araf et al., 2022).

Other studies around the world have also reported that the scarcity of personal protective equipment (PPE), exhausting work schedules, lack of care protocols, and the absence of specific treatment for the disease were risk factors for the development of stress in the hospital environment (Teo et al., 2021; Şanlitürk, 2021; Subhas et al., 2021; Ahn et al., 2021).

The shortage of PPE in various regions of the world, caused by the extreme demand during the COVID-19 pandemic, not only in health services – as is usually necessary – but also in all other work departments, generated even more fear, concern, and insecurity among healthcare professionals

on the front lines regarding SARS-CoV-2 contamination. Coupled with this, the absence of a vaccine – at the beginning of the pandemic – and of specific treatment for the disease, are determining factors of risk to psycho-emotional and occupational health (Şanlitürk, 2021; Yin; Zeng, 2020; Ippolito et al., 2020).

It is worth highlighting that the pandemic scenario also caused changes in the organization and operation of health services. Studies have shown that exhausting work schedules, precursors to professional burnout, were necessary due to the insufficient number of workers, especially suffered by nursing professionals in intensive care units (ICUs), to meet the uncontrollable demands resulting from COVID-19 (Tsegaw; Getachew; Tegegne, 2022; Teo et al., 2021; Şanlitürk, 2021). On the other hand, coordinators and managers, as well as other professionals not involved in direct patient care, were involuntarily asked to move to care areas due to the scarcity of human resources, in order to replace symptomatic employees or those aged ≥ 60 years who were absent for individual and collective safety. These workers were often forced to perform tasks that were not part of their routine or in which they had no experience in emergency circumstances, a situation that can imply a new pattern of contamination risk and represent an additional stressor in the work context (Costa; Servo; Figueiredo, 2022; Schmidt et al., 2020).

This review is not without limitations. The scarcity of longitudinal studies, cohort studies, and clinical trials focusing on the investigation of factors associated with work-related stress among tertiary healthcare professionals is noteworthy, restricting the analysis of causality and the understanding of the phenomenon studied. Furthermore, the limitations of this study relate to the choice of descriptors and databases/data sources, as they may not contain all national and international publications. However, this aspect does not compromise the results considering the number of articles and the period analyzed.

Final considerations

The results found in this study made it possible to understand and identify the factors associated with perceived stress in healthcare professionals in hospital care, comparing them before and after the onset of the COVID-19 pandemic. Occupational stress before the pandemic was associated with labor issues, service organization, work unit, professional category, experiences, and demographic, social, and psycho-emotional factors. On the other hand, occupational stress during the pandemic was linked to the fear of contamination from direct contact with patients infected with SARS-CoV-2, insufficient PPE, overwhelming patient demand, and the absence of a vaccine and specific treatment against the disease. Detecting the determinants of occupational stress is key to managing them and promoting interventions focused on reducing the causes of this prevalent condition in hospital work.

References

ABDULAH, D. M.; MUSA, D. H. Insomnia and stress of physicians during COVID-19 outbreak. Sleep Medicine, v. 2, n.10, p.100017, 2020.

AHN, M. H. et al. High Work-Related Stress and Anxiety as a Response to COVID-19 Among Health Care Workers in South Korea: Cross-sectional Online Survey Study. JMIR Public Health and Surveillance, v. 7, n. 10, e25489, 22 out. 2021.

AL-RUZZIEH, M. A.; AYAAD, O. Work Stress, Coping Strategies, and Health-Related Quality of Life among Nurses at an International Specialized Cancer Center. Asian Pacific Journal of Cancer Prevention, v. 22, n. 9, p. 2995-3004, 2021.

APPIANI, F. J. et al. Prevalence of stress, burnout syndrome, anxiety and depression among physicians of a teaching hospital during the COVID-19 pandemic. Archivos Argentinos de Pediatria, v. 119, n. 5, p. 317-324, out. 2021.

ARAF, Y. et al. Omicron variant of SARS-CoV-2: Genomics, transmissibility, and responses to current COVID-19 vaccines. Journal of Medical Virology, v. 94, n. 5, p. 1825-1832, 2022.

BABORE, A. et al. Psychological effects of the COVID-2019 pandemic: Perceived stress and coping strategies among healthcare professionals. Psychiatry Research, v. 293, 113366, 2020.

BAYE, Y. et al. Nurses' work-related stress and associated factors in governmental hospitals in Harar, Eastern Ethiopia: a cross-sectional study. PLoS ONE, v. 15, n. 8, e0236782, 2020.

BRASIL. Ministério da Saúde. Diretrizes metodológicas: Sistema GRADE – Manual de graduação da qualidade da evidência e força de recomendação para tomada de decisão em saúde. Brasília, DF: Ministério da Saúde, 2014.

BUTLER, H. et al. Guide to Writing a Qualitative Systematic Review Protocol to Enhance Evidence-Based Practice in Nursing and Health Care Ashleigh. Worldviews on Evidence-Based Nursing, v. 13, n. 3, p. 241-249, 2016.

CARMONA-BARRIENTOS, I. et al. Occupational stress and burnout among physiotherapists: a cross-sectional survey in Cadiz (Spain). Human Resources for Health, v. 18, n. 1, 91, 25 nov. 2020.

CENTER FOR DISEASE CONTROL AND PREVENTION (CDC). STRESS. At Work. Atlanta: CDC/NIOSH, 2020.

CHEN, J. Patogenicidade e transmissibilidade do 2019-nCoV-Uma rápida visão geral e comparação com outros vírus emergentes. Microbes and Infection, v. 22, n. 2, p. 69-71, 2020.

COSTA, N. N. G.; SERVO, M. L. S.; FIGUEREDO, W. N. COVID-19 e o estresse ocupacional vivenciado por profissionais de saúde no contexto hospitalar: revisão integrativa. Revista Brasileira de Enfermagem, v. 75, n.1, p.e20200859, 2022.

DANET, A. Psychological impact of COVID-19 pandemic in Western frontline healthcare professionals. A systematic review. Medicina Clínica, v. 156, n. 9, p. 449-458, 2021.

FAREMI, F. A.; OLATUBI, M. I.; ADENIYI, K. G. et al. Assessment of occupational related stress among nurses in two selected hospitals in a city southwestern Nigeria, v. 10, p. 68-73, 2019.

FENG, J. et al. Occupational stress and associated factors among general practitioners in China: a

national cross-sectional study. BMC Public Health, v. 22, n. 1, 1061-67, 2022.

GEOFFROY, P. A. et al. Psychological support system for hospital workers during the Covid-19 outbreak: rapid design and implementation of the Covid-Psy hotline. Frontiers in Psychiatry, v. 11, n.11, p.511-519, 2020.

GUIXIA, L.; HUI, Z. A study on burnout of nurses in the period of COVID-19. Psychology and Behavioral Sciences, v. 9, n. 3, p. 31-36, 2020.

HASSAN, N. M.; ABU-ELENIN, M. M.; ELSALLAMY, R. M.; KABBASH, I. A. Job stress among resident physicians in Tanta University Hospitals, Egypt. Environmental Science and Pollution Research International, v. 27, n. 30, p. 37557-37564, 2020.

HUANG, C. et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet, v. 395, n. 10223, p. 497-506, 2020.

IPPOLITO, M. et al. Medical masks and Respirators for the protection of healthcare workers from SARS-CoV-2 and other viroses. Pulmonology, v. 26, n. 4, p. 204-212, 2020.

KEUBO, F. R. et al. Psychological distress among healthcare professionals of the three COVID-19 most affected Regions in Cameroon: prevalence and associated factors. Annales Médico-Psychologiques, v. 79, n.10, p. 141-146, 2021.

KHAN, M. A.; SIVALINGAM, A.; HALLER, J. A. Perceptions of Occupational Risk and Changes in Clinical Practice of United States Vitreoretinal Surgery Fellows during the COVID-19 Pandemic. Ophthalmology Retina, v. 4, n. 12, p. 1181-1187, 2020.

KORB, S. M. B.; SOUZA, W. C. de. Occupational Stress and Cognitive Processes Among Teachers in the COVID-19 Pandemic. Paidéia, v. 32, n.10, p.e3237, 2022.

LAI, C. C. et al. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): the epidemic and the challenges. International Journal of Antimicrobial Agents, v. 55, n. 3, p.105924, 2020.

LAI, J. et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed

to Coronavirus Disease 2019. JAMA Network Open, v. 3, p. 3, p.e203976, 2020.

LIU, C. Y. et al. The prevalence and influencing factors in anxiety in medical workers fighting COVID-19 in China: a cross-sectional survey. Epidemiology and Infection, v. 148, n.10, p.e98, 2020.

LORENZ, V. R.; BENATTI, M. C. C.; SABINO, M. O. Burnout e estresse em enfermeiros de um hospital universitário de alta complexidade. Revista Latino-Americana de Enfermagem, v. 18, n. 6, p. 1084-1091, 2010.

LÜ, S. H. et al. Perceived stress in general public during prevalence of severe acute respiratory syndrome and its impact on health behavior. Zhonghua, v. 44, n. 2, p. 128-133, 2010.

MAGNAVITA, N.; SOAVE, P. M.; ANTONELLI, M. Prolonged Stress Causes Depression in Frontline Workers Facing the COVID-19 Pandemic-A Repeated Cross-Sectional Study in a COVID-19 Hub-Hospital in Central Italy. International Journal of Environmental Research and Public Health, v. 18, n. 14, p.7316-19, 2021.

MO, Y. et al. Work stress among Chinese nurses to support Wuhan in fighting against COVID-19 epidemic. Journal of Nursing Management, v. 28, n. 5, p. 1002-1009, 2020.

NAYAK, B. S. et al. Prevalence and factors associated with depression, anxiety and stress among healthcare workers of Trinidad and Tobago during COVID-19 pandemic: a cross-sectional study. BMJ Open, v. 11, n. 4, p.e044397, 2021.

NOVAES NETO, E. M.; XAVIER, A. S. G.; ARAÚJO, T. M. de. Factors associated with occupational stress among nursing professionals in health services of medium complexity. Revista Brasileira de Enfermagem, v. 73, n.1, p.e20180913, 2020.

OCHANI, R. et al. COVID-19 pandemic: from origins to outcomes. A comprehensive review of viral pathogenesis, clinical manifestations, diagnostic evaluation, and management. Infezioni em Medicina, v. 29, n. 1, p. 20-36, 2021.

OUZZANI, M. et al. Rayyan-a web and mobile app for systematic reviews. Systematic Reviews, v. 5, n. 1, p.210-219, 2016.

PAGE, M. J. et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ, v. 372, p.12, p.71-79, 2021.

PARIZAD, N. et al. Job stress and its relationship with nurses' autonomy and nurse-physician collaboration in intensive care unit. Journal of Nursing Management, v. 29, n. 7, p. 2084-2091, 2021.

PEGA, F. et al. Global, regional, and national burdens of ischemic heart disease and stroke attributable to exposure to long working hours for 194 countries, 2000–2016: a systematic analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury. Environment International, v. 154, n.10, p.106595, 2021.

PINHEIRO, J. M. G. et al. Qualidade de vida profissional e estresse ocupacional em trabalhadores de enfermagem durante a pandemia de COVID-19. Revista Gaúcha de Enfermagem, v. 44, n.10, p.e20210309, 2023.

ROMERO-GARCÍA, M. et al. Moral distress, emotional impact and coping in intensive care unit staff during the outbreak of COVID-19. Intensive and Critical Care Nursing, v. 70, n.10, p.103206, 2022.

SADIR, M. A.; BIGNOTTO, M. M.; LIPP, M. E. N. Stress e qualidade de vida: Influência de algumas variáveis pessoais. Paidéia, v. 20, n. 45, p. 73-81, 2010.

SALARI, N. et al. The prevalence of stress, anxiety and depression within front-line healthcare workers caring for COVID-19 patients: a systematic review and meta-regression. Human Resources for Health, v. 18, n. 1, 100, 17 dez. 2020.

SALILIH, S. Z.; ABAJOBIR, A. A. Work-related stress and associated factors among nurses working in public hospitals of Addis Ababa, Ethiopia: a cross-sectional study. Workplace Health & Safety, v. 62, n. 8, p. 326-332, 2014.

ŞANLITÜRK, D. Perceived and sources of occupational stress in intensive care nurses during the COVID-19 pandemic. Intensive and Critical Care Nursing, v. 67, n.11, p.103107, 2021.

SANTOS, N. A. R. dos et al. Estresse ocupacional na assistência de cuidados paliativos em oncologia. Cogitare Enfermagem, v. 22, n. 4, p. 1-10, 2017.

SCHMIDT, B. et al. Saúde mental e intervenções psicológicas diante da pandemia do novo coronavírus (covid-19). Estudos de Psicologia, v. 37, n.11, p.e200063, 2020.

SETHI, B. A.; SETHI, A.; ALI, S.; AAMIR, H. S. Impact of Coronavirus disease (COVID-19) pandemic on health professionals. Pakistan Journal of Medical Sciences, v. 36, n. 4, p. 6-11, 2020.

SHARMA, A.; AHMAD FAROUK, I.; LAL, S. K. COVID-19: A Review on the Novel Coronavirus Disease Evolution, Transmission, Detection, Control and Prevention. Viruses, v. 13, n. 2, 202-229, 2021.

SUBHAS, N. et al. The Cross-Sectional Relations of COVID-19 Fear and Stress to Psychological Distress among Frontline Healthcare Workers in Selangor, Malaysia. International Journal of Environmental Research and Public Health, v. 18, n. 19, 10182-10189, 2021.

SUN, R. et al. Identifying the risk features for occupational stress in medical workers: a cross-sectional study. International Archives of Occupational and Environmental Health, v. 95, n. 2, p. 451-464, 2022.

TEO, I. et al. Healthcare worker stress, anxiety and burnout during the COVID-19 pandemic in Singapore: A 6-month multi-centre prospective study. PLoS One, v. 16, n. 10, p.e0258866, 2021.

TSEGAW, S.; GETACHEW, Y.; TEGEGNE, B. Determinants of Work-Related Stress Among Nurses Working in Private and Public Hospitals in Dessie City, 2021: Comparative Cross-Sectional Study. Psychology Research and Behavior Management, v. 15, n.11, p. 1823-1835, 26 jul. 2022.

VAHEDIAN-AZIMI, A. et al. Effects of Stress on Critical Care Nurses: A National Cross-Sectional Study. Journal of Intensive Care Medicine, v. 34, n. 4, p. 311-322, 2019.

WHITTEMORE, R.; KNAFL, K. The integrative review: updated methodology. Journal of Advanced Nursing, v. 52, n. 5, p. 546-553, 2005.

WORLD HEALTH ORGANIZATION (WHO). WHO announces COVID-19 outbreak a pandemic. Genève: WHO, 2020.

XIAO, H. et al. 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. Medical Science

Monitor, v. 26, n.11, p.e923549, 2020.

XIAO, X. et al. Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: a multi-center cross-sectional survey investigation. Journal of Affective Disorders, v. 274, n.9, p. 405-410, 2020.

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. International Journal of Nursing Sciences, v. 7, n. 2, p. 157-160, 2020.