REVIEW PAPER

International Journal of Occupational Medicine and Environmental Health 2023;36(1):21–58
https://doi.org/10.13075/ijomeh.1896.02007

PREVALENCE OF BURNOUT AMONG HEALTHCARE PROFESSIONALS DURING THE COVID-19 PANDEMIC AND ASSOCIATED FACTORS – A SCOPING REVIEW

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Abstract
The outbreak of the COVID-19 pandemic exerted significant mental burden on healthcare workers (HCWs) operating in the frontline of the COVID-19 care as they experienced high levels of stress and burnout. The aim of this scoping review was to identify prevalence and factors associated with burnout among HCWs during the first year of the COVID-19 pandemic. A literature search was performed in PubMed, Web of Science, and CINAHL. Studies were selected based on the following inclusion criteria: cross-sectional, longitudinal, case-control, or qualitative analyses, published in peer-reviewed journals, between January 1, 2020 and February 28, 2021. Studies carried out on other occupations than healthcare workers or related to other pandemics than COVID-19 were excluded. Following the abstract screen, from 141 original papers identified, 69 articles were eventually selected. A large variation in the reported burnout prevalence among HCWs (4.3–90.4%) was observed. The main factors associated with increase/decrease of burnout included: demographic characteristics (age, gender, education level, financial situation, family status, occupation), psychological condition (psychiatric diseases, stress, anxiety, depression, coping style), social factors (stigmatisation, family life), work organization (workload, working conditions, availability of staff and materials, support at work), and factors related with COVID-19 (fear of COVID-19, traumatic events, contact with patients with COVID-19, having been infected with COVID-19, infection of a colleague or a relative with COVID-19, higher number of deaths observed by nurses during the COVID-19 pandemic). The findings should be useful for policy makers and healthcare managers in developing programs preventing burnout during the current and future pandemics. Int J Occup Med Environ Health. 2023;36(1):21–58

Key words:
burnout, workplace stress, prevalence, review literature, COVID-19, health care professionals

INTRODUCTION

The World Health Organization (WHO) recognizes occupational burnout as a result of chronic stress experienced in the workplace, which consists of 3 dimensions, as follows: the feeling of energy loss, negative feelings about work, and the psychological distance toward work, as well as reduced professional effectiveness [1]. According to one of the most popular and widely recognized theories created by Maslach et al. [2], burnout is defined as a "psychological syndrome characterized by emotional exhaus-

Funding: the University Hospital in Cracow and the Jagiellonian University Medical College are supported by the National Center for Research and Development CRACoV-HHS project ("Model of multi-specialist hospital and non-hospital care for patients with SARS-CoV-2 infection") through the initiative "Support for specialist hospitals in fighting the spread of SARS-CoV-2 infection and in treating COVID-19" (contract No. SZPITALE-JEDNOIMIENNE/18/2020).
Received: April 8, 2022. Accepted: October 12, 2022.
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tion, depersonalization, and a sense of reduced accomplishment in day-to-day work". In the latest 11th revision of the International Classification of Diseases (ICD-11), it has been stated that burnout is a syndrome resulting from "chronic workspace stress that has not been successfully managed" [1]. The status of occupational burnout has been strengthened by clarifying its definition and placing it in the category of problems resulting from strictly professional work and consequently recognizing it as a serious health issue.

The meta-analyses conducted before the COVID-19 pandemic indicated that burnout turns out to be a global concern that strongly affects the well-being of healthcare workers (HCWs). For instance, based on 113 studies included in a systematic review and 61 studies considered in a meta-analysis, Woo et al. [3] showed that 11.23% of nurses worldwide experienced burnout symptoms. In turn, Shanafelt et al. [4] indicated, in another systematic review, that among 7288 U.S. physicians, 45.8% reported at least 1 symptom of burnout. Apart from the total score, researchers focused on the prevalence of specific components of burnout. Molina-Praena et al. [5], in a meta-analytic study on medical nurses, indicated the prevalence of 31% for emotional exhaustion (EE), 24% for depersonalization (DP), and 38% for the lower personal achievement (LPA) component of burnout. According to the systematic review conducted by Imo [6], the prevalence of burnout scores among United Kingdom physicians for emotional exhaustion ranged 31–54.3%, depersonalization 17.4–44.5%, and in case of low personal accomplishment 6–39.6%.

The already high prevalence of burnout among HCWs in ordinary times became even a more serious concern during the epidemics which occurred over the last 20 years, notably the Severe Acute Respiratory Syndrome (SARS) in 2003, the Middle East Respiratory Syndrome (MERS) first reported in 2012, and the current COVID-19 pandemic [7]. Healthcare workers represent a group at specific risk during infectious disease outbreaks since they provide care for suspected or confirmed cases, while maintaining close physical contact with the patients [8]. In effect, the enormous psychological burden of working under stressful conditions severely affects their well-being in the workplace, leading to development of burnout [9]. The meta-analysis of Salazar de Pablo et al. [10] regarding the impact of the coronavirus epidemics on physical and mental health revealed that HCWs exposed to SARS, MERS, and COVID-19 reported symptoms of fear, insomnia, psychological distress, burnout, and anxiety. To the best of authors' knowledge, in only one recently published systematic review [7], the paper focused specifically on the impact of previous outbreaks of the SARS and MERS epidemics on the occurrence of burnout among HCWs. As it has been indicated, about one-third of HCWs experienced the burnout syndrome during those epidemics.

Since the onset of the COVID-19 pandemic, burnout among HCWs has become an urgent topic in further examinations. Researchers have indicated that the current pandemic has exerted significant mental burden, especially on HCWs operating in the front line of the COVID-19 care because they have experienced high levels of stress, have faced difficult ethical decisions, such as how to allocate limited numbers of ventilators, or have been forced to wear personal protective equipment (PPE) for an extended period of time [9,11]. At the same time, they have had to cope with excessive heat caused by extra clothes, dehydration, poor nutrition, lack of sleep, and fatigue, all of which exposed them to burnout [9,11]. Wu et al. [12] found that a significant proportion of physicians experienced more burnout after the outbreak of COVID-19 compared to the pre-COVID-19 times. Thus, there is a need for more comprehensive reviews and meta-analytic studies regarding this topic.

In the last 2 years, a relatively large number of meta-analyses and reviews about the impact of the COVID-19 pandemic on mental health of HCWs have been pub-

lished. However, only a few reviews have referred to the impact of COVID-19 on occupational burnout among HCWs specifically [7,11,13]. In terms of risk factors associated with the burnout syndrome, Sharifi et al. [11], based on 12 studies, listed such factors as higher levels of workload, less time to deal with occupational challenges, uncertain prognosis of patients, lack of adequate medical resources for diagnosis, treatment, and prevention, insufficient amount of PPE, rapid changes in public health-related policies, decreased income, and conflicting information announced by the authorities. Moreover, they stated that burnout was more common among HCWs who had a child or a family member >65 years old or with a chronic illness, because they had a fear of transmitting the infection. Amanullah and Ramesh Shankar [13] distinguished being in the front line of care, being female, increased workload, sleep deprivation, and lack of PPE as factors associated with burnout incidence, whereas support from colleagues and family as protective factors. In turn, Magnavita et al. [7] listed high psychosocial demands, high workload, low job control, low remuneration, and job insecurity as factors increasing the risk of developing burnout. In addition, they stated that the lack of awareness of the need for psychological support and lack of equipment, staff time, or skills needed for intervention are the main factors hindering the prevention of the burnout syndrome [7].

The aforementioned studies have shown high discrepancies in burnout prevalence rates and associated factors, which in the view of the authors require systematization in order to draw conclusions that could be usable in practice. Additionally, in the face of the current pandemic situation and its social and psychological consequences for HCWs, it is inevitable to assess the impact of COVID-19 on occupational burnout among professionals working in healthcare institutions. This might help staff and managers to apply measures protecting against the aforesaid syndrome. Therefore, the main aim of this scoping review was to identify the prevalence and factors associated with the burnout syndrome experienced by HCWs during the first year of the COVID-19 pandemic.

METHODS

Search strategy

A literature review was performed with the aim of answering the following research question: "What is the prevalence and what are the factors associated with burnout among healthcare workers during the COVID-19 pandemic?" The following databases were searched: PubMed, Web of Science, CINAHL. Additionally, references of eligible studies and other publications were taken into account. The search included studies published between January 1, 2020 (the COVID-19 outbreak) and February 28, 2021, in English, French, Spanish and Polish languages, as these languages are spoken by the reviewers. The following keywords and operators were used: ((covid) OR (coronavirus)) AND ((healthcare workers) OR (nurses) OR (physicians)) AND (burnout).

Inclusion and exclusion criteria

Cross-sectional, longitudinal, case-control, and qualitative studies, published in peer-reviewed journals were included. Other types of studies (systematic reviews, editorials, commentaries) were used to prepare the background for the review, but they were not included in the summary table.

For the final analysis, only studies carried out on the population of healthcare workers (nurses, physicians, residents, other staff, for example medical students, auxiliary and administrative staff) were selected. All other professions were excluded. Studies regarding other diseases than the COVID-19 pandemic (SARS, MERS, AH1N1) were also excluded. The research was not restricted to any specific geographical area. If ≥2 articles described the same study, only one was selected.

Data extraction

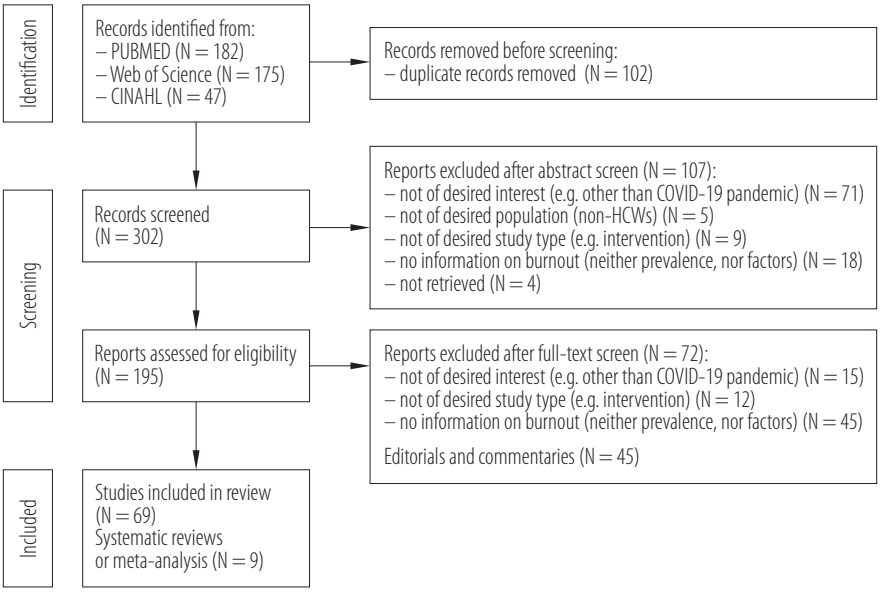
Data were extracted and presented in a summary table (available from the authors on request) based on the following information: the author's name and year of publication, study type, country, study population (information on healthcare workers involved), exposure to COVID-19 (front line workers, staff working in the wards dedicated to patients with COVID-19, staff caring or not for patients with COVID-19), sample size, primary outcomes (burnout prevalence and/or associated factors), tools used to measure burnout, reason for exclusion, and the time period of the study. The studies that provided information on burnout prevalence only, without identification of any associated factors, or vice versa, with only factors indicated, but without burnout prevalence, were still included in the analysis.

Two reviewers assessed the publications independently. In case of divergences, consensus was achieved based on consultations with a third author. In the process of selection of articles and presentation of results, the authors followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations [14]. The review was registered in the Open Science Framework repository, prior to analysis of the data.

RESULTS

Overall, the literature search resulted in finding 182 articles in PubMed, 175 in Web of Science, and 47 in CINAHL (Figure 1). After duplicates were removed, the authors received 302 publications altogether: 248 original studies, 45 editorials and commentaries, and 9 systematic reviews or meta-analyses. Following the abstract screen, from 141 original papers identified, 69 articles were eventually selected providing data specifically on the prevalence and/or associated factors of burnout of HCWs during the COVID-19 pandemic.

In the final presentation of results, the researchers focused on the following: the author and year of publication, country, study population and sample size, burnout prevalence, associated factors, and measurement method (Table 1).



PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Figure 1. PRISMA Flow Diagram presenting the selection of the relevant studies on prevalence of burnout among healthcare professionals during the COVID-19 pandemic and associated factors (January 1, 2020–February 28, 2021)

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020–February 28, 2021)

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Abdelhafiz et al., 2020 [49]	Egypt	physicians (N = 220)	MBI-HSS	total: 36.36% EE: 28.18% DP: 31.82% reduced-PA: 89.09%	increasing burnout: – the need to buy PPE from participants' own money (EE, DP)* – harassment by patients' families (EE, DP)* – younger age (EE, DP)* – male (DP)* – working in isolation hospital ICU (DP)* – dissatisfaction about cure rate of COVID-19 patients (reduced-PA)* – not working in triage hospital (reduced-PA)* – infection of a colleague with COVID-19 (EE) – being female (EE) – work in isolation hospital ICU (EE) – colleagues infected with COVID-19 (EE) – colleagues or relatives died from COVID-19 (reduced-PA) – younger (reduced-PA) – lack of experience (reduced-PA)
Aebischer et al., 2020 [62]	Switzerland	medical students (N = 550), residents (N = 227)	MBI (2 single items)	no information provided	increasing burnout: – non-involvement in the COVID-19 response (EE, DP) – being a frontline resident compared to frontline students (EE)
Algunmeeyn et al., 2020 [63]	Jordan	physicians, nurses, pharmacists (N = 30 altogether)	face-to-face interviews	no information provided	increasing burnout: – job stress – staff and resource inadequacy – fear of COVID-19 infection
Ali et al., 2020 [64]	USA	nurses (N = 109)	questionnaire (open-ended questions regarding burnout)	70% of nurses used the word "burnout" to summarize feelings related to working during the COVID-19 pandemic	no information provided

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Aydin Sayilan et al., 2020 [40]	Turkey	nurses (N = 267)	MBI	EE: 34.48% (M±SD 23.68±7.90) DP: 83.90% (M±SD 17.14±4.56) PA: 99.25% (M±SD 17.56±4.11)	increasing burnout: – younger age (EE)* – sleep quality (insomnia) (EE)* – units not caring for COVID-19 patients (EE)* – higher education (EE)* – having relative or friend diagnosed with COVID-19 (EE)* – male (EE) – being female (reduced-PA) – being single (EE, DP) – caring for patients diagnosed with COVID-19 (EE, PA) – sleep quality (insomnia) (EE, DP)
Barello et al., 2020 [65]	Italy	physicians, nurses, other HCWs (N = 532)	MBI	EE: 41% DP: 27% PG: 57%	increasing burnout: – increased demands due to the COVID-19 pandemic – professional risk – emotional demands – uncertainty of the clinical situation – conflict between work and family
Barello et al., 2020 [56]	Italy	physicians and nurses (N = 376)	MBI	EE : 37% DP: 24.7% PG: 53.2%	increasing burnout: – being female (EE)* – more frequent experience of symptoms (EE, DP, reduced-PG) – worse/lower self-perceived health status (EE)
Celmece and Menekay, 2020 [66]	Turkey	physicians, nurses, healthcare assistants (N = 240)	MBI	no information provided	increasing burnout: – stress and trait anxiety – being married – being nurse (vs. doctors and other HCWs)

Chen et al., 2021 [18]	China	nurses (N = 12 596)	MBI	men: EE: 20.7% DP: 22.3% reduced-PA: 3.1% women: EE : 21.5% DP: 17.9% reduced- PA: 1.1% total: EE: M±SD 19.1±10.0 DP: M±SD 5.5±4.6 reduced-PA: M±SD 19.0±8.4	increasing burnout: – being male (reduced-PA*, DP) – being female (EE)* – working in a COVID-19 designated hospital (EE*, DP*, reduced-PA) – critical care units or departments related to COVID-19 (EE, DP)* – never caring for patients with COVID-19 (DP, reduced-PA)*
Civantos et al., 2020 [67]	Brazil	head and neck surgeons (N = 163)	Mini-Z (online survey)	total: 14.7%	increasing burnout: – being female*
Civantos et al., 2020 [34]	Brazil	otolaryngologists (N = 349)	Mini-Z (online survey)	total: 21.8%	increasing burnout: – being attending physician (vs. resident)* – being female* – younger age
Coleman et al., 2021 [19]	USA	surgical residents and early-career surgeons (N = 1160)	MBI-HSS for Medical Personnel (3 questions)	residents: EE: 55%, DP: 39%, reduced-PA: 45%; early-career surgeons: EE: 56%, DP: 30%, reduced-PA: 45%	increasing burnout: – being female* – lack of wellness resources* – caring for known COVID-19-positive patients* – no access to adequate PPE* – reduction in elective surgery as a result of COVID-19 pandemic (76–100%) – operating on known COVID-19-positive patients – program hasn't instituted formal mechanisms to support resident wellness and promote resiliency – program has asked to provide own PPE

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Correia and Almeida, 2020 [26]	Portugal	physicians (N = 229), nurses (N = 268)	OLBI (Portuguese adaption)	physicians EX: M±SD 3.07±0.65 DG: M±SD 2.69±0.71 nurses: EX: M±SD 3.10±0.60 DG: M±SD 2.76±0.70	increasing burnout: – high workload (except for DG in physicians)* – affective empathy (EX in nurses)* – workload (DG in physicians) decreasing burnout: – procedural justice (EX, DG)* – professional identification (except for EX in nurses)* – older age, higher income, higher trust in policies (COVID-19) (EX in nurses)* – being a male (DG in physicians)* – religiosity, meaningful work, justice of colleagues, patient and family patient's justice, distributive justice, procedural justice, and professional identification (DG in nurses)* – income, trust in policies (COVID-19), justice of colleagues, distributive justice (EX, DG in physicians) – cognitive empathy, meaningful work, patient and family patient's justice (DG in physicians) – distributive justice and procedural justice (EX, DG in nurses) – sex (female) (DG in nurses) – age, years of professional experience and task changes (COVID-19), meaningful work, justice of colleagues and patient and family patient's justice (EX in nurses)
Demartini et al., 2020 [41]	Italy	HCWs (N = 432)	MBI	EE: 38.2% (M±SD 25.1±12.1) DP: 39.8% (M±SD 10.3 ±5.2) reduced-PA: 48% (M±SD 32.2 ±9.4)	increasing burnout: – being female (EE)* – working directly in contact with COVID-19 patients (EE)* – being COVID-19 healthcare workers vs. non-COVID-19 healthcare workers (EE) decreasing burnout: – being COVID-19 healthcare workers vs. non-COVID-19 healthcare workers (PA)
Dinibutun, 2020 [68]	Turkey	physicians (N = 200)	MBI	EE: M±SD 3.0±0.62 DP: M±SD 2.0±1.01 PA: M±SD 2.0±0.57	increasing burnout: – enthusiasm to choose the profession (reduced-PA among physicians who chose their profession willingly) – fighting actively against COVID-19 (higher total burnout) decreasing burnout: – age 18–23 (EE, DP) – enthusiasm to choose the profession (lower total burnout among physicians who chose their profession willingly) – fighting actively against COVID-19 (reduced-PA)

Dobson et al., 2021 [69]	Australia	senior and junior medical practitioners, nurses, allied health practitioners and non-clinical or other (N = 320)	PFI	total: 29.5%	increasing burnout: – profession (nurse, junior medical staff, allied health and other vs. senior medical staff) – working position (second-line vs. front-line HCW) – working in a high-exposure environment – past psychiatric history – greater endorsement of anxiety, depression and PTSD symptoms
Duarte et al., 2020 [20]	Portugal	physicians, nurses, pharmacists, nutritionists, psychologists, other allied health professionals, and healthcare assistants (N = 2008)	CBI (Portuguese adaptation)	PB: 52.5% WB: 53.1% CB :35.4%	increasing burnout: – frontline working positions (PB, WB, CB)* – higher levels of anxiety (PB), stress and depression (PB, WB, CB)* – being female (PB)* – higher level of education (WB)* – professional experience (6–15 years vs. less) (CB)* – having children <12 years old (vs. no children or having children >12 years old – PB)* – being diagnosed with health problems (PB, WB)* – direct contact with infected people (PB, WB)* decreasing burnout: – higher satisfaction with life (PB, WB, CB)* – resilience (PB, WB, CB)* – being single (vs. married/nonmarital partnership) (PB)* – professional experience (>15 years vs. ≤5 years) (CB)* – salary reduction (PB)* – death of relative or friend during pandemic period (CB)*
El Haj et al., 2020 [70]	France	HCW from acute geriatric units (N = 84)	OLBI	burnout total score: 38.4 EX: M±SD 20.94±5.68 DG: M±SD 17.40±4.89	no information provided
Elhadi et al., 2020 [50]	Libya	HCWs (N = 532)	aMBI (9 items)	EE: 67.1% (M±SD 11.25±4.81) DP: 47.4% (M±SD 8.5±5.06) reduced-PA: 22.7% (M±SD 12.74±3.74) burnout: M±SD 19.76±8.99	increasing burnout: – being male (EE, DP) – being ≥35 years old (DP) – working in high-risk departments for COVID-19 (EE, DP) – professional specialty (EE, DP) – fear of COVID-19 infection (EE, DP) – feelings of stigmatization due to COVID-19, internal displacement, verbal abuse, (DP) – living in conflict area (EE) decreasing burnout: – less working experience EE)

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Evanoff et al., 2020 [21]	USA	faculty, staff, and postdoctoral fellows of a university, including its medical school (N = 5550)	PFI	total: 34% not working in high-risk clinical settings: 32% working in high-risk clinical settings: 42.8%	increasing burnout: – age <40 years* – being female* – high number of stressors* – caring for patients with COVID-19* – poor supervisor support* – children <18 years old living at home
Fargen et al., 2020 [71]	USA	physicians (N = 151)	37-question online survey designed by researchers	35% increase during COVID-19	no information provided
Firew et al., 2020 [22]	USA	physicians, nurses, emergency medical technicians (N = EMTs), non-clinical staff (N = 2040)	MBI (1-item version)	no information provided	increasing burnout: – isolated while caring for COVID-19 patients – moved into a different residence temporarily – took all necessary precautions at home – having been infected with COVID-19 – having a coworker contracted with COVID-19 (yes and unsure vs. no) – having a coworker from the respondent's department admitted to the hospital because of COVID-19 – spending ≥25% of work hours in close contact with COVID-19 patients
Foley et al., 2020 [72]	Ireland	radiographers (N = 370)		40% (subjective reported burnout symptoms)	no information provided
Franza et al., 2020 [73]	Italy	HCWs of a psychiatric and multidisciplinary medical department (N = 102)	*Caregiver Burden Inventory* (1-item version)	total: 34.25%	increasing burnout: – department (psychiatric department vs. multidisciplinary) – specialization (physicians and psychologists compared to other HCWs)
Gemine et al., 2021 [28]	United Kingdom	NHS staff (N = 257)	CBI	work- related burnout: M±SD 45.7±15.7/100	increasing burnout: – COVID-19 back office (vs. non-COVID-19 role)* – declining ability to rest and recover during breaks (higher burnout when seldom vs. sometimes)* – having any concerns about PPE*

Giusti et al., 2020 [42]	Italy	hospital HCWs (N = 330)	MBI	EE : 31.9%, DP: 12.1%, reduced-PA: 34.3%	increasing burnout: – increased work hours (EE, DP, reduced-PA)* – psychological comorbidities (EE, DP, reduced- PA)* – fear of infection (EE, DP, reduced-PA)* – being female (EE, DP)* – working in the hospital vs. working from home (EE, DP)* – being in contact with COVID-19 patients (EE, DP)* – older age (reduced-PA)* – being a nurse vs. other (EE, DP)* – support from family and support from friends
Guha et al., 2021 [74]	Czech Republic	otorhinolaryngo-logists (N = 181)	online survey (burnout characterized according to ICD-11 criteria)	total: 12.7%	increasing burnout: – HCWs with 21–35 years of experience vs. other
Jha et al., 2020 [75]	USA	interventional pain physicians (N = 100)	32-question online survey designed by researchers	total: 52%	increasing burnout: – financial stress – administrative burden – uncertainty
Jose et al., 2020 [76]	North India	frontline nurses (N = 120)	MBI-GS	EE : 54% DP: 43%, reduced-PA: 12.5%	decreasing burnout: – resilience (EE, DP, reduced-PA)
Kamali et al., 2020 [77]	Iran	nurses (N = 261)	MBI	total: 64.6% EE : 63.6% DP: 14.9% PA: >97%	increasing burnout: – younger age (EE) – being single, divorced vs. marriage (EE) – work experience <10 years (EE, DP) – hospital ward: COVID-19 ward, emergency, internal (EE, DP) – higher number of deaths observed by nurses during the COVID-19 pandemic (EE, DP) – increased total number of shifts during the COVID-19 pandemic (EE)
Kannampallil et al., 2020 [31]	USA	physician trainees (N = 393)	PFI (online)	total: 40.7%	increasing burnout: – contact with patients being tested for COVID-19*

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Khalafallah et al., 2020 [47]	USA	neurosurgeons (N = 407)	MBI	total: 20.4% EE : 19.2% DP: 2.5% PA: 81.1%	increasing burnout: – choosing not to pursue or feeling uncertain about pursuing neurosurgery again if given the choice* – being in practice for 5–15 years (vs. <5 years)* – not having children* – working in a hostile or difficult work environment* – spending increased time conducting non-neurosurgical medical care* – feeling uncertain about future earnings – performing too few cases – spending less time interacting with family members – feeling that their professional and personal lives had worsened due to COVID-19 increasing PA: – Hispanic, Latino, or Spanish ethnic origin – having cerebrovascular subspecialty training – having children – not having spine/peripheral nerve subspecialty training – not feeling that their professional life had worsened due to COVID-19 – more likely to pursue neurosurgery again if given the choice
Khasne et al., 2020 [78]	India	HCWs looking after COVID-19 patients (N = 2026)	CBI	PB: 44.6% WB: 26.9%, PAND_B: 52.8%	increasing burnout: – younger age (21–30 years vs. ≥31 years for PB, 21–30 years vs. ≥41 years for WB, 21–30 years vs. ≥61 years for PAND_B) – older age (31–50 years vs. 21–30 years for PAND_B) – being female (PB, WB) – being doctor or support staff vs. administration (PAND_B) – being nurse vs. administration (WB) – being administrative vs. support staff (PB) – working in high-risk hospital environment (WB, PAND_B)
Lange et al., 2020 [54]	France	community pharmacists (N = 135)	MBI	EE : 25% DP: 34.9% reduced-PA: 3%	increasing burnout: – being female or male (DP) – unspecified

Lasalvia et al., 2021 [23]	Italy	HCWs (N = 1961)	MBI-GS	EX: 38.3% reduced-EF: 46.5% CY: 26.5%	increasing burnout: – being a resident vs. physician (EX, reduced-EF, CY)* – being a nurse vs. physician (EX, CY)* – being female (EX)* – being single (EX)* – workplace – ICU (EX, CY)* – length of working experience (≥6 years vs. less) (EX)* – increased conflict among colleagues (EX, CY)* – additional task assignment (EX, CY)* – increased workload (EX)* – pre-existing psychological problems (EX, reduced-EF, CY)* – having experienced a COVID-related traumatic event (EX, CY)* – having experienced interpersonal avoidance in the workplace and personal life* – move out of the family house to protect family members (EX, reduced-EF, CY) – having experienced a COVID-related traumatic event (reduced-EF) – length of working experience <6 years (reduced-EF, CY) – being directly engaged with patients with COVID-19 (EX,CY)
Leskovic et al., 2020 [55]	Slovenia	HCWs in nursing homes (N = 781)	MBI	EE: M±SD 24.8±10.8 DP: M±SD 8.2±4.9 PA: M±SD 48.7±11.8	no statistical association with gender, age, education and position
Liu et al., 2020 [43]	China	physicians and nurses (N = 880)	MBI	total: 39.21% EE: 9.09% DP: 50.57% reduced-PA: 56.59%	increasing burnout: – higher work intensity (EE)* – more night shift quantity (EE, DP)* – having symptoms of COVID-19 (EE, DP)* – working in the high infection region (EE)* – working in the low infection region (DP, reduced-PA)* – negative coping style (EE, DP, reduced-PA)* – senior title (DP, reduced-PA)* – direct contact with patients (EE) – isolation from family (EE)
Luceño-Moreno et al., 2020 [79]	Spain	HCWs having contact with patients with COVID-19 (N = 1422)	MBI-HSS (Spanish adaptation)	EE : 41% DP: 15.2% reduced-PA: 8.4%	increasing burnout: – being male (DP) – posttraumatic stress (EE, DP), anxiety and depression (EE, DP, reduced-PA)* decreasing burnout: – resilience (EE, DP, reduced-PA)

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Manzano García et al., 2020 [35]	Spain	nurses (N = 771)	no information provided	no information provided	increasing burnout: – work overload* – perceived threat of COVID-19* – role conflict and ambiguity decrease burnout: – social support at work* – availability of material and human resources* – autonomy
Matsuo et al., 2020 [32]	Japan	physicians, nurses, laboratory medical technologists, radiological technologists, pharmacists (N = 312)	MBI-GS (Japanese version)	total: 31.4% nurses: 46.8% radiological technologists: 36.4% pharmacists 36.8%	increasing burnout: – being nurses, laboratory medical technologists, radiological technologists, pharmacists vs. physicians* – fewer years of experience* – heightened anxiety because of unfamiliarity with personal protective equipment* – decreased sleep length compared with the prepandemic period* – desire for reduced workloads* – desire for expectations of appreciation or respect* – being female, younger age – lower time off per month – dropout intentions – anxiety of transmission to patients – anxiety for lack of daily necessities – unhealthy diet compared to the prepandemic period – decreased relaxation time compared with the prepandemic period – types of support needed now (staff increase, hazard pay, educational resources for infection prevention, counseling)
Miguel-Puga et al., 2021 [33]	Mexico	frontline HCWs (N = 204)	depersonalization/derealization inventory, short version of the *Burnout Measure*	first evaluation: 15.1% second evaluation: 19.6% third evaluation: 18.6%	increasing burnout: – younger age* – anxiety, depression, dissociation, acute stress, depersonalization, state anxiety, lower sleep quality decreasing burnout: – resilience

Morgantini et al., 2020 [15]	international (60 countries)	HCWs (N = 2707)	single item with 7-point Likert scale (1 – strongly disagree to 7 – strongly agree)	EE: 51.4%	increasing burnout: – work impacting household activities* – feeling pushed beyond training* – exposure to COVID-19 patients* – making life prioritizing decisions due to supply shortages* – difficulty obtaining COVID-19 testing (only high income countries)* – work impacting quality of life (only high income countries)* decreasing burnout: – adequate PPE* – country: Italy, Sweden, other vs. USA*
Murat et al., 2020 [48]	Turkey	frontline nurses (N = 705)	MBI	EE: M±SD 18.9±8.5 DP: M±SD 7.3±4.5 PA: M±SD 11.4±5.0	increasing burnout: – being male (EE) – education: high school degree (reduced-PA), bachelor's degree (EE, DP) – having ≤10 years experience (EE, DP) – having ≤21 years experience (reduced-PA) – working at a public hospital (EE, DP) – unwillingness to work voluntarily and being tested positive for COVID- 19 (EE, DP) – willingness to work voluntarily (reduced-PA) – undecided if he/she feeling competent in patient care during the pandemic (reduced-PA)
Naldi et al., 2021 [44]	Italy	physicians and nurses (N = 797)	MBI	EE : 40.7% DP: 30.2% reduced-PA: 36.4%	increasing burnout: – trait anxiety (DP, EE, reduced-PA)* – being male, no children (DP)* – frequent contact with patients with COVID-19 (DP*, EE, reduced-PA) – family division (EE*, DP) – increased workload (EE)* – job changes (EE*, reduced-PA)
Orrù et al., 2021 [16]	international (45 countries)	physicians, nurses, surgeons, psychologists, other HCWs (N = 184)	MBI-HSS	EE: 56.0% DP: 48.9% reduced-PA: 38%	increasing burnout: – perceived stress total group (EE)* – perceived stress among frontline HCWs (EE, DP)* – perceived stress among other HCWs (DP)* – perceived stress and secondary traumatic stress, intrusion, avoidance, arousal (EE, DP) – being female (EE) – higher number of hours per day spent with patients in frontline HCWs (DP) – no children and younger age (reduced-PA) decreasing burnout: – older age (DP) – perceived stress (PA) – having children (EE)

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Ozdemir and Kerse, 2020 [80]	Turkey	medicine/ laboratory/X-ray technicians, paramedics, nurses, health officers, other HCWs (N = 169)	aMBI (9 items)	EE: M±SD 2.76±0.9	increasing burnout: – job stress decreasing burnout: – optimism about COVID-19
Park et al., 2020 [52]	Korea	infectious disease physicians (N = 115)	MBI-HSS	total: 90.4% EE: 84.3% DP: 66,1% reduced-PA: 66,1%	increasing burnout: – being female (EE)
Pérez-Chacón et al., 2021 [51]	Spain	HCWs (N = 694)	MBI (Spanish adaptation)	total: 4.3% EE: M±SD 26.92±12.81 DP: M±SD 5.97±5.45 PA: M±SD 39.93±6.84	increasing burnout: – ease of excitation (EE, reduced-PA)* – sensory processing sensitivity (increased sensitivity to the environment and increased aesthetic sensitivity) (EE) – low sensory threshold (EE) – quality of life – compassion fatigue (EE, DP, reduced-PA) decreasing burnout: – increased compassion satisfaction (EE, DP, reduced-PA)* – low sensory threshold (reduced-PA)* – quality of life – compassion satisfaction (EE, DP, reduced-PA) – low sensory threshold (reduced-PA)
Ramaci et al., 2020 [37]	Italy	physicians and nurses (N = 273)	ProQOL	burnout: M±SD 1.82±0.97	increasing burnout: – stigma related to discrimination, stigma fear, psychological job demand and fatigue* – being female,older – long-term workers (vs. temporary workers) – lower satisfaction
Rapisarda et al., 2020 [81]	Italy	HCWs working with people with mental health problems (N = 241)	MBI	total: 31.7% EE: 13.7% DP: 19.9%	increasing burnout: – being female – working in close contact with non infected users vs. no direct contact – being a medical doctor – working in outpatient services – perceiving a medium or high risk of contracting COVID-19 at work – anxiety and depressive states

Rodriguez et al., 2020 [82]	USA	academic emergency medicine physicians (N = 426)	single item with 7-point Likert scale (1 – strongly disagree to 7 – strongly agree)	prepandemic: Me (IQR): 3 (2–4) since-the-pandemic-started: Me (IQR): 4 (3-6)	no information provided
Roslan et al., 2021 [29]	Malaysia	assistant medical officers, doctors, health inspectors, hospital food preparation personnel, medical laboratory technologists, nurses, paramedics, pharmacists, physicians, physiotherapists, dieticians, therapists, psychologists, counsellors, radiographers, and social workers (N = 933)	CBI	PB: 53.8% WB: 39.1% PatB: 17.4%	increasing burnout: – direct involvement in screening or treating COVID-19 patients (PB, WB, PatB)* – having a medical condition (PB, WB, PatB)* – perceived inadequate psychosocial support at work (PB, WB, PatB)* – having inadequate childcare support at home (PB, WB)* – work: >60 h/week (PB*, WB*, PatB) – age: <40 years, (PB*, PatB*, WB) – irregular spiritual routines (WB*, PB, PatB) – having no children (PB, WB, PatB) – being single (WB, PatB)
Ruiz-Fernández et al., 2020 [38]	Spain	physicians and nurses (N = 506)	ProQOL	low: 16% medium: 48% high:36%	increasing burnout: – compassion fatigue* – being physician (vs. nurse) – working on specific COVID-19 unit – perceived stress decreasing burnout: – compassion satisfaction*
Sagherian et al., 2020 [45]	USA	nurses and nursing assistants (N = 587)	MBI-HSS	EE: M±SD 32.21±12.01 DP: M±SD 11.13±6.99 PA: M±SD 32.95±8.00	increasing burnout: – caring for patients with COVID-19 (DP) – skipping 30-minute breaks (EE) – part time work status, extended shift length, and 3–8 years of experience (DP) – worked >40 h/week (EE) – worked ≤40 h/week (reduced-PA)

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Sarboozi Hoseinabadi et al., 2020 [27]	Iran	nurses (N = 245)	OLBI	burnout: M = 2.57	increasing burnout: – job stress (including COVID-19 related job stress)* – employment type (contracted vs. corporate, temporary and official) – experience in taking care of patients with COVID-19 infection decreasing burnout: – hospital resources for treatment of COVID-19
Serrão et al., 2021 [24]	Portugal	HCWs (N = 2008)	CBI	PB: 52.5% WB : 53.1% CB: 35.4%	increasing burnout: – depression (PB, WB, CB)* – direct contact with infected people (PB, WB, CB)* – gender (meaningful, but not specified direction), having children ≤12 years old, frontline working position, diagnosed health problem (PB, WB)* – being married and no interest in being COVID-19 tested (PB)* – professional experience: 6–15 years vs. <6 years (CB), ≥6 years vs. <6 years (WB)* – higher education (WB)* decreasing burnout: – psychological resilience (PB, WB, CB)* – death of relative or friend during the pandemic period (CB)*
Soto-Rubio et al., 2020 [39]	Spain	nurses (N = 125)	*Questionnaire for the Assessment of Workplace Burnout Syndrome* (CESQT)	no information provided	increasing burnout: – emotional work* – interpersonal conflict* – role conflict* decreasing burnout: – emotional repair (emotional intelligence)*
Sunjaya et al., 2021 [83]	Indonesia	general practitioners, emergency doctors, and doctors in various specialists, dentists, nurses, midwives, analysts, pharmacists, and public health practitioners (N = 544)	*Burnout Inventory* (BOI)	total: 42.4% PB: 52.75% WB: 52.75% PatB: 46.71%	increasing burnout: – contact with patients with COVID-19 (burnout, PatB)

Tan et al., 2020 [25]	Singapore	doctors, nurses, allied health professionals, administrative, and support staff (N = 3075)	OLBI	EX: 75.3% DG: 79.7%	increasing burnout: – Chinese or Malay (vs. Indian) ethnicity (EX, DG)* – higher education (having a degree for DG and having degree or diploma for EX)* – HADS anxiety or depression scores ≥8 (EX, DG)* – being redeployed (EX, DG,)* – shifts lasting ≥8 h (EX)* decreasing burnout: – job satisfaction, higher stress recognition, better perception of management, better working conditions (EX, DG)* – teamwork and higher safety climate (DG)*
Tiete et al., 2021 [30]	Belgium	physicians and nurses (N = 647)	PFI	total: 45.6%	increasing burnout: – occupation (being nurse vs. physician)* – increase in workload* – perceived poor social support* – being younger*
Trumello et al., 2020 [84]	Italy	HCWs (N = 627)	ProQOL	not working with COVID-19 patients: M±SD 26.38±6.76 working with COVID-19 patients: M±SD 29.70±7.35	increasing burnout: – working with patients with COVID-19 – working in the Italian regions most affected by COVID-19
Vagni et al., 2020 [46]	Italy	emergency volunteers (N = 494)	MBI	no information provided	increasing burnout: – higher stress levels: cognitive (EE, DP, reduced-PA), emotional (EE, reduced-PA), physical (EE), organizational-relational (DP) inefficacy-decisional (reduced PA)* decreasing burnout: – *Dispositional Resilience Scale* scores (EE, DP, reduced-PA)* – hardiness (EE, DP, reduced-PA)* – older age (reduced-PA)* – inefficacy-decisional (reduced-PA)* – treating patients with COVID-19 (reduced-PA)
Varani et al., 2021 [58]	Italy	palliative care professionals (N = physicians and nurses) (N = 145)	MBI	total: 22.0% EE: 8.4% DP: 26.1% reduced-PA: 11.9%	increasing burnout: – psychological morbidity (EE, DP, reduced-PA)*

Table 1. Publications included in the scoping review on prevalence of burnout among Healthcare Professionals during the Covid-19 pandemic and associated factors (January 1, 2020 – February 28, 2021) – cont.

Reference	Country	Participants	Tool	Burnout prevalence	Burnout-associated factors
Wahlster et al., 2021 [17]	international (77 countries)	interdisciplinary HCWs caring for patients with COVID-19 (N = physicians, nurses, respiratory therapists, advanced practice providers) (N = 2700)	questionnaire designed by researchers	total: 52.0%	increasing burnout: – being female* – being a nurse (vs. attending physician)* – region (Europe and Central Asia vs. North America)* – region (East Asia and Pacific vs. North America) – experiencing poor communication from supervisors* – reporting a shortage of powered air-purifying – respirators* – reporting lack of nurses* – number of patients with COVID-19 cared for (≥10 vs. <10)* – respiratory therapists (RTs), and advanced practice providers (APP) vs. attending physician – limited ventilator availability – reporting a shortage of ICU nurses – treating most severe cases of COVID-19
White et al., 2021 [85]	USA	nursing home staff (N = 152)	questionnaire designed by researchers	no information provided	increasing burnout: – increased workloads – staffing shortages – emotional burden of caring for residents facing significant isolation, – illness and death
Wu et al., 2020 [12]	China	HCWs (N = 190)	MBI	burnout - high EE and/or high DP: frontline: 13% usual wards: 39% burnout - reduced-PA: frontline: 39% usual wards: 61%	increasing burnout: – working in usual wards vs. working in COVID-19 wards (frontline)*
Yörük et al., 2021 [86]	Turkey	midwives and nurses (N = 377)	MBI-HSS for Medical Personnel	EE: M±SD 20.06±7.88 DP: M±SD 6.42±4.67 PA: M±SD 22.70±7.88	increasing burnout: – depression (EE, DP, reduced-PA)* – social resources (reduced-PA) decreasing burnout: – social competence, structured style, perception of future, perception of self, total psychological resilience (EE, DP, reduced-PA) – social resources (EE, DP) – family cohesion (DP, reduced-PA)

Zerbini et al., 2020 [87]	Germany	physicians and nurses (N = 110)	MBI	no information provided	increasing burnout: – fear of being infected with COVID-19 (EE) – feeling more stressed at work – working in COVID-19 wards (for nurses only: EE, reduced-PA)
Zhang et al., 2020 [53]	China	nurses (N = 107)	MBI	EE: 21.5%, DP: 7.5% reduced-PA : 81.0%	increasing burnout: – working longer hours in COVID-19 quarantine units (EE,DP, reduced-PA)* – younger age (EE, DP, reduced-PA)* – less working experience (EE, reduced-PA)* – lower degrees (reduced-PA)*

aMBI – abbreviated *Maslach Burnout Inventory*; CBI – *Copenhagen Burnout Inventory*; MBI – *Maslach Burnout Inventory*; MBI-GS – *Maslach Burnout Inventory – General Survey*; MBI-HSS – *Maslach Burnout Inventory - Human Services Survey*; Mini-Z - *Mini-Z Burnout Assessment*; OLBI – *Oldenburg Burnout Inventory*; PFI - *Professional Fulfillment Index*; ProQOL – *Professional Quality of Life Scale*.
CB – client-related burnout; CY – cynicism; DG – disengagement; DP – depersonalization; EE – emotional exhaustion; EF – professional efficacy; EX – exhaustion; PA – personal accomplishment; PAND_B – pandemic-related burnout; PatB – patient-related burnout; PB – personal-related burnout; PG – personal gratification; WB – work-related burnout.
PPE – personal protective equipment.
* Multivariable analysis.

Sixty five of the studies were cross-sectional, among which 1 follow-up, 2 qualitative, and 1 mixed methods study were identified (Table 2). Most of the reviewed papers presented local or national studies. Only 3 studies provided analyses based on international data [15–17]. The highest number of publications showed results for the Southern European (N = 25), North American (N = 12), and Asian (N = 11) countries. Ten studies were carried out in other European regions, 5 in Africa, 2 in South America, and 1 in Australia. The articles were also categorized according to sample size: studies of large samples (≥1000 participants – 12 publications) [15,17–25], medium-sized samples (201–999 participants – 38 publications), and small samples (≤200 participants – 19 publications). The most frequent data collection method was online survey (49 publications). However, printed versions of questionnaires and face-to-face interviews were also used (13 publications).

The majority of surveys were conducted using the Maslach Burnout Inventory for Human Service Survey (MBI-HSS) or General Survey (MBI-GS) (34 publications). However, researchers used different cut-offs for burnout and they presented the outcomes in many different ways. Other studies included such instruments as: *Oldenburg Burnout Inventory (OLBI)* [25–27], *Copenhagen Burnout Inventory* (CBI) [20,24,28,29], *Stanford Professional Fulfilment Index* [21,30,31], or surveys designed by researchers [15,17,22,32,33]. Some tools were used in single studies, for example the single-item *Mini-Z Burnout Assessment* [34], *Spanish Burnout Inventory* [35], the short version of the *Burnout Measure by Malach-Pines* [36], *Professional Quality of Life Questionnaire* (ProQoL) [37,38], *Questionnaire for the Assessment of Workplace Burnout Syndrome* (CESQT) [39].

Most studies included in this review identified factors associated with burnout among HCWs during the COVID-19 pandemic, namely 64 out of 69 included in the review (the remaining 5 papers reported burnout prevalence only). Among them, 40 presented results of a multivariable linear regression analysis (these are marked with an asterisk in Table 3). Nine studies did not

Table 2. General characteristics of the publications included in the scoping review on prevalence of burnout among healthcare professionals during the COVID-19 pandemic and associated factors (January 1, 2020 – February 28, 2021)

Variable	Articles [n]
Study design	
cross-sectional	65
follow-up	1
qualitative	2
mixed-methods	1
Participants	
≤200	19
201–999	38
≥1000	12
Method of data collection	
online survey	49
face-to-face interviews	1
questionnaire completed onsite (printed)	12
electronic and printed questionnaire	3
unspecified	4
Instrument	
*Maslach Burnout Inventory**	34
Mini-Z Burnout Assessment	2
Oldenburg Burnout Inventory	4
Stanford Professional Fulfillment Index	4
Copenhagen Burnout Inventory	5
Caregiver Burnout Inventory	1
Spanish Burnout Inventory	1
Professional Quality of Life Scale	3
Questionnaire for the Assessment of Workplace Burnout Syndrome	1
Burnout Inventory	1
other	13
Analysis	
multivariable	40
univariable	24
only prevalence	5
Occupation	
physicians	28
nurses	34
other	50
medical students	2
medical residents	2
pharmacists	6
healthcare assistants	2
surgeons	4
otolaryngologists	2
nutritionists, dieticians	2
psychologists	3
medical emergency technicians	1
radiographers, radiological technologists	3
laboratory medical technologists, analysts	4
paramedics	2
physiotherapists	1
social workers	1
dentists	1
midwives	2
therapists	2
emergency volunteers	1
administrative staff	1
unspecified (HCWs generally)	18
Frontline	
yes	34
no/unspecified	35
Geographic area	
international	3
national/local	66
Region	
Western Europe	7
Southern Europe	25
Northern Europe	1
Central-Eastern Europe	2
North America	12
South America	2
Asia	11
Africa	5
Australia	1

* *Maslach Burnout Inventory for Human Service Survey* (MBI-HSS) or *General Survey* (MBI-GS).

Table 3. Factors associated with burnout of healthcare workers (HCWs) during the COVID-19 pandemic (January 1, 2020–February 28, 2021)

Factor	Burnout increasing factor	Burnout decreasing factor
Sociodemographic		
age	younger [21*,29*,30*,32,33*,34,40*,49*,53*,77,78]	younger (age 18–23 years) [68]
	older [42*,50,78,37]	older [16,26*,46*]
gender	female [16,17*,18*,19*,20*,21*,23*,32,34*,37,40,41*,42*,49, 52,56*,67*,78,81]	female [26]
	male [18*,40,44*,48,49*,50,79]	male [26*]
	unspecified direction [24*]	
marital status	single [23*,29,40,77]	single [20*]
	married [24*,66]	
having children	yes [20*,21,24*]	yes [16,47]
	no [16,29,44*,47*]	
education	higher [20*,24*,25*,40*,48]	
	lower [53*]	
income/salary		lower [20*]
		higher [26*]
financial stress	higher [47,75]	
religiosity	no (irregular spiritual routines)	yes (declaration of being religious)
occupation	nurse [17*,23*,32*,30*,42*,66,69,78]	
	physician [34*,38,73,78,81]	
	resident [23*]	
	professional specialty [17,50,73]	
	administrative staff [78]	
professional experience	short [23,32*,45,48,49*,53*,77]	short [50]
	medium [20*,23*,24*,47]	
	long [43*,48,74]	long [26,20*]
place of living	conflict area [50]	
	high-infection region [43*,84]	low-infection region [43*]
geographic area	Europe and Central Asia vs. North America [17*]	Italy, Sweden, other vs. USA [15*]
	East Asia and Pacific vs. North America [17]	
ethnicity	Chinese or Malay (vs. Indian) ethnicity [25*]	Hispanic, Latino, or Spanish ethnic origin [47]
Psychological and health related factors		
past psychiatric history or preexisting psychological problems	yes [23*,42*,58*,69]	
greater endorsement of anxiety, depression and PTSD symptoms	yes [20*,24*,25*,32,33,69,79,81,86*]	
stress (including stress at work)	yes [16*,20*,21*,27*,33,38,46*,63,66,80,87]	
psychological/emotional job demand and fatigue	emotional burden and professional risk [37*,39*,65,85]	emotionally rewarding work, conviction of doing meaningful work [26*]

Table 3. Factors associated with burnout of healthcare workers (HCWs) during the COVID-19 pandemic – cont.

Factor	Burnout increasing factor	Burnout decreasing factor
Psychological and health related factors – cont.		
compassion fatigue/satisfaction	compassion fatigue [38*,51*]	compassion satisfaction [38*,51*]
satisfaction with life		high [20*]
interpersonal conflict	yes [23*,39*]	
role conflict and/or ambiguity	yes [35,39*]	
coping style and individual adaptive characteristics	negative coping style [43*]	emotional repair, psychological resilience, hardiness, cognitive empathy [20*,24*,26,33, 39*,46*,76,79,86]
other individual characteristics	dissociation, depersonalization [33]	
	intrusion, avoidance, arousal [16]	low sensory threshold [51]
	ease of excitation [51*]	inefficacy-decisional [46*]
	sensory processing sensitivity (increased sensitivity to the environment and increased aesthetic sensitivity) [51]	social competence, structured style, perception of future, perception of self [86]
	low sensory threshold [51]	higher stress recognition [25]
	affective empathy [26*]	
	trait anxiety [44*,66]	
health problems or conditions	medical conditions, symptoms or worse self-perceived health status [20*,24*,29*,56]	
	insomnia or decreased sleep length or quality [32*,33,40*]	
	unhealthy diet compared to the prepandemic period [32]	
Social factors		
stigma, abuse	stigma related to discrimination, stigma fear [37*]	
	feeling of stigmatization due to COVID-19, verbal abuse [50*]	
	having experienced interpersonal avoidance in the workplace and personal life [23*]	
	harassment by patients' families [49*]	
desire for expectations of appreciation or respect	yes [32*]	
conflict between work duties and own family life	yes [15*,22,23,43,44*,47,65]	
taking all necessary precautions at home	yes [22]	
childcare support	no [29*]	
family cohesion		yes [86]
social support from family/ friends	poor [30*,86]	good [42]
Organizational factors		
workload (h/week)	high [23*,25*,26*,29*,30*,32*,35*,42*,43*,44*,45,53*,77,85]	
	normal (40 h/week) [45]	

Table 3. Factors associated with burnout of healthcare workers (HCWs) during the COVID-19 pandemic – cont.

Factor	Burnout increasing factor	Burnout decreasing factor
Organizational factors – cont.		
no or insufficient rest	yes [28*,32*,45]	
workplace	hospital [42*,48]	
	isolation/COVID-19 designated hospital or ward [18*,49*,50,69*, 77,78]	usual wards vs. working in COVID-19 wards (frontline) [12*]
	intensive care unit (ICU) [23*]	
	psychiatric department vs. other [73]	
	outpatient services and direct contact with patients [81]	
	working in a hostile environment [47*]	
human and material resources	no access to personal protective equipment (PPE) [19*,28*,32*,49*]	access to PPE provided [15*,63]
	inadequate or lack of other material resources (supply shortages) [15*]	availability of other material, equipment, environmental resources [35*,63]
	lack of hospital resources for treatment of COVID-19 [17*]	availability of hospital resources for treatment of COVID-19 [27]
	staff shortages [17*,85]	staff increase [32]
	difficulty obtaining COVID-19 testing [15*]	
competencies in treatment of patients with COVID-19	lack of /or insufficient training [15*]	
	feeling of being not enough competent in care for patient with COVID-19 [48*]	
	experiencing poor supervisors' support [17*,21*]	
employment issues	employment type [27*,37]	
	being redeployed, internal displacement [25*,50*]	
	change of duties [19,23*,47*]	
	increased work demands [65*]	
	administrative burden [75]	
motivation to work	uncertainty about pursuing the specialization) [47*]	choosing profession willingly [68]
	unwillingness to work voluntarily (higher reduced-PA) [48]	willingness to work voluntarily (lower EE and DP) [48]
	dropout intentions or job changes [32,44]	
working conditions (safety vs. uncertainty)	uncertainty of the clinical situation [65,75]	
		procedural justice and professional identification [26*]
		justice (of colleagues, patient and family patient's justice, distributive justice, procedural justice) and trust in policies [26*]
		job satisfaction, better perception of management, better working conditions, teamwork and higher safety climate [25]
		autonomy at work [35]

Table 3. Factors associated with burnout of healthcare workers (HCWs) during the COVID-19 pandemic – cont.

Factor	Burnout increasing factor	Burnout decreasing factor
Organizational factors – cont.		
work impacting quality of life	yes [15*]	
psychosocial support at work	poor [19,29*]	good [35*]
COVID-19 related factors		
fear of COVID-19 infection, perceiving risk of contracting COVID-19	yes [35*,42*,50,63,81,87]	
interest in being COVID-19 tested	no [24*]	
having been infected with COVID-19	yes [22,48]	
having symptoms of COVID-19	yes [43*]	
infection or death of a colleague or relative with COVID-19	yes [22*, 40,49*]	yes [20*,24*]
having experienced a COVID-19-related traumatic event	yes [23*]	
higher number of deaths observed by nurses during the COVID-19 pandemic	yes [77,85]	
dissatisfaction about cure rate of patients	yes [49*]	
optimism about COVID-19		yes [80]
contact with patients with COVID-19 (COVID-19 ward/frontline position/caring for patients with COVID-19)	yes [15*,16,17*,19*,20*,21*,22,23,24*,27*,28*,29*,31*,38,40, 41*, 42*,43,44*,45,46*,50,68,83*,84,87] no [18*,40*,62,69]	

Abbreviations as in Table 1.
* Results of multivariable analyses.

provide data on burnout prevalence, but indicated factors associated with burnout among HCWs only.

The articles demonstrated burnout in multi-professional HCW groups or in specific professional groups, among which data for hospital nurses and/or physicians were the most frequently presented. Thirteen studies provided data from staff working in hospitals, departments, wards, or units dedicated to patients infected with SARS-CoV-2 (Table 3). Some of the papers showed comparisons of burnout levels between staff exposed vs. not exposed to SARS-CoV-2 [15,18–22,24,28,29,31,40–46].

DISCUSSION

The articles included in this review differed primarily in the methodology, and in their findings. As expected, the most popular tool used by researchers was the MBI considered to be the most widely used instrument to measure burnout [13]. The OLBI and the CBI as other standardized psychological tools used to evaluate the burnout level among HCWs were also recognized. Some researchers developed questionnaires themselves. Therefore, in terms of burnout prevalence, estimates and comparisons are complicated due to a large variability

in definitions and assessment methods. Firstly, different versions of MBI, namely MBI-GS, as well as MBI-HSS, were used. Secondly, it was observed that even in the articles in which one version of the MBI tool was used, the way of reporting results differed. For instance, in some articles, the burnout rate was reported as a global outcome [21,30,34], whereas other authors delivered rates of each subdimension of burnout [18,19,24]. Additionally, the incomparability of the studies was attributable to the inconsistency of reporting the subdimension of personal accomplishment: some authors reported the rate of personal accomplishment [40,47,48], while others presented the result as reduced personal accomplishment (RPA) [18,19,42,43,49,50].

Prevalence of occupational burnout during the COVID-19 pandemic

Numerous studies have reported significant differences in prevalence of burnout observed among HCWs during the COVID-19 pandemic.

The percentage of staff with a high total score of burnout ranged from 4.3% [51] to 90.4% [52]. Similarly, reports on particular components of burnout among HCWs differed largely: high levels of EE ranged from 21.5% [53] to 67.1% [50]; high DP from 2.5% [47] to 66.1% [52], and RPA from 3% [54] to 89.1% [49].

It was impossible to distinguish the mean total score of burnout measured with MBI as not all of the analyzed studies provided this information. As far as single dimensions of burnout are concerned, their mean scores ranged from 18.9 [48] to 32.2 [45] for EE; from 6.0 [51] to 17.1 [40] for DP and from 11.4 [48] to 48.7 [55] for PA.

Large discrepancies in the findings might result from a variety of population samples: some authors examined all HCWs altogether, regardless of profession, whereas others investigated specific professional groups separately (e.g. physicians, nurses, and residents).

Factors associated with occupational burnout

Factors associated with burnout were grouped into the following categories: sociodemographic, psychological, social, and organizational. The vast majority of them were increasing burnout, but protective factors were also identified.

Sociodemographic factors associated with burnout

Age

In 7 studies, as confirmed by multivariable linear regression analyses, it was demonstrated that younger age is related to higher burnout [21,29,30,33,40,49,53]. The research findings regarding the impact of older age are inconsistent. Namely, in 3 studies, burnout was more frequent in older HCWs [37,50], and reduced PA was associated with older age [42]. In 3 other papers, older age was related to lower burnout [16,26,46]. These findings should draw more attention to burnout prevention specifically among younger HCWs who seem to be more at risk.

Gender

In 19 papers, it was noted that being female was associated with higher burnout, especially in terms of emotional exhaustion [18,41,42,56]. These results are in line with the findings from another review [13]. Only in 3 studies, the male gender was indicated as an independent factor associated with a higher burnout level [18,44,49]. This may be explained by the gender role theory which states that, in general, females are more likely to express feelings of emotional and physical fatigue compared to men [57]. Therefore, they tend to score higher on emotional exhaustion.

Marital status and having children

The findings regarding marital status were inconsistent. On the one hand, in a study based on a multivariable linear regression analysis, being married was listed as

a factor increasing burnout due to the double-workload role of women in society, relating to their professions and home lives, as well as due to inadequate childcare support [24]. On the other hand, based on 4 other studies, being single was associated with more frequent burnout [29,40] or higher odds of burnout [23]. Contrarily to these results, in a study on a large sample of HCWs in Portugal, being single was demonstrated as decreasing burnout [20].

In 7 papers, having children or not was considered as associated with occupational burnout. More specifically, Portuguese HCWs having children <12 years of age had a higher chance of burnout compared to those whose children were older [20,24]. According to Roslan et al. [29], having inadequate childcare support may also increase the risk of occupational burnout in HCWs. Finally, having no children, as reported by US neurosurgeons [47], all-type Malaysian HCWs [29], and Italian physicians and nurses [44] was also related to a higher chance of burnout.

Education level and financial situation

In 4 surveys confirmed by multivariable linear regression analyses, higher education, regardless of other factors, was associated with higher burnout, both among nurses and other HCWs [20,24,25,40]. Higher level of education often imposes greater responsibility on professionals and therefore may cause work-related burnout. The evidence regarding the impact of the financial situation on burnout among HCWs is inconsistent. Financial stress and feeling uncertain about future earnings reported by neurosurgeons [47] were associated with more frequently reported burnout. Two different studies in Portugal provided contradictory results. On the one hand, Correia and Almeida [26] indicated that higher income among Portuguese nurses was an independent factor associated with lower burnout, which was explained by the fact that financial incentives may have stronger meaning for the well-being of people with lower incomes (which is the case for nurses) than for workers earning higher salaries. Furthermore, researchers noted that financial motivation helps individuals to overcome inconveniences and difficulties, as well as to be more engaged in less enjoyable professional activities [26]. On the other hand, Duarte et al. [20] observed that salary reduction among HCWs was related to lower personal burnout, but not to lower work-related burnout, which is not clearly explained by the authors. The role of financial incentives or measures providing financial assurance should be studied more with regard to prevention of occupational burnout, as implementation of specific benefits for the front line workers might improve their financial security.

Religiosity

Interestingly, the irregularity of spiritual routines among HCWs in Malaysia was associated with higher burnout [29]. The authors of this study explain that spiritual practices correlated negatively with burnout as they had a positive influence on work performance and helped to cope with stressful work demands. Furthermore, spiritual practices are seen as a source of comfort and hope during difficult circumstances of life and are recognized as an important resource in dealing with burnout [29]. These results are consistent with another study on physicians and nurses in Portugal, which indicated that religiosity was protective against burnout [26].

Occupation and professional experience

Five of the reviewed studies, confirmed by multivariable linear regression analyses, provided evidence of higher burnout among nurses compared to physicians [17,23,30,32] and other HCWs [42]. Researchers claim that due to the greater frequency of exposure to the virus and a relatively low position in the hospital hierarchy, nurses might have experienced more chronic stress compared to physicians, and this might have led

them to develop burnout [23]. Moreover, it was observed that, during the pandemic, difficult working conditions and high workload were also implicated in emotional and mental burnout among nurses [23,40].

As far as physicians are concerned, Civantos and Byrnes [34], in a multivariable linear regression analysis, demonstrated that attending physicians had a higher chance of burnout than residents. On the contrary, Lasalvia et al. [23] reported that residents had a higher risk of burnout than physicians.

Generally, regarding professional experience, some authors suggest that less working experience correlates with higher incidence of burnout [32,49,53]. This could be explained by the fact that lower experience of HCWs is associated with a relatively low position in the hospital hierarchy with simultaneous high job demands established by supervisors, which increases the chance of burnout [23]. In contrast to these results, Khalafallah et al. [47] found that physicians who were in practice for 5–15 years had a higher chance of burnout, in comparison to those working less than 5 years. The authors explain that this might be, among others, due to lower career satisfaction, greater administrative duties, or increased personal health issues among mid-career workers [47].

Psychological factors associated with burnout

Pre-existing psychological problems

Three papers based on multivariable linear regression analyses provided evidence of increased odds or rates of burnout among HCWs with pre-existing psychological problems or morbidity [23,42,58]. This population was found to be more vulnerable to stressors associated with COVID-19 and more likely to adopt dysfunctional coping strategies (e.g. self-isolation) compared with those without mental health disorders [59]. In particular, there is a significant relationship between burnout and depression [60], which has been confirmed among HCWs during this pandemic [20,24,25].

Stress and anxiety

Higher levels of stress [16,20,21,27,46] and anxiety [20,25] were recognized as independent psychological factors associated with higher burnout. The unwillingness to work voluntarily in the front line posed additional stress, thus increasing burnout rates among HCWs [48]. Likewise, the trait of anxiety was indicated as a factor associated with higher burnout, but only one multivariable linear regression analysis took this characteristic into consideration and confirmed its relation with burnout [44].

Coping style

The coping style has an important meaning in dealing with stressful events and may protect from burnout. Liu et al. [43] underlined that a negative coping style is associated with higher EE, DP, and lower PA among physicians and nurses, while another study showed that nurses with emotional intelligence are capable of emotional repair, which in turn prevents burnout [39]. Other studies showed that psychological resilience [20] and hardiness [46] are protective against burnout, while cognitive empathy is not [26]. Although these characteristics depend largely on personality, psychosocial support for staff members might improve their skills in coping with stressful situations [35].

Health problems

Some researchers indicated that poor self-evaluation of health [56], somatic health problems [20,24] or medical conditions [29], insomnia [40], and reduced sleeping time duration [32] reported by HCWs during the pandemic were associated with higher burnout, compared with the pre-pandemic period.

Social factors associated with burnout

Stigmatization

Stigmatization due to COVID-19 was demonstrated as an independent social factor increasing the chance of burn-

out among HCWs, which was associated with: the fear of stigma and stigma related to discrimination [37], having experienced interpersonal avoidance in the workplace and personal life [23], and harassment from the families of patients [49]. Burnout was more frequent among HCWs that had been verbally abused [50]. The findings regarding the association between burnout and stigmatization due to COVID-19 is in line with the results provided previously by de Brier et al. [61].

Family life

Conflict between work duties and family life was reported by HCWs as associated with increased burnout in 7 studies indicating isolation [43] as the most frequent precautions-related reason for moving out of home (protection of family members) [23], sending cohabitants away from home [22], or spending less time interacting with family members [47]. Family division was indicated as an independent factor increasing the odds of higher EE among nurses and physicians in Italy [44]. A survey of HCWs in 60 countries showed that work which had an impact on household activities increased the risk of burnout during the current pandemic [15]. However, it should be taken into account that, in this international study, burnout in its core domain of emotional exhaustion, was assessed only by a single item on a 7-point Likert scale (1 – strongly disagree to 7 – strongly agree) using the statement "I am burned out in my work" [15].

Organizational factors associated with burnout

Workload

Fourteen studies indicated that burnout was associated with workload. In 5 of them, high workload was reported as an independent factor increasing burnout [23,26,30,35,53]. In 4 other papers, prolonged working hours [42], working >60 h weekly [29], extended shift length (>8 h) [25], and higher number of night shifts [43] increased the odds of burnout. Higher burnout was also related to having no or insufficient rest [28], as well as skipping 30-minute breaks by nurses [45]. Extended shifts led to a disruption in the work-life balance and sleep deprivation resulting in higher burnout levels [13].

Access to PPE and other resources

A limited access to personal protective equipment (PPE) [28,32,49] and other resources, for example difficulty in obtaining the COVID-19 testing [15] or lack of medical equipment to treat patients with COVID-19 [17], were associated with a higher chance of burnout among HCWs. This may be explained by a heavy stress resulting from the necessity of making by the staff life prioritizing decisions due to supply shortages [15]. A large study on HCWs in 77 countries revealed that insufficient human resources, especially shortages of nurses, increased the risk of burnout among staff [17]. By way of contrast, adequate access to PPE [15,19] and human resources [35] was perceived as a factor decreasing the prevalence of burnout.

Other organizational factors

Several other organizational factors were noted as increasing burnout, for example the type of employment (contracted vs. corporate, temporary, and official) [27], redeployment [25,50], a change of role and duties [47]. Furthermore, emotional work demand, role conflict [37,39], and interpersonal conflict with colleagues at work [23,39] were found to enhance the chance of burnout. Feeling pushed beyond training [15] and poor support from the supervisor [17,21] were demonstrated as important factors that increase burnout due to the feeling of lacking competencies in treatment of patients with COVID-19. It can be assumed that adequately trained staff that have access to proper PPE might have a greater sense of control of their situation in the workplace, which is thought to be a major driver of engagement in occupational tasks and an important method of avoiding burnout.

Burnout related to COVID-19 pandemic

Fear and traumatic events

Six studies that showed an association between fear of the COVID-19 infection and burnout were found. Two of them demonstrated that it was an independent factor increasing EE and/or DP [35,42]. A univariable linear regression analysis of data from 2 surveys showed that burnout was more frequent among HCWs who had been infected with COVID-19 previously [22,48]. Several surveys provided evidence that having a relative, a friend, or a colleague diagnosed with COVID-19 [40] or admitted to the hospital because of COVID-19 [22] increased the level of burnout. Furthermore, having experienced a COVID-19-related traumatic event enhanced the chance of burnout [23]. Burnout was more frequent among nurses that had observed a high number of deaths during the COVID-19 pandemic, both in hospitals and nursing homes. Interestingly, a study carried out in Portugal demonstrated that death of a relative or a friend during the pandemic decreased the level of burnout [20,24].

Contact with or care for patients with COVID-19

Twenty six articles showed that staff who had contact with or provided care for patients with COVID-19 or worked in the front line, in the ward for patients with COVID-19, more often reported burnout. Multivariable linear regression analyses presented in 15 of these papers provided evidence that these factors increased the risk of burnout among HCWs (Table 3). In fact, they shed more light on the conflicting findings of previous reviews [11,13]. In only one study, physicians and nurses working in the COVID-19 wards reported lower burnout since they felt more valued [12].

Factors protecting from burnout

Among many factors, the authors distinguished some person-related and work-related characteristics which are associated with lower burnout. For example, being married and receiving help from colleagues and family were indicated as linked to reduced burnout, as friends and relatives provide significant social support inducing the negative influence of work-related stress [29]. Decreased burnout was also noted in association with the level of satisfaction with life and psychological resilience [20,24,33]. Another protective factor was religiosity, which is explained by the fact that spiritual practices provide comfort and hope, as well as help to overcome adversities [29]. Also, the coping style and emotional resilience decrease the chances of burnout as they help to maintain a good relationship with the patient and protect from the adverse effects of psychological risks [39,43].

Other protective factors include the previously mentioned age [16,26,47] and professional experience [20]. As possible explanations of the association of these factors with decreased burnout, researchers indicate changes in the career trajectory and differences in responsibilities among younger HCWs during the pandemic, as well as a greater ability to manage anxiety and stress in older professionals compared to the younger ones [20]. Correia and Almeida [26] distinguished procedural justice and professional identification, as well as the conviction of doing a meaningful job as factors decreasing the incidence of burnout among physicians and nurses. Additionally, the authors indicated the beneficial meaning of increased income as a resource compensating for less enjoyable work and related burnout [26].

Among factors decreasing burnout, the researchers also found several that were associated with the working environment. These are: willingness to work voluntarily [48]; job satisfaction, better perception of management, better working conditions, teamwork and a higher safety climate [25]; feeling of autonomy and psychosocial support at work [35]. In addition, access to PPE [15] and other materials [27,35], as well as increased staff resources [32], were all demonstrated as factors protecting against burnout, as they contribute to the safety of HCWs and improve their physical and mental well-being [19]. There was only

one study indicating that working in COVID-19 wards compared to the usual wards was found to be protective, which is explained by a greater sense of control among front line workers [12].

Finally, it is important to mention that, in some studies, the results are inconsistent regarding factors protecting from burnout in the COVID-19 pandemic, e.g., a univariable linear regression analysis by Correia and Almeida [26] indicated that being female is protective against burnout, but a multivariable analysis in the same study confirmed that it is the male gender that decreases burnout. Differences regarding protective factors were also observed between studies that confirmed a positive correlation between burnout and infection or death of a colleague or relative with COVID-19 [22,40], while 2 other studies showed a negative correlation of this variable with burnout (which is not clearly explained by the authors) [20,24]. Therefore, more research is needed to clarify these and other inconsistencies.

Limitations

This scoping review covers articles published during the first and the second wave of the COVID-19 pandemic. Therefore, it is more comprehensive than those previously published [11,13]. Studies published in 4 languages (English, Spanish, French and Polish) were included to show the international and intercontinental perspective of the phenomenon.

Despite all the efforts deployed, this review has some limitations. Firstly, the prevalence of burnout was measured with the use of different methods. Thus, it was not possible to aggregate the data to make cross-country comparisons. Secondly, it was difficult to draw conclusions, specifically in terms of risk factors, because a vast majority of the studies were cross-sectional, which did not allow the authors to infer any causal relationships. Therefore, the interpretation of the results was limited to the observations of the associations between particular factors and burnout.

CONCLUSIONS

The burnout syndrome is a multidimensional phenomenon that depends on many factors which differ in nature. This review aimed to distinguish the prevalence and factors associated with burnout during the first and the second wave of the COVID-19 pandemic among healthcare professionals. A wide range of burnout prevalence was found (4.3–90.4%) which the authors attribute to the use of different outcome measures, study samples, settings (place of work) and geographical areas. Differences were also observed in the sub-domains of burnout: EE, DP, and PA. Hence, the interpretation of the results should take into account the methodological divergences in the reviewed studies.

Based on these observations, a long list of factors associated with the increase or decrease of burnout was created. They include:

- demographic features (age, gender, education, financial situation, family status, occupation),
- psychological condition (psychiatric diseases, stress, anxiety, depression, coping style),
- social factors (stigmatization, family life),
- work organization (workload, working conditions, availability of staff and materials, support at work),
- factors related to COVID-19 (fear of COVID-19, traumatic events, contact with patients with COVID-19, having been infected with COVID-19, infection of a colleague or a relative with COVID-19, higher number of deaths observed by nurses during the COVID-19 pandemic).

This review delivers some practical implications for decision makers in hospitals, which should be applied in case of future epidemics or pandemics. Based on the results received, the recommendations focus especially on organizational and psychological factors associated with burnout occurrence. The suggestions include elaborating professional trainings, establishing clear procedures for effective protection from infection, as well as full access to

PPE, to the COVID-19 testing and to the necessary medical equipment for HCWs, in order to enable them to treat patients without fear of infection. In terms of psychological aspects, more support would be certainly beneficial for the well-being of HCWs during such stressful periods as epidemics. Apart from that, a strong emphasis is put on the need for development of psychological trainings concerning adequate coping strategies, strengthening resilience and hardiness among HCWs, which could help reduce or prevent the occurrence of burnout.

Hopefully, the findings regarding factors that increase or decrease the odds of burnout will be useful for policy makers and healthcare managers in developing programs to prevent burnout during the current and future pandemics.

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