Burnout syndrome in healthcare workers during the COVID-19 pandemic: a systematic review

Síndrome de burnout em trabalhadores da saúde durante a pandemia de COVID-19: uma revisão sistemática

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ABSTRACT | There is evidence that harm to the mental health of healthcare workers has occurred during the pandemic caused by COVID-19. The burnout syndrome is a form of exhaustion that occurs in occupational settings and is a condition caused by long-term stress in the workplace. The objectives of this systematic review of observational studies were to present data from research into the prevalence of burnout syndrome in healthcare workers during the COVID-19 pandemic and observe its prevalence among frontline workers. The search was conducted on the MEDLINE, LILACS, and Embase databases from 2019 to May of 2021 and returned 538 publications, which underwent a two-stage process of selection by independent peers, resulting in selection of a sample of 29 articles. Data were then extracted and synthesized for presentation in narrative form. Cross-sectional designs were more prevalent (n = 26) than longitudinal studies (n = 3). The sample included research from 19 different countries, with one Brazilian study. A wide range of different instruments were administered by study authors to assess burnout syndrome, the most common of which was the Maslach Burnout Inventory (n = 13). The prevalence of burnout syndrome in the studies varied from 76 to 14.7%. Data on the relationship between development of burnout syndrome and working on the frontline were controversial. The lack of standardization of burnout syndrome assessment was a source of considerable difficulty, compromising comparability of the results, and should therefore be targeted for improvement by researchers. We suggest that more investigations should be conducted into prevalence and the associated factors of risk and protection.

Keywords | professional burnout; occupational health; healthcare personnel; COVID-19; pandemics.

RESUMO | Durante a pandemia causada pela COVID-19, foram evidenciados agravos à saúde psíquica de trabalhadores da saúde. A síndrome de burnout, sinônimo de “esgotamento” no âmbito profissional, é uma condição causada por estresse de longo prazo no local de trabalho. Esta revisão sistemática de estudos observacionais objetivou apresentar dados de pesquisas sobre a prevalência da síndrome de burnout em trabalhadores da saúde no período da pandemia de COVID-19, bem como observar sua prevalência entre trabalhadores da linha de frente. A busca, realizada nas bases MEDLINE, LILACS e Embase entre 2019 e maio de 2021, resultou em 538 publicações, as quais foram submetidas a um processo de seleção por pares independentes em duas etapas, encerrado com 29 artigos. Em seguida, executou-se a extração e a síntese dos dados, apresentadas em narrativa. Prevaleceram os desenhos transversais (n = 26) aos longitudinais (n = 3). Havia pesquisas de 19 países diferentes, sendo uma brasileira. Uma grande diversidade de instrumentos foi aplicada pelos autores para a avaliação da síndrome de burnout, sendo mais frequente o uso do Maslach Burnout Inventory (n = 13). A prevalência de síndrome de burnout variou de 76 a 14,7% nos estudos. Os dados sobre desenvolvimento de síndrome de burnout em relação à atuação na linha de frente foram controversos. Uma dificuldade importante foi imposta pela falta de padronização na avaliação da síndrome de burnout, o que compromete a comparabilidade dos resultados, devendo, portanto, ser aprimorada pelos pesquisadores. Sugérimos mais investigações sobre a prevalência e os fatores de risco e proteção associados.

Palavras-chave | esgotamento profissional; saúde do trabalhador; pessoal de saúde; COVID-19; pandemias.

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INTRODUCTION

A new coronavirus, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged towards the end of 2019 in Wuhan, capital of the Chinese province of Hubei. The virus spread rapidly, causing a global public health crisis, which was declared a pandemic by the World Health Organization (WHO) in March of 2020. A little more than 1 year later, more than 3.5 million deaths had been recorded worldwide, with more than 450 thousand in Brazil alone.1

In addition to the physical risks of the disease caused by SARS-CoV-2, harm to mental health has been observed in a large proportion of the population, even in uninfected people. Fear of infection, compounded by the rapid spread and lack of knowledge about the disease can make members of the public more susceptible to psychological suffering.2

Studies indicate that anxiety and stress levels increased significantly among healthy people and that preexisting symptoms in people with mental health disorders have been exacerbated. One phenomenon observed in the context of uncertainty about the virus was panic and anxiety crises, amplified by fear of contamination of oneself and of others and fear of death.3

The mixture of workplace stress factors and personal fears linked to COVID-19 pandemic appears to have placed an enormous psychological burden on healthcare teams. One of the most important disorders observed in workers is burnout syndrome (BS), a form of exhaustion that occurs in occupational settings and is a condition caused by long-term stress in the workplace.

Burnout syndrome was first described by Herbert Freudenberger in 1974. The social psychologist Christina Maslach developed the classic definition of BS, characterizing it in three dimensions: emotional exhaustion (feelings of overload and emotional and physical exhaustion), depersonalization (feelings of indifference or distance in relation to others in the workplace), and low personal accomplishment (feelings of incompetence or lack of achievement and productivity at work).4 Schaufeli & Greenglass5 summarized BS as “a state of physical, emotional and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding.”

The WHO only recognized BS as a chronic disease in 2019, and there is a clear lack of research and publications on the subject prior to this date.6

Risk factors for development of BS may be situational or individual. Different aspects of the working environment can be cited as situational factors, for example, workload, availability of support, and a person’s degree of control over their work.7 The individual aspects are related to a person’s primary personality structure, such as idealism, perfectionism, timidity, insecurity, and difficulty coping with stressful situations, and to their prior experience, (weak) support network, etc.8

There are a number of other characteristics linked in the literature with development of BS in healthcare workers in the context of the pandemic, such as coping difficulties, providing care in high-risk units, and contact with infected patients. In counterpoint, resilience, trust in protective measures, organizational support, and training have been identified as protective factors.9

The consequences of this disorder can be harmful to both professionals and patients. There is a possibility of increased frequency of medical errors, negligence, team member turnover, suicide, and abuse of alcohol and drugs by physicians, in addition to patient dissatisfaction, and lower quality of care.10-12 Higher rates of employee absenteeism are also related to BS, which has also been linked to development of cardiovascular diseases, musculoskeletal pain, and depressive symptoms etc.13

There is much yet to be learned about which interventions are most effective for treating BS, but individual and group activities have been studied, including mindfulness and group therapy, in addition to the effect of reducing working hours.14,15 On the other hand, the importance of investing in prevention and worker protection is indisputable.16

In other recent health crises with significant impact, such as the Middle East respiratory syndrome (MERS) and the severe acute respiratory syndrome (SARS) epidemics, a prevalence of BS was observed equating to around one third of healthcare workers.17
OBJECTIVES

The objective of this systematic review of observational studies was to present data from Brazilian and international research into the prevalence of burnout syndrome in healthcare workers during the COVID-19 pandemic and observe its possible association with working on the frontline.

METHODS

STUDY DESIGN

This study adopts the systematic review of observational studies model. The research question was defined using the PECO method (an acronym formed from P: Population/patient; E: Exposure; C: Comparison/control; and O: Outcome), providing the foundation for the database searches.

STUDY IDENTIFICATION AND SELECTION

The bibliographic search was conducted in May of 2021 on the following databases: MEDLINE, LILACS, and Embase. The search strategy employed combinations of the main descriptors related to mental health, healthcare workers, and COVID-19, including publications from 2019 up to the search date.

A two-stage study selection process was conducted independently by peers. The elements these researchers analyzed in the first stage were limited to reading title and abstract and identifying at least one exclusion criterion, at which point the publication was eliminated (Table 1). The second stage of selection required the researchers to certify that all preselected inclusion criteria were present by reading the full texts of each of the publications not eliminated in the first stage. Any disagreements between the examiners during the selection process were decided by a third analyst with more experience.

Table 1. Exclusion and inclusion criteria for selection of articles

| Inclusion criteria                                                                 | Exclusion criteria                                                                 |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| I. Observational studies (cohort, case-control, cross-sectional, comparative, non-randomized). | I. Studies not conducted with human beings.                                          |
| II. Studies of populations of healthcare workers exposed to the COVID-19 pandemic while working. | II. Absence from the study of any terms at least minimally related to the subject of the review. |
| III. Information on emergence of psychological disorders or symptoms during the period. | III. Literature reviews, meta-analyses, opinion pieces, editorials, letters, case reports and studies, information bulletins, chapters, guidelines, technical standards and similar, intervention studies, randomized clinical trials, studies using exclusively qualitative methodology, studies without data to characterize the target population; studies conducted by medical/health sciences students. |
| IV. Application of a validated or original instrument to assess burnout syndrome. | IV. Articles in languages other than English, Portuguese, or Spanish.                 |

BURNOUT SYNDROME ASSESSMENT INSTRUMENTS

A number of instruments are used in the literature to assess BS. The oldest of these instruments, the Maslach Burnout Inventory (MBI), was developed in 1996 for use with humans and health services workers – for which reason it was given the subtitle Human Services Survey (MBI-HSS). Later, two other versions were developed with minor alterations for use with educators and the general public. The MBI assesses three dimensions of BS: emotional exhaustion, depersonalization, and low personal accomplishment. The scale comprises 22 items with Likert scale responses and the total score can classify the respondent at different levels of burnout. However, there is no consensus on adoption of cutoff points, which vary in the literature.18

The Copenhagen Burnout Inventory (CBI) is a three-part questionnaire: personal burnout, work-related burnout, and client-related burnout. These
three subdivisions were adopted to enable the questionnaire to be used in many different domains. The questions related to part 1, personal burnout, are formulated in a generic manner so that anyone can answer them. This part comprises six items about a prolonged state of physical and psychological exhaustion. Work-related burnout is measured with seven items on the questionnaire and covers a prolonged state of physical and psychological exhaustion that the respondent perceives as related to their type of paid employment. Finally, client-related burnout, covered by six items, covers a prolonged state of physical and psychological exhaustion perceived at the workplace of respondents who serve clients (including patients, students, and others).

There is also a diverse range of other instruments for assessment of burnout in use in the literature, including Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo (CESQT), Mini Z Burnout Survey (Mini Z), 15 item Occupational Fatigue Exhaustion Recovery (OFERS-15), Oldenburg Burnout Inventory (OLBI), Professional Quality of Life (ProQOL), Physician Work Life Study (PWLS), and Work-related Stress Test (WRST). Self-report of presence of burnout is also used.

**EXTRACTION AND SYNTHESIS OF DATA**

The data extraction process was performed by the same researchers, noting in a spreadsheet the following data from the articles selected: (1) authorship; (2) year of publication; (3) study location; (4) description of the study population; (5) study design; (6) sample size; (7) data collection period; (8) instrument used to assess BS; (9) prevalence of burnout in the sample; and (10) prevalence of burnout in frontline workers and those doing other jobs.

A synthesis of the results obtained is presented in narrative form, in addition to analysis of descriptive statistics for certain data.

**RESULTS AND DISCUSSION**

The search of MEDLINE identified 383 references; the search of LILACS found 54 references; and 104 articles were found on Embase. Duplicate texts were removed, resulting in 538 citations (Figure 1). A total of 340 articles were eliminated in the first stage of selection and 169 were removed in the second stage, leaving a final sample of 29 publications for review.

Cross-sectional study (n = 26) was the most common type of study design. The sample also included longitudinal studies (n = 3). Publications from 19 different countries were selected (Figure 2), including Spain (n = 4), the United States (n = 4), China (n = 3), Italy (n = 2), and Singapore (n = 2). The populations studied were healthcare workers in a range of categories. Data for the studies were collected from February to November of 2020.

The studies reviewed used a range of different instruments to assess BS, nine of which were preexisting assessment models, while two were self report measures. The instrument most often used was the MBI (Table 2), administered in 13 studies (44.8%). However, even among studies adopting the same tool, there were differences in how authors interpreted it. Some articles defined burnout as present on the basis of high scores in one of the three dimensions assessed by the MBI (emotional exhaustion, depersonalization, or low personal accomplishment), but not all used cutoff points, presenting results in levels: low, moderate, or high.

| Instrument | Studies n (%) | Study population n | % |
|------------|---------------|-------------------|---|
| MBI        | 13 (44.8)     | 19,468            | 62.54 |
| CBI        | 3 (10.3)      | 1,056             | 3.39 |
| PWLS       | 3 (10.3)      | 2,797             | 8.99 |
| OLBI       | 2 (6.8)       | 3,320             | 10.67 |
| CESQT      | 2 (6.8)       | 896               | 2.88 |
| Others     | 6 (20.6)      | 3,682             | 11.83 |

CBI = Copenhagen Burnout Inventory; CESQT = Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo; MBI = Maslach Burnout Inventory; OLBI = Oldenburg Burnout Inventory; PWLS = Physician Work Life Study.
541 records found in the databases searched (MEDLINE: 383; LILACS: 54; EMBASE: 104)

Duplicates eliminated (n = 3)

Analysis of titles and abstracts of publications (n = 538)

Eliminated on the basis of exclusion criteria (n = 340)

Analysis by reading the full text (n = 198)

Eliminated on the basis of inclusion criteria (n = 169)

Articles included in the review (n = 29)

**Figure 1.** Flow diagram illustrating the phases of the systematic review.

**Figure 2.** Map illustrating the studies selected for the systematic review.
**Table 3.** Characteristics of cross-sectional studies of burnout in healthcare workers during the Covid-19 pandemic

| Authors            | Country         | Target population | Data collection period | n     | Instrument   | Prevalence of BS (%) |
|--------------------|-----------------|-------------------|------------------------|-------|--------------|----------------------|
| Gonçalves et al.²⁰ | Portugal        | Nurses            | July to November, 2020 | 153   | CBI          | NR                   |
| Nishimura et al.²¹ | Japan           | Physicians, nurses, and clinical engineers | November, 2020 | 130   | MBI          | 24.2                 |
| Hawari et al.²²   | Jordan          | Physicians, nurses, technicians, and pharmacists | April to May, 2020 | 1,006 | PWLS         | 32.8                 |
| Alsulimani et al.²³ | Saudi Arabia    | Physicians, nurses, and assistants | June and August, 2020 | 646   | CBI          | 75.0                 |
| Torrente et al.²⁴ | Spain           | Physicians, nurses, and assistants | April to May, 2020 | 643   | MBI          | 43.4                 |
| Huang et al.²⁵    | Singapore       | Healthcare workers in general | March to July, 2020 | 1638  | PWLS         | 21.2                 |
| Gemine et al.²⁶   | United Kingdom  | Healthcare workers in general | April, 2020 | 257   | CBI          | NR                   |
| Lasalvia et al.²⁷ | Italy           | Healthcare workers in general | April to May, 2020 | 1,961 | MBI          | NR                   |
| Abdelnafiz et al²⁸ | Egypt           | Physicians        | April, 2020 | 220   | MBI          | NR                   |
| Tan et al.²⁹      | Singapore       | Physicians, nurses, and assistants | May to June, 2020 | 3,075 | OLBI         | 68.2                 |
| Manzano Garcia & Ayala Calvo²⁹ | Spain | Nurses | April, 2020 | 771   | CESQT       | NR                   |
| Soto-Rubio et al.³⁰ | Spain           | Nurses            | March to April, 2020 | 125   | CESQT       | NR                   |
| Chen et al.³¹     | China and Taiwan | Nurses         | April, 2020 | 12,596 | MBI       | NR                   |
| Yoruk & Güler³²   | Turkey          | Midwives and nurses | May and June, 2020 | 377   | MBI        | NR                   |
| Firew et al.³³    | United States   | Healthcare workers in general | May, 2020 | 2,040 | MBI        | NR                   |
| Mohd Fauzi et al.³⁴ | Malaysia        | Physicians        | May, 2020 | 1,050 | OFERS15    | NR                   |
| Hoseinabadi et al.³⁵ | Iran           | Nurses            | March to April, 2020 | 245   | OLBI       | NR                   |
| Ruiz-Fernández et al.³⁶ | Spain        | Physicians and nurses | March to April, 2020 | 506   | ProQOL     | 36.0                 |
| Civantos et al.³⁷  | Brazil          | Head and neck Surgeons | May, 2020 | 163   | Mini Z     | 14.7                 |
| Matsuo et al.³⁸   | Japan           | Healthcare workers in general | April, 2020 | 312   | MBI        | 31.4                 |
| Monterrosa-Castro et al.³⁹ | Colombia    | Family physicians | March and April, 2020 | 531   | WRST       | 64.4                 |
| Rodriguez et al.⁴⁰ | United States   | Emergency physicians | February to April, 2020 | 426   | Self-report | NR                   |
| Dimitriu et al.⁴¹ | Romania         | Resident Physicians | April and May, 2020 | 100   | MBI        | 76.0                 |
| Wu et al.⁴²       | China           | Oncology physicians, and nurses | March, 2020 | 190   | MBI        | NR                   |
| Demartini et al.⁴³ | Italy           | Healthcare workers in general | March, 2020 | 123   | MBI        | NR                   |
| Zhang et al.⁴⁴    | China           | Nurses            | February, 2020 | 646   | MBI        | NR                   |

CBI = Copenhagen Burnout Inventory; CESQT = Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo; MBI = Maslach Burnout Inventory; Mini Z = Mini Z Burnout Survey; NR = not reported; OFERS-15 = 15 item Occupational Fatigue Exhaustion Recovery Scale; OLBI = Oldenburg Burnout Inventory; ProQOL = Professional Quality of Life; PWLS = Physician Work Life Study; BS = burnout syndrome; WRST = Work-Related Stress Test.
The characteristics of the cross-sectional studies have been compiled in Table 3.

The study with the largest sample (n = 12,596) was conducted with hospital nurses in China and Taiwan and employed the MBI instrument. The sample’s mean score was considered to show a moderate degree of burnout in the dimensions “emotional exhaustion” (19.1±10.0) and “depersonalization” (5.5±4.6), but was endorsed at higher levels by the subset of professionals in the frontline of the fight against COVID-19 (p < 0.001). The mean score in the dimension “lack of personal accomplishment” was rated low (19.0±8.4) and there was no significant difference among frontline workers.31

Some studies reported a high prevalence of burnout in their samples. A Romanian study conducted with physicians in hospital residency41 found a 76% overall prevalence of burnout. In that study, residents attached to other departments had an 86% prevalence of the condition compared to 66% among those working on the frontline (p = 0.1928).

A high prevalence of burnout was also observed among healthcare personnel working in hospitals in Saudi Arabia during the COVID-19 pandemic. Applying part of the CBI questionnaire, the study found a 75% prevalence (p < 0.0001; 95% confidence interval [95%CI] = 0.71-0.78) among these workers.33

A study conducted in Colombia39 applied the Work-related Stress Test, which explores the presence of psychosomatic symptoms related to working in a range of activities to define a diagnosis of burnout. A high prevalence (64.4%) was found in the population of family physicians assessed.

The lowest prevalence of burnout found was in a Brazilian study (14.7%) administering the Mini Z questionnaire to a small sample of head and neck surgeons from all over the country.37

Three of the 29 studies reviewed were longitudinal. In other words, they are research studies that analyzed the variations and characteristics of BS over a period.

Table 4. Characteristics of longitudinal studies of burnout in healthcare workers during the Covid-19 pandemic

| Country       | Kelker et al.45 | Kok et al.46 | Baumann et al.47 |
|---------------|-----------------|--------------|------------------|
| Target population | Emergency physicians and assistants | Intensive care professionals | Emergency physicians |
| Data collection period | March to April, 2020 | October 2019 to June 2020 | March to April, 2020 |
| n             | 153             | 130           | 1,006            |
| Instrument    | PWLS            | MBI           | Self-report      |
| Prevalence of BS (%) | Week 1: 300    | Pre-pandemic: 230 | Post-pandemic: 36.1 |
|               | Week 2: 230     |               | NR               |
|               | Week 3: 200     |               |                  |
|               | Week 4: 220     |               |                  |

CBI = Copenhagen Burnout Inventory; MBI = Maslach Burnout Inventory; NR = not reported; BS = burnout syndrome.
the percentage in the fourth week was 2% higher than in the previous week. In the second study, burnout levels increased by 13% during the pandemic. The other study with North-American emergency physicians did not report data on the frequency of BS.

The findings of studies that analyzed the association between development of BS and working on the frontline of the fight against COVID-19 were controversial. At least nine publications found a positive association between working on the frontline and a higher prevalence of burnout, while four others found the opposite. It is important to point out that there was a great deal of variability between the methodologies adopted in each study to test the association and the results cannot simply be compared with each other.

Certain difficulties identified during the review should be noted. They are primarily related to extraction of information about the prevalence of burnout, since there is little consistency and great variability in conceptualization of the syndrome. A large range of types of instruments with different measurement criteria are used. There is not always consensus between authors on cutoff points when using the same instrument. The lack of standardization of measurement creates a degree of heterogeneity that makes comparison of results difficult.

Observational studies are also subject to biases, such as selection bias, and their results can be influenced by confounding variables. This systematic review did not adopt procedures to assess the methodological quality of the studies included and it is therefore suggested that the results described should be read critically.

**CONCLUSIONS**

This systematic review presented data from recent publications on the impacts of the COVID-19 pandemic on healthcare workers, with a focus on BS. There was considerable variation in the results of the studies reviewed. This could be a consequence of the lack of uniformity between the assessment methodologies adopted by the different authors. Standardization of instruments and their interpretations could increase comparability between studies. We recommend more investigations into prevalence and associated factors of risk and protection in order to guide development of effective public policies and interventions to prevent, treat, and rehabilitate healthcare workers, whether in periods of normality or of crisis.

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