## RESEARCH

# Burnout syndrome and accidents in primary healthcare nursing workers: a scoping review

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## Abstract

**Context** Burnout syndrome is characterized by intense physical and psychological exhaustion related to work. Many professionals are exposed to this condition, but nursing workers stand out. Working in primary healthcare requires a lot of attention and constant demands that can lead to exhaustion and thus make them more vulnerable to occupational accidents. This study aimed to map the profile and summarize the available scientific evidence on burnout syndrome and its relationship with accidents among primary health care nursing workers, as well as ways of coping.

**Methods** A scoping review was carried out in the National Library of Medicine (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science (WoS), Excerpa Medica DataBASE (Embase), PsycINFO— APA PsycNET (American Psychological Association) and Latin American and Caribbean Literature in Health Sciences (LILACS) databases, published in Portuguese, Spanish, or English, without a time frame. Partial research reports, editorials and response letters were excluded.

**Results** A total of 872 articles were found from primary sources and 11 from references cited in articles. After selection and application of eligibility criteria, a sample of 11 materials was obtained. The studies showed convergence in some findings that were grouped into the following categories: Profile and risk factors for occupational accidents associated with burnout; Risks and harm to patients; and Strategies for coping with and reducing accidents associated with burnout.

**Conclusion** The materials were published mainly in English, produced in various regions of the world and using different methods. Primary healthcare nursing professionals providing direct patient care, with less experience and with a medium level of education were those who most frequently reported accidents resulting from burnout. Accidents involving biological and chemical materials were the most frequent and were associated with the need for very quick decision-making, little training, excessive demands and long working hours. There were repercussions on patient safety and accidents further aggravated the feeling of professional burnout. Coping measures include the use of stress and fatigue measurement instruments, training to reduce accidents and internet-based interventions. The studies' methodological quality suggests the need for more in-depth experimental research to suggest more assertive evidence.

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## **Open Access**

Keywords Burnout, Professional, Nursing, Primary health care, Accidents, Occupational

#### Introduction

Burnout is a response to chronic stress caused in the professional environment, characterized by emotional and physical exhaustion that is accompanied by feelings of frustration and failure [1]. This condition not only affects an individual's well-being, but also has profound impacts on job performance and safety, especially among healthcare professionals.

Studies on Burnout began in 1970 and, about 50 years later, the World Health Organization (WHO) began to list Burnout syndrome as an occupational disease in the International Classification of Diseases 11th Revision (ICD-11), characterized by three dimensions: feelings of exhaustion or depletion of energy; increased mental distance from work or feelings of negativity or cynicism related to work; and a sense of inefficiency and lack of achievement. By relating and delimiting Burnout syndrome to an exclusively occupational phenomenon, workers now have some rights guaranteed by labor and social security laws [1, 2].

In the realm of primary healthcare, nursing professionals encounter a variety of occupational hazards, including physical, biological, chemical, mechanical, ergonomic, and psychosocial risks. Frequent exposure to challenging situations such as family disputes, social vulnerability, and violence increases the likelihood of developing Burnout syndrome. Moreover, the shortage of both human and material resources, coupled with excessive workloads, the accumulation of non-clinical tasks, and unstable employment conditions, undermines the quality of care delivered. This, in turn, adversely impacts patient satisfaction with the services provided [3]. Primary health care is the main gateway for patients into the complex system of care. Decisions made during care can affect the entire course of treatment. It also includes many responsibilities for nursing professionals in relation to disease prevention, health promotion and rehabilitation [3, 4].

The path that can lead a healthcare worker to an accident due to occupational risks does not depend only on professionals' individual behavior, but also on institutional and contextual factors. A study on vulnerability in healthcare professionals' practices addresses the perception of risk of occupational accidents. These professionals' risk perception is influenced both by activities they perform and by the environment in which they are inserted, making this issue complex. Among those who work in basic healthcare units, the main factors of concern include biological risk, issues related to infrastructure and work organization, stress and emotional exhaustion, violence and difficulty in solving problems or meeting patients' needs, which can lead to a feeling of frustration and helplessness [4].

A recent study on job satisfaction and workplace satisfaction refers to the existence of little research in primary healthcare relating healthcare professionals' health status and burnout to the type of environment where care is provided, which includes the type of health unit and the region where it is located. It concludes that, in order to reduce stress and consequently professional burnout, it is essential to ensure measures that cover working conditions, management as well as professional well-being [5].

The exhaustion faced by nursing professionals, due to constant exposure to stressors, interferes with their quality of life and work performance, considering that the profession's main characteristic is to care for others and that research mentions the presence of anxiety, stress, depression, fear, anguish and other illnesses caused by work overload. Concern for workers' mental health is important, as a sick professional cannot offer quality care to patients [5].

A study on the incidence of Burnout syndrome among Portuguese healthcare professionals reinforces this scenario. The work environment and demands exert significant psychological pressure on these professionals, increasing the risk of burnout. Moreover, the perception of poor working conditions was identified as the main predictor of Burnout syndrome and its worrying effects, as emotional exhaustion not only affects professional well-being, but also harms patient satisfaction and can prolong recovery time [6].

Nursing professionals' work is extremely important for the society's health, a fact that gained visibility during the pandemic, when it became clear that nursing is essential to ensuring uninterrupted care, 24 h a day. Regardless of the field of activity or level of care, the nature of the profession requires direct and continuous contact with patients, family members and multidisciplinary teams. This proximity, however, makes nursing an emotionally demanding activity, exposing professionals to pain, distress and death [7].

Therefore, it is important to recognize that these professionals, who dedicate themselves to caring for others, also face the emotional and psychological consequences inherent to their profession, and that Burnout syndrome is a challenge for primary healthcare professionals, affecting not only the quality of care provided, but also work the safety and quality of healthcare services offered to the population.

Searches of the Open Science Framework (OSF), the International Prospective Register of Systematic Reviews (PROSPERO), the Medical Literature Analysis and

Retrieval System Online (MEDLINE) and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) found no records of systematic or scoping review protocols on the association between burnout and occupational accidents among primary care nursing workers, indicating a possible gap in knowledge on the subject and in the adoption of good practices. Thus, the following question arose among the authors: What is the main scientific evidence on the relationship between Burnout syndrome and occupational accidents among primary healthcare nursing professionals? It is expected that the results will allow an analysis of the vulnerability situation of primary healthcare professionals who experience professional burnout and will allow the planning and implementation of policies to prevent this condition. Therefore, this study aimed to map the profile and summarize the available scientific evidence on burnout syndrome and its relationship with accidents among primary health care nursing workers, as well as ways of coping.

#### Method

#### Study design, period and place

This was a scoping review, a method that seeks to map evidence about a given fact and identify existing gaps [8]. The use of selection criteria based on relevance to the phenomenon allows a scoping review to distinguish itself from other forms of reviews. The research protocol was registered with the Open Science Framework (https://os f.io/cdbpt/).

The search strategy was applied between May and June 2024. The search involved the three steps recommended by the JBI [9], which were: (A) an initial exploratory search to find "seed references", which are records of studies that met the inclusion criteria for the review question; (B) the development of a comprehensive search strategy using keywords and indexed terms for the protocol's main database; and (C) the supplementary search of gray literature, which included citation searching and manual searching. Searches were carried out in the National Library of Medicine (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science (WoS), Excerpa Medica DataBASE (Embase), PsycINFO—APA PsycNET (American Psychological Association) and Latin American and Caribbean Literature in Health Sciences (LILACS) databases. Gray references were also searched in Open Access Theses and Dissertations, MedNar, World Wide Science and Google Scholar. Furthermore, additional studies were included from references cited in articles extracted from primary sources (manual search).

### Inclusion and exclusion criteria

The inclusion criteria were studies that dealt with occupational accidents in primary health care nursing workers suffering from burnout or similar psychological conditions that could be associated with accidents, published in Portuguese, Spanish or English, with no time period. Partial research reports, editorials and response letters were excluded. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation was used to prepare the review report [10]. There was no time frame for the publications because it is still a scarce topic in primary care nursing.

#### Study protocol

To develop the review question, the phases recommended by the JBI [9] were followed, with the identification of the question and search for relevant studies, selection, data extraction, grouping, summary, and presentation of results. The PCC [Population, Concept and Context] strategy was used to formulate the research question, with the following representations: P = primaryhealthcare nursing workers; C = Burnout syndrome; and C = occupational accidents. Thus, the review question was: What is the main evidence available on occupational accidents among primary healthcare nursing professionals with Burnout syndrome?

Two reviewers performed independent searches. As for Medical Subject Headings (MeSH) descriptors, such as "Occupational Accidents", "Nursing Staff", "Primary Health Care" and "Professional Burnout" were used, as well as Health Sciences Descriptors (DeCS), in Brazilian Portuguese, such as "Acidentes de Trabalho", "Profissionais de Enfermagem", "Atenção Primária à Saúde" and "Esgotamento Profissional", in both cases, the term "Burnout" was associated. The term "Burnout" was used to map the largest number of potential references on the topic and specificity.

For searches in other databases, modifications were made according to their specificities. The descriptors were combined in different ways to broaden the searches, in addition to the use of terminological variations and synonyms in listed languages. The combination of descriptors was done using the Boolean operators AND (restrictive combination) and OR (additive combination). OR was used between the keywords of the same acronym of the PCC strategy, and AND was used for the combination between different acronyms, as shown in Chart 1.

#### Ethical aspects

Since this is not research involving human beings or animals, there was no need for submission and approval by the *Universidade Federal de São Paulo* (UNIFESP) Research Ethics Committee. However, a declaration of responsibility and assessment by the Department of Public Health was completed, in accordance with Resolution 200 of 2021 of UNIFESP's University Council.

## Chart 1 Search strategy in databases. São Paulo, São Paulo, Brazil, 2024

PubMed	("Compassion Fatigue"[MeSH Terms] OR "burnout, professional"[MeSH Terms] OR "burnout"[Title/Abstract] OR "exhaustion"[Title/Abstract] OR "fatigue"[Title/Abstract] OR "burned out"[Title/Abstract] OR "chronic stress"[Title/Abstract] OR "job burnout"[Title/Abstract] OR "compassion Fatigue"[Title/Abstract] OR "mental exhaustion"[Title/Abstract] OR "professional fatigue"[Title/Abstract] OR "compassion Fatigue"[Title/Abstract] OR "emotional depletion"[Title/Abstract] OR "occupational stress"[Title/Abstract] OR "work-induced fatigue"[Title/Abstract] OR "adrenal fatigue"[Title/Abstract]) AND ("nursing staff"[MeSH Terms] OR "nursing staff"[Title/Abstract] OR "hospital nursing staff"[Title/Abstract] OR "nurses"[MeSH Terms] OR "nurse"] OR "nurse"[Title/Abstract] OR "nurse"[Title/Abstract] OR "nurse"[Title/Abstract] Abstract] OR "registered nurses"[Title/Abstract] OR "nursing workforce"[Title/Abstract] OR "nursing personnel"[Title/Abstract] OR "nursing professionals"[Title/Abstract] OR "nursing workforce"[Title/Abstract] OR "nursing team"[Title/Abstract] OR "nursing care team"[Title/Abstract] OR "nursing workforce"[Title/Abstract] OR "nursing team"[Title/Abstract] oR "nursing care team"[Title/Abstract] OR "nursing workforce"[Title/Abstract] OR "nursing employees"[Title/Abstract] OR "nurse staffing"[Title/Abstract] OR "nursing work environment"[Title/Abstract] OR "nursing employees"[Title/Abstract] OR "nurse staffing"[Title/Abstract] OR "nursing work environment"[Title/Abstract] OR "nursing "Cocupational accidents"[tiab] OR deformation, professional [tiab] OR occupational disease [tiab] OR occupational disorder [tiab] OR occupational accidents"[tiab] OR occupational illness [tiab] OR professional deformation [tiab] OR occupational accidents [mh] OR occupational diseases [mh] OR occupational injuries [mh] OR wounds and injuries [mh] OR Workplace accident [tiab] OR "workplace accident" [tiab] OR "work-related accident" [tiab] OR "job accident" [tiab])
Embase	('compassion fatigue'/exp OR 'fatigue' OR 'chronic fatigue syndrome' OR 'professional burnout'/exp OR 'burnout':ti,ab,kw OR 'exhaustion':ti,ab,kw OR 'fatigue':ti,ab,kw OR 'burned out':ti,ab,kw OR 'chronic stress':ti,ab,kw OR 'gob burnout':ti,ab,kw OR 'work-related stress':ti,ab,kw OR 'mental exhaustion':ti,ab,kw OR 'professional fatigue':ti,ab,kw OR 'compassion fatigue':ti,ab,kw OR 'emotional depletion':ti,ab,kw OR 'occupational stress':ti,ab,kw OR 'work-induced fatigue':ti,ab,kw OR 'adrenal fatigue':ti,ab,kw OR 'mental exhaustion':ti,ab,kw OR 'work-induced fatigue':ti,ab,kw OR 'adrenal fatigue':ti,ab,kw) AND ('nursing staff'/exp OR 'nursing staff':ti,ab,kw OR 'hospital nursing staff':ti,ab,kw OR 'nurse'/exp OR 'nurse':ti,ab,kw OR 'negistered nurses':ti,ab,kw OR 'nursing personnel':ti,ab,kw OR 'nursing professionals':ti,ab,kw OR 'hospital nurses':ti,ab,kw OR 'nurse' personnel':ti,ab,kw OR 'nursing professionals':ti,ab,kw OR 'nurse ides':ti,ab,kw OR 'nursing team':ti,ab,kw OR 'nursing care team':ti,ab,kw OR 'nursing workforce':ti,ab,kw OR 'nursing employees':ti,ab,kw OR 'nurse staffing':ti,ab,kw OR 'nursing work environment':ti,ab,kw OR 'primary care':ti,ab,kw OR 'primary health care'/exp AND ('occupational accidents':ti,ab,kw OR 'deformation, professional':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational disorder':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational accidents':ti,ab,kw) AND ('care nursing':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational accidents':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational disease':ti,ab,kw OR 'occupational accidents':ti,ab,kw)
CINAHL/ PsycINFO	<ul> <li>(MH "Compassion Fatigue" OR MH "Burnout, Professional" OR TI "burnout" OR TI "exhaustion" OR TI "fatigue" OR TI "burned out"</li> <li>OR TI "chronic stress" OR TI "job burnout" OR TI "work-related stress" OR TI "mental exhaustion" OR TI "professional fatigue" OR</li> <li>Ti "compassion fatigue" OR TI "emotional depletion" OR TI "occupational stress" OR TI "work-induced fatigue" OR TI "adrenal fatigue") OR AB "burnout" OR AB "exhaustion" OR AB "fatigue" OR AB "burned out" OR AB "compassion fatigue" OR AB "burnout" OR AB "exhaustion" OR AB "fatigue" OR AB "compassion fatigue" OR AB "gob burnout" OR</li> <li>AB "work-related stress" OR AB "mental exhaustion" OR AB "professional fatigue" OR AB "compassion fatigue" OR AB "emotional depletion" OR AB "occupational stress" OR AB "compassion fatigue" OR AB "emotional depletion" OR AB "occupational stress" OR AB "work-induced fatigue" OR AB "adrenal fatigue")</li> <li>AND</li> <li>(MH "Nursing Staff" OR MH "Nurses" OR TI "nursing staff" OR TI "hospital nursing staff" OR TI "nurses" OR TI "nurses traffing" OR TI "nursing work environment" OR AB "nursing team" OR AB "nursing care team" OR AB "nursing workforce" OR AB "nursing personnel" OR AB "nursing professionals" OR AB "nursing team" OR AB "nursing care team" OR AB "nursing employees" OR AB "nursing assistants" OR AB "nursing work environment")</li> <li>AND</li> <li>(MH "Primary Health Care" OR "care nursing" OR "primary care" OR "primary health care" OR "care nursin</li></ul>
Web of Science	"occupational dysfunction" OR AB "occupational illness" OR AB "occupational injuries") TS = ("burnout" OR "exhaustion" OR "fatigue" OR "burned out" OR "chronic stress" OR "job burnout" OR "work-related stress" OR "mental exhaustion" OR "professional fatigue" OR "compassion fatigue" OR "emotional depletion" OR "occupational stress" OR "work-induced fatigue" OR "adrenal fatigue") AND TS = ("nursing staff" OR "hospital nursing staff" OR "nurses" OR "nurse" OR "registered nurses" OR "nursing workforce" OR "nursing personnel" OR "nursing professionals" OR "hospital nurses" OR "clinical nurses" OR "nurse practitioners" OR "nursing assistants" OR "nurse aides" OR "nursing team" OR "nursing care team" OR "nursing employees" OR "nurse staffing" OR "nursing work environment") AND TS = ("care nursing" OR "primary care" OR "primary health care") AND TS = ("occupational accidents" OR "professional deformation" OR "occupational disease" OR "occupational disorder" OR "occupational dysfunction" OR "occupational illness" OR "occupational injuries")

#### Chart 1 (continued)

LILACS (burnout OR exhaustion OR fatigue OR exhaustion OR "burned out" OR "chronic stress" OR "job burnout" OR "work-related stress" OR "mental exhaustion" OR "professional fatigue" OR "compassion fatigue" OR "emotional depletion" OR "occupational stress" OR "work-induced fatigue" OR "adrenal fatigue") AND ("nursing staff" OR "hospital nursing staff" OR nurses OR nurse OR "registered nurses" OR "nursing workforce" OR "nursing personnel" OR "nursing professionals" OR "hospital nurses" OR "norsing assistants" OR "nurse aides" OR "nursing team" OR "nursing care team" OR "nursing employees" OR "nurse staffing" OR "nursing work environment") AND ("primary care" OR "primary health care" OR "care nursing") AND ("occupational accident" OR "work-related accident" OR "work injury" OR "work-place injury" OR "work-related injury" OR "professional accident")

#### Analysis of results

To collect the data, we used the criteria of an instrument validated for this purpose, whose variables included title, authors, year of publication and journal, language, objectives, design and main results [11]. The methodological quality and risk of bias of the selected studies were assessed by two researchers using the JBI Appraisal Tools [12], and the assessment of methodological quality is justified in order to allow quick visualization and assess the robustness of the study. Articles with 80–100% correspondence to the JBI Appraisal Tools criteria were classified as having high methodological quality, those with 60–79% correspondence as moderate and those with less than 59% correspondence as low quality. The results were analyzed descriptively with a summary of each of the included studies.

#### Results

A total of 872 articles were found from primary sources and 11 from references cited in the articles. After removing duplicate texts and those deleted due to incompleteness, 391 materials remained. These were analysed and the exclusion criteria applied, resulting in the final selection of 11 texts. The flowchart in Fig. 1 presents a summary of the article selection process.

Of the studies included in the review, the majority were published in English (n = 9; 81.8%) and Portuguese (n = 2; 18.2%). As for nationality, the majority are from the United States of America (n = 4; 36.5%) and Brazil (n = 3; 27.4%). However, texts produced in Belgium (n = 1; 9%), Spain (n = 1; 9%), the Netherlands (n = 1; 9%) and Tunisia (n = 1; 9%) were also found. The methods used were cross-sectional (n = 3; 27.4%), review (n = 3; 27.4%), randomized clinical trial (n = 1; 9%), case-control (n = 1; 9%), reflection (n = 1; 9%), qualitative (n = 1; 9%) and mixedmethods (n = 1; 9%) published between 2010 and 2023. Table 1 presents the summaries of selected articles.

Using the JBI Appraisal Tools, it was identified that few studies had high methodological quality, with the majority being classified as moderate quality. The total number of participants was 6727, excluding reviews and reflection articles. The settings were predominantly primary healthcare units or health promotion, disease prevention or rehabilitation services. The studies showed convergence in some findings that were grouped together to generate the following categories: (1) Profile and risk factors for occupational accidents associated with burnout [13–17, 22]; (2) Risks and harm to patients [16, 20]; and (3) Strategies for coping with and reducing accidents associated with burnout [18, 21, 23].

Regarding the risk factors for occupational accidents associated with burnout, several aspects were highlighted, such as higher levels of physical and mental exhaustion, difficulties in resolving conflicts, little institutional support, rapid and frequent decision-making, double or multiple work shifts and working in countries classified as low-income [13, 15–17], despite the phenomenon having been classified as a global occurrence [14].

The profile was apparently more associated with midlevel nursing professionals, with less experience and working on the front line or in first contact with patients. Those who handled biological and chemical materials more frequently were more vulnerable to more serious accidents, and those who dealt with contact with family members were more likely to suffer aggression during initial care [22].

In relation to risks to patients, a dialectical aspect was noted. Just as professional burnout increased the possibility of harm to patients, the constant need to avoid errors intensified the feeling of exhaustion and dissatisfaction with work, leading to a constant cycle of selfdemands [13, 14, 16].

The strategies used to address the phenomenon have sometimes shown promise, sometimes inadequate to mitigate the problem. Promising strategies suggest collective measures by managers, such as training on work demands, reducing working hours when possible, and the application of instruments such as the Maslach Burnout Inventory [14]. An intervention program carried out online for self-knowledge and the search for resilience also showed significant reductions in occupational stress levels and helped to improve the integration between work and personal life [19]. Performance feedback provided by managers and strategies without evidence (immediate and alternative solutions) have proven to be ineffective measures, requiring the creation of more lasting institutional and public policies to improve wellbeing and quality of life at work [18].



Fig. 1 Flowchart according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) criteria according to JBI, Brazil, 2024

#### Discussion

Burnout syndrome is recognized as an occupational risk associated with chronic stress in the workplace, and is characterized as an occupational disease. The syndrome is characterized by physical, emotional and mental exhaustion resulting from work demands and conditions. This syndrome increases the likelihood of occupational accidents, since exhaustion affects a professional's ability to concentrate, judge and react [21]. As a result, Burnout syndrome increases the risk of workers making mistakes or suffering accidents.

Several factors influence the development of Burnout syndrome, such as working conditions, insufficient safety practices and lack of psychological support. Work overload stands out as the main triggering factor [14, 15, 20].

The relationship between Burnout syndrome and occupational accidents is evidenced in the studies obtained. Professionals who suffer from Burnout are more vulnerable to accidents, due to physical and mental exhaustion,

#### Year/country Authors/title Objectives Study design Outcomes Method-Sample/setting ological quality 2016 Van Gersen et al. [13] Investigate the preva-Cross-sectional There was a high number of incidents High Belgium Increased risk of burnout lence of healthcare Sample: 5788 nurses involving patients who had higher levels of for physicians and nurses professionals personally and physicians burnout. The abuse of medication to treat Involved in a patient involved in a patient Settings: 37 health psychological symptoms also increased the safety incident safety incident as well units chances of errors and accidents, including as the relationship biological ones. Such occurrences further between involvement increased symptoms of burnout and the degree of harm with problematic medication use, excessive alcohol consumption, risk of burnout, workhome interference and turnover intentions 2020 Pérez-Francisco et al. [14] Identify the relation-Review Primary healthcare nursing worker overload High Spain Influence of workload on ships between work Sample: 45 studies is a phenomenon that occurs in several Settings: n/a\* parts of the world, leading to early Burnout primary care nurses' overload, nursing Health and burnout, illness, professional syndrome, increasing the risk of occupapatients' safety, and burnout, quality and tional accidents and reducing patient safety guality of safety in services; and in daily procedures. The use of the Maslach Care: integrative review differentiate measure-Burnout Inventory prevailed in research ment methods and instruments 2018 Arcanjo et al. [15] Identify the occupa-Cross-sectional The most frequent risks were biological, Moderate Brazil Gerenciamento dos tional risks to which Sample: 8 nursing chemical and violence by patients or family Riscos Ocupacionais da primary healthcare workers members. Occupational risk factors associ-Enfermagem na Atenção nursing professionals Setting: two basic ated with work in primary healthcare were Básica: Estudo Exploratório are exposed, describe health units unsatisfactory pay, difficulty in resolving Descritivo the risk factors and corconflicts with superiors and more than one relate them with safety employment relationship conditions Examine the associa-2021 Jun et al. [16] Review Nurse burnout was inversely associated Moderate USA Relationship between tions between nurse Sample: 20 articles with patient safety, quality, commitment, nurse burnout, patient burnout and organiza-Setting: n/a\* productivity, and satisfaction. Measures and organizational tional outcomes to prevent burnout should be adopted to outcomes: systematic reduce accidents and improve healthcare review indicators 2018 Dugani et al. [17] Analyze the prevalence Nurses from low-income countries, such High Review USA Prevalence and factors and factors associated Sample: 20 as South Africa and Lebanon, who work in associated with burnout with burnout among Setting: n/a.\* initial patient care had a higher prevalence among frontline primary primary healthcare of burnout and accident risks, with triggering factors such as little time to make health care providers in professionals in lowlow- and middle-income and middle-income decisions, work overload, high stress and countries: A systematic countries little organizational support review 2021 Giesbers et al. [18] Understand feedback Mixed-methods Nurses who work directly in care, especially Moderate Netherlands Towards a better practice and nurse Sample: 184 in the first consultation with users/patients, understanding of the burnout Setting: teaching understand the practice of feedback given relationship between hospitals by human resources managers as an action feedback and nurses' negatively related to their performance, work engagement and triggering symptoms of burnout in workers burnout: A convergent mixed-methods study on nurses' attributions about the 'why' of feedback

#### Table 1 Summary of selected materials. São Paulo, São Paulo, Brazil, 2024

#### Table 1 (continued)

Year/country	Authors/title	Objectives	Study design Sample/setting	Outcomes	Method- ological quality
2022 USA	Sexton et al. [19] Effectiveness of a bite-sized web-based intervention to improve healthcare worker wellbeing: A randomized clinical trial of WISER	Test the efficiency of an intervention called Web-based Implemen- tation for the Science of Enhancing Resilience (WISER) to improve di- mensions of healthcare professional well-being	Randomized clinical trial Sample: 482 health- care professionals Settings: various healthcare services	Primary healthcare nurses who received the WISER intervention had improved work-life integration and reduced burnout. The intervention appears to be an auxiliary tool in reducing secondary problems, such as the risk of occupational accidents	High
2017 Brazil	Barros et al. [20] Burnout syndrome among nurses of primary and tertiary health care: a comparative study	Analyze and compare the prevalence of burnout syndrome in primary and tertiary healthcare nurses	Case-control Sample: 78 nurses (29 cases and 49 controls) Settings: health units and hospitals	It was evident that primary healthcare nurses are less professionally fulfilled than those in hospital care. There was equiva- lence of burnout between the groups	High
2023 Brazil	Barbosa and Alencar [21] Estresse Ocupacional em Profissionais da Atenção Primária de Saúde: Um Estudo de Caso em Região do Sertão Paraibano	Assess the phases of stress reported by primary healthcare pro- fessionals based on the Lipp stress symptom inventory	Qualitative Sample: 27 workers Settings: health units	Physical and psychological symptoms associated with exhaustion were found. Implementation of policies to reduce stress and exhaustion is suggested, thus reducing the risk of occupational accidents	Moderate
2020 Tunisia	Kotti et al. [22] Burnout and occupa- tional accident	Analyze the levels of burnout in victims of occupational accidents in the health sector	Cross-sectional Sample: 160 health- care professionals Setting: n/a.*	Burnout was evidenced in 23.1% of victims of occupational accidents. High emotional exhaustion (46.9%), high depersonalization (36.3%) and low professional achievement (34.4%) were found. Nursing professionals with fewer years in the role and with sec- ondary education were the most affected by burnout. There was an association be- tween traumatic accidents ( $p$ =0.012) and needlestick injuries ( $p$ =0.009) and burnout	Moderate
2010 USA	Halbesleben [23] The role of exhaustion and workarounds in predicting occupational injuries: a cross-lagged panel study of health care professionals	Reflect on the role of burnout in occupa- tional injuries among healthcare profession- als and possible solu- tions to reduce cases	Reflection Sample: n/a. Setting: n/a.*	Problem-solving processes with little evidence (alternative solutions) can lead to failures in nursing worker health safety systems. Strategies such as action research and workplace well-being programs can be useful resources for dealing with burnout, but approaches are suggested according to each worker's needs and the characteristics of the health territory demands	Moderate

\*n/a—not applicable

the need to make quick decisions and the handling of risky materials, such as biological and chemical products. Nursing professionals, especially those with less experience, are particularly affected, which increases their vulnerability [13, 17, 20, 22].

The profile identified in this study is composed of professionals with less experience and working on the front line, similar to the profile found in the education field, where greater vulnerability to Burnout syndrome is evidenced among beginning professors, dissatisfied with their work and who wish to change professions. The lack of support from school management also contributed to discomfort in the workplace. At the beginning of their careers, many professors face difficulties in adapting to the demands of the profession, leading to excessive involvement in the work and, consequently, increased dissatisfaction and emotional exhaustion [24].

However, research on burnout in education contradicts this scenario, showing that burnout predominantly affects professors in more advanced stages of their careers. These professors, often with doctoral and post-doctoral degrees, have dedicated years to training in areas they have always wanted to pursue [25]. The findings highlight that the burnout phenomenon can manifest itself in different ways, varying according to the experience and stage of professionals' careers.

The profile also extends to a study that highlights perfectionism as a risk factor in nurses. Maintaining high standards can lead to distress, especially in challenging situations, and the inability to meet these standards intensifies the risk of burnout [26, 27]. Personality traits such as extraversion and low neuroticism are associated with well-being and performance, whereas high levels of neuroticism increase emotional overload and burnout [27]. This phenomenon is similar to that identified in athletes, where excessive demands arise not only from their own expectations, but also from pressure imposed by coaches, reflecting challenges similar to those faced by nursing professionals [28].

Recognition at work, although it can serve as a motivating factor, can also impose an additional burden of responsibility and stress, especially in situations related to promotions. Knowing these profiles highlights the importance of factors such as gender, age, level of education, career stage and personality traits in developing specific preventive strategies for each group, aiming to minimize the risk of accidents and burnout. A study on indicators of professional burnout among primary healthcare workers highlights that professional burnout represents a challenge for these professionals. Among the main indicators of burnout are psychosocial risks, which are closely related to occupational stress [29]. Factors such as excessive workload, intense emotional pressure and unfavorable work environments can harm both professionals' mental and physical health.

Conflict resolution is essential to an effective workplace, especially in nursing, where clear communication and collaboration among team members are vital to patient safety. When conflicts are not managed well, they can destabilize the team, create communication barriers, and prolong disagreements, leading to a work environment marked by stress, frustration, and an increased risk of accidents. On the other hand, conflicts can also bring positive results, serving as an opportunity for learning, growth, and self-analysis [30].

Inadequate institutional support is a factor that aggravates burnout, and when combined with work overload, is directly associated with errors and safety incidents in the workplace. The absence of an organizational environment that promotes support not only compromises workers' mental health, but also the ability to maintain adequate safety standards [31].

A study involving 9150 nurses in the United States investigated the factors that lead these professionals to consider seeking career changes or a new professional direction. The results reveal that problems in the workplace predate the COVID-19 pandemic. Among the main issues are chronic lack of adequate staffing, burnout and violence in the workplace. Inadequate work environments, combined with a lack of institutional support and increased demands without commensurate resources, negatively impact both healthcare professionals and patient safety. The study reinforces the need for effective institutional responses to mitigate these structural problems and ensure health worker well-being [32].

Workers who need to make quick and frequent decisions under pressure are more susceptible to burnout, which can increase the likelihood of errors and accidents. The cognitive overload generated by the constant demand for choice and action raises stress levels and compromises the accuracy of the tasks performed. Healthcare professionals are often faced with situations that require immediate responses, making them especially vulnerable to burnout and the resulting occupational accidents. Although nursing involves performing standardized and protocol-based tasks, practice requires more than following predefined sequences; it requires quick and prudent judgments about the best action to be taken at the exact moment, often under unpredictable circumstances. In another context, this reality is similar to that of airline pilots, who, even in a highly regulated environment, need to make critical judgments and decide which actions to take at the appropriate time, thus avoiding errors that lead to accidents [33, 34].

The socioeconomic context has a significant influence on primary healthcare nursing professionals' working conditions, impacting professional burnout and the occurrence of occupational accidents. In countries with territorial inequalities, the unequal distribution of resources affects both the population's health and the work environment quality. The Brazilian Health System (In Portuguese, Sistema Único de Saúde-SUS) is one of the largest primary healthcare systems in the world, but it faces ongoing challenges due to chronic underfunding and the complexity of its management, which covers more than 5500 municipalities and faces health and socioeconomic disparities. Although SUS has strengths, such as the Family Health Strategy model, which reaches approximately 60% of the population, there are regions where care is insufficient. This heterogeneity results in a healthcare professional overload, exposing them to greater risks of burnout and accidents, especially in poorer regions, where working conditions are more challenging [35, 36].

Furthermore, the shortage of skilled workers in the health sector is also a growing concern. A recent study conducted in Germany investigated how to make the sector more attractive to mitigate this shortage. The analysis revealed that 70% of medical students and 37% of students in other healthcare areas consider careers in the public sector to be unattractive. This lack of attractiveness is linked to less competitive working conditions and high levels of stress and burnout, factors that not only make it difficult to retain professionals, but also to attract new workers, contributing to the growing shortage of staff in the public healthcare system [37].

The socioeconomic context notably affects healthcare professionals, who face the same social determinants that impact the general population's quality of life. Issues such as poverty, poor infrastructure and services, insecurity and lack of prospects for the future. This reality generates a vicious cycle, where dissatisfaction and stress accumulate, harming both the mental health and the performance of these workers.

As for the risks and harm to patients resulting from Burnout syndrome in caregivers, there are important considerations. There is a feedback loop, where occupational stress and safety incidents feed burnout, which in turn increases the risk of new errors, creating a harmful cycle for professionals and patients [38].

Research indicates that high levels of occupational stress and burnout can compromise the safety and quality of care provided, resulting in an increase in the occurrence of errors and adverse events. The work environment is a crucial factor that directly impacts burnout and, consequently, patient safety and professional performance. Aspects such as communication, response to errors and institutional support emerge as factors that shape the experience of nurses, affecting both emotional well-being and professional efficiency. In addition to addressing Burnout, the literature also mentions the relationship between stress and variables such as moral and emotional intelligence, which can mitigate the negative impacts of stress, highlighting the importance of these skills for job performance [39].

Another relevant point is the underreporting of accidents due to fear of punishment, which hides real problems and prevents the implementation of corrective measures, affecting both patient safety and professional well-being [37–39].

A study conducted with nurses sought to investigate the relationship between occupational fatigue and the safety climate at work. Fatigue, which can be caused by factors such as overwork, lack of sleep and demanding working conditions, impairs attention span, increases the risk of errors and compromises quality of care. The safety climate, as part of the organizational climate, refers to employees' perception of the organization's commitment to safety [40].

Strategies to address and reduce burnout-related incidents are essential not only for nurse well-being, but also for patient care safety and quality. It is important to recognize that mental health is a shared responsibility between individuals and healthcare organizations. Nurses should be encouraged to take care of their mental health, while institutions need to create an environment that supports and values this practice.

To achieve this, organizations must implement policies that prioritize professionals' mental health, in addition to establishing a safe space where nurses feel comfortable discussing their concerns and seeking support. Leaders' behavior plays a vital role in identifying problems related to stress and burnout. They are essential in implementing interventions that address these issues, promoting an organizational culture that values flexibility and work-life balance [41].

The main limitations of this study are the selected databases and search languages, which may have excluded relevant studies in other languages or in less common databases. The scoping review also covered a variety of research methods, limiting a detailed comparison between interventions and outcomes, since it was not possible to consistently analyze the effectiveness of specific preventive strategies for Burnout syndrome and the occurrence of accidents in primary healthcare professionals. Given the complexity of the topic, it was challenging to isolate the contextual variables that influence the relationship between burnout and occupational accidents. Despite these limitations, the study contributes significantly by highlighting primary healthcare nursing professionals' vulnerability, highlighting the need for specific policies to prevent burnout and occupational accidents in this group.

#### Conclusion

Occupational accidents occurring in primary healthcare services can be strongly influenced by the presence of Burnout syndrome in professionals, and the occurrence of accidents itself can cause exhaustion that increases worker burnout. This phenomenon appears to be global and significantly affects quality of life at work and the safety of both nursing professionals and patients under their care. Professionals with less experience, working on the front line or in direct patient care are the most vulnerable to the occurrence of burnout and accidents, especially those of biological and chemical origin.

The need to make very quick decisions, double or multiple working shifts and working in low-income countries are shown to be conditions that increase the risk of burnout and occupational accidents.

Prevention and control strategies, such as the implementation of specialized training on the flows and demands inherent in primary health care, the reduction of working hours, the use of accurate evaluation instruments and the adoption of intervention programs aimed at reducing occupational stress, can be effective measures to mitigate the incidence of the "professional burnoutoccupational accidents" dyad. In addition, the scarcity of experimental studies with significant samples, together with the lack of research with high methodological rigor, highlights the imperative need for the scientific community to explore the subject in greater depth, with a view to promoting practices based on increasingly robust and reliable evidence.

#### Abbreviations

WHO	World Health Organization
ICD-11	International Classification of Diseases 11th Revision
PROSPERO	International Prospective Register of Systematic Reviews
OSF	Open Science Framework
PubMed	National Library of Medicine
CINAHL	Cumulative Index to Nursing and Allied Health Literature
WOS	Web of Science
EMBASE	Excerpa Medica DataBASE
APA PsycNET	American Psychological Association
LILACS	Latin American and Caribbean Literature in Health Sciences
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-
	Analyses Extension for Scoping Reviews
PCC	Population, Concept and Context
MeSH	Medical Subject Headings
DeCS	Descritores em Ciências da Saúde

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#### Author contributions

CCFG, ARL, PH, MT, MFPO and HF conceptualized the review and design. CCFG and HF conducted the review, data collection, and data analysis. CCFG, PH, MFPO, MT, ARL and HF prepared the original draft of the manuscript. CCFG, ARL, MFPO, MT and HF contributed to revising and finalizing the manuscript by providing critical feedback to drafts. All authors have reviewed and approved the final manuscript.

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#### Data availability

Data relating to selected materials can be obtained from https://osf.io/cdbpt/. Additional information can also be requested from the authors.

#### Declarations

#### **Ethical approval**

International ethical legislation was respected. There was no need for approval by a Research Ethics Committee because the study was based on the analysis of articles published in scientific journals.

#### **Consent for publication**

Not applicable.

#### **Clinical trial number**

Not applicable.

#### Competing interests

The authors declare no competing interests.

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