

# Prevalence, risk factors and prevention of burnout syndrome among healthcare workers: An umbrella review of systematic reviews and meta-analyses

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**KEY WORDS:** Burnout syndrome; healthcare workers; mental health; occupational health; systematic review.

## Abstract

**Introduction:** Burnout syndrome (BOS) is a psychological syndrome characterized by emotional exhaustion, depersonalization, and low personal accomplishment. This umbrella review aimed to investigate BOS among healthcare workers (HCWs).

**Methods:** An umbrella review of systematic reviews and meta-analyses concerning the prevalence of BOS among physicians, nurses, medical students and other HCWs, and its associated factors was conducted across PubMed Central/Medline, Cochrane Library, PROSPERO and Epistemonikos databases. Only systematic reviews and meta-analyses from inception to 15 January 2020 and restricted to English language documents were included.

**Results:** A total of 43 studies met the full inclusion criteria and were included. Among them, there were 3 meta-analyses, 26 systematic reviews, and 14 systematic reviews with meta-analysis. The prevalence of BOS was highest among nurses, younger persons, and trainees. The most frequent risk factors associated with BOS included stress, lack of family support, and organizational risk factors such as prolonged night shifts, length of experience, and exposure to traumatic events. Individual coping strategies such as exercise and communication with peers, and organizational strategies such as periodic review of shift schedule should be undertaken.

**Discussion:** BOS has profound effects on the mental health states of HCWs. Individuals and the hospital authority need to pay specific attention to work-related stress risk factors to improve the psychological well-being of HCWs.

## TAKE-HOME MESSAGE

*This umbrella review of systematic reviews and meta-analyses showed the occurrence of burnout among healthcare workers. Policymakers should commence interventions for the prevention and management of burnout syndrome in healthcare workers.*

**Competing interests** - none declared.

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## INTRODUCTION

Burnout syndrome (BOS) is a psychological syndrome characterized by emotional exhaustion (EE) or mental fatigue, depersonalization (DP) or cynicism represented by negative feelings and perceptions about the people one works with, and low personal accomplishment (PA)—and appears because of chronic work stress [1]. Recently, the World Health Organization included burnout in the 11th version of the International Classification of Diseases (ICS-11) and defined it as a syndrome resulting from poor management of chronic workplace stress [2, 3]. Burnout is characterized by feelings of energy depletion or emotional exhaustion, increasing mental detachment from work, or feelings of negativism or cynicism about work and consequently decreased occupational efficiency [2, 3]. The World Health Organization described BOS in the chapter: ‘Factors influencing health status or contact with health services’ – as some conditions with no direct health relevance for which people require health services. Indeed, burnout is a recognized and well-established workplace hazard in the healthcare sector [4–6] affecting workers in a growing number of professions [7, 8], but especially nurses and physicians being the most frequently affected [9]. For this reason, work-related stress among healthcare workers (HCWs) has become a problem of public health significance [10]. Indeed, occupational stress and burnout can have adverse effects on both patients, healthcare provider(s), and organization(s) [11]. BOS is the consequence of chronic work-related stress exposure and is 2-3 times higher among physicians than among other professionals [12]. It is a prolonged response to long-term emotional and interpersonal stressors on the job [13]. Burnout is strongly related to workload and time pressure, role conflict and role ambiguity, lack of social support, lack of feedback, lack of autonomy and lack of participation in decision-making (organizational assets); however, according to the job strain models

by Karasek and the effort-reward imbalance model for predicting BOS [14], high workload and emotional demands as well as low control and rewards are the most important organizational risk factors for BOS [15, 16]. Burnout among HCWs may affect the well-being of HCWs as well as the quality of professional care they provide and can, therefore, be detrimental to patient safety [17]. BOS can have a strong impact on physician’s quality of life and a corresponding decrease in the quality of care with an evident economic burden for the healthcare system [18]. Evidence from literature reports an association between BOS and increase in absenteeism, turnover, mood disorders, and medical errors [19, 20]. Given the difficulty of defining and measuring with precision this puzzling syndrome however, systematic reviews and meta-analyses on the prevalence of BOS in physicians often lead to contradictory results [21, 22]. Despite this, BOS is increasingly recognized, and diagnosed by occupational stakeholders to such an extent that in many countries, this syndrome is widely being considered as an occupational disease [3, 23]. However, research on burnout in healthcare has several limitations due to overlaps between burnout and work-related stress as psychosocial risk factors [5, 7, 24] and between BOS and depression as individual outcomes [25]. However, research found that situational and organizational factors play a huge role in burnout and work-related stress than individual factors. Furthermore, associations between burnout and gender, age, specialty, and geographical location of training are unclear [26, 27]. Interventions to prevent or manage burnout have been proposed at individual and organizational levels. Systematic reviews and meta-analyses and, more generally, literature on burnout have increased over the years, and in the field of occupational and public health since evidence-based research is key to healthcare interventions. To the best of our knowledge, only one systematic review is publicly available on interventions to identify the varying pattern of BOS in healthcare

settings. Differences exist in the experiences of BOS among HCWs. For instances, some HCWs have feelings of exhaustion, cynicism, and ineffectiveness, while others experience exhaustion, but remain highly engaged and very consequential. Thus, highly elevated scores on one or more of the subscales of BOS (EE, DP, and PA) are essential to understanding the extent to which BOS affects HCWs' engagement at work during these undesirable mental conditions. Therefore, we reviewed systematic reviews and meta-analyses studies (with highly elevated scores on one or more of the subscales of BOS) to evaluate the prevalence of BOS in physicians, nurses and other categories of HCWs.

## METHODS

### *Research question*

To conduct an umbrella review of systematic reviews, a well-defined research question is needed, as with original studies and systematic reviews. Therefore, we used the PEOD strategy (population, exposure, outcome, study design), which is suitable for observational studies and could be adapted and used for overview of systematic reviews as well.

*Population:* Physicians, nurses, and healthcare workers.

*Exposure:* Occupational stress

*Outcomes:* Burnout syndrome

*Design:* Systematic reviews with or without meta-analyses

### *Search strategy*

A search was conducted on PubMed and Medline, investigating systematic reviews and meta-analyses from inception to 15 January 2020, and restricted to English language documents. Two authors (FC and AAA) independently conducted the searches

as well as the initial selection of studies by their title and/or abstract. Full papers were then examined for eligibility. Disagreements were resolved by discussion. The combined PRISMA search flowchart for the selection of included studies for the two parts of the umbrella review is shown in Figure 1. We also screened the following databases: databases of systematic reviews, databases with separate indexing of systematic reviews, guideline registries, general bibliographic databases, and then websites of relevant institutions. Google Scholar was searched for grey literature. We used a combination of MeSH keywords and selected free-text terms (e.g., burnout, systematic review, meta-analysis) to search titles and abstracts by using the following search strings:

Key terms: "burnout AND systematic review":

Search string: ("burnout, psychological"[MeSH Terms] OR ("burnout"[All Fields] AND "psychological"[All Fields]) OR "psychological burnout"[All Fields] OR "burnout"[All Fields]) AND ("systematic review"[Publication Type] OR "systematic reviews as topic"[MeSH Terms] OR "systematic review"[All Fields]).

Key terms: "Burnout AND meta-analysis"

Search string: ("burnout, psychological"[MeSH Terms] OR ("burnout"[All Fields] AND "psychological"[All Fields]) OR "psychological burnout"[All Fields] OR "burnout"[All Fields]) AND ("meta-analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta-analysis"[All Fields]).

### *Inclusion criteria*

We included systematic reviews of quantitative evaluation studies with or without meta-analysis. The review focused on the occurrence of burnout among physicians, nurses and other HCWs with no geographical restrictions. Articles with abstracts published in

English language only were included.

#### *Exclusion criteria*

We excluded reviews that focused on mental illness, psychosocial risk, and occupational stress among HCWs, that were not specifically designed to study BOS. Reviews without a clear selection process or flowchart or non-BOS related outcome were also excluded.

#### *Data extraction*

Screening and data extraction were carried out by FC and checked by AAA. We extracted information on author(s), year of publication, population target, number of studies included, prevalence of BOS, whether a meta-analysis was conducted or not, quality assessment of the original studies, and overall findings.

#### *Methodological quality*

There exist various tools that can be used to assess the quality of included systematic reviews. AMSTAR has been recommended for assessing the methodological quality of systematic reviews among others, from the World Health Organization and by the Canadian Optimal Medication Prescribing and Utilization Service, as it possesses good reliability in clinical settings and has undergone both internal and external validation [27]. The AMSTAR comprises of 11 items addressing criteria relating to the assessment of methodological rigor (Table 2). The items are scored “yes,” “no,” “cannot answer,” or “not applicable.” The maximum score is 11. Scores 0–4, 5–8, and 9–11 indicate low-, moderate-, and high-quality reviews, respectively [[https://amstar.ca/Amstar\\_Checklist.php](https://amstar.ca/Amstar_Checklist.php)]. A minimum score for inclusion was 5. Authors conducted the appraisal independently, using a standardized form [28].

#### *Registration and ethical aspects*

As this was an overview of systematic reviews, registration of the study on databases such as PROSPERO was not appropriate. Since

there is no ethical approval requirement for conducting systematic reviews, no ethical approval was obtained [27].

#### *Data analysis*

Studies were grouped according to the type of population (e.g., physician/nurses/medical students), and results were narratively synthesized. We followed the PRISMA reporting guidelines which though originally developed for systematic reviews of primary studies is also applicable to umbrella reviews [29].

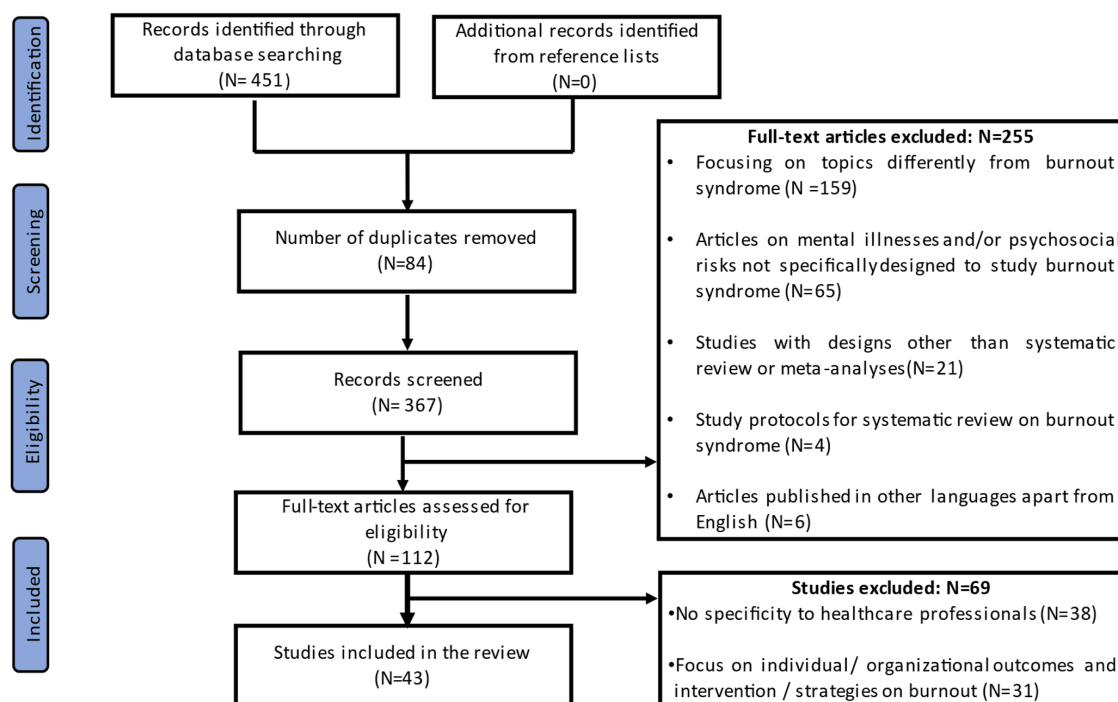
## RESULTS

#### *Description of the included studies*

Overall, 451 articles were retrieved from database search. Through screening, 84 duplicate articles were identified, and 367 articles were assessed. Two hundred and fifty-five articles were excluded based on pre-defined criteria. Overall, 43 articles were included in the final review. The flowchart for the selection process is presented in Figure 1.

#### *Prevalence of physician burnout*

Low et al. included 22,778 participants in their meta-analysis, showing no statistically significant difference in BOS prevalence rates between medical and surgical residents. In the analysis by specialty, radiology (77.16%, 95% CI 0.60 to 1.0), neurology (71.93%, 95% CI 0.66 to 0.77), and general surgery (58.39%, 95% CI = 0.46 to 0.70) were the top three specialties with the highest prevalence rates of burnout. In addition, more than 50% of residents experienced burnout in internal medicine (57.11%, 95% CI 0.45 to 0.68), orthopedics (55.63%, 95% CI 0.51 to 0.60), dermatology (51.89%, 95% CI 42.42 to 61.21), obstetrics and gynecology (52.84%, 95% CI 0.42 to 0.64), and neurosurgery (52.02%, 95% CI 0.31 to 0.72). In contrast, psychiatry (42.05%, 95% CI 0.33 to 0.52), oncology (38.36%, 95% CI 0.33 to 0.44), and family medicine (35.97%, 95% CI 0.14 to 0.66) had the lowest prevalence rates of bur-



**Figure 1.** Flowchart for identification of studies included in the review (n = 43).

Tables 1–4 summarizes the description of articles included in the review. Figures 2 and 3 presents the forest plot of results.

nout [29]. A systematic review on the phenomenon of surgeon burnout using the Maslach Burnout Inventory (MBI) showed that 31.7% of respondents reported high in EE, 26% scored high in DP, and 12.8% percent reported a low sense of PA. The most reported factor contributing to burnout was difficulty with work-life balance. Moreover, nights on call, younger age, and work hours were associated with greater likelihood of burnout. Private surgeons were significantly more likely to experience burnout compared to those in an academic setting (AOR=1.17; 95% CI 1.02 to 1.34). With regards to specialty, trauma surgeons (AOR=1.41; 95% CI 1.09 to 1.83) were more likely to experience burnout and pediatric surgeons were least likely (AOR=1.18; 95% CI 1.02 to 1.38). The review showed consequences of BOS, including among surgeons, potential adverse consequences such as depression, increased likelihood of medical errors, suicidal ideation and decreased quality of life [30]. Another systematic review by Abraham et al (2019), identified the prevalence, predictors and outcomes of burnout among primary care providers

(PCP) in the United States. Prevalence of burnout ranged from 13.5% to 60%. The primary care practice environment was the most common predictor of PCP burnout, while outcomes were described at the patient, provider, or organizational level [31]. A systematic review of burnout among emergency physicians and emergency medicine residents showed a prevalence of burnout ranged between 25.4 and 71.4%, and between 55.6% and 77.9% emergency physicians (7 articles included) and emergency medicine residents respectively (4 articles included) [32]. A systematic review evaluated the prevalence of burnout in Physical Medicine and Rehabilitation specialists and trainees showing prevalence rates from 22.2% to 83.3% among trainees and 48% to 62% among specialists. Organizational and system challenges were the primary risk factors for burnout amongst specialists [33]. A systematic review aimed to study the prevalence of burnout amongst psychiatry residents, the contributory factors, and potential ways to manage burnout. The study found an overall BOS prevalence of 33.7%, which was associated with certain de-

mographics (non-parental status), training (junior years of training, lower priority of psychiatry as career choice, lack of clinical supervision, discontinuation from training), work (high workload, long hours, insufficient rest), and learner factors (more stressors, greater anxiety, and depressive symptoms, low self-efficacy, decreased empathic capacity, poor coping, self-medication, and use of mental health services). Authors suggested interventions such as refining candidate selection, enforcement of work hour limits, enhancement of support and supervision, and equipping of stress coping skills may ameliorate burnout related to training, work, and learner factors respectively [34]. Hui et al. carried out a systematic review to summarize evidence regarding burnout among orthopedic surgeons. The prevalence of burnout varied considerably between orthopedic surgeons from different centres and of different cadres. The key determinants of burnout included personal, family, working environment and career factors [35]. A systematic review and meta-analysis of the prevalence of BOS and associated factors among 5,768 oncologists drawn from 26 studies showed, prevalence rates for MBI subscales of EE at 32%; DP at 24%; and low PA at 37%. Burnout was associated with being single, young, reduced psychological well-being, difficulties outside of work, workplace demands and workplace stress [36]. A meta-analysis of 16 cross-sectional studies were included, totaling 3,581 subjects. A random effects model approximated BOS at 3.0% (95% CI 2.0% to 5.0%;  $I^2=78.1\%$ ). Subscale analysis of EE, DP, and PA indicated subscale burnout in 30.0% (95% CI 25.0% to 36.0%;  $I^2=93.2\%$ ), 34.0% (95% CI 25.0% to 43.0%;  $I^2=96.9\%$ ), and 25.0% (95% CI 18.0% to 32.0%;  $I^2=96.5\%$ ) of surgeons, respectively. Significant differences ( $P \leq 0.001$ ) in MBI subscale scoring existed among surgical specialties [37]. A systematic review on anesthesiologists found that burnout prevalence greatly varied across studies (10%-41%). Factors most consistently associated with burnout were strained working pattern, working

as younger consultant, and having children. There was no consistent relationship between burnout and hospital characteristics, gender, or marital status [38]. A systematic review was carried out to estimate a more precise prevalence of burnout among residents of obstetrics and gynecology. The overall prevalence rate of burnout on all the three subscales was 44% (95% CI 30% to 57%) in this group of residents [39]. A systematic review with meta-analysis was conducted to determine the burnout levels experienced by radiation therapists. Nearly 45% of radiation therapists had high EE scores (95% CI 24.8% to 52.6%); 25% had high DP scores (95% CI 10.1% to 40.2%), and almost 29% had low PA scores (95% CI 17.4% to 41.6%) [40]. Among a systematic review that aimed to provide an estimate of the prevalence of burnout in practicing physicians, BOS prevalence data were extracted from 182 studies involving 109,628 individuals in 45 countries published between 1991 and 2018. Studies reported prevalence estimates of 67.0% (122/182) on overall burnout, 72.0% (131/182) on EE, 68.1% (124/182) on DP, and 63.2% (115/182) on low PA. EE, DP, and low PA prevalence ranged from 0% to 86.2%, 0% to 89.9%, and 0% to 87.1%, respectively. Because of inconsistencies in the definitions of and assessment methods for burnout across studies, associations between burnout and sex, age, geography, time, specialty, and depressive symptoms could not be reliably determined [41]. A systematic review with meta-analysis (26 studies) aimed to estimate burnout levels among different medical residency specialties. The study involved 4,664 medical residents and found an overall burnout prevalence for all specialties as 35.1% (95% CI 26.8% to 43.5%). Specialties were distributed into three groups of different levels of burnout prevalence: general surgery, anesthesiology, obstetrics/gynecology, and orthopedics (40.8%); internal medicine, plastic surgery, and pediatrics (30.0%); and otolaryngology and neurology (15.4%). Overall burnout prevalence found for all specialties was 35.7%. The meta-analytic prevalence estimate of high DP for all specialties

was 43.6% (95% CI 38.4% to 48.9%), with the highest DP values found in cardiology (72.4%), otolaryngology (53.3%) and obstetrics and gynecology (50.6%). The overall prevalence rate of high EE was 38.9% (95% CI 31.8% to 46.0%) with the highest percentage values in general surgery (54.8%), otolaryngology (47.3%) and radiation oncology (48.9%) [42]. A systematic review of the literature on burnout among inpatient-based and outpatient-based physicians worldwide was undertaken to determine whether inpatient physicians experience more burnout than outpatient physicians. Outpatient physicians reported more EE (Range = 2.65%-31.0%) than inpatient physicians (Range = 19.2%-25.0%), but no statistically significant differences in DP or PA was found. However, the review's limitations were the heterogeneity of instruments used to measure burnout and the lack of available information about practice location in many studies [43]. A systematic review with meta-analysis among French physicians that included 37 studies and 15,183 participants, showed random effects pooled prevalence estimate as 49 (95% CI 0.45 to 0.53,  $P \leq 0.001$ ,  $I^2=93.1\%$ ) for burnout, 5% (95% CI 0.04 to 0.07,  $P \leq 0.001$ ,  $I^2 = 92.7\%$ ) for severe burnout, 21% (95% CI 0.19 to 0.24,  $P \leq 0.001$ ,  $I^2 = 94.7\%$ ) for high EE, 29% (95% CI 0.25 to 0.33,  $P \leq 0.001$ ,  $I^2 = 96.7\%$ ) for high DP, and 29% (95% CI 0.24 to 0.34,  $P \leq 0.001$ ,  $I^2=97.7\%$ ) for low PA. Emergency physicians were found to have a trend for higher rates of burnout, and significantly more severe burnout compared to other physicians. Junior residents were found to have higher rates of DP and anesthesiologists were found to have lower rates of high EE and high DP [12]. A systematic review found that the overall prevalence of BOS among doctors in China ranged from 0.67-0.88. The review suggested that negative impact of burnout included association with anxiety symptoms and low job satisfaction at the individual doctors' level, and susceptibility to committing medical mistakes, thus affecting patient safety and higher turnover intention at the society/organizational level.

Burnout was higher among doctors who worked over 40 h/week, working in tertiary hospitals, on younger age group within the profession (at age 30-40), and with negative individual perception to work and life [44].

### *Prevalence of nurses' burnout*

A systematic review showed high levels of BOS among nurses providing gynecology and obstetrics services. The meta-analysis showed among 464 nurses, the prevalence rates of EE as 29% (95% CI 0.11 to 0.52), DP as 19% (0.06 to 0.38), and low PA as 44% (95% CI 0.18 to 0.71). Regarding the relationship between burnout syndrome and the sociodemographic and work-related variables considered, most studies have observed high levels of EE among young people, those who are single, and those with less working experience. In terms of organizational characteristics, falling staff numbers and the reorganization of services, due to low birth rates in developed countries, increase EE and reduce PA. Regarding the psychological variables considered, stress and verbal violence are major risk factors for burnout and symptoms of depression are common among these professionals, with a prevalence of 64%, which is related to high EE and DP, and low PA [45]. A systematic review with meta-analysis about the prevalence of burnout among mental health nurses and related factors estimated in a sample of 868 mental health nurses, prevalence rates of 25% for high EE, 15% for DP, and 22% for low PA. The studies included in the review informed that variables such as work overload, work-related stress, professional seniority, male gender, being single, and aggression at work, among other factors, contribute to burnout development [46]. A meta-analysis of 6,092 nurses from internal medicine, cardiology, pneumology, neurology, nephrology, oncology and/or hematology recorded high EE among 31% respondents (95% CI 0.19 to 0.43) and high levels of DP among 24% of the nurses (95% CI 0.10 to 0.41). The main risk factors identified were age (younger age in some studies, and older age in others



in others), while uneven results were reported with respect to the influence of marital status, with most studies highlighting the protective influence of social and family support. Occupational variables associated with burnout included working night shifts, multiple employment, a perceived lack of work-performance recognition and length of experience/seniority [9]. A meta-analysis on the prevalence of nurses' burnout in Iran included 10 articles and a sample size of 1,758 subjects, showing an overall prevalence of burnout measured as 54% (95% CI 43 to 64). By gender, the total prevalence of burnout measured among men and women was 46% and 65% respectively [47]. A systematic review with meta-analysis of 8 studies and a total sample of 1,110 primary care nurses, found a high EE prevalence of 28% (95% CI 0.22 to 0.34), high DP of 15% (95% CI 0.09 to 0.23) and 31% (95% CI 0.06 to 0.66) for low PA [48]. A systematic review with meta-analysis of papers published from 1997 to 2017 estimated burnout levels in emergency nurses by using MBI scale included 11 studies. The total mean estimate was moderate for emotional exhaustion (25.55), but clearly trending towards higher level, whereas DP (10.38) and lack of personal accomplishment (30.65) showed higher burnout levels. The proportion of emergency nurses suffering from high EE, high DP, and low PA was 40.5%, 44.3%, and 42.7%, respectively [49]. A systematic review of 34 studies targeting burnout in pediatric nurses, with no restrictions on the date of publication included in the meta-analysis 1600 pediatric nurses showed the following prevalence values: (i) High EE, 31% (95% CI 25% to 37%); (ii) High DP, 21% (95% CI 11 to 33%); and (iii) low PA, 39% (95% CI 28% to 50%) [50]. A systematic review with meta-analysis based on 21 selected articles with 4,180 participants found an overall prevalence of burnout among Iranian nurses as 36% (95% CI 20% to 53%) [51]. A systematic review to estimate the prevalence and risk factors of burnout among oncology nurses found that 3%-38% of oncology nurses presented with severe EE, 63% had high DP, and

100% recorded an absence of PA among their work [52]. A systematic review of empirical quantitative studies on burnout in emergency nurses including 17 studies, found that on an average, 26% of the emergency nurses suffered from burnout. Individual factors such as demographic variables, personality characteristics and coping strategies were predictive of burnout. Work-related factors such as exposure to traumatic events, job demands, job control, social support and exposure to traumatic events are determinants of burnout [19].

### *Prevalence of burnout among medical students*

A systematic review by Rothenberger [10] selected studies on healthcare organizations within the United States from 2000 to 2016 and showed that all US medical students, physicians in training, and practicing physicians are at significant risks of burnout with prevalence rates higher than 50%. Causes identified included disruptive changes in society, medical profession, and healthcare system, whereas interventions at individual and organizational levels were found to improve resiliency and well-being of the physicians. A systematic review focusing on the prevalence of burnout among medical students major US multi-institutional studies, estimated that at least half of all medical students (50%) may be affected by burnout during their medical education. Studies showed that burnout may persist beyond medical school, and is, at times, associated with psychiatric disorders and suicidal ideation. A variety of personal and professional characteristics correlate well with burnout. Potential interventions include school-based and individual-based activities to increase overall student well-being [53]. A systematic review with meta-analysis that studied 17,431 medical students from 24 studies, showed an overall prevalence rate of burnout to be 44.2% (95% CI 33.4% to 55.0%). Furthermore, prevalence was estimated to be 40.8% for high EE (95% CI 32.8% to 48.9%), 35.1% (95% CI 27.2% to 43.0%)

for high DP and 27.4% (95% CI 20.5% to 34.3%) for low PA. There was no significant gender difference in the occurrence of burnout. The prevalence of burnout resulted to be slightly different across countries with a higher prevalence in Oceania and the Middle East than in other continents [54]. A systematic review and meta-analysis on the prevalence of professional burnout among medical students included 58 studies with prevalence rates for professional burnout ranging from 7.0% to 75.2%, depending on country-specific factors, applied instruments, cutoff-criteria for burnout symptomatology. Twelve studies met the criteria for the meta-analysis with the following weighted mean values for the three sub-dimensions of the MBI-HSS: Mean = 22.93 (SD = 10.25) for EE, mean = 8.88 (SD = 5.64) for DP, and mean = 35.11 (SD = 8.03) for PA [55]. A systematic review with narrative synthesis of medical students experiencing burnout in China, found that high levels of burnout reported by included studies ( $n = 33$ ) amongst medical students, with over 40% of students in most studies identified as having more than moderate levels of burnout. Sex, age and location of students' geographical residence (urban or rural) were all identified as significant predictors in some studies, but findings were not consistent across the included studies; social support was negatively correlated to EE and DP; three studies, finally, reported associations between burnout and other psychological constructs, indicating that those experiencing poorer mental health overall were also more likely to suffer burnout [56].

### *Prevalence of burnout among other healthcare workers*

A systematic review on the prevalence of burnout among health professionals (nurses, physicians, and social workers), working in palliative care (palliative care units, specialized palliative home care or hospices), revealed a prevalence of burnout of 17.3% among health professionals. Personal accomplishment was the sub-scale from the MBI that

had the highest prevalence (19.5%). Nurses had higher levels of EE (19.5%) and DP (8.2%), and physicians had lower levels of PA (41.2%). The prevalence of burnout was, however, higher among social workers (27%). The palliative care context with the highest prevalence of burnout was home care (19.6%) [57]. A systematic review found that the prevalence of burnout among intensive care unit professionals ranged from 6% to 47%. The factors associated with burnout in this category of healthcare workers were age, sex, marital status, personality traits, work experience in the intensive care unit, work environment, workload and shift work, ethical issues, and end-of-life decision-making [17]. A systematic review to identify the most significant factors associated with burnout among dentists and dental students in published literature found that high EE ranged between 44 and 47% [59]. Residents in their later years of study exhibited higher levels of EE (23%) and DP (15%) compared to those in their earlier years [58]. A systematic on about physician burnout in the Middle East found that burnout is prevalent among physicians, nurses, and other medical professionals with estimates ranging between 40 and 60%. Nurses reported the highest levels of burnout among HCWs. High levels of burnout were associated with harsh work conditions, stress, and exposure to violence and conflict, whereas the number of reported interventions aimed at alleviating burnout in the Middle East is scarce [59]. A systematic review among healthcare providers in sub-Saharan Africa found that burnout is common among physicians, nurses, and other HCWs (e.g., midwives and health students) in sub-Saharan Africa with prevalence estimates ranging from 40 to 80%, with the highest levels of burnout recorded among nurses. High levels of burnout were associated with unfavorable work conditions, high job demands, and low job satisfaction [60]. A systematic review estimated the prevalence of burnout among health care professionals in Arab countries and explored individual and work-related factors associated with burnout in this population. Findin-

gs showed a moderate to high self-reported burnout among HCWs with a wide range of prevalence estimates for the three MBI subscales, high EE ranging between 20.0-81.0%, high DP between 9.2% and 80.0%), and low PA ranging between 13.3 and 85.8%. Gender, nationality, service duration, working hours, and shift patterns were all significantly associated with burnout [61]. In a systematic review regarding burnout among applied psychologists, the prevalence of high EE was reported to be 34.5%. Workload and work settings were the most common job-related factors that contributed to burnout among applied psychologists [62]. Among a systematic review prevalence of BOS and factors associated with provider burnout in HCWs in low and middle-income countries, the prevalence of high EE ranged between 2.3%-31.3%, high DP ranged between 0.7% and 17.8%, while low PA ranged between 3.9% and 39.3% [64]. Frontline nurses in South Africa had the highest prevalence of high EE and DP, while primary healthcare providers in Lebanon had the highest reported prevalence of low PA. Higher provider burnout (for example, among nurses, pharmacists, and rural health workers) was associated with high job stress, high time pressure and workload, and lack of organizational support [63]. A systematic review on job burnout among psychotherapists found that nearly 55% of sampled psychotherapists reported moderate to high levels of burnout, with most results based on quantitative cross-sectional self-report surveys. Younger age, fewer years of work experience, and extreme involvement in client problems were the most common personal risk factors for moderate-high levels of stress and burnout among psychotherapists [64]. A systematic review with meta-analysis to evaluate the presence of burnout among cancer care providers included 10 studies and 2,375 participants in the analysis, founding an overall prevalence of high EE of 36% (95% CI 31 to 41%), a high DP of 34% (95% CI 30 to 39%), and a low PA as 25% (95% CI 0.16 to 34) [65]. Nearly 9,400 participants were included in the systematic review and meta-a-

nalys on the prevalence and determinants of burnout among mental health professionals, showing an overall estimated pooled prevalence of high EE of 40% (95% CI 31% to 48%), high DP of 22% (95% CI 15% to 29%) and low levels of PA of 19% (95% CI 13% to 25%). Increasing age was found to be associated with an increased risk of DP but also a heightened sense of PA. Work-related factors such as workload and relationships at work, are key determinants for burnout, while role clarity, a sense of professional autonomy, a sense of being fairly treated, and access to regular clinical supervision appear to be protective. Staff working in community mental health teams may be more vulnerable to burnout than those working in some specialist community teams etc., e.g., assertive outreach, crisis teams [66].

**Table 1.** Studies reporting prevalence of BOS among physicians (n = 17).

Authors and year	Review's objectives (type of review)	Type of healthcare workers	Prevalence data	Factors associated with burnout syndrome	Implications
Low et al., 2019 [29]	To determine the difference in BOS (Systematic review)	Medical and surgical residents	Prevalence of BOS by specialty include: (77.16%, 95%CI=0.60-1.0), neurology (71.93%, 95%CI= 0.66-0.77), and general surgery (58.39%, 95%CI=0.46-0.70)	The occurrence of BOS varies across specialties	-
Dimou et al., 2016 [30]	Prevalence of BOS using the MBI (Systematic review)	Surgeons (younger or older surgeons working in either academic or private institutions)	Prevalence of BOS = 40%; Prevalence of EE = 31.7%; proportion of surgeons with DP = 26%; and low PA = 12.8%	a. Difficulty with work-life balance b. Type of setting: Private surgeons had higher odds for burnout than academic surgeons (AOR=1.17; 95%CI=1.02-1.34) c. Specialty: Trauma surgeons had higher odds for burnout than pediatric surgeons (AOR=1.18; 95%CI=1.02-1.38) Primary care practice environment	Potential adverse effects of burnout include depression, increased likelihood of medical errors, suicidal ideation, and decreased quality of life
Abraham et al., 2019 [31]	Prevalence, predictors, and outcomes of BOS (Systematic review)	Primary care providers in the USA	Prevalence of BOS = 13.5%-60%	Organization risk factors	BOS among primary care physicians increased medical error, worsened patient outcome, and adverse effects in the facility.
Verougstraete & Hachimi Idrissi, 2019 [32]	Prevalence of BOS (Systematic review)	Physical medicine and rehabilitation specialists and trainees	Prevalence of BOS among trainees ranged between 22.2% and 83.3%, and 48.0%-62.0% among specialists	Organizational and system challenges	BOS reduces organizational capacity to provide care to patients. Organizational and system challenges promoting burnout should be addressed (e.g., heavy workload should be simplified)
Bateman and Viana, 2019 [33]	To determine the prevalence of BOS in physical medicine and rehabilitation department (Systematic review)	Physical medicine and rehabilitation specialists and trainees	The prevalence of BOS ranged between 22.2% and 83.3% among trainees, and 48%-62% among specialists		
Chan et al., 2019 [34]	Prevalence of BOS, of the contributory factors, and potential ways to manage BOS (Systematic review)	Psychiatry residents	Overall prevalence of BOS = 33.7%	a. Younger years in training b. Work (high workload, long hours, and insufficient rest) c. Learner factors (high stress level, greater anxiety, depressive symptoms, low self-efficacy, decreased empathic capacity, poor coping, self-medication, and use of mental health services)	Interventions such as refining candidate selection, enforcement of work hour limits, enhancement of support and supervision, and equipping of stress coping skills may ameliorate burnout related to training, work, and learner factors should be put in place
Hui et al., 2019 [35]	Prevalence of BOS and risk factors (Systematic review)	Orthopedic surgeons	Prevalence of high EE=40%, high DP=34.5%, and low PA=29.6%	Prevalence of high EE=40%, high DP=34.5%, and low PA=29.6%	Prevalence of BOS varied considerably between orthopedic surgeons from different centres
Yates & Samuel, 2019 [36]	Prevalence of BOS and risk factors by using the MBI (Systematic review)	Oncologists	Prevalence of EE = 32%, and low PA =37%	Marital status (more singles were at a higher risk for burnout) Age (younger oncologists had a higher risk for burnout) Workplace demands and stress Difficulties outside work environments	Flexibility in work schedule is needed to reduce BOS

Authors and year	Review's objectives (type of review)	Type of healthcare workers	Prevalence data	Factors associated with BOS	Implications
Bartholomew et al, 2018 [37]	Bartholomew et al, 2018 [37]	3,581 surgeons	Prevalence of BOS = 3.0% (95%CI 0.02 to 0.05, I2=78.1%); EE=30.0% (95%CI 0.25 to 0.36, I2 = 93.2%); DP=34.0% (95%CI 0.25 to 0.43, I2 =96.9%), PA=25.0% (95%CI 0.18 to 0.32, I2 = 96.5%)	Surgical specialists are at high risk for burnout in all three aspects	-
Sanfilippo et al, 2017 [38]	Prevalence of BOS and risk factors (Systematic review)	Anesthesiologists (Consultants, Directors, Nurses, and Residents)	Prevalence of BOS=10-41%	i. A straining work pattern ii. Length of professional experience (younger consultants experienced the highest share of burnout)	There exist no consistent relationship between burnout and hospital characteristics
Moradi et al, 2015 [39]	Prevalence of BOS (systematic review and meta-analysis)	2,509 residents of obstetrics and gynecology	Prevalence of BOS on all the three subscales was 44% (95% CI 0.30 to 0.57)	-	-
Guerra & Patricio, 2018 [40]	Prevalence of BOS (Systematic review with meta-analysis)	Radiation therapists	Nearly 45% of radiation therapists had high EE scores (95%CI 24.8% to 52.6%); 25% had high DP scores (95%CI 10.1% to 40.2%), and almost 29% had low PA scores (95%CI 17.4% to 41.6%)	-	Workplace environments are cause burnout among radiation therapists. Strategies need to be implemented to reduce the occurrence of burnout
Rotenstein et al, 2018 [41]	Prevalence of BOS (Systematic review)	Practicing physicians	Overall prevalence of BOS = 67.0%; EE=80% (95%CI 72.0% to 86.2%); DP=70.9% (95%CI 68.1% to 89.9%); low PA=68.9% (95%CI 63.2% to 87.1%)	-	Physicians are at risk of high EE and DP, and low PA
Rodrigues et al 2018 [42]	Prevalence of BOS among different medical residency specialists (Systematic review and meta-analysis)	Residents doctors in general surgery, anesthesiology, obstetrics/gynecology, orthopedics, internal medicine, plastic surgery, pediatrics, otolaryngology and neurology	Overall prevalence of burnout =43.6% (95%CI 38.4% to 48.9%); BOS in Cardiology residents=72.4%, Otolaryngology=53.3%, Obstetrics/Gynecology=50.6%.	-	Differences exist in the prevalence of burnout among resident doctors based on their medical residency specialties
Roberts et al, 2013 [43]	Roberts et al, 2013 [43]	Inpatient and outpatient physicians	Prevalence of high EE ranged between 19.2% and 25.0% among in-patient physicians, and 2.65%-31.0% among out-patient physicians	Outpatient physicians reported more emotional exhaustion than inpatient physicians	Burnout experiences are not equal among physicians

Authors and year	Review's objectives (type of review)	Type of healthcare workers	Prevalence data	Factors associated with burnout syndrome	Implications
Kansoun et al, 2019 [12]	Prevalence of BOS (Systematic review and meta-analysis)	French physicians	Pooled prevalence of BOS =0.49 (95%CI 0.45 to 0.53, P<0.001, I2=93.1%); severe burnout=0.05 (95%CI 0.04 to 0.07, p<0.001, I2 = 92.7%); EE=0.21 (95% CI 19.0% to 24.0%, P < 0.001, I2 = 94.7%); DP=0.29 (95%CI 0.24 to 0.34, P<0.01, I2 = 97.7%)	Emergency physicians were found to have a trend to higher rates of burnout, and significantly more severe BOS compared to other physicians. Junior residents were found to have higher rates of DP and anesthesiologists were found to have lower rates of high EE and high DP	Units where physicians work influence the prevalence of burnout
Lo et al., 2019 [44]	Prevalence of BOS (Systematic review)	Chinese physicians	Overall prevalence of burnout =0.67-0.88	Burnout was higher among doctors who worked over 40 h/week, working in tertiary hospitals, on younger age group within the profession (at age 30-40), and with negative individual perception to work and life	BOS is associated with anxiety symptoms and low job satisfaction Due to burnout syndrome, doctors are prone to committing medical mistakes affecting patient safety and higher turnover intention at the society/organizational level

**Table 2.** Studies reporting prevalence of burnout among nurses (n = 10).

Authors and year	Review's objectives (type of review)	Type of healthcare workers	Prevalence data	Factors associated with BOS	Implications
De la Fuente-Solana et al, 2019 [45]	Prevalence of BOS among nurses employed in different clinical services (Systematic review and meta-analysis)	464 nurses working in gynecology and obstetrics services	Overall prevalence rates of EE was 0.29 (95%CI 0.11 to 0.52), DP was 0.19 (95%CI 0.06 to 0.38), and low PA was 0.44 (95%CI 0.18 to 0.71)	i. Age: High levels of burnout occur among younger people ii. Marital status: Burnout is more likely to occur among unmarried people iii. Working experience: The fewer the years spent on the work, the less likely the likelihood of burnout iv. Stress and verbal violence are major risk factors for burnout and symptoms of depression are common among these professionals, with a prevalence of 64%, which is related to high EE, DP, and low PA	The longer the length of stay in the nursing profession, the lesser the occurrence of burnout
Lopez-Lopez et al., 2019 [46]	Prevalence of BOS and risk factors (Systematic review and meta-analysis)	868 mental health nurses	Prevalence of EE=0.25, DP=0.15, and low PA=0.22	Work overload, work-related stress, professional seniority, male gender, singlehood, and workplace aggression	Heavy workload account for a greater portion of causes of burnout among nurses

Authors and year	Review's objectives (type of review)	Type of HCWs	Prevalence data	Factors associated with BOS	Implications
De la Fuente-Solana et al, 2019 [45]	Prevalence of BOS among nurses employed in different clinical services (Systematic review and meta-analysis)	464 nurses working in gynecology and obstetrics services	Overall prevalence rates of EE was 0.29 (95%CI 0.11 to 0.52), DP was 0.19 (95%CI 0.06 to 0.38), and low PA was 0.44 (95%CI 0.18 to 0.71)	i. Age: High levels of burnout occur among younger people ii. Marital status: Burnout is more likely to occur among unmarried people iii. Working experience: The fewer the years spent on the work, the less likely the likelihood of burnout iv. Stress and verbal violence are major risk factors for burnout and symptoms of depression are common among these professionals, with a prevalence of 64%, which is related to high EE, DP, and low PA	The longer the length of stay in the nursing profession, the lesser the occurrence of burnout
Lopez-Lopez et al, 2019 [46]	Prevalence of BOS and risk factors (Systematic review and meta-analysis)	868 mental health nurses	Prevalence of EE=0.25, DP=0.15, and low PA=0.22	Work overload, work-related stress, professional seniority, male gender, singlehood, and workplace aggression	Heavy workload account for a greater portion of causes of burnout among nurses
Molina-Praena et al, 2018 [9]	Prevalence of BOS (Meta-analysis)	6,092 nurses from internal medicine, cardiology, pneumology, neurology, nephrology, oncology and/or hematology	Prevalence of emotional exhaustion=0.31 (95%CI 0.19 to 0.43) and high levels of DP among 24% of the nurses (95%CI 0.10 to 0.41)	i. Marital status: Unmarried people had higher odds for burnout ii. Protective influence of social and family support helped to reduce burnout iii. Occupational variables associated with burnout included working night shifts, multiple employment, a perceived lack of work-performance recognition and length of experience/seniority	Interventions at the family and organizational levels are needed to reduce the severity of burnout
Khammar et al, 2018 [47]	Prevalence of BOS (Meta-analysis)	1,758 Iranian nurses	The overall prevalence of burnout = 54% (95% CI 43% to 64%). By gender, the total prevalence of burnout measured among men and women was 46% and 65%, respectively	-	Gender differences occur in the experience of burnout
Monsalve-Reyes et al, 2018 [48]	Prevalence of BOS (Systematic review and meta-analysis)	1,110 nurses in primary care units	Prevalence of EE=28% (95%CI 0.22 to 0.34), DP=15% (95%CI 0.09 to 0.23) and 31% (95%CI 0.06 to 0.66) for low PA	-	Nurses employed in primary care units may be at higher risk of burnout
Li et al, 2018 [49]	Prevalence of BOS by using the MBI (Systematic review and meta-analysis)	Emergency nurses	Prevalence of high EE, high DP, and low PA was 40.5%, 44.3%, and 42.7%, respectively	-	Emergency nurses are at a high risk for burnout
Pradas-Hernández et al, 2018 [50]	Prevalence of BOS (Systematic review)	1,600 pediatric nurses	Prevalence of EE=31% (95%CI 25% to 37%); (ii) DP=21% (95%CI 11 to 33%); and low PA=39% (95%CI 28% to 50%)	-	A high prevalence of burnout occurs among pediatric nurses
Rezaei et al, 2018 [51]	Prevalence of BOS (Systematic review and meta-analysis)	4,180 Iranian nurses	Overall prevalence of burnout =0.36 (95%CI 0.20 to 0.53)	-	Nurses are at risk for burnout

Authors and year	Review's objectives (type of review)	Type of HCWs	Prevalence data	Factors associated with BOS	Implications
Gómez-Urquiza et al., 2016 [52]	Prevalence and risk factors of BOS (Systematic review)	11,107 oncology nurses	Prevalence of severe EE ranged between 3 and 38%; DP=63%; and 100% recorded an absence of personal accomplishment in their work	i. Oncology nurses present high levels of EE and of reduced PA ii. Age, work experience, workload, and communication skills are among the factors that may influence development of the syndrome	A large proportion of these nurses are at risk of developing burnout
Adriaenssens et al., 2015 [19]	Prevalence and risk factors of BOS (Systematic review)	Emergency nurses	Overall prevalence of BOS = 26%	Individual factors such as demographic variables, personality characteristics and coping strategies were predictive of burnout. Work-related factors such as exposure to traumatic events, job demands, job control, social support, and exposure to traumatic events	Interventions to promote healthy coping with work demands should be developed and implemented

**Table 3.** Studies reporting prevalence of BOS among medical students (n = 5).

Authors and year	Review's objectives (type of review)	Type of HCWs	Prevalence data	Factors associated with BOS	Implications
Rothenberger, 2017 [10]	Prevalence of BOS (Systematic review)	All medical students, physicians in trainings, and practicing physicians in the United States	-	Causes of burnout included: disruptive changes in society, medical profession, and healthcare system and well-being of the physicians	Interventions at individual and organizational levels were found to improve resiliency and well-being of the physicians
Ishak et al., 2013 [53]	Prevalence of BOS (Systematic review)	Medical student based on major US multi-institutional studies	Nearly 50% of medical students are affected by burnout	Burnout may persist beyond medical school, and is, at times, associated with psychiatric disorders and suicidal ideation	Potential interventions include school-based and individual-based activities to increase overall student well-being
Frajerman et al., 2019 [54]	Prevalence of BOS (Systematic review and meta-analysis)	Medical student	The overall prevalence rate of burnout=44.2% (95%CI 33.4% to 55.0%), 40.8% for EE (95%CI 32.8% to 48.9%), 35.1% (95%CI 27.2% to 43.0%) for DP, and 27.4% (95%CI 20.5% to 34.3%) for low PA. The prevalence of BOS resulted to be slightly different across countries with a higher prevalence in Oceania and the Middle East than in other continents	There was no significant gender difference in burnout	A high prevalence of burnout exists among medical students
Erschens et al., 2019 [55]	Prevalence of BOS by using MBI (Systematic review and meta-analysis)	Medical student	Prevalence of BOS ranged between 7.0% to 75.2%.	Burnout among medical students is primarily caused by the large workload	-

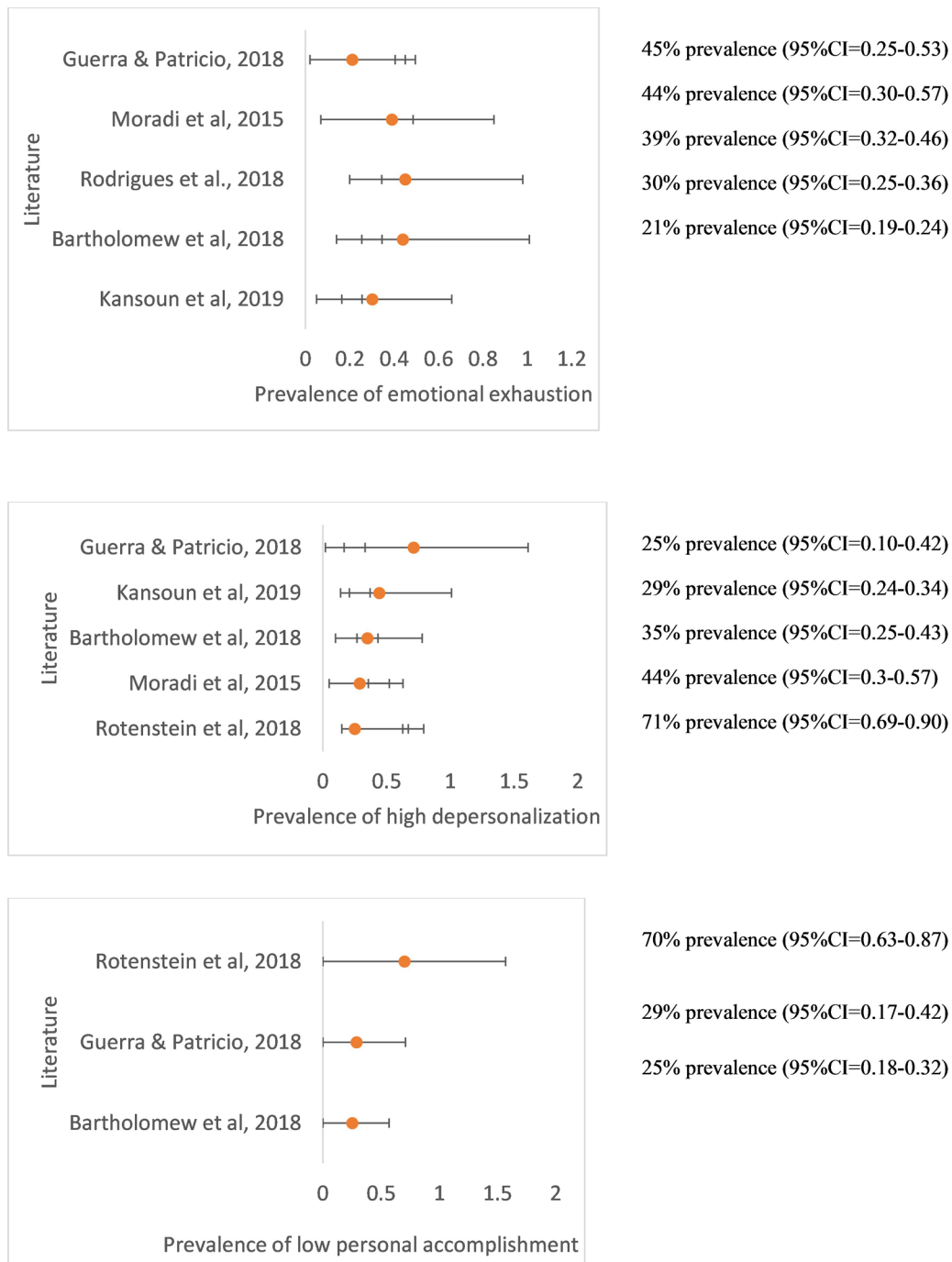


Authors and year	Review's objectives (type of review)	Type of HCWs	Prevalence data	Factors associated with BOS	Implications
Chunming et al, 2017 [56]	Prevalence of BOS (Systematic review)	Chinese medical student	Prevalence of BOS=40%	i. Social support was negatively correlated to high EE and high DP ii. Those experiencing poorer mental health overall were also more likely to suffer burnout	i. Burnout could cause poor mental health ii. Social support is needed to recover from burnout

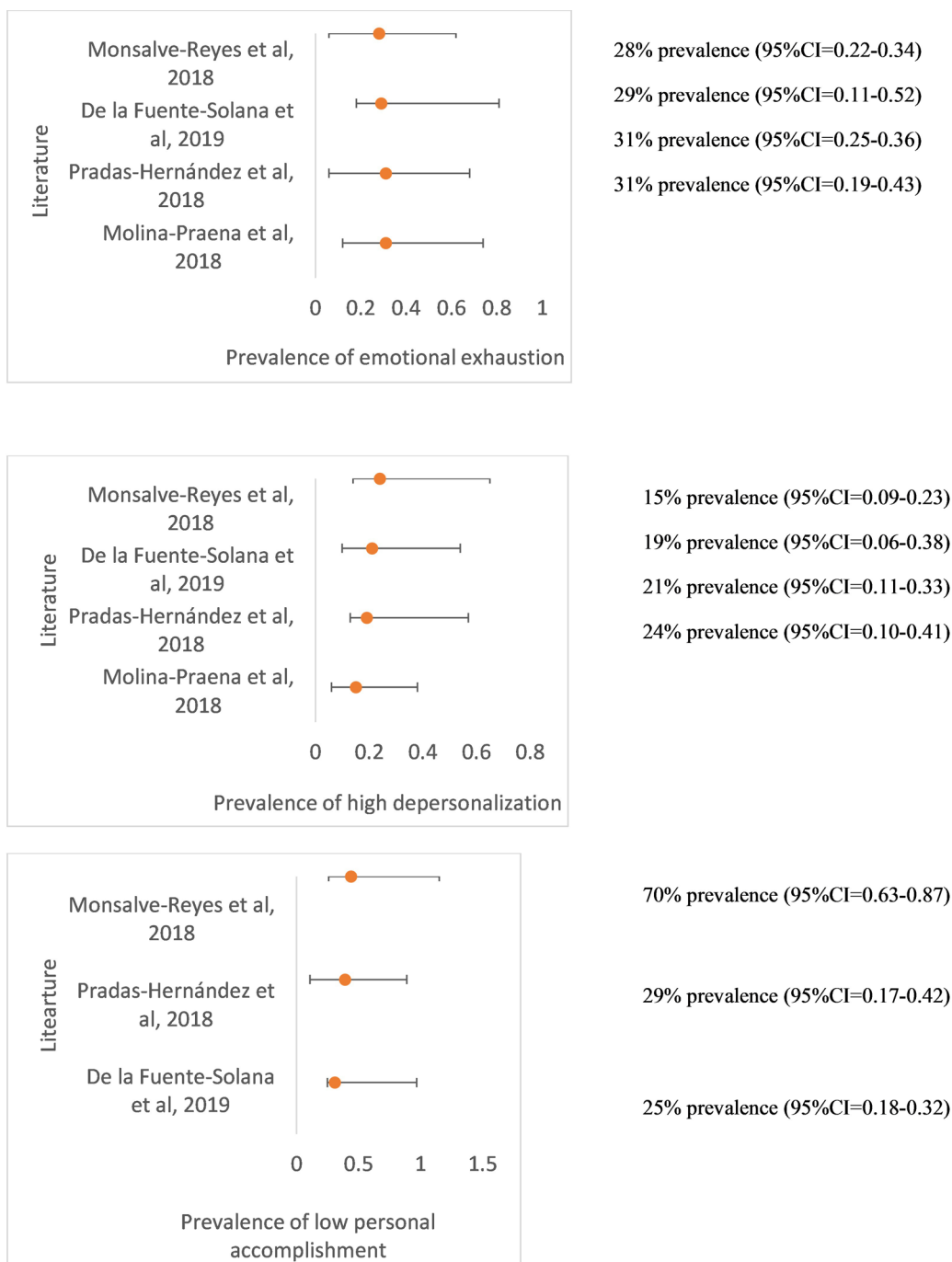
**Table 4.** Studies reporting prevalence of BOS among other healthcare workers (n = 11).

Authors and year	Review's objectives (type of review)	Type of HCWs	Prevalence data	Factors associated with BOS	Implications
Parola et al, 2017 [57]	Prevalence of BOS by using MBI (Systematic review)	Nurses, physicians, and social workers, working in palliative care, palliative care units, specialized palliative home care or hospices	Overall prevalence of burnout =17.3% Nurses had higher levels of EE (19.5%) and DP (8.2%), and physicians had lower levels of PA (41.2%). The prevalence of burnout was, highest in social workers (27%). The palliative care context with the highest prevalence of burnout was home care (19.6%)		The general healthcare population are at risk for burnout
Chuang et al, 2016 [17]	Prevalence of BOS (Systematic review)	Diverse HCWs in intensive care units staff	Prevalence of BOS ranged between 6% to 47%	Younger age, sex (male), marital status (singlehood), work experience in the intensive care unit, work environment, workload and shift work, and end-of-life decision-making	Intensive care unit staff are at a high risk for burnout due to the heavy workload present therein
Singh et al, 2016 [58]	Prevalence of BOS (Systematic review)	Dentists and dental students	High EE=44%-47% Prevalence of high EE among residents in their later years=23%, while 15% in their earlier years had high levels of EE	Age (Younger), Sex (Male), high job-strain/working hours	-
Chemali et al, 2019 [59]	Prevalence of BOS (Systematic review)	Physicians, nurses, and other medical professionals in the Middle East	Prevalence of BOS = 40-60% Nurses reported the highest levels of BOS among healthcare providers.	High levels of burnout were associated with harsh work conditions, stress, and exposure to violence and conflict	Given the scarcity of burnout interventions in the Middle East, healthcare workers are continually exposed to stress and are very likely to commit errors when administering care
Dubale et al, 2019 [60]	Prevalence of BOS (Systematic review)	Physicians, nurses, midwives and health students in Sub-Saharan Africa	Prevalence of BOS= 40-80%	High levels of burnout were associated with unfavorable work conditions, high job demands, and low job satisfaction	The high prevalence of burnout and the sparsity of interventions are likely to increase burnout among healthcare workers

Authors and year	Review's objectives (type of review)	Type of HCWs	Prevalence data	Factors associated with BOS	Implications
Elbarazi et al, 2017 [61]	Prevalence of BOS (Systematic review)	Healthcare workers in Arab countries	Prevalence of EE=20.0-81.0%, high DP (9.2-80.0%), and low PA (13.3-85.8%)	Individual factors: Gender Work-related: Service duration, working hours, Shift pattern	All healthcare workers experience burnout, although at varying levels
McCormack et al, 2018 [62]	Prevalence of BOS (Systematic review)	Applied psychologists	High EE=34.5%	i. Workload ii. Work setting	EE is a leading manifestation of BOS among psychologists
Dugani et al, 2018 [63]	Prevalence of BOS (Systematic review)	Physicians, nurses, community health workers, midwives, and pharmacists in low and middle-income countries	High EE=2.3%-31.3% High DP=0.7%-17.8% Low PA=3.9%-39.3%	High time pressure and workload, and lack of organizational support	Organizational support and reduced workload should be undertaken to reduce the occurrence of burnout
Simionato & Simpson, 2018 [64]	Prevalence and risk factors of BOS (Systematic review)	Psychotherapists	Overall prevalence of BOS=55%	Younger age, reduced work experience, and over-involvement in client problems	BOS is a leading heavy workload among psychologists
Truffelli et al, 2008 [65]	Prevalence of BOS (Systematic review and meta-analysis)	2,375 cancer care providers	Prevalence of EE was 36%(95%CI 31 to 41%), DP was 34% (95%CI 30 to 39%), and low PA was 25% (95%CI 0.16 to 34)	-	-
O'Connor et al, 2018 [66]	Prevalence and risk factors of BOS (Systematic review and meta-analysis)	Mental health professionals	An overall estimated pooled prevalence for emotional exhaustion of 40% (95%CI 31% to 48%), DP of 22% (95%CI 15% to 29%) and low levels of PA of 19% (95%CI 13% to 25%)	Individual factors: Increasing age was found to be associated with an increased risk of DP but also a heightened sense of low PA Work-related factors such as workload and poor relationship increase the occurrence of burnout	i. Staff working in community mental health teams may be more vulnerable to burnout than those working in some specialist community teams, e.g., assertive outreach, crisis teams ii. Role clarity, professional autonomy, a sense of fair treatment, and access to regular clinical supervision



**Figure 2.** Forest plot of the prevalence of emotional exhaustion, depersonalisation, and low personal accomplishment among medical doctors.



**Figure 3.** Forest plot of the prevalence of emotional exhaustion, depersonalisation, and low personal accomplishment among medical nurses.

## DISCUSSION

This study revealed the occurrence of burnout (using highly elevated scores on one or more of the subscales of BOS) among HCWs. Due to their heavy workload and the lack of institutional support from their places of engagement, many HCWs experience high EE and DP, and low PA. HCWs that are emotionally exhausted feel fatigued and are unable to meet their work expectations or relate positively with people. DP, a sense of detachment from oneself and one's identity, and low PA are likely consequences of intense physical and mental activity among HCW. Thus, although burnout emanated from the desire to increase the productivity of the HCWs and the healthcare organization at large, many overarching consequences may result both at the individual, family, and organizational level. Significant negative personal effects of burnout include broken relationships and suicide [67], while professional consequences include impaired quality of care, medical errors, and reduced patient satisfaction [68]. Factors associated with burnout among the general population of HCWs include younger age, being a member of the nursing profession, or few years of working experience. Among medical doctors, the prevalence of high DP was highest, followed by low PA, and high EE. The prevalence of the trio indicates the vulnerability of physicians to work-related stress. Research on burnout among these professionals has improved awareness of mental wellbeing as a critical issue among physicians. Among all the components of burnout, literature on stress-burnout relationship have revealed a strong positive correlation between stress and high EE, thus implying that stress is the most likely predictor of EE among physicians [69]. Evidence across studies revealed that burnout among medical professionals cultivate its seeds during medical training, and persists further till residency training period, and matures during practice as a physician [70–73]. In the present study, nearly one-half of medical students were affected by burnout, nearly 54% of resident doctors were affected, and 68% of

specialists were affected by burnout. This therefore suggests that burnout occurs along the medical practice continuum, and interventions should be tailored across all phases. In this study, low personal achievement and high EE had the highest prevalence among nurses. This is in tandem with literature that reported nearly 83% prevalence of burnout among nurses [74]. As previously stated, EE is a consequence of occupational stress, and stems from irregular shift schedules and increased workload. Thus, the stress born by nurses could be identified as an occupational hazard [75]. Because nurses are closest to patients and patients' relatives, they are frequently under pressure, and are posed with the highest proportion of mental health challenges [76]. Furthermore, the lack of understanding from patients and their caregivers may prolong psychological imbalances for nurses regardless of their workstations, resulting in burnout [77]. Among other HCWs, burnout again exists across high EE, high DP, and low PA fields. In many instances, close relationship with patients (especially among males), high job demands, long working hours, and poor working environment have been implicated in the occurrence of occupational stress among HCWs. Likewise, unsteady shift pattern also contributed to high levels of EE and low PA among other healthcare staff. These experiences were recounted during the COVID-19 pandemic among HCWs deployed in the COVID-19 response [72–76]. A radical change in the culture of work is quintessential to contradict the stereotype of endurance that overvalues stoicism and dismisses complaints as signs of weakness and identify the limitations of HCWs on a physical, cognitive, and emotional level [77–79]. Burnout interventions on an individual, family, and organizational level have been proven to improve the resilience of HCWs [79, 80]. Physical activity, physical and mental relaxation, balanced diet, and good sleep are basic individual practices that could be adopted [81, 82]. Family support is crucial to the psychological well-being of HCWs [79]. Though this channel, HCWs can share their experiences with

family members in reflective discussions, and this will help them to gain some emotional motivation to survive through odd events. At the organizational level, communication is critical. Even during tight work schedules, the adoption of blame-free environments to share emergency issues and challenges and seek guidance, involvement of all cadres of HCWs in decision-making at the administrative level to promote a sense of togetherness and positivity and providing opportunities for review after a work shift should be considered [80]. Likewise, the set-up of a multi-disciplinary team of medical social workers, psychologists, counsellors, and occupational health and safety physicians are required to provide HCWs with professional psychosocial support during experiences of burnout [83-85].

### *Study limitations*

Most studies on individual interventions concluded that the heterogeneity of interventions and methodological limitations in the study design creates uncertainty in the effectiveness of these approaches. Therefore, there are limitations on the strength of implications for practice that can be made in this field. Furthermore, we followed the WHO as well as Leiter and Maslach's definitions of BOS [2, 86], which is a syndrome characterized by emotional exhaustion, cynicism, and inefficacy, and included only studies referring to a score on at least one of BOS' subscales (EE, DP, and PA) and general prevalence of BOS.

## **CONCLUSION**

A good understanding of work-related burnout and implementation of corresponding preventive and control measures are of great significance to maintaining the health of HCWs, improve their performance, and stabilize the medical team. This study revealed that all cadre of HCWs especially nurses and those working in emergency department experienced high levels of work-related burnout. In addition, characteristics such as age, gender, occupation, marital status, and work

experience are associated with the occurrence of burnout. Thus, individual coping strategies such as exercise, good sleeping habits, and communication with peers may prove useful to avoid burnout, and cope during its occurrence. Hospital management board, and the national authority need to pay specific attention to work-related stress risk factors to improve the psychological well-being of HCWs. Periodic review of each shift schedule, and provision of support from experienced HCWs in each department should be undertaken.

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