

The prevalence and associated factors with burnout among healthcare workers in Morocco: A systematic review

Prévalence et facteurs associés au burnout chez les professionnels de la santé au Maroc: Une revue systématique

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ABSTRACT

Aims: Health professionals are often confronted with new workplace risks that go beyond physical risks to include psychosocial risks. Moroccan healthcare professionals often experience burnout. Understanding the impact of burnout is essential for creating a healthy work environment in healthcare institutions. This study aimed to systematically analyze: 1) the prevalence of burnout among Moroccan health care professionals. 2) the factors associated with burnout in the same population.

Methods: A systematic review of articles published in PubMed, Scopus, Science Direct, Web of Science, Medline, and ProQuest databases was conducted using keywords up to July 2024. This review included studies that used the Maslach Burnout Inventory (MBI) to evaluate burnout among Moroccan healthcare professionals in three domains: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment.

Results: A total of 14 studies assessing burnout in 4382 Moroccan healthcare professionals were included. The average prevalence of burnout was 73.36%. The burnout prevalence for the three domains ranged from 29 % to 85.71% for high emotional exhaustion (EE), 17% to 79.70% for high depersonalization (DP), and 6% to 85.90% for low personal accomplishment (PA). Young age, female sex, single status, low job satisfaction, poor organization, poor communication, and work conflict were identified as risk factors for burnout.

Conclusion: The identification of factors associated with burnout syndrome can help prioritize areas of intervention to prevent it. This will guarantee the work-life quality for health professionals in Morocco.

Key words: Prevalence, Burnout, Healthcare Professional, Morocco

RÉSUMÉ

Objectifs : Les professionnels de la santé sont souvent confrontés à de nouveaux risques qui vont au-delà des risques physiques et incluent des risques psychosociaux. Les professionnels de la santé marocains souffrent souvent de burnout. Il est essentiel de comprendre l'impact de burnout pour créer un environnement de travail sain dans les établissements de la santé. Cette étude visait à analyser systématiquement : 1) la prévalence de l'épuisement professionnel chez les professionnels de la santé marocains ; 2) les facteurs associés à l'épuisement professionnel chez la même population.

Méthodes : Une revue systématique des articles publiés jusqu'au juillet 2024, dans les bases de données PubMed, Scopus, Science Direct, Web of Science, Medline et ProQuest a été réalisée à l'aide des mots-clés. Cette revue comprenait des études qui utilisaient le Maslach Burnout Inventory (MBI) pour évaluer l'épuisement professionnel chez les professionnels de santé marocains dans trois domaines : l'épuisement émotionnel (EE), la dépersonnalisation (DP) et l'accomplissement personnel.

Résultats : Au total, 14 études évaluant l'épuisement professionnel chez 4382 professionnels de la santé marocains ont été incluses. La prévalence moyenne de l'épuisement professionnel était de 73,36 %. La prévalence du burnout pour les trois domaines variait de 29 % à 85,71 % pour l'épuisement émotionnel élevé (EE), de 17 % à 79,70 % pour la dépersonnalisation élevée (DP) et de 6 % à 85,90 % pour la faible réalisation personnelle (PA). Le jeune âge, le sexe féminin, être célibataire, la faible satisfaction professionnelle, la mauvaise organisation, la mauvaise communication et les conflits au travail ont été identifiés comme des facteurs de risque de burnout.

Conclusion : L'identification des facteurs associés au syndrome d'épuisement professionnel peut aider à hiérarchiser les domaines d'intervention afin de le prévenir. Cela permettra de garantir la qualité de vie professionnelle des professionnels de la santé au Maroc.

Mots clés : Prévalence, Burnout, Professionnel de santé, Maroc

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INTRODUCTION

Currently, burnout is a major challenge for the scientific community. The rapid transformation of working environments, the emergence of new diseases, such as the coronavirus disease 2019 (COVID-19) pandemic, and the serious consequences of COVID-19 on mental and physical health are attracting growing interest (1).

The definition of burnout has not reached consensus among researchers. In 1978, Kahn defined burnout as an unpleasant physical and emotional syndrome of inadequate attitudes toward clients and self (2). It is also a state of fatigue caused by an event or relationship that does not produce the expected results (3). According to Schaufeli and Enzmann (2020), burnout is a negative, long-lasting work-related state of mind that affects normal individuals (4). Cherniss (1980) described it as a process in which an already engaged professional decides to withdraw from his or her work because of the job's stresses and strains (5). Also, Demerouti and Hariharan used a dual approach to explain burnout, including increased demands and reduced resources (6,7). In 2014, Leiter et al. (2014) described burnout as a downstream reaction to workplace interpersonal stress (8,9). This reaction comprises three dimensions: emotional exhaustion, depersonalization, and low personal accomplishment.

Burnout affects all categories of healthcare personnel (doctors, nurses, and administrative staff). The data differ from one study to another (10) (11) (12). It has important repercussions on the quality of care, such as increasing the risk of medical malpractice, depression, and suicide (13). Burnout also has an impact on the quality of life of healthcare professionals, accentuating interpersonal conflict and aggression (14).

Several systematic reviews and meta-analyses of the literature on the prevalence and risk factors of burnout among healthcare professionals have been published. They concern either all healthcare professionals (15–22), or a category such as nurses (23–28), and physicians (29–31).

Although burnout has been extensively studied internationally, the Moroccan context remains poorly explored. To date, no systematic review has determined the prevalence of burnout among Moroccan healthcare professionals. Therefore, a contextualized synthesis of local data is essential.

This systematic review aims to achieve two main objectives:

1. To estimate the prevalence of burnout among healthcare professionals in Morocco.
2. To identify factors associated with burnout in the same population.

METHODS

Search strategy

The Preferred Reporting Items for Systematic and Meta-analysis recommendations (PRISMA) were followed to

conduct this systematic review (32).

The protocol for this systematic review was registered in the Prospective International Register of Systematic Reviews (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024536359).

Search and screening strategy

A literature review of articles published in databases up to July 2024 was conducted to answer the following research question: What are the prevalence and factors associated with burnout among Moroccan healthcare professionals?

PubMed, Scopus, Science Direct, Web of Science, MEDLINE, and ProQuest databases were consulted.

Keywords such as "health workers", "health care professional", "nurses", "doctors", "physicians", "burnout", "burnout", "emotional exhaustion", "depersonalization", "personal accomplishment", "Morocco", were used to search the databases. Supplementary File 1 shows the search strings that were used for all databases.

A structured manual design was used for data search, selection, extraction, and analysis. Given the heterogeneity of terminology (languages, specialties, types of healthcare structures), automatic software was not used to ensure that all relevant studies were included. Recent studies indicate that automation methods produce results comparable to those produced by manual design (33,34).

Eligibility criteria

The inclusion criteria included the following:

-Observational study design (cohort, case-control, and cross-sectional) of health professionals working in Moroccan health institutions.

-Articles written in English or French was published any year up to 07/2024.

-The Maslach Burnout Inventory (MBI) was used to measure burnout and scores of the three sub-domains of burnout namely: Emotional Exhaustion, Depersonalization, and reduced personal accomplishment, to minimize tool heterogeneity and strengthen the validity of the synthesis.

Exclusion Criteria

Articles were excluded if they met one or more of the following criteria:

Population: Apprentices or workers in training.

The study uses solely qualitative research methods.

Studies not from Morocco.

Grey papers, preprints, and unpublished work.

Study Selection

The search terms and Boolean operators were selected from the databases. The publications were then filtered by publication date to narrow down the results based on the eligibility criteria. To eliminate duplicates, the search results were exported to Zotero. Subsequently, the

database was imported into the Rayyan software (35), and two reviewers independently selected the included articles according to the title and abstract.

In the event of disagreement over the first selection, meetings were organized to resolve the problem.

Disagreements were resolved by consensus, and a third reviewer was involved in the event of persistence, whose decision was considered final.

Full-text articles that met the eligibility criteria were reviewed.

The final decision on inclusion or exclusion was made by two reviewers. Any disagreement between the two reviewers was resolved by discussion with a third reviewer.

Data synthesis

After a thorough reading of the articles satisfying the inclusion criteria, data extraction was done in an Excel sheet where the pertinent data of the study were summarized: Authors, year of publication, year and period of study, city, region, sample size, study design, response rate (%), professional group, individual and workplace factors, prevalence of high EE (%), prevalence of high DP (%), and prevalence of low PA (%).

Risk of bias

Two independent reviewers (AO and OA) performed the data selection, extraction, and synthesis. In the case of discrepancies or inconsistencies in interpretation between reviewers, a third reviewer resolved these issues (KW).

The risk of bias was assessed by two reviewers (AO and OA) using the JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data (36). This tool includes 9 questions for each question. A value of 1 was assigned to the answer "yes" and 0 for "not reported," "unclear," or "not applicable." On the basis of the total score, articles were classified as having high (7-9), medium (5-7) or low (0-4) quality.

The kappa test was used to measure the agreement between the two reviewers.

Summary measures

The Maslach Burnout Inventory (MBI) is the most widely used tool in scientific research to measure burnout syndrome(4,37).

This tool comprises three dimensions that measure burnout: depersonalization (DP), emotional exhaustion (EE), and personal accomplishment (PA) (8).

The Maslach Burnout Inventory (MBI) comprises 22 items in three subscales: the EE (9 items) subscale assesses the feeling of being emotionally exhausted in the workplace; the DP (5 items) subscale measures a negative, cynical attitude toward customers of care institutions; and the PA (8 items) subscale assesses competence to succeed in work, a low level of personal accomplishment corresponding to demotivation, and loss of self-confidence.

Each question is scored on a scale from 0 (never) to 6 (every day). A high degree of burnout is represented by high EE (≥ 27) and PD (≥ 13) scores and a low PA score (≤ 31) (8).

Patient and public involvement

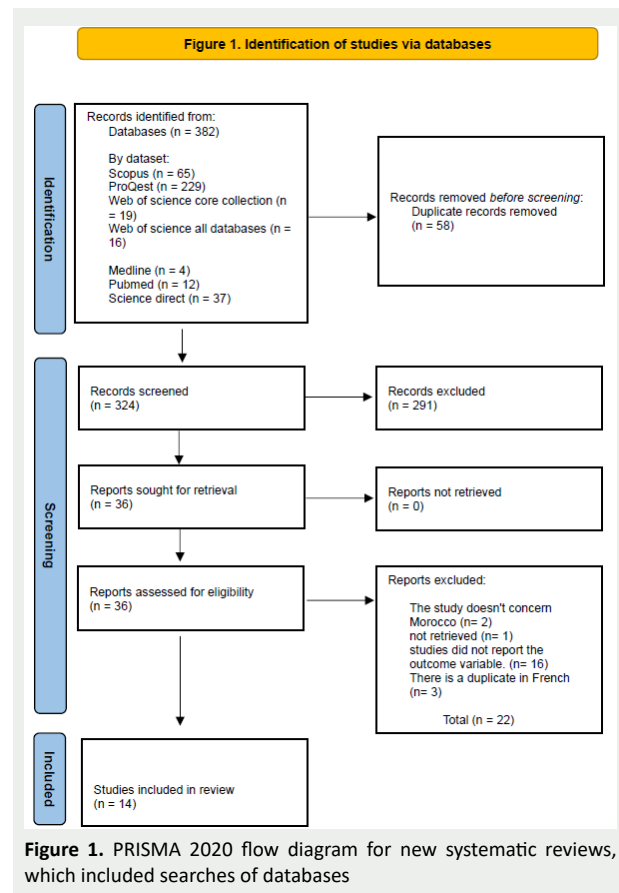
We used data from published articles and did not solicit any contributions from patients or the public.

RESULTS

Identification and selection of studies

Following the PRISMA principles, a flowchart of the electronic database search is presented in Figure 1. Initially, 382 articles were registered. After removing duplicates (52 articles), 324 articles formed the basis of the screening phase. After examining the title and abstract, 291 articles were eliminated.

A total of 36 studies were read in full. When the full text was examined, articles were rejected in the following cases: studies not related to Morocco ($n = 2$), not retrieved ($n = 1$), studies that did not report the outcome variable ($n = 16$), and studies with duplicates in French ($n = 3$). This systematic review included 14 studies.



Characteristics of the Studies

Of the 14 observational studies included, 12 were cross-sectional studies. The study population comprised 4382 healthcare professionals. Table 1 presents the

main characteristics of the 14 studies included in this systematic review.

Concerning the distribution of studies included in the review by location, the city of Rabat is the most dominant with 5 studies, followed by the city of Casa 3 studies, the cities of Fez, Marrakesh, Kenitra, Settat, 2 studies, and the rest with a single study.

By time, most of the studies were completed after 2020 (11 studies), compared with just 3 studies in 2009, 2017,

and 2018.

The target population of the studies included in this review comprises general physicians, specialist physicians, pharmacists, epidemiologists, general nurses, midwives, psychiatric nurses, emergency and intensive care nurses, anesthesia and intensive care nurses, and administrators. The study sample size varied from 07 to 1583, with a response rate ranging from 64.2% to 100%.

Table 1. Characteristics of studies included in the review

Authors, Year of Publication	Year and period of study	City, region	Sample size	Study design	Gender	Response rate (%)	Professional Group	Individual and Workplace Factors	Prevalence High EE (%)	Prevalence High DP (%)	Prevalence Low PA (%)	Prevalence BO (%)
(44)	2009	Rabat, Casablanca, Fez, Marrakesh	308	cross-sectional study	Males (55.5%), Females (45.5%)	94.15%	Doctors (52.8%), nurses (48.2%)	The professional status Disorganization of work, Fear of malpractice unsatisfactory salaries	48.27%	21.28%	42.47%	69.65%
(10)	2017	Casablanca	1583	Cross-sectional study	Males (37.2%), Females (62.8%)	68.6 %	Doctors (%), nurses (%)	Gender, high body mass index, sport activity, work department, professional seniority, route problems liberal complementary activity Job strain	29%	25.9 %	36.9 %	59.70%
(43)	from January to June 2018	Casablanca, Rabat and Kenitra	100	Cross-sectional study	Males (45%), Females (55%)	83 %	general practitioners (19%) specialist doctors (35%) pharmacists (22%) nurses (24%)	Gender, labor conflict, credit.	40 %	34 %	6 %	NA
(41)	2020	public health surveillance units COVID-19 in Morocco	210	Cross-sectional study	Males (43%), Females (57%)	64.2%	Doctors, (48,9%) Nurses, (14,8%) idemiologists (17,8%) Support staff (18,5%)	The number of shifts per month the number of hours worked per week the number of hours worked per day; the occupation time; the satisfaction of the professional relationship with hierarchical superiors; the fear of being contaminated.	35.6 %	17%	85.9 %	84.44 %
(38)	From January to September 2020	FEZ	110	Cross-sectional study	Males (29.7%), Females 70.3%)	67.3%	Nurses	Gender, age the marital status (celibacy), the elevated number of working hours, working in ICU department and the confrontation with a stressful event (like death of patient)	31.1%	31.1%	47.3%	58.10 %

Table 1. (Continued) Characteristics of studies included in the review

Authors, Year of Publication	Year and period of study	City, region	Sample size	Study design	Gender	Response rate (%)	Professional Group	Individual and Workplace Factors	Prevalence High EE (%)	Prevalence High DP (%)	Prevalence Low PA (%)	Prevalence BO (%)
(42)	NA	(CHU and regional hospitals) in Morocco	118	Cross-sectional study	Males (35.6%), Females 64.4%)	NA	Physicians (62.7%) Caregivers (37.3%)	Gender, age, Function, Presence of protection means Organization of the work Communication within the team Place of work Department of practice Number of shifts per month	81.4%	79.7%)	46.6%	NA
(45)	from March to June 2020	Rabat-Sale-Kenitra Region of Morocco	90	Cross-sectional study	Males (48%), Females (52%)	NA	Doctors (39 %), nurses (61 %)	Marital status, Lack of protective measures at the Covid-19 service level. Conflicts at work Lack of organizational support.	40%	41%	52%	80%
(39)	From January to March 2021	Marrakech	191	Cross-sectional study	Males (46.1 %), Females (53.9 %)	NA	Doctors (69.4 %), nurses (30.4 %)	age lack of protection Average working hours per day The fear of infecting psychiatric antecedents Lack of protective measures job satisfaction the satisfaction of colleagues' support. number of persons in charge number of guards per week	60.2 %	59.7 %	73.3 %	85.3 %
(46)	From April to December 2019	intensive care units or working in operating rooms in Morocco	500	Cross-sectional study	Males (46.7 %), Females (53.3 %)	84 %	Doctors (42.9%), nurse anaesthetists (57.1%)	age groups, salary, the on-call system, years of practice, and practice location.	48 %	43.2 %	21 %	NA
(47)	NA	Rabat	270	Cross-sectional study	Males (43.3 %), Females (56.7 %)	NA	Doctors (29.6%) nurses (55.6%) Administrators (14.8%)	seniority at work work schedule/ hours of work system means of transportation	53.30 %	42.40%	48.70%	83%

Table 1. (Continued) Characteristics of studies included in the review

Authors, Year and Year of Publication	Year and period of study	City, region	Sample size	Study design	Gender	Response rate (%)	Professional Group	Individual and Workplace Factors	Prevalence High EE (%)	Prevalence High DP (%)	Prevalence Low PA (%)	Prevalence BO (%)
(48)	From 1 October 2021 to 30 November 2021.	the Settat region of Morocco.	30	exploratory mixed-method study	Males (66.66 %), Females (33.34 %)	100 %	Nurses (100%)	NA	73.33%	66.66%	33.33%	66.7%
(48)	From 10 June 10 2022 to 17 July 2022	the Settat region of Morocco.	07	quasi-experimental study	NA	100 %	Nurses (100%)	NA	85.71%	57.14 %	28.57 %	NA
(49)	NA	Rabat	270	Cross-sectional study	Males (43.3 %), Females (56.7 %)	NA	Doctors (29.6%) Nurses (55.6%) Administrators (14.8%)	Age, seniority at work; length of the period of work hours of work system means of transportation	56.30%	42.40%	48.70%	NA
(50)	From March 2018 to February 2019.	our different university hospitals and 12 regional hospital centers in Morocco.	575	Cross-sectional study	Males (26 %), Females (74 %)	93 %	general nurses (36%), midwives (28%), psychiatric nurses (20.6%), and emergency and intensive care nurses (15.4%).	NA	63.6%	41.3%	29.2%	NA

Burnout prevalence

The prevalence of burnout was reported in eight of the 14 articles included in this review, ranging from 58.10% (38) to 85.30% (39), with an average of 73.36%.

The burnout prevalence for the three domains ranged from 29 % (10) to 85.71% (40) for high emotional exhaustion (EE), 17% (41) to 79.70% (42) for high depersonalization (DP), and 6% (43) to 85.90% (41) for low personal accomplishment (PA).

Table 2 summarizes data on the prevalence of burnout by occupational category.

Factors associated with burnout among healthcare professional

In all included studies, burnout was associated with either individual or workplace factors.

Burnout is associated with gender. The results showed that women were more affected by burnout than men (10,38,42,43), age (young age) (38,39,42,46,49), and family status (single) (38).

Several studies have reported a significant association between workplace factors and burnout among healthcare professionals. A study conducted in public health surveillance units in Morocco showed a significant association between the prevalence of burnout and the number of hours worked per week during the COVID-19

pandemic. Those who worked more than 40 hours a week were the most affected ($p = 0.034$), the number of hours worked per day during the COVID-19 period, Those who worked more than 8 hours a day were the most affected ($p = 0.007$) (41). The same results were reported by the Rabat study, which revealed an association between burnout and work schedule/hours of work system, the on-call system is a risk factor for burnout ($p = 0.04$) (49). Poor organization, workplace conflicts, and poor communication significantly increase the risk of burnout (10,42–46,49).

Fear of contamination, low job satisfaction, poor remuneration, number of persons in charge, and injustice were also associated with high levels of burnout (39,41,44).

Quality assessment

the assessment of the risk of bias using the JBI control grid showed that of the 14 studies included in this review, 12 were of high quality and 2 of medium quality.

The kappa test value was 0.75, indicating a strong agreement between the two reviewers.

Table 2. the prevalence of burnout by Professional Group

Authors, Year of Publication	Professional Group	Burnout		p
		Yes	Now	
(44)	Physician teacher	8.4%	21.6%	0.01
	specialist doctor	5%	5.7%	
	Resident physician	37.6%	29.5%	
	Nurses	49%	43.2%	
(10)	Physicians	55.8%	54.2%	0.08
	Nurses	61.6%	38.4%	
(41)	epidemiologist	58.3%	41.7%	0.048
	Physicians	33.3%	66.7%	
	Nurses	40%	60%	
	Structure of APU	16%	84%	
(38)	Nurses	58.10%	41.90%	--
(42)	Physicians	87.8%	12.2%	0.01
	Paramedical	70.5%	29.5%	
(45)	Doctor	77.14%	22.86%	0.50 ns
	Nurses	81.81%	18.19%	
(39)	Doctor	59.4%	40.6%	0.41 ns
	Nurses	62.1%	37.9%	
(46)	Doctor	49.4%	50.6%	--
	Nurses	46.9%	50.1%	
(48)	Nurses	66.7%	33.3%	--

Discussion

Main findings

This review summarized the results of 14 studies concerning a population of 4382 healthcare professionals in Morocco. The first objective of this study was to estimate the prevalence of burnout.

Based on our results, we can conclude that burnout was present in all categories of healthcare professions, regardless of their role. Other studies have reported similar results (17,29,51). The highest rate (85.30%) was reported in the study by (39) in a sample of 191 doctors and nurses from Marrakech, while the lowest rate 58.10% was reported in the study by (38) in a sample of 110 nurses from Fez.

The small sample size of most of the studies included in this review can explain these results. Most of the included studies were conducted after 2020, in a COVID-19 context marked by excessive workloads and organizational stress. This temporal bias probably amplifies the reported prevalence of burnout, reflecting a period of crisis rather than a normal situation. Our results can be compared with those of other systematic reviews of burnout among healthcare professionals. In comparing the prevalence of burnout with international reviews, we considered the period of inclusion of the studies (pre- or post-COVID-19) to interpret the differences observed based on the organizational and psychosocial changes caused by the pandemic. Indeed, a meta-analysis reported a prevalence of burnout that ranged from 10.5% to 66.2% (20), and another study noted that estimates ranged from 6% to 33% (52). Also, the study by (53) reported that overall burnout among physicians ranged from 0% to 80.5%.

The 2nd objective of this review is to determine the individual and workplace factors associated with

occupational burnout. Only 11 studies have reported results on burnout-associated risk factors. In these studies, the research on associated factors was a secondary objective following the main objective, which is the prevalence of burnout. Several factors were identified. The results of our review showed that age and female sex are often individual factors associated with burnout, which corroborates the findings of other studies (54–57).

Numerous studies have reported the prevalence of burnout syndrome among women, young people, single people, and workers with children (22,55).

Several studies included in this review reported poor work organization and workload as factors associated with burnout, which corresponds to the findings of studies identifying workload (58–60), number of working hours per week, number of night shifts per week (61), as a source of burnout.

In this review, three studies identified job satisfaction as a factor associated with burnout (39,41,44). The same result was found in a cross-sectional study in Saudi Arabia that evaluated the presence of burnout among intensive care nurses (62).

Strengths and limitations

Among the advantages, this study is the first to use a rigorous systematic methodology to synthesize published studies on burnout among healthcare professionals in Morocco using a structured methodological approach based on the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

In addition, the diversity of health professionals allows a global vision of the phenomenon in the Moroccan context. Finally, the critical assessment of the methodological quality of the included studies guarantees the robustness of the results.

Among the limitations, this review included studies that used different versions of Maslach's burnout; this instrumental heterogeneity could introduce variability in prevalence estimates. In addition, we only included articles published in indexed databases, so we did not include information contained in gray literature, conference proceedings, and government reports.

The studies included have other limitations: the majority were cross-sectional studies, the target population was heterogeneous, and the sample sizes were small.

The results must also be interpreted considering changes in the work environment. The COVID-19 pandemic results should be interpreted with caution. Burnout levels during COVID-19 may not necessarily indicate structural trends but rather an acute condition associated with global health conditions. The health crisis may influence the prevalence of burnout and limit direct comparability with international reviews based on pre-pandemic data.

To ensure the completion of the reviews in future research, conducting secondary research on the biography of the included studies is suggested. Additionally, the categories of healthcare professionals should be considered when measuring burnout. The use of longitudinal design to

identify associated factors is another area for future research. Studies should also use scales validated in specific geographical and cultural contexts for burnout assessment validity.

CONCLUSION

This review identified the prevalence of burnout among healthcare professionals in Morocco. Several risk factors associated with professional burnout were identified. However, the conclusions of this study cannot be generalized to all Moroccan healthcare professionals due to heterogeneity, the number of studies included in this review, and their small sample sizes. In our findings, preventing burnout requires regulating workload, improving organizational conditions, and strengthening managerial support. The introduction of psychosocial support mechanisms and stress management programs is also essential, particularly in high-pressure departments. Future research should analyze in-depth the factors associated with burnout to determine the relative importance of work-related factors, so that the results will be useful for the implementation of burnout prevention programs among healthcare professionals.

REFERENCES

1. Restauri N, Sheridan AD. Burnout and Posttraumatic Stress Disorder in the Coronavirus Disease 2019 (COVID-19) Pandemic: Intersection, Impact, and Interventions. *J Am Coll Radiol*. juill 2020;17(7):921-6.
2. Cordes CL, Dougherty TW. A Review and an Integration of Research on Job Burnout. *Acad Manage Rev*. oct 1993;18(4):621.
3. Freudenberger HJ, Richelson G. Burn-out: the high cost of high achievement. Toronto: Bantam Books; 1981.
4. Schaufeli W, Enzmann D. The Burnout Companion to Study and Practice: A Critical Analysis [Internet]. 1re éd. CRC Press; 2020 [cité 16 août 2024]. Disponible sur: <https://www.taylorfrancis.com/books/9781000124118>
5. Cherniss C. Staff burnout: job stress in the human services. Beverly Hills, Calif: Sage Publications; 1980. 199 p. (Sage studies in community mental health).
6. Demerouti E. Strategies used by individuals to prevent burnout. *Eur J Clin Invest*. oct 2015;45(10):1106-12.
7. Hariharan TS, Griffin B. A review of the factors related to burnout at the early-career stage of medicine. *Med Teach*. 2 déc 2019;41(12):1380-91.
8. Maslach C, Schaufeli WB, Leiter MP. Job Burnout. *Annu Rev Psychol*. févr 2001;52(1):397-422.
9. Leiter MP, Bakker AB, Maslach C. Burnout at work: a psychological perspective. Hove: Psychology press; 2014. (Current issues in work and organizational psychology).
10. Laraoui O, Manar N, Laraoui S, Hammouda R, Deschamps F, Laraoui CH. Risques psychosociaux et syndrome d'épuisement professionnel des professionnels de soins hospitaliers. *Arch Mal Prof Environ*. nov 2019;80(5):386-97.
11. Grace MK, VanHeuvelen JS. Occupational variation in burnout among medical staff: Evidence for the stress of higher status. *Soc Sci Med*. juill 2019;232:199-208.
12. Jarzynkowski P, Piotrkowska R, Mędrzycka-Dąbrowska W, Książek J. Areas of Work Life as Predictors of Occupational Burnout of Nurses and Doctors in Operating Theaters in Poland—Multicenter Studies. *Healthcare*. 24 déc 2021;10(1):26.
13. Tateno M, Jovanović N, Beezhold J, Uehara-Aoyama K, Umene-Nakano W, Nakamae T, et al. Suicidal ideation and burnout among psychiatric trainees in Japan. *Early Interv Psychiatry*. oct 2018;12(5):935-7.
14. Wu SY, Li HY, Wang XR, Yang SJ, Qiu H. A Comparison of the Effect of Work Stress on Burnout and Quality of Life Between Female Nurses and Female Doctors. *Arch Environ Occup Health*. oct 2011;66(4):193-200.
15. Cohen C, Pignata S, Bezak E, Tie M, Childs J. Workplace interventions to improve well-being and reduce burnout for nurses, physicians and allied healthcare professionals: a systematic review. *BMJ Open*. juin 2023;13(6):e071203.
16. Elbarazi I, Loney T, Yousef S, Elias A. Prevalence of and factors associated with burnout among health care professionals in Arab countries: a systematic review. *BMC Health Serv Res*. déc 2017;17(1):491.
17. Ghahramani S, Lankarani KB, Yousefi M, Heydari K, Shahabi S, Azmand S. A Systematic Review and Meta-Analysis of Burnout Among Healthcare Workers During COVID-19. *Front Psychiatry*. 10 nov 2021;12:758849.
18. Gualano MR, Sinigaglia T, Lo Moro G, Rousset S, Cremona A, Bert F, et al. The Burden of Burnout among Healthcare Professionals of Intensive Care Units and Emergency Departments during the COVID-19 Pandemic: A Systematic Review. *Int J Environ Res Public Health*. 2 août 2021;18(15):8172.
19. Kesarwani V, Husaain ZG, George J. Prevalence and Factors Associated with Burnout among Healthcare Professionals in India: A Systematic Review and Meta-Analysis. *Indian J Psychol Med*. mars 2020;42(2):108-15.
20. Nagarajan R, Ramachandran P, Dilipkumar R, Kaur P. Global estimate of burnout among the public health workforce: a systematic review and meta-analysis. *Hum Resour Health*. 21 mai 2024;22(1):30.
21. O'Connor K, Muller Neff D, Pitman S. Burnout in mental health professionals: A systematic review and meta-analysis of prevalence and determinants. *Eur Psychiatry*. sept 2018;53:74-99.
22. Vinuela-Solórzano AM, Almansa JFF, Basso C, Ávila GZ, Bento IDJ, Burgos FJB, et al. A Systematic Review of Burnout among Healthcare Professionals in Latin America. *Rev Psicol Organ E Trab* [Internet]. 2023 [cité 23 août 2024];23(3). Disponible sur: <https://submission-pepsic.scielo.br/index.php/rpot/article/view/24803>
23. Adriaenssens J, De Gucht V, Maes S. Determinants and prevalence of burnout in emergency nurses: A systematic review of 25 years of research. *Int J Nurs Stud*. févr 2015;52(2):649-61.
24. Chen C, Meier ST. Burnout and depression in nurses: A systematic review and meta-analysis. *Int J Nurs Stud*. déc 2021;124:104099.
25. Galanis P, Vraika I, Fragkou D, Bilali A, Kaitelidou D. Nurses' burnout and associated risk factors during the COVID-19 pandemic: A systematic review and meta-analysis. *J Adv Nurs*. août 2021;77(8):3286-302.
26. Gómez-Urquiza JL, Albendín-García L, Velando-Soriano A, Ortega-Campos E, Ramírez-Baena L, Membrive-Jiménez MJ, et al. Burnout in Palliative Care Nurses, Prevalence and Risk Factors: A Systematic Review with Meta-Analysis. *Int J Environ Res Public Health*. 21 oct 2020;17(20):7672.
27. Ramírez-Elvira S, Romero-Béjar JL, Suleiman-Martos N, Gómez-Urquiza JL, Monsalve-Reyes C, Cañadas-De La Fuente GA, et al. Prevalence, Risk Factors and Burnout Levels in Intensive Care Unit Nurses: A Systematic Review and Meta-Analysis. *Int J Environ Res Public Health*. 30 oct 2021;18(21):11432.
28. Woo T, Ho R, Tang A, Tam W. Global prevalence of burnout symptoms among nurses: A systematic review and meta-analysis. *J Psychiatr Res*. avr 2020;123:9-20.
29. Macaron MM, Segun-Omosehin OA, Matar RH, Beran A, Nakanishi H, Than CA, et al. A systematic review and meta analysis on burnout in physicians during the COVID-19 pandemic: A hidden healthcare crisis. *Front Psychiatry*. 12 janv 2023;13:1071397.
30. Sanfilippo F, Noto A, Foresta G, Santonocito C, Palumbo GJ, Arcadipane A, et al. Incidence and Factors Associated with Burnout in Anesthesiology: A Systematic Review. *BioMed Res Int*. 2017;2017:1-10.
31. Amofo E, Hanbali N, Patel A, Singh P. What are the significant factors associated with burnout in doctors?: Table 1. *Occup Med*.

- mars 2015;65(2):117-21.
32. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 29 mars 2021;n71.
33. Callaghan M, Müller-Hansen F, Bond M, Hamel C, Devane D, Kusa W, et al. Computer-assisted screening in systematic evidence synthesis requires robust and well-evaluated stopping criteria. *Syst Rev*. 22 nov 2024;13(1):284.
34. Gates A, Guitard S, Pillay J, Elliott SA, Dyson MP, Newton AS, et al. Performance and usability of machine learning for screening in systematic reviews: a comparative evaluation of three tools. *Syst Rev*. déc 2019;8(1):278.
35. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. *Syst Rev*. déc 2016;5(1):210.
36. Munn Z, Moola S, Lisy K, Riitano D, Tufanaru C. Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and cumulative incidence data. *Int J Evid Based Healthc*. sept 2015;13(3):147-53.
37. Cordes CL, Dougherty TW. A Review and an Integration of Research on Job Burnout. *Acad Manage Rev*. oct 1993;18(4):621.
38. Bouazzaoui AE, Mukuka E, Labrigui S, Touzani S, Houari N, Boukatta B, et al. BURNOUT IN NURSES AT HASSAN II UNIVERSITY HOSPITAL IN FEZ MOROCCO: -RESULTS OF A PROSPECTIVE SURVEY-. 2021;(2).
39. Mansoury O, Chamsi K, Essoli S, Mansouri A, Sebbani M, Adarmouch L, et al. Burnout among health personnel at the Mohammed VI university hospital in Marrakesh - Morocco. *Arch Mal Prof Environ*. nov 2023;84(6).
40. CChahbounia R, Gantare A. A Pilot Study to Assess the Effect of Coaching on Emergency Nurses' Stress Management. *Nurs Rep*. 1 févr 2023;13(1):179-93.
41. Kapasa RL, Hannoun A, Rachidi S, Ilunga MK, Toirambe SE, Tady C, et al. Évaluation du burn-out chez les professionnels de santé des unités de veille sanitaire COVID-19 au Maroc. *Arch Mal Prof Environ*. oct 2021;82(5):524-34.
42. Benhaddouch Y, Khalfi S, Benmaamar S, Marzouki C, El Houda Fares N, Sbai M, et al. Burnout among physicians and caregivers in oncology: the Moroccan experience. *ecancermedicallscience* [Internet]. 2022;16((Benhaddouch Y., benhaddouch.yassine@gmail.com; Marzouki C.; El Houda Fares N.; Sbai M.; Bout A.; Aarab C.; Aalouane R.) Department of Psychiatry-Addictology, CHU Hassan II of Fez, Fez, Morocco). Disponible sur: <https://www.embase.com/search/results?subaction=viewrecord&id=L2022607166&from=export>
43. Abidli Z, Jadda S, Kharbouch D, Detsouli A, Mokhtari A, Zaidouni A, et al. The evaluation of burnout syndrome among health professionals in Casablanca, Rabat and Kenitra. *Res J Pharm Technol*. 2019;12(11):5219-22.
44. Massou S, Doghmi N, Belhaj A, Aboulaala K, Azendour H, Haimeur C, et al. Survey on burn out in healthcare providers working in four Moroccan academic intensive care units. *Ann Med Psychol (Paris)*. sept 2013;171(8):538-22.
45. Tahiri K, Abidli Z, Amri A, Esserkassi A, Hannoun Z, Turk JE, et al. Assessment of Occupational Exhaustion during the COVID 19 Period on Healthcare Professionals in the Rabat-Sale-Kenitra Region of Morocco. *Int J Biol Biomed Eng*. 2022;16((Tahiri K.; Amri A.; Hannoun Z.; Bour A.) Ibn Tofail University, Faculty of Sciences of Kenitra, Laboratory of Biology and Health, Morocco):90-5.
46. Benhamza S, Khalayla M, Lahlou L, Amine Z, Lazraq M, Miloudi Y, et al. The Prevalence and Contributing Factors of Burnout Among Anesthesiologists and Intensive Care Unit Staff in Morocco: A Cross-Sectional Analysis. *Cureus*. sept 2023;15(9):e44956-e44956.
47. Chtebi H, Mammad K, Chkirate M, Ahami A. Professional stress risk factors evaluation among moroccan health staff. 2023;65(4).
48. Chahbounia R, Gantare A. Managing Occupational Health Issues through Coaching, Emerging Perspectives from Emergency and Intensive Care Nurses: A Mixed-Method Study. *Nurs Rep Pavia Italy*. 14 août 2023;13(3):1077-89.
49. Chtibi H, Mammad K, Chkirate M, Ahami A. Professional stress risk factors evaluation among moroccan health staff. *Act Nerv Super Rediviva*. 2023;65(4):139-49.
50. Ikrou A, Guejda R, Bhugra D, Ventriglio A, Abouqal R, Belayachi J. Structural Equation Model for Nursing's Spiritual Commitment, Religious Adaptation, and Their Relationship to Quality of Life and Burnout. *Middle East J Rehabil Health Stud* [Internet]. 14 nov 2023 [cité 15 juill 2024];11(2). Disponible sur: <https://brieflands.com/articles/mejrh-139573>
51. Babamiri M, Bashirian S, Khazaei S, Sadegh Sohrabi M, Heidari Moghadam R, Mortezaipoor A, et al. Burnout and Mental Health of COVID-19 Frontline Healthcare Workers: Results from an Online Survey. *Iran J Psychiatry* [Internet]. 13 mars 2022 [cité 22 août 2024]; Disponible sur: <https://publish.kne-publishing.com/index.php/IJPS/article/view/8903>
52. Karuna C, Palmer V, Scott A, Gunn J. Prevalence of burnout among GPs: a systematic review and meta-analysis. *Br J Gen Pract*. mai 2022;72(718):e316-24.
53. Rotenstein LS, Torre M, Ramos MA, Rosales RC, Guille C, Sen S, et al. Prevalence of burnout among physicians: a systematic review. *JAMA - J Am Med Assoc*. 2018;320(11):1131-50.
54. Azoulay E, Cariou A, Bruneel F, Demoule A, Kouatchet A, Reuter D, et al. Symptoms of Anxiety, Depression, and Peritraumatic Dissociation in Critical Care Clinicians Managing Patients with COVID-19. A Cross-Sectional Study. *Am J Respir Crit Care Med*. 15 nov 2020;202(10):1388-98.
55. Barelli S, Palamenghi L, Graffigna G. Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic. *Psychiatry Res*. août 2020;290:113129.
56. Shah K, Chaudhari G, Kamrai D, Lail A, Patel RS. How Essential Is to Focus on Physician's Health and Burnout in Coronavirus (COVID-19) Pandemic? *Cureus* [Internet]. 4 avr 2020 [cité 25 août 2024]; Disponible sur: <https://www.cureus.com/articles/29993-how-essential-is-to-focus-on-physicians-health-and-burnout-in-coronavirus-covid-19-pandemic>
57. Wahlster S, Sharma M, Lewis AK, Patel PV, Hartog CS, Jannotta G, et al. The Coronavirus Disease 2019 Pandemic's Effect on Critical Care Resources and Health-Care Providers. *Chest*. févr 2021;159(2):619-33.
58. Moghaddasi J, Mehralian H, Aslani Y, Masoodi R, Amiri M. Burnout among nurses working in medical and educational centers in Shahrekord, Iran. *Iran J Nurs Midwifery Res*. 2013;18(4).
59. Shah MK, Gandrakota N, Cimiotti JP, Ghose N, Moore M, Ali MK. Prevalence of and Factors Associated With Nurse Burnout in the US. *JAMA Netw Open*. 4 févr 2021;4(2):e2036469.
60. Zakaria N, Zakaria NH, Bin Abdul Rassip MNA, Lee KY. Burnout and coping strategies among nurses in Malaysia: a national-level cross-sectional study. *BMJ Open*. oct 2022;12(10):e064687.
61. Wan Z, Lian M, Ma H, Cai Z, Xianyu Y. Factors associated with burnout among Chinese nurses during COVID-19 epidemic: a cross-sectional study. *BMC Nurs*. déc 2022;21(1):51.
62. Alharbi J, Wilson R, Woods C, Usher K. The factors influencing burnout and job satisfaction among critical care nurses: a study of Saudi critical care nurses. *J Nurs Manag*. sept 2016;24(6):708-17.