



A Systematic Review and Meta-Analysis of Burnout Among Healthcare Workers During COVID-19

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Burnout among healthcare personnel has been exacerbated by the COVID-19 pandemic's unique features. During the COVID-19 pandemic, this systematic review and meta-analysis aims to provide a complete assessment of the prevalence of burnout across various healthcare personnel. Until January 2021, systematic searches for English language papers were conducted using PubMed, Scopus, EMBASE, Web of Science, Cochrane Library, and ProQuest. Thirty observational studies were found after conducting systematic searches. The pooled overall prevalence of burnout was 52% [95% confidence interval (CI) 40–63%]. Pooled emotional exhaustion (EE), depersonalization (DP), and lack of personal accomplishment (PA) were 51% (95% CI 42–61%), 52% (95% CI 39–65%), and 28% (95% CI 25–31%), respectively. This study demonstrated that nearly half of the healthcare workers experienced burnout during the COVID-19 pandemic. In the studies that were included, non-frontline COVID-19 exposed healthcare personnel also experienced burnout. From high to lower middle-income countries, there was a gradient in the prevalence of total burnout, EE, and lack of PA. Further studies on burnout in low and lower-middle-income countries are suggested. A uniform diagnostic tool for the assessment of burnout is warranted.

Keywords: burnout, healthcare workers, COVID-19, systematic review, meta-analysis

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has affected various aspects of communities, including political, economic, social, psychological, and health management elements as well as their physical health (1–4). The physical and emotional well-being of healthcare professionals plays a major contribution in pandemic containment. As evidenced during previous outbreaks, such as severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS), the psychological well-being of healthcare professionals is of crucial importance for health authorities, particularly their burnout (5–7). Burnout is a three-dimensional affective response to continuous work-related stress and is common in workplaces where employees spend more time supporting others. Both individual characteristics of healthcare workers and work-related factors contribute to this situation (5, 8–12). Burnout includes emotional exhaustion (EE), depersonalization (DP), and a loss of personal accomplishment [PA] (13, 14). EE occurs when employees feel tired or having little

energy to participate emotionally. DP contains developing negative attitudes and feelings toward others who perform labor for them. Those who experience reduced PA tend to underestimate their abilities to carry out tasks and interact with others. In the wake of the COVID-19 pandemic, research into burnout among healthcare workers has evolved. There is evidence indicating the negative effects of burnout on the number of healthcare workers, which depends on several factors such as patient-facing roles [doctors, nurses, and other clinical] (15, 16), frontline exposure with COVID-19 patients (17), and country income level (16, 18). In addition, burnout has negative repercussions for healthcare staff as well as patients (19–25).

Some burnout reviews have focused on particular populations and/or groups. Nevertheless, according to the best knowledge of the author, no meta-analysis has been conducted on the overall prevalence of burnout among healthcare workers. Most of the currently published studies have focused on burnout among healthcare staff of COVID-19 wards (26), physicians (27), or female healthcare workers (28), and primarily described the triggers and risk factors, as well as interventions and suggestions for burnout reduction. One study summarized the prevalence of nurse burnout during pandemics (29). Nonetheless, a thorough assessment and meta-analysis of the prevalence of burnout among all healthcare workers during the COVID-19 epidemic appears desirable. Understanding the prevalence of burnout and the characteristics of high-risk groups would provide useful evidence for health policymakers to better develop screening procedures intended to identify vulnerable healthcare professionals as well as implementing appropriate pro-active holistic measures without delay (30, 31). The goal of this systematic review and meta-analysis was to present a comprehensive picture of the prevalence of burnout among healthcare workers during the COVID-19 pandemic.

METHODS

Study Design

For conducting this systematic review and meta-analysis, the Cochrane criteria and Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) recommendations were utilized. The protocol of this systematic review and meta-analysis has been registered (code: CRD42021229152) in the international prospective register of systematic reviews (PROSPERO).

Search Strategy and Data Sources

By January 1, 2021, a systematic search of peer-reviewed and English-language materials relating to the study question, “What is the prevalence of burnout among healthcare providers in the face of COVID-19?” has been completed. First, a rapid and initial search of the Scopus, Cochrane Library database, and PROSPERO databases was performed to ensure that no registered systematic reviews precisely matched the purpose of the current investigation. There were no related articles found. In the next step, PubMed, Scopus, EMBASE, Science Direct Web of Science, Cochrane Library, and ProQuest were all searched. Gray literature, which included Internet sites, conference papers, and dissertations, was also searched. Also, the

research team tried to obtain any relevant unpublished studies through searching of registries such as clinicaltrials.gov. The “AND” operator was used to perform a search between groupings of words regarded to represent a different understanding. Between the synonyms, the “OR” operator was also utilized. The search was conducted in the article’s “Title, Abstract, and Keyword” sections. Besides the MeSH and Emtree thesauruses, the free-text method was also employed to achieved appropriate terms. Three compartments of PICO (population, intervention, comparison, and outcome), including population, intervention, and outcome, were considered in the search strategy process. Initially, the search string was created for the PubMed database and then adapted for other interested databases. **Supplementary File 1** shows the search strings that were used for the four main databases.

Study Selection

For each article, a thorough list of references was compiled. First, two authors assessed the titles of all articles in the database (SGH, SA). Articles that matched the inclusion criteria and were about the research objective were chosen. The abstracts of the selected papers were then read by the two authors in the following phase.

Articles about the prevalence of burnout in healthcare workers during the COVID-19 pandemic were chosen. All of the above steps were repeated twice. In the event of a disagreement regarding whether or not to include the study, the senior author (KBL) was the final evaluator. The papers contained the prevalence of burnout and/or three burnout dimensions (EE, DP, and the lack of PA) within the article or its supporting information considered acceptable for meta-analysis.

Inclusion Criteria

According to the PICO compartments, P denotes the study population, I represents COVID-19 disorders, and O represents burnout. C, or the comparison group, was not examined in this investigation because there was no comparison group. Burnout is defined per each study’s goal. Articles in English were included. Unpublished articles (Gray literature), instructions, guidelines, and reports from recognized organizations, were also reviewed. Articles should be related to the research question and should be based on a valid and reliable study tool. Only articles that had been peer-reviewed were chosen. Letters and short communications which have the required data were included in the study. Original articles, including cross-sectional, case-control, and cohort studies, were included.

Exclusion Criteria

Articles with no factors related to the research topic (prevalence of burnout) and articles examining the burnout of medical students, residents, and other health-related students were omitted. Furthermore, reports revealed burnout of specific wards or experts (other than intensive care unit specialists and infectious specialists who may have direct contact with COVID-19 patients), studies that assessed burnout with a single item, and studies in which only evaluated emotional exhaustion were omitted. In addition, case reports, reviews, protocols, editorials, and qualitative studies were not included.

Quality Appraisal

The final included full texts' quality was assessed using 22 items from the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist. This checklist includes questions for each of the following sections: title and abstract, introduction, methods, results, discussion, and other information.

A description of the study design, setting, participants and variables, data sources/measurement, bias, study size, quantitative variables, and statistical procedures were among the methodological criteria.

For all items, "1" indicates the presence of the item, "0" shows the absence of the item, and "?" indicates that the criteria were not met completely or were not applicable. "0," "?," and "1" will be rated as 0, 1, and 2, respectively, in the computation of total study quality. The sum of the scores for each study's quality will next be computed. The quality of each study was graded as either good (most criteria met with a low risk of bias, score 39–44), fair (some criteria met with a moderate risk of bias, score 33–38), or poor (i.e., few criteria met and with a high risk of bias, score <33). The two authors (SA, MY) assessed quality independently, and disagreements were resolved by consensus or by consulting a third senior researcher (KBL). Low-quality studies will be included among the other research qualities. If meta-analysis is possible, the impact of these low-quality studies on the pooled effect will be examined using subgroup analysis and sensitivity analysis. We did not exclude them from the final analysis.

Data Extraction

Following a thorough reading of the articles, the necessary information was retrieved using the summary and collection form. The title, responsible author, the sample size of the study, country and time of the study, study design, study participants based on their patient-facing roles (doctor, nurse, and other clinical), exposure of the participants to COVID-19 patients in the workplace, diagnostic instrument, and findings were all provided on this form. For each of the selected articles, summary forms were filled.

Data Analysis

All meta-analyses were carried out using the Metaprop tool in STATA 11.0. (Stata Corp., College Station, TX, USA), and the exact binomial approach was used to obtain the 95% confidence interval. To assess heterogeneity, *I*-square (I^2) was used. Due to the heterogeneity of the included studies, a random-effects meta-analysis was used to pool the prevalence ($I^2 \geq 50\%$). To identify the cause of heterogeneity, subgroup analyses were performed based on the moderator's factors [country income level, study participants based on their patient-facing roles (doctor, nurse, and other clinical), exposure of the participants to COVID-19 patients in the workplace, sample size, time of data collection, and diagnostic instrument].

Income levels of countries are collected from the World Bank's most recent updates: <https://data.worldbank.org> and classified as low income (LIC), high income (HIC), lower middle income (LMIC), and upper middle income (UMIC).

Participants in the study, based on their patient-facing roles, were divided into two groups: nurses and/or physicians and mixed healthcare workers.

Based on the exposure of the participant to COVID-19 patients in the workplace, three categorizations were developed: yes (only participants with exposure to COVID-19 cases were studied), no (participants were not exposed to COVID-19 patients), and mixed exposure (both groups were studied) were developed.

Nurses and/or physicians include doctors or nurses, nurses and physicians, MDs and specialists, medical doctors (MDs) and nurses, MDs, and nurses.

Based on the date stated for the end of the data collection period, the time of data collection was categorized as the first 3 months of the pandemic (January, February, and March), and the following months (April, May, June, July, and after that).

Lists of diagnostic tools were 1—versions of MBI including Maslach Burnout Inventory-Human Services Survey for Medical Personnel [MBI-HSS (MP)], Maslach Burnout Inventory Human Services Survey (MBI-HSS), and Maslach Burnout Inventory-General Survey (MBI-GS); 2—versions of MBI modified or adapted (Chinese, Spanish, etc.); and 3—other tools (Copenhagen Burnout Inventory, the Stanford Professional Fulfillment Index, the Professional Quality of Life Questionnaire, and the Oldenburg Burnout Inventory).

Four of the seven studies that used adapted or modified MBI versions used a language-specific adapted version, including three Chinese (8, 32, 33) questionnaires and one Spanish (34) questionnaire. Out of the three Chinese adapted versions, two studies used a reliable and valid 15-item Chinese version of the MBI (8, 32) and one used a 22-item Chinese version of the MBI-HSS [MP] (33). In addition, the MBI-HSS Spanish adaption (34) includes a valid and reliable 22-item questionnaire. Three studies (35–37) utilized abridged versions of MBI. **Table 1** contains information on the diagnostic instruments utilized in various studies.

RESULTS

Identification and Selection of Studies

According to PRISMA principles, **Figure 1** depicts the flowchart of the literature search. Through electronic databases, we first discovered 1,646 possible records, of which 833 remained after deleting duplicates. Seven hundred forty-nine records were eliminated after the titles and abstracts were screened. Finally, in this systematic review, we included 30 studies (8, 17, 32–59) of which 27 had sufficient data for the meta-analysis. Three studies neither reported the overall prevalence nor the three dimensions of burnout, due to distinctive study tools, so they were excluded from the meta-analysis (45, 56, 58).

Characteristics of the Studies

Twenty-nine of the 30 observational studies included were cross-sectional. The study population included 32,724 healthcare workers. Three of the studies were not original research publications (41, 42, 52). The main characteristics of the 30 studies included in our systematic review are shown in **Table 1**.