



Psychological impact of the COVID-19 pandemic on Spanish healthcare workers: a systematic review of prevalence and wave-based patterns

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Accepted: 8 December 2023
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Abstract

The COVID-19 pandemic has impacted the mental health of the entire population, and especially of the healthcare, due to their close contact with the virus and the health emergency. However, the diversity of studies makes it difficult to determine the prevalence of mental health problems in Spanish healthcare workers. This study aims to examine the studies carried out during COVID-19 with the Spanish healthcare population to determine the prevalence of anxiety, depression, stress, post-traumatic stress (PTSD) and burnout symptomatology. A systematic search of the articles in the PubMed, Scopus and Web of Science databases was performed following PRISMA criteria. Pooled prevalence was obtained for all the mental health symptomatology from moderate to severe, as well as divided by wave. Our data revealed that 50.54% of healthcare workers reported stress, 41.02% burnout, 35.25% anxiety, 29.76% depression, and 25.82% PTSD symptomatology. Anxiety, depression, PTSD and burnout symptomatology diminished in the second and/or the third waves but increased in the following waves. However, stress showed the maximum prevalence during the second wave. Our study highlights a significant impact on the mental health of healthcare workers during health crises, and emphasizes the immediate need for mental health support for healthcare workers during and after pandemics. Anxiety, depression, PTSD, and burnout symptomatology exhibit a “valley” effect, initially decreasing but increasing with prolonged exposure to the COVID-19 health crisis. This underscores the necessity to implement prevention strategies to enhance stress management, emotional regulation skills, and coping abilities.

Keywords COVID-19 · Pandemic · Healthcare workers · Mental health

Introduction

Psychological distress is a common experience during a pandemic, affecting both the general population and healthcare professionals. Various studies have looked into the consequences of the first major disease outbreak of the 21st century before COVID-19, Severe Acute Respiratory Syndrome (SARS) (Chua et al., 2004; Lee et al., 2007; Mak et

al., 2009). These studies discovered that following the SARS outbreak, people often faced mental health challenges like adjustment difficulties, stress, and increased anxiety levels. A study conducted in a large teaching hospital in Toronto during the SARS outbreak found that nearly two-thirds of healthcare workers surveyed were dealing with significant psychological distress (Sim & Chua, 2004).

Working during or immediately after the onset of an infectious disease outbreak or a pandemic that could affect the healthcare system takes a toll on healthcare workers' mental health and overall well-being. In their research, Mak et al. (2009) emphasize the importance of improving the readiness and competence of healthcare professionals in recognizing and addressing the psychological impact of potential infectious disease outbreaks (like SARS) in the future.

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The COVID-19 pandemic has impacted the mental health of the entire population, leading to detrimental mental health outcomes such as depression, anxiety and traumatic stress (Salari et al., 2020; Xiong et al., 2020). Specific pandemic stressors associated with the pandemic, such as exposure to the virus or death, can increase the threat of being infected, uncertainty, distress and anxiety (Boden et al., 2021). These stressors are particularly prevalent in specific occupations, such as healthcare-related ones. Healthcare workers have been identified as one of the most vulnerable populations due to their close contact with the virus and the potential resulting health emergency (Kang et al., 2020). They may experience fear of contagion and concerns about spreading the virus to their loved ones (Xiang et al., 2020).

Furthermore, the use of protective equipment during the COVID-19 pandemic has been related to physical and psychological issues, with fear due to the lack of protective equipment (Sánchez-Sánchez et al., 2021), but also fear and anxiety about wearing protective equipment reported by 14–28% of healthcare workers (Radha et al., 2022). Additionally, discrimination and stigmatization faced by healthcare workers during the pandemic (Bagechi, 2020) could increase the risk of suffering distress, anxiety, and depression (Park et al., 2018). These factors collectively highlight healthcare workers as a population with a particular risk of suffering mental well-being deterioration during the Covid-19 pandemic (Tomalá León et al., 2021).

Healthcare workers have experienced a high prevalence of emotional disorders, sleep problems, physical and mental exhaustion, post-traumatic stress, and suicidal ideation (Kang et al., 2020). A recent meta-analysis (Saragih et al., 2021) revealed that post-traumatic stress disorder was the most common mental health disorder reported by healthcare workers during the COVID-19 pandemic (49%), followed by anxiety (40%), depression (37%) and distress (37%). In addition to impacting their well-being, these manifestations can affect the service quality and interfere with patients' health (Firth-Cozens & Greenhalgh, 1997; Shanafelt et al., 2002; Williams et al., 2007).

Moreover, mental health problems such as depressive and anxiety disorders were especially increased in the areas more affected by COVID-19, where the restrictions were stricter (Aknin et al., 2022). Spain was one of the European countries more affected by the COVID-19 pandemic during the first wave, with a peak of 913 daily deaths in April 2020 (World Health Organization, 2023). The national health system faced overwhelming circumstances, and healthcare workers were exposed to significant risks of infection. A state of emergency was declared in March 2020 to manage the health emergency in this country when there was still no vaccine and a worldwide shortage of masks and protective equipment. Since then, urgent measures have been

taken to address the spread of the virus and mitigate the impact of the COVID-19 pandemic. One of these measures was the lockdown, which was one of the most restrictive in Europe (Ayuso-Mateos et al., 2021). People were confined to their homes, except for essential activities, which also had a significant psychological and social impact on the Spanish population (Matalí-Costa & Camprodon-Rosanas, 2022). A study conducted in the initial stage of the COVID-19 pandemic showed that 18.7% of Spaniards revealed depression, 21.6% anxiety, and 15.8% PTSD symptoms (González-Sanguino et al., 2020). In addition, a study comparing the mental health of Chinese and Spanish individuals found that Spanish participants reported higher levels of stress and depression than their Chinese counterparts. Adverse mental health outcomes were associated with increased exposure to health information (Wang et al., 2021). Also, one study showed greater emotional problems in Spanish nursing students who volunteered to provide health aid in the absence of health personnel compared with other countries (Patelarou et al., 2021). This evidence raises questions about whether the Spanish health system could be particularly affected by the COVID-19 pandemic. Alonso et al. (2021) showed that one in seven Spanish healthcare workers could have suffered a mental disorder during the first wave of the COVID-19 pandemic. In the context of a pandemic, a “wave” refers to a period of increased disease incidence, where the number of cases rises sharply, reaches a peak, and then gradually declines. Waves represent peaks and troughs in the infection curve over time, indicating recurrent outbreaks of the disease in a population. The duration and magnitude of each wave can vary based on factors like control measures, virus variants, and population response. In Spain, to date, there have been seven distinct waves of the COVID-19 pandemic, resulting in a cumulative death toll exceeding 120,000 (INE, 2023). These successive waves represent complex epidemiological dynamics, requiring an analysis to understand their psychological impact better.

Based on the existing evidence on mental health in health professionals during the COVID-19 pandemic, the present study aims to provide a broad vision of the psychological impact caused on health professionals in Spain. Specifically, this study investigates the prevalence of symptoms of depression, anxiety, stress, post-traumatic stress disorder (PTSD), and burnout among Spanish healthcare workers. It encompasses both overall data and a comprehensive wave-by-wave analysis. Understanding the most prevalent symptoms among this population (e.g., doctors, nurses, paramedics, support staff, etc.) and identifying the characteristics of healthcare workers most affected by the COVID-19 pandemic are crucial steps toward developing effective tools to support these individuals (Tomalá León et al., 2021).

Method

Search strategy

A systematic search of the literature available in the PubMed, Scopus and Web of Science databases was performed, following the criteria of the PRISMA statement (Page et al., 2021). The terms used for this systematic review were organized around three elements: (1) COVID-19 pandemic (terms used: COVID, coronavirus, SARS CoV-19); (2) health and social-health workers who provided healthcare during the pandemic (terms used: healthcare, staff, professional, workers, nurse, physician, professional caregivers); (3) psychological impact (terms used: mental, emotion, psychol*, stress and burnout). The search was conducted in September 2022. Additionally, Google Scholar and citations and reference lists from relevant articles were reviewed (forward and backward snowballing searches).

Identification and selection studies

Two investigators conducted the screening, identification, and selection process (IJ and CA-G). They independently analyzed all the articles by title and abstract to exclude those unrelated to the topic. Next, the investigators assessed full-text versions of the relevant articles to determine final eligibility. The inclusion criteria were (1) original articles, (2) Spanish or English language, (3) published between 2019 and 2022, (4) Spanish health and social-health professionals, (5) variables assessed: depression, anxiety, stress, PTSD, and burnout, (6) frequencies for moderate or severe symptomatology. The exclusion criteria were: (1) do not meet any of the inclusion criteria; (2) sample: physiotherapists, dentists, and pharmacists who do not work in a health or social-health centre; (3) insufficient data to obtain prevalences; (4) do not use of validated measures. After this classification by the authors, the agreement was checked. When consensus was not reached, a third reviewer (DC) was included, who made the final decision.

Data extraction

A pre-designed data extraction sheet was used to include the data about the final included studies. This sheet contains the following variables: (a) study (authors and year of publication), (b) aim of the study, (c) design of the study, (d) participants, (e) sample size, (f) wave of the pandemic when the data was collected, (g) measures of assessment, and (h) the percentage of participants with moderate to severe mental health symptomatology for anxiety, depression, stress, PTSD and/or burnout. Additionally, the number of participants with moderate and severe symptomatology

was extracted or calculated from the percentages provided by the authors to obtain a pooled prevalence of mental health problems (Supplementary material 1). Studies that did not report specific percentages or the number of participants with anxiety, depression, stress, PTSD, or burnout symptomatology were excluded from this analysis. All the variables mentioned above were extracted and coded independently by IJ and CA-G. Disagreements were resolved through discussion with a third author (DC).

To mitigate the risk of analyzing the same sample across multiple publications, we carefully reviewed the articles to confirm the explicit specification of sample collection dates. Consequently, we decided to leave the baseline subsample of Alonso et al. (2022) out of our analyses, as it corresponds to the sample used in their 2021 study. Also, studies that recruited their samples during different waves were classified based on the wave when recruitment began. This method was implemented to prevent redundant analysis of identical datasets and to uphold the integrity of our systematic review. However, new data from two publications conducted by the same authors in the same wave were included (Mediavilla et al., 2021, 2022; Dosil et al., 2020, 2021) due to the uncertainty regarding the sample used in the more recent study.

Results

Selection and inclusion of studies

The search in the three databases generated a total of 515 articles (PubMed=104; Scopus=371; Web of Science=40). Additionally, one study was obtained through Google Scholar. After eliminating duplicates, a total of 459 documents were screened by title and abstract by two independent researchers. After comparing the findings from both researchers, 140 full-text versions were assessed for eligibility. After exclusions, a total of 44 studies were selected to be included in the systematic review (Fig. 1).

Characteristics of included studies

The characteristics of the included studies are presented in Table 1. The studies included in this systematic review were mainly conducted during the first wave. Some studies were conducted during the subsequent waves, including the second, third, fourth or fifth waves. Notably, no studies were identified that were conducted during the sixth wave. Regarding the study design, the majority of the studies were cross-sectional. Additionally, one study was a validation study, and one was a Randomized Controlled Trial. Furthermore, some studies utilized a longitudinal design to

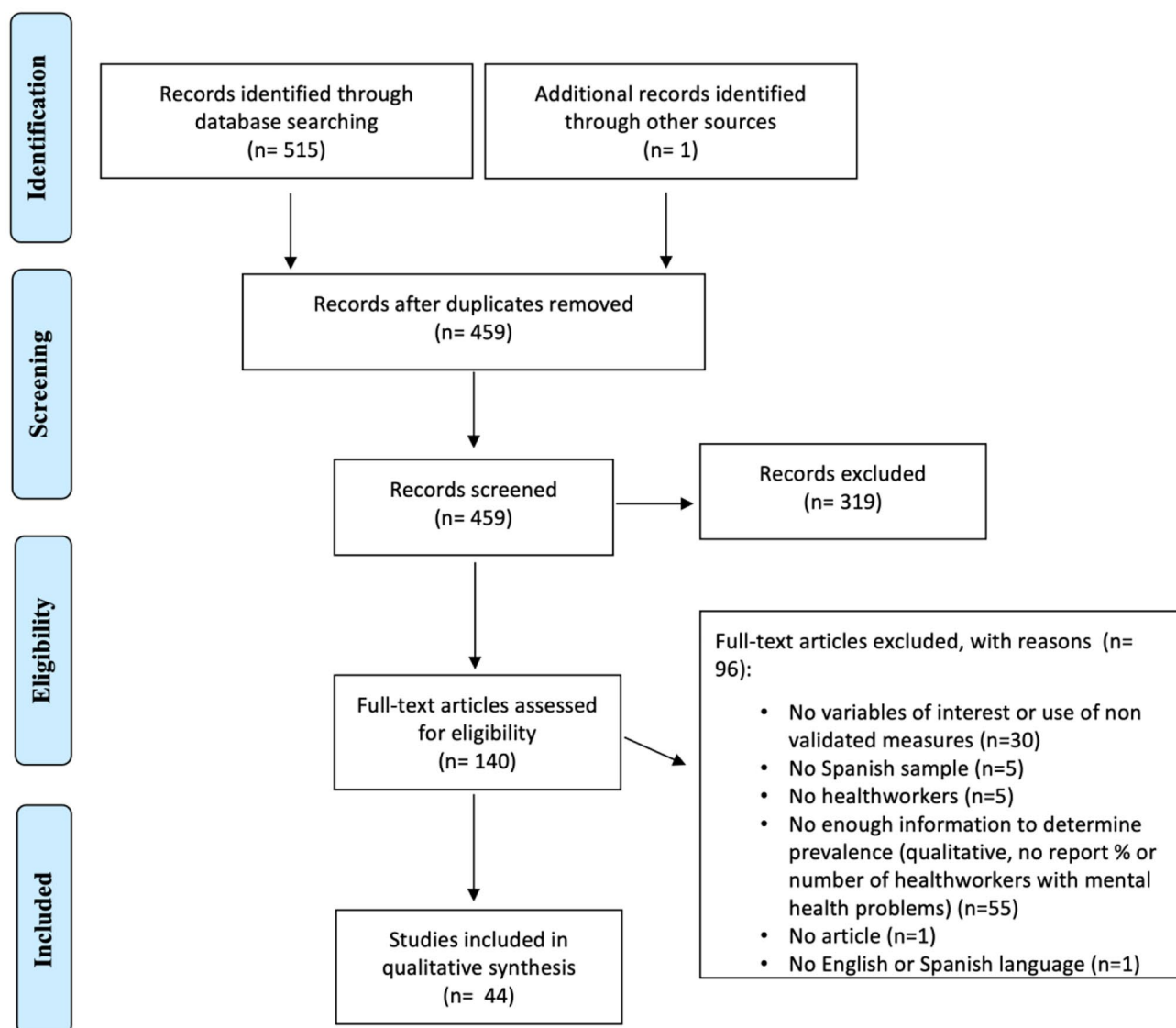


Fig. 1 PRISMA Flowchart

examine healthcare workers' mental health during different phases of the COVID-19 pandemic.

Regarding the sample, studies usually included physicians, nurses, nursing assistants, technicians, and other health workers indistinctly. In addition, they collected a large number of participants from different inpatient and outpatient health centres such as primary care, hospitals, outpatient services, covid units, and ICUs, among others. Also, two studies were distributed in public and private socio-health care centres (e.g., nursing homes for older adults; Martínez-López et al., 2021; Molina-Mula et al., 2022).

Studies assessed anxiety (n=24), depression (n=26), stress (n=19), PTSD symptomatology (n=13) and burnout (n=13) using different measures. Specifically for anxiety,

studies included the Generalized Anxiety Disorder Scale (GAD-7; n=7), the Depression Anxiety Stress Scale-21 (DASS-21; n=6), the Hospital Anxiety Depression Scale (HADS, n=5), the State-Trait Anxiety Inventory (STAI; n=3), the Beck Anxiety Inventory (BAI; n=1), and the Goldberg Anxiety and Depression Scale (GADS; n=1). In terms of depression, the questionnaire most used was the Patient Health Questionnaire (PHQ), which was used in the nine (n=7), eight (n=2), and two items (n=2) versions. The second measure most used was the DASS-21 (n=6), followed by the HADS (n=5), the Beck Depression Inventory-II (BDI-II; n=1), the Hamilton Depression Rating Scale (HDRS; n=1), the Montgomery-Asberg Depression Rating Scale (MADRS; n=1), and the Goldberg Anxiety and Depression Scale (GADS; n=1). Also, one study

Table 1 Characteristics of the included studies

| Authors (year) | Design | Participants | Sample size | Setting | Wave of the pandemic | Measures | Outcomes |
|----------------------------|---|---|---------------------------------|--|--|--|---|
| Alonso et al. (2022) | Longitudinal observational cohort study | Physicians, nurses, other profession | 4809 | Health institutions (hospitals, primary care, others) | 2nd wave (October-December 2020) | PHQ-8 GAD-7 PCL-5 | Anxiety: 19.4%; Depression: 24%; PTSD: 21% |
| Alonso et al. (2021) | Observational cohort study | Physicians, nurses, other profession | 9138 | Health institutions (hospital, primary care, others) | 1st wave (May 5 - September 7, 2020) | PHQ-8 GAD-7 PCL-5 | Anxiety: 22.5%; Depression: 28.1%; PTSD: 22.2% |
| Aranda-Reneo et al. (2021) | Observational study | Nurses, doctors of primary care and paediatrics, and non-medical staff | 252 | Primary care centres | 1st and 2nd waves (June-November 2020) | BCSQ-36 | Burnout: 79.96% |
| Bajo et al. (2021) | Cross-sectional study | Nurses and medical doctors | 232 | Public and private hospitals | 1st wave (March 28-April 4, 2020) | STAI DTS | Anxiety: 70.7%; PTSD: 34.5% |
| Beneria et al. (2020) | Prospective observational cohort study | Doctors, nurses | 141 | Medical specialities | 1st wave (November 2019- March 2020) | PSS-14 HADS | Anxiety and depression: 48.94%; Stress: 72.3% |
| Bourne et al. (2022) | Prospective cross-sectional study | Healthcare professionals on the International Society of Ultrasound in Obstetrics and Gynaecology and non-members | 136 | Specialist consultation | 1st wave (7 to 21 May 2020) | HADS | Anxiety: 14.3%; Depression 7.1% |
| Cunill et al. (2020) | Cross-sectional | Nurses, medical professionals, nursing assistants, hospital porters and other professions (pharmacists, physical therapists, residents and students of health sciences) | Anxiety: 1117; Depression: 1054 | Primary care, emergency room/intensive care, sociosanitary residence/Geriatric hospital, Covid-19 centre, Hospitalization, other | 1st wave (4–10 April) | GAD-7 PHQ-9 | Anxiety: 37.7%; Depression: 49.7% |
| Dosil et al. (2021) | Cross-sectional | Health-care professionals | 421 | Public and private hospitals of the Basque Country and Navarra | 1st wave | DASS-21 | Anxiety: 28.7%; Depression: 16.9%; Stress: 31.4% |
| Dosil et al. (2020) | Cross-sectional study | Doctors, nurses, and auxiliaries/technicians | 973 | Public and private hospitals | 1st wave (after the flattening of the curve of the Covid-19) | DASS-21 PCL-C ProQol | Anxiety: 44.6%; Depression: 29.9%; Stress: 44.2%; PTSD: 11.1%; Burnout: 35.1% |
| Echeverria et al. (2021) | Cross-sectional | Doctors, nurses, nursing assistants, administrative staff, security members, cleaning personnel, psychologists, social workers, and orderlies. | 90 | Hospital centre of specialities of oncology, mental health, ophthalmology among others. | 1st wave (20 April-27 May) | BAI BDI-II Ad-hoc questionnaire based on DSM-5 criteria for acute stress | Anxiety: 42.2%; Depression: 21.1%; Stress: 32.2% |
| Erquicia et al. (2020) | Cross-sectional | Medical personnel, Nursing aide, orderly, technician radiology, other | 395 | Hospital | 1st wave (March-April) | DASS-21 MADRS | Anxiety: 31.4%; Depression: 12.2; Stress: 14.7% |

Table 1 (continued)

| Authors (year) | Design | Participants | Sample size | Setting | Wave of the pandemic | Measures | Outcomes |
|---------------------------------|--|---|------------------------------|---|--|-------------------------|---|
| Esteban-Sepúlveda et al. (2022) | (1) cross-sectional; (2) longitudinal cohort prospective study | Physicians, nurses, nursing assistants, with direct contact with patients with COVID-19 diagnosis | Time (1) 90; Time (2) 64 | Acute 3rd level hospital | Time (1) 2nd wave July-November 2020; Time (2) 3rd wave (November 2020-March 2021) | STAI PHQ-2 PSS-14 PCL-5 | Time 1) Anxiety: 95.6%; Depression: 18.2%; Stress: 77.8%; PTSD: 24.4%. Time 2) Anxiety: 98.4%; Stress: 78.1%; PTSD: 26.6% |
| Fiol-DeRoque et al. (2021) | Randomized controlled Trial | Physicians, nurses, nurse assistants, others, who had provided direct health care to patients with COVID-19 | 482 | Health workers from any medical speciality (pneumology, internal medicine, emergency, primary care, etc.) | 1st wave (14 May-25 July, 2020) | DASS-21 DTS | Anxiety: 40%; Depression: 30.7%; Stress: 48.13%; PTSD: 40.2% |
| Gago-Valiente et al. (2022) | Descriptive, cross-sectional study | Medical professionals | 128 | Public hospital in Huelva (Spain) | 1st wave (May-June 2020) | MBI-HSS | Burnout: 5.1% |
| García-Hedra et al. (2021) | Cross-sectional study | Health care workers who cared for COVID-19 patients | 448 | Intensive Care Units and post-surgical critical care units throughout Spain. | 1st wave (May-June 2020) | GAD-7 | Anxiety: 58.7% |
| Gómez-Salgado et al. (2021) | Cross-sectional observational study | Nurses, doctors, and other allied health care professionals | 1459 | hospitals and primary care centres | 1st wave (March-April, 2020) | GHQ-12 | Stress: 80.6% |
| González-Mesa et al. (2021) | Cross-sectional | Ob-Gyn specialists | 220 | - | 5th wave (September of 2021) | ITQ PHQ-9 GAD-7 | Anxiety: 37%; Depression: 37%; PTSD: 12.4% |
| Guillén-Astete et al. (2020) | Observational cross-sectional | Physicians | 328 | Hospital and outpatient emergencies | 1st wave (6–12 April 2020) | IAB HDRS | Anxiety: 28.7%; Depression: 22.8% |
| Jiménez-Labaig et al. (2021) | Cross-sectional | Young Spanish oncologists | Survey 1) 243; Survey 2) 263 | Oncology services | 2nd wave (16 May-31 December 2019) | GAD-7 PHQ-9 ProQOL-30 | Anxiety: 37.3%; Depression: 30.5%; Burnout: 25.1% |
| Lara-Cabrera et al. (2021) | Cross-sectional | Nurses providing direct patient care | 214 | Canary Islands Health Service | 1st wave (June 2020) | PSS-4 | Stress: 51.4% |
| Luceño-Moreno et al. (2020) | Cross-sectional | Physicians, nurses, assistant nurses, caregivers, other | 1422 | Primary care, hospital, nursing home or day centres, other | 1st wave (1–30 April 2020) | IES-R HADS MBI-HSS | Anxiety: 79.3%; Depression: 51.3%; PTSD: 56.6% |
| Macía-Rodríguez et al. (2021) | Observational, cross-sectional, descriptive study | Internists (resident doctor, medical specialist, service head, medical director) | 1015 | Hospital | 1st wave (May, 2020) | MBI-HSS | Burnout: 40.1% |
| Manzanares et al. (2021) | Cross-sectional study | Nurses, health care assistants, health technicians, final year nurse student nurses, foreign nurses, and other nurse-related health workers | 686 | Tertiary referral hospital | 1st wave (6 and 27 May 2020) | PHQ-9 | Depression: 25% |

Table 1 (continued)

| Authors (year) | Design | Participants | Sample size | Setting | Wave of the pandemic | Measures | Outcomes |
|----------------------------------|---|--|---|--|--|------------------------------|--|
| Martín et al. (2021) | Prospective cohort study | Health workers (medical doctor, nurses, nursing assistant, other) and socio health workers | Anxiety: 2087; Depression: 2071; Distress: 2086. | Emergencies, Anaesthesiology & Reanimation, Respiratory, Intensive Medicine, Internal Medicine and Infection Diseases, primary care, nursing homes/geriatric services, central services. | 1st and 2nd waves (April-September, 2020) | GAD-7 IES-R PHQ-9 | Anxiety: 51.8% Depression: 38.6%; Stress: 60.4% |
| Martínez-Caballero et al. (2021) | Cross-sectional study | Doctors, nurses, and emergency medical technicians | 317 | Emergency Medical Services | 1st wave (20 May-2007/2020) | GHQ-12 DTS-8 | Stress: 36%; PTSD: 30.9% |
| Martínez-López et al. (2021) | Cross-sectional study | Residential care workers | 296 | Nursing homes for the elderly people | 2nd wave (9 November to 27 November) | MBI-HSS | Burnout: 6.4% |
| Mediavilla et al. (2021) | Prospective Cross-sectional study | Hospital and non-hospital healthcare workers | 2370 | Outpatients and inpatient facilities | 1st wave (24th April- June 22nd, 2020) | GHD-12 PHQ-9 | Depression: 27%; Stress: 74.4% |
| Mediavilla et al. (2022) | Prospective cohort study and longitudinal study | Physicians, nurses, health technicians, ancillary workers, other health workers, and residential support workers | Time 1) Depression: 663; Stress: 677. Time 2) Depression: 639; Stress: 649; PTSD: 619. | Outpatient and inpatient facilities | Time 1) 1st wave (24th April – 22nd June 2020; Time 2) 3rd wave (January - March 2021) | GHD-12 PHQ-9 PC-PTSD-5 | Time 1) Depression: 28.5%; Stress: 74.4%. Time 2) Depression: 21.4%; Stress: 56.4%; PTSD: 51.6% |
| Mira et al. (2020) | Cross-sectional study | Physicians, nurses and other health staff | 685 | Primary care and hospitals | 1st wave (18 March – 17 May, 2020) | EASE | Stress: 28.5% |
| Molina-Mula et al. (2022) | Cross-sectional study | Nurses | 892 | Socio-health centres | 3rd wave (February-March 2021) | MBI-HSS HADS IES-R | Anxiety: 48.4%; Depression: 19.5; PTSD: 14.1; Burnout: 34% |
| Moraleda-Cibrian et al. (2022) | Validation | Health and social health worker in charge of the Covid-19 patients | 135 | Hospitals, health care centres for Covid-19 patients, primary health centres, geriatrics, and convalescent centres. | 3rd and 4th waves (January-July 2021) | GADS | Anxiety: 59.3%; Depression: 82.2% |
| Oprisan et al. (2022) | Cross-sectional study | Radiologists | 150 | Primary, secondary and tertiary centres, private hospitals, and speciality centres | 1st and 2nd waves (April-August, 2020) | MBI-HSS | Burnout: 49.3% |
| Ortega-Galan et al. (2020) | transversal observational study | Doctors, nurses, and technicians | 537 | Hospital, primary care | 1st wave (30 March-16 April 2020) | ProQol | Burnout: 83.2% |
| Pérez-Chacón et al., 2021 | Cross-sectional study | Healthcare workers | 694 | Community context | 1st wave (April-May 2020) | ProQol | Burnout: 4.3% |

Table 1 (continued)

| Authors (year) | Design | Participants | Sample size | Setting | Wave of the pandemic | Measures | Outcomes |
|--------------------------------|-------------------------------------|--|----------------------------|---|---|--|--|
| Reno-Chanca et al. (2021) | Prospective cohort study | Dieticians, veterinarians, pharmacist, nurses, psychotherapists, general practitioners, dentists and optometrists | 898 | - | 1st wave | DASS-21 | Anxiety: 30.9%; Depression: 26.8%; Stress: 33.6% |
| Rodríguez-Rey et al. (2020) | Cross-sectional | Frontline professionals | 269 | - | 1st wave (21 March 2020 and 4 June 2020) | IES-R Depression screening | Depression: 14.1%; PTSD: 78.1% |
| Rodríguez-Menéndez, (2021) | Cross-sectional | Health workers involved directly or indirectly with in the care of COVID-19 patients (Resident, physician, nurses, health care assistants, general practitioners, other) | 1407 | - | 1st wave (11–31 May 2020) | SARS-Q | Stress: 24.7% |
| Ruiz-Fernández et al. (2020) | Cross-sectional study | Physicians and nurses | 506 | Primary care, ICU, Emergency department, Regular hospital care, specific Covid unit, Health and social care centres | 1st wave (30 March, April 16, 2020) | ProQol | Burnout: 84% |
| Ruiz-Frutos et al. (2021) | Cross-sectional study | Occupational health professionals (physicians, nurses) | 499 | Occupational health department | 1st wave (April 23–June 24) | GHQ-12 | Stress: 65.5% |
| Sánchez-Sánchez et al. (2021) | Observational cross-sectional study | Nurses, Auxiliary nursing care technicians | Time (1) 627; Time (2) 655 | - | 1st, 2nd waves (March–June 2020/ September–November 2020) | HADS | Time 1) Anxiety: 68.3%; Depression: 49.6%. Time 2) Anxiety: 49.5%; Depression: 35.1% |
| Seda-Gombau et al. (2021) | Longitudinal descriptive study | Physicians | 40 | Primary care | 2nd wave (October, 2020) | MBI-HSS | Burnout: 50% |
| Sobregreu Sangrà et al. (2022) | Cross-sectional | Frontline healthcare workers, mainly nurses, of the monitoring shift and the emergency service. | 184 | Tertiary hospitals (Covid-19 hospitalisation wards, emergency service, and Intensive Care Units) | 2nd wave (July–October, 2020) | VASS PSS-10 PCL-5 STAI PHQ-2 | Anxiety: 90.2%; Depression: 13%; Stress: 72.3%; PTSD: 23.4% |
| Soto-Cámara et al. (2022) | Cross-sectional descriptive study | Physicians, nurses, emergency medical technicians, other | 1710 | Emergency medical services | 4th wave (1 February 2021–30 April 2021) | DASS-21 | Anxiety: 39.4%; Depression: 30.5%; Stress: 37.4% |
| Torrente et al. (2021) | Cross-sectional study | Physicians, nurses, nursing assistants and emergency healthcare technicians | 674 | Primary care, hospital (mainly tertiary hospitals) | 1st wave (21 April–3rd May 2020) | MBI-HSS | Burnout: 43.3% |

Note: PHQ: Patient Health Questionnaire; GAD-7: Generalized Anxiety Disorder Scale; PCL: PTSD Checklist for DSM-5; PC-PTSD-5: Primary Care PTSD Screen for DSM-5; BCSQ-36; Burnout Clinical Subtype Questionnaire-36; STAI: State-Trait Anxiety Inventory; DTS: Davidson Trauma Scale; HADS: DASS-21; MBI-HSS; ProQol: Professional Quality of Life Scale; BDI-II: Beck Depression Inventory; MADRS: Montgomery-Asberg Depression Rating Scale; GHQ-12: General Health Questionnaire-12; ITQ: International Trauma Questionnaire; BAI: Beck Anxiety Inventory HDRS: Hamilton Depression Rating Scale; IES-R: Impact of Event Scale-Revised; EASE: Acute stress of healthcare professionals Caring COVID-19 Scale; GADS: Goldberg anxiety and Depression Scale. SARS-Q: Stanford Acute Stress Reaction Questionnaire; VASS: Visual Analogue Scale for Stress; PSS: Perceived Stress Scale; GHQ-12: General Health Questionnaire-12; SARS-Q: Stanford Reaction Questionnaire

(Rodríguez-Rey et al., 2020) used two items in which participants were asked if they were depressed and how sad they were feeling to screen for depression, which had shown adequate sensitivity and specificity to detect emotional distress in previous studies. The scale most used for assessing stress was the DASS-21 ($n=6$), followed by the Perceived Stress Scale (PSS) in the four ($n=1$), ten ($n=1$) or 14 items ($n=2$) versions. The Stanford Reaction Questionnaire ($n=1$), the General Health Questionnaire-12 ($n=3$), the Impact of Event Scale-Revised (IES-R; $n=4$), and the EASE ($n=1$) were also used. In addition, one study also use screenings based on DSM-5 criteria for assessing acute stress. For the assessment of PTSD symptomatology, the measure most used was the PTSD Checklist for DSM-5 (PCL-5; $n=5$). In addition, the Impact of Event Scale-Revised (IES-R; $n=4$), the Davidson Trauma Scale (DTS; $n=3$), the International Trauma Questionnaire (ITQ; $n=1$), and the Primary Care PTSD Screen for the DSM-5 ($n=1$) were used. Finally, the Burnout Syndrome was mainly evaluated by the Maslach Burnout Inventory (MBI; $n=8$), but also with the Burnout Clinical Subtype Questionnaire (BCSQ-36; $n=1$), and the Burnout subscale of the Professional Quality of Life Scale (ProQoL; $n=5$).

Prevalence findings for anxiety

As shown in Table 1, the reported prevalence of moderate and severe anxiety symptoms among the studies included in this systematic review ranged from 14.28 to 98.43%. The lowest prevalence was found in the study by Bourne et al. (2022), conducted during the first wave with professionals working with ultrasounds in obstetrics and gynecology. The highest prevalence was found in the longitudinal study by Esteban-Sepúlveda et al. (2022) conducted during the second and third waves with healthcare workers with direct contact with patients with COVID-19.

The pooled percentages of moderate and severe anxiety symptoms were calculated using the total number of participants with symptoms during each wave across all studies. Results indicated a pooled prevalence of 35.18% for moderate and severe anxiety symptoms. In addition, the analysis of prevalence conducted by wave showed that the third wave was the wave with a higher prevalence of anxiety (Fig. 2A). Likewise, the third, fourth, and fifth waves showed higher prevalence than the first and second waves.

Prevalence findings for depression

The prevalence of moderate and severe depressive symptoms in this systematic review ranged from 7.14 to 82.22%. As in the case of anxiety, the study of Bourne et al. (2022) was the study showing the lowest depression prevalence,

while the highest prevalence was found in the study conducted by Moraleda-Cibrián et al. (2022) during the third and fourth waves.

The pooled prevalence of moderate and severe depression symptomatology was 29.77%. As shown in Fig. 2B, the prevalence of depression symptomatology decreased from the first to the second and third waves but raised again in the fourth and fifth waves, with the fifth wave showing the highest prevalence of depression symptomatology. Accordingly, longitudinal studies found that depression was less prevalent during the first wave compared to the second wave (Sánchez-Sánchez et al., 2021) and during the first wave compared to the third wave (Mediavilla et al., 2022).

Prevalence findings for stress

Concerning stress, the included studies reported a prevalence of moderate to severe symptoms with percentages ranging from 14.68% to 80,60%. Most studies that included stress as an outcome were conducted during the first wave, with only one study conducted during the fourth wave and none in the fifth wave. The lowest prevalence was found in the study conducted by Erquicia et al. (2020) during the first wave in hospitals, while the highest prevalence was found in the study by Gómez-Salgado et al. (2021) during the first wave in hospitals and primary care.

The pooled prevalence of stress was 50.52%, this symptom being the most prevalent during the COVID-19 pandemic, compared to the other outcomes included in this systematic review. As shown in Fig. 2C, the total stress prevalence pooled by the wave was similar for the first, second and third waves (50.20% and 56.20%, respectively), while the only study conducted in the fourth wave with health professionals of emergency medical services (Soto-Camara et al., 2022) found the lowest stress prevalence (37.37%).

Prevalence findings for post-traumatic stress symptoms

The studies included in this systematic review showed a wide range of PTSD symptoms prevalence, ranging from 11.10 to 78.07%. Specifically, the highest prevalence was found by Rodríguez-Rey (2020), who collected a sample of frontline professionals during the first wave. The lowest prevalence was found in the study conducted by Dosil et al. (2020) after fattening the curve of the first wave with a higher pool of healthcare professionals not necessarily working on the frontline.

Regarding the pooled prevalence, this study found that a quarter of the healthcare workers (25.82%) showed

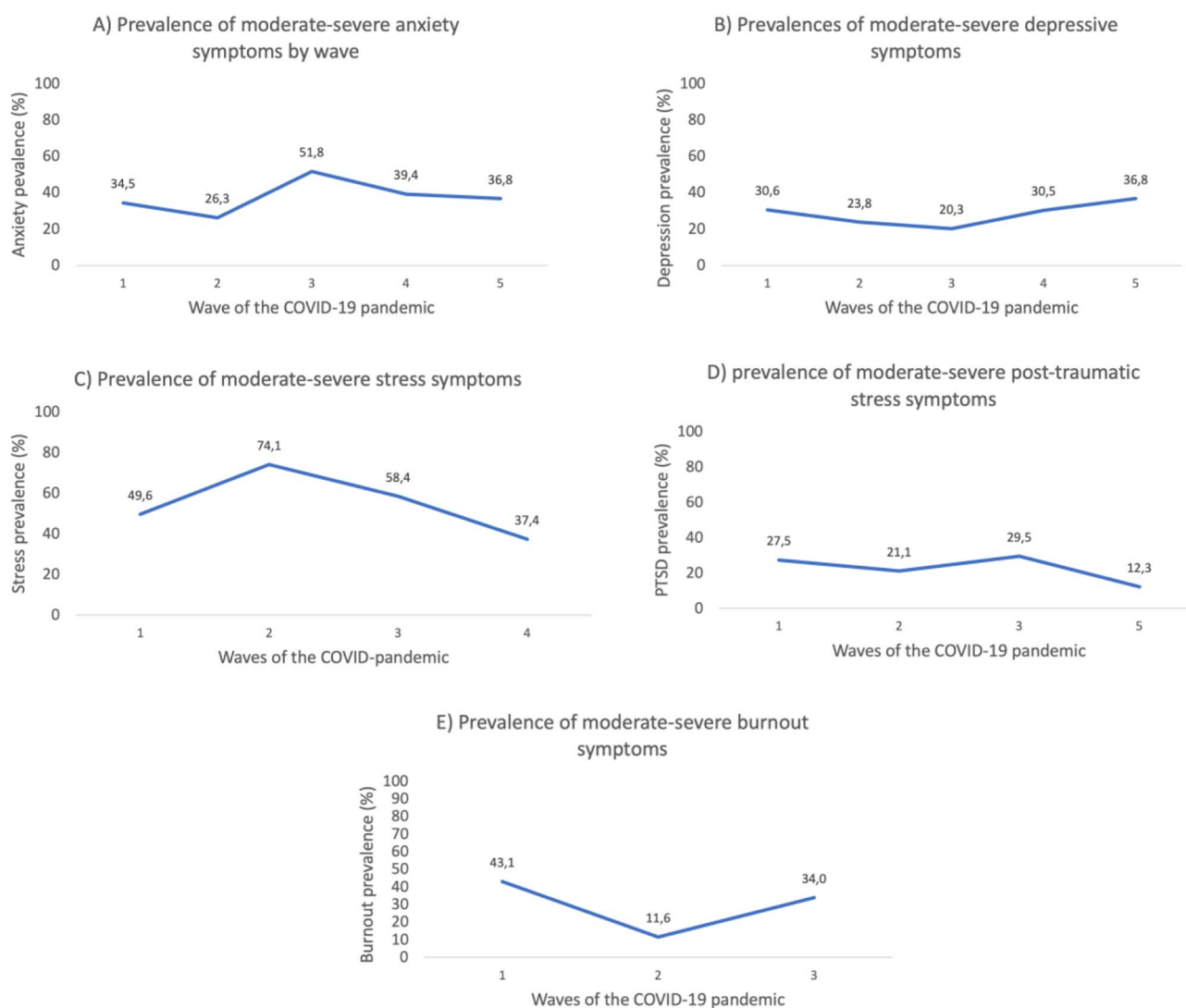


Fig. 2 Prevalence of anxiety, depression, stress, post-traumatic stress and burnout symptoms in Spanish healthcare workers divided by wave

moderate-severe PTSD symptomatology. Notably, there was a decrease in prevalence observed between the first three waves (21.1–29.5%) and the fifth wave (12.3%) of the COVID-19 pandemic (Fig. 2D). These results are in line with the longitudinal study conducted by Esteban-Sepúlveda et al. (2022), which showed that the stress prevalence in the second and third waves was very similar, with a slight increase from the second to the third wave (24.44% and 26.56% respectively).

Prevalence for burnout symptoms

The prevalence of burnout symptoms among health workers during the COVID-19 pandemic has varied considerably depending on the study, ranging from 4.32 to 83.99%. The

highest and the lowest prevalences were found during the first wave (Ruiz-Fernandez et al., 2020; Ruiz-Fernandez et al., 2020).

The pooled prevalence for burnout symptomatology was 41,02%. All studies that included burnout outcomes were conducted during the first, second, and third waves, with no studies found for the fourth and fifth waves. As shown in Fig. 2E, the cases of burnout symptomatology were higher during the first wave (43.1%) compared with the other waves. The rate of burnout symptoms decreased during the second wave; it increased again during the third wave, although without reaching the levels of the first wave.

Table 2 provides a summary of the prevalence ranges found for each symptom, as well as the mean for each wave.

Table 2 Summary of general prevalences (by range and by wave)

| | Prevalence Range | Wave1 | Wave2 | Wave3 | Wave4 | Wave5 |
|-----------------------|------------------|-------|-------|-------|-------|-------|
| Anxiety | 14.28-98.43% | 34.5% | 26.3% | 51.8% | 39.4% | 36.8% |
| Depression | 7.14 – 82.22% | 30.6% | 23.8% | 20.3% | 30.5% | 36.8% |
| Stress | 14.68%-80,60% | 49.6% | 74.1% | 58.4% | 37.4% | ND |
| Post-traumatic stress | 11.10-78.07% | 27.5% | 21.1% | 29.5% | ND | 12.3% |
| Burnout | 4.32 – 83.99% | 43.1% | 11.6% | 34.0% | ND | ND |

ND=No Data

Discussion

This systematic review represents the first comprehensive examination of the prevalence of depression, anxiety, stress, post-traumatic stress disorder (PTSD), and burnout symptoms among Spanish healthcare professionals during the COVID-19 pandemic. The study analyzed a total of 44 studies conducted during the first five waves of the COVID-19 pandemic in Spain, covering the period from the beginning of the pandemic to September 2022.

The results indicated that 50.54% of healthcare workers reported symptoms of stress, 41.02% reported burnout, 35.25% reported anxiety, 29.76% reported depression, and 25.82% reported PTSD symptoms. The prevalences obtained in this study were slightly higher than those reported by the global study by Salari et al. (2020), who found prevalences of stress, anxiety, and depression of 45%, 25.8%, and 24.3%, respectively. It is worth mentioning that most of the studies included in Salari et al. (2020) were conducted in Asia (i.e., China, Nepal, Iran, Japan, and India). Therefore, these findings align with previous literature (Wang et al., 2021), suggesting that the Spanish population report higher levels of emotional symptomatology than the Chinese population.

In addition, the pooled prevalences of post-traumatic stress, anxiety, and depression symptoms obtained in this study were lower than those reported in the meta-analyses conducted by Saragih et al. (2021), which included studies from various countries. However, the prevalence of stress shown in this systematic review was higher than the one reported by Saragih et al. (2021). One possible explanation for this discrepancy may be the difference in search dates. The current study included a larger set of studies published until September 2022, whereas Saragih et al. (2021) finished their search in November 2020. Subsequently, Saragih et al. (2021) included data collected only during the first two waves, while this systematic review included studies conducted from the first to the fifth wave, periods with fewer restrictions and severity of COVID-19 cases in medical services. This might explain the higher prevalence reported by Saragih et al. (2021) compared to the prevalence found in our study, as mortality rates were likely lower during later waves.

In this line, our results showed differences in the prevalence of symptomatology related to stress, PTSD, and burnout symptomatology across the different pandemic waves. Anxiety and burnout showed a reduction in symptomatology in the second wave but rose again in the third wave, affecting 51.8% and 34% of healthcare workers, respectively. Similarly, depression symptoms decreased during the second and third waves but increased again in the fourth, with up to 30% of healthcare workers experiencing it. Also, PTSD symptomatology decreased on the second wave with an increase in the third wave, although slighter in this case. Our findings are consistent with previous longitudinal studies that have reported a reduction in the prevalence of anxiety and depression symptoms from the first to the third wave (Sánchez-Sánchez et al., 2021; Mediavilla et al., 2022). However, our results suggest that Spanish healthcare workers still suffered from the emotional consequences of the pandemic during the fourth and fifth waves, with prevalences even higher than during the first wave. This is evident in the patterns of anxiety symptoms waves, in which the third, fourth, and fifth waves exhibited a higher prevalence than the first and second waves. These results are in contrast with longitudinal studies that were included in this review, showing that the prevalence of anxiety was higher during the first wave compared with the second and the third waves of the COVID-19 pandemic, suggesting that the beginning of the pandemic could be associated with more confusion, lack of information, lack of training of these professionals, the large number of infections and a lack of diagnostic tests (Mediavilla et al., 2022; Sánchez-Sánchez et al., 2021).

Importantly, it is widely recognised that long-term stress can lead to adverse psychological outcomes, and this holds particularly true for healthcare practitioners who encounter elevated levels of stress in their professional roles (Kersting et al., 2019; Lykkegaard et al., 2020). Therefore, although the number of studies decreases considerably after the third wave, it is crucial to continue monitoring and addressing the mental health needs of healthcare workers (Zhang et al., 2020). In fact, a recent study conducted in Romania showed that the COVID-19 pandemic continues to have a high impact on healthcare workers' mental health (Briciu et al., 2023). Thus, prevention and developing intervention programs that enhance emotional skills are essential, especially

in this population. Additionally, supportive leadership, communication, and access to mental health resources can help alleviate the pandemic's burden on healthcare workers (Kang et al., 2021).

The prevalences obtained in this systematic review conducted with healthcare workers were higher compared to those obtained with the general population (Ozamis-Etxebarria et al., 2020; Sandin et al., 2020), yielding evidence of the mental health problem of healthcare workers during the COVID-19 pandemic. Furthermore, a study included in this systematic review (Seda-Gombau et al., 2021) showed a significant rise in burnout symptoms among health workers during the COVID-19 pandemic, compared with pre-pandemic periods. In this regard, several studies have highlighted the impact of healthcare workers' mental health on the quality of care they provide (Shanafelt et al., 2015, 2016; Maben et al., 2012; Koinis et al., 2015). Therefore, it is essential to prioritize healthcare workers' mental health to ensure high-quality patient care. By promoting and developing interventions to improve and preserve healthcare workers' mental health, we can ensure they are better equipped to provide high-quality patient care.

Interestingly, this systematic review found differences in the prevalence of symptomatology even in studies conducted in the same period. This suggests that factors such as the type of healthcare professionals or the type of centre participating in the study may affect the prevalences obtained. For instance, some studies (Erquicia et al., 2020; Dosil-Santamaría et al., 2021) showed that the prevalence of mental problems was higher for centres with higher exposure to COVID-19 contagion (i.e., primary care centres) and the severity of the patients was greater (i.e., emergency services, urgencies, critical health units). However, most studies included a mix of different types of healthcare facilities, which makes it challenging to tease apart the specific influence of each factor in this study. In addition, it is worth noting that there was little representation of workers from social-health centres, either because there is a lack of studies focused on this population or because they have not been differentiated from the personnel from healthcare centres. Consequently, it was not possible to determine the specific prevalence of mental health symptomatology for social-health workers and compare them with healthcare personnel. Also, using different measures to assess mental health makes comparing the prevalences obtained in the different studies difficult.

Another notable aspect is that studies included in this systematic review have also shown that the proportion of healthcare workers with emotional symptomatology was higher when there is a perceived lack of centre preparedness (Alonso et al., 2022), including less personal protection equipment availability (Bajo et al., 2021). These findings highlight the importance of work-related factors concerning

mental health problems and suggest the need to address them to decrease chronicity among healthcare workers (Alonso et al., 2022).

Limitations

Our research has several limitations that should be considered. Firstly, due to the relatively recent emergence of the COVID-19 pandemic, there is a possibility that we might have overlooked studies that have yet to be published. In addition, the differentiation between first-line healthcare services and other healthcare services was challenging because most of the studies included in this systematic review encompassed a variety of healthcare settings. Another limitation arises from the exclusion of certain studies from the analysis. Some studies were excluded because they did not provide data on the number or percentage of participants experiencing symptoms of anxiety, depression, stress, PTSD, or burnout (e.g., Lara-Cabrera et al., 2021). Also, in cases where studies recruited their samples during different waves, we categorized them according to the specific wave in which recruitment began. This categorization was essential to prevent analysis using identical datasets. However, this method could influence the prevalences obtained in this systematic review. Furthermore, we had to exclude studies that used the Maslach Burnout Inventory (MBI) to assess burnout symptoms but reported participant numbers affected by specific MBI subscales (such as emotional exhaustion, depersonalization, or personal realization) without reporting across all the scales, which is the criterion for diagnosing burnout syndrome with this measure (Maslach & Jackson, 1982).

Lastly, another potential limitation of this systematic review pertains to our choice of search terms, specifically "mental," "emotion," "psychol*," "stress," and "burnout." Although these terms are comprehensive and encompass a wide range of psychological manifestations, the articles included in this systematic review primarily focus on the specific symptoms outlined in our research—stress, burnout, anxiety, depression, and PTSD symptomatology. This limitation suggests that our findings may not fully encompass the complete spectrum of psychological symptoms associated with this topic, primarily due to the constraints inherent in the reviewed articles.

Conclusions

To sum up, this systematic review revealed that stress was the most prevalent symptom experienced by healthcare workers during the COVID-19 pandemic, followed by burnout, anxiety, depression, and PTSD symptoms. The prevalence of mental health symptoms ranged from 27% to 49, highlighting the significant psychological impact that the pandemic

had on healthcare workers. In addition, the results divided by wave provide insight into the impact of the COVID-19 pandemic on mental health across different and emphasize the urgent need for psychological interventions to improve and preserve the mental health of healthcare professionals, given their high risk of developing mental health disorders. Therefore, it is crucial to prioritize implementing measures and resources to support the psychological well-being of healthcare workers during and after the pandemic.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-023-05542-9>.

Author contributions Conceptualization: Diana Castilla; Methodology and analysis: Irene Jaén and Carolina Ausín; Writing the manuscript: Irene Jaén; Review and editing the manuscript: Diana Castilla; Supervision: Diana Castilla.

Funding Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature. This work was supported by Generalitat Valenciana. Conselleria de Educació, Universitats i Empleo. «Subvenciones para la realización de proyectos I+D+i desarrollados por grupos de investigación emergentes 2022». Proyecto CIGE/2021/102.

Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature.

Data Availability All data generated or analysed during this study are included in this published article and its supplementary material.

Declarations

Ethical approval An ethics statement is not applicable because this study is based exclusively on published literature.

Informed consent Informed consent is not required since this work is a systematic review.

Competing interests The authors declare no conflicts of interest.

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