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Review article

Mental health of healthcare workers of Latin American countries: a review of studies published during the first year of COVID-19 pandemic

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ABSTRACT

Objective: Identify and review articles that evaluated mental health of HCW of Latin American countries (except Brazil), published during the first year of COVID-19 pandemic.

Method: We systematically searched EMBASE, PsycINFO, Scopus, PUBMED/ Medline, Web of Science, PePSIC, and Scielo for articles published during the first year of the COVID-19 pandemic. Two independent researchers reviewed titles and abstracts and then, for eligible studies, extracted data from full texts. Outcomes included mental health variables, country where the study was conducted, period of data collection, healthcare professional categories, study design, mental health measurements and main outcomes. The quality and risk assessment was also performed.

Results: Out of 248 records identified, 24 initially were assessed for eligibility. From those, 17 studies matched eligibility criteria and were included in the review. Higher scores of anxiety were reported in different studies, as well as an increased level of depression among HCW. Being a female, younger age, and closer distance of the epicenter of the outbreak increased the likelihood to develop mental health disorder. Concerns and fear related to COVID-19 have a greater impact on stress, anxiety, and depression symptoms.

Conclusion: Our findings highlight that COVID-19 pandemic had been worse for HCW from Latin America, showing the harmful effects of burnout on their health. Greater psychological distress, as well as anxiety and depression had been experienced by HCW from Latin America in their fight against COVID-19, demonstrating the importance of psychological well-being policies for them during and post- the pandemic.

1. Introduction

Coronavirus disease 2019 (COVID-19) emerged in December 2019 in China, where it was identified for the first time and from where it spread

quickly worldwide. The disease was declared a global pandemic in March 2020. Since then, many regions and countries worldwide have been experiencing cycles of outbreaks and an increasing number of infections and deaths. After a year from the declaration of COVID-19 as a

Abbreviations: AU-10, Professional Self Efficacy Scale; BIPQ, Brief Illness Perception Questionnaire; CI, Confidence interval; COVID-19, Coronavirus disease 2019; DD, Depersonalization/ derealization inventory; DES, Dissociative Experiences Scale; DSM-5, Diagnostic and Statistical Manual of Mental Disorders, 5th ed; EPPC-Cov10, Concern for the Transmission of COVID-19 in Health Personnel; FCV-19S, Fear of COVID Scale; GAD-2, Generalized Anxiety Disorder Scale-2; GAD-7, 7-item Generalized Anxiety Disorder; GAD, Generalized anxiety disorder; GADS, Goldberg Depression and Anxiety Scale; H-YBOCS, Hypochondriasis Yale-Brown Obsessive-Compulsive Scale; HADS, Hospital Anxiety and Depression Scale; HCWs, Health care workers; ISI, Insomnia Severity Index; K6, Kessler Screening Scale for Psychological Distress; MBI, Maslach Burnout Inventory; PCL-C, Post-Traumatic Stress Disorder Check List-C; PePISC, The Portal of Electronic Journals in Psychology. PHQ-2, Patient Health Questionnaire-2; PHQ-4 items, Patient Health Questionnaire; PHQ-9, 9-item Patient Health Questionnaire on Depression; PPE, personal protective equipment; ProQOL – CSF-vIV, Professional Quality of Life: Compassion Satisfaction and Fatigue Subscales; PSQI, Pittsburgh Sleep Quality Index; PTSD, post-traumatic stress disorder; SD, Standard deviation; SciELO, Scientific Electronic Library Online; SSOM, Somatic Symptoms without Organic or Medical Cause Current Status Assessment Questionnaire; STAI, State-Trait Anxiety Inventory; SWIFT, Sleepiness-Wakefulness Inability and Fatigue Test; WHO, World Health organization.

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global pandemic, the cumulative number of infections was almost 120 million and deaths exceeds 2,6 million worldwide (World Health Organization (WHO) 2021). In general, infected persons could develop a wide range of severity, from severe to mild symptoms or even being asymptomatic, which could still transmit the virus to other people. The average time from exposure to the virus to the beginning of the symptoms is around five days, and most individuals who develop symptoms do so within 11.5 days of infection (Wiersinga et al., 2020). In general, the most common symptoms of the COVID-19 are fever, shortness of breath, sore throat, and dry cough (Wu et al., 2020). Although most of the patients are considered to show a favorable prognosis, both elderly and those with chronic conditions are more susceptible to develop a severe condition. Those patients might require intensive care unit admission and are likely to suffer substantial sequelae (Wiersinga et al., 2020).

Currently, more than 200 countries worldwide have been affected by COVID-19 and their health systems are suffering to deploy technical and human resources to minimize the spread of the virus and its respective morbidity and mortality (Morgantini et al., 2020). The first case in Latin America was confirmed in Brazil at the end of February of 2020 (Rodríguez-Morales et al., 2020, Burki, 2020). Even with late identification of its first case and death, when compared with the rest of the world, the region had become one of the world epicenters of the disease during the first year of the pandemic, and since then has been in an epidemiological emergency (Taylor, 2020). According to the Pan American Health Organization [PAHO] (2021), the region surpassed 1 million deaths as of May 21, 2021. The reported number of healthcare workers (HCWs) who had been infected with the virus in the region was approximately 1.8 million, and almost 9000 had died (Pan American Health Organization, 2021).

One of the key points in this context is related to mental health, which has been a concern among researchers, HCWs, and governmental leaders, particularly in low- and middle-income countries (Castro-De-araujo and Machado, 2020). Several studies have been describing the impacts of the COVID-19 and measures to minimize its spread on mental health (Pollock et al., 2020, Tausch et al., 2022, Lima et al., 2020, Javed et al., 2020), in particular among HCWs, which were considered, at the same time, as essential workers during the pandemics and one of the most affected groups. In addition, they also may be considered as one of the most vulnerable groups to develop mental disorders, such as depression, anxiety, or stress (Esperidião et al., 2020). The most common factors that contribute to mental health deterioration are excessive working journeys and shifts, employment contracts, insufficient personal protective equipment (PPE), and continuous exposure to the virus, which may represent a risk for their health (Lai et al., 2020, Lu et al., 2020, Monterrosa-Castro et al., 2020, Zhang et al., 2020).

However, even with a high prevalence and mortality of the COVID-19 in Latin America and the known effects of the pandemic on the mental health of HCWs, there were only a few studies published reporting their mental health during the first year of the COVID-19 pandemics. Although there have been published several reviews determining the psychological impact, as well as the prevalence of anxiety, depression, and stress symptoms among HCW worldwide (Major and Hlubocky, 2021, Batra et al., 2020, Luo et al., 2021, Şimşir et al., 2021, Adibi et al., 2021), to our knowledge, there was no published review identifying mental health outcomes nor describing their main characteristics among HCWs from Spanish-speakers Latin American countries, which makes the present review more relevant. Then, considering the effect of the COVID-19 pandemic, its consequences on mental health, the lack of studies focusing on mental health of HCWs from this region, and the fact that Latin America has become one of the epicenters of the disease since its outbreak, the current review aimed to identify and review articles that evaluated mental health of HCWs of Latin American countries (except Brazil) published during the first year of COVID-19 pandemic.

2. Method

An integrative review was performed, aiming to identify and review articles published during the first year of COVID-19 pandemics, since its outbreak in the region (from March 2020 to March 2021). There was no previous published protocol.

2.1. Search strategy

We systematically searched seven electronic databases: EMBASE, PsycINFO, Scopus, PUBMED/ Medline, Web of Science, SciELO (Scientific Electronic Library Online), and PePISC (The Portal of Electronic Journals in Psychology). The search was performed three times: November 2020, March 2021, and January 2022. The first search extraction was on the 17th of November of 2020 and the second search extraction occurred on the 21st of March 2021. An additional search extraction was performed on the 22nd of January 2022. The search terms were ((COVID-19) AND (MENTAL HEALTH) AND (HEALTH PERSONNEL) AND [Latin American countries]). An excerpt of the search terms and the search strategy for each database is in the supplementary material (Supplementary Material 1).

2.2. Eligibility and exclusion criteria

The present study included only studies published during the first year since the COVID-19 outbreak in the region (from March 2020 to March 2021), which were written either in English or Spanish. Additionally, a broad eligibility criterion was used to capture all potential studies, based on PECO model (Morgan et al., 2018) described as follow: (a) *population*: HCWs from Latin American countries (only Spanish speakers' countries); (b) *exposure*: the main exposure was the COVID-19 pandemics since its outbreak in the region; (c) *control*: there were no specific inclusion or exclusion criteria for a comparison group in the selected studies; (d) *outcomes*: one or more aspects of mental health (either as primary or secondary outcomes) of the selected population.

2.3. Study selection

All studies were imported into Mendeley (version 1.19.8), where they were screened independently by the first and the second authors (KMRV and OICB). During this first screening process, both researchers assessed the eligibility based on the titles and abstracts. Then, during the second screening process, both researchers independently read abstracts and full-texts and, if the latter were not available online, corresponding authors were contacted. Unclear articles and disagreements between researchers were discussed by both researchers with co-authors and the supervisor.

2.4. Data extraction

The first and second authors independently extracted relevant data from the selected articles based on an extraction form, which was developed based on the objectives of the current review. The extraction form contained the following information: article code, title, authors, DOI number, primary aim, country of data collection, sample size, the average age of participants (or any related information), professional categories, general measures, mental health measurements/ inventories, COVID related measurements/ questionnaires, main outcomes, COVID related outcomes, and conclusions.

2.5. Data analysis

A qualitative analysis was performed, in which the evidence was summarized and organized around the following topics: primary aim, variables assessed, study designs, sample population and country in which the study was conducted, mental health and COVID-19

measurements, and main outcomes. Quality and risk assessment was also assessed by two independent researchers (SMMG and RZ) using the STROBE checklist for cohort, case-control, and cross-sectional studies (combined) (to see all available checklists <https://www.strobe-statement.org/index.php?id=available-checklists>). All items and subitems from the checklists were assessed and rated as 0, if the information was not reported, 1, if the information was reported in the study, and X, if the information was not applicable, reaching a maximum of 34 points. Then, final scores were converted into percentages concerning the relation to the number of assessed items (rated as 0 or 1), ranging from 0% to 100%. It is important to highlight that STROBE analysis were only descriptive, and all eligible studies were included in the final review.

3. Results

Out of 248 records identified, 24 initially matched eligibility criteria

and were assessed for eligibility. Then, seven studies were later excluded after a discussion with co-authors, and the supervisor and 17 were finally included in the review. The PRISMA flow diagram was presented in Fig. 1.

3.1. Primary aim and main variables assessed

Mental health problems and the needs of HCWs involved in the fight against the COVID-19 pandemic in Latin America were related to individual characteristics, and the severity of the pandemic observed in each country. All studies included in the present review evaluated one or more aspects of the psychological impact of the COVID-19 pandemic on HCWs, such as anxiety and depressive symptoms, stress, distress, and/or sleep aspects (see Table 1 for more information).

Additionally, nine studies assessed the frequency of generalized anxiety disorder symptoms, eight of them using the 7-Item Generalized

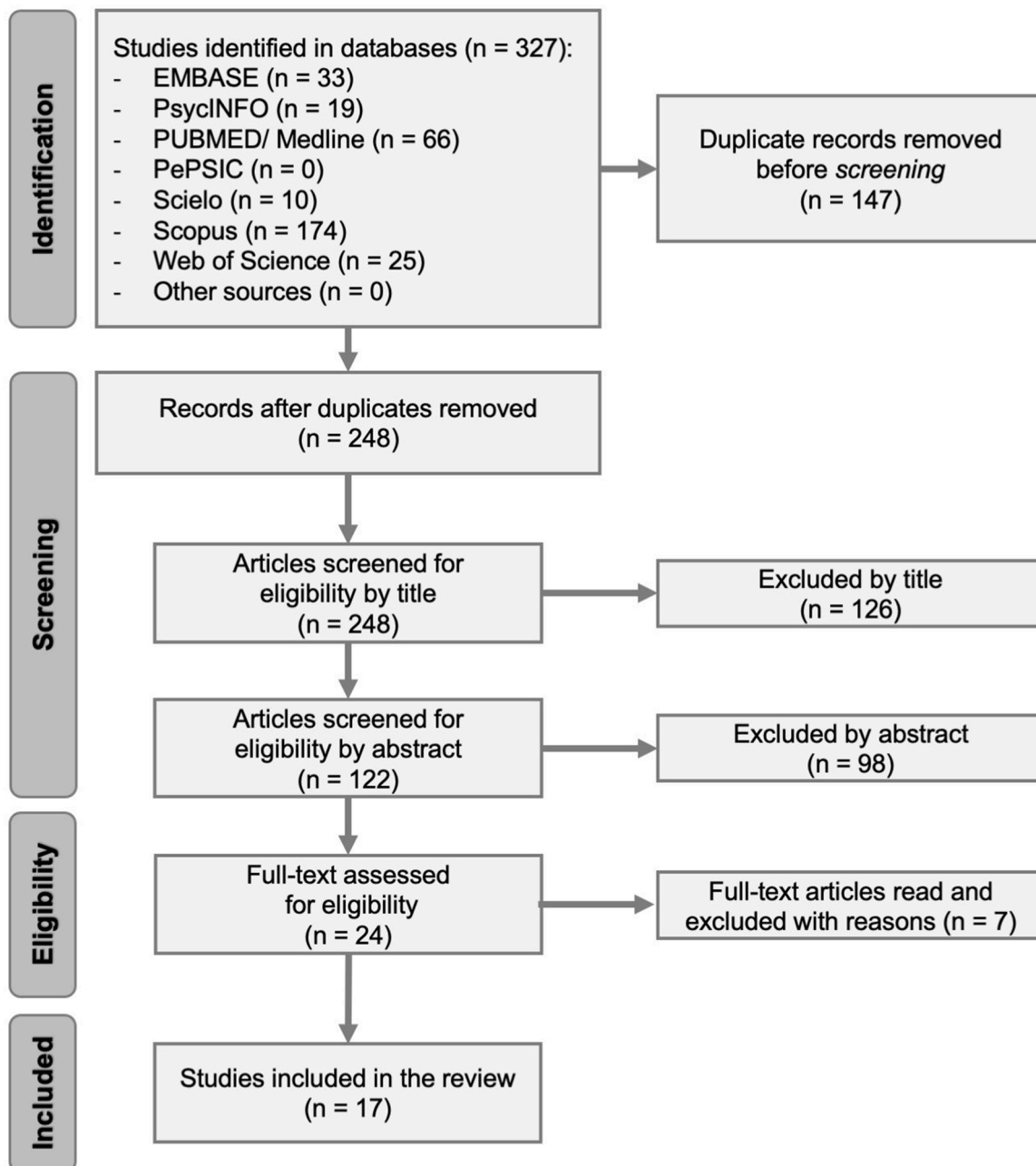


Fig. 1. PRISMA flowchart diagram showing study identification and selection process.

Table 1
Mental health variables assessed in reviewed studies.

Study	Psychosocial variables assessed
Chapa-Koloffon G del et al., 2021 Chávez et al., 2021	Stress Anxiety Burnout Depression
Chen et al., 2020	Anxiety Psychological distress Well-being and life satisfaction
García-Reyna et al., 2020 Giardino et al., 2020	Fear (related to COVID-19) Anxiety Depression Fatigue and sleepness Insomnia Sleep quality
Guiroy et al., 2021	Depression Juárez-García et al., 2021
Burnout Depression Stress Mamani-Benito et al., 2021	Anxiety Concerns (related to COVID-19) Depression Psychological distress Self-efficacy and coping
Miguel-Puga et al., 2021	Anxiety Depression Dissociative symptoms Posttraumatic stress disorder Resilience Sleep Stress
Monterrosa-Castro et al., 2020	Anxiety Fear (related to COVID-19) Stress
Pazmiño Erazo et al., 2021	Anxiety Depression Insomnia Posttraumatic stress disorder
Restrepo-Martínez et al., 2021	Anxiety Depression
Robles et al., 2020	Anxiety Depression Posttraumatic stress disorder Somatophorm symptoms Well-being and burnout risk
Rodante and Bellotti, 2020	Anxiety Depression Hypochondria
Samaniego et al., 2020	Anxiety Burnout Depression Insomnia Psychological distress
Villalba-Arias et al., 2020	Anxiety Depression Posttraumatic stress disorder
Yáñez et al., 2020	Anxiety Psychological distress Turnover intention

Anxiety Disorder Scale (GAD-7) and one using Generalized Anxiety Disorder Scale-2 (GAD-2). Depression was assessed by 12 studies, most of them using different versions of the Patient Health Questionnaire (PHQ-9). Four studies evaluated aspects related to post-traumatic stress disorder (PTSD) among those professionals, whereas burnout symptoms were specifically assessed by three studies. A single study aimed to show the impact of belief in conspiracy theories as a negative predictor of mental health among HCWs whereas another study aimed to estimate the long-term impact of compulsory social isolation on the psychological well-being of HCWs.

When COVID-19 specifically was taken into account, five studies included either instruments or isolated questions to assess COVID-19 related aspects, such as fear, coping needs, and conspiracy theories.

With regards to non-modifiable factors, such as age, sex, demographic characteristics, and professional category, all studies collected those data and analyzed their association to mental health variables.

3.2. Study Design, Sample Population, and Country

Studies included in this current review were conducted in the following countries: Colombia, Ecuador, Mexico, Argentina, Paraguay, and Peru. Although the study conducted by Guiroy et al. (2021) collected data from 13 different countries of the region (including Brazil), there were reported less than two participants from seven different countries of the region and only five participants from one of the countries, in comparison with the whole sample ($n = 204$). Regarding study design, 15 of 17 studies included in the review were identified as cross-sectional studies (most of them were conducted through online surveys). The study conducted by Miguel-Puga et al. (2021) and Rodante and Bellotti (2020), were identified as cohort studies.

Concerning the target population, HCWs from multiple areas were included, from specialist doctors to technicians, nurses, pharmacists, and laboratory workers. Out of four studies included in their sample administrative and support personnel who were working in hospital settings (García-Reyna et al., 2020, Juárez-García et al., 2021, Yáñez et al., 2020, Giardino et al., 2020), whereas one study also included volunteers (Yáñez et al., 2020). From all studies, one of them did not specify each professional category included in its sample, classifying all participants only as HCWs (Chen et al., 2020). Although most studies specified the number of HCWs of each category, some of them analyzed data together, grouping different professional categories into one group. A large range of sample sizes was also observed among studies. The largest sample size was identified in the study conducted by Robles et al. (2020) ($n = 5938$), whereas the smallest was found in the study conducted by Chávez et al. (2021) ($n = 125$) (see Table 2).

3.3. Mental health and COVID-19 measurements

Anxiety symptoms were evaluated in 13 of the selected studies, using instruments such as 7-Item Generalized Anxiety Disorder (GAD-7), used in eight of the studies, and the State-Trait Anxiety Inventory (STAI) used in two of the studies. Generalized Anxiety Disorder Scale-2 (GAD-2) was used only by Mamani-Benito et al. (2021). Robles et al. (2020) used the 5-item Anxiety Scale from the field study for ICD-11 Primary Health Care (PHC) to assess anxiety. Miguel-Puga et al. (2021) in addition to STAI, evaluated both depression and anxiety symptoms using the Hospital Anxiety and Depression Scale (HADS), whereas Giardino et al. (2020) administered the Goldberg Depression and Anxiety Scale (GADS) for the same purpose.

Seven studies administered the PHQ-9 to evaluate symptoms of depression, while Juárez-García et al. (2021) used the Patient Health Questionnaire (PHQ-4 items). The Patient Health Questionnaire-2 (PHQ-2) was used by Mamani-Benito et al. (2021) and Robles et al. (2020). Additionally, it is important to highlight that PHQ-9 was the only evaluative instrument in the whole study conducted by Guiroy et al. (2021).

Both sleep patterns and disorders of HCWs were also evaluated through the following instruments: the PSQI (Pittsburgh Sleep Quality Index) by Miguel-Puga et al. (2021) and the ISI (Insomnia Severity Index) by both Pazmiño Erazo et al. (2021) and Samaniego et al. (2020). Giardino et al. (2020) not only used PSQI and ISI, but also used Sleepiness-Wakefulness Inability and Fatigue Test (SWIFT).

Psychological distress was assessed in three different studies through the Kessler Screening Scale for Psychological Distress (K6) scale to evaluate psychological distress (Yáñez et al., 2020, Chen et al., 2020, Mamani-Benito et al., 2021). Stress and burnout were assessed in most of the studies through a wide range of instruments. Monterrosa-Castro et al. (2020) used the Work-related Stress Test; Chen et al. (2020) used

Table 2
Characteristics of studies included in the present review.

Study	Country (n) *	Sample (n)	Period of data collection	Age (years) $\bar{x} \pm SD$ (min-max)	Professional category	Study design	Measurements
Chapa-Koloffon G del et al., 2021	Mexico	206	23 rd April to 23 rd May, 2020	Resident physicians: 28.6±2 Attending physicians: 39.9±10.2 Nursing personnel: 40.7±7.5	- Resident and attending physicians - Nursing personnel	Cross-sectional	- Acute stress disorder scale (ASD)
Chávez et al., 2021	Paraguay	139	July to September 2020	20-29: 21 30-39: 75 40-49: 35 Over 50: 6 (no specific average age)	- Physicians - Nurses	Cross-sectional	- Patient Health Questionnaire on Depression (PHQ-9) - 7-Item Generalized Anxiety Disorder (GAD-7) - Maslach Burnout Inventory (MBI)
Chen et al., 2020	Ecuador	252	10 th April to 2 nd May, 2020	(18-69)	- Healthcare workers (unspecified categories)	Cross-sectional	- 7-Item Generalized Anxiety Disorder (GAD-7) - K6 Screening scale - Life and job satisfaction questionnaire - Conspiracy theory specific to COVID-19 questions - Fear of COVID Scale (FCV-19S)
García-Reyna et al., 2020	Mexico	2,860	April to May 2020	35.4±8 (18-62)	- Nursing personnel** - Medical personnel - Administrative personnel - Non-clinical hospital personnel with direct contact with COVID-19	Cross-sectional	- Pittsburgh Sleep Quality Index (PSQI) - Insomnia severity index (ISI) - Sleepiness-Wakefulness Inability and Fatigue Test (SWIFT) - Goldberg depression and anxiety scale (GADS)
Giardino et al., 2020	Argentina	1,059	5 th to 25 th June, 2020	41.7±10.7 (21-70)	- Physicians - Nurses - Psychologists - Nutritionists - Physician in trainee residency - Administrative and - Security personnel	Cross-sectional	- Pittsburgh Sleep Quality Index (PSQI) - Insomnia severity index (ISI) - Sleepiness-Wakefulness Inability and Fatigue Test (SWIFT) - Goldberg depression and anxiety scale (GADS)
Guiroy et al., 2021	Argentina (n=122) Chile (n=13) Colombia (n= 7) Costa Rica (n=1) Ecuador (n=2) Guatemala (n=1) Mexico (n=12) Panama (n=3) Paraguay (n= 1) Dominican Rep.(n=5) Uruguay (n=1) Venezuela (n=1)	204	4 th to 6 th April 2020	44.77	- Spine surgeons	Cross-sectional	- Patient Health Questionnaire on Depression (PHQ-9)
Juárez-García et al., 2021	Mexico	269	June to July 2020	Up to 32: 68 33-39: 80 40-46: 59 Over 47: 62 (no specific average age)	- Medical personnel - Nursing - Operating staff - Administrative personnel - Various health professions	Cross-sectional	- Patient Health Questionnaire (PHQ-4 items) - Single item version for stress and burnout
Mamani-Benito et al., 2021)	Peru	401	August 25 th to September 28 th 2020	47.7±9.2 (22-67)	- Nurses - Nursing technicians - Physicians - Obstetricians - Dentists - Psychologists - Nutritionists	Cross-sectional	- Scale of Concern for the Transmission of COVID-19 in Health Personnel (EPPC-Cov19) - Patient Health Questionnaire-2 (PHQ-2) - Generalized Anxiety Disorder Scale-2 (GAD-2)

(continued on next page)

Table 2 (continued)

Study	Country (n) *	Sample (n)	Period of data collection	Age (years) $\bar{x} \pm SD$ (min-max)	Professional category	Study design	Measurements
Miguel-Puga et al., 2021	Mexico	204	Information not available (Submitted in 16 th Oct 2020)	(19-58)	- Clinical staff - Support personnel - Physicians - Laboratory and imaging personnel	Cohort	- Professional Self Efficacy Scale (AU-10) - Kessler Psychological Distress Scale (K6) - Hospital Anxiety and Depression Scale (HADS) - Dissociative Experiences Scale (DES) - Resilience scale - Pittsburgh Sleep Quality Index (PSQI) - Depersonalization/derealization inventory (DD) - Stanford Acute Stress Questionnaire - State-Trait Anxiety Inventory (STAI) - Burnout Measure - Posttraumatic Stress Disorder Symptom Severity Scale-Revised
Monterrosa-Castro et al., 2020	Colombia	531	24 th to 30 th March 2020	33±9.3 (21-70)	- Physicians (General Practitioners)	Cross-sectional	- Fears and perceptions concerning medical work during COVID-19 - 7-Item Generalized Anxiety Disorder (GAD-7) - Work-related Stress Test - Fear of COVID Scale (FCV-19S)
Pazmiño Erazo et al., 2021	Ecuador	1028	30 th March to 22 nd April 2020	From 18 years onwards (no specific average age)	- Physicians - Nurses - Laboratory workers - Paramedics - Psychologists - Respiratory therapists	Cross-sectional	- 7-Item Generalized Anxiety Disorder (GAD-7) - Patient Health Questionnaire on Depression (PHQ-9) - Insomnia Severity Index (ISI)
Restrepo-Martínez et al., 2021	Colombia	1,247	1 st March to 31 st May 2020	37.1±10.5 (18-80)	- Physicians - Nurses - Nursing technicians - Respiratory therapists	Cross-sectional	- Patient Health Questionnaire on Depression (PHQ-9) - 7-Item Generalized Anxiety Disorder (GAD-7)
Robles et al., 2020	Mexico	5,938	7 th April to 7 th May 2020	39.6±11.9	- Physicians - Nurse - Psychologists - Social workers - Paramedics	Cross-sectional	- PTSD Checklist for DSM- 5 - Physician Well-Being Index - 5-item Anxiety Scale from the field study for ICD-11 PHC - SSOM Current Status Assessment Questionnaire (first 8 items) - Patient Health Questionnaire-2 - COVID-19 coping needs of health care workers
Rodante and Bellotti, 2020	Argentina	350	1 st April to 31 st May 2020 (1 st data collection) 1 st July to 31 st August 2020 (2 nd data collection)	38.85±9.6 (23-68)	- Physicians - Nurses - Psychologists - Support personnel - Social workers - Speech therapists - Occupational therapists - Psychopedagogues	Cohort	- Patient Health Questionnaire on Depression (PHQ-9) - Brief Illness Perception Questionnaire (BIPQ) - The Hypochondriasis Yale-Brown Obsessive-Compulsive Scale (H-YBOCS) - State-Trait Anxiety Inventory (STAI)
Samaniego et al., 2020	Paraguay	126	4 th to 28 th April 2020	32.22±8.23 (18-61)	- Physicians - Nurses - Psychologists - Dentists	Cross-sectional	- Patient Health Questionnaire on Depression (PHQ-9) - 7-Item Generalized Anxiety Disorder (GAD-7) - Insomnia severity index (ISI) - 22-item Impact of Event Scale-Revised (IES-R) - Professional Quality of Life: Compassion Satisfaction and Fatigue Subscales (ProQOL – CSF-vIV)
Villalba-Arias et al., 2020	Paraguay	125	April to June 2020	33.8 ± 7.4 (18-65)	- Physicians - Nurses - Biochemist - Obstetricians	Cross-sectional	- Patient Health Questionnaire on Depression (PHQ-9) - 7-Item Generalized Anxiety Disorder (GAD-7) - Post-Traumatic Stress Disorder Check List-C (PCL-C)
Yáñez et al., 2020	Peru	303	10 th April to 2 nd May 2020	From 18 years onwards (no specific)	- Physicians - Nurses	Cross-sectional	

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Table 2 (continued)

Study	Country (n) *	Sample (n)	Period of data collection	Age (years) $\bar{x} \pm SD$ (min-max) average age)	Professional category	Study design	Measurements
					- Pharmacists - Technical workers - Volunteers		- 7-Item Generalized Anxiety Disorder (GAD-7) - K6 Screening scale

Notes. *Only in the studies conducted in two or more countries; ** Medical personnel (physicians and medical residents), administrative personnel (archive, office, and administration personnel), and non-clinical hospital personnel with direct contact with COVID-19 (laboratory, pharmacy, cleaning, kitchen, nutrition, radiology, security, and psychology personnel)

Life and Job Satisfaction Questionnaire; Mamani-Benito et al. (2021) also administered the Professional Self Efficacy Scale (AU-10); Samaniego et al. (2020) used the fourth version of the Professional Quality of Life: Compassion Satisfaction and Fatigue Subscales (ProQOL – CSF-vIV). Robles et al. (2020) used the first eight items from the Somatic Symptoms without Organic or Medical Cause Current Status Assessment Questionnaire (SSOM), the Physician Well-Being Index and PTSD Checklist for DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th ed); Rodante and Bellotti (2020) used Brief Illness Perception Questionnaire (BIPQ) and analyzed hypochondria symptoms through the Hypochondriasis Yale-Brown Obsessive-Compulsive Scale (H-YBOCS); Chávez et al. (2021) administered the Maslach Burnout Inventory (MBI) to investigate burnout symptoms; Villalba-Arias et al. (2020) administered the Post-Traumatic Stress Disorder Check List-C (PCL-C). Chapa-Koloffon G del et al. (2021) only administered the Acute Stress Disorder Scale in their study, while Juárez-García et al. (2021) only administered single items questions for both stress and burnout. Finally, it is important to highlight that Miguel-Puga et al. (2021) used five stress and burnout assessment instruments as follow: (a) the Dissociative Experiences Scale (DES), (b) Resilience Scale, (c) PTSD Symptom Severity Scale-Revised, (d) Stanford Acute Stress Questionnaire, and (e) Burnout Measure.

Instruments directly related to the assessment of COVID-19 aspects were used by four of the selected studies. Chen et al. (2020) administered some questions to assess conspiracy theory specific to COVID-19 as a predictor in mental health of HCWs, whereas administered the scale of Concern for the Transmission of COVID-19 in Health Personnel (EPPC-Cov19). García-Reyna et al. (2020) and Monterrosa-Castro et al. (2020) used the Fear of COVID Scale (FCV-19S) (See Table 2).

3.4. Main outcomes

In general, all studies identified high frequencies of HCWs reporting mental health problems. Out of 12 studies evaluated one or more aspects related to anxiety, and the frequency of participants reporting anxiety ranged from 10.6% in the study conducted by Robles et al. (2020) to 76.5% in the study conducted by Giardino et al. (2020). The following frequencies of individuals reported anxiety in each study: 10.6% (Robles et al., 2020), 32.5% (Chen et al., 2020), 39.2% (Pazmiño Erazo et al., 2021), 39.3% (Monterrosa-Castro et al., 2020), 41.3% (Samaniego et al., 2020), 42.3% (Chávez et al., 2021), 49.9% (Restrepo-Martínez et al., 2021), 54.4% (Villalba-Arias et al., 2020), 74.7% (Juárez-García et al., 2021), and 76.5% (Giardino et al., 2020). Yáñez et al. (2020) completed two data collections in their study, in which 45.4% of all HCWs met the criteria for anxiety disorders first data collection, while 48.3% met criteria for anxiety disorders in the second one. Robles et al. (2020) also identified that 15.6% of their sample presented both anxiety and somatization. Mamani-Benito et al. (2021) also found that concerns about COVID-19 had a greater effect on anxiety ($\beta = 0.77$), whereas Chávez et al. (2021) found that HCWs working at intensive care units and surgery, as well as those with increased work-hours (longer than 12-hour shifts) present a greater risk to develop anxiety symptoms.

Regarding depression, in the study conducted by Giardino et al. (2020), 81% of all participants reported symptoms of depression, while

in the studies conducted by Pazmiño Erazo et al. (2021) it was found among 27.3% of all HCWs. The following frequencies of individuals reported depressive symptoms in each study: 31.3% (Robles et al., 2020), 32.8% (Chávez et al., 2021), 48.8% (Villalba-Arias et al., 2020), 56.9% (Juárez-García et al., 2021), and 59.4% (Restrepo-Martínez et al., 2021). When participants who reported depressive symptoms were evaluated according to the severity of their symptoms, Samaniego et al. (2020) found 41.3% of all HCWs with moderate to severe depressive symptoms, whereas Pazmiño Erazo et al. (2021) found that 35.7% of all participants met criteria for mild depression, 17.5% met the criteria for moderate depression, and 9.8% for severe depression. Likewise, in the study conducted by Guiroy et al. (2021), from 48.5% of participants who reported depressive symptoms, 54.5% met criteria for mild depression, 15.2% met the criteria for moderate depression, and 5.1% for severe depression. Restrepo-Martínez et al. (2021) found that 26% of all HCWs met the criteria for mild, 4.7% for moderate, and 1.7% for severe depressive symptoms. They also found that moderate and severe depressive symptoms were more associated with female gender ($p = 0.005$) and onsite work ($p = 0.005$). Finally, in the study conducted by Rodante and Bellotti (2020), 50.7% of all professionals met the criteria for major depressive disorders in the first data collection while 61.4% met the criteria in the second one, conducted around two months from the first collection, demonstrating an increase in depression among participants throughout the pandemic.

Although stress was investigated by six studies, each of them evaluated different aspects of this variable, using a wide range of instruments (See Table 2). The study conducted by Pazmiño Erazo et al. (2021) classified 19.3% of all the HCWs with severe stress, whereas the study conducted by Juárez-García et al. (2021) identified 46.8% of their sample with stress. Samaniego et al. (2020) identified 38.9% of all HCWs with symptoms of stress, of which 23% presented moderate symptoms and 15.9% presented severe symptoms. In the study conducted by Chapa-Koloffon G del et al. (2021), 88.8% of all participants reported at least nine symptoms of stress.

Regarding burnout symptoms, Juárez-García et al. (2021) found that 49.8% of all participants reported burnout, and Samaniego et al. (2020) identified that 64.3% of their participants reported compassion fatigue. The prevalence of burnout syndrome in the study of Chaves and colleagues Chávez et al. (2021) was 24.1% of the sample. Monterrosa-Castro et al. (2020) identified 64.4% of work-related stress factors, which could be associated with burnout syndrome while Robles et al. (2020) identified 5.4% of all participants with a high risk of burnout. Mamani-Benito et al. (2021) also found that concerns about COVID-19 had a greater effect on stress ($\beta = 0.65$).

PTSD was the focus of four studies: Robles et al. (2020), who identified 29.4% of all participants with PTSD symptoms, Pazmiño Erazo et al. (2021), who identified PTSD symptoms among 43.8% of the participants of their study, and Villalba-Arias et al. (2020) found the prevalence of 7.2%. Additionally, Miguel-Puga et al. (2021) did not report the frequency of participants who met the criteria for any of the disorders investigated, such as depression, anxiety, or stress. However, they identified that pre-existing depression and anxiety symptoms, as well as acute stress or anxiety increase the likelihood to develop PTSD. Finally, it is important to highlight that each study adopted different criteria to classify if their sample were able to or not to meet criteria for

anxiety, depression, or stress.

Regarding sleep problems and insomnia, all studies which investigated those variables identified an overall bad quality of sleep in most participants. Pazmiño Erazo et al. (2021) identified 16.3% of the sample with insomnia, of which 38.6% presented mild symptoms, 15.0% presented moderated symptoms and 1.4% presented severe symptoms. Similarly, in the study of Giardino et al. (2020), 84.7% of all participants reported poor quality of sleep, 73.7% reported insomnia, and 58.9% reported nightmares during the pandemic. Likewise, Restrepo-Martínez et al. (2021) found that 25.7% of all women and 19.8% of all men of their sample presented sleep problems and insomnia.

Out of three studies investigated COVID-19 aspects related to mental health, such as fears and concerns (Monterrosa-Castro et al., 2020, García-Reyna et al., 2020, Mamani-Benito et al., 2021). Mamani-Benito et al. (2021) found that concerns related to COVID-19 impact both anxiety and depression, which might increase psychological discomfort. On the other hand, they also found that concerns related to COVID-19 had a minimal impact on professional self-efficacy. García-Reyna et al. (2020) found similar outcomes, associating fear of COVID-19 with either depression or anxiety. They also identified higher levels of fear among administrative staff than both nursery and medical personnel. Monterrosa-Castro et al. (2020) study, 98% of those participants with generalized anxiety disorder symptoms also were being afraid of losing life because of COVID-19.

3.5. Quality and risk assessment

The quality and risk assessments of studies included in the present review ranged from 55.2% to 90.0%. The average value was 76.8%. The inter-rater reliability was $K = 0.88$ ($SD = 0.01$, $p < 0.001$ [$95\% CI = 0.84, 0.92$]). The final quality and risk assessment ratings could be seen in Table 3.

4. Discussion

The main findings of the present study support studies published before the COVID-19 pandemic, reporting that the mental health of HCWs was poorer than the mental health of general population. However, the situation had worsened during the first year of COVID-19, particularly in Latin American countries, such as Colombia, Ecuador, Argentina, Peru, Paraguay, Chile, and Mexico. According to studies included in the review, frequent factors that affected the mental health of HCWs during this period were anxiety, stress, fatigue, depression, and burnout. One of the variables that were reported in the studies was the capacity of public healthcare systems to treat patients with COVID-19. Given the imminent collapse of the health systems throughout Latin America, it had been necessary to increase the number of healthcare workers and maximize their service capacity (Burki, 2020, East et al., 2020). There is broad consensus that these professionals, while responding to social changes and emotional stressors, also faced an increased risk of exposure to illness, extreme workloads, moral dilemmas (World Health Organization (WHO), International Labour Organization 2021), violence, and stigmatization (Taylor, 2020, García-Reyna et al., 2020).

As indicated by Monterrosa-Castro et al. (2020), in the first stages of epidemics, fear and anxiety were present as unconscious mechanisms of survival and defense against the attacks of infectious agents. According to García-Reyna et al. (2020) and Juárez-García et al. (2021), the most common fear reported by HCWs during the beginning of the pandemic was related to get infected by the virus and/or carry the virus home. Later, those mechanisms became pathological, affecting their general well-being and their ability to make decisions. Situations like the COVID-19 pandemic could impact their ability to provide adequate treatment and care and to be part of frontline working, compromising their well-being and quality of life (Silarova et al., 2015). A recent systematic review and meta-analysis aiming to estimate fear of COVID-19

Table 3
Quality and risk assessment for each item according to STROBE checklist.

Study	1a	1b	2	3	4	5	6a	6b	7	8	9	10	11	12a	12b	12c	12d	13a	13b	13c	14a	14b	14c	15	16a	16b	16c	17	18	19	20	21	22	(%)	
Chapa-Kolofón G del et al., 2021	1	1	1	1	1	1	1	0	X	1	1	0	0	1	1	0	X	0	X	X	1	0	X	1	0	X	X	1	1	1	1	1	1	1	57.7
Chávez et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	0	0	X	0	X	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	65.5
Chen et al., 2020	1	1	1	1	1	1	1	1	X	1	1	1	1	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	71.4
García-Reyna et al., 2020	1	1	1	1	1	1	1	1	X	1	1	1	1	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	89.7
Giardino et al., 2020	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	90.0
Guiroy et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	62.1
Juárez-García et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	82.8
Mamani-Benito et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	86.2
Miguel-Puga et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	80.0
Monterrosa-Castro et al., 2020	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	86.2
Pazmiño Erazo et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	82.8
Restrepo-Martínez et al., 2021	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	89.7
Robles et al., 2020	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	80.0
Rodante and Bellotti, 2020	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	80.0
Samaniego et al., 2020	0	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	72.4
Villalba-Arias et al., 2020	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	55.2
Yáñez et al., 2020	1	1	1	1	1	1	1	1	X	1	1	0	0	1	1	1	0	X	0	X	1	0	X	1	1	X	X	1	1	1	1	1	1	1	79.3

Note. STROBE checklist for cohort, case-control, and cross-sectional studies (combined) (to see the full checklist: <https://www.strobe-statement.org/index.php?id=available-checklists>)

worldwide found that the average mean in FCV-19S among the general population was 18.57 (Luo et al., 2021), while the average mean by García-Reyna et al. (2020) was 19.3. A similar study conducted among HCWs in the Philippines found a higher score (19.92).

Additionally, it is important to highlight the stigmatization suffered by HCWs in some areas, as reported by García-Reyna et al. (2020), in Mexico, and by Mamani-Benito et al. (2021), in Peru, which could deeply impact their mental health. In the same direction, we found that some studies identified that pre-existing anxiety, depression, or stress disorders could have contributed to the presentation of more severe mental health symptoms as well as the development of mental disorders among those professionals. In a study conducted among Mexican HCWs, the development of PTSD was related to pre-existing anxiety, depression, and acute stress and pre-existing resilience skills could be understood as protective factors to minimize the development of this disorder (Chapa-Koloffon G del et al., 2021). Several studies record PTSD symptoms related to a high degree of anxiety and depression, as well as exhaustion among HCWs (Miguel-Puga et al., 2021, Robles et al., 2020, Johnson et al., 2020, Marvaldi et al., 2021, Carmassi et al., 2020).

According to Walton et al. (2020), mental health disorders have negative impacts not only on HCWs but also on patients and the entire population. We can reaffirm that the negative influence of these disorders during a peak of inpatient admissions at COVID-19 may contribute to the development of PTSD symptoms in frontline HCWs (Miguel-Puga et al., 2021). Similar outcomes were identified by Maiorano et al. (2020), who reported the protective role of resilience skills and behaviors as a prevention to the development of mental disorders, in particular PTSD. According to Blekas et al. (2020), HCWs that reported higher levels of negative mental health symptoms, such as insomnia, depression, and anxiety, were more likely to present PTSD in comparison with those who did not report those symptoms. Restrepo-Martínez et al. (2021) also found that HCWs who presented moderate to severe levels of either depression or anxiety during COVID-19 were more likely to report appetite problems, sleep problems, and suicide ideation. In their study, 6.4% of all women and 6.6% of all men who presented moderate to severe levels of either depression or anxiety reported suicidal ideation.

When sociodemographic variables were taken into account, significant correlations were identified in each of the studies reviewed. In general, gender and age were identified as risk factors either to develop mental disorders or present worsened mental health outcomes. In the study conducted by Chapa-Koloffon G del et al. (2021), younger and female professionals were more likely to develop PTSD in comparison with male participants from the same sample. Similarly, the study conducted by Guiroy et al. (2021) identified higher levels of depression, anxiety, and hypochondria among women in comparison to men, as well as lower age as a significant predictor in the development of this disorder. According to them, higher rates of depression during the COVID-19 pandemic were associated with lower age professionals and the female gender. Similar outcomes were found by Samaniego et al. (2020), who found higher distress, anxiety, and depressive symptoms among younger HCWs. However, it is important to noteworthy that the study conducted by Guiroy et al. (2021) investigated only spine surgeons and administered a single instrument, which could be a limitation in further analysis. Additionally, the latter study did not mention if the professionals were directly involved in the treatment of COVID-19 patients during the first outbreak or when the pandemic worsened in the region.

Furthermore, the fact of being a woman is another factor associated with the presence of mental disorders, as shown by Chapa-Koloffon G del et al. (2021) and Guiroy et al. (2021), and found in systematic reviews and meta-analysis including HCWs worldwide (Sun et al., 2021, Ghahramani et al., 2021). This is a concern, as more than 70% of HCWs, including those who work in healthcare institutions are women, and even so, the inequality between them and male professionals is enormous (Boniol et al., 2019). In Argentina, for example, female HCWs were more likely to work overtime in comparison with their male

colleagues, regardless of the salary difference. Additionally, it is important to highlight that in the context of the pandemic, female HCWs are exposed to countless forms of violence in their workplace, on the street, and even in their own homes due to stigmatization and unsympathetic reactions driven by the fear of COVID-19 (East et al., 2020). On the other hand, only Chávez et al. (2021) found in their study that being a man would be a significant risk factor for anxiety. However, they presented a small sample size, as well as a convenience sample, which were limitations of their study and do not allow the generalizability of their outcomes. Despite being the most important force of action in the healthcare system around the world, female HCWs are at a great disadvantage both in terms of their physical and mental health, as well as their social and economic well-being. Our outcomes in the present review show that their reality is not different among Latin American countries, as reported by different studies included in this current review.

Additionally, both psychosocial and demographic factors have also been associated with a greater number of mental disorders, such as anxiety disorder. In Colombia, four of ten clinical profiles present symptoms of anxiety (Monterrosa-Castro et al., 2020). According to a recent meta-analysis including 19 studies worldwide, the average prevalence of GAD was 32% among HCWs, lower than found in most studies included in this review (Adibi et al., 2021). The most common factors associated with poorer mental health outcomes were long working shifts, fear of being exposed or infected by COVID-19, unavailability of PPE, patient demands, lack of effective treatment against COVID-19, death of colleagues after exposure to COVID-19, social distancing, and isolation from their loved. Similar outcomes were found in different countries, such as the United Kingdom, as reported by Greene et al. (2021).

However, due to the lack of resources and the limited number of HCWs, we could hypothesize that the situation is worse throughout Latin American countries. García-Reyna et al. (2020) found lower fear of COVID-19 scores in the general Italian population in comparison with Mexican HCWs, which could indicate the role of fear among the latter group during the pandemic. In addition, the number of HCWs who died of COVID-19 is greater in Latin America in comparison to the rest of the world. According to Agren (2020), by August 2020 Mexico led the rank of HCWs who died from COVID-19. Out of 55.8% of all HCWs in Mexico had lost a family member, a colleague, or a close person to the disease, which might affect their mental health, increase their fear, and the risk to develop mental disorders, such as PTSD, or even commit suicide (Juárez-García et al., 2021). A recent meta-analysis showed that fear of COVID-19 among HCWs was strongly associated with anxiety, traumatic stress, and distress and moderately associated with depression and stress (Şimşir et al., 2021).

Regarding burnout outcomes among HCWs, we might conclude based on studies we included in the current review that they were related to some variables such as long working hours, and both insomnia and stress symptoms. The collapse of healthcare systems throughout Latin American countries might have played a fundamental role in the deterioration of the physical and emotional well-being of HCWs. According to the United Nations report named *The Impact of Covid-19 in Latin America and The Caribbean*, the region faced situations that have exposed and worsened deficiencies of both social protection and public healthcare systems (Nations, 2020). Burnout has been associated with different factors according to the income of each country. In this context, limited access to PEP, lack of support from healthcare authorities, as well as life and death decisions due to the shortage of medical supplies, might be a trigger for burnout among HCWs in Latin America during COVID-19 crises (Morgantini et al., 2020, Delgado et al., 2020). Furthermore, symptoms of PTSD appear to be greater according to the geographical location of action of HCWs and the distance from the epicenters of the pandemic in each country or region. Both Yáñez et al. (2020) and Miguel-Puga et al. (2021) identified an association between both factors in their studies.

Although differences in mental health outcomes of HCWs were clear among studies included in the current review, it is not possible to compare them directly due to the fact that studies were different in their methods. Additionally, HCWs categories were very dissimilar across studies and, in some of them, all categories were grouped together in their analysis. In those studies, it is not possible to compare different HCWs categories regarding their mental health outcomes. When fear of COVID-19 was taken into account, [García-Reyna et al. \(2020\)](#) found that administrative personnel working in hospital settings presented higher levels of fear of COVID-19 than both nursery and medical personnel. [Yáñez et al. \(2020\)](#) found that those professionals working closer to COVID-19 epicenters presented higher levels of anxiety and depression than those working far from it.

Regarding the quality and risk assessment, it was only descriptive. There was no inclusion or exclusion criteria related for acceptance of the studies, and eligible studies were included in the final review. The average value was 76.8%, demonstrated that most of the articles followed most of good practices in the reporting of studies. However, some points should be mentioned, such as the fact that most of studies did not describe how sample size was calculated, how missing data were addressed, and analytical methods taking in account sampling strategies. One possible explanation is the fact that those studies were conducted mostly based on online surveys, with convenience samples.

We consider this study of valuable academic relevance as it is the first of its kind. A review might be appropriate because it is a broader method in comparison with other studies that also focus on the mental health of HCWs in Latin American. An important point to clarify is the deliberate exclusion of Brazil in this review. Although it could be considered a limitation, it would be very difficult to fit the study to the reality of a continental country that, in addition to having a linguistic, cultural, and demographic difference, also has a universal public healthcare system that is different from healthcare systems of other Latin-American countries. In a rapid search, the number of studies conducted in Brazil during the first year of the COVID-19 pandemic was larger than the number of studies conducted throughout all Spanish-speakers' countries of Latin America. In addition, the country has been experiencing an overwhelming political crisis since the beginning of the pandemic. Finally, it is important to noteworthy that quarantines and effective closure measures were not implemented widely in Brazil as a national health policy to cope with COVID-19 crises, contrasting with most Spanish-speakers countries of Latin America, which implemented this measure. The absence of effective measures to prevent and minimize the infection led the country to a rapid increase in the number of infections and deaths. With this, it is not our intention to express that the rest of Latin America acted in better ways to confront the COVID-19 pandemic, simply the political reality of this country has been more difficult to handle than in the rest of Latin America during this period of emergency health. Considering that different countries and regions worldwide adopted distinctive strategies against COVID-19, might be interesting to conduct future reviews comparing the mental health of HCW from different regions, as well as how different approaches to the pandemic worldwide impact the mental health of HCWs.

Another important point is that our review focused only on studies published during the first year of the pandemic, from March 2020, when the first case was reported in the region, to March 2021, when most of the countries in the region were starting their massive vaccination campaigns. Our focus was to assess scientific production during the first year of the pandemic, demonstrating the fragility of mental health of HCWs in Latin America in the face of the first large wave of COVID-19, at a time when uncertainty had still prevailed, and the world was waiting for an effective vaccine and treatment against COVID-19, which was still under development.

This review identified mental health outcomes of HCWs from Mexico, Argentina, Ecuador, Peru, Colombia, Paraguay, and Chile, showing high levels of anxiety, depression, and PTSD during the first year of the COVID-19 pandemic in their population. Particularly,

depression symptoms might get worse over time, from mild to moderate, or even to severe. In this context, stress related to work, with long working hours, the limited availability of PPE, inefficient routine bio-security protocols, and poor sleep quality are variables that could be related to higher psychological distress and might contribute to the increased depression among HCWs ([World Health Organization \(WHO\), International Labour Organization 2021](#)). We can also affirm that there would be an association between the presence of anxiety and depression symptoms as risk factors for the development of PTSD in the long term. Both depression and anxiety could also be impacted by concerns and fear of COVID-19, showing the effects of the disease on mental health of HCWs ([García-Reyna et al., 2020](#), [Mamani-Benito et al., 2021](#)).

The most relevant factors associated with the presence of mental disorders are, according to our review, the professional specialty of the HCWs, age, and gender. We also identified that the mental health of HCWs worsened according to the distance from the epicenter of the pandemic. In general, increased levels of GAD prevailed in more populated cities, where the level of contagion was higher, and the demand for hospital service exceeded the capacity of the healthcare systems ([Yáñez et al., 2020](#)). These findings allow us to understand the need for early mental health screening in HCW during periods of public health emergencies and highlight the importance of timely psychosocial interventions directed for those individuals. It is fundamental to change the perception of COVID-19 through psychological interventions and adaptation strategies to different scenarios, aiming to reduce symptoms associated with mental disorders. Therefore, we conclude that it is essential to know the epidemiological behavior of each mental disorder and the variables associated with the increase in its incidence among HCW, in particular in Spanish-speakers Latin-American countries.

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Data availability

Relevant data will be made available for sharing upon request to the authors.

CRediT authorship contribution statement

Kimberly Massiel Rosales Vaca: Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Oscar Ivan Cruz Barrientos:** Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Samara Girón López:** Data curation, Formal analysis. **Sayra Noriega:** Data curation, Formal analysis. **Adriana More Arias:** Data curation, Formal analysis. **Suzana Maria Menezes Guariente:** Data curation, Formal analysis, Writing – original draft. **Robson Zazula:** Project administration, Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Supervision, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.psychres.2022.114501](https://doi.org/10.1016/j.psychres.2022.114501).

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