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## **COVID-19 y la salud mental de los profesionales de la kinesiología: una revisión sistemática**

## **COVID-19 and mental health of kinesiology professionals: a systematic review**

## **COVID-19 e saúde mental dos profissionais de cinesiologia: uma revisão sistemática**

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### **RESUMEN**

El Covid-19 afectó a la salud mental de los kinesiólogos debido a la sobrecarga de trabajo, la toma de decisiones cruciales y la exposición continua al virus. El objetivo de esta revisión sistemática fue sintetizar las pruebas de Covid-19 sobre la salud mental en kinesiólogos. Se utilizó PRISMA y 4 bases de datos (Pubmed, Scopus, CINAHL y WOS), se seleccionaron estudios observacionales, que evaluaron la ansiedad, depresión, burnout, estrés y estrés postraumático en profesionales de la kinesiología durante Covid-19. Se realizó una valoración crítica de la lista de verificación de valoración crítica del JBI. Los 17 estudios incluidos mostraron estadios de leves a graves para la ansiedad ( $n = 11$ ), alta prevalencia de síntomas depresivos ( $n = 13$ ) y efectos sobre el burnout, el estrés y el estrés postraumático. Factores como la convivencia con niños, la disminución de ingresos y la exposición continuada al virus se observan como factores agravantes. Se deben promover acciones para proteger la salud mental de los kinesiólogos, considerando los efectos post pandémicos y generando estrategias de prevención frente a las altas demandas de salud.

PROSPERO ID: CRD42024518069.

**Palabras clave:** ansiedad; burnout; depresión; fisioterapia; estrés.

### **ABSTRACT**

Covid-19 affected their mental health of kinesiologists through work overload, crucial decision making, and continuous exposure to the virus. The aim of this systematic review was to synthesize the evidence of Covid-19 on

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## Soto-Schulz et al.

mental health in kinesiologists. We used PRISMA and 4 databases (Pubmed, Scopus, CINAHL and WOS), selected observational studies, which evaluated anxiety, depression, burnout, stress and post-traumatic stress in kinesiology professionals during Covid-19. Critical appraisal of the JBI's Critical Appraisal Checklist was performed. The 17 included studies showed mild to severe stages for anxiety (n = 11), high prevalence of depressive symptoms (n = 13) and effects on burnout, stress and post-traumatic stress. Factors such as living with children, decreased income and continuous exposure to the virus are observed as aggravating factors. Actions should be promoted to protect the mental health of kinesiologists, considering the post-pandemic effects and generating prevention strategies in the face of high health demands.

PROSPERO ID: CRD42024518069

**Keywords:** anxiety; burnout; depression; physiotherapy; stress.

## RESUMO

A Covid-19 afetou a saúde mental dos cinesiologistas devido à sobrecarga de trabalho, à tomada de decisões cruciais e à exposição contínua ao vírus. O objetivo desta revisão sistemática foi sintetizar as evidências da Covid-19 sobre a saúde mental dos cinesiologistas. Usamos o PRISMA e quatro bancos de dados (Pubmed, Scopus, CINAHL e WOS), selecionamos estudos observacionais que avaliaram ansiedade, depressão, esgotamento, estresse e estresse pós-traumático em profissionais de cinesiologia durante a Covid-19. Foi realizada uma avaliação crítica da Lista de Verificação de Avaliação Crítica do JBI. Os 17 estudos incluídos mostraram estágios leves a graves de ansiedade (n = 11), alta prevalência de sintomas depressivos (n = 13) e efeitos sobre o esgotamento, o estresse e o estresse pós-traumático. Fatores como viver com crianças, renda reduzida e exposição contínua ao vírus são observados como fatores agravantes. Devem ser promovidas ações para proteger a saúde mental dos cinesiologistas, considerando os efeitos pós-pandêmicos e gerando estratégias de prevenção diante das altas demandas de saúde.

PROSPERO ID: CRD42024518069

**Palavras chave:** ansiedade; burnout; depressão; fisioterapia; estresse.

## INTRODUCTION

In 2019, the COVID-19 pandemic had a significant impact on society, causing an unprecedented global health crisis, with more than 676 million individuals infected and millions of deaths worldwide (Johns Hopkins Coronavirus Resource Center, 2023). This situation put enormous pressure on healthcare systems and, in particular, on healthcare professionals and physiotherapists, resulting in significant work overload (Traoré et al., 2023; Ulfa et al., 2022). During this period, the average number of physiotherapists increased significantly in order to respond to the care of infected users. For example, in Chile, despite the high availability of physiotherapists in Intensive Care Units, the presence of specialists in intensive, respiratory or cardiovascular physiotherapy remains limited. Therefore, one of the solutions was the continuous training courses in critical care during the pandemic, since the presence of physiotherapists in intensive care units increased significantly (González-Seguel et al., 2020).

At the health systems level, the pandemic highlighted the deficits in the capacity of health systems to adequately meet the health needs of the population, as well as the exposure of professionals to high workloads and significant psychological demands resulting from this crisis (Juarez García, 2020). During this period, physical therapists also experienced significant repercussions in their lives, such as fear of exposure to the virus, abrupt changes in their work environment, additional workloads and the responsibility of making crucial decisions, generating a considerable emotional impact, manifested in disorders such as anxiety, stress and depression (Conesa, 2021). The COVID-19 pandemic had significant effects on physical therapists: 32.3% reported symptoms of anxiety and 18.5% reported symptoms of depression (Conesa, 2021), without taking into account the fear of contracting the virus, work stress and various factors that affect the mental health of these professionals.

## COVID-19 mental health kinesiology systematic review

Mental health is defined as a state of emotional, psychological and social well-being (World Health Organization, 2018). It encompasses how people think, feel and act, playing a crucial role in quality of life. This concept can affect the ability to manage stress, make decisions and relate to others. During the COVID-19 pandemic, mental health problems among healthcare personnel, especially physiotherapists, increased dramatically due to the growing demand for their services in various areas, which impacted both their physical and psychological well-being. A study in Chile involving 125 healthcare workers aged 18-67 years found that women in this sector had a higher prevalence of mental health problems such as depression compared with men (Urzúa et al., 2020). This is consistent with the findings of Bettinsoli et al. (2020), who observed higher levels of emotional distress, separation anxiety and self-efficacy in women health professionals compared to men; although men experienced a deterioration in their psychological well-being, it was lower than that of women.

To date, systematic reviews provide useful information on the factors that predispose healthcare professionals to a higher incidence of mental health problems, indicating that women are more prone to higher levels of anxiety, burnout, and depression. In addition, professionals with children and families showed higher levels of distress and anxiety when dealing with COVID-19 patients (Bohórquez-Blanco et al., 2022). However, these studies focused mainly on physicians and nurses, which highlights the need to investigate the effects of the pandemic on mental health in other specialists, such as physical therapists. These professionals also had direct contact with patients with COVID-19, so it is important to investigate how the pandemic affected their mental health during this critical period.

Based on the above, the objective of this study is to synthesize the evidence evaluating the effects of the COVID-19 pandemic on the mental health of physical therapists. Conducting this review will allow us to gather information that underscores the importance of mental health, especially in high-demand professional contexts, supporting expert opinions on the need to establish occupational health policies (Chirico et al., 2021; Restauri & Sheridan, 2020) and promote healthier coping strategies through continuous professional development, the promotion of self-care and the adjustment of the organizational culture towards better teamwork and mutual support practices.

## MATERIAL AND METHODS

The study design was a Systematic Literature Review, following the guidelines of the PRISMA (Preferred Reporting Items for Systematic Reviews and MetaAnalyses) guide (Page et al., 2021). The protocol was registered at PROSPERO ID: CRD42024518069.

### *Eligibility Criteria*

To establish the eligibility criteria, the question framework PECOD (Patient/population/problem, exposure, comparison, outcome, duration/design) (Dawes et al., 2007) was used and the inclusion and exclusion criteria established in Table 1 were taken into account to answer the question: What were the effects of the COVID-19 pandemic on the mental health of kinesiology professionals?

**Table 1**

*Eligibility criteria by PECOD.*

	Inclusion	Exclusion
Patient/population/problem	Kinesiology professionals regardless of the country.	Professions not homologated to what is understood by kinesiology. Not having been exposed for reasons of sick leave or unemployment.
Exposition	Work situations related to COVID-19.	
Comparator	Absence of a control group or groups of professionals who did not suffer the effects of COVID-19.	Control groups of other professionals such as physicians, administrative personnel, among others that do not separate the data from the kinesiology professional.
Outcome	Mental health variables such as anxiety, depression, burnout, stress and post-traumatic stress.	Evaluations performed with non-validated tools.
Design	Observational studies, either cross-sectional or longitudinal.	Studies of protocols or congresses that do not show results.

Studies that met all inclusion and exclusion criteria were grouped according to mental health variables, differentiating the analysis according to anxiety, depression, burnout, stress and post-traumatic stress.

*Sources of information*

Identification of studies was performed by three authors (hereafter X will be used instead of the authors' abbreviations to ensure blinded review) and reviewed by two authors (X) independently. Four databases (Pubmed, Scopus, Web of Science, and CINAHL) were searched until February 27, 2024 without date or language restriction. In addition, references of similar articles were reviewed for potentially eligible studies. This was followed by an update of the review on 21 June 2025 at the request of the reviewers.

*Search strategy*

The search is presented in Table 2.

**Table 2**

*Search strategy.*

Databases	Strategy
Pubmed	((("physiotherapist*"[Title/Abstract]) OR ("physical therapist*"[Title/Abstract])) OR ("kinesiology"[Title/Abstract])) AND ((("covid-19 pandemic"[Title/Abstract]) OR ("covid-19"[Title/Abstract]))) AND (((("mental health"[Title/Abstract]) OR ("mental hygiene"[Title/Abstract])) OR ("hygiene mental"[Title/Abstract])) OR (anxiety[Title/Abstract])) OR (depression[Title/Abstract]))
Scopus	((TITLE-ABS("physiotherapist*")) OR (TITLE-ABS("physical therapist*")) OR (TITLE-ABS("kinesiology")))) AND ((TITLE-ABS("covid-19 pandemic")) OR (TITLE-ABS("covid-19")))) AND ((TITLE-ABS("mental health")) OR (TITLE-ABS("mental hygiene")) OR (TITLE-ABS("hygiene mental")) OR (TITLE-ABS(anxiety)) OR (TITLE-ABS(depression))))
Web of Science	(TS=(“physiotherapist*”) OR TS=(“physical therapist*”) OR TS=(“kinesiology”)) AND (TS=(“covid-19 pandemic”) OR TS=(“covid-19”)) AND (TS=(“mental health”) OR TS=(“mental hygiene”) OR TS=(“hygiene mental”) OR TS=(“anxiety”) OR TS=(“depression”))
CINAHL	(AB “physiotherapist*” OR AB “physical therapist*” OR AB “kinesiology”) AND (AB “covid-19 pandemic” OR AB “covid-19”) AND AB (“mental health” OR AB “mental hygiene” OR AB “hygiene mental” OR AB anxiety OR AB depression)

## COVID-19 mental health kinesiology systematic review

### *Selection process*

Once the records were identified, they were exported to the Rayyan.ai platform to perform the complete review process, including the automated filter and keyword search allowed by the software. First, duplicate studies were detected and excluded. Subsequently, two independent reviewers (D.A. and J.L.) screened studies, applying the eligibility criteria to the title and abstracts, and then reviewed the full text. Discrepancies were resolved by a third reviewer (C.G.) In turn, two authors (K.S.-S. and N.P.-R.) reviewed and updated the search performed.

### *Data extraction process*

The final synthesis was carried out by three authors (D.A., C.G. and J.L.) who extracted the data from the studies independently using tables that were transferred to the final document. These data were reviewed and updated by two other authors (K.S.-S. and N.P.-R.). Studies and unavailable data were requested from the respective authors by e-mail addressed to the corresponding author, giving a deadline of 2 weeks, contacting a maximum of 2 times.

### *Items and synthesis*

From the selected studies, data extraction was performed in a table that includes the following items: reference; country; type of design; sample size and characteristics (total number of final participants, gender and number of persons according to gender, mean age and its respective standard deviation); mental health variables assessed; measurement instrument; area of action and effects on mental health (through the comparison between mean score and standard deviation pre-pandemic and post-pandemic in the case of having that information and through the mean and standard deviation of the assessment performed or percentage in the case of cross-sectional studies); main conclusions.

### *Assessment of the risk of bias of the study*

The risk of bias assessment was performed using the JBI critical appraisal (Munn et al., 2022). This tool includes eight questions to assess the risk of bias in cross-sectional studies. Each domain is assessed as “yes,” “no,” “unclear,” or “no information.” A general domain is then assessed as “included,” “excluded,” or “more information.” However, no studies were excluded, as the assessment was performed to increase transparency and take it into account in the analysis of the results, so all studies meeting the eligibility criteria, regardless of their methodological quality, will be considered in the qualitative synthesis.

The data were presented in a table after analysis in Microsoft Excel. One author performed the analysis (K.S.-S.) and then a second author reviewed it (N.P.-R.). Every effort was made to avoid publication bias by searching different databases and various information sources, as well as using JBI Critical Appraisal (Munn et al., 2022). In addition, the results were analyzed cautiously, considering this risk of bias.

### *Effect sizes*

Although not originally included in the study protocol, an additional analysis of effect sizes was incorporated following the reviewers' recommendation, with the aim of enhancing the interpretation of the findings. Odds ratios (ORs), unstandardized regression coefficients (B), and standardized betas reported in the included studies were extracted and summarized, focusing on associations between sociodemographic or occupational factors (e.g., gender, having children, current practice setting, and COVID-19-related work exposure) and psychological outcomes previously included in the study.

## RESULTS

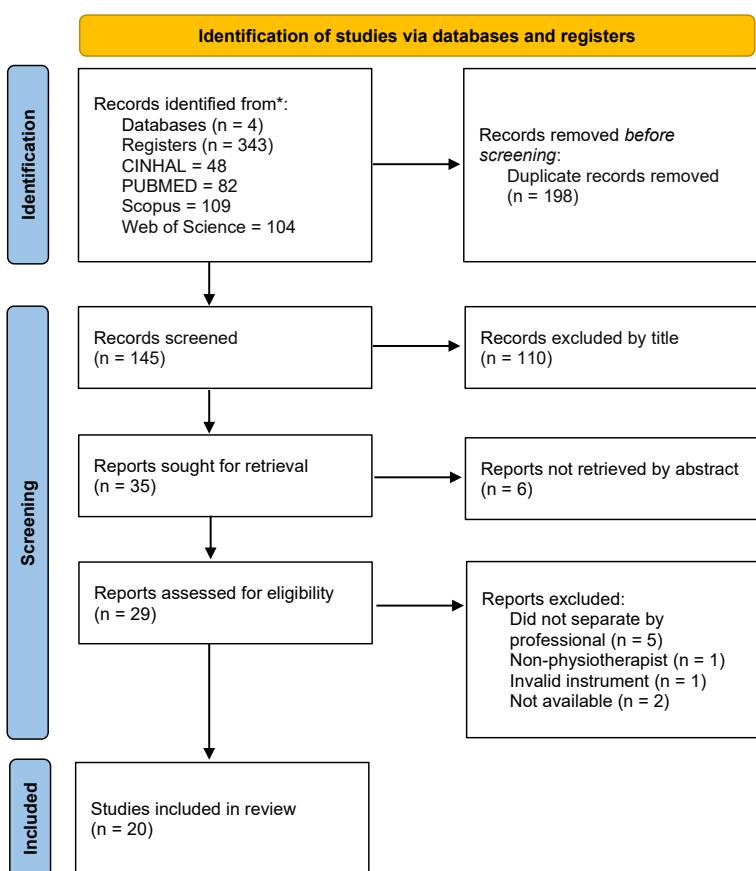
### *Selection of studies*

The latest search and update of the revision resulted in 343 potential records were found. After applying the inclusion and exclusion criteria, the number of records was reduced to 145. Subsequently, an evaluation by title and abstract was performed, resulting in the exclusion of 116 records. Of the remaining 35 records, 29 were selected for

a full eligibility assessment, eliminating 3 of them because they did not separate data from the different professions (Alnaser et al., 2022; Aly et al., 2021; Campoy Aranda et al., 2024; Elkhawaga et al., 2024; Jow et al., 2023), 1 because there were no physical therapists (Osório et al., 2021), 1 because it did not have a valid assessment (Moura et al., 2023) and 2 of them because they were not available (Ghogare et al., 2022; Sica et al., 2023). Finally, a total of 20 studies were included in the systematic review.

**Figure 1**

*Study selection by PRISMA.*



#### *Characteristics of the studies*

All the selected studies were cross-sectional studies; however, two of them performed the measurements in two annual periods so that, although they were declared as cross-sectional, they were considered cohort studies. According to the countries of origin the studies were conducted in the continents of Europe (n = 7; 35%), South America (n = 4; 20%), Asia (n = 6; 30%), Africa (n = 2; 10%) and North America (n = 1; 5%). Of the total, 2617 were female and 1014 were male, except for two studies that did not detail gender. Ages ranged from 20 to 65 years, with the most common range being 30 to 40 years.

Taking all studies into account, the total sample was 3943, of which, according to study designation, 1069 were physical therapists and 2874 were physiotherapists. As for the participants, all were professional physiotherapists working in a variety of settings and specialties, including public, private and university hospitals, as well as intensive care units, oncology, outpatient clinics, among others, as detailed in Table 3.

## COVID-19 mental health kinesiology systematic review

In relation to the variables evaluated, anxiety, depression, burnout, stress and post-traumatic stress were mainly measured. For this purpose, tools such as the Perceived Stress Scale (PSS-10) (n = 11) and the Work Stress Assessment Questionnaire (SWAQ) (n = 1) was used to assess stress. The Secondary Traumatic Stress (STS) subscale of the Professional Quality of Life Questionnaire (ProQOL) (n = 1), the Posttraumatic Stress Disorder Checklist - Specific (PCL-S) (n = 1) and the Impact of Event Scale - Revised (IES-R) were used to assess posttraumatic stress (n = 2). Moreover, the Generalized Anxiety Disorder - 7 (GAD-7) (n = 5), the Korean Occupational Stress Scored Short Form (KOSS-SF) (n = 1) and the State-Trait Anxiety Inventory (STAI) (n = 1) were used to assess anxiety, the Beck Depression Inventory (BDI) (n = 2) and the Korean Center for Epidemiologic Studies Depression Scale-Revised (K-CESD-R) (n = 1) to assess depression, and the Patient Health Questionnaire - 9 (PHQ-9) (n = 6), the Depression, Anxiety and Stress Scale - 21 (DASS-21) (n = 4) and the Hospital Anxiety and Depression Scale (HADS) (n = 2) to measure both variables. Finally, the Burnout subscale (BO) of the Professional Quality of Life Questionnaire (ProQOL) (n = 1) and the Maslach Burnout Scale (BMS) (n = 1), the Maslach Burnout Inventory (MBI) (n = 2) and the Oldenburg Burnout Inventory (OLBI) (n = 1) were used to assess burnout.

### Stress

In a total of 5 studies reviewed (Chatzitofis et al., 2021; Gołuchowska et al., 2024; Haezebrouck & Yorke, 2023; Ibrahim et al., 2024; Pigati et al., 2022), between 9% and 11% of participants obtained scores exceeding the cut-off point for posttraumatic stress according to IES-R and PCL-S. For this same variable, higher levels were found in 2020 than in 2018 (Haezebrouck & Yorke, 2023), as well as those with lower resilience and those who worked in COVID-19 units (Pigati et al., 2022).

Regarding perceived stress, of 7 studies reviewed (Chatzitofis et al., 2021; Jácome et al., 2021; Lee et al., 2024; Mont'Alverne et al., 2023; Pigati et al., 2022; Valizadeh et al., 2023; Wojtowicz & Kowalska, 2023), one found a 54.8% prevalence of severe or very severe stress (Valizadeh et al., 2023). Mean stress scores ranged from 6 to 18 overall, dropping to 3 when considering physical therapists who did not work with COVID-19 directly (Pigati et al., 2022) and those who did not work directly with patients (Jácome et al., 2021). In addition, statistically significant and higher levels were found pre COVID-19 than during the pandemic for both perceived stress and occupational stress (Wojtowicz & Kowalska, 2023). In the case of Gołuchowska et al. (2024), the original table presents two sets of frequencies for "perceived stress level (0–5) due to COVID-19 risk," but the column headers do not clearly differentiate whether the values refer to personal risk or concern for loved ones. Both sets were included here for transparency, despite the ambiguous labeling in the original publication.

### Anxiety

A total of 12 included studies assessed anxiety (Abdulghani et al., 2022; Capellini et al., 2023; Chatzitofis et al., 2021; Hassem et al., 2022; Ibrahim et al., 2024; Jácome et al., 2021; Mohammed et al., 2024; Mont'Alverne et al., 2023; Pigati et al., 2022; Sinha et al., 2021; Szwamel et al., 2022; Yang et al., 2021). The prevalence of anxiety symptoms varied according to 4 studies (Abdulghani et al., 2022; Capellini et al., 2023; Ibrahim et al., 2024; Sinha et al., 2021) ranging from 3.9% to 28.8% of participants for severe anxiety, between 8.5% and 26.2% for moderate, between 25.4% and 51.8% for mild, and between 21.1% and 61.2% had no anxiety symptoms according to the cutoff points. Mean anxiety scores varied with a mean of 9 for GAD-7 and between 2 and 3.9 for DASS-21. Finally, those with lower resilience and those who worked in front of COVID-19 had higher levels of anxious symptoms (Hassem et al., 2022; Pigati et al., 2022).

### Depression

Assessment of depressive symptoms was conducted in 15 studies (Abdulghani et al., 2022; Aydin & Atıç, 2023; Capellini et al., 2023; Chatzitofis et al., 2021; Hassem et al., 2022; Ibrahim et al., 2024; Jácome et al., 2021; Lee et al., 2024; Mohammed et al., 2024; Mont'Alverne et al., 2023; Pigati et al., 2022; Sinha et al., 2021; Szwamel et al., 2022; Valizadeh et al., 2023; Vispute & Kumar, 2021; Yang et al., 2021). Severity ranged from 2.1% to 43.7% of participants for severe depression, 7.7% to 23% for moderate, 14.8% to 44.9% for mild, and 15.1% to 90.4% had no depressive symptoms according to cutoff points (Abdulghani et al., 2022; Capellini et al., 2023; Ibrahim et al.,

## **Soto-Schulz et al.**

2024; Sinha et al., 2021; Vispute & Kumar, 2021). Again, as with the previous variables, those with lower resilience and those who worked in front of COVID-19 had higher levels of anxious symptoms (Hassem et al., 2022; Pigati et al., 2022).

### *Burnout*

Finally, 5 of the studies evaluated burnout (Haezebrouck & Yorke, 2023; Ibrahim et al., 2024; Pniak et al., 2021; Szwamel et al., 2022; Wojtowicz & Kowalska, 2023). The data were varied, finding 66.1% of absence of burnout (Ibrahim et al., 2024). More specifically, Emotional Exhaustion (EE) presented a mean of 32.31 (CI: 29.47-35.15), suggesting a high perception of stress among participants. On the other hand, Depersonalization (PD) had an average of 16.25. In addition, personal achievement (PA) was evidenced with means of 33.17 and 7.50, respectively, suggesting dissatisfaction with the achievements attained. Regarding OLBI, a significant reduction in burnout and disengagement levels was observed during COVID-19 compared to previous levels (Wojtowicz & Kowalska, 2023), as well as higher burnout levels in 2021 compared to 2018 (Haezebrouck & Yorke, 2023).

## COVID-19 mental health kinesiology systematic review

**Table 3**

*Study characteristics.*

Reference / country	Design	Sample size	Gender (F/M)	Age	Mental Health	Performance area	Results	Conclusions
Abdulghani et al. (2022) Arabia Saudita February 2021	Cross-sectional	N = 117 physical therapists N = 12	72/45 (<1%)	≤ 25 (17.9%), 26 - 35 (63.2%), 36 - 45 (15.4%), 45 - 55 (2.6%), 56 - 65 (<1%)	Anxiety: GAD-7 Anxiety and depression: PHQ-9	General Hospital Private Medicine Faculty and Dicle Investigation University	Anxiety: none 43 (36.8%), mild 48 (41.0%), moderate 19 (16.2%), and high 7 (6.0%) Depression: none 52 (44.4%), mild 38 (32.5%), moderate 21 (17.9%), and high 6 (5.1%)	Many physical therapists, especially young, single, childless women, experienced symptoms of anxiety and depression. Physical therapists experienced the lowest rates compared to other professionals.
Ayndin & Atıcı (2023) Turkey	Cross-sectional	physiotherapists	7/5	32.88 ± 7.51	Depression: BDI		Depression: $27.42 \pm 6.11$ (min 18/max 42) Anxiety: none 88 (21.1%), mild 216 (51.8%), moderate 104 (24.9%), high 97 (23.3%).	
Capellini et al. (2023) Brazil	Cross-sectional	N = 417 physiotherapists	339/78	Med = 35 (Q1 = 28; Q3 = 40)	Anxiety: GAD-7 Anxiety and depression: PHQ-9	266 (63.8%) private, 111 (26.6%) public, 26 (6.2%) philanthropy and 14 (3.4%) other sectors	Depression: none 84 (20.1%), mild 112 (26.9%), moderate 96 (23.0%), moderate high 88 (21.1%), high 37 (8.9%). Med GAD-7 9 (6; 14) and PHQ-9 10 (5; 16) PHQ-9 score ≥ 10: 12 (16%) IES-R score > 33: 8 (11%) IES-R total: $16 \pm 12$ PSS-10 score: $18 \pm 7$ Nivel de Stress (IQR): low 20 (27%); medium: 32 (43%); high: 23 (31%)	High Anxiety and depression in physiotherapists during COVID-19, linked to sleep problems, financial worries and loneliness.
Chatzitofis et al. (2021) Cyprus	Cross-sectional	N = 75 physiotherapists	40/35	38.2 ± 9.24	Anxiety and depression: PHQ-9 Post-traumatic stress: IES-R Stress: PSS-10	Private ambulatory sector (77%), public hospital sector (13%), private hospital sector (9.3%) Rehabilitation clinic/centre: 26.85%; Private office: 24.83%; Hospital: 6.71%; Nursing home or health care centre: 3.36%; Sanatorium or health restoration hospital: 2.01%; Individual physiotherapy practice: 15.44%; Sports club / gym / fitness club: 7.38%; Massage room / SPA room: 6.04%; Other: 7.38%	Feeling stress caused by the risk of contracting COVID-19 in the last 12 months: Yes: Females 49* (66%), Males 9 (30%); No: Females 25 * (34%), Males 21 (70%) Level of perceived stress caused by the risk of contracting COVID-19 (0, - 5 - severe, paralysing stress) Females: 0: 21 * (28 %); 1: 6 (8 %); 2: 16 * (22 %); 3: 17 * (23 %); 4: 12 (16 %); 5: 2 (3 %); Males: 0: 19 (64 %); 1: 4 (13 %); 2: 1 (3 %); 3: 3 (10 %); 4: 3 (10 %); 5: 0 (0 %) BO (2018): Med = 21.0 (10-36); BO (2021): Med = 25.0 (13-38); STS (2018): Med = 22.5 (10-40); STS (2021): Med = 25.0 (12-45)	Physiotherapists experienced significant mental distress during the pandemic, with women and young individuals particularly affected by depressive symptoms.
Gołuchowska et al. (2024) Poland	Diagnostic survey (cross-sectional)	N= 104 Physiotherapists N = 54 (2018), N = 53 (2021)	74/30	Females: $29.77 \pm 4.9$ Males: $30.2 \pm 5.1$	Stress: PSS-10			The COVID-19 pandemic caused changes in health behaviours among physiotherapists, with increased physical activity time and higher stress levels, particularly in women.
Haezebrouck & Yorke (2023) USA	Cross-sectional (but Cohort)	N. R. physical therapists	N. R.	N. R.	Burnout and secondary post-traumatic stress: ProQOL (BO and STS)	Physical therapy in acute care	BO (2018): Med = 21.0 (10-36); BO (2021): Med = 25.0 (13-38); STS (2018): Med = 22.5 (10-40); STS (2021): Med = 25.0 (12-45)	Less experienced professionals may need closer support, as they face greater job stress and emotional challenges.

## Soto-Schulz et al.

**Table 3 (continuation)**

*Study characteristics.*

Reference / country	Design	Sample size	Gender (F/M)	Age	Mental Health	Performance area	Results	Conclusions
Hassem et al. (2022) South Africa	Cross-sectional	N = 171 physical therapists	163/7	37.25 ± 11.28 COVID vs. non-COVID Care Units: 20 to 29 years (33.3% vs. 13.3%), 30 to 39 years (28.6% vs. 53.3%), 40 to 49 years (14.3% vs. 6.7%), and 50 years and over (23.8% vs. 26.7%).	Anxiety and depression: HADS Burnout: BMS	It was not formally assessed in the study, but more participants in the exposure group mentioned working in a hospital setting, while more participants in the nonexposure group mentioned working in a private practice.	Mental health: 3.50 (SD = 1.002) overall; 3.71 (SD = 0.946) without COVID-19 exposure; 3.22 (SD = 1.010) with COVID-19 exposure. Anxiety: 8.89 (SD = 4.335) overall; 7.94 (SD = 4.135) without COVID-19 exposure; 10.15 (SD = 4.296) with COVID-19 exposure. Depression: 5.77 (SD = 3.573) overall; 5.12 (SD = 3.474) without COVID-19 exposure; 6.62 (SD = 3.545) with COVID-19 exposure. Major mental health problems: 74 (43.3%) with COVID-19 exposure showed significant differences in mental health outcomes compared to 97 (56.7%) without COVID-19 exposure. Anxiety: low mild 43 (37.4%), mild 35 (30.4%), moderate 23 (20.0%), high 10 (8.7%), and moderate high 4 (3.5%) Burnout: ausencia 76 (66.1%), and agotamiento 39 (33.9%) Depression: none 104 (90.4%), and TEPT 11 (9.6%)	The well-being of South African physiotherapists, especially those exposed to COVID-19 patients, has declined, necessitating the need for psychoeducational interventions to improve mental health and work experiences.
Ibrahim et al. (2024) Belgium	Cross-sectional	N = 115 physiotherapists	64/51	Med = 33 (Q1 = 28; Q3 = 41) 38.2% were under 30 years of age, 33.6% were between 30 and 39 years, and 21.1% were between 40 and 50 years	Post-traumatic stress: PCL-S Anxiety: STAI Burnout: PFI	COVID-19 Units: 73.0 (84) and Non-COVID-19 Units: 26.1 (30)	Depression: 1[0;5]; Anxiety 2*[0;5]; Stress 6[3;9] (median [Q1; Q3] working with patients vs. not working directly with patients) 2.24 (SD = 0.40) for musculoskeletal; 2.39 (SD = 0.40) for neurologic; 2.32 (SD = 0.41) for modalities; 2.33 (SD = 0.50) for pediatric; 1.97 (SD = 0.26) for ETC; 2.19 (SD = 0.25) for multiple; 2.41 (SD = 0.00) for no division specified Anxiety: no anxiety 69 (18.9%), mild 140 (38.4%), moderate 88 (24.1%), severe 68 (18.6%) Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)	High prevalence of mental health problems; need for mental health training for physical therapists. High personal and occupational burnout may be related to low income, increased workload and pandemic-related uncertainty among physical therapists. Musculoskeletal physical therapists and department heads reported the highest stress levels. Mindfulness, particularly among more educated professionals, acted as a protective factor. The study shows high rates of anxiety, depression and insomnia in physiotherapists during COVID-19, affected by work, infection, psychological support and vaccination.
Jácome et al. (2021) Portugal	Cross-sectional	N = 511 physiotherapists	417/94	Med = 33 (Q1 = 28; Q3 = 41) 38.2% were under 30 years of age, 33.6% were between 30 and 39 years, and 21.1% were between 40 and 50 years	Depression, Anxiety and Stress: DASS-21	Private (50%) and pavilions (35%)	Depression: 1[0;5]; Anxiety 2*[0;5]; Stress 6[3;9] (median [Q1; Q3] working with patients vs. not working directly with patients) 2.24 (SD = 0.40) for musculoskeletal; 2.39 (SD = 0.40) for neurologic; 2.32 (SD = 0.41) for modalities; 2.33 (SD = 0.50) for pediatric; 1.97 (SD = 0.26) for ETC; 2.19 (SD = 0.25) for multiple; 2.41 (SD = 0.00) for no division specified Anxiety: no anxiety 69 (18.9%), mild 140 (38.4%), moderate 88 (24.1%), severe 68 (18.6%) Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)	Depression: 1[0;5]; Anxiety 2*[0;5]; Stress 6[3;9] (median [Q1; Q3] working with patients vs. not working directly with patients) 2.24 (SD = 0.40) for musculoskeletal; 2.39 (SD = 0.40) for neurologic; 2.32 (SD = 0.41) for modalities; 2.33 (SD = 0.50) for pediatric; 1.97 (SD = 0.26) for ETC; 2.19 (SD = 0.25) for multiple; 2.41 (SD = 0.00) for no division specified Anxiety: no anxiety 69 (18.9%), mild 140 (38.4%), moderate 88 (24.1%), severe 68 (18.6%) Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)
Lee et al. (2024) December 2021 to January 2022	Cross-sectional	N = 280 physical therapists	NR	38.2% were under 30 years of age, 33.6% were between 30 and 39 years, and 21.1% were between 40 and 50 years	Stress: KOSS-SF Depression: K-CESD-R	Primary hospitals (42.9%), rehabilitation hospitals (27.9%).	Depression: 1[0;5]; Anxiety 2*[0;5]; Stress 6[3;9] (median [Q1; Q3] working with patients vs. not working directly with patients) 2.24 (SD = 0.40) for musculoskeletal; 2.39 (SD = 0.40) for neurologic; 2.32 (SD = 0.41) for modalities; 2.33 (SD = 0.50) for pediatric; 1.97 (SD = 0.26) for ETC; 2.19 (SD = 0.25) for multiple; 2.41 (SD = 0.00) for no division specified Anxiety: no anxiety 69 (18.9%), mild 140 (38.4%), moderate 88 (24.1%), severe 68 (18.6%) Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)	Depression: 1[0;5]; Anxiety 2*[0;5]; Stress 6[3;9] (median [Q1; Q3] working with patients vs. not working directly with patients) 2.24 (SD = 0.40) for musculoskeletal; 2.39 (SD = 0.40) for neurologic; 2.32 (SD = 0.41) for modalities; 2.33 (SD = 0.50) for pediatric; 1.97 (SD = 0.26) for ETC; 2.19 (SD = 0.25) for multiple; 2.41 (SD = 0.00) for no division specified Anxiety: no anxiety 69 (18.9%), mild 140 (38.4%), moderate 88 (24.1%), severe 68 (18.6%) Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)
Mohammed et al. (2024) Egypt	Cross-sectional	physical therapists	263/102	20-30: 183 (50.1%), 30-40: 149 (40.8%), 40-50: 33 (9%)	Anxiety: GAD-7 Depression PHQ-9	Outpatients 206 (56.4%), Inpatient 78 (21.4%), Isolation hospital 48 (13.2%), Staff member 33 (9%)	Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)	Depression: normal 55 (15.1%), mild 127 (34.8%), moderate 78 (21.4%), severe 105 (28.8%)

## COVID-19 mental health kinesiology systematic review

**Table 3 (continuation)**

*Study characteristics.*

Reference / country	Design	Sample size	Gender (F/M)	Age	Mental Health	Performance area	Results	Conclusions
Mont'Alverne et al. (2023) Brazil	Cross-sectional	N = 102 physiotherapists	89/13	34 (29 - 38)	Depression, Anxiety and Stress: DASS-21	Oncology	Stress = 6.9 (4 - 10); Depression = 4.2 (1 - 6); Anxiety = 3.9 (1 - 7). Analysis of the association between working conditions and depression, Anxiety and Stress scores indicated that physical therapists working in outpatient centers/clinics had lower depression scores ( $p = 0.038$ ). In addition, longer working hours were associated with higher levels of Anxiety ( $p = 0.016$ ) and Stress ( $p = 0.011$ ), and transfer to another oncology unit resulted in higher Stress ( $p = 0.021$ ).	The COVID-19 pandemic led to reduced working hours, unit transfers and increased stress for physical therapists, who often resorted to tele-rehabilitation to maintain contact with patients.
Pigati et al. (2022) Brazil	Cross-sectional	N = 519 physiotherapists	452/67	COVID work vs NO COVID: 20 - 30 (36.1% vs. 33.5%), 31 - 40 (50.8% vs. 50.5%), 41 - 50 (9.8% vs. 13.9%), 51 - 60 (3.3% vs. 2.1%)	Depression, Anxiety and Stress: DASS-21 Post-traumatic stress: IES-R	Working with COVID vs. non-COVID: Critical Care Units (35.1% vs. 78.2%), semi-intensive units (5.4% vs. 2.9%), inpatient ward (40.5% vs. 14.8%), supervision (6.8% vs. 1.8%), outpatient (12.2% vs. 0.4%) Hospital clinical departments: Intensive Care Unit and Anesthesiology; Department of Orthopedics and Traumatology; Department of Neurology.	Low resilience presented higher levels of depression (9 vs. 4), Anxiety (7 vs. 5), and Stress (12 vs. 9) and higher scores (avoidance: 13 vs. 9, intrusion: 14 vs. 9, hyperarousal: 12 vs. 7). Working with COVID-19 patients also showed higher levels of depression (7 vs. 1), Anxiety (7 vs. 0), and Stress (3 vs. 11) and higher scores (avoidance: 11 vs. 2.5, intrusion: 11 vs. 3, hyperactivity: 10 vs. 2).	Low resilience and working with COVID-19 patients correlate with increased depression, Anxiety and Stress.
Pniak et al. (2021) South-West Poland	Cross-sectional	N = 106 physiotherapists	69/37	N. R.	Burnout: MBI	EE: M = 32.31 (CI 29.47-35.15); DP: M = 16.25 (CI 14.48-18.03); PA: Mean = 26.25 (CI 24.41-28.10)	High rates of burnout in all three settings among physical therapists during the pandemic	
Sinha et al. (2021) India	Cross-sectional	N = 378 physiotherapists	164/214	21-35 60.6% (229); 36-45 31.5% (119); 46-60 7.9% (30)	Depression: BDI Anxiety: GAD - 7	Private: 313 (82.8%) Public: 65 (17.2%)	Depression: none 261 (69.0%), mild 56 (14.8%), bordering 23 (6.1%), moderate 29 (7.7%), high 8 (2.1%), and extrem 1 (0.3%). Anxiety: none 235 (62.2%), mild 96 (25.4%), moderate 32 (8.5%), and high 15 (3.9%)	People 21-35 years old, women and those who were working as clinicians during the closure higher levels of depression and anxiety. Clinic closure, greater use of the Internet and preoccupation with professional practice related to higher levels of depression and anxiety. High resilience lower of both disorders.

## Soto-Schulz et al.

**Table 3 (continuation)**

*Study characteristics.*

Reference / country	Design	Sample size	Gender (F/M)	Age	Mental Health	Performance area	Results	Conclusions
Szwamel et al. (2022) Poland	Cross-sectional	N = 106 physiotherapists N = 135 physiotherapists	84/22 97/38	37.19 ± 9.61; Med = 37 (29–45) M = 35.3 ± 8.4	Burnout: MBI Anxiety and depression: HADS	Primary care: 38 (15.83%); Specialty clinic: 22 (9.17%); Specialty hospital for infectious diseases: 23 (9.58%); other hospitals: 156 (65.00%); Palliative care or long-stay home centers: 10 (4.17%); Inpatient palliative care or long-stay facilities: 16 (6.67%); Otros: 39 (16.25%) Hospitals (31.3%), private clinics (38.5%) or both (30.2%)	EE: 24.74 ± 12.19; Med = 23 (16–32) DP: 5.67 ± 5.39; Med = 4 (1–9); Lack of accomplishment: 33.17 ± 7.43; Med = 33.5 (28–38); Anxiety: 7.5 ± 3.13; Med = 7 (5–9); Depression: 4.49 ± 4.29; Med: 4 (0.25–7.75)	The study detected high levels of burnout, Anxiety and depression among physiotherapists during COVID-19, which impacts their quality of life.
Valizadeh et al. (2023) Iran	Cross-sectional				Depression, Anxiety and Stress: DASS-21		43.7% high/severe depression; 43.8% high/ severe anxiety; 54.8% high/ severe stress	COVID-19 caused high levels of depression, Anxiety and Stress among physiotherapists in Iran. The closure of COVID-19 caused widespread mental health problems, and 44.9% of physical therapists experienced mild depression, especially clinicians.
Vispute & Kumar (2021) India	Cross-sectional	N = 88 physiotherapists	66/22	N. R.	Depression: PHQ-9	Clinical physical therapists (64.4%) Academic physical therapists (35.6%)	None/ min depression: 27%; Depression mild: 44.9%; Depression moderate: 20%; Depression moderate high: 6.7% PSS-10 (sten): 5.99 (SD=1.9) Pre COVID-19 / 5.38 (SD= 1.7) during COVID-19 (P<0.0342) SWAQ total (sten): 7.63 (SD=1.9) Pre COVID-19 / 5.73 (SD= 2.2) during COVID-19 (P<0.00001)	
Wojtowicz & Kowalska (2023) Poland	Cross-sectional (but cohort)	N = 70 (Pre COVID-19) N= 100 (during COVID-19)	56/14 (Pre- COVID-19) 70/30 (during COVID-19)	M = 40.1 (Pre COVID-19) M = 31.9 (in COVID-19) 20s (32.3%, n = 21), 30s (30.8%, n = 20), 40s (24.6%, n = 16), and 50s (12.3%, n = 8)	Stress: PSS-10 Stress occupational: SWAQ Burnout: OLBI	Sanatoriums, hospitals, public and private outpatient centers	OLBI- Exhaustion (sten): 5.97 (SD=1.6) Pre COVID-19 / 4.68 (SD=1.8) during COVID-19 (P<0.00001) OLBI- Disconnection (sten): 5.83 (SD=1.7) Pre COVID-19 / 4.36 (SD=1.8) during COVID-19 (p<0.00001)	Research shows that healthcare professionals faced considerable Stress and burnout, exacerbated by working conditions, but Stress levels were surprisingly higher before the COVID-19 pandemic.
Yang et al. (2020) South Korea	Cross-sectional	N = 65 physical therapists	31/34		Anxiety: GAD-7 Depression and Anxiety: PHQ-9	Physiotherapists in university hospitals during COVID-19	Anxiety: 32.3%; Depression: 18.5%	Physiotherapists in their 30s and 50s, and those who live with young children, need special attention.

Note: BDI = Beck Depression Inventory; DASS-21 = Depression, Anxiety, and Stress Scale-21; DP = depersonalization; EE = emotional exhaustion; GAD-7 = Generalized Anxiety Disorder Scale; IES-R = Impact of Events Scale-Revised; MBI = Maslach Burnout Questionnaire; N. R. = not reported; PA = personal accomplishment; PCL-5 = Posttraumatic Stress Disorder Checklist for DSM-5; PCL-S = Posttraumatic Stress Disorder Checklist Scale; PFI = Stanford Professional Fulfillment Index; PHQ-9 = Patient Health Questionnaire-9; ProQOL (BO and STS) = Professional Quality of Life (Burnout and Secondary Traumatic Stress); PSS = Perceived Stress Scale; PSS-10 = Perceived Stress Scale-10; STAI = State-Trait Anxiety Scale; STAI Y-B = Trait Anxiety Scale.

## COVID-19 mental health kinesiology systematic review

Table 4 shows effect sizes reported in each study. Among the studies that reported these statistics, female gender was consistently associated with higher levels of anxiety and depression, with significant ORs reported in Capellini et al. (2023) and elevated regression coefficients in Jácome et al. (2021) and Valizadeh et al. (2023). Additionally, professionals working directly with COVID-19 patients showed increased personal and work-related burnout (Jácome et al., 2021), while having young children was associated with significantly higher odds of anxiety in Yang et al. (2020). However, several associations showed wide confidence intervals and did not reach statistical significance, indicating variability across study designs and sample sizes.

**Table 4**

*Effect sizes in different groups.*

Reference / comparation	Gender	Do you have children	Current practice setting	COVID experience
(Abdulghani et al., 2022)	Anxiety: mild = 2.09 (0.89–4.8); moderate = 2.26 (0.7–7.0); severe = 6.28 (0.69–56.7)	Anxiety: mild = 0.89(0.37–2.10); moderate = 1.5(0.45–4.9); severe = 3.2(0.35–29.2)	Anxiety: mild = 1.34(0.49–3.69); moderate = 1.29(0.35–4.6); severe = 2.41(0.34–17.0)	Have you working person care during COVID-19?
OR(95%IC)		Depression: mild = 0.77(0.33–1.8); moderate = 2.65*(1.09–6.4); severe = 5.9*(1.2–28.3)	Depression: mild = 2.34(0.79–6.8); moderate = 0.75(0.24–2.3); severe = 2.18(0.23–20.4)	Anxiety: mild = 1.43(0.59–3.4); moderate = 1.65(0.50–5.4); severe = 1.48(0.25–8.5)
Reference group: male/yes/general in anxiety		private in depression/no		Depression: mild = 0.96(0.3–2.37); moderate = 0.72(0.25–2.0); severe = 2.2(0.23–20.5)
Comparing groups with no anxiety/depression		14(0.75–261)		
(Aydin & Atiç, 2023)	-	-	-	-
(Capellini et al., 2023)	Anxiety: 2.07*(1.01–4.24)	-	-	-
OR(95%IC)	Depression: 2.16*(1.03–4.55)			
Reference group: male				
Comparing yes with no anxiety/depression				
(Chatzitofis et al., 2021)	not separated physiotherapists only	by	not separated physiotherapists only	by
OR(95%IC)	-	-	-	-
(Pigati et al., 2022)	-	-	-	-
(Haezebrouck & Yorke, 2023)	-	-	-	-
(Hassem et al., 2022)	-	-	-	-
(Ibrahim et al., 2024)	-	-	-	-
(Jácome et al., 2021)	Personal burnout: B = 7.72 (p < 0.001)	-	Personal burnout: B = 4.55 (p < 0.001)	Personal burnout: B = 4.78 (p = 0.008)
Regression coefficients B (95%CI)	Work burnout: B = 4.28 (p = 0.019)	-	Work burnout: B = 3.23 (p = 0.019)	
Reference group: male / not working with COVID-19 patients				
Only significant results were reported				
(Mont'Alverne et al., 2023)	-	-	-	-
(Pniak et al., 2021)	-	-	-	-
(Sinha et al., 2021)	-	-	-	-
(Szwamel et al., 2022)	-	-	-	-
	Depression: -5.200 (p = 0.003)	-	Depression: clinic = -1.005 (p = 0.586); hospital and clinic = -0.412 (p = 0.828)	
	Anxiety: -4.914 (p = 0.006)	-	Anxiety: clinic = -5.120 (p = 0.007); hospital and clinic = -4.647 (p = 0.010)	
	Stress: -6.796 (p = 0.000)	-	Stress: clinic = -1.083 (p = 0.558); hospital and clinic = -2.789 (p = 0.144)	
(Valizadeh et al., 2023)				
Beta (p-valor)				
Reference group: male / hospital				
(Vispute & Kumar, 2021)	-	-	-	-
(Wojtowicz & Kowalska, 2023)	-	-	-	-
(Yang et al., 2020)	-	Anxiety: None vs. 6-year-old infant OR = 6.727 (1.699–26.636), p = 0.007	-	-
OR (95% IC)				
Comparing depression vs. no depression				
Mohammed et al. (2024)	-	-	-	-
Goluchowska et al. (2024)	-	-	-	-
Lee et al. (2024)	-	-	-	-

Nota: \*p < 0.05, \*\*p < 0.005

*Risk of bias*

Regarding the risk of bias (Table 4), most of the investigations showed a good level of description of the subjects and the context, with some exceptions where the criteria could have been defined more specifically. All studies showed adequate objective measurement of outcomes, using appropriate instruments for mental health variables. Despite this, many studies presented lack of clarity in the measurement of exposure, as they did not include accurate data to control that the data were due to pandemic exposure. In addition, although the presence of confounding factors was recognized, few studies detailed specific strategies to control for them. On the other hand, many studies did not assess the normality of the data distribution, which is considered as noncompliance with item 8. Finally, all studies were included in the data synthesis, noting two of them as see for more information (Vispute & Kumar, 2021; Wojtowicz & Kowalska, 2023), although it is suggested to read them with caution considering their possible biases.

**Table 4**

*Risk of bias by JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies.*

<b>Reference</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
Abdulghani et al., 2022	yes	yes	unclear	yes	yes	unclear	yes	no	included
Aydin & Atiç, 2023	yes yes	yes yes	no yes	yes yes	unclear yes	unclear unclear	yes yes	yes yes	included included
Capellini et al., 2023	unclear unclear	yes yes	no unclear	yes yes	yes yes	unclear yes	yes yes	yes yes	included included
Chatzitofis et al., 2021	unclear unclear	unclear yes	yes unclear	yes yes	unclear yes	unclear unclear	yes yes	no yes	included included
Pigati et al., 2022	yes yes	yes yes	unclear unclear	yes yes	yes yes	no unclear	yes yes	no yes	included included
Haezebrouck & Yorke, 2023	yes unclear	yes yes	yes yes	yes yes	yes yes	yes unclear	yes yes	no yes	included included
Hassem et al., 2022	yes yes	no yes	yes yes	yes yes	no yes	no unclear	yes yes	unclear no	included included
Ibrahim et al., 2024	yes yes	yes yes	unclear unclear	yes yes	yes unclear	unclear unclear	yes yes	unclear no	included included
Jácome et al., 2021	unclear	yes	unclear	yes	no	no	yes	no	More information
Mohammed et al., 2024	yes yes	yes yes	yes yes	yes yes	yes yes	unclear yes	yes yes	no yes	More information included included
Gołuchowska et al., 2024	yes	yes	yes	yes	yes	no	yes	yes	included
Lee et al., 2024	yes	yes	yes	yes	yes	yes	yes	yes	included

## COVID-19 mental health kinesiology systematic review

### DISCUSSION

The aim of this study was to synthesize the evidence evaluating the effects of the COVID-19 pandemic on the mental health of physical therapists. Based on this, the results showed relevant aspects on symptoms of anxiety, depression, post-traumatic stress and burnout.

In relation to the anxiety variable, a high prevalence is observed among physical therapists during the COVID-19 pandemic. In particular, the study by Valizadeh et al. (2023) in Iran, who reported that 43.8% of physical therapists experienced severe or very severe levels of anxiety, stands out. According to the authors, this result is due to the need for direct contact with patients, the fear of becoming infected and transmitting the virus to their relatives, in addition to the high workload and long working hours during the pandemic. Similar factors were identified in studies of other health professionals, where fear of infecting their loved ones and increased workload during the pandemic were also identified (Aly et al., 2021; Temsah et al., 2020).

On the other hand, some studies identified protective factors that appeared to reduce the impact of anxiety on these professionals. Resilience stood out as a key element in several contexts, as physical therapists with higher levels of resilience showed lower levels of anxiety and stress, especially those who were directly exposed to COVID-19. This coping ability helped mitigate the emotional impact of the pandemic, decreasing the incidence of anxiety among physical therapists (Pigati et al., 2022; Sinha et al., 2021). The development of institutional programmes that strengthen resilience and active coping could be key to reducing health workers' vulnerability to future health crises. These results also highlight the need to strengthen the competencies of health professionals through specific plans and profiles (Soto-Schulz et al., 2025) as part of their continuous training, in order to improve their ability to cope with highly demanding situations such as the one experienced during the pandemic.

The findings found during the review are aligned with different studies in the international literature for COVID-19 in other healthcare professionals (Barrett et al., 2021; Hooper et al., 2021; Kannan et al., 2019) and are even similar to other relevant infectious outbreaks such as SARS (Nickell et al., 2004). The main challenges mentioned were linked to increased work intensity and new responsibilities for which they were not prepared, which directly affected the results in increased anxiety, depression and burnout (Barrett et al., 2021; Hooper et al., 2021; Kannan et al., 2019). Some studies (Abdulghani et al., 2022; Sinha et al., 2021) also highlighted the role of gender and age. In this sense, women had higher levels of anxiety and depression than men, something also noted in another previous study (Bezak et al., 2022), which identified the lack of flexibility of employers and the need for preparation. Regarding age, it was mentioned that younger people had higher rates of anxiety and depression, something also mentioned in other previous studies with other health professionals (Spychała et al., 2023).

The significant increase in anxiety, depression and/or burnout is also present in people who worked actively during Covid-19 (Chatzitofis et al., 2021; Fari et al., 2022; Yang et al., 2021) considering also the present factor of concern on the part of workers who live with people who have underlying chronic diseases and the constant fear of contagion (Yang et al., 2021). As it has been observed, regardless of the place where research was conducted on the disorders that increased during the pandemic in health professionals, there is a significant general increase in the symptoms mentioned, such as anxiety, depression and/or burnout, whether mild or even severe (Chatzitofis et al., 2021; Fari et al., 2022; Hassem et al., 2022; Yang et al., 2021). All this is also attributable to the low quality of life of health personnel (Suryavanshi et al., 2020), with excessive work shifts and little free time, which leads to insufficient levels of physical activity, an excellent protective factor. These findings also highlight the need to review the structural conditions of health work, where long working hours, lack of organisational support and poor emergency preparedness can affect the psychological wellbeing of professionals.

While this study provides information about mental health in kinesiology professionals during the Covid-19 pandemic, several limitations must be acknowledged. First, the sample obtained is relatively small and does not fully represent the broader population of kinesiologists, and the studies were conducted in a wide range of countries, not contemplating a large number of professionals from other geographic locations, leaving out of the analysis different contexts and including a diversity of social characteristics that may imply variables not analyzed. Furthermore, even though more than a year has passed since the pandemic was declared over, the number of

published studies is still small, since the focus at that time was on research to achieve effective therapeutic interventions to reduce the spread and effects of Covid-19.

Although the effect size analysis was added post hoc in response to reviewers' suggestions, it provided meaningful insights into the strength of associations beyond statistical significance. The findings highlighted a consistent pattern across several studies, where female gender was associated with higher levels of anxiety and depression, supported by both significant odds ratios and regression coefficients. Exposure to COVID-19 patients was also linked to increased personal and work-related burnout. However, the strength and significance of associations varied across studies, and some estimates were accompanied by wide confidence intervals, reflecting sample variability and methodological differences. This underscores the importance of including effect size estimates in future studies to better evaluate the clinical relevance of psychological outcomes among healthcare professionals.

The information obtained in this review, despite being focused on an exceptional health context, can provide guidance on the need to raise awareness in institutions and employers regarding the mental health of health professionals, especially kinesiologists, due to the role and level of work they must perform mainly in the respiratory area.

## **CONCLUSIONS**

The results of this review show a significant impact of the COVID-19 pandemic on the mental health of kinesiologists, highlighting high levels of anxiety, depression, post-traumatic stress disorder and burnout, particularly among women, young professionals and those in direct contact with infected patients. These findings underline the urgent need to implement institutional strategies for prevention, evaluation and psychological support aimed at this group, especially in contexts of high health demand. In addition, it is recommended that protective factors such as resilience, self-care and organizational support be fostered, not only as a response to future crises, but also as part of a permanent culture of holistic care for health workers. Future research should focus on exploring specific interventions for this professional group and on expanding the geographical and contextual coverage of studies in order to gain a deeper and more representative understanding of their psychological well-being.

## **PRACTICE APPLICATIONS**

The findings of this study have important practical implications for Sport Psychology, as they highlight the need to implement prevention and psychological support strategies for kinesiologists working in sport settings. Given their fundamental role in the preparation, recovery and rehabilitation of athletes, their psychological well-being is key to maintaining optimal performance in sport. Intervention programs focused on stress management, emotional resilience and self-care can help mitigate the negative effects of burnout and anxiety in these professionals. In this sense, adaptations could be made to interventions previously carried out in other population groups (Boix et al., 2014; Chinchilla-Fonseca et al., 2022; Oliveira et al., 2021). In addition, the incorporation of support networks and organizational policies that prioritize mental health in sports teams could contribute to a healthier and more efficient work environment, benefiting both kinesiologists and the athletes they work with.

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## COVID-19 mental health kinesiology systematic review

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