


Psychological interventions for healthcare professionals during the COVID-19 pandemic: A systematic review

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Abstract

Healthcare professionals were especially vulnerable to pandemic, both to become infected and to develop a psychological problem. The aim of this systematic review is to analyze the effectiveness of psychological interventions for healthcare professionals in reducing the experienced psychological impact. From the 405 identified studies, 10 were included in this review. Four databases were searched and the risk of bias of included studies was assessed. The studies considered were randomized controlled trials. The screening and selection process was conducted by two independent reviewers. All studies presented results related with depression, anxiety, and stress during pandemic. Six were delivered using new technologies. The most effective were two psychological interventions with frequent contact and feedback provided by a mental health professional. The psychological interventions compared with non-intervention groups presented more significant results than those compared with another intervention. The highlights of this systematic review were the urgency of designing effectiveness psychological interventions for healthcare professionals to reduce the emotional burden associate with this job. These interventions should be maintained over the time, supported by a professional and provided from the workplace. These proposals presented promising results but were more psychological resources than psychological interventions.

KEYWORDS

COVID-19, healthcare professional, mental health, psychological intervention, randomized controlled trial

1 | INTRODUCTION

Since December 2019, the novel coronavirus or COVID-19 has spread rapidly across the whole world, becoming a global pandemic on March 2020 according to the World Health Organization (WHO, 2020).

New coronavirus infection has had a major impact on mental health. Population received an increasing amount of uncertain

information about the disease (Torales et al., 2020). The immediate consequences were fear of uncertainty, panic, distress, a feeling of losing control, anger, frustration, and vulnerability (Bao et al., 2020; Brooks et al., 2020; Rajkumar, 2020). Accordingly, psychological problems like depression, anxiety and stress have increased during this period in general population (Salari et al., 2020). Additionally, an increase of suicidal thoughts and behaviours have been observed in

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relation to the appearance of infectious diseases epidemics (Rodgers et al., 2021).

Healthcare professionals were especially vulnerable to this health crisis, presenting 12 times more risk than the general population to get infected (Nguyen et al., 2020). These workers had an essential role in the quality of the healthcare system during the pandemic (Bao et al., 2020). Disease exposure, the lack of protection and the saturation of sanitary resources forced these professionals to work in precarious conditions (García-Iglesias et al., 2020; Vieta et al., 2020). These situations had a direct impact on the mental health of these workers and, consequently, an indirect effect on the well-functioning of the sanitary system (Shultz et al., 2016; Yang et al., 2020).

COVID-19 pandemic increased the prevalence of psychological problems like anxiety, depression, stress, post-traumatic stress disorder (PTSD), insomnia, and burnout between healthcare professionals (Lazzerini & Putoto, 2020; Li et al., 2020; Vieta et al., 2020). According to these results, previous systematic reviews reported high levels of anxiety (Pan et al., 2020) and PTSD (Carmassi et al., 2020) for this population. Other stressful experiences were the grief for relatives and/or patients, self-blame for not being able to save them, and fear of getting sick and infecting their families (Wallace et al., 2020).

Health crisis, such as COVID-19, have required the use of adaptive coping strategies. However, many healthcare professionals presented problems in dealing with the pandemic due to the uncertainty of the situation and the lack of knowledge about the disease. To cope with psychological distress, health workers reported the use of exercise (44.9%), social connections (31.7%) and alcohol (26.3%) (Smallwood et al., 2021). New technologies, especially psychological wellbeing applications, were also a resource used by this population (Smallwood et al., 2021).

Previous studies found an association between burnout in health workers and patient safety. COVID-19 represented an extreme situation with the presence of these two variables (Hall et al., 2016). For all these reasons, healthcare professionals should be considered as a population at risk to suffer psychological problems, especially in a health crisis like COVID-19 pandemic. Accordingly, the creation of psychological programs adapted to their needs is an urgency.

During the first year of the pandemic, 6.4% of the adult population requested psychological attention in Spain (Confederación Salud Mental, 2021). Different resources like phone assistance with brief psychological intervention were available. During quarantine, the number of calls was 15,170, 75.3% needed an intervention (Berdulas-Saunders et al., 2020). However, the evidence for specialized psychological programs for healthcare professionals was limited. Muller et al. (2020) presented a rapid systematic review at the beginning of the pandemic. Results showed that the most frequent strategies and resources used by health workers were social/family support, lifestyle adjustments, mindfulness, or distraction. A minority of professionals asked for psychological assistance (Muller et al., 2020).

The design of mental health resources and interventions for healthcare professionals has become an urgency. This population needs easy access to psychological programs adapted to their characteristics to deal with psychological problems and the emotional

burden related with the workplace, especially during health crisis (Mira et al., 2020).

The main aim of this systematic review is to perform an update of the psychological interventions designed for healthcare professionals and delivered during the pandemic and analyzed their effectiveness in reducing the psychological impact experienced by the participants.

2 | METHOD

This systematic review follows the guideline of Preferred Reporting Items for Systematic Reviews (Page et al., 2021). The international prospective register for systematic reviews (PROSPERO) accepted the protocol of this study on 16 March 2022, registration number CRD42022318685.

2.1 | Eligibility criteria

The Population, Intervention, Comparator and Outcome framework was used to report the eligibility criteria of this systematic review (O'Connor et al., 2008).

- **Population.** Healthcare professionals who worked during the COVID-19 pandemic.
- **Intervention.** Psychological interventions, provided from the workplace, addressed to reduce the psychological impact of healthcare professionals who worked during the COVID-19 pandemic.
- **Comparator:** Any comparator, including pharmacological treatment, control group or no treatment group.
- **Outcome.** Validated questionnaires used to measure pre- and post-intervention comparisons in any variable related with mental health.
- **Studies.** Randomized Controlled Trials (RCT).

2.2 | Information sources

The search was conducted using the electronic databases: Web of Science, Scopus, Cochrane Central Register of Controlled Trials (CENTRAL) and PubMed. The search was closed on 28 January 2022. An updated search was conducted on 12 September 2022.

2.3 | Search strategy

The search presented some limitations: the study design had to be RCT, the language had to be English or Spanish, and years 2020 onwards. The combination of keywords used to conduct the search was:

(covid-19 OR "covid 19" OR sars-cov-2 OR coronavirus OR "severe acute respiratory syndrome coronavirus 2" OR "corona virus") AND ("healthcare professional*" OR "health care professional*" OR "health care worker*" OR "health worker*" OR "healthcare worker*")

OR "health professional*" OR "health personnel" OR "medical staff") AND (intervention OR "psychological intervention" OR "psychological support" OR "program" OR "psychological program" OR treatment OR "psychological treatment" OR prevention OR preventive) AND ("mental health" OR "burnout" OR "psychol*" OR anxiety OR depression OR depressive OR stress OR "psychological wellbeing" OR "psychological impact" OR "post-traumatic stress disorder" OR "PTSD" OR "posttraumatic stress disorder") AND ("randomized controlled trials" OR "randomized controlled trial" OR "controlled clinical trial" OR "controlled-clinical trial" OR randomly OR RCT OR "controlled-trial" OR "controlled trial")

2.4 | Selection process

A total of 254 studies were identified from the different databases. These studies were imported into Rayyan, a research tool designed to work with systematic reviews. After automatically removing duplicates with Rayyan, 157 studies by title and abstract were screened by two independent reviewers, based on eligibility criteria. The remaining articles were full text assessed by the same independent reviewers. Finally, to resolve disparities between the two reviewers the chosen method was discussion.

During the search update, 151 new studies were identified between 28 January and 12 September 2022. A total of 67 duplicates were identified and removed, the remaining 87 studies were screened by title and abstract. Finally, only four were full text assessed and three met the inclusion criteria. The entire process was conducted by the same independent reviewers responsible of the initial search.

2.5 | Data collection process

Two independent reviewers collected data from the included studies. The information extracted was: (i) study characteristics: authorship, year and country; (ii) sample characteristics: sample size, gender, age, occupation; (iii) characteristics of the interventions and comparators: type of psychological intervention, sample size of each intervention arm, length of the intervention; (iv) outcome characteristics: questionnaires used to measure the variables of interest, pre- and post-intervention difference in variables of interest.

2.6 | Study risk of bias assessment

To ensure the methodological quality of the study, two independent reviewers assessed the included studies according to the criteria of Cochrane Collaboration Handbook (Higgins & Altman, 2008). This tool contained the following domains to assess sequence allocation, blinding of the participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting and other sources of bias. Each domain could be assessed for high, low or unclear risk of bias (Higgins & Altman, 2008).

3 | RESULTS

The number of identified studies between the initial search and the update was 405. After removing duplicates and the first screening of title and abstract by two independent reviewers, 20 full-text studies were screened. Finally, 10 articles, 7 at the initial search and 3 at the update, met the pre-specified inclusion criteria and were included in the review (Figure 1).

3.1 | Description of included studies

The main characteristics of included studies are summarized in Table 1. Six articles were published in 2021 and four in 2022. Studies were carried out in Spain ($n = 2$), Italy ($n = 1$), India ($n = 1$), Iran ($n = 2$), United States ($n = 1$) United Kingdom ($n = 1$), Turkey ($n = 1$) and Canada ($n = 1$). The total number of participants was 2099. In two studies women represented the 100% of the sample, in five studies represented more of the 50%, in two studies this percentage was below 50% and one did not specify the number of women or men neither the age. Studies did not present the associations between gender and job roles. Following the inclusion criteria, the entire sample worked as healthcare professionals during COVID-19 pandemic. All studies presented at least one psychological intervention arm, 11 intervention arms and 10 control arms were identified. Interventions were delivered using new technologies (phone, web applications or video), except three. One of them used ordinary mail to send the materials (Procaccia et al., 2021). The other two administered their interventions in person (Ferrerres et al., 2022; Yildirim & Yildiz, 2022). The length of interventions ranged between 1 day and 8 weeks, only 3 studies reported follow-up data (Amsalem et al., 2022; Ferreres et al., 2022; Fiol-DeRoque et al., 2021).

3.2 | Risk of bias

Figure 2 shows the risk bias assessment for the included studies. All the studies presented low risk for bias except for one, which showed unclear risk of bias in three of the six assessed areas (Otared et al., 2021). In general, there is a clear explanation about the entire research procedure (recruitment, group allocation, intervention, data extraction and statistical analysis) followed by the studies included in this review. Providing reliability to the information analyzed in this study.

3.3 | Primary outcomes

Since all but one of the studies reported (Amsalem et al., 2022) results on depression, anxiety, stress, and symptoms of PTSD, these were classified as primary outcomes of this review.

Five studies used web applications to deliver psychological interventions (Fiol-DeRoque et al., 2021; Ghazanfarpour et al., 2021;

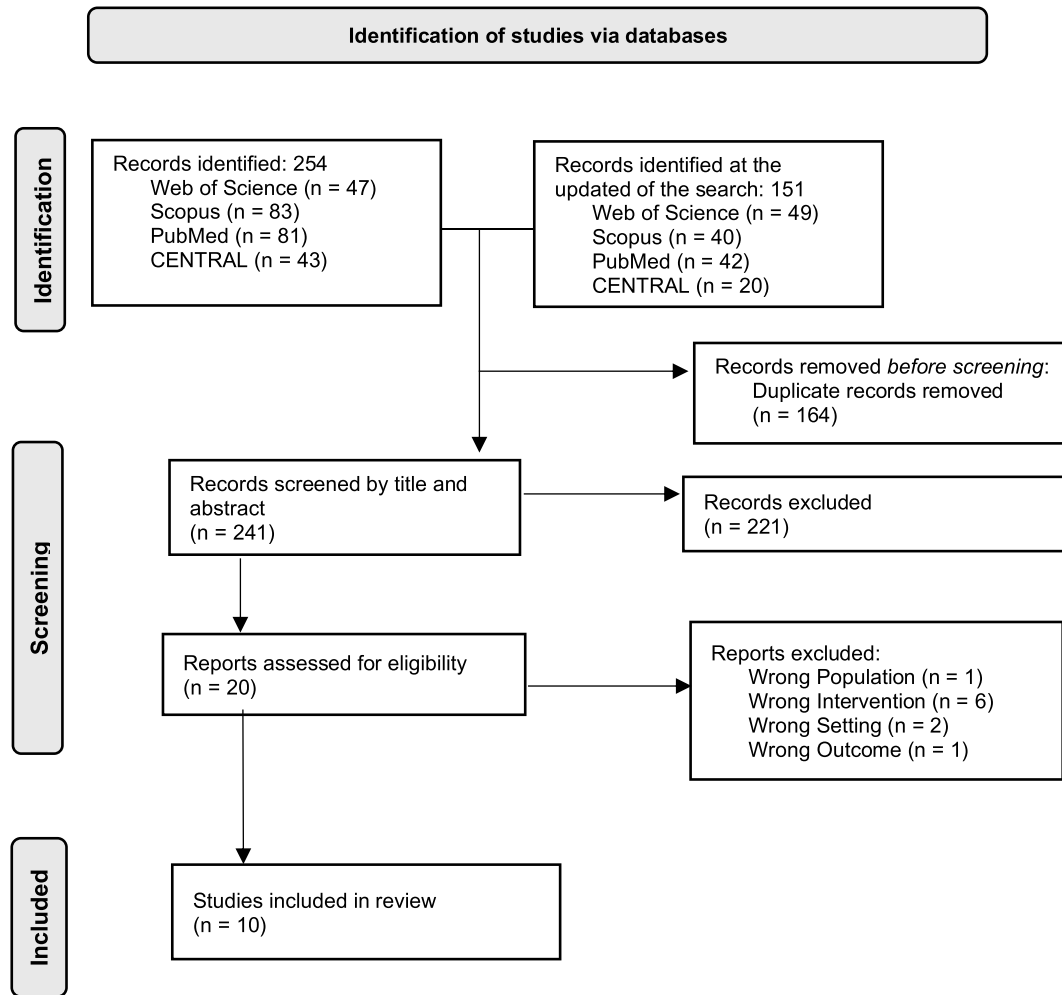


FIGURE 1 Flow diagram of study selection.

Gnanapragasam et al., 2022; Gupta et al., 2021; Otared et al., 2021). Two studies did not show significant differences between groups for the primary outcomes (Fiol-DeRoque et al., 2021; Gupta et al., 2021).

Fiol-DeRoque et al. (2021) used the PsyCovidApp, a self-managed psychoeducational intervention focused on working emotional skills, health lifestyle behaviour, social support, work stress and burnout. Control group used an informational mental healthcare application during COVID-19 pandemic. Adjusted standardized between-group mean differences (aMD) were not significant when comparing PsyCovidApp and ControlApp groups (depression, aMD = 0.00, 95% confidence interval [95% CI] = -0.07 to 0.08, $p = 0.47$; anxiety, aMD = -0.04, 95% CI = -0.12 to 0.04, $p = 0.15$; stress, aMD = -0.06, 95% CI = -0.14 to 0.01, $p = 0.06$; PTSD symptoms, aMD = 0.00, 95% CI = -0.06 to 0.06, $p = 0.47$). Significant differences were only observed in the subgroup analysis, considering the treatments received before the web applications. PsyCovidApp + psychotropics, showed significantly lower scores for anxiety (aMD = -0.26, 95% CI = -0.45 to -0.08; $p = 0.004$), stress (aMD = -0.30, 95% CI = -0.50 to -0.09, $p = 0.003$) and PTSD symptoms (aMD = -0.20, 95% CI = -0.37 to -0.03, $p = 0.01$) than ControlApp group. PsyCovidApp + psychotherapy, significantly

improve symptoms of anxiety (aMD = -0.24, 95% CI = -0.48 to 0.00, $p = 0.03$) and stress (aMD = -0.27, 95% CI = -0.55 to 0.001, $p = 0.02$) compared to ControlApp group. Gupta et al. (2021) also found no significant MD between groups for depression (MD = -1.56, 95% CI = -8.4 to 15.2, $p = 0.126$), anxiety (MD = -0.163, 95% CI = -3.8 to 2.9, $p = 0.872$) or general stress (MD = -2.16, 95% CI = -13.9 to -0.40, $p = 0.23$). The intervention consisted of tele-counselling sessions conducted through audio telephone conversation. The content of these sessions consisted of empathy, psychoeducation about COVID-19, relaxation, problem-solving, life skill training and motivational interviewing. Control group received tele-counselling on standard information related to COVID-19. Only the intervention group presented significantly lower scores for stress related to COVID-19 (MD = -2.16, 95% CI = -13.9 to -0.40, $p = 0.036$).

Gnanapragasam et al. (2022) used the Foundations smartphone application, the main aim of this tool was to promote well-being habits and behaviour change, promoting mental well-being, improving sleep and managing stress. Participants in the application group presented a significant reduction of psychiatric morbidity symptoms (aMD = -1.39, 95% CI = -2.05 to -0.74, $p < 0.001$) as

TABLE 1 Characteristics of included studies.

Study	Age M (SD)/range	Females	Professional group	Intervention/length	Comparator	Outcome measures	Main results
Amsalem et al. (2022) United States	38.8 (11.5) 18–70	74%	Nurse, 68% Physician, 15% EMT, 9% Other, 9%	Video + booster (n = 115) Video (n = 114) 14 days	Non-intervention (n = 121)	ATSPPH-SF GAD-7 PC-PTSD-5 PHQ-9	The two video interventions group showed greater increases in treatment-seeking intentions than CG, especially video + booster group
Ferreres et al. (2022) Spain	45.7 (7.7) 26–62	100%	Nurse, 100%	Train emotional regulation skills (n = 13) 5 days	Non-intervention (delayed intervention) (n = 14)	DASS-21 DERS NEO-FFI MBI IES-R EuroQoL	A significant reduction of depression and anxiety scores was observed in the IG but not in CG Significant differences were observed between groups. IG showed lower emotional exhaustion and better personal accomplishment after the intervention than the CG
Fiol-DeRoque et al. (2021) Spain	42.4 (10.4) 23–63	83.2%	Doctor, 31.7% Nurse, 33.4% Nurse assistant, 30.5% Other, 4.6%	PsyCovidApp (n = 248) 14 days	Control app (n = 234)	DASS-21 DTS MBI-H55 ISI GSE	No significant differences were observed between IG and CG group for main (DASS-21) or secondary outcomes
Ghazanfarpour et al. (2021) ^a Iran	<30 (n = 65) ≥30 (n = 30)	15.8%	Medical staff, 100%	Tele-counselling WhatsApp (n = 44) 7 days	Non-intervention (n = 51)	HADS SHAI	Anxiety related to coronavirus and likelihood to illness were significant lower in the IG than CG. Depression related to coronavirus and anxiety of negative consequences did not show significant differences
Gnanaprasam et al. (2022) United Kingdom	44.3 20–76	84.3%	Healthcare professionals, 60.9% Healthcare workers, 39.2%	FoundationsApp (n = 425) 8 weeks	Control group (n = 469)	GHQ-12 BRS SWEEMWBS SPS-6 GAD-7 PHQ-9 WSAS MISS	Participants of IG reported a significant reduction in psychiatric comorbidity, improvement in well-being and reduction in insomnia compared to participants in CG
Gupta et al. (2021) ^b India	≤30 (n = 16) >30 (n = 3)	63.2%	Nurse, 26.3% Intern trainee, 68.4% Senior resident, 5.3%	Brief eclectic psychotherapy (n = 9) 7–10 days	Standard treatment (n = 10)	DASS-21 IES-R	No significance difference was found between groups for depression, anxiety, or stress. Only stress related to COVID-19 showed lower significance differences in IG compared with CG
Moench and Billsten (2021) Canada	-	-	Mental health clinicians, 100%	STEP (n = 16) 7 days	Wait list (n = 17)	DASS-21 GSE	Pre- and post- comparisons showed a significant decrease in depression, anxiety and stress in IG compared with CG. There was also a significant increase for self-efficacy in the IG
Otared et al. (2021) ^b Iran	IG = 33.4 (4.5) CG = 31.5 (5.4)	IG, 45% CG, 50%	HECWs, 100%	Online-group ACT (n = 20) 8 sessions	Wait list (n = 20)	BDI BAI QOLI GAF AAQ-II	ACT group showed significant lower scores in depression and anxiety, as well as an improvement in quality of life compared with CG
Procaccia et al. (2021) Italia	46.4 (9.9) 28–61	74.5%	Nurse, 54.5% Physician, 27.3% Allied HECWs, 18.2%	Expressive writing (n = 30) 3 days	Neutral writing (n = 25)	BDI LASC SCL-90 MSPSS	Post-traumatic disorder symptoms were significantly reduced in IG. Otherwise, depression symptoms and SCL-90 punctuation were significantly lower in IG group, while increased in CG group

TABLE 1 (Continued)

Study	Age M (SD)/range	Females	Professional group	Intervention/length	Comparator	Outcome measures	Main results
Yildirim and Yildiz (2022) ^b Turkey	IG = 27.6 (5.2) CG = 29.1 (6.6)	100%	Nurse, 100%	Mindfulness and music therapy (n = 52) 1 session	Control group (n = 52)	STAI PWBS WRSS	IG showed significant lower scores for stress and work-related strain than CG. Moreover, IG presented significant higher scores for psychological well-being than CG. Intragroup comparisons were significant for the three variables only in IG group

Abbreviations: AAQ-II, Acceptance and Action Questionnaire; ACT, Acceptance Commitment Therapy; ATSPH-SF, Attitudes Toward Professional Psychological Help Scale; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; BR5, Brief Resilience Scale; CG, Comparator Group; DASS-1, Depression Anxiety Stress Scale; DERS, Difficulties in Emotion Regulation Scale; DTS, Davison Trauma Scale; EMT, Emergency Medical Technician; EuroQoL, European Quality of Life; GAD-7, Generalized Anxiety Disorder; GAF, Global Assessment of Functioning Scale; GHQ, General Health Questionnaire; GSE, General Self-Efficacy Scale; HADS, Hospital Anxiety Depression Scale; HECWs, Healthcare Workers; IES-R, Impact of Event Scale Revised; IG, Intervention Group; ISI, Insomnia Severity Scale; LASC, Los Angeles Symptom Checklist; MBI-HSS, Maslach Burnout Inventory Human Services Survey; MISS, Minimal Insomnia Symptom Scale; MSPSS, Multidimensional Scale of Perceived Social Support; NEO-FFI, NEO Five Factor Personality Inventory; PC-PTSD-5, Primary Care Post-Traumatic Stress Disorder; PHQ-9, Patient Health Questionnaire; PWBS, Psychological Well-Being Scale; QOLI, Quality of Life Index; SCL-90, Symptom Check List; SHA1, Short Health Anxiety Inventory; SPS-6, Short Presenteeism Scale; STAI, State Anxiety Inventory; STEP, Self-Care Traumatic Episode Protocol; SWEMWBS, Short Warwick-Edinburgh Mental Well-Being Scale; WRSS, Work Related Strain Scale; WSAS, Work and Social Adjustment Scale.

^aFrequencies by groups of age.

^bMean age by intervention arm.

well as a significant increase in well-being ($aMD = 0.54$, 95% CI = 0.20–0.89, $p = 0.002$) compared to control group.

Ghazanfarpour et al. (2021), proved the effectiveness of WhatsApp tele-counselling compared to non-intervention group. Only anxiety related to coronavirus ($MD = 1.52$, 95% CI = 0.63–2.4, $p = 0.001$) and anxiety of likelihood to illness ($MD = 0.87$, 95% CI = –0.11 to 1.87, $p = 0.001$) significantly decreased compared to non-intervention group. Depression and anxiety of coronavirus negative consequences did not show significant differences. Otared et al. (2021) provided online group acceptance and commitment therapy (ACT) versus waiting list. Anxiety ($F = 155.07$, $p < 0.05$, effect size $[\eta p^2] = 0.81$) and depression ($F = 39.54$, $p < 0.05$, $\eta p^2 = 0.52$) presented significantly lower scores in ACT group than waiting list.

Two studies used video to deliver the psychological intervention (Amsalem et al., 2022; Moench & Billsten, 2021). One study used the DASS-21 to measure the variables of interest, however it only reported general score. The results showed significantly lower differences on Self-Care Traumatic Episode Protocol (STEP) group compared to the wait list for general DASS-21 score [$MD = -7.68$, $F(2, 30) = 5.22$, $p < 0.05$]. STEP programme consisted of watching a series of videos about different techniques to handle possible situations related to COVID-19 (e.g., EMDR, breathing, handling disturbing memories) (Moench & Billsten, 2021).

Amsalem et al. (2022) presented as main outcome treatment-seeking intentions. However, this outcome was associated with depression, anxiety and PTSD because the 80% of the sample screened positive for these variables. Video-based interventions (group \times time interaction: Wald $\chi^2 = 59.4$, $p < 0.001$), showed significantly higher scores in treatment-seeking intentions than non-intervention group. Both video + booster intervention (from mean $[M] = 7.9$ [95% CI: 7.3–8.4] to $M = 9.2$ [95% CI: 8.7–9.7], $p < 0.001$, Cohen's $d = 0.50$) and video intervention (from $M = 8.3$ [95% CI 7.9–8.8] to $M = 9.4$ [95% CI 9.0–9.7], $p < 0.001$, Cohen's $d = 0.46$) significantly increased treatment-seeking intentions from baseline to post-intervention.

Only three studies did not use new technologies to deliver the intervention (Ferrerres et al., 2022; Procaccia et al., 2021; Yildirim & Yildiz, 2022). In one of them, the psychological intervention consisted of expressive writing and the comparator was neutral writing. PTSD symptoms ($F = 13.72$, $p = 0.002$) and depression ($F = 6.12$, $p = 0.02$) were significantly lower in expressive writing group compared to neutral group (Procaccia et al., 2021). In other study, participants in the intervention group received a 30-min session of mindfulness and music therapy. Intervention group showed a significant reduction of stress ($MD = -7.46$, 95% CI = –12.79 to 2.13, $p = 0.01$) and work-related stress ($MD = -3.39$, 95% CI = –6.04 to 0.72, $p = 0.36$) compared to control group. Moreover, a significant improvement of psychological well-being was found ($MD = 5.15$, 95% CI = 1.27–9.03, $p = 0.30$) in the intervention group compared to control group. The control group did not show significant differences in the intragroup pre and post-test comparisons (Yildirim & Yildiz, 2022).

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participant personnel and outcome (performance bias)	Incomplete outcome data (attrition bias)	Selective outcome reporting	Other bias
Amasalem et al. 2022	?	?	+	+	+	+
Ferreres et al. 2022	+	+	?	+	+	+
Fiol-DeRoque et al. 2021	+	+	+	+	+	+
Gnanapragasam et al. 2022	+	+	+	+	+	+
Ghazanfarpour et al. 2021	+	?	+	+	+	+
Gupta et al. 2021	+	+	+	+	+	+
Moench & Billsten, 2021	+	+	+	+	+	?
Otared et al. 2021	?	?	+	+	?	+
Procaccia et al. 2021	?	?	+	+	+	+
Yildirim et al. 2022	+	+	?	+	+	+

FIGURE 2 Graphic for risk bias.

Finally, Ferreres et al. (2022) proved the effectiveness of a preventive programme to train emotional skills in healthcare professionals. In the pre- and post-test intragroup comparisons, only the intervention group presented significant differences for depression (MD = -2.16, $p = 0.024$, Cohen's $d = -0.40$), stress (MD = -2.08, $p = 0.039$, Cohen's $d = -0.48$) and personal accomplishment (MD = -5.77, $p = 0.036$, Cohen's $d = -0.76$).

3.4 | Secondary outcomes

Some studies reported supplementary measures to the main outcomes. Fiol-DeRoque et al. (2021) assessed insomnia (aMD = 0.01, 95% CI = -0.05 to 0.07, $p = 0.38$) and self-efficacy (aMD = 0.01, 95% CI = -0.06 to 0.09, $p = 0.36$) but no significant differences were observed between groups. In the subgroup analysis insomnia showed

significantly lower differences in PsyCovidApp + psychotropics (aMD = -0.16 , 95% CI = -0.30 to -0.02 , $p = 0.01$) and PsyCovidApp + psychotherapy (aMD = -0.20 , 95% CI = -0.42 to 0.02 , $p = 0.03$) compared to ControlApp. Another study found a significant reduction for insomnia scores (adjusted odd ratio = 0.36 , 95% CI = 0.21 – 0.60 , $p < 0.001$) compared to the control group (Gnanapragasam et al., 2022).

Moench and Billsten (2021) found a significant increase of self-efficacy (MD = 4.12 , $F(2, 30) = 5.22$, $p < 0.05$) in STEP group compared to wait list. One study reported a significant increase of quality of life ($F = 27.35$, $p < 0.05$, $\eta p^2 = 0.42$) and acceptance and act skills ($F = 44.96$, $p < 0.05$, $\eta p^2 = 0.55$) in ACT group compared to wait list (Otared et al., 2021).

Ferreres et al. (2022) observed significant intergroup differences in emotional exhaustion (MD = -7.48 , $F = 4.66$, $p = 0.042$) and personal accomplishment (MD = -5.27 , $F = 4.96$, $p = 0.036$), with lower scores for the intervention group.

3.5 | Follow-up outcomes

Finally, three studies reported follow-up results (Amsalem et al., 2022; Ferreres et al., 2022; Fiol-DeRoque et al., 2021).

Video + booster intervention showed a significant increased, compared to video and non-intervention groups (Wald $\chi^2 = 7.2$, $p = 0.028$), for treatment-seeking intentions from post-intervention to 14 days follow-up (from $M = 9.2$ [95% CI 8.7–9.7] to $M = 9.8$ [95% CI 9.3–10.3], $p = 0.026$, Cohen's $d = 0.24$) (Amsalem et al., 2022). Fiol-DeRoque et al. (2021) did not find significant differences in any assessed variable at 2 weeks follow-up.

Ferreres et al. (2022) measured the evolution of variables over time (1-, 3- and 6-month follow-up), once the intervention has been administrated in both groups. Statistically, effects were found for the time variable with reductions in personal accomplishment ($F = 3.95$, $p = 0.005$, Cohen's $d = 0.80$), neuroticism ($F = 2.58$, $p = 0.043$, Cohen's $d = 0.64$), intrusion ($F = 4.91$, $p = 0.001$, Cohen's $d = 0.89$) and avoidance ($F = 4.81$, $p = 0.001$, Cohen's $d = 0.88$) at 6-month follow-up.

4 | DISCUSSION

To the best of our knowledge, this is the first systematic review about the effectiveness of psychological interventions for healthcare professionals during COVID-19 pandemic. Previous studies were conducted to identify the psychological resources available for this population (Hooper et al., 2022) or/and patients with COVID-19 (Legakul et al., 2022; Tasleem et al., 2022).

However, the vulnerability of healthcare professionals to health crisis (García-Iglesias et al., 2020; Nguyen et al., 2020; Vieta et al., 2020), the observed psychological impact (Shultz et al., 2016; Yang et al., 2020) and the lack of resources (Muller et al., 2020; Smallwood et al., 2021) revealed the urgency of designing

psychological interventions adapted to the needs of health workers. The number of women was superior in most of the included studies. There was no evidence for the relation between gender and job roles, except for the two studies where the entire sample was composed by women nurses. However, it has been observed that women represent 70% of workers in social and health sector. Especially, there was observed more female presence between nurses than other roles (Boniol et al., 2019). Nurses participated in six of the included studies. In previous studies, nursing was the occupation with the highest levels of psychological problems, like anxiety or depression, due to the close contact with patients for long working hours (Boniol et al., 2019; Danet, 2021; Shaikat et al., 2020).

Ten studies accomplished the inclusion criteria of this review. The main assessed variables were depression, anxiety, stress, and PTSD because they were identified as the most prevalent between healthcare workers (Lazzerini & Putoto, 2020; Li et al., 2020; Vieta et al., 2020). Work-related stress was also analyzed because burnout was a relevant variable during the pandemic (Yildirim & Yildiz, 2022).

Most of the interventions were delivered using new technologies because of the safety regulations imposed due to COVID-19. *Ehealth* interventions, defined as the combination of electronic communication and new technologies in the health area, showed positive results according to previous studies (Oosterveen et al., 2017). Presenting advantages like less cost, more flexibility, anonymity and reaching more people at the same time (Beleigoli et al., 2019). However, two of the included studies did not show significant differences between groups. The proposed interventions were psychoeducational web applications (Fiol-DeRoque et al., 2021) and tele-counselling by phone (Gupta et al., 2021). The length of the interventions could be another aspect to consider being 14 and 7 days respectively (Fiol-DeRoque et al., 2021; Gupta et al., 2021).

In these two studies, the interaction with a mental health professional was not enough, considering the severity of the situation. In fact, Fiol-DeRoque et al. (2021) observed that the intervention group showed significant differences compared to control group, when the applications was combined with an additional method like psychotherapy or psychotropics. Therefore, these proposals (Fiol-DeRoque et al., 2021; Gupta et al., 2021) could be considered additional resources more than psychological interventions by themselves. Fiol-DeRoque et al. (2021) found same results for the secondary outcomes, insomnia, and self-efficacy. Moreover, there was no significant differences for any variable at 2 weeks follow-up. These results revealed that interventions should be more personalized, supported by a mental health professional and maintained over time to prove their effectiveness (Sherrington et al., 2016).

However, Gnanapragasam et al. (2022) used an application not only to reduce psychiatric morbidity symptoms, also to increase well-being between health workers obtaining positive results for the intervention group compared to control group. Yildirim and Yildiz (2022), used mindfulness and music therapy, instead of new technologies, to reduce work-related stress but also to increase psychological well-being, obtaining positive results for the intervention group.

Currently, the definition of health implies a state of complete physical, mental and social well-being, and not just the absence of disease (WHO, 2022). Programs that promote wellness at the workplace, instead of removing symptoms, could be more beneficial both individuals and organizations by optimizing the functioning of health care systems in the long term (Shanafelt et al., 2019).

Another study used tele-counselling during 7 days for the intervention groups and obtained significantly lower scores for anxiety related to COVID-19 and likelihood to illness compared to non-intervention group (Ghazanfarpour et al., 2021). The main difference with Gupta et al. (2021) was the control group, without intervention and basic information respectively (Ghazanfarpour et al., 2021; Gupta et al., 2021). The evolution of the pandemic and the arrival of a new normality, could influence these results. Previous studies found that the impact of pandemic was maintained over time, even increasing levels of anxiety and depression (González-Sanguino, et al., 2020). For these reasons, ensuring the psychological well-being of health workers has become a sanitary priority, as well as, implementing organizational measures to protect the mental health of healthcare workforce (Mira et al., 2020; Søvold et al., 2021). Proposing policy suggestions could be a useful tool to achieve long-term effectiveness results in this field (Søvold et al., 2021). Additionally, teaching self-care strategies, like emotional skills training (Ferrerres et al., 2022), provides long-term tools to face stressful situations during the lifespan. If psychiatric symptoms reappear, the individual will be able to manage the situation (Søvold et al., 2021).

Otared et al. (2021) delivered a group-based online ACT. The results showed significantly lower scores in ACT group compared to wait list for anxiety and depression. Moreover, participants in the intervention group reported significantly higher scores for quality of life and acceptance and act skills compared to wait list. Supporting the relevance of promoting well-being, rather than treating the symptoms, to achieve long-term individual and organizational results (Shanafelt et al., 2019; Søvold et al., 2021). The multi-protocol ACT was elaborated from the information provided by Hayes et al. (2012). According to previous studies, this intervention was guided by mental health professionals, providing instructions with frequent and personalized feedback (Sherrington et al., 2016). This intervention presented the advantage of the group format. Group therapy provided a space to share common fears, provide solutions, show empathy and not feel alone. Besides, participants provided feedback to each other, strengthening group cohesion. Especially relevant in crisis like COVID-19 outbreak (Rodríguez-Zafra & García-Galeán, 2022).

Moench and Billsten (2021) used another complete programme, teaching different techniques to cope with difficult situations related to pandemic. Significantly lower scores were observed for intervention group compared to wait list. The intervention group also showed a significant increase of self-efficacy compared to wait list. The presence of self-regulation skills and active coping strategies, such as problem solving, were associated with better mental health (Teixeira et al., 2015). Promoting these skills from the workplace will result in fulfilled workers, therefore more effectiveness, better system

functioning and less organizational costs (Shanafelt et al., 2019; Søvold et al., 2021).

Amsalem et al. (2022) used video to encourage participants to seek psychological treatment. The 80% of the participants presented depression, anxiety, or PTSD. Intervention groups scored significantly higher on treatment-seeking intentions than the non-intervention group. These results were replicated in the 14- and 30-day follow-up. However, like in previous studies (Fiol-DeRoque et al., 2021; Ghazanfarpour et al., 2021; Gupta et al., 2021) these videos were complementary resources. In fact, this proposal was a programme to seek comprehensive psychological intervention, proving that mental health is a priority for this population.

Procaccia et al. (2021) proposed an intervention delivered without new technologies. Expressive writing group obtained significantly lower scores for PTSD and depression than neutral writing. These results supported that focusing on deeper feelings and thoughts, rather than avoiding them, reduces the psychological impact of COVID-19 pandemic (Teixeira et al., 2015). Therefore, psychological interventions are needed to learn to handle the emotions resulting from working in limit situations (Shanafelt et al., 2019).

Finally, most of the proposed interventions lasted between 3 and 14 days, were self-manage or with minimal contact with the mental health professional and were based on psychoeducation. These programs were not comprehensive enough to be considered effective psychological interventions, the results were promising but more research is needed. Especially, longitudinal studies to ensure long-term effects and demonstrate that mental health programs could be a beneficial organization investment (Søvold et al., 2021). Some of these programs were oriented to well-being rather than removing symptoms, supporting the WHO concept of health to achieve long-term effectiveness results (Ferrerres et al., 2022; Gnanapragasam et al., 2022; Moench & Billsten, 2021; Otared et al., 2021; Yildirim & Yildiz, 2022).

The health international crisis around the world by COVID-19 outbreak has change healthcare system in every country. The results of this review, according with previous studies (Shanafelt et al., 2019; Søvold et al., 2021), reveal the urgency of designing quality psychological interventions for healthcare professionals. The poor working conditions have caused many psychological disorders in this community. Normally, these workers are in close contact with people struggling with difficult situations and the emotional burden is high. COVID-19 pandemic has enhanced these factors, increasing the psychological impact and the precarious conditions (García-Iglesias et al., 2020; Mira et al., 2020; Nguyen et al., 2020; Vieta et al., 2020). For these reasons, psychological well-being of health workers should be a global priority, as well as, providing comprehensive, high quality and personalized psychological interventions from the workplace and the institutions (Mira et al., 2020; Shanafelt et al., 2019; Søvold et al., 2021). In fact, psychological programs could increase the satisfaction with the workplace and, consequently, a better labour performance with less sick leaves (Yslado-Méndez et al., 2019). This psychological approach should be accompanied by an improvement

of the labour conditions, reducing marathon days and stabilizing working conditions.

This systematic review also presents some limitations. The small number of included studies and the time elapsed since the start of COVID-19 pandemic. Besides, all included studies are cross-sectional, longitudinal studies will be necessary to prove the long-term effectiveness of the proposed interventions. In fact, 2 years is a short period of time to performed psychological interventions and prove their effectiveness through RCT. Another limitation was heterogeneity presenting the outcomes through the different included studies. Further investigative research should be driven to supply these limitations.

AUTHOR CONTRIBUTIONS

All authors participated and revised the design and the purpose of this systematic review. Carmen Varela conducted the search. Carmen Varela and M. Almudena Gómez Pulido conducted the research: screen the titles and abstracts, review the full-text, and extract the data. Carmen Varela and AG drafted the manuscript with contributions from all authors. The authors read and approved the final manuscript.

ACKNOWLEDGEMENTS

This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

DATA AVAILABILITY STATEMENT

This is a systematic review and is registered in the international prospective register for systematic reviews (PROSPERO), the protocol of this study was accepted on 16 March 2022, registration number CRD42022318685.

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How to cite this article: Varela, C., Montero, M., Serrano-Ibáñez, E. R., de la Vega, A., & Pulido, M. A. G. (2023). Psychological interventions for healthcare professionals during the COVID-19 pandemic: A systematic review. *Stress and Health*, 39(5), 944–955. <https://doi.org/10.1002/smi.3246>