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SUMÁRIO

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Effectiveness of telehealth interventions to promote mental health among healthcare professionals: a systematic review

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Resumo: Objetivo: Investigar a eficácia de intervenções de telessaúde na promoção da saúde mental de profissionais da saúde. Métodos: Trata-se de uma revisão sistemática, com buscas nas bases de dados Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed), Cochrane Central Register of Controlled Trials (CENTRAL/Cochrane Library) e Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS). Foram incluídos ensaios clínicos randomizados que investigaram a eficácia de intervenções de telessaúde direcionadas a profissionais da saúde. O desfecho analisado foi a melhora da saúde mental desses profissionais. A ferramenta Revisada da Cochrane para avaliação de risco de viés em ensaios randomizados (RoB 2.0) foi utilizada. Resultados e discussões: Foram analisados dois ensaios clínicos randomizados com baixo risco de viés. Um estudo mostrou diferença significativa a favor do grupo de intervenção com plataforma interativa após 6

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meses (-0,96; IC 95%, -1,52 a -0,40) e 9 meses (-1,14; IC 95%, -1,69 a -0,58). No outro estudo, não houve diferença significativa entre os grupos após duas semanas (-0,04; IC 95%, -0,11 a 0,04; P = 0,15). Entretanto, uma análise de subgrupo envolvendo participantes em uso de psicotrópicos demonstrou diferença significativa em favor do grupo que utilizou o aplicativo (-0,29; IC 95%, -0,48 a -0,09; P = 0,004). Em ambos os estudos, não foram observadas diferenças significativas entre os grupos para os desfechos de burnout e estresse. Conclusão: A evidência disponível é insuficiente para estabelecer conclusões definitivas sobre a eficácia das intervenções de telessaúde na promoção da saúde mental de profissionais da saúde. A interpretação dos achados é limitada pelo pequeno número de estudos incluídos e pela heterogeneidade das intervenções avaliadas. Estudos clínicos mais robustos, com protocolos padronizados e maior tempo de acompanhamento, são necessários para esclarecer o impacto dessas intervenções.
Palavras-chave: Recursos Humanos em Saúde; Telemedicina; Telessaúde; Telepsicologia.

Abstract: Objective: To investigate the effectiveness of telehealth interventions in promoting the mental health of healthcare professionals. Methods: This systematic review searched the Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed), the Cochrane Central Register of Controlled Trials (CENTRAL/Cochrane Library), and the Latin American and Caribbean Health Sciences Literature (LILACS) databases. Randomized controlled trials investigating the effectiveness of telehealth interventions targeted at healthcare professionals were included. The primary outcome was improvement in mental health among healthcare professionals. The Revised Cochrane Risk of Bias Tool for Randomized Trials (RoB 2.0) was used to assess the risk of bias. Results and discussion: Two randomized clinical trials were analyzed, both with a low risk of bias. One study showed a significant

difference in favor of the interactive platform's intervention group after 6 months (- 0.96; 95% CI, -1.52 to -0.40) and 9 months (-1.14; 95% CI, -1.69 to - 0.58). In the other study, no significant difference was found between the groups after two weeks (- 0.04; 95% CI -0.11 to 0.04; P = 0.15). A subgroup analysis of participants taking psychotropic drugs showed a significant difference between the groups in favor of the app intervention group (-0.29; 95% CI -0.48 to -0.09; P = 0.004). Discussion: In both studies, there was no significant difference between the groups for the Burnout and Stress outcomes. Conclusion: The available evidence is insufficient to draw definitive conclusions regarding the effectiveness of telehealth interventions in promoting the mental health of healthcare professionals. Interpretation of the findings is limited by the small number of included studies and the heterogeneity of the interventions evaluated. Further robust clinical trials with standardized protocols and longer follow-up periods are needed to clarify the impact of these interventions on the mental health of healthcare professionals.
Keywords: Human Resources in health; Telemedicine; Telehealth; Telepsychology.

Introduction

Healthcare services around the world are calling for implementing strategies to mitigate the serious psychological consequences daily experienced by health professionals[1,2]. Among the different types of strategies considered, mobile health interventions (Health) are receiving special attention, not only because of their easy and attractive implementation characteristics, but also because they can be delivered in the absence of face-to-face interactions, reducing then the risk of infections, in addition to the motivational issue[3-6].

Technological interventions have been widely used due to their advantageous application characteristics, despite the lack of

evidence of their effectiveness among healthcare professionals (HP)[7,8]. The global health emergency generated by the COVID-19 pandemic, for example, posed an unprecedented extra challenge for health professionals who faced heavy workloads and psychologically difficult situations[9-14].

Technological changes combined with a new form of structuring the labor system have been contributing to the emergence of diseases that affect not only physical, but also psychic/mental well-being[15-19]. New ways of working and methods of charging productivity by managers have been reported as etiological factors for several mental disorders. Such factors are routinely characterized by altered behavior and mood, lack of energy, and they are associated with an increased risk of chronic disease[20-24].

Telehealth tools have been geared towards the various demands of patients, neglecting the needs of health professionals. It is not clear from the literature how effective these tools are to improve mental health of these professionals. Detecting the effectiveness of telehealth tools that use for this group of workers can help to design programs for their mental health and create specific public policies for this population. Therefore, the aim of this study was to investigate the effectiveness of telehealth programs in mental health of healthcare professionals.

Methods

This is a systematic review following a checklist on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[25] and it is registered on platform PROSPERO, CRD 42024567724.

The three databases as follows were selected to carry out the systematic review: Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed), Cochrane Register of Controlled Trials (CENTRAL CCTR/Cochrane Library), Latin American and Caribbean

Literature on Health Sciences (LILACS) and Virtual Health Library (VHL). The search was carried out in June 2024. The search strategies according to the selected databases are described in Table 1.

Table 1. Search strategies used in electronic databases for studies on telehealth interventions and mental health among healthcare professionals, 2024.

Database	Search strategy
PubMed/Medline	#1 "Health Personnel"[Mesh] OR "Delivery of Health Care"[Mesh] OR “Health Care Provider*” [tw] OR “Community Health Workers" [tw] OR “employee” [tw] OR “Occupational health” [tw] OR “Health Care Workers” [tw] OR “Health professional” [tw] #2 "Telemedicine"[Mesh] OR "Mental Health Teletherapy"[Mesh] OR "Distance Counseling"[Mesh] OR "Remote Consultation"[Mesh] OR “E-Therap*” OR "eHealth" [tw] OR “Telehealth education” [tw] OR “Health promotion” [tw] OR “telemedicine” [tw] OR “Telecare” [tw] OR “Virtual Medicine” OR “Mobile Health” [tw] OR “Health, Mobile” [tw] OR “mHealth” [tw] OR “Telehealth” [tw] OR “eHealth” [tw] OR “Telepsychotherapy” [tw] OR “Telepsychology” [tw] #3 "Mental Health"[Mesh] OR “Health, Mental” [tw] OR “Mental Hygiene” [tw] OR “Hygiene, Mental” #1 AND #2 AND #3
Cochrane	#1“Pessoal de Saúde” OR “Personal de Salud” OR “Health Personnel” #2“Telemedicina” OR “Telemedicina” OR “Telemedicine” OR “Telessaúde Mental” OR “Teleterapia de Salud Mental” OR “Mental Health Teletherapy” #3 “Saúde Mental” OR “Salud Mental” OR “Mental Health” #1 AND #2 AND #3
Biblioteca Virtual em Saúde (Virtual	#1“Pessoal de Saúde” OR “Personal de Salud” OR “Health Personnel”

Health Library of Brazilian Ministry of Health)	#2 “Telemedicina” OR “Telemedicina” OR “Telemedicine” OR “Telessaúde Mental” OR “Teleterapia de Salud Mental” OR “Mental Health Teletherapy” #3 “Saúde Mental” OR “Salud Mental” OR “Mental Health” #1 AND #2 AND #3

The initial selection was carried out using the titles and abstracts of the studies, and were evaluated by two authors, independently and blindly. The articles were read in their entirety and the studies included were selected. In cases of disagreement, this was resolved by the action of a third reviewer.

The choice of studies was made according to the PICOS strategy: (Population, Intervention, Control, Outcome, and Study Design):

- Population: healthcare professionals
- Intervention: at least one experimental group with synchronous or asynchronous telehealth, consisted of audiovisual programs in isolation.
- Control: No interventions, in-person health interventions, placebo interventions, and any intervention without telehealth.
- Outcomes: mental health assessed using validated instruments.
- Type of study: Randomized clinical trials (RCTs).

Preliminary and pilot studies, abstracts published at conferences, articles with insufficient data on the results, and studies with participants other than health workers analyzed together with the population of interest were excluded.

The Cochrane Collaboration recommendations were used to assess the risk of bias for all randomized clinical trials using the RoB 2.0 tool (Revised Cochrane risk-of-bias tool for randomized trials)

used by the Microsoft Excel program, consisting of five domains: Bias in the randomization process; Deviations from the intended intervention; Bias due to missing data; Bias in measuring outcomes; Bias in reporting outcomes. The risk-of- bias assessment was carried out by two independent researchers.

Data extraction from the included studies was performed using a standardized form adapted from the Cochrane Collaboration Checklist[5], extracted by two independent reviewers. This study was conducted in accordance with the ethical standards required by the Brazilian Ministry of Health, following Resolutions No. 466/2012, 510/2016, and 580/2018. As this is a systematic review based on previously published data, approval by a Research Ethics Committee was not required.

Results

An initial search was carried out and 1779 studies were analyzed, and 2 RCTs were selected for qualitative analysis, totaling 1757 participants. The study selection process is detailed in Figure 1. The studies were conducted in Spain and the United States. The average age of the participants was 40 years, the ages range from 18 to 65 years, and gender division was approximately 80% women and 20% men. In both studies, the participants were health professionals, physicians, nurses, and nursing aides who were selected based on exposure to high-demand scenarios, such as the COVID-19 pandemic, and who showed signs of stress and Burnout at the start of the studies. The data of the participants analyzed in the included studies, as well as the types of intervention and the instruments used to assess the outcomes of interest, are described in table 2.

The assessment tools used in the analyzed studies were validated and widely used in the literature, ensuring the robustness of the measures. Outcomes were assessed by using Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder (GAD-7),

Depression, Anxiety, and Stress Scale (DASS-21), Davidson Trauma Scale (DTS), Maslach Burnout Inventory Human Services Survey (MBI-HSS), Insomnia Severity Index (ISI), and General Self-Efficacy Scale (GSE). The baseline assessment period and last reassessment ranged from 2 weeks[2] and 6 to 9 months[26].

Table 2. Characteristics of randomized clinical trials included in the systematic review on telehealth interventions for mental health among healthcare professionals.

Author/date	Type of study	Participants			Intervention
Fiol-DeRoque et al. (2021)	Parallel RCT	EXP:	n = 248; 210 (84.7%) women 38 (15.3%) men age 42 (34-51; 23-63)	EXP:	PsyCovidApp (15 min/day, 2x week, for 2 weeks)
		CG:	n = 234; 191 (81.6%) women 43 (18.4%) men age 41 (32-47; 23-61)	CG:	Control app (15 min/day, 2x week, for 2 weeks)
Agarwal et al. (2024)	Parallel RCT	EXP:	n = 642 534 (83.2%) women 108 (16.8%) men	EXP:	Interactive text messaging platform (18 min/day, 4x week, for 6 and 9 weeks)

	38.6 years old		
CG:	n = 633 529 (83.6%) women 104 (16.4%) men 38.6 years old	CG:	Web-based mental health platform (18 min/day, 4x week, for 6 and 9 weeks)

[a]CG: Control group; RCT: Randomized clinical trials; RCT: Experimental group; DASS-21: Depression, Anxiety, and Stress Scale; GAD-7: Generalized Anxiety Disorder; PHQ-9: Patient Health Questionnaire.

A study[6] implemented a digital engagement strategy, in which participants accessed an online platform that offered interactive content on mental health, with weekly mindfulness modules, stress reduction exercises, and virtual appointments with therapists. Participants were encouraged to use the platform for at least 20 minutes a day, over 4 weeks. Another study[2] used PsycovidApp, a mobile application designed to provide psychological support for health professionals during the pandemic. The app included features such as daily emotional state tracking, breathing exercises and guided meditation, and motivational messages sent automatically. The participants used the app for an average of 15 minutes daily for 6 weeks.

Regarding the outcomes of anxiety and depression, a study[6] showed a significant difference in favor of the intervention group after 6 months (- 0.96; 95% CI, -1.52 to -0.40) and after 9 months (-1.14; 95% CI, -1.69 to - 0.58). In the other study2, no significant difference was found between the groups after two weeks (- 0.04; 95% CI -0.11 to 0.04; P = 15). However, in an analysis of the subgroups, a significant difference was observed between the groups in favor of the intervention group, in which the participants used psychotropic

drugs, even before and during the study (-0.29; 95% CI -0.48 to -0.09; P = 0.004). In the two studies analyzed, there was no significant difference between the groups for the outcomes of Burnout and Stress.

Both studies showed a low risk of bias in all domains (Figure 2). In Domain 1 (Randomization), both studies used appropriate methods for random sequence generation and allocation concealment (computerized randomization with adequate concealment). In Domain 2 (Deviations from Intervention), adherence to interventions was high in both studies, and participants were not informed about their allocations, minimizing the risk of bias. In Domain 3 (Missing Data), follow-up loss rates were minimal, approximately 2% in the study by Agarwal *et al.* (2024) and 10% in the study by Fiol-deRoque et al. (2021), in addition, the missing data were duly treated. In Domain 4 (Outcome Measurement), the outcome evaluators were blind to the allocation of the groups and the scales used were validated. Finally, in Domain 5 (Outcome Selection), all pre-specified outcomes were reported in both studies, with no evidence of bias in the selection of results.

Figure 1. Flowchart of study selection according to PRISMA guidelines for telehealth interventions on mental health among healthcare professionals, 2024.

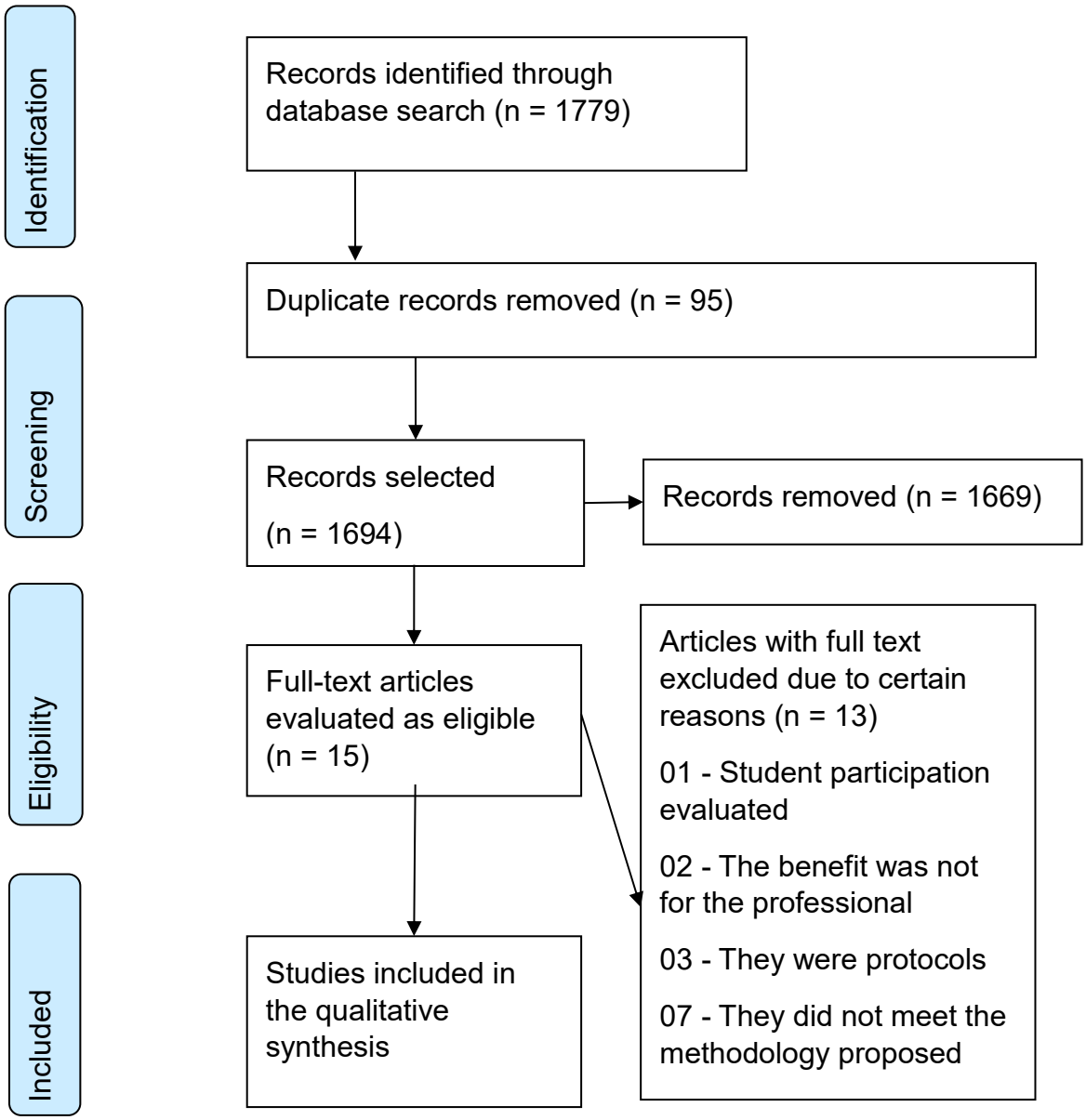
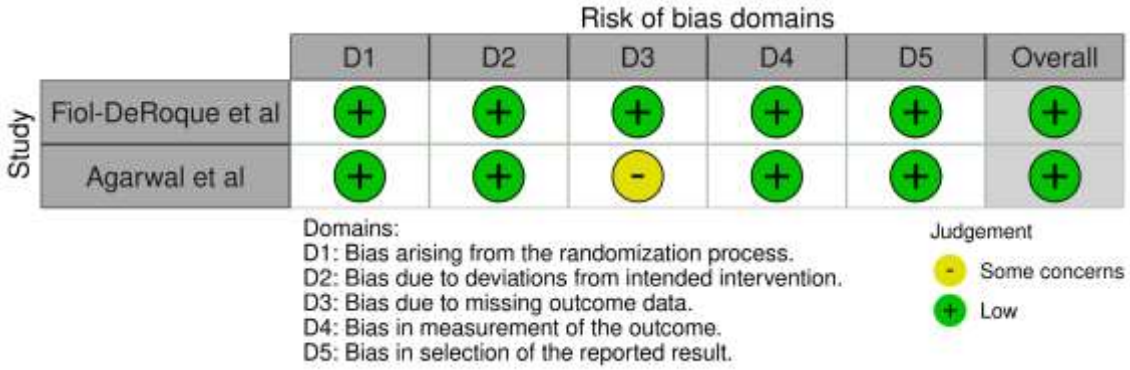


Figure 2. Risk of bias assessment of included randomized clinical trials using the RoB 2.0 tool in studies on telehealth interventions for mental health among healthcare professionals.



Discussion

The findings of this review reveal inconsistent results regarding the effectiveness of telehealth interventions for mental health outcomes among healthcare professionals. One study showed positive results for anxiety and depression after six and nine months of intervention via an interactive platform, while the other showed that the app intervention was not effective. In the latter, an improvement in anxiety and depression was observed only in a sub-group of participants who used psychotropic drugs. As for the methodological quality of the studies, both showed a low risk of bias.

In the articles analyzed there is inconsistency between the studies, since the type and time of intervention were different, as were the dose and frequency used for telehealth, causing then differences between the results. Each patient has peculiar characteristics and specific mental problems, and when such problems are hegemonically evaluated, their specificities are not considered. Thus, the duration of psychotherapeutic treatments is

relevant and may vary from a few weeks to years, depending on the patients' needs and therapeutic objectives[27].

In both studies, anxiety and depression were evaluated, and a significant difference was observed between the groups in favor of telehealth intervention when evaluated after a longer period. Agarwal *et al*. (2024) concluded that it is possible to improve the treatment of depression and anxiety among health professionals over six months by using a proactive digital engagement strategy, including text messages, mobile mental health assessments, and connection to care, when compared to providing the same resources for individuals to find and use. Likewise, the research conducted by Fiol-DeRoque *et al*. (2021), which used an application (PsyCovidApp) in the intervention group, obtained a positive evaluation in participants who used psychotropic drugs, reducing mental health problems in just two weeks among these health professionals.

In the study by Agarwal *et al*. (2024) the participants were health professionals with daily access to a smartphone and at least 4 clinical hours per week. The control group had open access to a web-based mental health platform, while participants in the intervention group received monthly text messages about mental health, mental health assessments, and links to treatment in an interactive way.

A group treated with interactive telemedicine could benefit from greater accessibility to health care, with treatments performed remotely, which facilitates continuous monitoring and allows for faster responses in case of complications. In addition, interactive telemedicine can promote greater patient engagement, since patients can access health information and resources in real time. In contrast, the group not treated with interactive telemedicine may face difficulties accessing information, especially in remote areas, resulting in possible treatment delays, in addition to a lower frequency of follow-up, which may negatively impact health outcomes[28].

Fiol-DeRoque *et al.* (2021) carried out a clinical trial and the results were analyzed only in two weeks, where the PsycovidApp intervention group used an application focused on emotional skills, healthy lifestyle behavior, exhaustion and social support, and a control group used an application with general recommendations on mental healthcare.

The duration of psychotherapeutic treatment varies according to several factors, such as the approach used, the nature of the problem being treated, and the individual needs of the patient. Cognitive behavioral therapies (CBT) may have a relatively short duration, but 10 to 20 sessions are still necessary, including one weekly session, while psychoanalytic or psychodynamic therapies can last for years. Evaluating the results of a treatment in psychotherapy generally involves measuring changes in emotional well-being, reduction of symptoms, improvement in daily functionality, and satisfaction with treatment, which requires a certain period of time[27].

Telehealth can be implemented in various ways, such as through audiovisual courses, applications, and online platforms that offer a variety of resources and content. Some of these telehealth applications proved to be effective for the health professionals themselves in the works analyzed. These works used different methodologies, where one performed an evaluation after six months obtaining a significantly positive result. Another study after two weeks obtained favorable results only for professionals who used psychotropic drugs. The authors recommend expanding the discussion of the topic, as well as the definition and clarification of the best modality and its applicability[29].

The diagnosis of a mental and emotional illness is still rooted in countless prejudices, which makes it very difficult for health professionals to adhere to treatment. Recognizing themselves as a “sick” person and seeking care has been reported in the literature as something difficult for health professionals, causing them to hide

their afflictions and the search for some type of assistance to be delayed. Some forms of telehealth, such as online platforms, are accessible to everyone thanks to the advent of the internet, but individuals must seek such support[30].

In the studies analyzed, it was relevant to realize that the interactive telehealth strategies used made it possible to considerably increase individuals' adherence to the treatments proposed. Through interactions using messages and sound warnings, engagement with the professionals encouraged them to interact with the proposed idea of treatment to improve their mental health.

It is worthwhile having an instrument to assist health professionals in a moment of weakness. Such an instrument can help them to move forward, assist them professionally, as well as emotional support, once in current times everyone is facing work overload. A stressed, emotionally impaired professional will have their productivity hampered both quantitatively and qualitatively. New mental support tools focused on health professionals should be extensively studied and developed to improve the entire clinical care chain. It is important to realize that health professionals are also human beings, who are likely to become ill, mentally exhausted, and who also need to be cared by competent bodies. The key point, therefore, is seeking care for the caregiver, that is, providing health to those who promote health.

This study has some limitations, first the use of different scales to assess anxiety and depression in different countries. Second, it was only possible to include two studies in just three databases for studies in English. Third, due to the scarcity of analytical data, it was not possible to carry out the meta-analysis and, finally, studies that deal with the same object of study, but which are still in progress and have not been published, were not included in this review.

Conclusion

Based on this review, the available evidence remains insufficient to draw definitive conclusions regarding the effectiveness of telehealth interventions in promoting the mental health of healthcare professionals. Interpretation of these findings is challenging due to the limited number of studies, the diversity of telehealth strategies employed, and variations in intervention delivery, including synchronous and asynchronous approaches. Furthermore, the effectiveness of telehealth should be considered within the scope of outcomes that are realistically achievable through remote healthcare delivery. Future robust clinical trials with standardized protocols, direct comparisons between telehealth modalities, and longer follow-up periods are needed to clarify the clinical impact of telehealth interventions on the mental health of healthcare professionals.

Conflicts of Interest

The authors declare no conflicts of interest.

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