UNIVERSITY OF PADOVA

Department of General Psychology

Bachelor's Degree Course in Psychological Science

Final dissertation

Applications for Remote Psychological Support for People in Forced Isolation: A PRISMA Systematic Review

Supervisor

Professor Patrik Pluchino

Candidate: Aleksandar Zaplatic

Student ID number: 2007797

Academic Year 2022/2023

Table of contents

Abstract

Title: Applications for Remote Psychological Support for People in Forced Isolation: A PRISMA Systematic Review.

Background: The systematic review intends on evaluating previous research on applications in an extensive manner to assess the strengths and limitations of using them as an aid in psychological support for individuals in forced isolation.

Methods: The inclusion criteria for the review consisted of the research exploring and assessing applications that provide psychological support, along with providing a measure of psychological well being, while the exclusion criteria were being conducted during a period of forced isolation (the COVID-19 pandemic, situations of forced isolation, or circumstances, such as chronic illnesses or immunosuppressed patients, that prevent the possibility of reaching hospitals or facilities such as psychological centers) and not adequately explaining the platform applied to provide psychological support. The information sources employed to identify studies included in the review are the ACM digital library, Google Scholar, the IEEE digital library, PubMed, SAGE, Scopus, and Springer (last search made on March 29, 2023). Microsoft Excel was used to have a better overview when analyzing the data, while the PRISMA 2020 flow diagram for the systematic review was included to have a suitable representation of the search process. The total number of studies in the selection process was 199 (initially 184, with the later addition of 15 studies), with the relevant characteristics being that some were studies, while others were systematic reviews of studies and research papers focused on measuring the effectiveness of applications as a source of psychological support for individuals in forced isolation.

Findings: Of the 199 research articles identified, the number of articles included in the systematic review was 30. The relevant characteristics of the articles were summarized by outlining the author of the research (along with the year when the article was published), study design employed, country where the research was conducted, population of the study (as the number of individuals or number of studies in the review), whether there was a follow-up or not, platform used, as well as key findings. Findings from this systematic review indicate that applications for remote psychological support for people in forced isolation have significant beneficial effects on the well being of the population.

Interpretation: The findings appear to be largely in line with the recent systematic reviews, despite the rather limited number of studies included in the review (N=30). One's understanding of the generalizability of the applications for remote psychological support to non-western contexts would be immensely enhanced by a higher quantity and quality of research conducted across the world. Nevertheless, when directing the questions in future studies, it is important to clearly categorize the applications for remote psychological support through the way in which they are administered.

Introduction

When considering forced isolation and providing psychological support to individuals in these circumstances, one is able to identify a considerable number of cases in modern history, the most recent being the COVID-19 pandemic. However, despite the peculiar case of the recent COVID-19 pandemic, there are other situations of forced isolation or circumstances, such as chronic illnesses or immunosuppressed patients, that prevent the possibility of reaching hospitals or facilities, such as psychological centers, which are more common. To provide remote psychological support for people in forced isolation, researchers are working towards finding an appropriate platform to support them. Applications that implement psychological support have been available since the end of the 20th century; however, for a slightly different purpose, to solve the problem of limited psychiatric services for hospitals and clinics in remote areas (Brown, 1998). It is important to note that this particular area of research can be challenging due to the availability of platforms for providing support (especially in developing countries), their accessibility, and the troublesome nature of forced isolation. As Zangani (2022) noted, limited access to digital means, poor digital skills, and patients' preferences and individual needs may have contributed to differences in implementing and accessing telemental health services during the pandemic. Nevertheless, the current state of knowledge about applications for remote psychological support for the population in forced isolation is evolving every single day, particularly due to the COVID-19 pandemic. The uncertainties lie in the fact that research conducted during the pandemic and findings from the aforesaid area of research are published on a daily basis. The reason why it is important to conduct a systematic review is to have a

conclusive review of the growing research regarding the aforementioned topic, with an emphasis on people in forced isolation. An additional reason why the current review was considered necessary is that a different review method that will be applied in the present systematic review, the PRISMA method, is available but has not been used to address the review question. The interventions that have the purpose of providing remote psychological support in forced isolation work in a plethora of ways and are based on different approaches, some of which include mobile applications, video conferencing, along with other variations in digital technology and remote telemedicine.

Objective: This systematic review (based on the PRISMA method) intends on evaluating previous research on applications (research papers published since the beginning of the pandemic, as well as papers published in the last 23 years) in an extensive manner to assess the strengths and limitations of using them (a range of interventions mainly consisting of mobile applications, as well as other digital technology and remote telemedicine) as an aid in psychological support for individuals in forced isolation.

Methods

Eligibility criteria

Population: This systematic review included individuals from various demographic and socioeconomic groups without clearly defining any particular criterion with regards to these two factors. However, it is important to note that although the intention was to include as many cultural backgrounds as possible to grasp a better understanding of the global impact of the topic at hand, the population included in most studies represents mostly Western societies and the population of Eastern Asia.

Intervention: The research based on applications providing remote psychological support for individuals and the fact that the individuals were in forced isolation or circumstances that impeded the possibility of reaching hospitals or facilities were taken into consideration when distinguishing the eligibility criteria for the intervention. Applications in this specific context can

be described as offering different solutions and showing effectiveness in managing many psychological issues administered online through different platforms (Drissi et al., 2021). Some of the examples of interventions that were not included in this systematic review include interventions focused on providing information regarding general health (i.e., related to COVID-19, instead of mental health and psychological support), interventions not delivered to individuals in the distinct setting of forced isolation, which was one of the main objectives of this review, and interventions with insufficiently defined study designs. Additionally, research articles that included platforms that were not clearly defined throughout the research (defined in terms of what they are, how they work, along with the potential positive and negative aspects) were excluded, particularly the abundant research based on hotlines.

Outcome: Specific studies were ineligible because the outcomes of interest, such as whether the use of remote applications for psychological support for individuals in forced isolation is adequate or not, were not measured and the results of the studies were not precisely detailed.

When considering the report characteristics as a criterion for eligibility, unpublished manuscripts and conference abstracts were not eligible for inclusion. Notwithstanding, the review was not only restricted to studies published during the recent COVID-19 pandemic (this period could be defined as studies published from 2020 onward, ruling out the 2009 H1N1 pandemic), but also included other situations of forced isolation or circumstances (chronic illnesses or immunosuppressed patients) that prevent the possibility of reaching hospitals or facilities such as psychological centers.

Information sources

On October 10, 2022, a search of Google Scholar (a web search engine) was conducted, which was the first resource utilized on the topic. Google Scholar was one of the main information sources used in this systematic review. Each source was categorized in a Microsoft Excel spreadsheet to give a better overview of the sources. A 'snowball' search was carried out afterwards (throughout the entire period of searching for information sources, the last date being March 29, 2023) with the purpose of identifying additional sources. What the 'snowball' search

entailed was the use of reference lists (the types of references being both references cited in research reports included in the systematic review and references cited in systematic review reports on the same or a similar topic), along with Google Scholar, to pinpoint the studies, articles, and papers that were citing the research. Moreover, on November 29, 2022, a search (browsing online) of SAGE was made utilizing the SAGE Publications online platform (sagepub.com), along with the IEEE digital library, to add further studies. After thoroughly exploring the SAGE and the IEEE digital library databases, an additional database search (explored on December 11, 2022) was the search (browsing online) of Springer, the platform through which it was searched being the Springer online platform (springer.com). The final three databases, searched on March 23, 2023, were the ACM digital library, PubMed, and Scopus. It is important to note that research papers identified through these databases were added after the screening process, as indicated in Figure 1 (the PRISMA 2020 flow diagram). The restrictions that were applied were the same for all databases (ACM digital library, Google Scholar, IEEE digital library, PubMed, SAGE, Scopus, and Springer) consisting of research published from 2000 and onwards, with the purpose of adequately portraying the development of applications through time, as well as narrowing the searches, as well as certain search terms that will be discussed later.

Search strategy

The Google Scholar search was done using the freely accessible web search engine (scholar.google.com) and was the first database that was explored. The database coverage consisted of research articles published from 2000 to the present. Google Scholar was initially searched on October 10, 2022, with the last search made on March 29, 2023. The sequence of candidate terms that were used to search this simpler interface began with defining the keywords that were of interest to the systematic review. The initial keywords consisted of the words applications, remote, telemedicine, psychological support, forced isolation, and COVID-19, as this was the topic of interest. Consequently, through a draft search strategy developed using those keywords, additional search terms were identified and expanded to include mobile applications, digital technology, digital interventions, videoconferencing, remote, rural, chronic illness, as well

as other key terms that were deemed appropriate (i.e., telemental health intervention). The employed strategy was validated by evaluating whether it could be used to identify several known and eligible studies, the eligibility being defined through the appropriateness of the study in the systematic review, taking note of the abstract along with the most important aspects and details. When the initial 10 studies were deemed relevant in further searches, they were used to identify additional studies within Google Scholar (later the ACM digital library, the IEEE digital library, SAGE, Scopus, and Springer in addition to Google Scholar). As previously discussed, the limits applied included the year when the research was published (the criterion being published in 2000 and onwards due to its relevance to the topic and development of technology used as psychological support), with the addition of the research being published in English or at least having a version in English available to interpret. Despite the fact that the ACM digital library, IEEE digital library, SAGE, Scopus, and Springer searches were made at a later point in time (November 29, 2022, December 11, 2022, and March 23, accordingly), they were established on the same criteria listed above.

Selection process

The person conducting this research independently reviewed the titles and abstracts of studies (obtained with the purpose of including them in the review) and examined whether the aforementioned studies are suitable for obtaining an objective description of the topic. Furthermore, the titles and abstracts were inserted in a Microsoft Excel table, along with many other pieces of information deemed necessary, such as the citation and name of the journal in which they were published. In addition, it is important to note that throughout the entire selection process the same person who wrote the systematic review, was responsible for each stage of the screening process (screening the research, performing any necessary inclusions and exclusions). The supervisor was contacted for the sole purpose of confirming that an adequate quantity of sources had been obtained and to provide appropriate resources to perform the PRISMA systematic review afterwards.

Data collection process

One individual, the person writing this systematic review, independently collected data from each research article and inserted the relevant details into a Microsoft Excel spreadsheet. The relevant data were successfully obtained from full-text versions of the research articles available online and categorized in terms of the database, keywords, title, name of journal, impact factor, number of citations, the year the research articles were published, the abstract, platform of interest, as well as the most important aspects of the articles, all of which will be explored in greater detail in the following paragraphs. Furthermore, there was no need to contact the authors of the reported articles to provide further information.

Data items

An eligible outcome was categorized as the discrete type of effect of applications for remote psychological support on the wellbeing of the population observed, with the outcome being either positive (an improvement in mental health or overall wellbeing) or nonexistent (not a significant or no effect at all on mental health or overall wellbeing). Additionally, the time frame of measurement for which data were sought was not specifically defined; it varied depending on the study and the type of application included (oftentimes lasting a few months but not longer than a few years). It is important to specify that all results that were compatible with the outcome domains presented beforehand in each study were sought and included in the review. Nevertheless, a change was made to the inclusion criteria, particularly the definition of the outcome domain of type of effect. Moreover, the change was to include only the research articles displaying positive or nonexistent effects of applications on the population of interest. The rationale behind this decision was based on the fact that although it may be possible for the applications to have a negative impact on the wellbeing of individuals (in theory), the negative impact has yet to be observed (there has not been any research that has reported a negative impact on wellbeing). Any measure of psychological well being was eligible for inclusion, including the tests, questionnaires, or diagnostic criteria used in each study, which needed to have evidence of their reliability and validity for the assessment of wellbeing, despite the fact that studies were not excluded on this basis. Results could have been reported as an overall test

score providing a composite measure across multiple areas of psychological well being (overall psychological state), sub-scales that provide a measure of domain-specific well being (such as particular mental health issues or disorders), or both.

Data was collected on the report and the intervention. When collecting the data on the report, the key aspects of interest were who is the author of the research, the publication date, the source of the publication (the database, the journal, the impact factor of the journal, along with the number of citations of the research), the abstract, keywords, as well as the most important aspects of the research. Notwithstanding, when collecting the data on the intervention, the most important aspects taken into consideration were the type of intervention (type of application for psychological support), the mode of delivery, and the crucial information about the information (described in a few sentences).

Results

Study selection

184 records were found in the initial database search. After duplicates were removed (n = 31), 153 records were screened, from which 136 full-text documents were reviewed (due to the fact that some reports were not retrieved, n = 17). Moreover, there was a certain number of retrieved reports that needed to be excluded (n = 121) with the primary reasons for exclusion being that they were not focused on providing psychological support in forced isolation, lacking a clear definition of the application used, along with having an insufficiently defined study design. At a later point, extra documents were searched that cited any of the initially included studies as well as the references of the initially included research articles. Furthermore, extra articles that fulfilled inclusion criteria were found in these searches (n = 15) and added to the review (the total number of research articles being 30). A PRISMA flow diagram is presented below (in Figure 1) for a better understanding of the previously described study selection process.
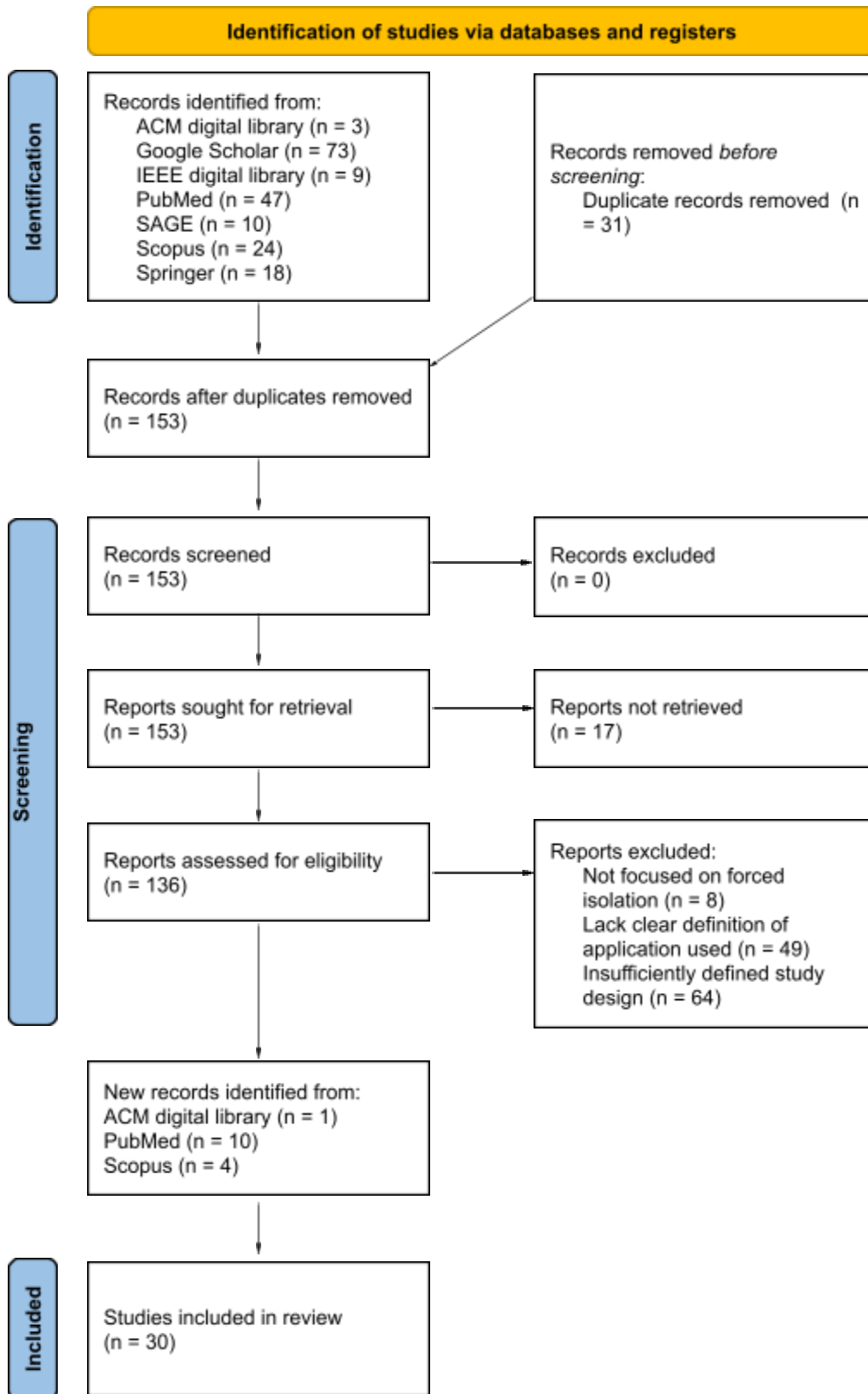
Figure 1 | PRISMA 2020 flow diagram for the systematic review (adapted from flow diagrams proposed by Boers and Mayo-Wilson et al. and Stovold et al.).

Nevertheless, nine studies (Landa-Ramírez et al. 2020; Davulis et al. 2021; Tarlow et al. 2020; Shaygan et al. 2020; Ben-Zeev et al. 2020; Cheng et al. 2021; Ripp et al. 2020; Richardson et al. 2020; Agyapong et al. 2021) appeared to meet the inclusion criteria, but were excluded due to several reasons explored below. Studies were excluded because they did not incorporate applications, despite the fact that they appeared to use a type of digital platform, such as phone calls, telephone hotlines (Landa-Ramírez et al. 2020, Davulis et al. 2021, Ripp et al. 2020), and texting interventions (Ben-Zeev et al. 2020, Agyapong et al. 2021), in providing psychological support to individuals in forced isolation. The Tarlow et al. (2021) study used telesupervision to follow the progress of individuals and see whether offering psychological support in this manner is effective; however, it did not explicitly explain what the platform is and how it works. Similarly, the research by Shaygan et al. (2020) and Cheng et al. (2021) initially met the initial inclusion criteria; however, after further review, it was noted that the online multimedia psychoeducational interventions and digital cognitive behavioral therapy were not analyzed in an appropriate manner. Finally, Richardson et al. (2020) did manage to explore the use of their clearly defined asynchronous virtual mental health (AVMH) resources, but failed to incorporate the actual impact on the psychological well being of the participants and define it in a proper manner.

In the systematic review evaluating the applications for remote psychological support for people in forced isolation, the author includes a table presenting for each included study the citation, study design, country, population of study, amount of time follow-up, platform adopted, and key findings (see table 1).

Table 1 | Table displays for each included study the citation, study design, country, population of study, amount of time follow-up, platform, and key finding.

Author (Year)	Study design	Country	Population of study (N)	Follow-up	Platform	Key finding
Abbaspur-Behbahani et al. (2022)	Systematic review	Iran	Elderly (N = –)	–	Mobile applications	An important issue to consider when using online services during the pandemic is the willingness and ability of older people to utilize

						m-health tools.
Adler et al. (2014)	Pilot project	USA	Mental health clinicians (N = 12)	10 months	Telepsychotherapy	Implementing telepsychotherapy has been met with growing success.
Alexandridis et al. (2021)	Descriptive	The Netherlands	Children with a chronic illness (N = –)	–	Gaming intervention	Contributed an understanding of training socioemotional skills and a structured proposal for design guidelines.
Ali et al. (2021)	Narrative review	Turkey	Adults using telehealth interventions (N = –)	–	Telemental health services	The provision of telemental health support reduced the burden of mental health diseases and promoted the wellbeing of the individual
Ammerlaan et al. (2017)	Randomized controlled trial	The Netherlands	Young adults with Juvenile Idiopathic Arthritis (N = 72)	6 months	Web-based self-management intervention	Intervention showed no improvement of self-efficacy, self-management, and quality of life.
Banbury et al. (2014)	Rapid literature review	Australia	Rural residents (N = –)	–	E-health	E-health has the potential to increase access to services in rural and remote conditions.
Berkanish et al. (2022)	Systematic review	USA	Adolescents with chronic illnesses (N = –)	–	Websites, chat messaging, and videoconferencing	Websites with discussion forums identified as the most used technology, followed by chat messaging and then videoconferencing.
David et al. (2021)	Narrative review	USA	Health care workers (N = –)	–	Mobile applications	Most programs did not consider methods to ensure program longevity or sustainability.
Deng et al. (2023)	Systematic review	USA	Adults with long-term physical conditions (N = –)	–	Application, videoconference, or virtual reality	Digital interventions for social participation are feasible and there are differences in

					platform	effectiveness among the various strategies.
Drissi et al. (2021)	Systematic review	UAE	Health care workers (N = –)	–	Social media platforms, e-learning content, online resources, and mobile applications	The number of identified interventions was limited and covered only a few countries. A lack of empirical evaluation of available interventions.
Fletcher et al. (2018)	Literature review	USA	Remote, difficult to reach, underserved population (N = –)	–	Video to home	This type of delivery offers a safe and effective option for increasing access to mental health care.
Godleski et al. (2012)	Descriptive	USA	U.S. Department of Veterans Affairs Patients (N = 98609)	–	Telemental health services	After the initiation of such services, patients' hospitalization utilization decreased by an average of approximately 25%.
Golden et al. (2021)	Descriptive	USA	Health care workers (N = 231)	3 months	Wellness Hub app	The resilience app was targeted to HCWs and applied within a global context.
Grubaugh et al. (2008)	Descriptive	USA	Primary care patients (N = 194)	–	Telehealth applications	The findings support the feasibility of applications, particularly for rural patients who may not otherwise receive necessary services.
Ibragimov et al. (2022)	Mixed method, sequential explanatory	France	Activity managers (N = 81)	–	Tele-Mental Health (MH) services	The services were a feasible alternative to in-person therapeutic interventions in humanitarian settings during the pandemic.
Jaworski et al. (2021)	Descriptive	USA	App users (N = 49287)	–	Mental health application	Apps like COVID Coach are an expandable way to provide tools and resources.

Kinori et al. (2022)	Descriptive	Spain	All individuals aged 18 years or more (N = 8588)	–	Web-based application - gesioemocional.cat	mHealth tools may help the population cope with stressful conditions associated with the COVID-19 pandemic.
Lau et al. (2021)	Systematic review	USA	Youth aged ≤25 years with chronic illnesses (N = –)	–	Telemental health interventions	The state of the science for telemental health interventions for youth with chronic illnesses is in a nascent stage.
Lu et al. (2014)	Descriptive	USA	Rural veterans (N = 1754)	–	Telehealth, Videoconferencing	It is possible to provide high quality mental health care to rural veterans at multiple distal sites and at home.
Maisto et al. (2021)	Systematic review	Italy	Patients with chronic illnesses (N = –)	–	Digital interventions	Chronic diseases are considered optimal target conditions for the development and implementation of telemedicine approaches.
Maulik et al. (2017)	Descriptive	India	Individuals with common mental disorders (N = 238)	3 months	Mobile technology	Showed that the delivery of mobile mental health services was possible in the community, and initial evidence suggests an increase in the use of mental health service.
Oliveira et al. (2021)	Systematic review	Portugal	College students (N = 2158)	6, 8, or 12 weeks, and 3 or 9 months	Mobile applications	Universities, particularly college counseling services, may benefit from mobile health interventions.
Saurman et al. (2013)	Descriptive	Australia	Remote patients (N = 5971)	–	Mental Health Emergency Care–Rural Access Program	Achieved acceptable levels of service activity and continues to be used as intended.
Serlachius et al. (2020)	Mixed methods	New Zealand	Young people	4 weeks	Whitu: 7 Ways in 7	Addresses the clear need to develop a

	(qualitative study and randomized waitlist-controlled trial)		(16-30 years old, N = 20)	and 3 months	Days well-being app	mental health toolkit to help New Zealanders cope with the pandemic.
Sinha et al. (2023)	Retrospective observational	USA	Users with symptoms of depression and anxiety (N = 4541)	–	Wysa (mental health application)	Evidence was shown for the efficacy of an AI-led health app in reducing symptoms of depression and anxiety.
Song et al. (2021)	Longitudinal control trial	China	Chinese participants with depression symptoms, at least 18 years old (N = 129)	2 months	Mobile application "Care for Your Mental Health and Sleep during COVID-19"	Some COVID-19-related mental health problems can be improved in as little as one week for participants with depression via CMSC.
Strudwick et al. (2021)	Systematic review	Canada	Population with access to a device and an internet connection (N = –)	–	Mobile applications and web-based resources	A number of digital interventions were identified, indicating that individuals have several options to choose from.
Sulaiman et al. (2020)	Descriptive	Malaysia	Healthcare workers (N = –)	–	Mobile application - Psychological First Aid (PFA) protocol	The protocol that utilizes remote protocol is the first of its kind to adopt a goal-directed framework in a "high-risk" university hospital in Malaysia.
Ueafuea et al. (2020)	Scoping review	Thailand	General population (N = –)	–	Mobile and wearable devices	Mobile and wearable devices are well placed for identifying and targeting individuals with psychological burdens in need of intervention.
Zhang et al. (2022)	Longitudinal observational	USA	Veterans receiving mental health treatment (N = –)	–	Telemental health (Clinical video)	Telemental health expanded to become the primary means by which encounters were delivered.

Discussion

Despite the fact that caution needs to be exercised in interpreting these findings due to the rather small number of studies (n=30), the findings nonetheless appear to be largely due in line with the recent systematic reviews on application to support the elderly during the COVID-19 outbreak of Abbaspur-Behbahani et al. (2022), on interventions to support population in Canada during the COVID-19 pandemic of Strudwick et al. (2021), on implications for occupational mental health and COVID-19 support programs for healthcare workers of David et al. (2021), on e-mental health solutions to assist health care workers during COVID-19 of Drissi et al. (2021), on effectiveness of mobile app-based psychological interventions for college students of Oliveira et al. (2021), along with the scoping review which indicated that mobile and wearable devices are well placed for identifying and targeting individuals with psychological burdens in need of intervention conducted by Ueafuea et al. (2020). Abbaspur-Behbahani et al. (2022) found that all the m-health interventions had positive effects on the health of the elderly (both physical and mental), with the m-health services for the elderly during the current pandemic being used for therapy, information provision, self-help, monitoring, and notably mental health consultation purposes. This is consistent with several other findings which suggest that mobile health interventions may have a positive effect on the well being of the population through provision of psychological support such as the rapid expansion of telemental health, which became the primary means by which encounters were delivered at a Veterans Health Administration facility in the longitudinal observational study of veterans receiving mental health treatment by Zhang et al. (2022), the decrease in patients' hospitalization utilization by an average of approximately 25%, after initiation of similar services, in the descriptive research of U.S. Department of Veterans Affairs patients by Godleski et al. (2012), along with the possibility to provide high quality mental health care to rural veterans at multiple distal sites and at home as demonstrated in the research by Lu et al. (2014) on rural veterans.

Strudwick et al. (2021) noted that the resources (mobile applications) were effective in the context in which they were used, although the effect of the interventions was not reported for all those identified in this synthesis. Similarly, in the systematic review conducted by Deng et al.

(2023), digital interventions for social participation were deemed feasible. In addition, Strudwick et al. (2021) identified a number of barriers and facilitators to using these interventions, such as access, cost, and connectivity. These results and points are consistent with the aforementioned review by Abbaspur-Behbahani et al. (2022), who expressed similar concerns. David et al. (2021) noted that mobile health applications have been adopted to develop mental health-focused applications for health care workers, particularly to support healthcare workers' emotional well-being. Furthermore, a research article conducted in Spain (included in the narrative review) was of greater interest, in which administrators assessed the efficacy of an app for health care workers, focusing on CBT and mindfulness techniques and including content on emotional skills, lifestyle behavior, work stress and burnout, social support, and practical tools (Fiol-DeRoque et al., 2021). This is consistent with other findings that assessed the use of mobile applications as a source of psychological support for health care workers, such as the findings of the research of Sulaiman et al. (2020), which observed the development of a remote psychological protocol for healthcare workers following the COVID-19 pandemic. Most programs included in the review, however, did not consider methods to ensure program longevity or sustainability (David et al., 2021). Furthermore, systematic reviews conducted by Maisto et al. (2021) and Berkanish et al. (2022), which found that chronic diseases were considered optimal target conditions for the development and implementation of telemedicine approaches and identified websites with discussion forums as the most commonly used technology, did not include any follow-ups with the patients with chronic illnesses.

Drissi et al. (2021) found overall positive feedback on the identified interventions, yet a lack of empirical evaluation was identified, especially regarding qualitative evidence. The overall positive feedback can be connected to the aforesaid studies of David et al. (2021) and Sulaiman et al. (2020) due to having a mutual area of interest in e-mental health interventions developed for health care workers during the COVID-19 pandemic (Drissi et al., 2021). The lack of data on effectiveness can be related to a lot of the research on this topic and is understandable given the publication date of this review, which corresponds to the onset of the global pandemic (both in the same year), as stated in the Strudwick et al. (2021) research article. Correspondingly, Lau et al. (2021) concluded that relatively few papers have been published on telemental health feasibility and efficacy among children, adolescents, and young adults with chronic illnesses, which may suggest that the science lags behind its rapid rate of adoption in clinical settings. The

gaming intervention, described by Alexandridis et al. (2021), contributed to an understanding of training socioemotional skills, a structured proposal for design guidelines, as well as reducing the loneliness of children with chronic illness. Other research articles employing a descriptive design provided findings to support the feasibility of telehealth applications, especially for rural patients (Grubaugh et al., 2008) and a description of a Mental Health Emergency Care–Rural Access Program that achieved acceptable levels of service activity and continues to be used as intended (Saurman et al., 2013). Furthermore, e-health has been shown to have the potential to increase access to services in rural and remote communities in the rapid literature review by Banbury et al. (2014).

Nevertheless, Oliveira et al. (2021) showed that mobile apps for mental health intervention in college students exist and demonstrate good acceptability and feasibility, as well as efficacy among students, evaluated acceptability and students' satisfaction with the intervention. This can be seen as compatible with other studies assessing the well being of the population through valid and reliable measures, as was concluded in the study of Golden et al. (2021) through a baseline assessment. Serlachius et al. (2020) predicted improved well-being (increased emotional and mental well-being). Emotional and mental well-being were assessed as primary outcomes at baseline, 4 weeks after baseline, and 3 months after baseline using the WHO-Five Well-Being Scale and the Short Warwick-Edinburgh Mental Well-being Scale, both Likert-type scales (Serlachius et al., 2020). The change in proportion of mental health services use by individuals suffering from common mental disorders was the primary outcome of the evaluation conducted by Maulik et al. (2017), while other outcomes were the feasibility and acceptability of the intervention, including process evaluation, assessed using qualitative interviews conducted post-intervention and reported separately, along with changes in depression and anxiety scores. Moreover, an increase in the proportion of individuals seeking mental health services, along with a significant reduction in the depression and anxiety scores between the start and end of the intervention, were observed (Maulik et al., 2017). Quantitative and qualitative outcome measures were collected online with questionnaires, text messages, and self-reported by participants and defined as self-efficacy in the randomized control trial by Amerlaan et al. (2017). However, the intervention proposed by Amerlaan et al. (2017) showed no improvement in self-efficacy, self-management, or quality of life.

Utilizing a narrative review, Ali et al. (2021) demonstrated that the provision of telemental health support reduced the burden of mental health diseases and promoted the wellbeing of the individual. In addition, Sinha et al. (2023) demonstrated evidence for the efficacy of an AI-led digital health app in reducing symptoms of anxiety and depression through their mental health application Wysa, which is in agreement with the findings of the aforementioned research by Ali et al. (2021). Likewise, Jaworski et al. (2021), who pointed out that applications like the COVID Coach are a scalable way to provide evidence-informed tools and resources to address COVID-19-related stress, and Kinori et al. (2022), who noted that mobile health tools may help the general population cope with stressful conditions associated with the pandemic scenario (through the web-based application gesioemocional.cat), displayed limitations in collecting any identifying information about their application users (49287 users in the former and 8588 in the latter), which could have provided information about the populations that they have reached.

A variety of individuals from various cultural backgrounds, countries, and age groups participated in the studies. Despite the fact that the author of this report aimed to include research with different cultural backgrounds, it is important to note that most of the studies on applications for psychological support in forced isolation are from Western, educated, industrialized, rich, and democratic societies (WEIRD samples, especially from the United States). Correspondingly, only a few studies, such as the study of a self-help cognitive behavioral therapy application for COVID-19-related mental health problems by Song et al. (2021) and the study of a web-based self-management intervention as a way of improving self-efficacy, self-management, and quality of life of young adults with Juvenile Idiopathic Arthritis presented by Ammerlaan et al. (2017), measured the effectiveness of applications through a longitudinal approach and a randomized controlled trial, therefore not extensively exploring the effects of applications on the well being of individuals. In a similar manner, Maulik et al. (2017) showed that the delivery of mobile-based mental health services was possible in the rural community in India while also including follow-ups after the intervention phase was completed. The samples of the studies included in the review were often not obtained in a randomized manner (often involving convenience sampling), therefore it can be concluded that they were limited by selection bias. In addition to the issues regarding randomization, it is important to acknowledge that there were a few eligible studies, as well as studies with a small number of participants (Adler et al., 2014; Ibragimov et al., 2022; and Serlachius et al., 2020) that were identified,

possibly leading to imprecise estimates. Considering the fact that some of the research articles included in the review were other systematic reviews, noting that some of the systematic reviews (such as the studies of Abbaspur-Behbahani et al., 2022, and Fletcher et al., 2018) incorporated a smaller number of studies in the review itself is of great importance as a limitation of the evidence included.

When discussing the limitations of the review process implemented in the systematic review, it is important to acknowledge that several valuable decisions were made, such as restricting eligibility to studies in English only (studies that had available translations in English were also included), not contacting the authors of the research articles included in the review to clarify unclear information, searching a rather small number of databases, having only one reviewer screen the records to be included, and having the same person be responsible for collecting data. Considering the fact that studies with available translations in English were included, the validity and reliability of the translations needed to be explored in greater detail. The impact of the implementation of research only published in English is that the research is susceptible to having a Western, educated, industrialized, rich and democratic sample (WEIRD), and therefore, having a low generalizability. Moreover, since a rather small number of databases were searched (ACM digital library, Google Scholar, IEEE digital library, SAGE, Scopus, and Springer), one may maintain the impression that the author is not presenting an objective point of view and is not grasping an all-inclusive overview of the data published during the period of the COVID-19 pandemic. To have only one reviewer screen the records to be included and the same person be responsible for collecting data has a plethora of implications in regards to the limitations of the review, the main one being the subjectivity of the findings. Despite the fact that any arguments, conflicts, or differing opinions are avoided, many errors made during the collection of data, along with the screening process could pass unnoticed; therefore, the plausibility of decisions and the correctness of data may be questionable. A point to acknowledge is that the author was unable to access some of the potentially eligible study reports, as well as carry out some of the planned analyses due to insufficient data in some of the research. Because COVID-19 has become a rapidly evolving pandemic, recent publications in the languages of countries that have become heavily affected in the meantime (Italian or Spanish) and other publications published in the period after the review process was concluded and before completing this review might have

been missed. Nevertheless, the author of the systematic review is confident that none of these methodological limitations would change the overall conclusions of this review.

Implications for practice and policy: Findings from this systematic review indicate that applications for remote psychological support for people in forced isolation have significant beneficial effects on the well being of the population. This finding provides important evidence of the effectiveness of similar interventions for psychological support across a wide range of age groups. Furthermore, the fact that results indicate positive effects (improvements in ratings of well being) on college students suggests that early implementation of applications for remote psychological support may be warranted. What is meant by early implementation could be understood as secondary schools with adolescents, as well as high school students. Despite the fact that results indicate positive effects on the well being of individuals, little evidence was found that these types of interventions had a long term effect on the well being of individuals since there were not many longitudinal studies conducted with this particular objective. Therefore, further practice should apply a longitudinal approach and follow the effects of psychological support over a longer period of time (making distinctive points in the longitudinal approach at which effects will be measured, such as 3 months, 6 months, 9 months, and 12 months) when implementing specific interventions.

Implications for research: Findings from the aforementioned systematic review suggest that there is a fairly strong body of research assessing applications as an intervention for remote psychological support and that this is an effective approach to improving the well being of the population in forced isolation. However, there are a couple of questions of greater significance worth further exploration. One of the questions focusing on the understanding of the causal mechanisms of interventions and the effects of these interventions would benefit from further analysis. What is meant by understanding mechanisms of interventions is that there are quite a lot of applications that lack a description of logistics (what the application is, how it works, and how it is implemented). By describing the logistics, both other researchers and possible participants are able to have a better understanding of the effects, how to implement the application in further research, how to replicate the research, and how to test the validity and reliability of the intervention. One's understanding of the generalizability of the applications for remote psychological support to non-western (non-US, non-Western European) contexts would

be immensely enhanced by a higher quantity and quality of research conducted across the world (with particular emphasis on South America, Africa, and Asia, excluding China, where the research is not lacking). Nevertheless, when directing the questions that future studies should address and which methods should be incorporated, it is important to clearly categorize the applications for remote psychological support through the way in which they are administered. Therefore, future research could categorize and compare them as mobile applications with independent software, videoconferencing, text-message-based applications, web-based services, and virtual reality. It is essential to observe how the outcomes are assessed, whether as an overall test score on self-reports providing a composite measure across multiple areas of psychological well being, sub-scales that provide a measure of domain-specific well being, or both. Moreover, outcome measures should consist of the aforementioned self-reports due to their ease of use and ease of collecting and categorizing data, despite potential limitations such as social desirability bias. Similarly, interviews are available for a more thorough assessment of participants' well being. Lastly, it is important to take note of the types of understudied participants who should be enrolled in future studies, with individuals with chronic illnesses and younger adolescents being the main groups of understudied participants.

References

Abbaspur-Behbahani, S., Monaghesh, E., Hajizadeh, A., & Fehresti, S. (2022). Application of mobile health to support the elderly during the COVID-19 outbreak: A systematic review. Health Policy and Technology, 100595.

Adler, G., Pritchett, L. R., Kauth, M. R., & Nadorff, D. (2014). A pilot project to improve access to telepsychotherapy at rural clinics. Telemedicine and e-Health, 20(1), 83-85.

Agyapong, V. I., Shalaby, R., Hrabok, M., Vuong, W., Noble, J. M., Gusnowski, A., ... & Greenshaw, A. J. (2021). Mental health outreach via supportive text messages during the COVID-19 pandemic: improved mental health and reduced suicidal ideation after six weeks in subscribers of Text4Hope compared to a control population. International journal of environmental research and public health, 18(4), 2157.

Alexandridis, D., Bakkes, S. C., Nijhof, S. L., Van De Putte, E., & Veltkamp, R. C. (2021, August). Ruby's Mission: Towards an Applied Gaming Intervention for reducing Loneliness of Children with Chronic Illness. In Proceedings of the 16th International Conference on the Foundations of Digital Games (pp. 1-13).

Ali, N. A., Khoja, A., & Kazim, F. (2021). Role of the Telemental Health Services During the COVID-19 Pandemic: A Systematic Review. Turk Psikiyatri Dergisi, 32(4), 275.

Ammerlaan, J., van Os-Medendorp, H., de Boer-Nijhof, N., Scholtus, L., Kruize, A. A., van Pelt, P., ... & Bijlsma, H. (2017). Short term effectiveness and experiences of a peer guided web-based self-management intervention for young adults with juvenile idiopathic arthritis. Pediatric Rheumatology, 15, 1-13.

Asadzadeh, A., & Kalankesh, L. R. (2021). A scope of mobile health solutions in COVID-19 pandemics. Informatics in medicine unlocked, 23, 100558.

Banbury, A., Roots, A., & Nancarrow, S. (2014). Rapid review of applications of e‑health and remote monitoring for rural residents. Australian Journal of Rural Health, 22(5), 211-222.Banbury, A., Roots, A., & Nancarrow, S. (2014). Rapid review of applications of

e‑health and remote monitoring for rural residents. Australian Journal of Rural Health, 22(5), 211-222.

Ben-Zeev, D., Buck, B., Meller, S., Hudenko, W. J., & Hallgren, K. A. (2020). Augmenting evidence-based care with a texting mobile interventionist: a pilot randomized controlled trial. Psychiatric Services, 71(12), 1218-1224.

Berkanish, P., Pan, S., Viola, A., Rademaker, Q., & Devine, K. A. (2022). Technology-based peer support interventions for adolescents with chronic illness: A systematic review. Journal of Clinical Psychology in Medical Settings, 29(4), 911-942.

Boers M. Graphics and statistics for cardiology: designing effective tables for presentation and publication. Heart 2018;104:192-200. doi:10.1136/heartjnl-2017-311581

Brooks, E., Manson, S. M., Bair, B., Dailey, N., & Shore, J. H. (2012). The diffusion of telehealth in rural American Indian communities: a retrospective survey of key stakeholders. Telemedicine and e-Health, 18(1), 60-66.

Brown, F. W. (1998). Rural telepsychiatry. Psychiatric services, 49(7), 963-964.

Cheng, P., Casement, M. D., Kalmbach, D. A., Castelan, A. C., & Drake, C. L. (2021). Digital cognitive behavioral therapy for insomnia promotes later health resilience during the coronavirus disease 19 (COVID-19) pandemic. Sleep, 44(4), zsaa258.

David, E., DePierro, J. M., Marin, D. B., Sharma, V., Charney, D. S., & Katz, C. L. (2021). Covid-19 pandemic support programs for healthcare workers and implications for occupational mental health: A narrative review. Psychiatric Quarterly, 1-21.

Davulis, T., Gasparėnienė, L., & Raistenskis, E. (2021). Assessment of the situation concerning psychological support to the public and business in the extreme conditions: case of Covid-19. Entrepreneurship and sustainability issues, 8(3), 308-321.

Deng, H., Vu, K. Q., Franco, J. R., Shepler, L. J., Abouzeid, C. A., Hamner, J. W., ... & Schneider, J. C. (2023). Digital Interventions for Social Participation in Adults with Long-term Physical Conditions: A Systematic Review. Journal of Medical Systems, 47(1), 1-14.

Drissi, N., Ouhbi, S., Marques, G., de la Torre Díez, I., Ghogho, M., & Janati Idrissi, M. A. (2021). A systematic literature review on e-mental health solutions to assist health care workers during COVID-19. Telemedicine and e-Health, 27(6), 594-602.

Fiol-DeRoque, M. A., Serrano-Ripoll, M. J., Jiménez, R., Zamanillo-Campos, R., Yáñez-Juan, A. M., Bennasar-Veny, M., ... & Ricci-Cabello, I. (2021). A Mobile phone–based intervention to reduce mental health problems in health care workers during the COVID-19 pandemic (PsyCovidApp): randomized controlled trial. JMIR mHealth and uHealth, 9(5), e27039.

Fletcher, T. L., Hogan, J. B., Keegan, F., Davis, M. L., Wassef, M., Day, S., & Lindsay, J. A. (2018). Recent advances in delivering mental health treatment via video to home. Current psychiatry reports, 20(8), 1-9.

Godleski, L., Darkins, A., & Peters, J. (2012). Outcomes of 98,609 US Department of Veterans Affairs patients enrolled in telemental health services, 2006–2010. Psychiatric services, 63(4), 383-385.

Golden, E. A., Zweig, M., Danieletto, M., Landell, K., Nadkarni, G., Bottinger, E., ... & Charney, D. S. (2021). A resilience-building app to support the mental health of health care workers in the COVID-19 era: Design process, distribution, and evaluation. JMIR Formative Research, 5(5), e26590.

Grubaugh, A. L., Cain, G. D., Elhai, J. D., Patrick, S. L., & Frueh, B. C. (2008). Attitudes toward medical and mental health care delivered via telehealth applications among rural and urban primary care patients. The Journal of nervous and mental disease, 196(2), 166-170.

Ibragimov, K., Palma, M., Keane, G., Ousley, J., Crowe, M., Carreño, C., ... & Llosa, A. (2022). Shifting to Tele-Mental Health in humanitarian and crisis settings: an evaluation of Médecins Sans Frontières experience during the COVID-19 pandemic. Conflict and health, 16(1), 1-15.

Jaworski, B. K., Taylor, K., Ramsey, K. M., Heinz, A., Steinmetz, S., Pagano, I., ... & Owen, J. E. (2021). Exploring usage of COVID coach, a public mental health app designed for the COVID-19 pandemic: evaluation of analytics data. Journal of medical Internet research, 23(3), e26559.

Kinori, S. G. F., Carot-Sans, G., Cuartero, A., Valero-Bover, D., Monfa, R. R., Garcia, E., ... & Ramos-Quiroga, J. A. (2022). A Web-Based App for Emotional Management During the COVID-19 Pandemic: Platform Development and Retrospective Analysis of its Use Throughout Two Waves of the Outbreak in Spain. JMIR Formative Research, 6(3), e27402.

Landa-Ramírez, E., Domínguez-Vieyra, N. A., Hernández-Nuñez, M. E., Díaz-Vásquez, L. P., & Santana-García, I. A. (2020). Psychological support during COVID-19 death notifications: Clinical experiences from a hospital in Mexico. Psychological Trauma: Theory, Research, Practice, and Policy, 12(5), 518.

Lau, N., Colt, S. F., Waldbaum, S., O'Daffer, A., Fladeboe, K., Joyce, P., ... & Rosenberg, A. R. (2021). Telemental health for youth with chronic illnesses: Systematic review. JMIR Mental Health, 8(8), e30098.

Lu, M. W., Woodside, K. I., Chisholm, T. L., & Ward, M. F. (2014). Making connections: Suicide prevention and the use of technology with rural veterans. Journal of Rural Mental Health, 38(2), 98.

Maisto, M., Diana, B., Di Tella, S., Matamala-Gomez, M., Montana, J. I., Rossetto, F., ... & Realdon, O. (2021). Digital interventions for psychological comorbidities in chronic diseases—A systematic review. Journal of Personalized Medicine, 11(1), 30.

Maulik, P. K., Kallakuri, S., Devarapalli, S., Vadlamani, V. K., Jha, V., & Patel, A. (2017). Increasing use of mental health services in remote areas using mobile technology: a pre–post evaluation of the SMART Mental Health project in rural India. Journal of global health, 7(1).

Mayo-Wilson E, Li T, Fusco N, Dickersin KMUDS investigators. Practical guidance for using multiple data sources in systematic reviews and meta-analyses (with examples from the MUDS study). Res Synth Methods 2018;9:2-12. doi:10.1002/jrsm.1277

Oliveira, C., Pereira, A., Vagos, P., Nóbrega, C., Gonçalves, J., & Afonso, B. (2021). Effectiveness of mobile app-based psychological interventions for college students: a systematic review of the literature. Frontiers in psychology, 12, 647606.

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & McKenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. bmj, 372.

Richardson, C. G., Slemon, A., Gadermann, A., McAuliffe, C., Thomson, K., Daly, Z., ... & Jenkins, E. (2020). Use of asynchronous virtual mental health resources for COVID-19 pandemic–related stress among the general population in Canada: Cross-sectional survey study. Journal of Medical Internet Research, 22(12), e24868.

Ripp, J., Peccoralo, L., & Charney, D. (2020). Attending to the emotional well-being of the health care workforce in a New York City health system during the COVID-19 pandemic. Academic medicine.

Saurman, E., Lyle, D., Perkins, D., & Roberts, R. (2013). Successful provision of emergency mental health care to rural and remote New South Wales: an evaluation of the Mental Health Emergency Care–Rural Access Program. Australian Health Review, 38(1), 58-64.

Serlachius, A., Schache, K., Boggiss, A., Lim, D., Wallace-Boyd, K., Brenton-Peters, J., ... & Thabrew, H. (2020). Coping skills mobile APP to support the emotional well-being of young people during the COVID-19 pandemic: protocol for a mixed methods study. JMIR research protocols, 9(10), e23716.

Shaygan, M., Yazdani, Z., & Valibeygi, A. (2021). The effect of online multimedia psychoeducational interventions on the resilience and perceived stress of hospitalized patients with COVID-19: a pilot cluster randomized parallel-controlled trial. BMC psychiatry, 21(1), 1-12.

Sinha, C., Meheli, S., & Kadaba, M. (2023). Understanding Digital Mental Health Needs and Usage With an Artificial Intelligence–Led Mental Health App (Wysa) During the COVID-19 Pandemic: Retrospective Analysis. JMIR Formative Research, 7(1), e41913.

Song, J., Jiang, R., Chen, N., Qu, W., Liu, D., Zhang, M., ... & Tan, S. (2021). Self-help cognitive behavioral therapy application for COVID-19-related mental health problems: A longitudinal trial. Asian journal of psychiatry, 60, 102656.

Stovold E, Beecher D, Foxlee R, Noel-Storr A. Study flow diagrams in Cochrane systematic review updates: an adapted PRISMA flow diagram. Syst Rev 2014;3:54. doi:10.1186/2046-4053-3-54

Strudwick, G., Sockalingam, S., Kassam, I., Sequeira, L., Bonato, S., Youssef, A., ... & Crawford, A. (2021). Digital interventions to support population mental health in Canada during the COVID-19 pandemic: rapid review. JMIR mental health, 8(3), e26550.

Sulaiman, A. H., Ahmad Sabki, Z., Jaafa, M. J., Francis, B., Razali, K. A., Juares Rizal, A., ... & Ng, C. G. (2020, July). Development of a remote psychological first aid protocol for healthcare workers following the COVID-19 pandemic in a university teaching hospital, Malaysia. In Healthcare (Vol. 8, No. 3, p. 228). MDPI.

Tarlow, K. R., McCord, C. E., Nelon, J. L., & Bernhard, P. A. (2020). Comparing in-person supervision and telesupervision: A multiple baseline single-case study. Journal of psychotherapy integration, 30(2), 383.

Ueafuea, K., Boonnag, C., Sudhawiyangkul, T., Leelaarporn, P., Gulistan, A., Chen, W., ... & Piyayotai, S. (2020). Potential applications of mobile and wearable devices for psychological support during the COVID-19 pandemic: a review. IEEE Sensors Journal, 21(6), 7162-7178.

Zangani, C., Ostinelli, E. G., Smith, K. A., Hong, J. S., Macdonald, O., Reen, G., ... & Cipriani, A. (2022). Impact of the COVID-19 pandemic on the global delivery of mental health services and telemental health: systematic review. JMIR mental health, 9(8), e38600.

Zhang, J., Boden, M., & Trafton, J. (2022). Mental health treatment and the role of tele-mental health at the veterans health administration during the COVID-19 pandemic. Psychological services, 19(2), 375.