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APPS FOR THE PROMOTION OF MENTAL HEALTH IN THE CONTEXT OF THE COVID-19 PANDEMIC: AN INTEGRATIVE REVIEW

APLICATIVOS PARA PROMOÇÃO DA SAÚDE MENTAL NO CONTEXTO DA PANDEMIA DE COVID-19: UMA REVISÃO INTEGRATIVA

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Abstract: The objective was to identify scientific evidence on the development of mobile apps built to promote mental health in the context of the COVID-19 pandemic. It is an integrative review of the scientific literature carried out in the Medline, Web of Science and

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Lilacs databases, and in the Cochrane library with the following guiding question: what is the scientific evidence on the development of mobile apps built to promote mental health in the context of the COVID-19 pandemic? A total of 194 studies were found, of which 181 were excluded for not addressing the theme and nine for not answering the guiding question, in this search scenario, four articles were identified. The findings demonstrate the existence of apps in the mental health area addressing the themes of depression, anxiety, psychological stress, burnout syndrome, suicidal ideation and psychological suffering, as well as the absence of scientific publications on the apps already available on digital platforms.

Keywords: APPS, Pandemic, Mental health, COVID-19.

Resumo: *O objetivo foi identificar evidências científicas sobre o desenvolvimento de aplicativos móveis construídos para promoção da saúde mental no contexto da pandemia de COVID-19. Trata-se de uma revisão integrativa da literatura científica realizada nas bases de dados Medline, Web of Science e Lilacs, e na biblioteca Cochrane com a seguinte questão norteadora: quais as evidências científicas sobre o desenvolvimento de aplicativos móveis construídos para promoção da saúde mental no contexto da pandemia de COVID-19? Encontrou-se um total de 194 estudos, dos quais excluíram-se 181 por não tratarem da temática e nove por não responder à questão norteadora, neste cenário de busca foram identificados quatro artigos. Os achados demonstram a existência de aplicativos na área da saúde mental abordando as temáticas depressão, ansiedade, estresse psicológico, síndrome de burnout, ideação suicida e sofrimento psicológico, bem como, a ausência de publicações científicas sobre os aplicativos já disponibilizados nas plataformas digitais.*

Palavras-chave: Aplicativos, Pandemia, Saúde Mental, COVID-19

INTRODUCTION

On March 11, 2020, the World Health Organization (WHO) officially declared the pandemic status of the new coronavirus, due to the rapid geographical spread of the disease (Agência Brasil, 2020).

The impacts of the pandemic extend beyond contamination by the virus, since, according to studies, in epidemic situations, the number of people psychologically affected, in general, is greater than the number of people affected by the infection. It is estimated that one third of half of the population may suffer psychological and psychiatric consequences if they do not receive adequate care (Fundação Oswaldo Cruz Centro de Estudos e Pesquisas em Emergências e Desastres em Saúde, 2020). Due to the high potential for the spread of the disease, the ongoing pandemic has raised, on the part of governments, social protection measures and to contain the spread of the virus, the main one of which is social isolation (Costa, Jatobá, Bellas, & Carvalho, 2020), which made it difficult for the population to access services and made assistance in the context of promoting mental health more complex.

The population that lives in a pandemic context as complex as this one suffers an immense psychosocial disturbance, which can cause innumerable disorders in the mental health of the same, these deleterious effects on the mental health in general are even more present in the populations in precarious conditions and that have a limited access to health and social services (Oliveira, 2020).

In this context, the development of new strategies for the promotion of mental health has become of short importance. Researches state that, between 2014 and 2019, the cell phone was the device most used by Brazilians to access the internet, reaching the incredible percentage of 99% of users (Pinto, et al., 2020). In this sense, with the wide use demonstrated, the use of this technology is quoted as a great tool for the aforementioned problematic.

One of the means used to take advantage of the constant use of mobile devices, are applications (apps), which integrate the so-called New Information and Communication Technologies (NTIC) and are technological tools on the rise, which bring with them a great possibility

of personalization. and individualization. The apps are extremely versatile and can be used for a variety of purposes. Many have attractive and intuitive interfaces, which facilitate and encourage use (de Oliveira & de Menezes Alencar, 2017).

In the scope of mental health, considering the potential of reaching these tools, their use is extremely valid, given that, they provide opportunities for health professionals to reach the adolescent public and promote the dissemination of knowledge related to health (de Oliveira & de Menezes, 2017), in addition to expanding the geographic approach and allow a rapprochement with the population during isolation.

In view of these considerations, the following research question arose: “what is the scientific evidence on the development of mobile apps built to promote mental health in the context of the COVID-19 pandemic?” Thus, this integrative literature review study aimed to identify the scientific evidence on the development of mobile applications built to promote mental health in the context of the COVID-19 pandemic.

1 METHOD

It is an integrative review of the scientific literature, whose construction steps followed a previously established model, in order to maintain methodological rigor, the following being: 1) elaboration of the research question; 2) definition of the criteria for inclusion of studies and selection of the sample (search or sampling in the literature); 3) representation of the selected studies in table format, considering all the common characteristics (data collection); 4) critical analysis of the included studies, identifying differences and conflicts; 5) interpretation / discussion of results; 6) presentation of the integrative review in a clear and objective way (evidence / data found) (Souza, Silva, & Carvalho, 2010).

For the construction of the research question, in order to consider the qualitative character of the phenomenon to be studied, the PICO strategy was used, in which P refers to the participants (population in general); I to the phenomenon of interest (use of mobile apps to promote mental

health) and Co to the context of a study related to the pandemic of the new coronavirus (Araújo, 2020).

The search for the articles was carried out in the Medline, Web of Science and Lilacs databases, and in the Cochrane library. In order to obtain a larger number of studies on the subject, the descriptors in the English language were used and the Boolean expressions AND and OR were combined, so that the crossing used was: (“Adolescent” OR “Young Adult” OR “Adult” OR “Child” OR “Aged”) AND (“Mobile Apps” OR “Health Promotion” OR “Software”) AND “Mental Health” AND (“Pandemics” OR “COVID-19” OR “Sars-CoV -two”). The surveys were carried out in February 2021.

The inclusion criteria were original research that addressed the use of applications to promote mental health, with no restriction on the period of publication and language, available electronically in full. The exclusion criteria were articles not related to the context, which did not answer the guiding question or which were found to be duplicates.

The selection of studies was carried out according to the PRISMA method (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Galvão, Pansani, & Harrad, 2015) and the way of classifying the level of scientific evidence of the surveys followed the criteria provided by Melnyk and Fineout-Overholt (Melnyk & Fineout-Overholt, 2015).

It is also worth mentioning the use of the URSI (Ursi & Gavão, 2006) instrument in the analysis of the included studies, to ensure the extraction of all relevant data, to minimize the risk of errors in the transcription, to ensure the accuracy in checking the information and to serve as a record (Souza, Silva, & Carvalho, 2010). In this, authors, country, year and place of publication, type of work, methodological information and results obtained were recorded.

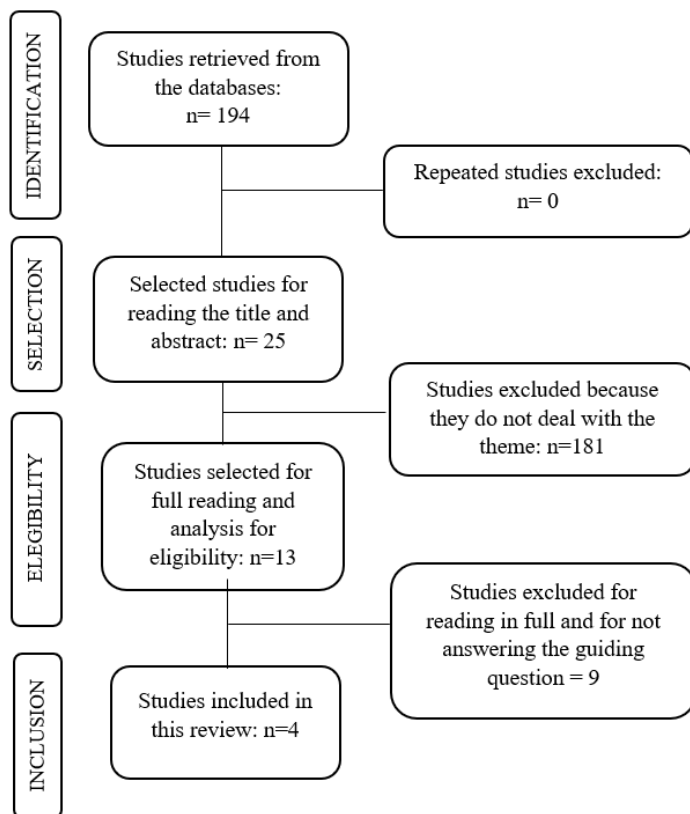
The study followed the ethical principles established by Resolution 510/2016 of the National Health Council (CNS) that involve the use of data made available to the public domain (Conselho Nacional de Saúde, 2016).

2. RESULTS

By conducting a search in the databases, a total of 194 studies were found, of which 181 were excluded because they did not address the theme and 09 for not answering the guiding question, so that only 04 were the included researches, can be seen in Figure 1.

Figure 1

Flowchart of the search and selection of studies according to the recommendations of PRISMA (Araújo, 2020)



Among the selected studies, it can be seen that all of them were published in 2020 and received a classification of two in the level of scientific evidence 10, and that, with respect to origin, two studies, that is, half of the researches, came from Australia (Deady, 2020; Han, et al., 2020), while the remaining two were produced in New Zealand (Serlachius, et al., 2020) and the other in Iran (Khademian, et al., 2020). As for the methodological profile, the studies were equally divided into a randomized clinical trial 13,14 and a mixed methods study (Serlachius, et al., 2020; Khademian, et al, 2020), and in the latter group, one of the studies, within their methods, was also used, from the randomized clinical trial, after an initial qualitative study (Serlachius, et al., 2020).

The summary, containing the central characteristics of the four selected studies, can be seen in Chart 1.

Chart 1

Characterization of the articles included in the study regarding authors, year, country, objective, method and level of evidence.

AUTHORS / YEAR	COUNTRY	OBJECTIVE	METHOD	LE
Deady M, 2020	Australia	To evaluate the effectiveness of the Anchored smartphone application in individuals, over the age of 18, who are unemployed due to the COVID-19 pandemic.	Randomized clinical trial	Level 2
Han J et al., 2020	Australia	Describe the protocol of a randomized clinical trial to assess the effectiveness of the LifeBuoy app for reducing suicidal thoughts and behavior, depression, anxiety and psychological distress, and improving overall mental well-being in young adults aged 18 to 25.	Randomized clinical trial	Level 2

AUTHORS / YEAR	COUNTRY	OBJECTIVE	METHOD	LE
Serlachius A et al., 2020	New Zealand	Assess the acceptability of the prototype application and examine the effectiveness of the refined application in improving mental and emotional well-being, and reducing depression, anxiety and stress in young people in New Zealand.	Mixed methods study, consisting of two phases, the first phase comprising a qualitative study and the second phase a randomized clinical trial.	Level 2
Khademian F, 2020	Iran	Evaluate an evidence-based web application (Naranj) for stress management among Iranian university students during the COVID-19 outbreak.	Randomized and controlled clinical trial.	Level 2

* LE = Level of evidence.

The apps developed and evaluated by the researchers add up to 4, one per study. For results, the authors aspire, with the use of their tools, to demonstrate, on the part of the users, a change in mental health, through the increase of the well-being (Deady, 2020; Serlachius, et al., 2020), and the self-compassion (Serlachius, et al., 2020); the decrease in depressive and anxious symptoms (Deady, 2020; Serlachius, et al., 2020), and stress (Serlachius, et al., 2020; Khademian, et al., 2020); improvement in sleep (Han, et al., 2020; Serlachius, et al., 2020) and in the Burnout Syndrome (Deady, 2020); and the change in resilience, alcohol use and physical exercise level (Deady, 2020). Only one app (Han, et al., 2020) did not provide the desired results.

The full details of each of the four apps, as well as the description of their respective results, are shown in Chart 2.

Chart 2

Main therapeutic components and the results obtained or expected by the researchers.

Authors	Suggested age range for using the app	Description of the therapeutic component of the application	Results obtained or expected
Deady M, 2020	Over 18 years old.	evidence-based, using a variety of formats, and addressing the skills of coping and resilience, mindfulness and behavioral activation, planning, setting goals, reviewing value-based activities, and developing coping skills.	They expect a change in depressive and anxious symptoms, and a change in alcohol use, in the level of physical exercise, in Burnout syndrome, in resilience and in well-being.
Serlachius A et al., 2020	Between 16 and 30 years old.	Whitu is the Maori word for "seven" and, as the name suggests, the app includes seven modules, which can be completed in a week, to learn evidence-based coping skills based on the authors' previous work, using CBT, psychoeducation and positive psychology techniques. The seven modules and skills, included in the application, have already demonstrated effectiveness for young people and individual eHealth interventions include: 1- identifying and evaluating emotions, 2- relaxation, 3- self-compassion, 4- gratitude, 5- staying connected, 6- physical care and 7- goal setting.	It is anticipated that the group that will use the Whitu app will demonstrate better well-being (greater emotional and mental well-being), greater self-compassion and better sleep. It is also hypothesized that the tool will promote a reduction in stress, depression and anxiety.

Authors	Suggested age range for using the app	Description of the therapeutic component of the application	Results obtained or expected
Khademian F, 2020	Between 20 and 35 years old.	The Naranj app includes a user profile, stress management strategies, consultation requests and COVID-19 sessions. Stress management strategies are based on Acceptance and Commitment Therapy (ACT), Stress Reduction Theory (SRT) and some other evidence-based strategies. This section consists of several parts, including ACT-based metaphors, 4-7-8 breathing technique, emotional freedom technique (EFT), images of nature, relaxing music, relaxing videos, educational quotes, my diary, forum and meditation.	It was hypothesized that the application is effective in reducing the psychological stress of university students. The expected secondary result is an improvement in the quality of sleep.

Still with regard to the expected consequences for the use of applications, by users, their developers direct the benefits of therapeutic methods, contemplated by the tools, for manifestations, of a mental nature, both natural and pathological, as can be seen in the relationship shown in Table 1.

Table 1

Main mental illnesses addressed in the applications.

Mental illnesses addressed in apps	N (%)	Authors
Depression	3 (75%)	Han J et al., 2020 Serlachius A et al., 2020 Deady M, 2020
Anxiety	3 (75%)	Han J et al., 2020 Serlachius A et al., 2020 Deady M, 2020
Psychological stress	2 (50%)	Khademian F, 2020 Serlachius A et al., 2020
Suicidal ideation	2 (50%)	Han J et al., 2020 Deady M, 2020
Burnout syndrome	1 (25%)	Deady M, 2020
Psychological suffering	1(25%)	Han J et al., 2020

3. DISCUSSION

The present work presented four studies, two studies carried out in Australia (Deady, 2020; Han, et al., 2020), while the other two were produced in New Zealand (Serlachius, et al ., 2020) and Iran (Khademian , et al., 2020).

That said, it is clear that the development of mental health applications, with Brazilian patents, is a deficient factor, both for the mental health care sector, as well as for stimulating scientific production. Strategies, such as mental health apps for smartphones, acquire significant importance, since they allow individuals, within the guidelines of social distance, to become aware of their mental state; interpret it, in the light of the concepts learned through the application; and manage it, achieving better self-efficacy, as attested by Hwang and Jo (2019) in the study aimed at evaluating an application for stress management in a group of 56 active Korean nurses.

The COVID-19 pandemic is a relatively recent event (Agencia Brasil, 2019). Thus, the perception of a small number of studies on the development and validation of applications aimed at supporting mental health during the period of social isolation is justified. . When dealing

with scientific productions available in the literature and referring to this theme, the lack is even more significant, especially in Brazil, as was evidenced above.

Contrary to these findings in the scientific literature, a total of 12 apps were found in the Play Store, available for Android devices, which proposed mental health intervention. However, when making a comparison between the apps selected in the Play Store and the studies published in the scientific community, it is evident that even if apps are being built and made available with fundamental importance during the quarantine period, considering the forms of mental health intervention, developers are not paying attention to the production of evidence based on science.

Another factor of important mention is the age range covered by the apps, which ranges from 16 to 35 years of age. Worldwide, it is estimated that 10% to 20% of adolescents experience mental health problems, but remain diagnosed and treated inappropriately (Miliauskas & Faus, 2020). When we turn to the pandemic context, these data tend to suffer a sudden increase. For the young population, the closure of schools, colleges, nightclubs, beaches, parks, among other leisure-related environments, has an impact on mental health, since it is closely related to peer interaction (Eu, Rio!, 2020).

In addition, according to research, the age group that most uses mobile apps is 15 to 24 years old, followed by 25 to 34 years old (Organização Pan-Americana da Saúde, 2020). Therefore, it is justified that the public chosen, and approached, by most apps is included and limited to these age groups. However, the specificity of the apps, regarding the public, becomes a fragile link, due to the need to approach all audiences, given that the psychological suffering, caused by social isolation and the pandemic of COVID-19, is not restricts it to a single age group.

On the other hand, it can be said that university students, mostly belonging to the age group chosen by the authors, are configured as a public that requires greater attention during the period of social isolation, since there was an increase in the rates of depression and interruption of treatment by some. Therefore, the uncertainties regarding academic life, confinement and the number of information conveyed by the media, are

characterized as factors arising from the pandemic panorama and provide for the emergence and worsening of depressive cases (Marin, de Araujo Caetano, Bianchin, & Cavicchioli, 2021). In this sense, validation and availability of applications, from the perspective of mental health, can act positively in providing support to this audience, mainly due to easier access to technological means.

In addition, the applications mainly focus on depression, anxiety and psychological stress, which is justified by the fact that these conditions are characterized as the main mental disorders promoted by the pandemic (Schmidt, et al, 2020), Demenech. Despite this, it is necessary to expand the functionalities, so that it is possible to cover a greater number of mental illnesses, considering that studies show an increase, also, of disorders, such as post-traumatic stress, anguish, fear and insomnia, which are mostly caused, due to the great incidence of information provided by the media (Organização Pan-Americana da Saúde, 2020), so common to the current pandemic context. However, it is worth mentioning that, since they are developed in the period of the pandemic, these applications contribute, in the same way, to act as a way of disseminating knowledge scientific, especially in mental health, for society in general, antagonizing and mitigating the excess of information, which have a great influence on the mental condition of individuals.

It can also be said that vulnerable populations represent an important demand, in relation to the exponential increase in mental disorders, and an audience not embraced by these technologies, since financial difficulties are new elements that, linked to feelings and social detachment also deserve extra attention (de Oliveira Soares, 2020). When dealing with this prism, related to vulnerable populations, mobile apps could be the extension that the mental health sectors would use to provide due assistance. However, the economic issue again acts as an obstacle to be overcome, as not all members of this group have access to smartphone devices, or the internet, for these apps to be installed. It is important to remember that these tools act as support strategies in the health education process, access to these technologies can

significantly influence the promotion of physical and mental health (Viana, et al., 2020).

ICT expands and multiplies exponentially and the health sector has to follow the trend. These make it possible to reduce costs and improve the efficiency of services, being able to reach population and professional groups more effectively (André & Ribeiro, 2020).

Furthermore, by highlighting the technologies produced, its contribution to the practice of health professionals is highlighted, by revealing ways to reach the population in this atypical period of social isolation, showing effective strategies for mental health promotion, as well as, provides subsidies for the development of new tools, such as apps, in the face of the national pandemic scenario.

It is noteworthy that the main limitation of the study was the search for articles with descriptors only in the English language, so that publications in other languages may not have appeared in the search. However, it is reinforced that the choice of English was made because this is the main language of scientific publications.

4. CONCLUSION

The articles found come from countries: Australia (Deady, 2020; Han, et al., 2020), New Zealand (Serlachius, et al., 2020) and Iran (Khademian, et al., 2020), published in English, with a focus on the young population, and have apps with proven and scientifically based therapeutic components.

In this sense, the review finds the existence of good apps in the area of mental health, addressing the themes of depression, anxiety, psychological stress, burnout syndrome, suicidal ideation and psychological suffering, but with limited scientific production on the apps already available on digital platforms. The products are produced and made available without the publication of the methodological steps that constituted the construction and validation of apps.

The apps, which the articles included in this review deal with, have unique therapeutic strategies, based on scientific literature and with interventions with great possibilities of effectiveness. Thus, it is essential

to emphasize the level of quality of these, also considering that the totality of studies received the classification of level of evidence II.

Despite the large number of apps available on the Play Store, scientific production on reporting the construction and validation of these apps is still at a reduced level. This factor becomes a major limitation, since the scientific literature is of short importance for the dissemination of quality knowledge and that the validation of apps makes them more attractive and reliable.

Therefore, we suggest that new studies be developed on the apps already available, aiming to better disseminate the therapeutic components present and validate their performance. In addition, we could not help suggesting that more apps are built, mainly, at the national level, since the need for mental health care, in the pandemic, remains and that none of the apps are aimed at the Brazilian population.

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