Potential Digital Tools for Psychological Symptoms associated with COVID-19

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Abstract

Background: Abstract

Introduction
In the four months since the discovery of the index case, there has been several studies highlighting the psychological impact of COVID-19 on frontline healthcare workers and on members of the general public. It is evident from these studies that individuals have elevated levels of anxiety and depression both in the acute phase when first becoming aware of the pandemic and that the psychological distress persists into subsequent weeks. It is becoming apparent that technological tools, such as text-messages, web-based interventions, mobile-based interventions, and conversational agents, could help ameliorate the psychological distress in the workplace and society. From our knowledge, there are limited publications that describes how digital tools have been used to ameliorate psychological symptoms amongst individuals.

Objective: It is thus the aim of this article to identify existing text, web, mobile and conversational agents that the general public could access to ameliorate the psychological symptoms that they face amidst the COVID-19 pandemic.

Methods: In order to identify any digital tools that have been published specifically for COVID-19, a search was ran through PubMed and MEDLINE from inception of the databases through to the 23rd of April 2020. The following keywords were used, that of “COVID-19” and “Mental Health” OR “Psychiatry” AND “Technology”. Another search was conducted on PubMed and MEDLINE to identify existing digital tools for depression and anxiety disorders. A web-based search engine (Google.com) was used to identify if the web-based intervention cited could be assessed. A mobile application search application, that of App Annie was used to determine if identified mobile applications could be assessed commercially.

Results: A total of 6 studies were identified. Of the identified web-based interventions, 5 websites were accessible. Of the identified mobile-based interventions, 7 applications were accessible. Of the identified conversational agents, only 2 were accessible.

Conclusions: The COVID-19 pandemic has resulted in significant psychological distress. Digital tools that are commercially available could potentially be of use for at-risk individuals, or individuals with pre-existing psychiatric symptoms.

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Abstract

Introduction

In the four months since the discovery of the index case, there has been several studies highlighting the psychological impact of COVID-19 on frontline healthcare workers and on members of the general public. It is evident from these studies that individuals have elevated levels of anxiety and depression both in the acute phase when first becoming aware of the pandemic and that the psychological distress persists into subsequent weeks. It is becoming apparent that technological tools, such as text-messages, web-based interventions, mobile-based interventions, and conversational agents, could help ameliorate the psychological distress in the workplace and society. From our knowledge, there are limited publications that describes how digital tools (except for that of Zhou XY et al., 2020) (6) have been used to ameliorate psychological symptoms amongst individuals. It is thus the aim of this article to identify existing text, web, mobile and conversational agents that the general public could access to ameliorate the psychological symptoms that they face amidst the COVID-19 pandemic.

Methods

In order to identify any digital tools that have been published specifically for COVID-19, a search was ran through PubMed and MEDLINE from inception of the databases through to the 17th of June 2020. The following keywords were used, that of “NCOV OR 2019-nCoV OR SARS-CoV-2 or Coronavirus or COVID19 OR COVID” and “mHealth OR eHealth OR text”. Another search was conducted on PubMed and MEDLINE to identify existing digital tools for depression and anxiety disorders. A web-based search engine (Google.com) was used to identify if the web-based intervention cited could be assessed. A mobile application search application, that of App Annie was used to determine if identified mobile applications could be assessed commercially.

Results

A total of 6 studies were identified. Of the identified web-based interventions, 5 websites were accessible. Of the identified mobile-based interventions, 7 applications were accessible. Of the identified conversational agents, only 2 were accessible.

Conclusions

The COVID-19 pandemic has resulted in significant psychological distress. Digital tools that are commercially available could potentially be of use for at-risk individuals, or individuals with pre-existing psychiatric symptoms.

Introduction

On the 31st of December 2019, the World Health Organization was alerted to a case of pneumonia of unknown cause, that originated from China (1). As numerous other individuals became afflicted, the World Health Organization declared there to be an outbreak, an outbreak that was an international public health emergency (1). The problem escalated with many individuals across different countries being afflicted and on 11th March 2020, the World Health Organization raised their alert to that of a pandemic (1). The causative pathogen was that of a novel coronavirus, which has now been referred to as COVID-19 (1). The rapid escalation of the numbers of individuals infected, the increasing number of deaths and the measures undertaken by the governments has resulted in significant psychological impact not only amongst healthcare workers, but also amongst the public (2).

In the four months since the discovery of the index case, there has been several studies highlighting the psychological impact of COVID-19 on frontline healthcare workers and on members of the public. Li ZY et al. (2020) (3) used a mobile phone application and administered the Chinese Version of the Vicarious traumatization questionnaire amongst 214 individuals from the public and 526 nurses (234 frontline nurses and 292 nurses not on the frontline). They found the scores of vicarious traumatization to be higher amongst the public and non-front-line healthcare workers. Wang C et al. (2020a) (4), using both the IES-R and the Depression, Anxiety and Stress Scale (DASS-21), investigated the mental health status of 1120 members of the public living in China. Notably, 53.8% reported the psychological impact to be moderate to severe, with 16.5% having moderate to severe depressive symptoms, 28.8% moderate to severe anxiety symptoms and 8.1% moderate to severe stress. Whilst these studies focused on the immediate psychological impact, Wang C et al. (2020b) (5) have, in their most recent study, examined the longitudinal changes in the mental health of the general population in China. A total of 1738 participants were included, and they undertook the Impact of Event Scale-revised questionnaire and the Depression, Anxiety and Stress Scale (DASS-21) at baseline and after four weeks. Whilst there was a mean reduction in the overall scores across a period of four weeks, the mean scores for the Impact of Event scale were still higher than the scores suggesting the presence of Post-Traumatic Stress Disorder (PTSD) symptoms (5). It is evident from these studies that individuals have elevated levels of anxiety and depression both in the acute phase when first becoming aware of the pandemic and that the psychological distress persists into subsequent weeks.

Since the onset of the pandemic, understandably, the priority for governments have been the treatment of people infected with COVID-19 and steps to limit spread. It is evident in many countries that the need for clinical services has exceeded that of the supply, requiring the construct of temporary medical facilities and redeployment of staff. Beyond the hospitals the impact of COVID-19 is multifactorial, with economies being affected, individuals suffering the bereavement of loved ones, whilst others are physically isolated and quarantined. Social distancing and lockdowns have resulted in difficulties accessing mental health services. Individuals with psychiatric disorders are likely to have increasingly difficulties with accessing conventional mental health services. Hao et al. (2020) (6) have reported that the mean post traumatic stress disorder, anxiety, depression, and insomnia scores were elevated in psychiatric patients, as compared to that of the general population. There is indeed a need for online mental health interventions, by means of digital tools. An editorial has also been published describing how online tools and social media have been used in China to support the mental health needs of frontline workers, and those infected, or living in quarantine facilities (7). It is becoming apparent that technological tools, such as text-messages, web-based interventions, mobile-based interventions, and conversational agents, could help ameliorate the psychological distress in the workplace and society. Zhou XY et al. (2020) (8), in an opinion paper,

described the efforts of the Australian government in providing tele-mental health solutions to address the psychological impact of COVID-19. Unfortunately, Zhou XY et al. (2020) (8)'s article was limited to the identification of relevant services in Australia. Another recent paper, Cosic K et al. (2020) (9) highlighted the potential of digital tools in dealing with the psychological distress associated with COVID-19, and how their prior experiences could be applied in developing relevant applications, but the authors failed to identify any existing digital tools that individuals could use. From our knowledge, there are limited publications that describes how digital tools (except for that of Zhou XY et al., 2020) (8) have been used to ameliorate psychological symptoms amongst individuals. It is thus the aim of this article to identify existing text, web, mobile and conversational agents that the public could access to ameliorate the psychological symptoms that they face amidst the COVID-19 pandemic.

Methods

To identify any digital tools that have been published specifically for COVID-19, a search was ran through PubMed and MEDLINE from inception of the databases through to the 17th of June 2020. The following keywords were used, that of "NCOV OR 2019-nCoV OR SARS-CoV-2 or Coronavirus or COVID19 OR COVID" and "mHealth OR eHealth OR text". Given that the aim was to identify potential digital tools, the terminologies of e-health, m-health and text were used, given that these terminologies would identify all potential web-based, mobile-based and text interventions.

Another search was conducted on PubMed and MEDLINE to identify existing digital tools for depression and anxiety disorders. To identify these tools, reviews of digital tools (Text Messaging, Internet interventions, mobile applications, and conversational agents) were identified. Only articles that were in English language were considered. A narrative synthesis of the identified tools was conducted.

A web-based search engine (Google.com) was used to identify if the web-based intervention cited could be assessed. A mobile application search application, that of App Annie was used. App Annie (10) is a mobile application search engine that was used to identify if the mobile application identified in the research literature was made available commercially.

Results

Based on the search strategy, a total of 9829 articles were identified from the databases. Of these, 80 were duplicated references. Upon further screening, a total of 24 articles were identified to be of potential relevance to COVID-19. Upon further examination of the full-texts of these 24 articles, only one article described how a text-messaging intervention has been applied for mental health issues resulting from COVID-19 (11). The remaining articles have not described or mentioned how a text, web or mobile intervention helped in ameliorating the psychological symptoms associated with COVID-19.

In our search for existing digital tools for depression and anxiety disorders, a total of five articles were identified. Two web-based reviews were identified for depressive disorders, and another for anxiety disorders. Of the identified web-based interventions, we managed to have access to five of the listed websites, namely that of Beating the Blue, Living life to the full, Deprexis, Moodgym and Interapy. One review was identified for mobile-based interventions for depressive and anxiety disorders. Of the identified mobile-based intervention, only seven out of the total of 32 applications were available on the commercial stores, that of Angesthjalpen, AnxietyCoach, SmartCAT, Headgear, MoodHacker, SuperBetter and Thought challenger. Another review highlighted conversational agents for psychiatric disorders. Of the identified conversational agents, only two were commercially available.

Table 1 provides a summarized overview of the identified studies.

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Name of Study	Mechanism of Delivery of Digital Tools	Identified Digital Tools & Prior Evaluations	Availability
Agyapong VIO et al. (2020) (11)	Text messaging (Specific for COVID-19)	Text4Hope (Specific for COVID-19): Enable subscribers to receive three months of daily supportive text messages, with or without web links to online mental health resources.	Only available for Individuals living in Alberta, Canada
Rodriguez-Pulido et al. (2020) (12)	Web-based Interventions	"Beating the Blue": Web-based interventions for depressive disorder	Available for use in the United Kingdom
Burger F et al. (2020) (13)	Web-based Interventions	"Living Life to the Full" (2 comparative trials done involving a total of 659 participants), "Deprexis" (6 comparative trials done involving a total of 1863 participants) and "SHADE" (3 comparative trials done involving a total of 475 participants) "Mood gym" has been extensively evaluated, with a total of 11 comparative trials conducted, involving a total of 7294 participants. All the above have been evaluated as websites providing psychological therapy for depressive disorders.	Living life to the full, Deprexis, Moodgym were available commercially
Anderson G et al. (2019) (14)	Web-based Interventions	Interapy" program from the Netherlands was highlighted as a program that assisted individuals with symptoms of depression, panic disorder, post-traumatic stress disorder and burnout. "Moodgym" was also highlighted as a commercially available option for anxiety and depression.	Moodgym and Interapy were available commercially
Miralles I et al. (2020) (15)	Mobile-based Interventions	7 Cups, Be good to yourself, Bluewatch, Dcombat, Get Happy Program, Headgear, iCare Prevent, MedLink, Mobile sensing and support, Moodhacker, Moodivate, MyGamePlan, PRIME-D, Push-D, SocioEmpathy, SPSRS, SuperBetter, The Sound Advice, Thought challenger, TODAC, Kokoro-App. All the above have been previously evaluated and reported in published research.	Headgear, MoodHacker, SuperBetter and Thought challenger.
Miralles I et al. (2020) (15)	Mobile-based Interventions	Agoraphobia free, Stress Free, Angesthjalpen, AnxietyCoach, CBT assistant, Challenger, Lantern, Psych Assist, Public Speech Trainer, SmartCAT, GET.ON.PAPP All the above have been previously evaluated and reported in published research.	Angesthjalpen, AnxietyCoach, SmartCAT,
Gaffney H et al. (2019) (16)	Conversational agents/ Chatbot	Woebot, Tess, eSMART-TH have been evaluated previously for depressive disorder. SABORI has been evaluated for psychological distress Tess has been evaluated for anxiety disorder	Woebot and TESS.

Discussion

This review is one of the first to have examined the literature for digital interventions that could be used by the general public, as well as specific groups, such as workers and healthcare professionals to ameliorate the psychological distress that they are experiencing and the specific symptoms such

as panic buying (17-20. The findings from our article complement those of Zhou XY et al (2020) (8), who in their article highlighted tools which individuals in Australia could tap onto. Our review helped to address some of the inherent limitations of Zhou XY et al. (2020)'s (8) work, given that the authors have merely listed available resources, without any justification of the evidence base of the suggested interventions. We identified a text-based intervention that has been designed to cater to the mental health needs of individuals in Canada. We have managed to identify web-based, mobile-based, and conversational agents that are available commercially, which have been previously validated by research.

Our review has identified only a single publication that describes how text-messaging technologies are used as a form of psychological support. As aforementioned in the introduction, there have been numerous studies that have been published that have characterize the immediate and delayed psychological impact of COVID-19 on medical workers and members of the public (2,4,5). There remains a lack of evaluation of psychological tools to deal with the identified psychological distresses, that of heightened levels of stress, anxiety, and depression. Whilst psychological distress is seen frequently in everyday life what is different in epidemics and pandemics, such as COVID-19, is the extremely high prevalence of distress and the inability of existing mental health services to function normally. This provides strong justification for the rapid identification of tools that have an evidence base, which could be promoted rapidly to cater to the unmet psychological needs of individuals. Our research has highlighted commercially available digital tools (web-based, mobile-based, and conversational agents) that individuals could tap upon during the COVID-19 pandemic. It is challenging for members of the public to be cognizant of tools which have been proven to be clinically effective, and available commercially, hence the importance of our review. We have focusing primarily on reviews of digital tools, in order to identify such tools. Our methods help to address the limitations of Zhou XY et al. (2020) (8)'s prior work, as they have suggested tools, but have made no attempt to review the evidence base of those tools. The evidence-based website, smartphone applications and conversational agent we have identified could help to ameliorate symptoms of depression and anxiety. They have wide application, they could help individuals who are at-risk of developing an illness; or help individuals with pre-existing illness to cope with these symptoms, as it is anticipated that it might be challenging for them to receive appropriate psychiatric care with governments imposing lockdowns and curbs in movements.

We have identified a variety of available commercial tools, but there may be limitations to some of these tools. Validation will have been conducted in certain localities/regions, and we cannot be sure that it will be as effective in other localities. However, we propose that a tool that has undergone validation, if not in the precise locality, is likely to be superior to one without any validation. We also recognise that accessing smartphone applications may sometimes be difficult in a different region or country.

It is evident from this work that psychological tools to help individuals cope with heightened stress, anxiety and depression due to COVID-19 are lacking. Whilst some commercial tools are available, they are not without their limitations. It is of importance for academic, clinicians and developers to jointly work together in order to conceptualize tools that could be used by the general population to ameliorate their symptoms of psychological distress. It might also be valuable to consider participatory action research design when conceptualizing new tools, to ensure that the tools created better meet the needs of individuals. It might be wise to consider modification of existing tools, so that versatile tools could be rapidly be deployed to cope with the increasing needs. In the interim period, whilst comprehensive treatment tools might not be available yet, we are made aware from Liu S et al. (2020)'s (7) editorial piece that in China, helplines and social media platforms are used to render support to individuals who are experiencing psychological distress. Similarly, in other

countries such as Singapore, the government has also setup a mental health hotline, to cater to the needs of the public, and to refer individuals who are at-risk to appropriate mental health services. These clinical services render some form of supportive therapy, but there remains a need for tools to provide individuals with more comprehensive treatment, such as that of cognitive behavioural therapy for depression or anxiety.

The strength of our current work is that we have examined the literature review for digital tools that have been validated, that could help with depressive and anxiety symptoms. In addition, we have conducted a search to determine if such tools are also available commercially. There is a possibility, despite these strengths, that we might miss tools; to mitigate this we included recently published reviews but acknowledge that their search for digital interventions might not be so recent.

Conclusions

The COVID-19 pandemic has resulted in significant psychological distress. Digital tools that are commercially available could potentially be of use for at-risk individuals, or individuals with pre-existing psychiatric symptoms. The tools which we have identified might help to address the psychological distress individuals are experiencing in the times of COVID-19.

References

1. World Health Organization (2020). Extracted from https://www.who.int/emergencies/diseases/novel-coronavirus-2019, last assessed on 26th March 2020
2. Rajkumar RP. COVID-19 and mental health: A review of the existing literature [published online ahead of print, 2020 Apr 10]. *Asian J Psychiatr*. 2020;52:102066. doi:10.1016/j.ajp.2020.102066
3. Li Z[1], Ge J[1], Yang M[1], Feng J[1], Qiao M[1], Jiang R[2], Bi J[3], Zhan G[3], Xu X[3], Wang L[4], Zhou Q[2], Zhou C[5], Pan Y[1], Liu S[1], Zhang H[1], Yang J[6], Zhu B[7], Hu Y[8], Hashimoto K[9], Jia Y[10], Wang H[11], Wang R[12], Liu C[13], Yang C[14]. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. Brain Behav Immun. 2020 Mar 10. pii: S0889-1591(20)30309-3. doi: 10.1016/j.bbi.2020.03.007. [Epub ahead of print]
4. Wang C, Pan R, Wan X, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *Int J Environ Res Public Health*. 2020;17(5):1729. Published 2020 Mar 6. doi:10.3390/ijerph17051729
5. Wang C, Pan R, Wan X, et al. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China [published online ahead of print, 2020 Apr 13]. *Brain Behav Immun*. 2020;S0889-1591(20)30511-0. doi:10.1016/j.bbi.2020.04.028
6. Hao F, Tan W, Jiang L, et al. Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A Case-Control Study with Service and Research Implications for Immunopsychiatry [published online ahead of print, 2020 Apr 27]. Brain Behav Immun. 2020;S0889-1591(20)30626-7. doi:10.1016/j.bbi.2020.04.06
7. Liu S[1], Yang L[2], Zhang C[2], Xiang YT[3], Liu Z[4], Hu S[5], Zhang B[6]. Online mental health services in China during the COVID-19 outbreak. Lancet Psychiatry. 2020 Apr;7(4):e17-e18. doi: 10.1016/S2215-0366(20)30077-8. Epub 2020 Feb 19.
8. Zhou X, Snoswell CL, Harding LE, et al. The Role of Telehealth in Reducing the Mental Health Burden from COVID-19 [published online ahead of print, 2020 Mar 23]. *Telemed J E Health*. 2020;10.1089/tmj.2020.0068. doi:10.1089/tmj.2020.0068
9. Ćosić K, Popović S, Šarlija M, Kesedžić I. Impact of Human Disasters and COVID-19 Pandemic on Mental Health: Potential of Digital Psychiatry. *Psychiatr Danub*. 2020;32(1):25–31. doi:10.24869/psyd.2020.25
10. App Annie. Extracted from https://www.appannie.com/en/, last assessed on 25th April 2020.
11. Agyapong VIO. COVID-19 Pandemic: Health System and Community Response to a Text Message (Text4Hope) Program Supporting Mental Health in Alberta [published online ahead of print, 2020 Apr 22]. *Disaster Med Public Health Prep*. 2020;1–5. doi:10.1017/dmp.2020.114
12. Rodriguez-Pulido F, Castillo G, Hamrioui S, et al. Treatment of Depression in Primary Care with Computerized Psychological Therapies: Systematic Reviews. *J Med Syst*. 2020;44(3):67. Published 2020 Feb 13. doi:10.1007/s10916-020-1543-7

13. Burger F, Neerincx MA, Brinkman WP. Technological State of the Art of Electronic Mental Health Interventions for Major Depressive Disorder: Systematic Literature Review. *J Med Internet Res*. 2020;22(1):e12599. Published 2020 Jan 20. doi:10.2196/12599
14. Andersson G, Carlbring P, Titov N, Lindefors N. Internet Interventions for Adults with Anxiety and Mood Disorders: A Narrative Umbrella Review of Recent Meta-Analyses. *Can J Psychiatry*. 2019;64(7):465–470. doi:10.1177/0706743719839381
15. Miralles I, Granell C, Díaz-Sanahuja L, et al. Smartphone Apps for the Treatment of Mental Disorders: Systematic Review. *JMIR Mhealth Uhealth*. 2020;8(4):e14897. Published 2020 Apr 2. doi:10.2196/14897
16. Gaffney H, Mansell W, Tai S. Conversational Agents in the Treatment of Mental Health Problems: Mixed-Method Systematic Review. *JMIR Ment Health*. 2019;6(10):e14166. Published 2019 Oct 18. doi:10.2196/14166
17. Tan W, Hao F, McIntyre RS, et al. Is Returning to Work during the COVID-19 Pandemic Stressful? A Study on Immediate Mental Health Status and Psychoneuroimmunity Prevention Measures of Chinese Workforce [published online ahead of print, 2020 Apr 23]. Brain Behav Immun. 2020;S0889-1591(20)30603-6. doi:10.1016/j.bbi.2020.04.055
18. Chew NWS, Lee GKH, Tan BYQ, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak [published online ahead of print, 2020 Apr 21]. Brain Behav Immun. 2020;S0889-1591(20)30523-7. doi:10.1016/j.bbi.2020.04.049
19. Tan BYQ, Chew NWS, Lee GKH, et al. Psychological Impact of the COVID-19 Pandemic on Health Care Workers in Singapore [published online ahead of print, 2020 Apr 6]. Ann Intern Med. 2020;M20-1083. doi:10.7326/M20-1083.
20. Ho CS, Chee CY, Ho RC. Mental Health Strategies to Combat the Psychological Impact of COVID-19 Beyond Paranoia and Panic. Ann Acad Med Singapore. 2020;49(3):155-160.