EJSIT
European Journal of Science, Innovation and Technology
ISSN: 2786-4936
www.ejsit-journal.com
Volume 3 | Number 3 | 2023

Efficacy of Digital Cognitive Behavior Therapy (DCBT) for the Treatment for Symptoms of Depression

Georgia Konstantopoulou and Eleni Mavroeidi
Department of Education and Social Work, School of Humanities and Social Sciences,
University of Patras, Greece

ABSTRACT

For over a decade, digital cognitive behavioral therapy (dCBT) has been available as part of the ubiquitous nature of digital technology, which has rapidly changed our daily lives bringing new approaches to the treatment of many disorders. As the dissemination and the highly structured nature of CBT made it particularly suitable to be delivered digitally as a distance therapy, a wealth of personalized, tailored and automated dCBT programs have been developed, released and investigated, in particular for depression and anxiety, which have shown dCBT to be effective. With the evidence base on the digital communicated form of CBT substantially increasing, the present study aims to investigate the effectiveness of dCBT in improving the symptoms of depression and anxiety. A total of 6 people (3 men, 3 women) were randomly selected to participate in a 12-week therapist-supported dCBT program and we used the Beck Depression Inventory (BDI) and the Hospitality Anxiety and Depression Scale (HADS) self-completion questionnaire to measure the depression and anxiety levels of the participants before, immediately after the end of the intervention program and a month after the completion of the intervention (follow-up). The results indicated the effectiveness of dCBT for all participants who followed the complete program.

Keywords: Digital Cognitive Behavior Therapy, dCBT, depression, BDI, HADS, distance therapy

INTRODUCTION

Cognitive behavior therapy (CBT) is an effective intervention for depression. Digital Cognitive Behavior Therapy (dCBT), which is found under various names and in various forms, refers to CBT therapy delivered via a computer or mobile device (mobile or tablet). It can provide a scalable means of delivering CBT at the population level (Jenna et al., 2020), and due to technological advances and its integration into healthcare, dCBT has now become a rapidly growing intervention channel compared to conventional face-to-face psychotherapy (Kumar et al., 2017). One of the major advantages of dCBT is its accessibility (Andrews et al., 2014), which appears to have been a key factor in its flourishing during the COVID-19 pandemic. It is a field that is constantly developing, and in many cases its results are comparable to face-to-face CBT, especially for anxiety disorders and depression (Richards et al., 2018) which boomed during the pandemic. Although many of the guidelines for the online practice of psychology are the result of the work of many national and international associations and bodies, such as the American Psychological Association and the European Federation of Psychological Associations, in an attempt to formulate a consensus on good online practices (American Psychological Association, 2002), at the time of the pandemic, a vast information base for good dCBT practices became available, as mental health professionals shared their experiences with online therapy in order to train their colleagues who were new to the approach to cope with the increasing number of people seeking treatment (Barker & Barker, 2021).

DCBT was – practically – a one-way street during the pandemic, but this does not mean that it was not a method suitable for the situation. As will be shown below, its effectiveness,

for the cases in which it is indicated, is not in doubt and the COVID-19 pandemic seems to have given it the attention it needs for further research and applications. DCBT appears to have already provided evidence of efficacy in the treatment of mental illnesses, as well as medical illnesses with psychiatric comorbidities (Kumar et al., 2017), while research results from a large group of clients receiving treatment for psychological disorders indicate that dCBT is at least as effective as face-to-face interventions (Richards et al., 2018). In this regard, technology-assisted psychological interventions are not recent and continue to be a growing field of study and clinical practice. In particular, in recent years, there has been a demonstrable increase in the number of published reports recommending and supporting dCBT for the treatment of a wide range of psychological disorders, including the treatment of major depressive disorder and a range of anxiety disorders including social anxiety, panic disorder and generalized anxiety disorder (Richards et al., 2018). Although questions regarding the effectiveness of dCBT compared to the traditional, face-to-face treatment are still raised, it is important to note that while dCBT was the only option during the pandemic and travel restrictions, many chose to continue this form of treatment despite the lifting of the measures. (Andersson et al., 2016). Therefore, there is a reasonable need for a debate on which of the two methods is more effective and in which cases.

According to Andersson et al. (2016), the differences of dCBT and in vivo treatment lie in the following areas: a) Pre-treatment assessment: in face-to-face CBT a questionnaire is required to be completed between sessions, whereas in online CBT this is done through a structured telephone interview (based on an assessment questionnaire) via the internet and a secure online platform. b) Mode of treatment delivery: in face-to-face CBT, visits are made by the client either to a structure (e.g., clinic) or to the therapist's office. In dCBT, sessions are conducted on a secure platform, so no travel or scheduling is required as patients can access the platform from wherever they are. c) Access to the treatment after a session: In dCBT this is possible through the access to both the written communications and the existing material shared by the therapist. d) The therapist's role: The role of the practitioner is particularly important in face-to-face CBT because they explain the rationale of the therapy, they control the patient's level of engagement with the practices suggested, they implement activities within the session and they ensure the therapeutic alliance. On the other hand, in the case of dCBT, the therapist has more of a supportive/explanatory role since the content, as already structured, is also offered by the platform (in the case of asynchronous dCBT). e) Outcome monitoring: in the case of face-to-face CBT, this is a time-consuming process that takes place during the sessions outside the therapeutic process. In contrast, in dCBT, this process is integrated as part of the treatment. f) Security and ethical issues: ensuring data security and privacy is a priority in both face-to-face CBT and dCBT. In this context, it is worth noting that dCBT therapists pay extra attention on security and ethical issues due to the use of online media, the ethical standards which are not well developed and/or vary between countries and the support and/or referral for emergencies when required (Andersson et al., 2016).

According to the abovementioned, it appears that dCBT makes the therapeutic process much easier on a practical level, with its main advantage being accessibility. This enables treatment for people who are unable to attend face-to-face sessions on a regular basis (Andrews et al., 2014). However, the acknowledged advantages of using digital sessions do not simply refer to their power to compensate for the limitations of traditional interventions (e.g., travel requirements for clients or therapists), nor to their use as complementary tools. Research by Jenna et al., (2020) investigating the effectiveness of a digital CBT program in people with depression based on the outcomes of the anxiety and worry levels, the depressive symptoms, the well-being, and the quality of life of the participants shows that there are several advantages associated with implementing intervention via the internet. These include easy accessibility, high adaptability, flexibility, convenience, evolution at the pace of the client, easy compliance,

monitoring of treatment, privacy and anonymity, cultural adaptability, low cost and high dissemination potential (Jenna et al., 2020).

Although the potential benefits of online interventions and the use of digital communications are acknowledged, there are also some caveats which refer to the need to better understand the impact of different modes of remote intervention (e.g., written, audio or audiovisual support) compared to face-to-face intervention (Richards et al., 2018). According to Jenna et al. (2020), the main challenges identified in the use of digital counseling include ethical concerns (e.g., safety, privacy, confidentiality, and absence or lack of ethical orientation regarding the therapeutic relationship. Moreover, online therapy can sometimes be experienced as more personal because the video call focuses on faces, and thus it was recommended that mental health professionals check more frequently how their patients experience the session (Barker & Barker, 2021). On the other hand, Federico's research (Barker & Barker, 2021) showed that this type of communication allows some therapists to open up, express their feelings and disclose difficult experiences more easily. Despite professionals' best efforts to create a sense of safety for patients in their office and in the therapeutic relationship, she had found that some therapists felt more comfortable in their homes and appeared more able to access private aspects of themselves. In this light, the aim of this study was to examine the effectiveness of a 12-week therapist-supported dCBT program in improving symptoms of depression and anxiety over a 9-month period.

METHOD

The study included a total of 6 participants, (3 women, 3 men). At the monthly follow-up, 5 of the 6 were still attending the dCBT program, while one person had dropped out of the program due to a busy schedule. Depressive symptom intensity was measured before the start of the intervention, at the end of the intervention and one month after the intervention as a monthly follow-up. More specifically, prior to the start of the intervention, preliminary individual sessions were held, where the therapist tried to gain an overall picture of the difficulties and needs of each individual participant. The program included structured lessons and tools (i.e., exercises and practices), as well as individual weekly sessions for 12 weeks. The therapeutic process was structured on the psycho educational model, based on the theory of social learning according to which behaviors (depression) is the result of learning influenced by the interaction of the individual with the environment (Bandura, 1977). The program consisted of 12 sessions (each session lasting two hours). In the first two sessions the social learning theory of depression was discussed, and instructions were given for learning self-regulation skills. In the next eight sessions the emphasis was initially placed on increasing pleasant activities and social skills were taught. The emphasis was placed on controlling negative or dysfunctional thoughts according to the Ellis, 1961 model, and finally training in relaxation was provided. The last two sessions focused on issues related to completion, maintenance of treatment success and prevention of relapse. All sessions included a brief introduction by the therapist with a review of homework, discussion, role-playing -which is taught with the therapist's assistance-, and structured activities. It became clear, therefore, that cognitive-behavior techniques designed for the treatment of depression in students were used in this therapeutic online intervention.

INSTRUMENTS

The Beck Depression Inventory (BDI) (Beck, 1961; Giannakou et al., 2013) and the Hospitality Anxiety and Depression Scale (HADS) (Zigmond, 1983; Michopoulos et al., 2007) self-completion questionnaire were administered before and after the intervention to obtain a more comprehensive picture of needs and to determine the intensity of the depressive

symptoms. Measurements were also taken with the same instruments at the end of the program and one month after the end of the intervention.

RESULTS

A series of non-parametric Wilcoxon paired tests were conducted to examine any statistically significant differences before, after treatment and one month after treatment for each HADS and BDI scale. The choice of this test for statistical treatment of the data was due to the fact that the sample size is too small (6 individuals) to assume that it follows a normal distribution. Statistically significant results were found in the following subscales of the HADS and the BDI:

HADS-D

Before - After the Treatment ($Z = 2.20$, $p = 0.028$)
Before the Treatment– follow up ($Z = 2.02$, $p = 0.043$)

HADS-A:

Before - After the Treatment ($Z = 1.99$, $p = 0.046$)
Before - After the Treatment– follow up ($Z = 2.02$, $p = 0.043$)

BDI: Before - After the Treatment ($Z = 1.99$, $p = 0.046$)

Table 1 presents the means and standard deviations of HADS and BDI scale scores for individuals who participated in the intervention both before the start and after the completion of the intervention and at the monthly review after the completion of the intervention.

Table 1. Means and standard deviations for all HADS and BDI scales values before - after treatment and follow-up (N = 6 persons)

HADS – BDI scores	Before treatment Mean (sd)	After treatment Mean (sd)	Follow-up Mean (sd)
Depression	26.67 (5.35)	14.17 (10.53)	10.0 (10.05)
Anxiety	11.50 (6.47)	6.17 (5.42)	5.0 (7.38)
BDI	27.17 (6.49)	13.83 (11.78)	11.40 (11.84)

As shown by the values of all HADS subscales and the BDI scale, the values after the intervention and at the monthly review were statistically significantly lower. It was found that depression levels were statistically significantly lower after the end of the intervention in those individuals who completed the entire treatment program. Levels of depression were statistically significantly lower after treatment and even lower at the monthly review after the completion of the intervention compared to the initial level of depression of participants prior to the start of the dCBT intervention (Figure 1).

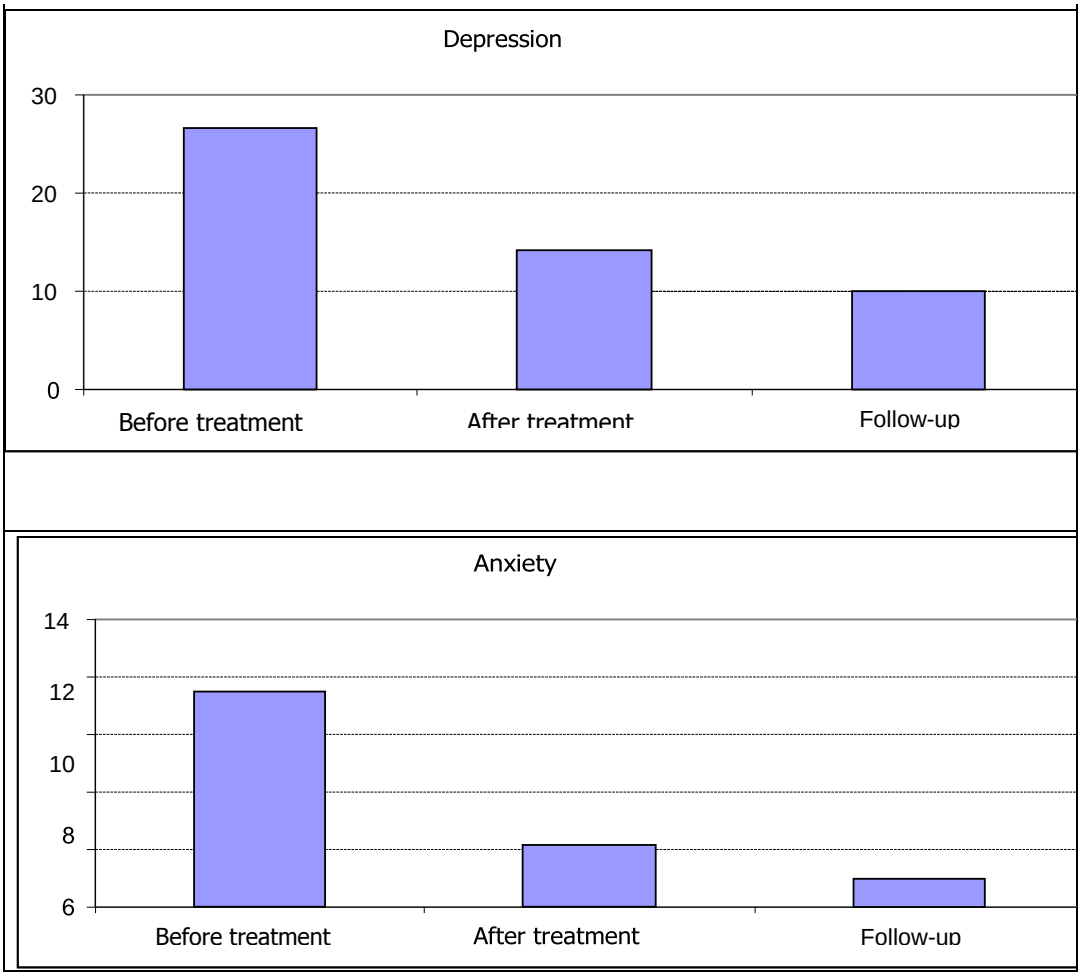

Figure 1. Depression and anxiety in three phases (before treatment, after treatment and follow-up)

LIMITATIONS OF THE STUDY

As in any study, there are some limitations which should be noted. One of the limitations was the small sample size, which, although it does not empower us to draw solid conclusions about the general population, it undoubtably contributes and extends the research on the efficacy of dCBT. Moreover, the small sample size and the results which were based solely on self-report do not enable us to widely generalize the results to other countries or cultures.

CONCLUSION

This study extends the research on the effects of dCBT on depression. The results of the dCBT intervention demonstrate that dCBT may be effective in the population with diagnosed depression, as a statistically significant reduction in depressive symptomatology was found in individuals who completed the treatment process. At the same time, it also shows that the participants showed improvement in their anxiety. The dCBT facilitates the therapeutic process on a practical level because it enables the treatment of people who are unable to attend face-to-face sessions on a regular basis. Such categories of individuals may include people who work full-time (or on a rotation basis), people with reduced/limited mobility, or people who reside in remote (and/or rural) areas (Andrews et al., 2014). This also enables the maintenance and extension of the therapeutic process as the change of residence (either for the therapist or for the patient) is no longer an inhibiting factor. Moreover, dCBT sessions, particularly for people with social anxiety, can be more effective. In a study (Carlbring et al., 2018) involving

a systematic review and a meta-analysis of 20 studies (with a total of 1418 participants), dCBT for psychiatric and physical conditions in the presence of a therapist was directly compared with face-to-face CBT in the same trial. As it emerged - although not statistically significant - in the treatment of social anxiety disorder, the results were slightly in favor of dCBT, with the therapist himself probably playing the role of the phobic object, while in face-to-face therapy, the increased focus of the patient might hinder their ability to fully concentrate on the treatment. However, there are cases of patients where dCBT may not be an appropriate method and the presence of the therapist in the same physical space as the patient may be necessary. Indicatively, for patients with paranoid or avoidant characteristics, with a history of child abuse or with symptoms of emotional dysregulation and dissociation, the e-therapy is contraindicated (Simpson & Reid, 2014). More specifically, in cases of post-traumatic stress disorder (PTSD) and associated symptomatology, the dCBT method has been shown to be less effective compared to face-to-face CBT (Sloan et al., 2011).

Pursuing this further, we should keep in mind that the mental health professional, in the case of dCBT, should be fully prepared and make provisions for for the smooth running of the session and have solutions for the problems - mainly of a technical nature - that may arise. Of course, the therapist must also have taken all the necessary measures for the safeguarding of the patients' personal data as well as for confidentiality, since the sessions will be conducted through a third-party online platform (Barker & Barker, 2021). To that end, the role of the therapist during dCBT is particularly important. A growing evidence base for dCBT clearly indicates that some form of guidance is required, especially for patients diagnosed with major depression. In fact, the published evidence on dCBT for depression without the support of a therapist show extremely weak success results and extremely high dropout rates, but this seems to improve by the use of hybrid models (Andersson & Cuijpers, 2008). Hybrid models that combine face-to-face meetings, but also online support (which works mainly as a complementary measure), have the advantage of increasing the performance of clients, reaping the benefits of early intervention in treatment and preventing non-attendance due to long waiting lists (in the public sector). In this light, successful implementation of a mixed model of care could have a significant impact on the development and delivery of therapeutic services (Richards et al., 2018). One such model is in therapy practice, which has been evaluated in the digital treatment of depression, post-traumatic stress, bereavement, work stress, panic disorder and bulimia nervosa. Digital therapy provides relatively easy access and can facilitate the early implementation of new evidence-based treatments in routine healthcare.

REFERENCES

American Psychological Association. (2002). Criteria for practice guideline development and evaluation. *American Psychologist*, *57*, 1048-1051.

American Psychological Association. (2023). Center for Workforce Studies. Retrieved from https://www.apa.org/practice/guidelines/telepsychology

Andersson, G., & Cuijpers, P. (2008). Pros and cons of online cognitive–behavioural therapy. *The British Journal of Psychiatry*, *193*. doi:10.1192/bjp.bp.108.054080

Andersson, G., Topooco, N., Havik, O., & Nordgreen, T. (2016). Internet-supported versus face-to-face cognitive behavior therapy for depression. *Expert Review of Neurotherapeutics*, *16*(1). doi:10.1586/14737175.2015.1125783

Andrews, G., Newby, J., & Williams, A. (2014). Internet-Delivered Cognitive Behavior Therapy for Anxiety Disorders Is Here to Stay. *Current Psychiatry Reports*, *17*. doi:10.1007/s11920-014-0533-1

Bandura, A. (1977). *Social Learning Theory*. New Jersey: Prentice Hall.

Barker, G. G., & Barker, E. E. (2021). Online therapy: lessons learned from the COVID-19 health crisis. *British Journal of Guidance & Counselling*, *50*(1), 66-81. doi:10.1080/03069885.2021.1889462

Beck AT, Ward C, Mendelson M (1961). Beck Depression Inventory (BDI). *Arch Gen Psychiatry*, *4*(6), 561–571.

Beck, J. S. (2011). *Cognitive therapy for challenging problems: What to do when the basics don't work.* Guilford Press.

Carl, J. R., Miller, C. B., Henry, A. L., Davis, M. L., Stott, R., Smits, J. A., ... & Espie, C. A. (2020). Efficacy of digital cognitive behavioral therapy for moderate-to-severe symptoms of generalized anxiety disorder: A randomized controlled trial. *Depression and anxiety*, *37*(12), 1168-1178. doi: 10.1002/da.23079

Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Lagerlöf, E. (2018). Internetbased vs. face-to-face cognitive behavior therapy for psychiatric. *Cognitive Behaviour Therapy*, *47*(1). doi:10.1080/16506073.2017.1401115

Ellis A, Harper RA. (1961). *A guide to rational living*. Hollywood, California: Wilshire Book.

Giannakou at, al. (2013). Adjustment of the BEC-II DEPRESSION SCALE in the Greek population. *Hellenic Journal of Psychology*, *10*, 120-146.

Kumar, V., Sattar, Y., Bseiso, A., Khan, S., & Rutkofsky, I. (2017). The Effectiveness of Internet-Based Cognitive Behavioral Therapy in Treatment of Psychiatric Disorders. *Cureus*, *9*(8). doi:10.7759/cureus.1626

Michopoulos, I., Kalkavoura, H., Michalopoulou, P., Fineti, K., Kalemi, G., Psarra, M., ... & Lykouras, E. (2007). The anxiety and depression scale at the general hospital (HADS): weighting in Greek population. *Psychiatry*, *18*(3), 217-224.

Richards, D., Enrique, A., Palacios, J., & Duffy, D. (2018). Internet-Delivered Cognitive Behaviour Therapy. In Ö. Şenormancı & G. Şenormancı (Eds.), *Cognitive Behavioral Therapy and Clinical Applications*. Croatia: IntechOpen. doi:10.5772/intechopen.71412

Sloan, D. M. et al. (2011). Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews. National Center for Biotechnology therapy. *The British Journal of Psychiatry*, *193*. doi:10.1192/bjp.bp.108.054080 https://www.ncbi.nlm.nih.gov/books/NBK81772/

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, *67*, 361–370.