

The effectiveness of psychological interventions delivered online on the mental health of university students: New challenges for psychological sciences

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Abstract

The purpose of this study was to provide an overview of studies on the effectiveness of online psychological and psychotherapeutic interventions aimed at university students.

Studies were identified by literature search on PubMed and Scopus. Included were empirical studies in peer-reviewed English-language scientific journals; studies with samples including university students; studies that included psychological interventions or psychotherapy performed online.

Eighteen studies were selected. The predominant online intervention was cognitive-behavioral therapy (CBT). Psychological interventions delivered online were found to be effective in reducing symptoms of anxiety and depression, but also in treating other psychopathological conditions. Moreover, they showed effectiveness and acceptability at least equal to classic interventions.

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Interventions delivered online were found to be effective in improving the mental health of college students. They represent a useful tool to be implemented in health services provided by universities.

Keywords: digital setting, online psychological intervention, university student, mental distress

Introduction

Even before the COVID-19 pandemic, psychological interventions delivered online increased because they have advantages over face-to-face interventions. Online interventions are easily accessible, often involve only virtual instructions that allow participants to remain anonymous and are effective in terms of cost and travel (Ma *et al.*, 2021). A study by Cipolletta and Mocellin (2018) shows that online psychological interventions are effective in several areas of psychological distress, such as pathological gambling, post-traumatic stress disorder, and obsessive-compulsive disorder (Abbott *et al.*, 2008; Barak *et al.*, 2009; Finn and Barak, 2010; Perle and Nierenberg, 2013; Lenhard *et al.*, 2014; Bolton and Dorstyn, 2015). The effectiveness of online psychological support has also been demonstrated in women with infertility, cancer patients and alcohol-dependent people (Baker and Ray, 2011), but also in patients who have previously completed in-person psychotherapy (Kivi *et al.*, 2014; Wagner *et al.*, 2014). Johansson and colleagues (2012) studied the effectiveness of Internet-based Psychodynamic Therapy (iPDT) in depression through a randomized controlled trial (RCT). The researchers found that most patients had improved. IPDT has also been applied to the treatment of anxiety disorders. Andersson and colleagues (2014) compared the effectiveness of iPDT, Internet-based Cognitive Behavioral Therapy (iCBT) and a control condition in the treatment of generalized anxiety disorder. The authors concluded that both interventions significantly reduced symptoms. Many studies on online therapies involve interventions based on Cognitive-Behavioral Therapy (CBT; Beck, 1967). Indeed, the first studies on CBT delivered online designed to reflect face-to-face treatments were conducted as early as the late 1990s (Barak, 1999). A large body of literature on this topic has grown over time. A 2010 meta-

analysis based on 22 RCT studies found that therapy delivered online for anxiety and depressive disorders is effective, acceptable, and practical from a clinical perspective (Andrews *et al.*, 2010). Several subsequent systematic reviews confirmed that CBT delivered online is as effective as face-to-face CBT in depression, social anxiety disorder, and panic disorder (Hedman *et al.*, 2012; Andersson *et al.*, 2014). A recent meta-analysis of 64 studies showed a large superiority of the efficacy of CBT delivered online over control groups, with maintenance of benefits at follow-up. This study also reported acceptable patient adherence and high satisfaction rates (Andrews *et al.*, 2018). Although these findings threaten to challenge the role of the face-to-face relationship in the effectiveness of interventions (Carlbring *et al.*, 2017), they also pose new challenges from which the psychological sciences cannot escape. Online interventions usually target anxiety disorders and depression (Arnberg *et al.*, 2014), but also procrastination (Rozental *et al.*, 2015), perfectionism (Shafran *et al.*, 2017) or alcohol use (Pedersen *et al.*, 2017). Likewise, studies suggest that online CBT might be adapted to many psychiatric and somatic conditions even in children and adolescents (Vigerland *et al.*, 2016). Moreover, traditional mental health services were not sufficient to meet the growing need for mental health care during the COVID-19 pandemic. As a result of social distancing, isolation and lockdown, many clinicians and mental health organizations shifted their activities to telemedicine solutions (Torous *et al.*, 2020). Wasil and colleagues (2021) demonstrated that brief online interventions could be useful in expanding access to mental health care in university students during the pandemic period. Specifically, the Author showed that young people are interested in these interventions and find them useful, with low drop-out rates. Therefore, digital interventions could provide evidence-based care to people who need support but cannot access other services. Moreover, due to their skills with technological tools, young people could be an important target group for psychological interventions delivered online.

Youth mental health has long been recognized as a global public health challenge (Patel *et al.*, 2007). Many mental disorders arise during young adulthood and have a negative impact on developmental trajectories, reduced academic success, increased substance use and unhealthy behaviour (Arnett *et al.*, 2014; Patel *et al.*, 2007). Although

young adults may represent a particularly vulnerable population to the psychological consequences of the COVID-19 pandemic, it seems that prevention and mental health of college students have not been prioritized. The pandemic situation has forced revisions in clinical practice. Short digital interventions were useful in expanding access to care during the COVID-19 crisis and may be useful in future public health emergencies. Evidence on university students' preferences before and during COVID-19 for psychological interventions delivered online versus face-to-face is mixed. Recent meta-analyses suggested that students prefer online self-help interventions to face-to-face interventions for depression (Ma *et al.*, 2021). Moreover, these self-help interventions may have comparable effects and equal adherence to face-to-face interventions (Carlbring *et al.*, 2017). However, other authors report higher dropout rates in online self-help interventions (Andrews *et al.*, 2018) and a preference for face-to-face interventions among students (Benjet *et al.*, 2020). As to the effectiveness of online interventions, based on a meta-analysis on 3.074 university students, Ma *et al.* (2021) indicated significant reductions in depressive symptoms compared. Literature suggests that college students are open to creative ways of receiving emotional help, such as games and searching for emotional help online (Lungu & Sun, 2016). As a matter of fact, in a 2016 study of college student preferences, most participants expressed a preference for online professional help over in-person help. One-third of them were inclined to disclose the same amount of information both online and in person, and most were interested in serious games for emotional distress (Lungu & Sun, 2016). On the other hand, drop-out rates in studies on digital interventions seem to be high (Fleming *et al.*, 2018). Users rarely spend more than a few minutes on digital mental health interventions (Baumel *et al.*, 2019) and most available mental health apps generally fail to retain users (Wasil *et al.*, 2020). On the contrary, university students seem to be interested in these interventions, complete them in high percentages and find them useful (Wasil *et al.*, 2021). One of the main advantages of these interventions seem to be their flexibility, continuous updating, and ability to be adapted to the needs of users (Wasil *et al.*, 2021). This perspective summarizes the effectiveness of the most significant psychological interventions delivered online in the university student population. Specifically, this perspective aimed to examine the effectiveness of a

range of psychological interventions that attempt to improve the mental health of college students. Although not an exhaustive review of literature on the topic, the purposes of this study were to identify the presence of specific interventions able to show superior effectiveness to others, the type of interventions most frequently delivered, the degree of student acceptance, the existence of a target group of students who benefit more (e.g., males versus females) and, the feasibility of integrating psychological interventions into the health care provided to students in the college setting. Finally, in this paper an overview of current, progress, gaps to be filled and future directions on this topic are argued offers an overview of current progress, gaps to be filled, and future directions on this topic.

Search strategy

In this paper, we attempted to provide an overview of studies on the effectiveness of online psychological and psychotherapeutic interventions aimed at university students. We planned two steps in the literature search. Not aiming to conduct a systematic literature review, we have selected the most recent articles on the topic, referring to the literature that emerged using the PubMed and Scopus search, which incorporates references to the biomedical, psychological, and social science literature. The following sets of keywords were used: (university student* OR college student*) AND (emotion training OR psychological intervention* OR psychotherapeutic intervention* OR psychotherap* OR psychological rehabilitation OR emotion focused therapy OR emotion* regulation intervention*) AND (online OR e-therapy OR digital setting). Based on a qualitative assessment, the studies considered most representative were selected, such as randomized clinical trials, but also cross-sectional observational studies. In the second phase, the snowballing search method was used to track down other articles using the reference list at the end of the most interesting articles from the first phase. Given that we were interested in analyzing the effectiveness of psychological and psychotherapy delivered online in university students, the following inclusion criteria were adopted: a) empirical studies in peer-reviewed English-language scientific journals; b) studies with samples including university students (>18 years

old); c) studies that included psychological or psychotherapy interventions conducted online. Also included were: d) clinical trials, randomized controlled trials, observational and qualitative studies; e) studies that used validated questionnaires, interviews or observational procedures to measure psychological outcomes. Exclusion criteria included: a) studies on developmental age population (< 18 years); b) interventions performed only in presence; c) studies that assessed only effects on academic performance; d) studies that were not published in English; e) articles whose full text could not be accessed; g) gray literature (e.g., dissertations, abstracts of conference proceedings). Based on these criteria, we selected 18 studies.

Results

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Of our 18 selected studies, 9 were based on the CBT approach, two used a positive psychology intervention, one used a brief psychodynamic oriented intervention, four reported data on the effectiveness of college counseling services, and two used an intervention based on personalized normative feedback (one of them also involved gamification). The countries in which these studies were conducted are quite heterogeneous and have the following backgrounds: 1 study from Ireland, 1 study from Finland, 1 study from the UK, 1 study from Florida, 1 study from China, 1 study from the Czech Republic, 1 study from Malaysia, 2 studies from Italy, 4 studies from Australia and 5 studies from the U.S.A.

CBT-oriented interventions

Since the pre-pandemic era, there was a great deal of research on the effectiveness of online psychological interventions targeted at university students. Most of the studies either used a cognitive-behavioral approach or were based on it. In most cases, after the intervention mental health outcome scores improved significantly compared to pre-

intervention scores. Four studies evaluated the effectiveness of online interventions based on the CBT approach. Richards and colleagues (2013) compared the effectiveness of eight weekly sessions of an online self-administered CBT with a therapist-assisted CBT treatment via email. In this study, both interventions reported efficacy and positive effects on depressive symptoms both at the end of treatment and at follow-up. The authors reported that perceptions of working alliance were similar in each group, but the link was significantly stronger for the therapist-assisted email CBT treatment condition, showing positive correlations between working alliance and improvement in depressive symptoms. The study found not significant differences between the two online treatments. Similarly, clinical improvement and recovery were demonstrated by both groups equally, suggesting that various types of online interventions could fill gaps in care provided by university services (Richards *et al.*, 2013). In a single-blind RCT conducted by Freeman *et al.* (2017), 3,755 undergraduate students with insomnia followed an iCBT for insomnia (n=1891) or usual care (n=1864). In this study, the iCBT intervention reduced insomnia, paranoia, and hallucination. Cognitive orientation interventions have also been effective in reducing symptoms of post-traumatic stress disorder and distress (PTSD) in victims of rape and other trauma. Littleton and colleagues (2012) enrolled five female students in an online CBT program focused on thoughts of self-blame, difficulties with trust and intimacy, and concerns about personal safety. After completing the “From Survivor to Thriver” program, four participants reported clinically significant reductions in symptoms and no longer met PTSD criteria, with reductions in trauma-related negative cognitions. A study by Zhou *et al.* (2020) used Imagery Rescripting (IR) during an iCBT intervention targeting young female students at risk of developing eating disorders. The authors included four conditions: body or general imagery rescripting, psychoeducation and control. The two IR conditions and psychoeducation reduced global eating psychopathology and improved body acceptance, but only IR had an impact on self-compassion and dysfunctional attitudes, secondary variables that maintain the eating disorder. Other five CBT studies evaluated the effectiveness of mindfulness-based interventions. In 2016, Räsänen *et al.* conducted a seven-week Acceptance and Commitment Therapy (ACT) online intervention. The intervention included two face-to-face meetings and a

five-week online program targeted at problems of stress, anxiety, and depression. The programmes included modules based on learning skills and strategies on ACT processes: (1) clarifying values, (2) taking action, (3) being present, (4) observing one's thoughts and (5) awareness and acceptance. Participants in the online ACT-based intervention achieved significantly higher results in terms of well-being, life satisfaction and mindfulness skills than the control group. In addition, the online intervention participants' self-reported stress and depression symptoms were significantly reduced and maintained over a 12-month follow-up period. In line with these findings, a pilot study confirmed that a mindfulness programme combining a face-to-face approach with the use of text, audio and video components and intensive reminders via social network is a feasible and effective tool for mental health support of university students (Světlač *et al.*, 2021). In this study, students reported a reduction in perceived stress, as well as a decrease in the frequency and intensity of negative affect, an increase in self-awareness and a higher rate of self-compassion. Whereas less effectiveness was found in improving the use of cognitive reappraisal. Another online programme that delivered psychotherapeutic modules based on CBT and mindfulness found significant reductions in social anxiety and improvements in academic self-efficacy, although it was not effective in reducing symptoms of depression, anxiety or psychological distress compared to the control group (Farrer *et al.*, 2019). In any case, most of the participants in the intervention group maintained the results at follow-up, declaring themselves satisfied with the applied programme. Still, an online programme designed to reduce the negative consequences of perfectionism based on mindfulness techniques, compassion for self and others, discomfort tolerance and acquisition of social skills ("Intentional Imperfection Program" by Visvalingam *et al.*, 2022) showed significant reductions in self-directed perfectionism, socially prescribed perfectionism, hostility, sensitivity to rejection, depression and anxiety and a small increase in perceived social support among students. The intervention was also perceived by participants as feasible, enjoyable and useful. Finally, a quasi-experimental study showed that a one-session online mindfulness intervention was effective in reducing anxiety and improving psychological flexibility, although it reported no differences in depression, stress or fear of COVID-19 (Pang *et al.*, 2023).

Other psychological intervention

Two studies evaluated the effectiveness of interventions delivered online on alcohol use in college students. Specifically, in a randomized Controlled Clinical Trial (RCT) Boyle *et al.* (2017) compared a new type of intervention based on personalized, gamified normative feedback, which includes a point-based reward system, with the standard personalized online normative feedback widely used on college campuses to reduce alcohol use. The authors found that gamified interventions, due to typical motivational features of a game, were more effective in providing prevention information and promoting behavior change. In this study, 237 students were randomly assigned to standard treatment based on personalized normative feedback or to personalized treatment with normative feedback provided within a Facebook-linked social game called Campus Gamified Alcohol Norm Discovery and Readjustment. The results of this study suggest that gamification may be a method to substantially improve the effectiveness of the intervention in reducing alcohol use. Another randomized controlled trial was designed to prevent the increase in problematic drinking abroad by college students by acting on misperceptions about drinking norms and promoting positive and healthy adaptation in the host culture (Pedersen *et al.*, 2017). A sample of 343 college students abroad were randomly assigned to a personalized normative feedback, a living abroad adaptation feedback intervention, a combined intervention, or a control condition. The results of this study suggest that the personalized normative feedback intervention may be helpful for lighter pre-departure drinkers and that the addition of the living abroad adaptation feedback intervention may help prevent dysfunctional behavior abroad for those who report more difficulties pre-departure.

Two studies used positive psychological intervention. Auyeung and Mo (2018) conducted an RCT to evaluate the effectiveness of a six-day online self-help positive psychological intervention aimed at improving well-being and reducing depressive symptoms in 100 Chinese university students. The intervention involved writing about the best possible self. The authors report that positive psychological intervention improved well-being and reduced depressive symptoms independently of each other. The intervention's effect on well-being was mediated by positive affect and satisfaction with autonomy, while the

effect on depressive symptoms was mediated by increased autonomy. DuPont *et al.* (2023) recruited 250 university students to determine whether a two-week online positive psychology intervention delivered during the COVID-19 pandemic was able to increase positive affect, improve psychological well-being, optimism, life satisfaction, perceived social support and loneliness, and reduce negative affect in college students. As part of the intervention, they were able to choose from six different positive psychology activities, including: (1) signing strengths, (2) three good things, (3) acts of kindness, (4) the best future self, (5) writing and delivering a letter of gratitude, and (6) savoring with a mindful photograph. The findings suggest that the online positive psychology intervention was not effective in influencing positive affect, psychological well-being, perceived social support, and loneliness or negative affect compared with the control condition. During the period of the COVID-19 pandemic, one study evaluated the effectiveness of a psychodynamically oriented short online intervention aimed at promoting a process of self-reflection, self-discovery and creation. In particular, the intervention focused on overcoming an ongoing crisis among Italian students and on their academic project. All students were offered four weekly sessions and then a follow-up session after three months. The results of the study showed a significant improvement in general functioning and a decrease in symptoms of depression, anxiety, burnout and hopelessness (Cerutti *et al.*, 2022).

Four studies have reported data on the effectiveness of college counseling services delivered online. Dear and colleagues (2019) conducted a study of the effectiveness of a five-session routine counseling service primarily directed at treating symptoms of anxiety and depression. The authors observed large clinical reductions in anxiety and depression symptoms and high levels of reported acceptability in a sample of 1081 students. Benton and colleagues (2016) in a large university counseling center conducted a study of the effectiveness of a seven-week individual psychotherapy using a blended online and in-person method, reducing direct contact with the psychotherapist but not eliminating it. The treatment combined online educational materials with brief contact with the therapist via phone, chat or videoconference, using mainly text message reminders, homework on mobile devices, online sessions and weekly progress assessments. Results of the findings showed a greater reduction in anxiety and greater

improvement in overall mental health, life functioning and sense of well-being in clients who received the experimental treatment than in clients treated with usual care.

Celia and colleagues (2022) evaluated the effectiveness of an online individual counseling intervention carried out during the COVID-19 pandemic aimed at improving levels of subjective well-being, global distress, emotional health, and future time perspective in a sample of 32 Italian university students. The counseling intervention used empathic listening, feedback to guide toward change and reformulation of verbal and nonverbal communication in order to generate new meanings. Results showed an increase in positive emotions, subjective well-being, and improved future time perspective after the intervention. At the same time, there was a reduction in negative emotions, global mental distress, state-trait anxiety, and perceived stress over time. Finally, one study compared online synchronous video counseling with in-person counseling using Solution-Focused Brief Therapy (SFBT) in 49 college students with mild to moderate anxiety (Novella *et al.*, 2022), suggesting that the online delivery system does not show less success than the classic in-person one.

Discussion

In this paper, we sought to provide an overview of recent empirical studies on the effectiveness of online psychological and psychotherapeutic interventions aimed at college students. The purpose of the study is to identify the most effective and most frequently delivered type of online psychological intervention currently provided to college students. Moreover, we intend to understand what gaps need to be filled and future directions on this topic. Eighteen studies were included in our work, and the most frequently found online intervention was cognitive behavioral therapy (CBT). Online psychological interventions reported acceptable, if not equal, efficacy data to face-to-face interventions. The most frequently treated disorders were anxiety and depression, but, as discussed below, online interventions have also found use in treating other conditions such as PTSD developed following sexual assault, eating disorders, or alcohol dependence. The concept of online psychological intervention refers to the interaction

between psychologist and user mediated by the use of web-based communication technologies. Individuals now live most of their daily lives connected in virtual networks: interacting with subjects and knowledge through multiple devices, breaking down barriers of time and space. The provision of psychological services at a distance is a hotly debated topic today, and one on which scientific research is still conducting studies to better understand critical issues and opportunities inherent in it. Telepsychology has revolutionized psychological services both for those who have logistical or motor problems accessing psychological services, but also for all those who prefer a more flexible way of accessing psychological services (Gamble, Boyle, & Morris, 2015). The world has changed, and the boundaries of psychological practice have expanded. In our analysis eighteen studies were selected. We found that the predominant type of online intervention was CBT (Richards *et al.*, 2013; Littleton *et al.*, 2012; Farrer *et al.*, 2019; Freeman *et al.*, 2017; Pang *et al.*, 2023; Räsänen *et al.*, 2016; Světlák *et al.*, 2021; Visvalingam *et al.*, 2022; Zhou *et al.*, 2020). This prevalence appears to be due to the ease of applying the protocol and measuring outcomes through specific standardized instruments. In most cases, psychological interventions delivered online have proven effective in reducing symptoms of anxiety, depression, eating disorders, or alcohol dependence (e.g.: Boyle *et al.*, 2017; Celia *et al.*, 2022; Cerutti *et al.*, 2022; Dear *et al.*, 2019; Novella *et al.*, 2020; Zhou *et al.*, 2020) in the college population. Interestingly, such interventions are also found to be effective in treating psychopathological conditions such as PTSD developed following sexual assault (Littleton *et al.*, 2012), a condition that involves an extreme state of physical alarm related to memories of the traumatic event. In such circumstances, an intervention delivered online can provide assistance to even the most reluctant and frightened people because of a devastating interpersonal event. Likewise, despite mixed results, these interventions have demonstrated high acceptability and adherence rates in university students. Indeed, a critical review of the literature by Richards and Viganó (2013), showed that online counseling can have a similar impact and is as likely to replicate facilitative conditions as face-to-face encounters. One target audience identified as being diffusely affected by the adoption of online therapeutic practices are young people. Millennials are digital natives and naturally expect to find and use all

kinds of services online. The positive results of chat counseling in young people were also demonstrated in 2015 by Dowling and Rickwood. In fact, multiple sessions and advancing the steps of the counseling process led to an alleviation of psychological distress within six weeks (Dowling & Rickwood, 2015). Two important components of access to counseling or psychological intervention should be considered. The psychologist, psychotherapist or psychoanalyst is called upon to adapt the profession to what are the possibilities and constraints offered by technology, always keeping in mind the deontological principles of the profession and the core characteristics, so as to accompany the evolution of their role in step with that of society. The social distance and the security measures have affected the relationship among people and their perception of empathy toward others. From this perspective, telepsychology and technological devices assumed important roles to decrease the negative effects of the pandemic. These tools present benefits that could improve psychological treatment of patients online, such as the possibility to meet from home or from the workplace, saving money and time and maintaining the relationship between therapists and patients. Telepsychology, for instance, is a valid tool, effective in taking charge of the psychological suffering caused by the pandemic and in preventing the chronicity of the disease. The prolonged stress could involve anxiety, depression, and the inability to manage traumatic and negative emotions. Furthermore, the constant fear of contagion affects daily life and leads to social isolation, modifying human relations. As a consequence of the emerging issues, psychotherapists provide psychological support online, addressing the technological challenge (Greenberg *et al.*, 2020; Liu *et al.*, 2020). In line with technological progress, professional organizations promoted specific guidelines and policies related to customer protection, privacy, screening, evaluation, and development of self-help products (Duan & Zhu, 2020; Zhou *et al.*, 2020). Technological development in mental health foreshadows future trends that include “smart” mobile devices, cloud computing, virtual worlds, virtual reality and electronic games in addition to the traditional psychotherapy tools. In this perspective, it is important to help future generations of psychologists and patients to collaborate in the potential growth areas, through education and training on the benefits and effectiveness of telepsychology. Tele-counseling is a diffuse online method used by

counselors and psychologists during the recent pandemic (De Luca & Calabrò, 2020). On this line, a significant example is the Virginia Commonwealth University (VCU) which proposed PhDs programme in telepsychology, with the aim of training future psychologists in managing the psychological effects of the pandemic through an online psychology service (Baylor *et al.*, 2019). In addition, Pietrabissa *et al.* (2015) identified some of the main benefits of telepsychology, such as reduced waiting time for consultation, time and expense savings, less travel and office rental costs for both the service provider and the user (Arnberg *et al.*, 2014; You *et al.*, 2022). As reported by the authors, online psychological services facilitate access to people who struggle to find support close to their social environment, avoiding difficulties related to mobility.

Our findings are relevant in several areas. Among the practical implications, the possibility of treating psychological distress through readily available technological tools emerges, especially for the population of college students, who are familiar with the use of digital devices and may feel more motivated to use them to improve their mental health. In addition, with telepsychology, the waiting time to get psychological counseling reduced and intervention in the treatment of psychological distress would take place more promptly than in the past. Therefore, individuals would be able to connect from home or their place of study or work, with both economic and time advantages. Among the psychological implications that emerged from our study, it is evident how online psychology can provide effective responses to various issues, pertaining to different areas of psychological distress, as also demonstrated by an Italian study (Cipolletta & Mocellin, 2018).

We conclude that online interventions may be an alternative and less expensive treatment to be implemented in university services or primary health care centers for students with depressive symptoms or at risk, especially when sufficient mental health professionals are not available. In addition, online services could be useful for students who fear a negative perception of psychological treatment and are more reluctant to access it. However, the wide heterogeneity of the analyzed interventions and collection measures limits the possibility of drawing unambiguous and generalizable conclusions. In addition, the identified interventions differ in terms of the number of sessions, total duration and outcomes considered. Further research is needed to determine

the intervention characteristics that are most relevant to therapeutic processes (Oliveira *et al.*, 2023). Based on this heterogeneity among the studies available in the literature, further RCT studies involving specifically trained professionals and interventions with a well-detailed and repeatable methodology are needed. Finally, studies are needed to establish the appropriate training and modalities to deliver online interventions aimed at such a specific target audience, as well as it is essential to establish effectiveness monitoring criteria to assess their long-term effects.

References

- Abbott, J. M., Klein, B., & Ciechowski, L. (2008). Best Practices in Online Therapy. *Journal of Technology in Human Services*, 26, 360–375. DOI: 10.1080/15228830802097257
- Andersson, G., Cuijpers, P., Carlbring, P., Riper, H., & Hedman, E. (2014). Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. *World psychiatry: official journal of the World Psychiatric Association (WPA)*, 13(3), 288–295. DOI: 10.1002/wps.20151
- Andrews, G., Cuijpers, P., Craske, M. G., McEvoy, P., & Titov, N. (2010). Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. *PloS one*, 5(10), e13196. DOI: 10.1371/journal.pone.0013196
- Andrews, G., Basu, A., Cuijpers, P., Craske, M. G., McEvoy, P., English, C. L., & Newby, J. M. (2018). Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: An updated meta-analysis. *Journal of anxiety disorders*, 55, 70–78. DOI: 10.1016/j.janxdis.2018.01.001
- Apolinário-Hagen, J., Harrer, M., Dederichs, M., Fritsche, L., Wopperer, J., Wals, F., Loerbroks, A., Lehr, D., Salewski, C., Angerer, P., & Ebert, D. D. (2021). Exploring the influence of testimonial source on attitudes towards e-mental health interventions among university students: Four-group randomized controlled trial. *PloS one*, 16(5), e0252012. DOI: 10.1371/journal.pone.0252012
- Arnberg, F. K., Linton, S. J., Hultcrantz, M., Heintz, E., & Jonsson, U. (2014). Internet-delivered psychological treatments for mood and anxiety disorders: A systematic review of their efficacy, safety, and cost-effectiveness. *PLoS One*, 9(5). DOI: 10.1371/journal.pone.0098118

- Arnett, J. J., Žukauskienė, R., & Sugimura, K. (2014). The new life stage of emerging adulthood at ages 18-29 years: implications for mental health. *The lancet. Psychiatry*, *1*(7), 569–576. DOI: 10.1016/S2215-0366(14)00080-7
- Auyeung, L. & Mo, P. K. H. (2019). The Efficacy and Mechanism of Online Positive Psychological Intervention (PPI) on Improving Well-Being Among Chinese University Students: A Pilot Study of the Best Possible Self (BPS) Intervention. *Journal of Happiness Studies*, *20*, 2525–2550. DOI: 10.1007/s10902-018-0054-4
- Baker, K. D., & Ray, M. (2011). Online counseling: The good, the bad, and the possibilities. *Counselling Psychology Quarterly*, *24*, 341–346. DOI: 10.1080/09515070.2011.632875
- Barak, A. (1999). Psychological applications on the Internet: A discipline on the threshold of a new millennium. *Applied and Preventive Psychology*, *8*, 231–245. DOI: 10.1016/S0962-1849(05)80038-1
- Barak, A., Klein, B., & Proudfoot, J. G. (2009). Defining internet-supported therapeutic interventions. *Annals of behavioral medicine: a publication of the Society of Behavioral Medicine*, *38*(1), 4–17. DOI: 10.1007/s12160-009-9130-7
- Baumel, A., Muench, F., Edan, S., & Kane, J. M. (2019). Objective User Engagement with Mental Health Apps: Systematic Search and Panel-Based Usage Analysis. *Journal of medical Internet research*, *21*(9), e14567. DOI: 10.2196/14567
- Baylor, C., Burns, M., McDonough, K., Mach, H., & Yorkston, K. (2019). Teaching Medical Students Skills for Effective Communication with Patients Who Have Communication Disorders. *American journal of speech-language pathology*, *28*(1), 155–164. DOI: 10.1044/2018_AJSLP-18-0130
- Beck, A. T. (1967). *Depression: Causes and treatment*. Philadelphia: University of Pennsylvania Press.
- Benjet, C. (2020). Stress management interventions for college students in the context of the COVID-19 pandemic. *Clinical psychology: a publication of the Division of Clinical Psychology of the American Psychological Association*, e12353. Advance online publication. DOI: 10.1111/cpsp.12353
- Benton, S. A., Heesacker, M., Snowden, S. J., & Lee, G. (2016). Therapist-assisted, online (TAO) intervention for anxiety in college students: TAO outperformed treatment as usual. *Professional Psychology: Research and Practice*, *47*(5), 363–371. DOI: 10.1037/pro0000097
- Bolton, A. J., & Dorstyn, D. S. (2015). Telepsychology for Posttraumatic Stress Disorder: a systematic review. *Journal of Telemedicine and Telecare*. DOI: 10.1177/1357633x15571996

- Boyle, S. C., Earle, A. M., LaBrie, J. W., & Smith, D. J. (2017). PNF 2.0? Initial evidence that gamification can increase the efficacy of brief, web-based personalized normative feedback alcohol interventions. *Addictive behaviors*, 67, 8–17. DOI: 10.1016/j.addbeh.2016.11.024
- Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Hedman-Lagerlöf, E. (2018). Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: an updated systematic review and meta-analysis. *Cognitive behaviour therapy*, 47(1), 1–18. DOI: 10.1080/16506073.2017.1401115
- Cerutti, R., Spensieri, V., Amendola, S., Biuso, G. S., Renzi, A., & Tambelli, R. (2022). Responding to the COVID-19 public health emergency: The usefulness of an online brief psychological intervention with Italian university students. *Psychology in the schools*, DOI: 10.1002/pits.22785. Advance online publication. DOI: 10.1002/pits.22785
- Celia, G., Tessitore, F., Cavicchiolo, E., Girelli, L., Limone, P., & Cozzolino, M. (2022). Improving University Students' Mental Health During the COVID-19 Pandemic: Evidence from an Online Counseling Intervention in Italy. *Frontiers in psychiatry*, 13, 886538. DOI: 10.3389/fpsy.2022.886538
- Cipolletta, S., & Mocellin, D. (2018). Online counseling: An exploratory survey of Italian psychologists' attitudes towards new ways of interaction. *Psychotherapy research: journal of the Society for Psychotherapy Research*, 28(6), 909–924. DOI: 10.1080/10503307.2016.1259533
- De Luca, R., & Calabrò, R. S. (2020). How the COVID-19 Pandemic is Changing Mental Health Disease Management: The Growing Need of Telecounseling in Italy. *Innovations in clinical neuroscience*, 17(4-6), 16–17.
- Dear, B. F., Johnson, B., Singh, A., Wilkes, B., Brkic, T., Gupta, R., Jones, M. P., Bailey, S., Dudeney, J., Gandy, M., Fogliati, R., & Titov, N. (2019). Examining an internet-delivered intervention for anxiety and depression when delivered as a part of routine care for university students: A phase IV trial. *Journal of affective disorders*, 256, 567–577. DOI: 10.1016/j.jad.2019.06.044
- Dowling, M. & Rickwood, D. (2015). Investigating individual online synchronous chat counselling processes and treatment outcomes for young people. *Advances in Mental Health*, 12, 216–224. DOI: 10.1080/18374905.2014.11081899
- Duan, L., & Zhu, G. (2020). Psychological interventions for people affected by the COVID-19 epidemic. *The lancet. Psychiatry*, 7(4), 300–302. DOI: 10.1016/S2215-0366(20)30073-0
- DuPont, C. M., Pressman, S. D., Reed, R. G., Manuck, S. B., Marsland, A. L. & Gianaros, P. J. (2023). Does an Online Positive Psychological Intervention

Improve Positive Affect in Young Adults During the COVID-19 Pandemic? *Affective Science*, 4, 101–117. DOI: 10.1007/s42761-022-00148-z

- Farrer, L. M., Gulliver, A., Katruss, N., Fassnacht, D. B., Kyrios, M., & Batterham, P. J. (2019). A novel multi-component online intervention to improve the mental health of university students: Randomised controlled trial of the Uni Virtual Clinic. *Internet interventions*, 18, 100276. DOI: 10.1016/j.invent.2019.100276
- Finn, J., & Barak, A. (2010). A descriptive study of e-counsellor attitudes, ethics, and practice. *Counselling & Psychotherapy Research*, 10(4), 268–277. DOI: 10.1080/14733140903380847
- Fleming, T., Bavin, L., Lucassen, M., Stasiak, K., Hopkins, S., & Merry, S. (2018). Beyond the Trial: Systematic Review of Real-World Uptake and Engagement with Digital Self-Help Interventions for Depression, Low Mood, or Anxiety. *Journal of medical Internet research*, 20(6), e199. DOI: 10.2196/jmir.9275
- Freeman, D., Sheaves, B., Goodwin, G. M., Yu, L. M., Nickless, A., Harrison, P. J., Emsley, R., Luik, A. I., Foster, R. G., Wadekar, V., Hinds, C., Gumley, A., Jones, R., Lightman, S., Jones, S., Bentall, R., Kinderman, P., Rowse, G., Brugha, T., Blagrove, M., ... Espie, C. A. (2017). The effects of improving sleep on mental health (OASIS): a randomised controlled trial with mediation analysis. *The lancet. Psychiatry*, 4(10), 749–758. DOI: 10.1016/S2215-0366(17)30328-0
- Gamble N., Boyle C., & Morris Z. A. (2015). Ethical Practice in Telepsychology. *Australian Psychologist*, 50, 292–298. DOI: 10.1111/ap.12133
- Greenberg, N., Docherty, M., Gnanapragasam, S., & Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ (Clinical research ed.)*, 368, m1211. DOI: 10.1136/bmj.m1211
- Hedman, E., Ljótsson, B., & Lindfors, N. (2012). Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness. *Expert review of pharmacoeconomics & outcomes research*, 12(6), 745–764. DOI: 10.1586/erp.12.67
- Johansson, R., Ekbladh, S., Hebert, A., Lindström, M., Möller, S., Petitt, E., ... Andersson, G. (2012). Psychodynamic guided self-help for adult depression through the internet – A randomised controlled trial. *PLoS ONE* 7(5), e38021. DOI: 10.1371/journal.pone.0038021
- Kivi, M., Eriksson, M. C., Hange, D., Petersson, E. L., Vernmark, K., Johansson, B., & Björkelund, C. (2014). Internet-based therapy for mild to moderate depression in Swedish primary care: short term results from the PRIM-NET randomized controlled trial. *Cognitive behaviour therapy*, 43(4), 289–298. DOI: 10.1080/16506073.2014.921834

- Lenhard, F., Vigerland, S., Andersson, E., Rück, C., Mataix-Cols, D., Thulin, U., Ljótsson, B., & Serlachius, E. (2014). Internet-delivered cognitive behavior therapy for adolescents with obsessive-compulsive disorder: an open trial. *PloS one*, *9*(6), e100773. DOI: 10.1371/journal.pone.0100773
- Littleton, H., Buck, K., Rosman, L., & Grills-Taquechel, A. (2012). From Survivor to Thriver: A Pilot Study of an Online Program for Rape Victims. *Cognitive and behavioral practice*, *19*(2), 315–327. DOI: 10.1016/j.cbpra.2011.04.002
- Liu, S., Yang, L., Zhang, C., Xiang, Y. T., Liu, Z., Hu, S., & Zhang, B. (2020). Online mental health services in China during the COVID-19 outbreak. *The lancet. Psychiatry*, *7*(4), e17–e18. DOI: 10.1016/S2215-0366(20)30077-8
- Lungu, A., & Sun, M. (2016). Time for a Change: College Students' Preference for Technology-Mediated Versus Face-to-Face Help for Emotional Distress. *Telemedicine journal and e-health: the official journal of the American Telemedicine Association*, *22*(12), 991–1000. DOI: 10.1089/tmj.2015.0214
- Ma, L., Huang, C., Tao, R., Cui, Z., & Schluter, P. (2021). Meta-analytic review of online guided self-help interventions for depressive symptoms among college students. *Internet interventions*, *25*, 100427. DOI: 10.1016/j.invent.2021.100427
- Na, H., Jo, M., Lee, C., & Kim, D. (2022). Development and Evaluation: A Behavioral Activation Mobile Application for Self-Management of Stress for College Students. *Healthcare (Basel, Switzerland)*, *10*(10), 1880. DOI: 10.3390/healthcare10101880
- Novella, J. K., Ng, K. M., & Samuolis, J. (2022). A comparison of online and in-person counseling outcomes using solution-focused brief therapy for college students with anxiety. *Journal of American college health: J of ACH*, *70*(4), 1161–1168. DOI: 10.1080/07448481.2020.1786101
- Oliveira, C., Pacheco, M., Borges, J., Meira, L., & Santos, A. (2023). Internet-delivered cognitive behavioral therapy for anxiety among university students: A systematic review and meta-analysis. *Internet interventions*, *31*, 100609. DOI: 10.1016/j.invent.2023.100609
- Pang, N. T. P., Tio, V. C. S., Singh, A. S. B., Tseu, M. W. L., Shoesmith, W. D., Abd Rahim, M. A., & Mohd Kassim, M. A. (2023). Efficacy of a single-session online ACT-based mindfulness intervention among undergraduates in lockdown during the COVID-19 pandemic. *Trends in psychiatry and psychotherapy*, *44*, e20200172. DOI: 10.47626/2237-6089-2020-0172
- Patel, V., Flisher, A. J., Hetrick, S., & McGorry, P. (2007). Mental health

of young people: a global public-health challenge. *Lancet (London, England)*, 369(9569), 1302–1313. DOI: 10.1016/S0140-6736(07)60368-7

- Pedersen, E. R., Neighbors, C., Atkins, D. C., Lee, C. M., & Larimer, M. E. (2017). Brief online interventions targeting risk and protective factors for increased and problematic alcohol use among American college students studying abroad. *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors*, 31(2), 220–230. DOI: 10.1037/adb0000242
- Perle, J.G., Langsam, L.C., & Nierenberg, B.P. (2011). Controversy clarified: an updated review of clinical psychology and tele-health. *Clinical psychology review*, 31(8), 1247–58. DOI: 10.1016/j.cpr.2011.08.003
- Pietrabissa, G., Manzoni, G.M., Algeri, D., Mazzucchelli, L., Carella, A., Pagnini, F. and Castelnuovo, G. (2015), Facebook use for consulting psychology. *Australian Psychologist*, 50, 299–303. DOI: 10.1111/ap.12139
- Räsänen, P., Lappalainen, P., Muotka, J., Tolvanen, A., & Lappalainen, R. (2016). An online guided ACT intervention for enhancing the psychological wellbeing of university students: A randomized controlled clinical trial. *Behaviour research and therapy*, 78, 30–42. DOI: 10.1016/j.brat.2016.01.001
- Reangsing, C., Abdullahi, S. G., & Schneider, J. K. (2023). Effects of Online Mindfulness-Based Interventions on Depressive Symptoms in College and University Students: A Systematic Review and Meta-Analysis. *Journal of integrative and complementary medicine*, 29(5), 292–302. DOI: 10.1089/jicm.2022.0606
- Richards, D., Timulak, L., Hevey, D., (2013). A comparison of two online cognitive-behavioural interventions for symptoms of depression in a student population: the role of therapist responsiveness. *Counselling and Psychotherapy Research*, 13(3), 184–193. DOI: 10.1080/14733145.2012.733715
- Richards D. & Viganó N. (2013). Online Counseling: A Narrative and Critical Review of the Literature. *Journal of Clinical Psychology*, 69(9), 994–1011. DOI: 10.1002/jclp.21974
- Rozental, A., Forsell, E., Svensson, A., Andersson, G., & Carlbring, P. (2015). Internet-based cognitive behavior therapy for procrastination: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 83(4), 808–824. DOI: 10.1037/ccp0000023
- Shafraan, R., Wade, T. D., Egan, S. J., Kothari, R., Allcott-Watson, H., Carlbring, P., Rozental, A., & Andersson, G. (2017). Is the devil in the detail? A randomised controlled trial of guided internet-based CBT for perfectionism. *Behaviour research and therapy*, 95, 99–106. DOI: 10.1016/j.brat.2017.05.014

- Světlák, M., Linhartová, P., Knejzlíková, T., Knejzlík, J., Kóša, B., Horníčková, V., Jarolínová, K., Lučanská, K., Slezáčková, A., & Šumec, R. (2021). Being Mindful at University: A Pilot Evaluation of the Feasibility of an Online Mindfulness-Based Mental Health Support Program for Students. *Frontiers in psychology, 11*, 581086. DOI: 10.3389/fpsyg.2020.581086
- Torous, J., Jän Myrick, K., Rauseo-Ricupero, N., & Firth, J. (2020). Digital Mental Health and COVID-19: Using Technology Today to Accelerate the Curve on Access and Quality Tomorrow. *JMIR mental health, 7*(3), e18848. DOI: 10.2196/18848
- Vigerland, S., Lenhard, F., Bonnert, M., Lalouni, M., Hedman, E., Ahlen, J., Olén, O., Serlachius, E., & Ljótsson, B. (2016). Internet-delivered cognitive behavior therapy for children and adolescents: A systematic review and meta-analysis. *Clinical psychology review, 50*, 1–10. DOI: 10.1016/j.cpr.2016.09.005
- Visvalingam, S., McHardy, H. L., Norder, S. J., Magson, N. R., & Norberg, M. M. (2022). A mixed methods study of an online intervention to reduce perfectionism. *Current psychology (New Brunswick, N.J.)*, 1–16. Advance online publication. DOI: 10.1007/s12144-022-02953-y
- Wagner, B., Horn, A. B., & Maercker, A. (2014). Internet-based versus face-to-face cognitive-behavioral intervention for depression: a randomized controlled non-inferiority trial. *Journal of affective disorders, 152-154*, 113–121. DOI: 10.1016/j.jad.2013.06.032
- Wasil, A. R., Taylor, M. E., Franzen, R. E., Steinberg, J. S., & DeRubeis, R. J. (2021). Promoting Graduate Student Mental Health During COVID-19: Acceptability, Feasibility, and Perceived Utility of an Online Single-Session Intervention. *Frontiers in psychology, 12*, 569785. DOI: 10.3389/fpsyg.2021.569785
- Wasil, A. R., Weisz, J. R., & DeRubeis, R. J. (2020). Three questions to consider before developing a mental health app. *World psychiatry: official journal of the World Psychiatric Association (WPA), 19*(2), 252–253. DOI: 10.1002/wps.20757
- You, J. H. S., Luk, S. W. C., Chow, D. Y. W., Jiang, X., Mak, A. D. P., & Mak, W. W. S. (2022). Cost-effectiveness of internet-supported cognitive behavioral therapy for university students with anxiety symptoms: A Markov-model analysis. *PLoS one, 17*(5), e0268061. DOI: 10.1371/journal.pone.0268061
- Zhou, X., Snoswell, C. L., Harding, L. E., Bambling, M., Edirippulige, S., Bai, X., & Smith, A. C. (2020). The Role of Telehealth in Reducing the Mental Health Burden from COVID-19. *Telemedicine journal and e-*

health: the official journal of the American Telemedicine Association, 26(4), 377–379. DOI: 10.1089/tmj.2020.0068

Zhou, Y., Pennesi, J. L., & Wade, T. D. (2020). Online imagery rescripting among young women at risk of developing an eating disorder: A randomized controlled trial. *The International journal of eating disorders*, 53(12), 1906–1917. DOI: 10.1002/eat.23370