

**A Short-Term, Self-Help Internet-Based, Cognitive Behavioral Therapy Intervention
for Decreasing Symptoms of Generalized Anxiety**

by

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Thesis Submitted to the Graduate School of Social Sciences and Humanities in Partial
Fulfillment of the Requirements for the Degree of

Master of Arts

in

Clinical Psychology



**KOÇ
ÜNİVERSİTESİ**

August 2023

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for Decreasing Symptoms of Generalized Anxiety**

Koç University
Graduate School of Social Sciences and Humanities

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ABSTRACT

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Master of Arts in Clinical Psychology

August 14, 2023

The mental health gap has considerably increased due to the pandemic. The most commonly experienced problem is anxiety, with 374 million people affected by anxiety disorders in 2021, marking a 25% increase from 2020. Moreover, 60% of people with anxiety disorders wait a median of 8 years before treatment. Out of anxiety diagnoses, generalized anxiety disorder is the most common. Untreated people suffer, and the resulting disabilities burden the households and economies, especially in low to middle-income countries. A plausible solution to reduce this gap is using internet-based technologies to deliver therapeutic and educational content. Mobile applications and websites offering mental health services become globally popular because they are accessible, cost-effective, and anonymous. Yet, there is limited research about such interventions in the Turkish language. The present study consisted of two phases: The pilot study was conducted to improve the intervention. The main study assessed the modified intervention through a randomized waitlist-controlled trial. The intervention included 10 sessions, each consisting of 4 modules: psychoeducational content, iCBT modules, relaxation exercises, and suggested daily activities. Participants completed the sessions in 14 days, and filled GAD-7, PHQ-9, and WHO-5 questionnaires at baseline, post-test, and one-month follow-up. Repeated-measures ANOVAs were used to test whether the intervention is effective in reducing generalized anxiety symptoms in the intervention group compared to the wait-list control group, as well as depression symptoms, and in increasing well-being scores. The results suggested that the iCBT intervention was effective in reducing the symptoms of anxiety and depression.

Keywords: anxiety, iCBT, self-help, internet-based intervention, digital psychotherapeutics

ÖZET

Yaygın Anksiyete Belirtilerini Azaltmada Kısa Süreli, Kendine Yardım, İnternet Tabanlı Bilişsel Davranışçı Terapi Müdahalesi

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Klinik Psikoloji, Yüksek Lisans

14 Ağustos 2023

Pandemi nedeniyle ruh sağlığı tedavi açığı önemli ölçüde artmıştır. En sık yaşanan sorun anksiyetedir ve 2021 yılında 374 milyon kişi anksiyete bozukluklarından etkilenerek 2020 yılına göre %25'lik bir artış göstermiştir. Ayrıca, anksiyete bozukluğu olan kişilerin %60'ı tedavi için ortalama 8 yıl beklemektedir. Anksiyete tanıları arasında en yaygın olanı yaygın anksiyete bozukluğudur. Tedavi edilmeyen insanlar acı çekmekte ve ortaya çıkan malullükler, özellikle düşük ve orta gelirli ülkelerde hane halklarına ve ekonomilere yük getirmektedir. Bu açığı azaltmak için makul bir çözüm, destekleyici ve eğitici içerik sunmak için internet tabanlı teknolojileri kullanmaktır. Ruh sağlığı hizmetleri sunan mobil uygulamalar ve web siteleri, erişilebilir, uygun maliyetli ve anonim olmaları nedeniyle dünya çapında popüler hale gelmiştir. Ancak, Türkçe dilinde bu tür müdahaleler hakkında sınırlı sayıda araştırma bulunmaktadır. Bu çalışma iki aşamadan oluşmaktadır: Pilot çalışma müdahaleyi geliştirmek için yürütülmüştür. Ana çalışma, revize edilmiş müdahalenin etkinliğini randomize bekleme listesi kontrollü çalışma ile test etmiştir. Müdahale, her biri 4 modülden oluşan 10 oturumdan oluşmuştur: psikoeğitim içeriği, iCBT içerikleri, rahatlama egzersizleri ve önerilen günlük aktiviteler. Katılımcılar oturumları 14 günde tamamlamıştır. YAB-7, PHQ-9 ve WHO-5'in başlangıç, son test ve bir aylık takip ölçümleri toplanmıştır. Müdahalenin, kontrol grubuna kıyasla müdahale grubundaki yaygın anksiyete semptomlarının yanı sıra depresyon semptomlarını azaltmada ve iyi oluş puanlarını arttırmada etkili olup olmadığını test etmek için tekrarlanan ölçümler ANOVA kullanılmıştır. Sonuçlar, iCBT müdahalesinin anksiyete ve depresyon belirtilerini azaltmada etkili olduğunu göstermiştir.

Anahtar Sözcükler: kaygı, iCBT, kendi kendine yardım, internet tabanlı müdahale, dijital psikoterapi

Acknowledgements

I wish to extend my profound appreciation to my esteemed advisors, Prof. Mehmet Eskin and Assoc. Prof. Ceren Acartürk. Their constant support, insightful guidance, and generous allocation of time have been invaluable throughout this journey. I feel extremely lucky to have been under their guidance.

Furthermore, my heartfelt gratitude goes to my parents Yeşim Anarat and Rüstem Tarık Anarat, who have been my pillars of strength, sharing in all my excitement, stress, and happiness from the beginning throughout this process. My journey was enriched by the simultaneous academic pursuits of my brother, Cemal Cem Anarat, who concluded his doctoral dissertation shortly before I finished my master's thesis. My gratitude also extends to my partner, Neslişah Boz, whose unwavering love and support have been invaluable during this demanding undertaking.

Also, I am deeply thankful to my friends, Amal Abdulcebbar, Alperen Kaplan, Dilek Demiray, Fevzi Çakmak, Ece Çağlak, Evrim Ozan Yılmaz, Fuat Kaan Aras, İbrahim Can Polat, İnci Dursundağ, Nihan Çaldır, and Nil Akyüz whose attentive counsel and continuous support provided solace and motivation during the most challenging times of this study. I would also like to extend my gratitude to Ayça Aksu for their counsel on the study's qualitative methodology, and to Dr. Elif Kurtuluş for their invaluable guidance and support.

Finally, I would like to thank TÜBİTAK for their support of this research and my graduate education through BİDEB 2210-A funding program.

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Abbreviations

CA:	Cognitive Avoidance
CBT:	Cognitive Behavioral Therapy
BDI:	Beck Depression Inventory
CONSORT:	Consolidated Standards of Reporting Trials
COVID-19:	Coronavirus Disease of 2019
GAD:	Generalized Anxiety Disorder
GAD-7:	Generalized Anxiety Disorder-7
HTTPS:	Hypertext Transfer Protocol Secure
iCBT:	Internet-based Cognitive Behavioral Therapy
IU:	Intolerance to Uncertainty
NICE:	National Institute for Health and Care Excellence
NPO:	Negative Problem Orientation
OCD:	Obsessive Compulsive Disorder
PHQ-9:	Patient Health Questionnaire-9
PBAW:	Positive Beliefs About Worry
PTSD:	Posttraumatic Stress Disorder
SSL:	Secure Sockets Layer
WHO:	World Health Organization
WHO-5:	World Health Organization-Five Well-Being Index
UX:	User Experience
WLC:	Waitlist Control
WWW:	World Wide Web

Introduction

1.1. Anxiety

At optimum levels, anxiety motivates individuals and increases their performance (Yerkes & Dodson, 1908; Eskin, 2012). Normal anxiety produced natural and adaptive responses that helped us to survive throughout our evolutionary history (Marks & Nesse, 1994). Homo sapiens faced numerous challenges, including predatory threats and inclement weather necessitating constant vigilance and focus for survival. Consequently, adaptive mechanisms such as heightened alertness and attention to potential dangers have evolved. Serving as a threat detector, anxiety helped people prepare (Bateson, Brilot, & Nettle, 2011). The evolutionary mechanism of getting anxious still persists to help us survive in the modern world.

Although, as opposed to prehistoric times, we rarely come across dangerous predators in today's world, and the survival impact of weather has significantly diminished due to the development of technology. Modern people feel anxious when they confront difficult or threatening situations, such as taking an exam, public speaking, or before making an important decision. Moreover, the thought content of our worries has shifted to become more abstract. Consequently, determining whether the imagined dangers are really threatening has become more difficult.

Anxiety's cognitive component i.e., worrying (Borkovec, 1985), is very common among the general population. Tallis and colleagues found that 38% of their nonclinical sample worried at least once a day (Tallis, Davey, & Capuzzo, 1994). The initiation of an anxiety reaction depends on the likelihood of dangers taking place, and the individual's susceptibility to those incidents (Bateson et al., 2011). Even though it is normal to have some level of anxiety and worry; when

they are dysregulated and excessive i.e., disproportionate to the threats, they may lead to anxiety disorders (Marks & Nesse, 1994). Anxiety is transdiagnostic i.e., it underlies many psychiatric conditions such as phobia-related disorders, panic disorder, post-traumatic stress disorder, and generalized anxiety disorder (GAD).

1.1.1. Generalized Anxiety Disorder (GAD)

GAD is characterized by excessive, persistent anxiety and worry about various aspects of daily life, such as health, family, work, and relationships. In some cases, individuals may experience heightened anxiety even in the absence of any specific triggering event. According to The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association [APA], 2013), excessive and persistent anxiety is accompanied by physical symptoms such as restlessness, fatigue, irritability, muscle tension, and sleep disturbances in GAD (APA, 2013).

The diagnostic criteria for GAD include excessive anxiety and worry occurring more days than not for at least 6 months, difficulty controlling the worry, and the presence of at least three of the physical symptoms listed above (APA, 2013). In addition to these criteria, GAD is also associated with significant impairment in social, occupational, or other areas of functioning (APA, 2013). The severity of GAD symptoms can vary, with some individuals experiencing mild symptoms while others may have severe and debilitating symptoms that significantly impact their daily lives. Its prevalence is estimated to be around 3-4% in the general population (Bandelow & Michaelis, 2015). Although it appears to be twice as common in women than in men (Tyrer & Baldwin, 2006). While the term high-functioning anxiety is gaining attention as a way to describe individuals who experience excessive anxiety yet do not meet the dysfunctionality criterion, there

is limited reference to this concept in peer-reviewed academic literature (Mellifont, 2018; Pandya, 2023).

GAD is a complex disorder with multifactorial etiology, involving both biological and environmental factors (Roemer & Orsillo, 2002). Some of the biological factors that have been implicated in the development of GAD include genetic vulnerability, neurochemical imbalances, and abnormalities in brain structure and function (Nutt & Malizia, 2007). Environmental factors such as childhood trauma, chronic stress, and family history of anxiety or mood disorders have also been associated with an increased risk for developing GAD (Bandelow & Michaelis, 2015). It often co-occurs with other mental health conditions, such as depression and other anxiety disorders (APA, 2013).

Understanding the various factors that contribute to the development and maintenance of GAD is essential for effective diagnosis and treatment. Psychosocial interventions such as cognitive-behavioral therapy (CBT), mindfulness-based interventions, and acceptance and commitment therapy (ACT) have been shown to be effective in reducing symptoms and improving functioning in individuals with GAD (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). Pharmacotherapy with selective serotonin reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors have also been shown to be effective in treating GAD (Bandelow & Michaelis, 2015).

To explore the nature of GAD, several theoretical frameworks have been proposed, including the cognitive-behavioral model, and the emotion dysregulation model. According to the cognitive-behavioral model, GAD is maintained by a cycle of negative automatic thoughts, physical symptoms, and maladaptive coping strategies (Beck, 1988). Individuals with GAD tend to engage in cognitive processes such as worry and rumination, which serve to maintain or

exacerbate anxiety symptoms. They also exhibit physiological symptoms, such as muscle tension and increased heart rate, which further contribute to anxiety. To cope with these symptoms, individuals with GAD may engage in avoidance behaviors, such as withdrawing from social situations, which can lead to a decrease in adaptive functioning.

The emotion dysregulation model suggests that GAD arises from difficulties in emotion regulation, specifically the inability to tolerate negative emotions (Mennin & Farach, 2007). According to this model, individuals with GAD are prone to experiencing high levels of emotional reactivity to stressors, which in turn leads to an increase in anxiety symptoms. They also tend to have low levels of emotion regulation skills, such as mindfulness and emotion acceptance, which can prevent them from effectively coping with stressors. These theoretical frameworks suggest that GAD is a complex disorder that arises from a combination of cognitive, behavioral, and emotional factors. Understanding the underlying mechanisms of GAD can inform the development of effective treatment interventions.

1.1.1.1. Cognitive Model of GAD

The Intolerance to Uncertainty Model (IUM) for GAD was formulated by Dugas and colleagues, highlighting four primary components that play a crucial role in understanding and treating GAD. These components are Intolerance to Uncertainty (IU), Cognitive Avoidance, Positive Beliefs About Worry (PBAW), and Negative Problem Orientation (NPO), (Dugas, Gagnon, Ladouceur, & Freeston, 1998).

IU refers to the perception that uncertainty is aversive and should be avoided (Carleton et al., 2012). Individuals with high levels of IU perceive uncertain situations as more threatening than individuals with low levels of IU, leading to an increased likelihood of worry and anxiety (Carleton et al., 2012). Relatedly IU is shown to be related to GAD symptom level, as were PBAW and NPO

(Ladouceur, Blais, Freeston, & Dugas, 1998). However, none of these components were related to the clinical status i.e., whether the individuals seek treatment or not. Another study suggested that individuals with nonclinical GAD report higher levels of IU than individuals without GAD symptoms (Dugas, Buhr, & Ladouceur, 2004).

An earlier study investigated the relationship between intolerance of uncertainty and worry, researchers reported results showing that intolerance of uncertainty was highly related to excessive and uncontrollable worry in a nonclinical sample (Dugas, Gosselin, Ladouceur, 2001). Given that excessive worry is the main feature of generalized anxiety disorder (GAD) and that intolerance of uncertainty is associated with the diagnosis of GAD (Dugas et al., 1998; Ladouceur et al., 1998), the researchers suggested the IUM of GAD might help nonclinical individuals to become more tolerant of uncertainty in the prevention of GAD.

IU is proposed to play a unique role in the development and maintenance of GAD. Research suggests that IU may contribute to worry and anxiety by increasing the perceived threat of uncertain situations and by promoting cognitive and behavioral strategies aimed at reducing uncertainty, such as excessive reassurance seeking and avoidance behaviors (Carleton, Mulvogue, Thibodeau, McCabe, Antony, & Asmundson, 2012). These strategies can reinforce and exacerbate worry and anxiety, leading to a vicious cycle of IU, worry, and anxiety.

1.1.1.1.1. Intolerance to Uncertainty (IU)

The fundamental fear of the unknown is at the core of anxiety. Intolerance to Uncertainty (IU) is the “tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events” (Dugas, et al., 2004, p. 143). In other words, it is an individual’s incapacity to regulate the aversive experiences triggered and sustained by the perceived uncertainty (Carleton, 2016).

The triggered experiences are aversive because the individual's internally oriented uncertainty is about whether their own resources are enough to deal with such potential threats or external uncertainties (Hong and Cheung, 2015). Unregulated and unwelcome experiences due to uncertainty may result in excessive worry. In turn, individuals with high levels of IU may engage in cognitive and behavioral strategies aimed at reducing uncertainty, such as excessive reassurance seeking and avoidance behaviors, which can reinforce and exacerbate worry and anxiety (Dugas et al., 2004).

Individuals who are low on tolerance for any level of ambiguity in potentially negative, stressful, and upsetting situations are motivated to avoid such experiences (Newman & Llera, 2011). However, behavioral avoidance is not always an option. As such, avoiding the cognitions and emotions related to those situations come into play.

1.1.1.1.2. Cognitive Avoidance (CA)

Individuals resort to experiential or cognitive avoidance to decrease the emotional processing of the worrisome situations. When one has a low tolerance to uncertainty or ambiguity, they have an ambiguity aversion (Bateson, Brilot, & Nettle, 2011). Even though avoidance might give a short-term relief, it worsens the situation in the long-term because avoiding ambiguity and anxiety paradoxically leads to increased anxiety symptomatology (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). This vicious cycle of avoidance further strengthens the valence of the worries (Butler, Wells, & Dewick, 1995). When individuals avoid and don't encounter the anxiety producing situations, their avoidance response shows resistance to extinction and may persist indefinitely (Köksal, Kumru, Anarat, Domjan, & Yeniçeri, 2021). Consequently, interventions targeting avoidance can ameliorate outcomes for patients with GAD (Lee, Orsillo, Roemer, & Allen, 2010).

1.1.1.1.3. Positive Beliefs About Worry (PBAW)

In addition to IU, if a person has positive beliefs about worry such as “Worrying helps me evaluate situations more carefully.”, they are more likely to have higher levels of worry (Freeston et al. 1994). This worry serves to negatively reinforce the avoidance of the worried situations, especially for those patients who worry about improbable events.

1.1.1.1.4. Negative Problem Orientation (NPO)

There are many definitions of problem orientation, but Eskin synthesizes them as “the cognitions, emotions, and beliefs about problems that a person has developed throughout life.” (Eskin, 2012, p. 31). Depending on its constructiveness and dysfunctionality, problem orientations can be positive or negative, respectively. The nature and content of these psychological components shapes the problem-solving process. Individuals with constructive or positive problem orientation believe that the problems can be solved (Eskin, 2012, p. 32). Such people can accurately find the causes of their problems. Problems are indispensable parts of life and crises are opportunities according to them. They do not easily quit until their problems are solved. Consequently, they are more likely to be successful at displaying the skills and efforts necessary for problem solving.

On the other hand, people with dysfunctional or negative problem-solving orientation ignore and avoid the problems (Eskin, 2012, p. 33). Even if the problems cause harm, they may choose not to see them because they view problems as threats. They do not have self-efficacy to solve the problems. As the avoided problems accumulate, more dysfunctionalities occur in their lives.

Negative problem orientation is strongly associated with many negative mental health outcomes such as depression, stress, worry, anxiety and so on (Eskin, 2012, p. 33). Dugas and

colleagues' results suggested that worry and negative problem orientation are related, but not problem-solving skills (Dugas et al., 1995). These cognitions and emotions increase their anxiety and worry (Behar et al., 2009).

1.2. The Mental Health Treatment Gap

There is a treatment gap of mental disorders across the globe. Mental health disorders are highly prevalent and go untreated. The prevalence of mental disorders is estimated to be around 1.145 billion across the globe (James et al., 2018). In that study, two most common disorders are reported to be anxiety and depressive disorders, estimated to affect 284 and 264 million people respectively. Moreover, the incidence rates have increased 13.5% between 2007 and 2017. The median treatment gap, i.e., the percentage of those untreated, is 57% for anxiety disorders and 56.3% for depression (Kohn et al., 2004). The authors also noted that the reported gap is likely to be an underestimation.

Furthermore, only 40% of the patients with anxiety and mood disorders sought treatment in the year of onset (Christiana et al., 2000). The remaining 60% waited for a median of 8 years before receiving treatment. The authors suggested intervention among early-onset cases as a cost-effective method. In addition, the mental health gap in low to middle income countries is even more pronounced.

1.2.1. Psychological and Economic Burden of the Mental Health Gap

The mental health gap causes psychological suffering, decreased quality of life, increased disability, significant reductions in social-occupational functioning, and loss of productivity (Burns, 2015). A study led by The World Health Organization (WHO) estimated that anxiety and depression cost the global economy 1.15 trillion USD annually due to loss of productivity

(Chisholm et al., 2016). The study concluded that for every unit spent as investment on mental disorders, 3.3-5.7 units are gained including the value of health returns.

It is no surprise that the mental health gap is wider in low to middle income countries than in high income countries because income and mental health are in a complex vicious cycle (Patel et al., 2010). Economic deprivation, low education and unemployment contributes to higher prevalence of mental disorders due to the lack of care. For the same reason, they follow a more severe course with a poor prognosis. This increases health expenditure, decreases productivity and people lose their jobs. This economic impact leads to more poverty at both the individual and societal level. As a result, it was reported that out of 800,000 global annual suicides, 86% occur in low- and middle-income countries (Burns, 2015).

1.2.2. The Mental Health Gap and COVID-19 Outbreak

On 30 January 2020, the WHO first declared Coronavirus Disease of 2019 (COVID-19) a public health emergency of international concern. On 11th of March, the outbreak was declared a pandemic to highlight the global spread of the COVID-19 (World Health Organization, 2020). Almost the whole world was shut down, millions of people were furloughed worldwide and experienced intensive anxiety. Travel was banned and people were locked down and isolated. Although these measures and social distancing helped us to flatten the curve and prevented further spread of the infection, they increased social isolation and loneliness, reduced social contact and social support systems such as friends and families which are strong protective factors for many mental disorders such as anxiety and mood disorders (Zhou et al., 2020).

The uncertainty caused by the pandemic resulted in increased anxiety. Talevi and colleagues analyzed 15 papers on the mental health outcomes of the COVID-19 pandemic. They have found high rates of anxiety and posttraumatic stress disorder (PTSD) symptoms and being

young and being female were associated with higher risk (Talevi et al., 2020). Other identified risk factors are financial insecurity, having existing chronic health conditions and being in a marginalized ethnic or sexual minority group (Gibson, Schneider, Talamonti, & Forshaw, 2021).

Researchers suggest that a psychiatric epidemic is co-occurring with the pandemic (Hossain et al., 2020). The general population who was already experiencing a variety of psychosocial stressors now have mental health problems such as anxiety disorders, stress, panic, sleeping disorders, PTSD, emotional problems and so on (Hossain et al., 2020). More specifically, major depressive disorder increased from a before COVID-19 base of about 193 million people worldwide to 246 million, which is about 28% increase (Santomauro et al., 2021). Same study reported that the anxiety disorders increased approximately 25% from about 298 million people affected to 374 million.

1.2.3. Addressing the Mental Gap with Technology

In the 2013 revision of the Mental Health Gap Action Programme, WHO called for the promotion of self-care through electronic and mobile health technologies (Mental Health Action Program 2013-2020, 48). Similarly, Tahalia and colleagues proposed three innovative strategies to reduce the mental health gap: i) integration of mental health into primary care, ii) increasing clinical care capacity, and iii) use of technological tools and innovative strategies (Tahilia et al., 2014).

Digital psychotherapeutics have the potential to increase treatment access to underserved populations and reduce the mental health gap. Digital revolution of mental health services is now underway to address the mental health crisis worldwide (Bucci et al., 2019). Currently, the treatment of mental health problems has already undergone a fundamental change. As a result, online clinics are expected to become commonplace in the next decade because user directed

digital treatments can provide access to mental health services to the underserved groups (Fairburn, 2017). This fundamental change is occurring in medical health services as well. For example, the Turkish Ministry of Health has legalized the remote medical examination in 2022 (Official Gazette of the Republic of Turkey, 2022).

1.3. Digitalization of Mental Health Services

1.3.1. History of Digitalization of Mental Health Services

Every fundamental service has been already digitized such as banking, transportation, education, healthcare. Mental health services are no exception. Use of technology for mental health services has a long history. Computerized assessment dates to 1970's where Dunn and colleagues reported a complete automatization of Minnesota Multiphasic Personality Inventory (MMPI) procedure (Dunn, Lushene & O'Neil, 1971).

Since then, many tools have been used to deliver psychological support services. For example, telephones enabled therapists to conduct their sessions at distance when face-to-face therapy was not possible due to geographical constraints. In 1988, Lindon reported first psychoanalysis by phone (Lindon, 1988). Computerized psychoeducation dates to 1990's where Andrewes and colleagues developed a computerized psychoeducation for patients with bulimia and anorexia nervosa (Andrewes, Mulder & Peter O'connor, 1996).

Nevertheless, computer-based approaches to psychoeducation or assessment necessitated participants to be physically present in labs prior to the widespread acceptance of the World Wide Web (WWW). The era of WWW spanning from 1994 to 2004 which is referred to as Web 1.0, permitted the creation of basic personal websites for storing static information. Additionally, it enabled the sending and receiving of electronic mails. Thus, the email revolution created a way to reach patients and e-mails were used as an adjunct to psychotherapy (Peterson & Beck, 2003).

In 2004, the advent and widespread adoption of Web 2.0 signified a substantial change in the online environment. Web 2.0 enhanced user involvement and collaboration with content, making room for dynamic, user-contributed input. This technological progress paved the way for the creation of interactive internet-based interventions. Simultaneously, progress in internet technologies enabled virtual one-to-one therapy through the development of video-call softwares like Skype, providing new opportunities for mental health service delivery.

In early 2010's smartphones with touchscreens revolutionized the way above-given technology-based interventions were administered. As the smartphones were adopted by the masses; conducting assessment, psychoeducation, and therapy became exponentially easier. Smartphones enabled access to the internet from almost anywhere with cellular data. In a meta-analysis of 66 randomized controlled trials of app-supported smartphone interventions for mental health problems, smartphone interventions significantly outperformed the control conditions in improving depressive ($g = 0.28$) and generalized anxiety ($g = 0.30$) symptoms, stress levels ($g = 0.35$), quality of life ($g = 0.35$), (Linardon, Cuijpers, Carlbring, Messer, & Fuller-Tyszkiewicz, 2019).

In mobile application (app) stores, numerous apps have been created to promote mental well-being including those that use meditations, breathing exercises, psychoeducational and therapeutic content. Also, numerous online psychotherapy platforms have emerged where psychotherapists and clients meet and conduct therapy sessions via apps. Despite the popularity of apps, internet-based interventions preserved their popularity because websites were adjusted for mobile access. With the advent of smartphones, virtual and augmented reality technologies have emerged, utilizing advanced camera capabilities. As of 2023, the development of large language models and generative models has progressed to the point where they can talk like therapists. It is

nonetheless expected that these AI models will likely assist human therapists in the future rather than replace them.

1.3.2. History of Digitalization of Mental Health Services in Turkey

A TurkStat survey in 2020 showed that almost 90.7% of households in Turkey have access to the internet and 79% of individuals use the internet (Ceylan, Demir, & Elri, 2021). Similarly, 53 million people (approximately 64%) are using a smartphone (Statistica, 2019). This large access to the internet renders Turkey a candidate country where internet-based psychological services might be used to reduce the treatment gap. Consequently, this thesis aims to advocate for the use of digital psychotherapeutics in Turkey for prevention and intervention purposes especially for populations who do not have access to mental health services due to geological constraints or financial reasons.

To the best of the author's knowledge, there are only a limited number of studies where internet-based psychological interventions were conducted in Turkey. Firstly, Yorulmaz and colleagues' research predicted that the internet-based programs and smartphone applications would be increasingly in popularity (Yorulmaz et al. 2018). The following year, Durmaz and colleagues conducted a smoking-cessation intervention via WhatsApp, an online messaging platform (Durmaz et al, 2019). In the same year, Unlu-Ince and colleagues registered a protocol for Problem Solving Therapy (PST) for depression (Unlu-Ince et al., 2019). After the start of the COVID-19 pandemic, the Turkish Psychologists Association (TPD) has introduced a guide for digital interventions in 2020 (Yorulmaz, Derin, Yorulmaz, Gültekin & Baş, 2020). Same year, Zeren and colleagues conducted the first RCT in Turkey in which online counseling, face-to-face counseling and control groups were compared in terms of effectiveness (Zeren, Erus, Amanvermez, Genc, Yilmaz, & Duy, 2020). In 2020, the results of a doctoral thesis study

suggested that a self-help iCBT intervention was effective in reducing the symptoms of Obsessive Compulsive Disorder (OCD) and depression (Yorulmaz, 2020).

In 2021, a meta-analysis on the use of electronic devices on recording the experiences of participants for assessing anxiety disorders was published (Gültekin & Yorulmaz, 2021). The authors suggested that such tools are promising in self-recording and can be extended for further use. In 2022, the results of an internet-based intervention indicated that it reduced the symptoms of OCD (Derin & Yorulmaz, 2022). A very recent study on an internet-based, clinician guided, self-help bereavement therapy has shown to be effective in reducing symptoms of Prolonged Grief Disorder and depressive symptoms as well (Baş & Yorulmaz, 2023). In summary, in contrast with developed countries, Turkey seems to have fallen behind regarding digital psychotherapeutics, as a developing country which suffers from the mental health gap.

1.3.3. Digital Mental Health Services During the COVID-19 Outbreak

COVID-19 challenged the mental healthcare delivery system in many ways. Lockdown and social distancing measures necessitated mental health services such as psychotherapy to be provided through online conferencing platforms such as Zoom. Online psychotherapy has long been suggested, but both users and providers have had a skeptical and resistant stance (Shore et al., 2020). However, the COVID-19 outbreak has changed the situation and contributed to the uptake of digital health worldwide (Naeem et al., 2020), (Moreno et al., 2020). The general resistance to digital mental health services and the system inertia have disappeared (Shore et al., 2020). Even governments supported this transition to deal with the increasing mental health problems due to quarantine measures. For example, the government in China actively promoted and provided digital mental health services during the pandemic (Zhou et al., 2020). The fast

transformation was supported by the previous research showing the effectiveness of digital services (Costa et al., 2021).

1.3.4. Post-COVID-19 Projections

Increased psychosocial problems such as anxiety and depression may have long-term adverse mental health consequences in the post-pandemic world and greatly increase the economical and psychological burden (Zhou et al., 2020). As a result, the mental health disparity is anticipated to expand further in the aftermath of the pandemic. The long-term mental health consequences have not been fully realized and are likely to escalate.

There are more vulnerabilities in developing countries where the mental health gap is large and post pandemic economic crises are more likely to happen. Such an economic crisis may worsen the psychological well-being and mental health of citizens further (Naeem et al., 2020). In the post-pandemic world, preference for digital mental health services is expected to develop because of the advantages including cost-effectiveness, accessibility, de-stigmatization and so on (Naeem et al., 2020). The future situation of the psychological services in the post-pandemic world is unpredictable, but they will surely have been transformed (Shore et al., 2020).

1.3.5. Advantages and Disadvantages of Digital Mental Health Services

1.3.5.1. Advantages

Technology-delivered interventions (via websites, mobile devices, and others) are not only shown to be effective in terms of intervention efficacy but also cost-effective due to several reasons including uniformity of intervention delivered, 24-hour access and customizability (Budman, Portnoy & Villapiano, 2002; Conley et al., 2016). Moreover, technology facilitates reaching large numbers of people in an easily accessible way. For instance, physical barriers such as distance to

clinics and lack of transportation result in exclusion of people with lower socioeconomic status (Syed, Gerber, & Sharp, 2013).

As a result, technology-delivered interventions not only have a higher potential to reach more people, but underserved populations by putting the geographical constraints away and thus enabling maximal use of the limited resources (Tahilia et al., 2014). Especially rural practice might benefit from technology-delivered interventions (Benavides - Vaello et al., 2013). Consequently, technological mental health interventions have the potential to reduce the mental health gap (Moock, 2014).

In addition to logistic advantages, user anonymity provided by such interventions contribute to destigmatizing of individuals, thus facilitating help-seeking behaviors (Bucci et al., 2019). Stigma can prevent individuals from seeking the help they need and can make recovery more difficult (Corrigan & Watson, 2002). Digital technologies, such as social media, online support groups, and mental health apps, have the potential to reduce mental health stigma and improve access to mental health services.

One advantage of digital technologies is that they can provide a safe and anonymous space for individuals to seek information and support for mental health conditions. For example, online support groups can reduce the isolation and shame associated with mental health conditions and provide a sense of community (Goffman, 1963). In a study of individuals with depression, researchers found that those who participated in an online support group had lower levels of stigma and greater improvement in their depressive symptoms compared to those who received usual care (Moessner et al., 2018). Digital technologies can also provide access to evidence-based treatments for mental health conditions. For example, cognitive-behavioral therapy (CBT) delivered via a smartphone app has been found to be effective in reducing symptoms of depression and anxiety

(Ebert et al., 2018). This type of treatment can be accessed from anywhere, and it may be more acceptable to individuals who are reluctant to seek traditional face-to-face therapy due to stigma or other barriers.

Furthermore, digital technologies can be used to educate the public about mental health conditions and reduce misinformation and stereotypes. For example, social media campaigns can raise awareness about mental health and encourage individuals to seek help (Kumar & Nayar, 2019). Additionally, online resources, such as blogs and podcasts, can provide accurate information about mental health conditions and reduce stigma associated with seeking help. Through information sharing about the symptoms and psychology with psychoeducation, individuals can have access to the current psychology literature presented in a daily language (Bucci et al., 2019).

Moreover, mental health promotion seeks to promote positive mental health both at community and the individual levels. Promoting mental health acts as a protective factor preventing diseases (Kaplan & Stone, 2013). Because mental health promotions could increase the well-being of individuals, as well as the resilience and thus lowering the incidence rates of mental health disorders. These benefits indicate the potential of digital psychotherapeutic approaches to address the mental health gap not only by alleviating symptoms but also through prevention and fostering well-being.

1.3.5.2. Disadvantages

Despite its advantages, digital psychotherapy may also present certain limitations that should be considered. First limitation is that social contact is a basic need and technology delivered services do not provide such contact unless they are supported with clinician guidance (Moock, 2014). Similarly, therapeutic alliance is an important factor predicting benefiting from therapy and

might be lacking in some forms of digital psychotherapeutic interventions. Also, since such services are not regulated by institutions, user confidentiality and privacy might be undermined and questioned (Moock, 2014). Nonetheless, user privacy can be provided by separating the online databases and identifiers. Identifiers can be kept in a hard drive for research purposes. This method would mostly eliminate such a concern.

Users' technological competence and literacy is another key issue which might limit the use of technology-delivered interventions. If they do not feel confident or capable of using such programs, they may not benefit or drop-out from the therapeutic process (Botella et al., 2009). Another issue is self-diagnosis on the part of the users. An intervention aiming to reduce symptoms of a psychosocial problem should make it clear that the intervention does not mean that the user has that diagnosis and that the diagnosis can only be made by a mental health expert.

A methodological disadvantage of using internet-based interventions is related to dropouts. While the dropout rates vary considerably across studies, some report drop-out rates as high as %80, especially when the interventions are not supported by a therapist. The researchers working with technology-delivered interventions must remain cautious and take steps to reduce the potential disadvantages and ethical concerns (Botella et al., 2009).

The use of digital psychology services raises important privacy and anonymity concerns. Users may be concerned about unauthorized individuals accessing their private data and sessions. Also, there is increased anxiety over the possibility of data breaches and the exploitation of sensitive data. Ensuring robust security measures, including encryption and secure data storage, is essential to alleviate these concerns and maintain the trust of users. It is crucial for both service providers and clients to be aware of these issues and take appropriate precautions to safeguard privacy and maintain anonymity in the digital mental health services.

1.3.5.3. The Effectiveness of Digital Mental Health Services

In summary, the benefits of incorporating technology into mental health services outweigh the disadvantages, particularly in a post-COVID-19 world. The pandemic has accelerated the adoption of digital psychotherapy because it was observed by the masses that the demand for digital mental health services can be met with streaming and video conferencing technology. This adoption made mental health services more accessible for individuals seeking support. As a result of the opportunities provided by technology, it has been observed that the support provided in the virtual environment and the support provided face-to-face yield similar results (Krzyzaniak et al, 2021).

Previous studies have shown that the services provided in the digital environment are cost-effective and allow clients to receive high-quality services more cost-effectively. In this respect, it is understood that digital mental health services are useful and effective in terms of providing personalized recommendations and determining the most suitable one among different service providers (Thomas et al, 2021; van Straten et al, 2015). Even though the mental health services have already undergone a fundamental change with the use of technology before (Fairburn, 2017), the COVID-19 pandemic solidified the digital revolution in the mental health services.

Despite potential drawbacks such as privacy concerns and drop-out rates, the advantages of digital interventions, including increased accessibility, cost-effectiveness, and convenience, are very compelling. As technology continues to advance, it is likely that digital mental health services will play an increasingly important role in bridging the mental health gap and improving overall well-being for many individuals.

1.4. The Rationale for the Intervention

1.4.1. NICE Guidelines for GAD

The Stepped-Care Model, as recommended by the National Institute for Health and Care Excellence (NICE), provides a systematic approach for managing GAD (NICE, Clinical Guide 113, 2011). This model's fundamental principle is the provision of the least intrusive yet efficacious intervention at the initial stage.

Step 1 is identifying and assessing all known and suspected presentations of GAD to whom psychoeducation about GAD and its treatments is provided. In step 2, a low-intensity individual psychological intervention should be provided in the form of either self-help or guided-help (Clinical Guide 113). If the individuals' symptoms do not improve or there is a significant dysfunction, then as the 3rd step, either a high-intensity psychological intervention (CBT/applied relaxation) or a drug treatment should be offered as a choice to the individuals. If there is a risk for neglect of self-care or a potential for self-harm, the individuals should be taken into a highly specialized treatment as the 4th step. The current study follows the stepped-care model and accordingly offers the first and the second steps on a website to the participants with mild to severe generalized anxiety symptoms, excluding those with suicidal thoughts and severe depressive symptoms.

1.4.2. Internet-Based Cognitive Behavioral Therapy (iCBT)

Internet-based Cognitive Behavioral Therapy (iCBT) interventions for the anxiety and depressive disorders are effective, acceptable and practical (Andrews et al., 2018). They are popular alternatives to therapist administered interventions. The interventions are composed of online modules that provide psychoeducation about the targeted anxiety disorder. They provide users with key CBT tools and skills to modify maladaptive thoughts, emotions, behaviors that

maintain their anxiety symptoms (Firth et al., 2018). The iCBT interventions can be transdiagnostic or focus on a specific symptom or disorder. Current study can be classified as transdiagnostic as it targets the components of generalized anxiety (IU, CA, PBAW, NPO) that can be observed in many anxiety diagnoses.

1.4.2.1. iCBT Principles

Users benefit from CBT provided over the internet in various ways. The two most common methods in Internet-based CBT practices are user self-registration or clinician invitation. The client's own enrollment in iCBT applications takes place when users gain access through the website provided by a healthcare institution or company without the need for evaluation. For example, employees may be provided with access to an internet-based stress management intervention. Therefore, an invitation can be created for the user intervention platform. After the invitation to the website (or another digital platform such as a mobile application), users can access the content of the intervention.

In some cases, enrollment of the user to the intervention may take place after clinical evaluation. When, after clinical evaluation, it is determined that the user is suitable for the intervention, the clinician invites the user to use the intervention. In any case, the user is given some preliminary information about the platform and is sent an email providing a precise link address directing them to the registration process or the login information for direct access to the content. Users can access the intervention program after completing the necessary steps for registration. Throughout the application, users are expected to log in to their accounts several times usually with a specified frequency. The clinician or support provider is expected to periodically review users' progress. These phases are communicated to the user before granting access for iCBT intervention (Richards et al, 2018).

1.4.2.2. Effectiveness of iCBT for GAD

Generally, an iCBT consists of phases that reflect the active components of a CBT protocol, including behavioral activation, cognitive restructuring, problem solving, and self-monitoring. The modules are designed to be implemented on a weekly or daily basis. These modules can be presented in a prescriptive or non-prescriptive way. A prescriptive intervention, which is used in the current intervention, requires the users to go through the modules in a certain order depending on their progress. In a non-prescriptive intervention process, service users are allowed to access the modules in any order they choose.

Studies show that iCBT interventions for GAD symptoms are generally effective. For example, Titov and colleagues reported a large between-group effect size ($d = 1.1$) on GAD-7 scores with therapist support with email when compared with the waitlist control group (Titov et al., 2009). A similar effect was present when the support was provided by a non-clinician technician in another intervention on GAD. The between group effect size on GAD-7 scores was large ($d = 1.25$) compared with the control. The support per participant did not exceed 10 minutes per session. Clinician or technicians support provided did not differ significantly.

A similar result was found in a study conducted by Olthuis and colleagues (Olthuis, Watt, Bailey, Hayden & Stewart, 2015). In the study, a meta-analysis of studies examining the effectiveness of therapist-guided, internet-based and non-guided internet-based CBT applications in adults with anxiety disorder was conducted. According to the findings of the study, in which a total of 30 randomized controlled studies were examined, it was found that therapist-guided internet-based CBT applications had the highest effect on reducing anxiety symptoms compared to other applications with a moderate effect size ($d = 0.51$). When examined in terms of generalized anxiety disorder symptoms, no significant difference was found between therapist-guided, face-to-face and internet-based CBT applications in terms of symptom reduction effects. The study

indicated that therapist-guided and non-guided internet-based CBT interventions are effective treatments for anxiety disorders in adults.

In a systematic review and meta-analysis study conducted by Eilert and colleagues, the effectiveness of internet-based treatment practices in the treatment of generalized anxiety disorder was examined (Eilert et al., 2021). According to the findings, twenty studies were found to be suitable for the criteria. When the effect size was examined, a high effect size was found in terms of providing primary results regarding anxiety and worry. In addition, the effect size was found to be moderate ($g = 0.79$) and high in terms of differences in depression, functionality problems and well-being levels accompanying generalized anxiety disorder.

In another study by Paxling et al. (2011) the effectiveness of internet-based cognitive behavioral therapy applications in the treatment of generalized anxiety disorder was examined in a randomized controlled trial (RCT). A total of 89 people, including the waiting list group and the iCBT group, participated in the study. Anxiety, depression, and well-being levels of the participants were evaluated before and after eight weeks of treatment. Based on the findings, there was a significant difference in all outcomes on the internet-based CBT group compared to the waiting list group and the effect sizes were large (Cohen's $d > 0.8$). In addition, it was determined that the changes provided by the treatment were preserved in the follow-up measurements after 1 and 3 years.

In a study conducted by Robinson and colleagues (2010), the effectiveness of internet-based CBT applications for the treatment of generalized anxiety disorder was examined. In the study examining the difference between clinician and technician-assisted treatment, technician-assisted six-session iCBT application was performed. Within group effect sizes on the GAD-7 were both large ($d = 1.55$, $d = 1.73$) respectively. An online discussion forum service has been

added to the clinician-supported application. According to the findings, it was determined that there was a significant improvement in state anxiety symptoms in the clinician-assisted group compared to the technician-assisted group. On the other hand, in terms of generalized anxiety symptoms, it was determined that the improvement of the symptoms of both the technician and the clinician supported group was similar and the effect size was high.

The effectiveness of internet-based CBT for the treatment of generalized anxiety disorder in individuals over the age of 60 was examined by Jones and colleagues (Jones, Hadjistavropoulos, & Soucy, 2016). In the randomized controlled study in which 46 people participated, 10 weeks of iCBT was applied. According to the findings of the study, it was determined that the generalized anxiety symptoms of the group that received the internet-based therapist-guided CBT application decreased significantly compared to the control group and large between-group effect sizes ($d = .85$) on the Generalized Anxiety Disorder-7, ($d = 1.17$) and the Patient Health Questionnaire-9 (PHQ-9). Finally, a meta-analysis conducted by Lewis and colleagues showed a significant difference ($d = -1.18$) in favor of the self-help group with symptoms of GAD (Lewis, Pearce, and Bisson, 2018).

In summary, iCBT interventions follow NICE guidelines on stepped-care, and they are safe and effective in reducing symptoms of GAD along with other psychological problems. Thus, the current study is expected to increase the wellbeing of the participants via a low-intensity intervention which is safe and low-cost to administer.

1.5. Current Study

1.5.1. Content

The content of iCBT programs generally starts with psycho-education elements, and continues with cognitive restructuring, activity scheduling, relaxation training, graded exposure,

and problem-solving strategies (Andersson, Carlbring, Ljótsson, & Hedman, 2013; Oliveira, Pacheco, Borges, Meira, & Santos, 2023). At the end of the intervention content, strategies for relapse prevention are discussed.

The content of the website consists of 10 modules following a very similar structure to the following Andersson's suggestions. The content was prepared by the researcher and was evaluated by and further developed under the supervision of the thesis advisors. Each day's module lasts a duration of approximately 20-25 mins (3.5-4 hours in total) to complete, consisting of Psychoeducation, iCBT Self-Help Exercises, Relaxation Exercises, and Suggested Activities components. The 10 modules are expected to be completed within 2 weeks which makes the current study a short-term intervention. The program is to be completed without the guidance of a therapist, but participants were encouraged to contact the researcher if they need any assistance.

1.5.1.1. Psychoeducation

As with most cognitive behavioral treatments, psychological education about GAD is an important aspect of therapy. Several reasons exist for the use of psychoeducation modules in iCBT interventions, including those targeting anxiety. First, knowledge can have a positive impact on patients' functioning and attitudes (Hayes, & Gantt, 1992). Many clients who come to treatment are never informed of their diagnosis and often have misconceptions about their symptoms as well as misinterpretations of physiological and emotional reactions to anxiety and stress (e.g., that anxiety is bad, or an increased heart rate means you're more likely to have a heart attack).

Moreover, some clients want to better understand why they are worried and what they can do about it. Although psychoeducation about psychosocial anxiety patterns does not lead to cure, some patients are relieved to learn that their experiences are not uncommon (Borkovec 1994). Instead, during psychoeducation, it is provided that there is considerable knowledge about the

etiology and phenomenology of GAD, and that available treatments are specifically designed for their symptoms. Besides, providing psychoeducation on GAD is one way to test the rationale for treatment and, therefore, to facilitate treatment adherence.

1.5.1.2. CBT Self-Help Exercises

When considering self-help exercises in CBT intervention strategies, Self-monitoring is one of the most basic yet essential parts of cognitive-behavioral treatment through providing self-help exercises. Monitoring is used as an assessment procedure (to determine the context and content of anxiety) and as a treatment strategy (aware of patterns and focusing on anxiety and restlessness that may lead to anxiety) to reduce anxiety and restlessness. The basic concept of follow-up is that whenever a patient feels anxious, they should record when and where anxiety started and the intensity of the experience, including symptoms already present. Patients can track their experiences on a full sheet of paper for an entire week or record each situation or day. The amount of information collected may vary from patient to patient, depending on individual abilities and needs. It should be noted that avoidance of monitoring is considered detrimental to treatment due to the possibility that the patient will avoid anxiety. Thus, it is preferred to simplify and solve the problems to achieve compliance rather than eliminate monitoring altogether.

To improve treatment compliance, therapists should inform patients of the rationale behind monitoring by helping identify specific patterns that occur and lead to episodes of anxiety, getting an accurate estimate of current symptoms, helping them to be able to see the impact of treatment on symptoms and for additional testing of anxiety (eg, cognitive, behavioral). Once cognitive restructuring was introduced, specific anxiety-related thought process tracking was added (Huppert and Sanderson, 2010).

The core skills and strategies of an iCBT intervention include a variety of activities that help the client learn new concepts and skills and apply what they have learned. For example, clients can understand the relationship between their thoughts, feelings, and behaviors and then apply this through an interactive activity that can help them become aware of their thought-emotion-behavior cycles. Users can return to previous modules and review specific content if needed. When the user finishes the intervention, he can give feedback on whether the intervention was effective or if he or she needs further assistance (Richards et al, 2018).

1.5.1.3. Relaxation Exercises

Relaxation exercises are an important component of most CBT-based GAD treatments. The function of relaxation exercises is to reduce the physiological correlation of anxiety and restlessness by lowering the patient's overall level of physical arousal. Relaxation obviously reduces arousal, but it can also play other roles. First, relaxation can help widen the attention span. Anxiety tends to narrow attention therefore, due to its anti-anxiety properties, relaxation can broaden the focus of attention and, therefore, increase the patient's ability to consider more alternatives in an anxiety-provoking situation (Barlow et al., 1996). Also, relaxation can serve as a distraction for anxiety triggering events. However, distraction only can be ineffective because by continually avoiding the perception of anxiety, patients subtly reinforce their belief that their thoughts are threatening and/or harmful.

Despite this limitation, distraction can be an effective tool when GAD patients are stuck in the vicious cycle of anxiety and are in need to disrupt distorted thoughts. Finally, contrary to the above concepts and conventional idea that views relaxation as just a coping strategy, relaxation can sometimes facilitate the triggering of anxious thoughts that are not otherwise processed thus helping to express anxious thoughts (Borkovec & Whisman, 1996). This may explain why some

patients describe becoming more anxious when they start doing relaxation exercises. Since anxiety inhibits processing of distorted information more, and relaxation helps to reduce functional and protective anxiety, it can ultimately expose oneself to disturbing thoughts, ideas, or images (Borkovec and Hu, 1990).

There are certain goals regarding proceeding with muscle relaxation. First, the goal is for the patient to feel relaxed. Although similar procedures are used to help patients with insomnia, the goal here is not to put the patient to sleep. Second, the process is similar to that used to initiate mindfulness. For this reason, patients may react to the procedure with anxiety, fear of losing control. It is important to explain to the patient that the difference between hypnosis and relaxation as used in CBT for GAD is that in the gradual process of muscle relaxation the focus is on awareness of bodily sensations. The goal is to facilitate exposure to triggers of concern rather than avoidance (Huppert and Sanderson, 2010).

Whether for one of the reasons above, relaxation clearly helps patients with GAD. More recent relaxation methods have adapted a flexible concept of teaching relaxation rather than emphasizing a particular method. Thus, although progressive muscle relaxation techniques are preferred for most patients and have the most evidence-based support, the patient prefers another method and can use it effectively. Sometimes a combination of relaxation techniques is also recommended, depending on the patient's needs. Therefore, yoga, transcendence or other meditation, tai chi can be preferred, especially if the patient is already engaged in such activities and/or if muscle relaxation could not be sufficient (Huppert and Sanderson, 2010).

1.5.1.4. Suggested Activities

Use of behavioral activity suggestions and homeworks are common in most CBT interventions and widely used for anxiety and depression. Behaviors stimulate cognitive and

physical changes in a bottom-up manner. They also help reinforce what is learned during the sessions with practice. The three above-written module components serve to both alter ineffective and anxiety producing cognitions as well as help users employ behavioral relaxation techniques. In addition to those, daily behavioral homeworks about what has been learned during the sessions are included in this study to maintain the potential gains of the sessions. For example, the seventh session of the intervention is about avoidance of anxiety producing thoughts and situations which reinforces the vicious cycle of avoidance and anxiety. At the end of the avoidance modules, behaviors such as approaching an anxiety producing situation (such as a small social gathering) are suggested to the users to help them practice what they have learned.

1.5.2. Aims and Significance

To the best of the researcher's knowledge, this study is the first study in Turkey assessing the feasibility and efficacy of an internet-based psychoeducational and cognitive behavioral intervention aiming to reduce the symptoms of generalized anxiety. In addition, this study is one of the first few studies using internet-based methods to offer a psychological intervention in Turkey even though such interventions are widely researched and used in Europe, Australia, U.S.A, and China.

In addition, only one study so far identified in the international literature that employed internet-based intervention on anxiety symptoms during a short time: 8 sessions in 11 days (Salemink, Kindt, Rientes & van den Hout, 2014). The current study uses a similar duration and structure (10 sessions in 14 days). Considering that internet-based interventions for generalized anxiety disorders typically consist of similar session numbers distributed across several weeks, this study will contribute to the international literature on short-term internet-based psychological interventions, as well as the Turkish literature.

Depending on the obtained effectiveness results and user feedback, this study aims to further develop the intervention in the future hoping to contribute to the reduction of treatment gap of anxiety disorders in Turkey. Finally, this study aims to contribute to the digital literacy of mental health services by reviewing the world literature.

1.5.3. Hypotheses

Hypothesis 1: Participants who receive the internet-based Cognitive Behavioral Therapy, will have significantly lower levels of general anxiety symptoms (as measured by GAD-7) at the post-test (within a week after the intervention) and at the follow-up (1 month after the intervention) when compared with the waitlist control group.

Hypothesis 2: Participants who receive the internet-based Cognitive Behavioral Therapy will have significantly lower levels of depression severity (as measured by PHQ-9) at the post-test (within a week after the intervention) and at the follow-up (1 month after the intervention) when compared with the waitlist control group.

Hypothesis 3: Participants who receive internet-based Cognitive Behavioral Therapy will have significantly higher scores of well-being (as measured by WHO-5) at the post-test (within a week after the intervention) and at the follow-up (1 month after the intervention) when compared with the waitlist control group.

Methods

The research design involves a two-stage process, beginning with a pilot study and process evaluation, followed by a main study using a two-arm randomized controlled clinical trial (RCT). Thus, a mixed-method approach, which incorporates both quantitative and qualitative data, was employed. According to Özdemir and Aslan (2022, p. 4), mixed-methods are methodologies that enable the research to capitalize on the strengths of both quantitative and qualitative data. For this research, the Exploratory Sequential Design was implemented.

The aim of the pilot study was to gather preliminary data and improve the intervention based on the qualitative findings and refine the know-how, which will then be implemented in the main study. The design of this study aimed to develop a user-friendly website and content to increase the adherence rate and the benefits of the intervention. Our research included 2 consecutive studies: the pilot study and the main study.

2.1. The Pilot Study

The pilot study employs qualitative research design. Semi-structured interviews were conducted with participants to explore their experiences, perspectives, and suggestions related to the intervention. The goal is to identify areas of improvement and gain insights that can be used to enhance the intervention before implementing it in the main study.

2.1.1. Participants

Interviews were conducted with seven participants with relevant experience (user experience, active use of technology or the field of psychology), between the ages of 24 to 31 years ($M = 26.86$, $SD = 2.27$). They were recruited for the pilot study with convenience sampling. Six participants had undergraduate, and one participant had graduate level education. The participants'

professionals were differentiated from mechanical engineer to medical doctor, from sociologist to psychologist. The diversity in educational backgrounds were intended to create a diverse set of feedback. Process evaluation interviews were conducted with the participants where they provided valuable feedback on the intervention's content, structure, and delivery. This pilot study was approved by the Koç University Ethics Committee (ID: 2021. 344.IRB3.146).

2.1.2. Materials

The materials used in this pilot study include the website and the intervention content. The intervention content consists of a total of 10 modules, each including one psychoeducation, iCBT worksheets, relaxation exercise and homework submodules. The site hosted a total of 54 unique pages because of the cumulative nature of the iCBT exercises. The content for each day and the whole program can be found in Figure 1. In each module, the content focused on one general topic and all submodules followed that day's topic i.e., the content was prepared in a holistic manner and all submodules complemented each other. Finally, the content was cumulative, that is each day participants remembered what they learned or wrote on the earlier days. The intervention content was prepared by the researcher who collected the science-based information about the topic, summarized the important points, and wrote them down in a daily language targeting the study population. Then the content has been examined by the advisors whose suggestions for improvement were implemented.

2.1.2.1. The Content

2.1.2.1.1. Psychoeducation

Psychoeducation was mainly made up of text and images, where science-based information about anxiety were presented in a daily and succinct manner, designed specifically for the lay

population. Each day's psychoeducation submodules focused on a different aspect of anxiety. First 4 days' content focused on the anxiety-inducing habit, the symptoms of anxiety, the fight or flight response, fear as a root cause of anxiety and so on. On the fifth day, an introduction to the Cognitive Model of GAD by Dugas and colleagues, and its four main components were made. During the next four days, psychoeducation modules focused on each of these components. On the final day, a summary of the whole modules and suggestions to maintain the gains were made.

2.1.2.1.2. Internet-based Cognitive Behavioral Therapy (iCBT)

ICBT modules followed the cumulative nature of the intervention. On the second day, participants just reported their anxious thoughts and their corresponding symptoms. On the third day, participants were presented with their anxious thoughts of the previous day and asked to contemplate on the possible underlying fears and the triggers of those worries. The next day, participants were presented with those worries and triggers, and contemplated on the potential automatic negative thoughts that help them get triggered to feel anxious. The following days included iCBT exercises focusing on the components of the Cognitive Model of GAD.

2.1.2.1.3. Relaxation Exercises

The relaxation exercises that were used in the study can be grouped into three: breathing exercises, stretching exercises, and meditations. There were a total of 9 relaxation exercises, each a video content whose lengths varied between 4 and 13 minutes. All the content was written by the researcher. The writings were recorded into voice by two volunteers, and those audio files were made into video by editing and bringing together the relevant stock videos.

2.1.2.1.4. Homework

Homeworks or suggested activities were the simplest submodules of the intervention. It included one or two written paragraphs, encouraging the participants to try and practice what they have learned during the courses. For example, on the first day, participants learned about habits that cause general anxiety, they rated their anxiety levels, and watched a short breathing exercise. The suggested activity of the day was to try the breathing exercise before the sleep to see if it reduces their anxiety levels.

2.1.2.2. The Website

The website utilized for this study is kaygicalismasi.com, two Turkish words which translate to "anxiestudy." The content management system employed in the research is WordPress, a widely used platform that facilitates website creation and management. The Eduma theme, specifically designed for educational content delivery purposes, enabled the development of courses and modules within the website. For the intervention website section, the Quiz and Survey Master plug-in was employed for creating iCBT exercise pages. The Hypertext Preprocessor (PHP) scripting language was utilized to establish connections to a database, which was necessary for the interactive nature of iCBT modules. PHP is a widely used open-source scripting language designed for web development, which allows for the creation of dynamic and responsive web pages.

In order to provide a secure and private environment for the website, Hypertext Transfer Protocol Secure (HTTPS) and Secure Sockets Layer (SSL) were used as part of the site's security measures. HTTPS encrypts communication between the user's browser and the website, protecting sensitive data from being accessed by unauthorized individuals. SSL certificates, meanwhile, establish an encrypted connection between a web server and a browser, further enhancing the site's

security. Furthermore, the login information for accessing the intervention content was anonymized by the researcher just in case of a security breach.

2.1.3. Procedure and Interview Guide

Participants were reached through personal contacts who agreed to access the intervention program through the website. Seven recruited participants accepted to participate in the pilot study and the following process evaluation interviews. The researcher conducted interviews in Turkish. All interviews were run online via online conferencing tool Zoom and recorded via the audio recording tool Voice Memos between 18 December 2022 and 5 January 2023. All participants consented for voice recording before the interview.

Interview questions focused on participants' experiences with the intervention, perceived benefits or challenges, and suggestions for improvements. In the first part of the interview, participants responded to questions about their general experiences and their thoughts on the obstructions and facilitatory factors they have faced during the program. Then they were asked about the strengths and weaknesses of the program according to them. In the second part, the participants were asked whether the program helped decrease their anxiety and whether they got any other benefits from the program. Also, they reported whether they used the intervention techniques in their daily lives. In the last part, participants share their comments to improve the intervention as a whole.

The interviews lasted an average of 8 minutes 52 seconds. All interviews were conducted in Turkish and then transcribed verbatim, except for the parts where the participants used English words instead of Turkish ones. To protect the participant's identity, pseudonyms were used instead of participant names.

2.1.4. Analytical Approach

The qualitative data were analyzed using the thematic analysis approach (Braun & Clarke, 2006). The corresponding topic guide and the interview questions can be found in Appendix A. The qualitative analysis was conducted following the six-phase of thematic analysis. First, all the interviews were read multiple times to gain familiarity with the material. Second, initial codes were generated while re-reading the interviews. Third, themes were searched by gathering these initial codes. The inductive approach was then used, and these themes were derived by detecting patterns from the responses of the interviewees. Afterwards, the researcher sought feedback to specify themes, to check the overall story of analysis. Finally, the themes were named and defined with the goal of accurately reflecting the data.

2.1.5. Personal Reflection

When conducting research, especially a qualitative one, it is necessary to reflect on one's own personal and group characteristics. To that aim, I will reflect on this qualitative research process. I was born in 1995 and I mostly belong to a generation that is born into the age of technological development. I have witnessed the transformation of almost every industry with the development of the internet, computers, smart phones and more. Thus, the idea of using technology to deliver mental health services came to me around the time I was about to start my master's degree in clinical psychology. In addition to that, I have been working as the content manager at an online psychotherapy platform for more than a year now (since February 2022). Even though those experiences make me more inclined to think that technological solutions can be effective in delivering psychological support to everyone, I did my best to keep my beliefs from interfering in my objectivity and neutrality during the qualitative analyses. Also, since the convenience sampling method was used in the pilot study, I was acquainted with the participants. Nonetheless, all

participants were encouraged to respond objectively and in full honesty according to the interview topic guide so that the intervention could be improved as much as possible. Also, the codes and the analysis were conducted under the supervision of a senior researcher. Thus, I believe this qualitative analysis offers objective and strong results on how to improve the intervention for the main study.

2.1.6. Qualitative Results

In the thematic analysis, four main themes emerged, providing valuable insights into the participants' experiences and perceptions of the intervention. These themes encompassed various aspects of the intervention: (1) the content, (2) the website infrastructure and user experience, (3) the facilitators and the barriers of the intervention, and (4) the intervention's effects on the participant's lives and thoughts.

2.1.6.1. The Intervention Content

Participants stated their views regarding the content of the intervention which was four-fold for each day's modules: Psychoeducation (written content), iCBT exercises (interactive content), Relaxation exercises (video content), Suggested activities (homework content). Participants' opinions on the content were clustered in three sub-themes: (1) thoughts on general content, (2) thoughts on specific content, and (3) suggestions for improvement.

Wording, module structures (e.g., giving descriptions, examples, training), and homework at the module's end were found positive and useful by some participants (Participants 1, 2, 3, 5, 7).

"At least it had an impact on me. I liked the content in general. I mean, I liked the flow, the rationale and introduction first, then including you in this flow and making you question it afterwards." - (Participant 2)

Each module had relaxation exercises (either breathing, muscle relaxation or meditation) video content related to the topic, and the main aim was to support the learning and anxiety reduction process. Participants stated that the variety of video content gave them an autonomy to choose a video that they find close to them:

“I think the variety of meditations is very nice. You know, not just meditations, but also breathing exercises, even muscle stretching exercises. So, it was nice to try different ones and choose the ones that I liked the most, not just one tool. It would be boring if it was only meditation.”
- (Participant 6)

It was a common perception among the participants that the visual support of the video content helped them to grasp the subject easily.

“I think the videos you put afterwards were even more effective. In other words, I think learning breathing exercises, visualizations for relaxation techniques, etc. in those videos were very effective.” - (Participant 7)

Participants also shared their suggestions and thoughts to improve the content. In addition to appreciating the video content, increasing the images and interactivity were one of these suggestions for some participants (Participants 1, 3, 5, 6, 7):

“You know, the content, especially the articles, can be made easier by adding more visuals, not everyone likes to read that much. So maybe a few more visuals can be added at those points, especially in long texts.” - (Participant 6)

“For example, there was a module on automatic thoughts. In that module, there was a part under something that arouses anxiety; 'Which automatic thought do you think this is? For example, they can be forgotten. You know, I can remember them, but someone who is not a master can forget automatic thoughts. There, for example, in the form of a visual, you can briefly remind the automatic thoughts at the beginning of the module by using visualization.” - (Participant 7)

Overall, the participants made suggestions for intervention content to improve readability with i) adding more images to text parts, ii) simplifying the language of theoretical parts of the texts, and iii) adding clearer instructions for iCBT exercises. However, the suggestion of making all text content into video contents was not prepared for the main study due to time constraints. When asked about the potential improvements to content, one participant responded:

“Direct video streaming. Streaming video even where there is text. Or animated slide transitions like this. In other words, I think it's actually a more interactive user experience that makes the user feel like they've leveled up.” - (Participant 3)

2.1.6.2. The intervention's effect on the participant's life and thoughts

All participants reported positive effects of the intervention on their lives and thoughts. Most participants reported that they have gained awareness about their anxiety and how to manage it (Participants 1, 2, 3, 4, 5, 6, 7)

The intervention's contribution to me was that I saw concrete examples of how one can handle some things on one's own without saying “I should take a walk and smoke.” - (Participant 3)

“As I said, awareness. When you are more aware, you can notice when you are stressed. That way you perceive that it is irrational more easily.” - (Participant 1)

Most participants reported to have adapted the anxiety management techniques they have learned during the intervention, when asked about whether they would use the techniques in their daily lives (Participants 2, 3, 4, 5, 7):

Absolutely. I was able to adapt them into my life very quickly like the breathing exercises and some meditations. For example, the sleep meditation where you close a window. I especially liked that and the mountain meditation and started using them.” - (Participant 5)

When asked whether the pilot intervention decreased their anxiety levels, some participants reported to have already seen effects (Participants 5, 6, 7), whereas others reported to need more time to observe effects (Participants 1, 2):

“Yeah sure. First, I noticed how big of a space anxiety was taking in my life. I was not so aware of it. First, I realized, and then I learned to manage it. - (Participant 5)

“I would see more of this effect in the longer term. But it provided good guidance for it. I would have benefited more if I did it for longer. But I believe it is a guiding tool for me in making sense of my anxiety, noticing my worries and getting into their roots.” - (Participant 2)”

2.1.6.3. The facilitators and barriers for the intervention

Participants reported what made the intervention process easier or harder for them. 2 participants reported only facilitators (Participants 3, 7), whereas 5 participants reported both facilitators and barriers (Participants 1, 2, 4, 5, 6).

The online and unguided nature of the intervention appeared to be a facilitator for the intervention for two participants (Participants 2, 6):

"What makes it easier is that it's online and it is done through the website without contacting anyone. Maybe it would have been better if it was an app, of course. But being able to do this therapy directly to myself has shown me that I can analyze myself. Knowing that I can do this without the need for direct communication with someone else, knowing that I can do it, well, it motivated me." - (Participant 2)

The rush of daily lives appeared to be a barrier for the intervention for one participant (Participant 4):

"I found it positive to divide it into days in terms of time. Like finishing this day, doing the second day and the next day. I just couldn't do it at the same time but when I remembered. For example, if I did the first day on Tuesday, I told myself that I would do the second day on Wednesday, but I remembered it on Thursday and did it. In the midst of my busy schedule, sometimes I forgot about it." - (Participant 4)

2.1.6.4. The website infrastructure and user experience (UX)

In addition to content, how it is presented (i.e., its form) can have a huge impact on interventions effectiveness, user retention, and overall experience. This is why the infrastructure

and UX theme appeared during the interviews. There were positive and negative comments regarding both. The topics of the positive comments are retained on the website and the negative comments are used to improve the technical infrastructure and UX for the main study.

Most participants suggested translation of English buttons to Turkish in order to achieve coherence of language on the website (Participants 2, 5, 6, 7):

“Here, as feedback, English terms and concepts should be translated into Turkish, because not everyone can understand them, you know. They can be translated.” - (Participant 7)

Some participants remarked the absence of reminders as an area for improvement (Participants 4, 6):

“Maybe it would be better if I received a reminder notification every day like in the apps, so I suggest you send a reminder by email, like ‘Don't forget the study.’ in order to strengthen that continuity.” - (Participant 6)

All feasible suggestions of the participants were implemented to the intervention before the main study such as language coherence, website speed optimization through cookie settings, reminders, content optimizations. However, there were some suggestions to improve the intervention, but they were not feasible to do before the main study such as creating a mobile application and turning off the auto log-out option after a period of inactivity.

The content of this study is presented via a website. However, some participants suggested the intervention to be presented via a mobile application (Participants 2, 4):

“User-friendly, maybe if it becomes an app and generally, you know, we all have very high screen times. If it becomes an app, instead of internet-based. For example, I usually use the

computer because I don't like to go online from the phone. But in general, people have smartphones in front of them more than computers. And if it becomes an app, maybe it can be more comfortable with a good easy-to-use interface.” - (Participant 4)

2.1.7. Conclusion of The Pilot Study

The pilot study for the intervention played a significant role in setting the groundwork for the subsequent main study. This preparatory phase, in conjunction with qualitative interviews, enabled the collection of important insights. These insights were then utilized to refine the intervention prior to its implementation in the main study. Specifically, enhancements were made in three main areas: content, user experience, and technical infrastructure.

2.1.7.1. Content

The results of the qualitative analysis of the interviews, played an important role in refining the intervention content. This process rendered the intervention content more relevant, clear, and effective for the target population. More images were added to make the content more easily readable, as well as the shortening of some texts and rewording of technical terms. The instructions for iCBT exercises were made clearer to comprehend. While it was not feasible to incorporate all suggestions, the majority of recommendations were addressed to enhance the overall quality of the intervention content.

2.1.7.2. User Experience (UX)

The pilot study highlighted the importance of an intuitive and engaging user interface in the website's design and navigation. The updated layout facilitated easier access to intervention materials, improved user engagement, and streamlined the overall experience for the participants.

2.1.7.3. Technical Infrastructure

Feedback from the pilot study participants allowed the researchers to identify and resolve any technical issues or bugs, optimizing the website's performance and stability. As a result, participants in the main study enjoyed a smoother and more reliable user experience.

It is important to note that, while some suggestions could not be implemented (e.g., creating a mobile application), the majority of recommendations were addressed, enhancing the intervention's delivery and effectiveness.

In conclusion, the pilot study served as a significant step in refining the intervention and optimizing the website. By incorporating the insights gained from the qualitative interviews, we were able to address potential issues and make improvements. This process not only improved the intervention, but also provided valuable know-how to conduct the main study, laying the foundation for a robust evaluation of the intervention's efficacy.

2.2. The Main Study Methods

2.2.1. Participants

Participants were recruited with purposive sampling between 15th - 25th January 2023. To recruit the participants, advertisements with the eligibility questionnaire link were placed on Instagram and WhatsApp messaging groups. A total of 90 individuals initially applied to participate in the study. Interested individuals clicked the provided link and were screened for eligibility based on an online questionnaire. The participants who met the eligibility criteria were then invited to take part in the study that took place on the website.

Inclusion criteria for the study required participants to be between the ages of 18-65, have daily access to the internet. Participants also needed to have at least mild generalized anxiety determined by the Generalized Anxiety Disorder-7 (GAD-7) questionnaire (score 5 or higher,

range: 0 - 21), (Spitzer, Kroenke, Williams, and Löwe, 2006). The exclusion criteria for the study were having suicidal thoughts determined by the ninth item in the Beck Depression Inventory (BDI) where the highest score was 1 that is “From time to time I think about killing myself, but I don't.”. Another exclusion criterion, indications of severe depression (BDI score 29 and higher), was determined by the total score of the same inventory (range: 0 - 43). The following paragraph outlines the process of exclusion based on each eligibility criteria.

Out of a total of 90 individuals, two people (2.2%) were excluded for not having daily access to the internet. Six (6.7%) applicants were excluded due to not completing all the required questions. Twelve (13.3%) applicants were excluded due to the presence of suicidal thoughts. Four (4.4%) individuals were excluded for meeting the criteria for severe depression. Thirty-seven (41.1%) applicants were excluded for not meeting the minimum anxiety cutoff (GAD-7 score 5). However, out of those criteria, 52 (57.8%) applicants were excluded in total because there were nine overlapping exclusions. All participants were contacted and explained the reasons for their exclusion within the context of study methodology. Then, they were provided with governmental medical contacts and sources to apply in case they needed to. They were also once again reminded that they can contact the researcher team anytime for further guidance anytime.

After applying the eligibility criteria, 38 eligible participants were left to start the study. This was approximately equal to the number of participants ($n = 42$) required by the a priori power analysis conducted with G*Power software using MANOVA Repeated Measures within-between interaction with a large effect size reported in the relevant literature ($d = 1.00$). The 38 eligible participants (28 females, 12 males) with ages ranging from 20 to 62 ($M = 33.53$, $SD = 12.82$) were then randomly assigned to either the intervention group ($n = 19$) or the control group ($n = 19$) using

a computer-generated randomization list aiming at equal allocation between the groups. The demographic characteristics of the participants are listed below.

2.2.2. Measurement Instruments

A questionnaire was used to collect the data before and after the intervention or waiting period. The questionnaire consisted of the following sections / parts:

2.2.2.1. Sociodemographic Information Form

A 22-item sociodemographics questionnaire was administered to all participants to gather information about their age, gender, educational status, opinions about digital psychotherapy, hours spent with technological devices daily, their experience with technological devices and other relevant characteristics. The questionnaire included both closed and open-ended questions to obtain both quantitative and qualitative data. It was designed to gather information to better understand the sample and contextualize the findings as well to control for potential confounds.

2.2.2.2. Generalized Anxiety Disorder-7 (GAD-7)

The GAD-7 is a 7-item assessment tool in which each item is scored on a 0-3 scale, resulting in a total score range of 0 to 21, developed by Spitzer and colleagues to assess the severity of GAD symptoms (Spitzer et al., 2006). Higher scores signify a greater presence of anxiety symptoms experienced during the previous two weeks. Its Turkish version was translated and validated by Konkan and colleagues, (Konkan, Şenormancı, Güçlü, and Sungur (2013). The study reported satisfactory reliability score ($\alpha = .89$) for the Turkish version of the GAD-7, confirming its appropriateness for use in Turkish-speaking populations. Due to its ease of administration and high reliability, the GAD-7 was chosen as a suitable measure for assessing anxiety symptoms in the present study. In the current study, the GAD-7 demonstrated internal consistency, as measured

by Cronbach's alpha ($\alpha = .77$) in the first measurement, ($\alpha = .89$) in the second measurement and ($\alpha = .89$) in the third measurement.

2.2.2.3. Beck Depression Inventory (BDI)

The Beck Depression Inventory (BDI) is a widely used self-report questionnaire that measures the severity of depressive symptoms in adults. The BDI consists of 21 items, and each item is scored on a 0 to 3 scale where higher scores indicate more severe depressive symptoms. The BDI was originally developed in English by Aaron Beck and colleagues (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The Turkish translation was done by Nesrin Hisli who evaluated its psychometric properties in a Turkish university student sample (Hisli, 1989). The internal consistency was found to be high ($\alpha = .80$). The test-retest reliability was reported to be moderate ($r = .74$). The study showed a significant correlation between the BDI scores and clinical assessments, indicating that the Turkish version of the BDI has good criterion validity. In the current study, internal consistency of BDI was calculated as ($\alpha = .79$).

2.2.2.4. The Patient Health Questionnaire-9 (PHQ-9)

The Patient Health Questionnaire-9 (PHQ-9) is a self-administered instrument comprising nine questions, designed to evaluate depressive symptoms and disorders experienced over the prior two weeks, developed by Kroenke and colleagues (Kroenke et al., 2001). Items utilize a Likert scale from 0 to 3, resulting in a total score range of 0 to 27, with higher scores signifying increased depressive symptoms. The PHQ-9 exhibits strong psychometric characteristics, including a sensitivity of 0.77 (95% CI: 0.71-0.84) and a specificity of 0.94 (95% CI: 0.90-0.97).

The questionnaire has been translated and adapted into Turkish by Sarı and colleagues (Sarı, Kökoğlu, Balcıoğlu, Bilge, Çolak, & Ünlüoğlu, 2016). The calculated reliability was strong ($\alpha = .84$). The Turkish adaptation of the PHQ-9 has been shown to be a reliable measure of

depressive symptoms in Turkish adults. Overall, the PHQ-9 is a useful tool for assessing depressive symptoms in both clinical and research settings. In the current study, the PHQ-9 demonstrated internal consistency, as measured by Cronbach's alpha ($\alpha = .71$) in the first measurement, Cronbach's alpha ($\alpha = .87$) in the second measurement and Cronbach's alpha ($\alpha = .83$) in the third measurement.

2.2.2.5. The World Health Organization-Five Well-Being Index (WHO-5)

The WHO-5 Well-Being Index evaluates an individual's well-being over the previous two weeks (Bech, 2004). The index comprises five positively phrased items, each scored on a 6-point Likert scale, such as "I have felt cheerful and in good spirits." Each item is rated from zero to five where higher scores indicate a greater well-being; with zero signifying the absence of positive feelings and five denoting constant positive feelings. It has been translated and adapted into various languages, including Turkish. The Turkish adaptation of the WHO-5 was conducted by Erhan Eser (Eser et al., 2017). The results suggested that the Turkish version of the WHO-5 was a reliable (Cronbach's α between .81-.85) tool, and has a good measurement capacity for subjective well-being in Turkish adults. In the current study, the WHO-5 demonstrated internal consistency, as measured by Cronbach's alpha ($\alpha = .78$) in the first measurement, Cronbach's alpha ($\alpha = .85$) in the second measurement and Cronbach's alpha ($\alpha = .91$) in the third measurement.

2.2.3. Materials

2.2.3.1. Website and Content

For the main study, the revised and improved version of the same website (kaygicalismasi.com) and intervention content were used as explained earlier. The content and the UX and the technical infrastructure were improved based on the results of the qualitative analysis.

2.2.4. Procedure

Prior to randomization, all participants ($n = 38$) completed a baseline assessment through the recruitment link. This assessment included the demographics form and the questionnaires mentioned above. After completing the baseline assessments, participants were randomly assigned to either the intervention group ($n = 19$) or the control group ($n = 19$) using a computer-generated randomization sequence.

Participants assigned to the intervention group received the intervention, updated based on the results of the pilot study. The content consisted of 10 psychoeducation, iCBT, relaxation and homework modules as mentioned. The intervention was delivered through the updated website. Participants assigned to the waitlist control (WLC) group did not receive the intervention until the end of the study after which all WLC group participants were offered access to the intervention.

After the end of the main study, participants ($n = 24$) completed a posttest assessment resulting in an attrition rate of 36.84% compared to baseline. This resulted in a posttest retention rate of 36.84% for the intervention group ($n = 12$) and 36.84% for the control group ($n = 12$). This assessment included the same questionnaires administered at baseline to measure changes in the primary and secondary outcome variables.

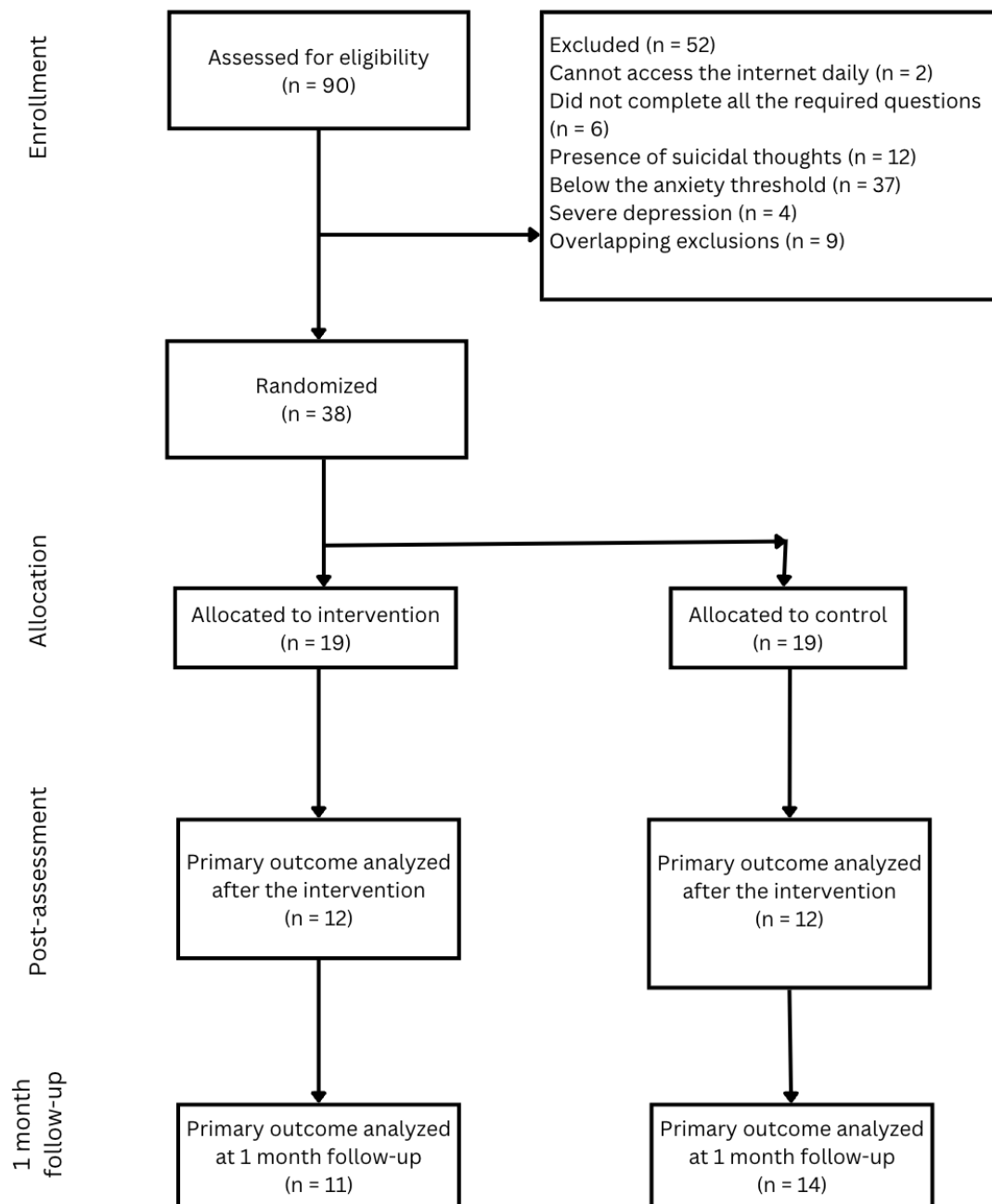
The follow-up assessment was conducted 1 month after the completion of the study to evaluate the longer-term effects of the intervention. These assessments also included the same questionnaires administered at baseline and posttest. Out of the initial 38 participants, 25 completed the follow-up assessment, resulting in an attrition rate of 34.21%. This resulted in a posttest attrition rate of 42.10% for the intervention group ($n = 11$) and 26% for the control group ($n = 14$).

A t-test was conducted to determine whether there were significant differences in the Beck Depression Inventory (BDI) and Generalized Anxiety Disorder (GAD) scores between participants

who dropped out of the experiment and those who completed it. For BDI scores, the results revealed no significant difference between the dropout group ($M = 16.76$, $SD = 6.89$) and the non-dropout group ($M = 18.84$, $SD = 6.60$), ($t(36) = 1.27$, $p = .21$). Regarding GAD scores, no significant difference was also found between the dropout group ($M = 10.00$, $SD = 5.22$) and the non-dropout group ($M = 7.76$, $SD = 2.66$), ($t(98) = 1.76$, $p = .087$).

The participant flow and attrition rates were presented using a flowchart, as recommended by the Consolidated Standards of Reporting Trials (CONSORT) guidelines (Schulz, Altman, & Moher, 2010). This flowchart illustrates the number of participants at each stage of the study, from screening and eligibility assessment to randomization, posttest, and follow-up assessments, as well as the reasons for attrition at each stage.

Figure 2.1. CONSORT Chart for Participant Flow



2.2.5. Statistical Analyses

All data analyses were conducted using the SPSS statistical software package, version 28.0. The analyses began with initial data screening to check for any missing values, and outliers. Descriptive statistics (mean, standard deviation) were calculated for all key variables. Baseline differences between the intervention and control groups were evaluated using independent sample t-tests for continuous variables and chi-square tests for categorical variables.

Then, violations of assumptions for the primary analysis method of Repeated Measures ANOVA. The assumptions of sphericity and homogeneity of variances were tested with Mauchly's Test and Levene's Test, respectively; and they were retained. Also, the distribution of the scores were tested for normality with kurtosis and skewness values. For low sample sizes ($n < 50$), kurtosis and skewness values must remain between -1.96 and 1.96 to retain the normality hypothesis (Kim, 2013). All of the values for the dependent variables were normally distributed (Table 2.1.).

Table 2.1. Exploratory Statistics for Outcomes Measures

	<i>Groups</i>														
	<i>Intervention Group</i>					<i>Control Group</i>					<i>Total</i>				
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
GAD-7 Time1	19	8.84	3.97	1.39	1.33	19	8.21	3.75	1.00	.07	38	8.53	3.82	1.16	.61
GAD-7 Time2	12	5.50	3.84	.207	-.76	12	9.83	4.43	.32	-.58	24	7.67	4.62	.34	-.28
GAD-7 Time3	19	2.95	3.59	1.24	1.04	19	6.84	6.19	.63	-.40	38	4.89	5.37	1.10	.68
PHQ-9 Time1	16	10.25	4.23	.78	-.99	16	8.25	3.02	.34	-1.10	32	9.25	3.76	.84	-.16
PHQ-9 Time2	12	6.25	3.79	1.25	.66	12	10.00	5.41	.49	-.94	24	8.12	4.95	.88	-.24
PHQ-9 Time3	11	5.00	3.49	.63	-1.04	14	9.36	5.11	.70	.14	25	7.44	4.91	.86	.54
WHO-5 Time1	16	11.56	4.68	-.36	-.18	16	12.75	4.42	.22	-1.42	32	12.15	4.52	-.11	-.60
WHO-5 Time2	12	13.58	4.20	-.13	-.69	12	11.00	5.49	-.88	-.34	24	12.29	4.96	-.76	.26
WHO-5 Time3	11	15.82	6.60	-1.19	.19	14	10.00	4.26	.56	-1.34	25	12.56	6.05	.05	-1.45

The primary analysis involved the use of 3 x 2 Repeated Measures Analysis of Variance (ANOVA) to assess the effects of group (intervention vs control), time (pre-intervention, post-intervention, and 1-month follow-up), and the interaction between group and time on key outcome measures such as GAD-7 and PHQ-9 scores. Effect sizes were calculated using partial eta squared (η^2p). An effect size of 0.01 was considered small, 0.06 medium, and 0.14 large for η^2p . Statistical significance was set at $p < 0.05$ for all analyses (Cohen, 1992).

In the case of significant ANOVA interaction effects, post-hoc analyses were conducted using the Bonferroni correction to control for multiple comparisons and to identify specific differences between groups at each time point. Finally, to shed light on the psychological effects of the massive earthquake centered at the city of Kahramanmaraş ($ML = 7.8$) that happened right before the post-test measurement, post-test and follow-up measures were computed into one variable and one-sided t-tests were performed.

Results

3.1. Participants

A detailed comparison of the baseline characteristics of the participants in the intervention group ($n = 19$) and the control group ($n = 19$) was conducted to ensure comparability between the two groups prior to the intervention.

Table 3.1. *Sociodemographic Characteristics of Participants for Continuous Variables*

	Group		t	p value
	Intervention	Control		
	(N=19)	(N=19)		
	M (SD)	M (SD)		
Age	33.00 (13.02)	34.05 (12.94)	-0.25	.80
Daily screen time (hour)	5.84 (3.14)	5.89 (2.86)	-0.05	.95
Experience with			-0.34	.73
technological devices	16.05 (4.08)	16.63 (6.15)		
(year)				

Table 3.2. *Sociodemographic Characteristics of Participants for Categorical Variables*

		Group		χ^2	p value
		Intervention	Control		
		(<i>N</i> = 19)	(<i>N</i> = 19)		
		N	N		
Gender	male	4 (21.1%)	8 (42.1%)	1.94	.14
	female	15 (78.9%)	11 (57.9%)		
	other	0	0		
Education	primary school	0 (0.0%)	0 (0.0%)	4.28	.23
	high school	5 (26.3%)	2 (28.6%)		
	undergraduate	11 (57.9%)	11 (57.9%)		
	master's	1 (5.3%)	6 (31.6%)		
	doctoral degree	1 (5.3%)	0 (0.0%)		

AtTUiPS	favors				
	technology	15 (78.9%)	14 (73.7%)		
	use				
	favors			.36	.83
	traditionality	3 (15.8%)	3 (15.8%)		
	other	1 (5.3%)	2 (10.5%)		
Psychotherapy	No	16 (84.2%)	17 (89.5%)	.23	.99
Experience	Yes	3 (15.8%)	2 (10.5%)		

Note. AtTUiPS: Attitudes towards Technology Use in Psychological Services

3.1.1. Age

Participants' ages ranged from 20 to 62 ($M = 33.53$, $SD = 12.82$). The age of intervention group participants ranged from 20 to 58 ($M = 33.0$, $SD = 13.02$), while the age in the control group ranged from 23 to 62 ($M = 34.05$, $SD = 12.94$). A two-tailed independent-samples t-test revealed no significant between-groups age difference ($t(36) = -0.25$, $p = .80$).

3.1.2. Gender

The sample of participants for the main study consisted of 26 individuals identifying as female (68.42%) and 12 identifying as male (31.58%). The intervention group comprised 4

participants identifying as men (21.1%) and 15 identifying as women (79.9%). In the control group, there were 8 individuals identifying as men (42.1%) and 10 identifying as women (57.9%). A chi-square test of independence indicated that the gender distribution was not significantly different between the two groups ($\chi^2(36) = 1.94, p = .14$).

3.1.3. Educational Status

Participants' educational levels were as follows: 0 (0%) with a primary school diploma, 7 (18.42%) with a high school diploma, 22 (57.89%) with an undergraduate degree, 8 (21.05%) with a master's degree, 1 (2.63%) with a doctorate, and 0 (0%) with other forms of education or training.

In the intervention group, 26.3% of participants had completed high school, 57.9% had obtained a college degree, and 15.8% held a postgraduate degree. In the control group, 10.5% had completed high school, 57.9% had obtained a college degree, and 31.6% held a postgraduate degree. A chi-square test of independence showed no significant differences in educational status between the groups ($\chi^2(35) = 4.28, p = .23$).

3.1.4. Attitudes towards Technology Use in Psychological Services

Of the total participants, 29 (76.32%) reported that they think psychological services should improve with technology, whereas 6 (15.79%) reported that they think psychological services should remain traditional, and 3 (7.89%) chose the 'other' option and suggested a mixed use of both. Of the intervention participants, 15 (78.94%) reported that they think psychological services should improve with technology, whereas 3 (15.78%) reported that they think psychological services should remain traditional, and 1 (5.26%) chose the 'other' option. Of the control group participants, 14 (73.68%) reported that they think psychotherapy services should improve with technology, whereas 3 (15.78%) reported that they think psychotherapy services should remain traditional, and 2 (10.52%) chose the 'other' option. A chi-square test of

independence showed no significant difference in the attitudes towards technology use in psychological services between the groups ($\chi^2(36) = .36, p = .83$).

3.1.5. Experience with Technology

Participants' reported experience with technology ranged from 0 to 27 years ($M = 16.34, SD = 5.16$). Intervention group's experience with technology ($M = 16.05, SD = 4.08$) was similar to the control group's experience with technology ($M = 16.63, SD = 6.15$). A two-tailed independent-samples t-test revealed no significant difference in experience with technology between the two groups ($t(36) = -.34, p = .73$).

3.1.6. Current Psychotherapy Experience

Of the total participants, 5 (13.15%) reported to receive psychotherapy where 33 (86.84%) did not. Of the intervention participants, 3 (15.78%) reported to receive psychotherapy while the remaining 16 participants (84.21%) reported not to receive psychotherapy. Of the control group participants, 2 (10.52%) reported to receive psychotherapy while the remaining 16 participants 17 (89.47%) reported not to receive psychotherapy. A chi-square test of independence showed no significant differences in current psychotherapy experience between the groups ($\chi^2(37) = .23, p = .99$).

3.1.7. Daily Screen Time

Participants' daily use of smartphones or computers with technology ranged from 0 to 10 hours ($M = 5.87, SD = 2.96$). For comparison between intervention group, ($M = 5.84, SD = 3.14$) control group ($M = 5.89, SD = 2.86$), a two-tailed independent-samples t-test revealed no significant difference in daily screen time in terms of hours between the two groups ($t(36) = -0.05, p = .95$).

3.2. Baseline Comparisons for Questionnaire Scores

All participants completed a battery of measurement tools designed to measure various psychological constructs related to the study. The scores of BDI measuring depressive symptoms ranged from 0 to 28, ($M = 14.84$, $SD = 6.76$, $n = 38$). The scores of GAD-7 measuring anxiety symptoms ranged from 5 to 18, ($M = 8.53$, $SD = 3.82$, $n = 38$). The scores of World Health Organization-5 measuring overall well-being ranged from 2 to 20, ($M = 12.16$, $SD = 4.52$, $n = 32$). The scores of PHQ-9 measuring depressive symptoms ranged from 4 to 18, ($M = 9.25$, $SD = 3.76$, $n = 32$). Baseline scores for each questionnaire were compared between the two groups using independent-samples t-tests.

For the BDI, the intervention group ($M = 15$, $SD = 6.40$) and the control group ($M = 14.0$, $SD = 7.27$) did not show a statistically significant difference ($t(36) = 0.28$, $p = 0.78$). Regarding the GAD-7 scores measured at the baseline, the intervention group did not significantly ($M = 8.75$, $SD = 3.37$) differ from the control group ($M = 8.31$, $SD = 3.94$) as indicated by a two-tailed t-test ($t(36) = 0.33$, $p = .73$). Regarding the PHQ-9 scores measured at the baseline, the intervention group did not significantly ($M = 10.25$, $SD = 4.23$) differ from the control group ($M = 8.25$, $SD = 3.02$) as indicated by a two-tailed t-test ($t(30) = 1.53$, $p = .13$). Regarding the WHO-5 scores measured at the baseline, the intervention group did not significantly ($M = 11.56$, $SD = 4.68$) differ from the control group ($M = 12.75$, $SD = 3.02$) as indicated by a two-tailed t-test ($t(30) = -0.73$, $p = .46$). The lack of any baseline differences suggest that the randomization before allocating the participants to groups worked as expected (Field, 2013).

Table 3.3. *Results for Group Differences of Questionnaires at Baseline from Independent Measures T-Tests*

<i>Outcomes</i>	<i>Time point</i>	<i>Descriptive statistics,</i>		<i>T-test</i>	
		<i>M (SD)</i>		<i>Mean</i>	<i>p-value</i>
		<i>Intervention</i>	<i>WLC</i>	<i>Differences</i>	
BDI	Baseline	15.00 (6.40)	14.0 (7.27)	0.28	.78
GAD-7	Baseline	8.75 (3.37)	8.31 (3.94)	0.33	.73
PHQ-9	Baseline	10.25 (4.23)	8.25 (3.02)	1.53	.13
WHO-5	Baseline	11.56 (4.68)	12.75 (3.02)	-0.73	.46

Note. BDI= Beck Depression Inventory, PHQ-9: Patient Health Questionnaire-9, GAD-7:

Generalized Anxiety Questionnaire-7, WHO-5: World Health Organization 5.

3.3. Inferential Analyses

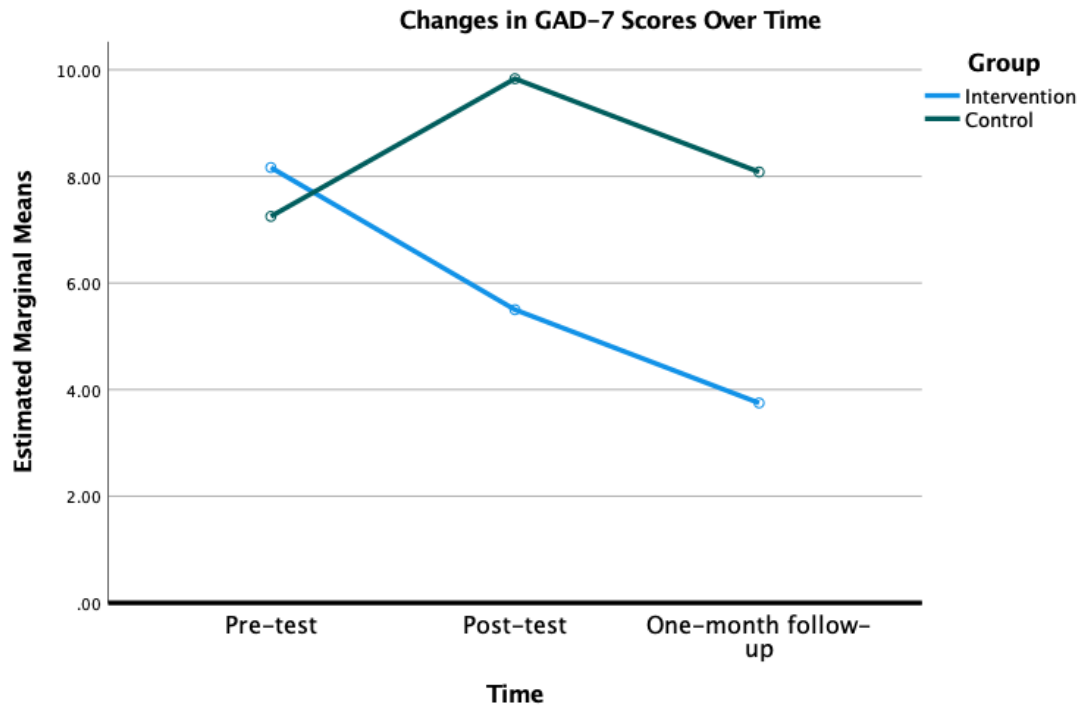
3.3.1. Primary Outcome Measure (GAD-7)

3x2 Repeated Measures ANOVA

A 3 (time: baseline, post-intervention, follow-up) x 2 (group: intervention, control) repeated measures ANOVA was also conducted to examine the effect of the intervention on anxiety symptoms (GAD-7 scores). Mauchly's Test of Sphericity was conducted to assess the assumption of sphericity, with the results yielding a non-significant value ($\chi^2(2) = 2.65, p = .26$), indicating that the assumption of sphericity was met. Additionally, Levene's Test of Homogeneity of Variances was performed for each measurement, which also produced non-significant results for baseline ($F(1, 22) = 2.03, p = .16$), post-test ($F(1, 22) = 0.26, p = .61$) and follow-up ($F(1, 22) = 4.76, p = .04$) confirming that the assumption of homogeneity of variances was satisfied for the first two measurement, but only slightly violated the third measurement.

In line with the primary hypothesis that the intervention group will lower the anxiety scores of the intervention group in comparison to the WLC group, there was a significant interaction effect of the intervention between time and group on the GAD-7 scores ($F(2, 44) = 4.69, p = .014, \eta^2 = .18$). The results revealed no significant main effect of time on GAD-7 scores ($F(2, 44) = 2.13, p = .130, \eta^2 = 0.08$), indicating that GAD-7 scores did not differ over time among participants. Post-hoc analyses for time were not performed due to the lack of a significant main effect of time. The results yielded a significant main effect of the intervention group on GAD-7 scores ($F(1, 22) = 4.41, p = .047, \eta^2 = 0.17$) indicating that the overall scores differed between the groups.

Figure 3.1. *Repeated Measures over Time in GAD-7 Scores in Intervention and Control Groups*



Post-Hoc Pairwise Comparisons for Groups

A two-tailed t-test revealed that, the mean difference for the group effects at the posttest between the intervention group ($M = 5.50$, $SD = 3.84$) and the control group ($M = 9.83$, $SD = 4.42$) was statistically significant ($t(36) = -2.55$, $p = .02$). Also, at the follow-up, the mean difference between the intervention group ($M = 5.09$, $SD = 3.36$) and the control group ($M = 9.29$, $SD = 5.35$) was statistically significant as indicated by a two-tailed t-test ($t(36) = -2.26$, $p = .03$). The results are summarized in Table 3.4.

Table 3.4. Results for Group Differences of Questionnaires at Post-Test and 1 Month Follow-Up from Independent Measures T-Tests

Outcomes	Time point	Descriptive statistics,		T-test	
		M (SD)		Mean	p-value
		Intervention	WLC	Differences	
GAD-7	Post-test	5.50 (3.84)	9.83 (4.42)	-2.55	.02*
	Follow-up	5.09 (3.36)	9.29 (5.35)	-2.26	.03*
PHQ-9	Post-test	6.94 (3.10)	9.30 (4.33)	-1.93	.06
	Follow-up	6.02 (2.88)	8.85 (4.42)	-2.33	.02*
WHO-5	Post-test	13.58 (4.20)	11.00 (5.49)	1.29	.21
	Follow-up	15.81 (6.60)	10.00 (4.26)	-2.26	.03*

Note. PHQ-9: Patient Health Questionnaire-9, GAD-7: Generalized Anxiety Questionnaire-7,

WHO-5: World Health Organization 5. * $p \leq .05$

One-Tailed Paired-Samples T-Tests Between Baseline and Post-Intervention

In order to analyze the overall effect of intervention on the GAD-7 scores, post-test and 1 month follow-up scores were computed into one variable (post-intervention) and were compared between the baseline scores with a one-tailed paired samples t-test. It was expected that post-intervention scores were lower as compared to baseline scores for GAD-7.

Table 3.5. One-tailed samples t-test between baseline and post-intervention scores in GAD-7

<i>Outcomes</i>	<i>Time Points</i>	<i>Descriptive statistics,</i>		<i>p-value</i>
		<i>M (SD)</i>	<i>Mean Differences</i>	
GAD-7 (Both Groups)	Baseline – Post-test	7.70 (2.59)	0.88	.19
		6.79 (4.56)		
GAD-7 (Control Group)	Baseline – Post-test	7.25 (8.02)	-1.31	.11
		8.96 (4.99)		
GAD-7 (Intervention Group)	Baseline – Post-test	8.17 (2.36)	2.84	.01**
		4.63 (2.91)		

In Table 3.5, the performed t-test for both groups showed that the scores at the baseline did not significantly differ ($M = 7.70$, $SD = 2.59$) from the post-intervention measurements ($M = 6.79$, $SD = 4.56$) as indicated by the test results ($t(23) = 0.885$, $p = .193$).

The performed t-test for the control group showed that the scores at the baseline did not significantly differ ($M = 7.25$, $SD = 8.02$) from the post-intervention measurements ($M = 8.96$, $SD = 4.99$) as indicated by the test results ($t(11) = -1.318$, $p = .107$).

A one-sided paired samples t-test performed for the intervention group showed that the scores at the baseline significantly differed ($M = 8.17$, $SD = 2.36$) from the post-intervention measurements ($M = 4.63$, $SD = 2.91$) as indicated by the test results ($t(11) = 2.84$, $p = .008$).

3.3.2. Secondary Outcome Measure I (PHQ-9)

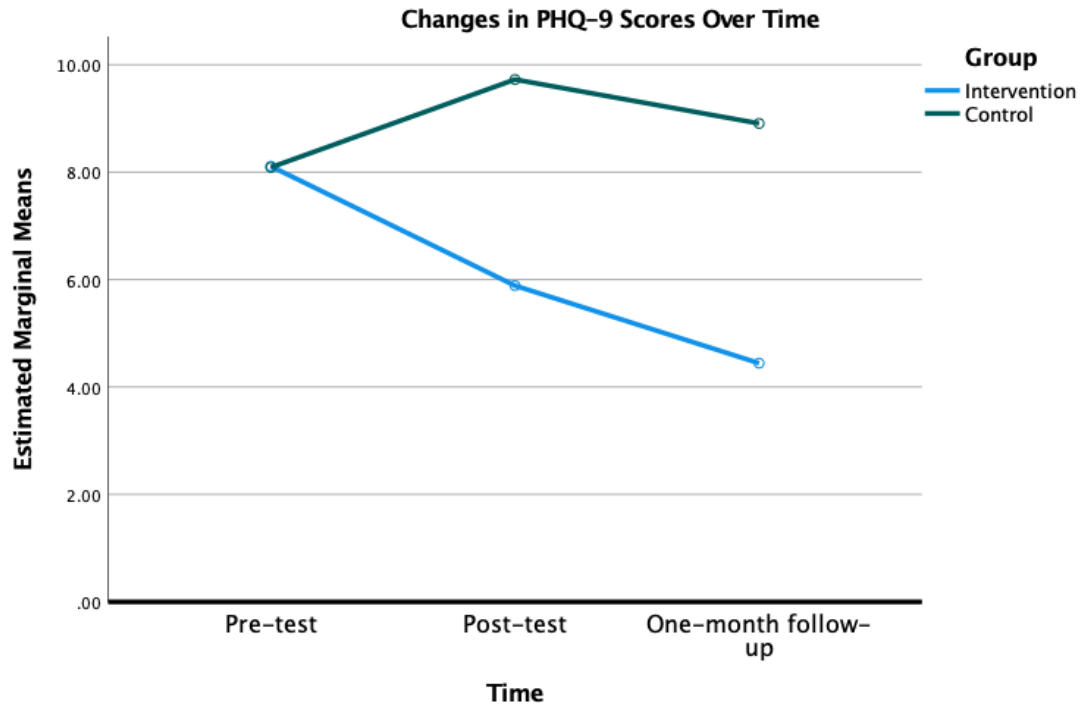
3x2 Repeated Measures ANOVA

A 3 (time: baseline, post-intervention, follow-up) x 2 (group: intervention, control) repeated measures ANOVA was also conducted to examine the effect of the intervention on depressive symptoms (PHQ-9 scores). Mauchly's Test of Sphericity was conducted to assess the assumption of sphericity, with the results yielding a non-significant value ($\chi^2(2) = 0.85$, $p = .65$), indicating that the assumption of sphericity was met. Additionally, Levene's Test of Homogeneity of Variances was performed for each measurement, which also produced non-significant results for baseline ($F(1, 18) = 2.10$, $p = .16$), post-test ($F(1, 18) = 3.15$, $p = .09$) and follow-up ($F(1, 18) = 0.67$, $p = .42$) confirming that the assumption of homogeneity of variances was satisfied.

In line with the secondary hypothesis that the intervention group will lower the depression scores of the intervention group in comparison to the WLC group, there was a significant interaction effect of the intervention between time and group on the PHQ-9 scores ($F(2, 36) = 3.84$, $p = .03$, $\eta^2 = 0.18$). The results revealed no significant main effect of time on PHQ-9 scores ($F(2, 36) = 1.47$, $p = .24$, $\eta^2 = 0.08$), indicating that PHQ-9 scores did not differ over time among participants. Post-hoc analyses for time were not performed due to the lack of a significant main effect of time. The results yielded a significant main effect of the intervention group on PHQ-9

scores ($F(1, 18) = 3.17, p = .09, \eta^2 = 0.15$) indicating that the overall scores differed between the groups.

Figure 3.2. *Repeated Measures over Time in PHQ-9 scores in Intervention and Control Groups*



Post-Hoc Pairwise Comparisons for Groups

Regarding the group effects at the posttest for PHQ-9, the mean difference between the intervention group ($M = 6.94, SD = 3.10$) and the control group ($M = 9.30, SD = 4.33$) was not statistically significant as indicated by a two-tailed t-test ($t(30) = -1.93, p = .06$), but suggested that the difference could be significant with bigger sample sizes. However, at the follow-up, the mean difference between the intervention group ($M = 6.02, SD = 2.88$) and the control group ($M = 8.85, SD = 4.42$) was statistically significant as indicated by a two-tailed t-test ($t(30) = -2.33, p = .02$). The results are summarized in Table 3.6.

Table 3.6. *One-tailed samples t-test between baseline and post-intervention scores in PHQ-9*

<i>Outcomes</i>	<i>Time Points</i>	<i>Descriptive statistics, M (SD)</i>	<i>T-test</i>	
			<i>Mean Differences</i>	<i>p-value</i>
PHQ-9 (Both Groups)	Baseline –	8.10 (2.95)	0.79	.22
	Post-test	7.45 (4.48)		
PHQ-9 (Control Group)	Baseline –	8.11 (2.57)	2.15	.03*
	Post-test	5.16 (2.92)		
PHQ-9 (Intervention Group)	Baseline –	8.09 (3.36)	-2.12	.01**
	Post-test	9.31 (4.76)		

One-Tailed Paired-Samples T-Tests Between Baseline and Post-Intervention

In order to analyze the overall effect of intervention on the PHQ-9 scores, post-test and 1-month follow-up scores were computed into one variable (post-intervention) and were compared between the baseline scores with a one-tailed paired samples t-test.

In Table 3.5., a one-sided paired samples t-test performed for the both groups showed that the scores at the baseline did not differ significantly ($M = 8.10$, $SD = 2.95$) from the post-intervention measurements ($M = 7.45$, $SD = 4.48$) as indicated by the test results ($t(19) = 0.790$, $p = .220$).

A one-sided paired samples t-test performed for the intervention group showed that the scores at the baseline differed significantly ($M = 8.11$, $SD = 2.57$) from the post-intervention measurements ($M = 5.16$, $SD = 2.92$) as indicated by the test results ($t(8) = 2.15$, $p = .032$).

A one-sided paired samples t-test performed for the intervention group showed that the scores at the baseline differed significantly ($M = 8.09$, $SD = 3.36$) from the post-intervention measurements ($M = 9.31$, $SD = 4.76$) as indicated by the test results ($t(10) = -2.12$, $p = .030$).

3.3.3. Secondary Outcome Measure II (WHO-5)

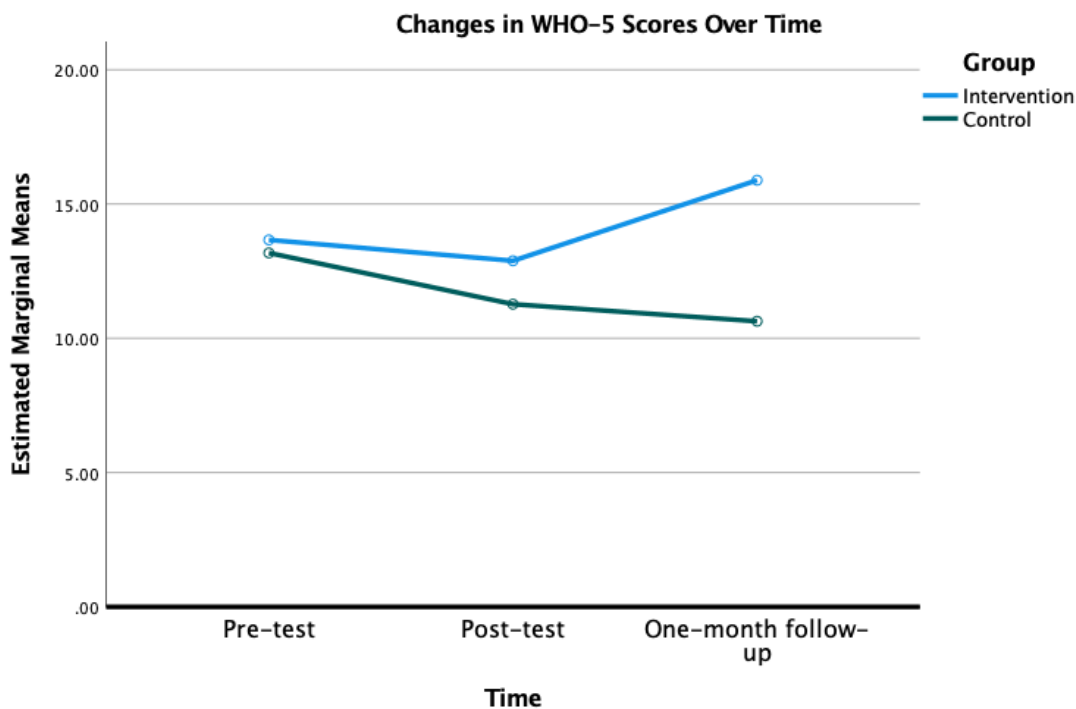
3x2 Repeated Measures ANOVA

A 3 (time: baseline, post-intervention, follow-up) x 2 (group: intervention, control) repeated measures ANOVA was also conducted to examine the effect of the intervention on participants' well-being scores measured with WHO-5. Mauchly's Test of Sphericity was conducted to assess the assumption of sphericity, with the results yielding a non-significant value ($\chi^2(2) = 0.26$, $p = .88$), indicating that the assumption of sphericity was met. Additionally, Levene's Test of Homogeneity of Variances was performed for each measurement, which also produced non-significant results for baseline ($F(1, 18) = 0.58$, $p = .46$), post-test ($F(1, 18) = 0.97$, $p = .34$) and follow-up ($F(1, 18) = 0.78$, $p = .39$) confirming that the assumption of homogeneity of variances was satisfied.

In line with the tertiary hypothesis that the intervention group will lower the well-being scores of the intervention group in comparison to the WLC group, there was a significant interaction effect of the intervention between time and group on the WHO-5 scores ($F(1, 18) = 2.93$, $p = .06$, $\eta^2 = 0.14$). The results revealed no significant main effect of time on WHO-5 scores ($F(1, 18) = 1.01$, $p = .37$, $\eta^2 = 0.05$), indicating that WHO-5 scores did not differ over time among participants. Post-hoc analyses for time were not performed due to the lack of a significant main

effect of time. The results yielded a significant main effect of the intervention group on WHO-5 scores ($F(1, 18) = 1.56, p = .23, \eta^2 = 0.08$) indicating that the overall scores differed between the groups.

Figure 3.3. *Repeated Measures over Time in WHO-5 Scores in Intervention and Control Groups*



Post-Hoc Pairwise Comparisons for Groups

Regarding the group effects at the posttest, the mean difference between the intervention group ($M = 13.58, SD = 4.20$) and the control group ($M = 11.00, SD = 5.49$) was not statistically significant as indicated by a two-tailed t-test ($t(30) = 1.29, p = .21$). However, at the follow-up, the mean difference between the intervention group ($M = 15.81, SD = 6.60$) and the control group ($M = 10.00, SD = 4.26$) was statistically significant as indicated by a two-tailed t-test ($t(30) = 2.67, p = .01$). The results are summarized in Table 3.5.

One-Tailed Paired-Samples T-Tests Between Baseline and Post-Intervention

In order to analyze the overall effect of intervention on the WHO-5 scores, post-test and 1 month follow-up scores were computed into one variable (post-intervention) and were compared between the baseline scores with a one-tailed paired samples t-test. Results are presented in Table 3.7. below.

Table 3.7. *One-tailed samples t-test between baseline and post-intervention scores in WHO-5*

<i>Outcomes</i>	<i>Time Points</i>	<i>Descriptive statistics, M (SD)</i>	<i>T-test</i>	
			<i>Mean Differences</i>	<i>p-value</i>
WHO-5 (Both Groups)	Baseline –	13.40 (4.18)	0.99	.16
	Post-test	12.50 (5.10)		
WHO-5 (Intervention Group)	Baseline –	13.67 (4.09)	-0.46	.33
	Post-test	14.39 (5.10)		
WHO-5 (Control Group)	Baseline –	13.18 (4.44)	2.54	.01*
	Post-test	10.95 (4.77)		

A one-sided paired samples t-test performed for the both groups showed that the scores at the baseline did not differ almost at all ($M = 13.40$, $SD = 4.18$) from the post-intervention measurements ($M = 12.50$, $SD = 5.10$) as indicated by the test results ($t(19) = 0.999$, $p = .165$).

A one-sided paired samples t-test performed for the intervention group showed that the scores at the baseline did not significantly differ ($M = 13.67$, $SD = 4.09$) from the post-intervention measurements ($M = 14.39$, $SD = 5.10$) as indicated by the test results ($t(8) = -0.46$, $p = .330$).

A one-sided paired samples t-test performed for the control group showed that the scores at the baseline significantly differed ($M = 13.18$, $SD = 4.44$) from the post-intervention measurements ($M = 10.95$, $SD = 4.77$) as indicated by the test results ($t(10) = 2.54$, $p = .015$).



Discussion

4.1. Research Rationale and Aims

Anxiety can serve adaptive and motivational functions when maintained at optimal levels; however, excessive and persistent anxiety can lead to anxiety disorders (Yerkes & Dudson, 1908; Eskin, 2012). Generalized Anxiety Disorder (GAD) is characterized by excessive anxiety concerning various aspects of daily life, resulting in functional impairment (APA, 2013). GAD's etiology is multifactorial, involving both biological and environmental factors (Roemer & Orsillo, 2002). Several theoretical frameworks have been proposed for understanding GAD, such as the Cognitive Model of GAD or the Intolerance to Uncertainty Model (IUM) by Michel Dugas and colleagues (Dugas et al., 1998). Anxiety disorders including GAD, are currently the most commonly reported psychiatric disorders and are significant contributors to the global treatment gap, with a median treatment gap of 57%, and also 56.3% for depression (Kohn et al., 2004).

Untreated mental health problems lead to psychological distress, diminished quality of life, and loss of productivity, costing the global economy an estimated 1.15 trillion USD annually (Burns, 2015; Chisholm et al., 2016). The mental health treatment gap is more pronounced in low- to middle-income countries, such as Turkey, due to the interaction between income and mental health (Patel et al., 2010). The COVID-19 pandemic has further intensified the impact of mental health problems, resulting in increased anxiety symptoms and a variety of other mental health problems (Talevi et al., 2020; Hossain et al., 2020; Santomauro et al., 2021). To address this gap, organizations like the World Health Organization (WHO) and the National Institute for Health and Care Excellence (NICE), as well as other researchers, have advocated for integrating mental health into primary care, expanding clinical care capacity, and employing technological tools and innovative strategies such as digital psychotherapeutics. These approaches have the potential to

enhance treatment access and reduce the mental health gap (Mental Health Action Program 2013-2020; Tahilia et al., 2014; Bucci et al., 2019; Fairburn, 2017).

Concurrently, a global interest in technology use in delivering mental health services was sparked around 2010's. Researchers and companies from countries such as the U.S.A, Netherlands, Germany, Australia, and China started to develop internet and mobile app based interventions for a variety of psychological problems. However, not all psychologists were supportive of this shift; a certain faction maintained a skeptical stance, advocating for the continuation of traditional face-to-face psychotherapy services. For example, Turkey stayed behind the global pace of digitalization of psychological services as there was only a dearth of research on internet or app based psychological interventions in the Turkish language until the COVID-19 pandemic (Durmaz et al., 2019; Unlu-Ince et al., 2019; Zeren et al., 2020).

The pandemic created the need for social and physical distancing, mental health services started to be mostly conducted through teleconferencing tools via smartphones and laptops. During the peak of the pandemic, psychotherapists conducted their sessions online and a surge took place regarding the mobile applications in the field of psychotherapy and self-help content. Even though the skepticism around the online therapy has mostly faded by practice, the dearth of research regarding the effectiveness of online therapy and self-help content in the Turkish language still prevails.

To the best of the author's knowledge, there are no master's or doctoral theses in Turkey in the field of digital psychotherapeutics. This research gap highlights the need for further academic examination of digital mental health services in Turkey, a developing country grappling with the mental health gap. Moreover, researchers in the global literature predominantly focus on long-term (approximately 10 weeks) internet-based cognitive behavioral therapy (iCBT)

interventions for anxiety disorders, while research on shorter-term interventions remains limited, despite their widespread practical use in mobile applications.

The current study was conducted to reduce the research gap on digital psychotherapeutics. It includes two consecutive parts: a pilot study for evaluating and improving an internet-based iCBT intervention and a two-arm RCT to evaluate the effect of a short-term intervention (2 weeks) primarily on anxiety, and secondarily on depression and well-being scores.

4.2. Key Findings and Their Interpretation

The results suggested that the participants in the iCBT condition had lower anxiety than those in the control condition. These results are in line with previous iCBT interventions and meta-analyses (Eilert et al. 2021; Linardon et al., 2019; Olthuis et al., 2015; Titov et al., 2009). Furthermore, the obtained effect sizes in this study fall in the lower bound of effectiveness range from a relatively recent meta-analysis (Etzelmueller et al., 2020).

Even though the primary focus of the study was not the depression symptoms, the results also suggested that the participants in the iCBT condition had lower depression symptoms than those in the control condition. Both effects on depression and anxiety are consistent with the results of a previous meta-analysis that iCBT interventions for the anxiety and depression disorders are effective, acceptable and practical (Andrews et al. 2018). The inclusion of depression as a measure is theoretically relevant in anxiety interventions due to the high comorbidity between depression and anxiety especially in low to middle income countries (January, Madhombiro, Chipamaunga, Ray, Chingono, & Abas, 2018). Post-hoc analyses of the interaction effect showed that the intervention group had fewer depressive symptoms 1 month after the intervention but did not reach the significance cutoff for right after the intervention. This discrepancy with the literature hints at the possibly low sample size for this effect.

The efficacy of the intervention in alleviating symptoms of anxiety and depression can be linked to a number of potential mechanisms of action. Firstly, the intervention might have enhanced cognitive reappraisal of the participants, a strategy of emotion regulation that involves changing the trajectory of emotional responses by reinterpreting the meaning of the emotional stimulus (Gross & John, 2003; Gross, 2014). Underutilization of cognitive reappraisal is related to anxiety and depression, and its utilization may decrease their symptoms (Dryman & Heimberg, 2018). Secondly, the intervention might have contributed to the participants' self-efficacy which refers to the belief in one's capabilities to organize and take the action required to produce a given outcome (Bandura, 1977). CBT interventions can bolster a patient's confidence in their ability to manage their symptoms and cope with their condition, eventually leading to improved mental health outcomes as perceived social and academic inefficacy are linked to depression (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999). Thirdly, the intervention included 9 different videos promoting relaxation and mindfulness which is the ability to pay attention to the present moment in a non-judgmental manner (Shapiro, Carlson, Astin, & Freedman, 2006). This approach has been shown to reduce anxiety and depression, perhaps by increasing awareness and acceptance of negative emotions without reacting to them (Hofmann, Sawyer, Witt, & Oh, 2010). Fourthly, the inclusion of both cognitive and behavioral exposure to avoided situations, thoughts, or feelings might have contributed to the produced effects as avoidance creates a vicious cycle that maintains anxiety. Finally, the basic behavioral homeworks at the end of each day serves as a basis for behavioral activation, which has been shown to reduce the symptoms of depression (Dimidjian et al., 2006).

These potential mechanisms of action need to be tested in future studies to elucidate the change mechanisms in the intervention. Researchers could collect data on these potential

mechanisms before, during, and after the intervention to examine whether changes in these variables are associated with changes in anxiety and depression. This will allow for a better understanding of how the intervention works and how it can be optimized to improve its efficacy.

The interaction effect for the participants' overall well-being missed the significance cutoff marginally. There are conflicting findings in the literature regarding anxiety targeting iCBT intervention's effects on well-being scores measured by WHO-5. One study with 70 participants reported decreased levels of anxiety but not increased well-being (Stjerneklar, Hougaard, McLellan, & Thastum, 2019). However, a more recent study with a bigger sample size of 196 participants reported decreased levels of anxiety as well as increased well-being (Nomeikaite et al., 2023). The inability to detect the effects of the current intervention in improving well-being might be due to the small sample size.

In addition, further analyses showed that the control group had lower well-being scores after the intervention when compared to the baseline. Similar effects were observed for the depression scores. The control group scored higher on the depression scores after the intervention, when compared to the baseline. Both the intervention and control group experienced between the baseline and both post-intervention measures were the massive earthquakes centered at the city of Kahramanmaraş ($ML = 7.7$, $ML = 7.5$). Even though there is not a published study of the effects of this disaster; as people who experienced a secondary trauma, we could expect that the psychological impact of this disaster was huge on the average citizen from all cities. This is why paired sample t-tests between the pre-earthquake measurement and post-earthquake measurements were conducted.

This finding can be partially explained by the massive earthquake that took place right after the intervention was done. This quake presumably affected all participants' post-test scores, but

the control group did not acquire the emotion regulation tools that was conveyed in the intervention. The intervention group on the other hand, possibly acquired such tools and were more equipped to deal with the secondary trauma caused by the devastating earthquake. The potential alleviating effects of the intervention are in line with the results of two very recent iCBT studies. Researchers examined the effects of an iCBT intervention following a natural disaster. The results suggested that iCBT interventions can increase the perceived social support in disaster survivors (Frenette, Ouellet, Guay, Lebel, Békés, & Belleville, 2023). Same research group also reported lower PTSD and anxiety scores following an iCBT intervention with trauma survivors (Belleville et al. 2023).

The overall results suggest that the intervention was effective in reducing the anxiety and depression scores of the intervention group participants when compared with the waitlist control group both at the post-test and 1-month follow-up. These findings are in line with the global literature of iCBT interventions on GAD regardless of whether the intervention was conducted through websites or apps. However, this study is possibly the first to demonstrate the effectiveness of a short-term iCBT intervention on GAD symptoms. This suggests that digital interventions can be effective when conducted each day in shorter time intervals.

4.3. Implications

This study's results add to the global literature with its implications that short-term iCBT interventions can be effective in reducing the symptoms of the most common psychological problems, anxiety and depression. It contributes to the literature on iCBT interventions for GAD, by providing support to the Cognitive Model of GAD by reducing GAD symptoms, possibly by targeting the components of the model (Dugas et al., 1998).

Intervention's effect on reducing the depressive symptoms even though a secondarily expected outcome implies that there can be transdiagnostic benefits of iCBT interventions in line with the findings of a recent meta-analysis where seven of the fifteen iCBT studies targeting anxiety measured both anxiety and depression scores (Oliveira, et al., 2023). This implies that the iCBT interventions targeting a specific psychological problem can help alleviate other and potentially comorbid problems.

The study also contributes to the growing body of research examining the effectiveness of iCBT interventions for a wide spectrum of mental health issues whilst simultaneously bolstering positive outcomes. Such interventions can even be helpful in fending off the devastating effect of natural disasters, especially when there is a gap between the mental health support needed and resources to provide them.

Indeed, stepped-care model based iCBT interventions providing self-managed care are valuable tools where healthcare systems lack the infrastructure to provide mental health services at scale, a common barrier in low- and middle-income countries (Cuijpers, Karyotaki, Reijnders, Purgato & Barbui, 2018). Massive online interventions can indeed be effective tools where adequate infrastructure is missing (Ricardo et al., 2016). The results of this research provides further support for the assertion that employment of digital interventions can significantly mitigate issues related to treatment accessibility, cost, and wait times, thereby reducing the overall disease burden (Chisholm et al., 2016; Cuijpers et al., 2018). Thus, this study provides support for the use of stepped and digital interventions in order to reduce the global mental health treatment gap.

Overall, this study provides a strong foundation for future policy on the digital psychotherapeutics. Even though the results are preliminary, policymakers can support the implementation of such interventions for disadvantaged groups for whom other interventions

are not accessible because they have a potential to be beneficial and no side effects were reported. This study also provides support for the ongoing trends in the practice of self-help content platforms. Even though they are widely used in Turkey and more so around the globe, there is a research gap on their effectiveness and safety.

Digital psychotherapeutics hold significant potential to enhance both the economic efficiency of mental health services and the well-being of citizens. Given their wide availability across app marketplaces, it seems only logical to leverage these resources in practice. However, to ensure effectiveness and safety, their use should be governed by robust scientific regulation and oversight. In essence, these interventions, while highly accessible, must still adhere to rigorous standards of scientific validity and clinical effectiveness to ensure their utility and safety for the public.

4.4. Limitations and Future Studies

This study has a number of limitations and areas for improvement. The first is that the sample sizes were relatively low for a comprehensive covariate analysis. This study was an exploratory study testing the practical feasibility and potential effectiveness of a short-term, internet-based iCBT intervention on anxiety. Since the potential of iCBT interventions in the Turkish language has been implicated by this study, future researchers should scale up the sample sizes to look for potential mediators, moderators, and covariates to gain new insights using similar interventions.

Secondly, research in psychotherapeutic interventions frequently demonstrates that different therapeutic methods are similarly beneficial, which is attributed to universal elements that exist in interventions. It may not be the specific techniques of the intervention but rather the common factors that result in the observed effectiveness (Cuijpers, Reijnders, & Huibers, 2019).

A therapeutic structure itself might explain some of the effects found in this study. Given that the individuals are aware they are receiving therapy; expectation or placebo effects may have contributed to the outcomes that were observed. Also, although it is frequently used in psychotherapeutic interventions, the waiting control group has some drawbacks. In addition, those on the waitlist can deteriorate as a result of no intervention (Furukawa et al., 2014). Therefore, it is crucial to critically evaluate what these data may and cannot tell us about the intervention process, even though the data indicate that it has a positive effect.

Thirdly, even though the study was effective in reducing the anxiety symptoms, we do not know how much the components of the UI Model of GAD contributed to the reduction of anxiety symptoms because that data was not collected in this study. Therefore, this study encounters limitations in detailing the specific components of the model that contributed to its effectiveness. Implementation of such components would be very valuable for theoretical purposes as well. Similar to the above-given limitation, future research can test this with larger sample sizes.

Another limitation of this study is the lack of a mobile app as a platform for intervention. Creation of a mobile app for the intervention was suggested during the process evaluation interviews but could not be implemented due to the lack of resources. Using a mobile app could have led to lower dropout rates and maybe lesser symptoms. The absence of a mobile app for intervention delivery could have influenced the participant engagement and dropout rates, possibly affecting the intervention's efficacy. Further researchers can use a mobile app for intervention or both an app and a website to examine potential differences.

Also, the follow-up measures were collected 1 month after the intervention. Additional data could have been collected at the 3- and 6-months follow-ups, and even 1 year to observe the

longer-term effects of the study. Even though this short-term intervention was effective 1 month after, its shortness may possibly result in fading effects. The short-term follow-up restricted the view on the longevity of the intervention's effects, leaving potential longer-term outcomes unknown. Further studies should follow-up longer to observe the longitudinal effects.

Though not the central emphasis of this study, the rising prevalence and significance of online psychotherapy within the realm of digital psychotherapeutics in Turkey cannot be understated. As of the time of this writing, its popularity has been steadily increasing. Future scholarly investigations should extend the ambit of their analysis to include online psychotherapy, elucidating the interactions within the broader context of digital mental health interventions. Such comprehensive exploration would contribute to a more nuanced understanding of the role and impact of digital psychotherapeutics in Turkey.

Lastly, regarding this study is that it essentially represents an initial, exploratory stage - a metaphorical crawling phase. The results of this study demonstrated promising potential, suggesting that it deserves further, perhaps even continuous, enhancements. If this study's results which suggest that anxiety and depression scores decreased due to the iCBT intervention is true, it raises the compelling question: might such an intervention be broadly applicable across other psychological conditions and parameters? Thus, the scope for future research and clinical applications appears to be considerably wide, inviting comprehensive exploration and experimentation.

Collectively, these limitations may have led to a narrower view of the intervention's impact and potential applications. A smaller sample size may have reduced the statistical power and the precision of the estimates, limiting our ability to detect significant effects, and reducing the reliability and generalizability of the findings. Moreover, not identifying the components of the UI

Model of GAD that influenced anxiety reduction hindered a precise understanding of the intervention's effective mechanisms. By delving deeper into these areas, a more nuanced understanding of the various factors that contribute to the effectiveness of digital mental health interventions can be developed and opportunities for enhancing their impact on users' well-being can be identified.

A final consideration to bear in mind, the focus on an internet-based iCBT, to the exclusion of the rapidly evolving field of online psychotherapy, limits the breadth of the study's findings in the context of the overall digital psychotherapeutics landscape in Turkey.

In conclusion, this study has the potential to serve as a pioneering venture in Turkish literature, by illuminating the untapped potential of digital psychotherapeutics. Although this study has a number of limitations, it serves an avenue for further refinement and novel approaches, both for research and practical implementation. By focusing on these areas of improvement, the study can be avant-garde in prompting the exploration of an enriched field of digital mental health interventions in Turkey. Future studies might seek to address the following questions:

What specific components of the UI Model of GAD contribute most significantly to the reduction of symptoms iCBT interventions targeting anxiety? How does the platform of delivery (website vs. mobile app) impact user engagement and outcomes in such interventions? What are the long-term impacts of short-term iCBT interventions beyond a 1-month post-intervention period? What role does online psychotherapy play in the broader digital mental health landscape in Turkey, and how does it interact with other digital interventions like iCBT? What potential lies in the continuous enhancement and broad application of iCBT interventions across various psychological conditions?

By tackling these questions, future research can build on the groundwork laid by this study to advance the knowledge and practice in the field of digital psychotherapeutics in mental health care.



Conclusion

This research provides a pioneering exploration into digital psychotherapeutics, mainly focusing on Internet-based Cognitive Behavioral Therapy (iCBT) for anxiety reduction in the Turkish context. The results support the utility of this digitally mediated approach, demonstrating significant reductions in symptoms of anxiety and depression in the treatment group. These findings confirm findings in the international literature, highlighting the effectiveness of such interventions while exploring the Turkish context, where the field of digital psychotherapy requires more investigation.

Looking ahead, this study paves the way for an exciting array of future research opportunities. In-depth investigations into potential mediators and moderators in such interventions are crucial next steps to optimize their efficacy. Expanding the scope of research to incorporate digital psychotherapeutic tools for other psychological conditions also holds great promise, given the preliminary results shown in this study.

In conclusion, this study marks a critical contribution to the evolving field of digital mental health, sparking further scientific inquiry and innovation. As the digital landscape continues to expand, the prospects for increasing the reach and impact of such interventions are vast. This research sets a precedent for future endeavors in the field, aimed at improving mental health care in Turkey and beyond, with the ultimate goal of optimizing digital psychotherapeutics to enhance the well-being and mental health of the global community.

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Appendix A.

Topic Guide for Qualitative Interviews

Objective

The objective of the research is to assess the pilot study participants' experience with the web-based generalized anxiety intervention. After the assessment, the insights we gained will be used to make the intervention more user friendly and effective in reducing anxiety symptoms.

The Information Given to the Participants

All the necessary information is provided before the interviews in the informed consent form regarding participants' rights to withdraw anytime without any negative consequences, the purpose and the content of the study, IRB approval, potential benefits and harms, and confidentiality.

Introduction

Welcoming the participants

Thank you for taking your time and accepting to participate in the pilot study and interview.

This interview will be audio recorded and be transcribed by the researcher. After the end of the study, the recordings will be deleted permanently.

You can withdraw from the study anytime, without any negative consequences.

During this interview we will focus on your experiences with the intervention. I will ask your questions regarding what made the intervention easy and hard for you, what did you like and not like, whether you think it benefitted you and how the intervention could be improved to be more effective and user friendly.

You are encouraged to talk freely about and criticize the intervention, this way we will learn how to improve it.

Questions

Identify and Elicit Participants' Overall Process Experience:

Looking back, how was the intervention process for you?

What were the factors that made the process easier for you to follow while participating in the intervention?

What were the factors that made the process harder for you to follow while participating in the intervention?

Identify and Elicit Participants' Likes and Dislike on the Specific Parts of the Intervention:

Specifically, what did you like about the study? What were your favorite parts of the intervention?

What did you dislike about the study? What were your least favorite parts of the intervention?

What would you suggest we add or take away from those sections?

Identify and Elicit Participants' Overall Assessment of the Intervention Content:

Do you think this intervention was useful in reducing your anxiety?

Do you think the intervention contributed to your life? If so, how?

Do you think you will benefit from the techniques you learned during the intervention in your daily life?

Identify and Elicit Participants' Further Suggestions on Improving the Intervention:

What changes would you suggest to us, in order to make the intervention more user-friendly overall?

What changes would you suggest to us, in order to make the intervention more effective in reducing anxiety overall?

Appendix B.**Demografik Form**

Yaşınız: _____

Cinsiyetiniz:

Kadın

Erkek

Diğer: _____

Tanısı konmuş bir psikolojik rahatsızlığınız var mı?

Evet: _____

Hayır

Herhangi bir psikiyatrik ilaç kullanıyor musunuz?

Evet

Hayır

Güncel olarak psikoterapi alıyor musunuz?

Evet

Hayır

İnternete günlük erişiminiz var mı?

Evet

Hayır

Kaç yıldır bilgisayar ve internet gibi teknolojileri kullanıyorsunuz? _____

Günde kaç saatinizi bilgisayar ve telefon kullanarak geçiriyorsunuz? _____

Aşağıdakilerden hangisi görüşünüzü yansıtmaktadır?

Psikolojik hizmetlerin teknolojiyle birlikte gelişmesi gerektiğini düşünüyorum.

Psikolojik hizmetlerin geleneksel kalması gerektiğini düşünüyorum.

Diğer: _____

Güncel olarak öğrenci misiniz?

Evet

Hayır

Eğitim Durumunuz:

İlkokul mezunu

Lise mezunu

Üniversite mezunu

Yüksek lisans mezunu

Doktora mezunu

Diğer: _____

Üniversite mezunu ya da öğrenciyseniz okuduğunuz bölüm nedir? _____

Çalışma Durumunuz:

Çalışmıyor

Evden çalışıyor

İş yerinden çalışıyor

Diğer: _____

Son Üç Aydaki Ortalama Geliriniz: _____

Yaşadığınız Şehir: _____

En uzun süre ikame ettiğiniz yerleşim birimi hangisidir?

Büyükşehir

İlçe

Köy-Kasaba

Yurt dışı

Konaklama Durumunuz:

Aile üyeleri ile paylaşılan ev

Partner ile paylaşılan ev

Arkadaşlar ile paylaşılan ev

Yurt

Otel

Diğer: _____

Medeni Durumunuz:

Evli

Bekar

Boşanmış

Diğer: _____

Anne Eğitim Durumu:

İlkokul mezunu

Lise mezunu

Üniversite mezunu

Yüksek lisans mezunu

Doktora mezunu

Diğer: _____

Baba Eğitim Durumu:

İlkokul mezunu

Lise mezunu

Üniversite mezunu

Yüksek lisans mezunu

Doktora mezunu

Diğer: _____

Kardeşiniz var mı? Cevabınız evetse kaç kardeşiniz var?

Evet: _____

Hayır

Bakmakla yükümlü olduğunuz insanlar (örneğin çocuk, kronik hasta, yaşlı) var mı?

Evet

Hayır

Yaygın Kaygı Bozukluğu – 7

Son iki hafta içinde yaşadıklarınızı değerlendirerek size uygun seçeneği işaretleyebilir misiniz?

1. Sinirli, kaygılı, endişeli olma

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

2. Endişelerinizi kontrol edememe ya da durduramama

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

3. Farklı konularda çok fazla endişelenme

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

4. Gevşeyip rahatlayamama

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

5. Yerinizde duramayacak kadar kıpır kıpır huzursuz olma

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

6. Çabuk sinirlenme, kızma ya da huzursuz olma

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

7. Çok kötü bir şey olacak diye korkma

0) Hiç

1) Birçok gün

2) Günlerin yarısından fazla

3) Hemen hemen her gün

Bu sorunlardan herhangi birini işaretlediyseniz, bu sorunlar işinizi yapmanızda, evinizle ilgili işleri halletmenizde veya diğer insanlarla olan ilişkilerinizde ne kadar zorluk yarattı?

Hiç zorluk yaratmadı

Oldukça zorluk yarattı

Çok zorluk yarattı

Aşırı derecede zorluk yarattı

Hasta Sağlık Ölçeği-9

Aşağıda bazı cümleler verilmiştir. Son 2 hafta içerisinde aşağıdaki sorunlardan herhangi biri sizi ne sıklıkla rahatsız etti?

Bir şeyleri yapmaya az ilgi duymak veya zevk almak

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Üzgün, depresif veya umutsuz hissetmek

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Uykuya dalmada veya uyumaya devam etmekte zorluk çekmek veya çok uyumak

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Yorgun hissetmek veya enerjinizin az olması

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

İştahsızlık veya çok fazla yemek yemek

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Kendinizi kötü/başarısız hissetmeniz ya da kendinizi /ailenizi hayal kırıklığına uğrattığınızı düşünmeniz

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Gazete okumak veya televizyon seyretmek gibi faaliyetlerde dikkatinizi toplamakta güçlük çekme

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Başkalarının fark edebileceği kadar yavaş hareket etmeniz/konuşmanız ya da tam aksine - normalden çok daha fazla hareket edecek kadar kıpır kıpır veya huzursuz olmanız

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

Ölmüş olsanız veya bir şekilde kendinize zarar verseniz daha iyi olacağınız düşünceleri

- 0) Hiçbir zaman
- 1) Bazı günler
- 2) Günlerin yarısından fazlasında
- 3) Hemen hemen her gün

WHO (Beş) İyilik Durumu İndeksi (1998 sürümü)

Aşağıdaki beş tanımlamadan her biri için, son iki hafta süresince kendinizi nasıl hissettiğinize en yakın olan yanıtı veriniz. Daha büyük sayıların daha iyi bir iyilik hali anlamına geldiğine dikkat ediniz. Örnek: Son iki hafta süresince geçen sürenin yarısından çoğunda neşeli ve keyifli hissettiyseniz, sağ üst köşesinde 3 sayısı olan kutucuğu işaretleyin.

Kendimi neşeli ve keyifli hissettim

- 5) Her zaman
- 4) Çoğu zaman
- 3) Geçen zamanın yarısında
- 2) Geçen zamanın yarısından daha azında
- 1) Bazen
- 0) Hiçbir zaman

Kendimi sakin ve gevşemiş hissettim

- 5) Her zaman
- 4) Çoğu zaman

- 3) Geçen zamanın yarısında
- 2) Geçen zamanın yarısından daha azında
- 1) Bazen
- 0) Hiçbir zaman

Kendimi aktif ve dinç hissettim

- 5) Her zaman
- 4) Çoğu zaman
- 3) Geçen zamanın yarısında
- 2) Geçen zamanın yarısından daha azında
- 1) Bazen
- 0) Hiçbir zaman

Sabahları kendimi taze ve dinlenmiş hissederek uyandım

- 5) Her zaman
- 4) Çoğu zaman
- 3) Geçen zamanın yarısında
- 2) Geçen zamanın yarısından daha azında
- 1) Bazen
- 0) Hiçbir zaman

Günlük yaşantım beni ilgilendiren şeylerle dolu

- 5) Her zaman
- 4) Çoğu zaman
- 3) Geçen zamanın yarısında
- 2) Geçen zamanın yarısından daha azında
- 1) Bazen
- 0) Hiçbir zaman