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Araştırma Makalesi

Effectiveness of an Internet-Based Guided Self-Help CBT Program for Reducing Procrastination in University Students: A Quasi-Experimental Pilot Study

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Makale Bilgisi

Keywords:

procrastination,
cognitive
behavioral therapy,
web-based
intervention,
university student

Abstract

This study was conducted using a quasi-experimental pilot study design to evaluate the effects of an Internet-Based Guided Intervention Program (Ertele-Me) on university students' procrastination behaviors, time management, and levels of depression, anxiety, and stress. The program consists of five Cognitive Behavioral Therapy (CBT)-based modules focusing respectively on psychoeducation about procrastination, self-regulation and time management skills, cognitive interventions, behavioral strategies, and maintenance of gains. Seventy-two students applied to participate in the study, and 26 eligible participants were assigned to either the experimental (N = 13) or control (N = 13) group. While the experimental group received a five-week internet-based guided intervention, the control group was informed that the intervention would begin at a later date. Data were collected using the Tuckman Procrastination Scale (TPS), the Depression, Anxiety, and Stress Scale (DASS-21), and the Time Management Questionnaire (TMQ). Findings indicated a significant reduction in procrastination behaviors and an improvement in time management skills within the experimental group. However, no statistically significant difference was observed between the post-test scores of the two groups. These preliminary findings suggest that internet-based guided self-help programs are promising tools for supporting the academic development of university students. Further research with larger samples and more rigorous methodological designs is recommended. This study was registered and completed as a clinical trial in the ClinicalTrials.gov database under registration number NCT06278142.

Anahtar Kelimeler:

erteleme,
bilişsel davranışçı
terapi,
web tabanlı müdahale,
üniversite öğrencisi

Öz

Bu çalışma, İnternet Tabanlı Rehber Destekli Müdahale Programı (Ertele-Me)'nin üniversite öğrencilerinin erteleme davranışı, zaman yönetimi ve depresyon, anksiyete, stres düzeyleri üzerindeki etkisini değerlendirmek amacıyla yarı deneysel pilot çalışma deseniyle gerçekleştirilmiştir. Program, bilişsel davranışçı terapi (BDT) temelli beş modülden oluşmakta olup sırasıyla erteleme davranışına ilişkin psikoeğitim, öz düzenleme ve zaman yönetimi becerileri, bilişsel müdahaleler, davranışsal stratejiler ve kazanımların sürdürülmesine odaklanmaktadır. Çalışmaya 72 öğrenci başvurmuş, belirlenen kriterlere uyan 26 katılımcı deney (N=13) ve kontrol (N=13) gruplarına atanmıştır. Deney grubuna beş haftalık internet tabanlı rehber destekli müdahale uygulanırken, kontrol grubuna müdahalenin ilerleyen bir tarihte başlayacağı bildirilmiştir. Veri toplama sürecinde Tuckman Erteleme Davranışı Ölçeği (TEÖ), Depresyon Anksiyete ve Stres Ölçeği (DASS-21) ve Zaman Yönetimi Ölçeği (ZYÖ) kullanılmıştır. Bulgular, deney grubunda erteleme davranışlarında anlamlı bir azalma ve zaman yönetimi becerilerinde iyileşme olduğunu göstermiştir. Bununla birlikte, gruplar arasındaki son test puanları istatistiksel olarak anlamlı farklılık göstermemiştir. Pilot çalışmadan elde edilen bu bulgular, internet tabanlı rehber destekli programların üniversite öğrencilerinin akademik gelişimini desteklemede umut vadeden araçlar olduğuna işaret etmektedir. Daha geniş örneklemler ve güçlü metodolojik desenlerle ileri araştırmalar yapılması önerilmektedir. Bu çalışma, ClinicalTrials.gov veri tabanında NCT06278142 numaralı klinik araştırma olarak kayıtlıdır.

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Introduction

The university years often represent a significant developmental transition, typically marked by leaving the family environment and entering a more independent phase of life. During this time, individuals build new friendships, engage with diverse cultural experiences, and assume responsibility for managing their financial and personal affairs (Richardson et al., 2017). While these changes can be exciting, they are often accompanied by various academic and social demands that may lead to increased levels of stress and anxiety. Coping with increasing responsibilities can be particularly challenging for individuals who have a strong need for acceptance and struggle to adapt (Broglia et al., 2021; Cole et al., 2017).

Research indicates that university students constitute a high-risk group in terms of mental health concerns. Common issues encountered during this period include depression, anxiety, academic difficulties, and social adjustment problems (Ghilardi et al., 2018; Musso et al., 2022). According to Kessler et al. (2007), 75% of all mental disorders emerge by the mid-20s. Academic pressure, uncertainty about the future, difficulties in interpersonal relationships, and financial stressors during this stage may significantly impact students' emotional and psychological well-being (Linden et al., 2021). Particularly prevalent problems include depression, anxiety, eating disorders, academic challenges, and family-related conflicts (Broglia et al., 2021; Ghilardi et al., 2018; Sheldon et al., 2021). Sheldon et al. (2021) highlighted the high prevalence of depression and suicidal ideation among university students, noting that these mental health issues are linked to a variety of individual, relational, and environmental risk factors. These findings underscore the urgent need to develop preventive and targeted intervention programs for university students.

One of the major challenges students face during university life is procrastination. Procrastination refers to the irrational delay of responsibilities or tasks despite foreseeable negative consequences (Steel, 2007). Research has shown that procrastination is highly prevalent among university students, with estimates ranging from 70% to 95% (Oram & Rogers, 2022). Steel (2007) noted that nearly all students engage in procrastination to some extent, and 75% identify themselves as habitual procrastinators. Approximately half of the individuals report that procrastination has become a persistent issue that negatively impacts their academic performance and overall quality of life (Grunschel & Schopenhauer, 2015). In a large-scale study conducted in Sweden, Rozental et al. (2022) found that 96% of university students viewed procrastination as a significant problem, and about one-third considered seeking professional help. These findings indicate that procrastination is widespread and a self-regulation issue that can adversely affect psychological well-being and academic achievement (Giguère et al., 2016; Rozental et al., 2022).

Although procrastination is often linked to poor time management, the literature emphasizes its association with psychological factors such as anxiety, difficulties in self-regulation, fear of failure, and perfectionism (Milgram et al., 1998; Sirois, 2007). It is a multifaceted behavior with cognitive, emotional, and behavioral components, and tends to occur especially in response to academic tasks such as writing assignments or studying for exams (Mandap, 2016; Sirois, 2013; Solomon & Rothblum, 1984). While procrastination may offer short-term relief, it leads to long-term adverse outcomes, including stress, anxiety, guilt, and reduced life satisfaction (Beutel et al., 2016; Simpson & Pychyl, 2009). Research has further demonstrated that procrastination is closely linked to processes involving self-regulation, time management, and motivation, as well as psychological variables such as fear of failure, low self-efficacy, and perfectionism (Sirois et al., 2003; Van Eerde, 2003; Van Eerde & Klingsieck, 2018). Studies conducted in Turkey similarly reveal that academic procrastination is widespread among university students and negatively affects both academic achievement and psychological well-being (Doğan Koç, 2022; Günay, 2022; Uzun Özer et al., 2009).

Deficits in self-regulation and time management skills contribute to persistent procrastination behaviors (Burka & Yuen, 1983; Milgram et al., 1998). Intense academic schedules, high-performance expectations, and low self-regulatory capacity can lead students to delay their tasks, increasing stress levels (Ferrari, 1992; Stead et al., 2010). Therefore, access to support systems is crucial for helping students cope with such challenges (Brown et al., 1997; Dodd, 2021). The literature reports the development of various intervention programs aimed at reducing procrastination, which have demonstrated effectiveness across cognitive, behavioral, and emotional domains (Burka & Yuen, 1983; Eckert et al., 2018; Rozental et al., 2014; Sirois, 2013). In particular, Cognitive Behavioral Therapy (CBT)-based interventions have been shown to assist individuals in replacing dysfunctional thinking patterns with more adaptive behavioral strategies (Ellis & Knaus, 1979; Knaus, 2010).

A systematic review by Salguero-Pazos & Reyes-de-Cózar (2023) examined 32 intervention studies to reduce academic procrastination. Most of these interventions were conducted with university students, with 90% focusing on developing self-regulation skills. However, only 3% targeted anxiety levels directly, 6% addressed personality traits, 18.7% focused on self-esteem, and 28.2% targeted self-efficacy. For example, Fabiani Bendicho et al. (2017) developed an augmented reality-based intervention designed to enhance motivation and sustain attention among students. Blouin-Hudon and Pychyl (2017) utilized a future-self continuity-based guided imagery approach to reduce procrastination. Additionally, Davis and Abbitt (2013) reported that interventions delivered via short message services helped students complete tasks on time. These findings suggest that comprehensive programs addressing

cognitive, emotional, and motivational components can effectively reduce academic procrastination among university students. Therefore, it is recommended that interventions implemented in university settings incorporate multidimensional variables such as self-regulation, self-efficacy, anxiety management, and motivation.

With technological advances, the landscape of psychological support has also evolved. Internet-based interventions are now widely used not only in clinical contexts but also to address academic and behavioral issues. Self-help interventions are structured approaches that individuals can implement independently or with limited professional guidance to cope with their problems and enhance their well-being. These interventions are typically categorized as either unguided or guided; in unguided approaches, individuals proceed independently, whereas guided approaches involve minimal professional support (Andersson et al., 2008; Cuijpers et al., 2013; Titov et al., 2011).

The digitalization of self-help interventions has increased their accessibility, enabling structured content to be delivered within a predefined protocol. This allows individuals to receive systematic support tailored to their needs (Andersson & Titov, 2014). Features such as anonymity, low cost, and flexibility in time and location make these applications a practical alternative to traditional face-to-face therapy (Barak et al., 2009). Internet-based interventions have proven effective across various domains, including depression, anxiety, stress management, eating disorders, and smoking cessation. Supported by user-friendly interfaces, such programs are increasingly reaching broader populations while also fostering the development of self-regulation and psychological resilience (Andersson, 2009; Barak et al., 2008; Christensen et al., 2004; Cuijpers et al., 2010; Karyotaki et al., 2021).

In recent years, various internet-based interventions have been developed to help university students cope with procrastination behaviors. Rozental et al. (2015) demonstrated that both the guided and unguided versions of a CBT-based online self-help program effectively reduce procrastination. Gagnon et al. (2019) found that a web-based Acceptance and Commitment Therapy intervention was effective in reducing academic procrastination, while Eckert et al. (2018) reported significant reductions in procrastination through the SMS-supported “ON TOP” program. Zhou and Wang (2023) evaluated the effectiveness of a 12-session CBT-based intervention through a randomized controlled trial. Similarly, Amarnath et al. (2023) developed a guided online intervention that targeted not only procrastination but also depression, anxiety, and quality of life. In the large-scale “Focus” study conducted by Åsberg and Bendtsen (2023) with 2,209 university students, a single-session digital intervention was tested but did not yield significant differences compared to the control group. Lastly, a systematic review by Kirchner-Krath et al. (2025) classified digital interventions into five design archetypes and emphasized that personalized and low-threshold solutions may be

particularly effective for university students. These studies indicate that internet-based interventions offer flexible, accessible, and practical frameworks for addressing procrastination, although they vary significantly in content, duration, and level of guidance.

In Turkey, internet-based interventions remain a relatively new area of research. The existing literature primarily consists of reviews and theoretical studies (Özer & Köksal, 2023), while empirical studies evaluating their effectiveness are still limited. Some research has examined the efficacy of interventions targeting obsessive-compulsive disorder (OCD) and COVID-19-related stress. For example, Akın Sarı et al. (2022) developed a mobile application that effectively alleviated OCD symptoms during the COVID-19 pandemic. Similarly, Göcek Yorulmaz (2020) created an internet-based CBT self-help program that reduced OCD symptoms. However, the limited number of such studies highlights the need for further research. Examples of internet-based psychological interventions in Turkey include the CBT-based online support platform developed by Özer and Ceyhan (2021) and programs such as UNIPDES. Özer et al. (2024) focused on user profiling. In addition, an attitude scale toward internet-based interventions has also been developed and introduced into the literature (Özer et al., 2024). Despite these contributions, no structured and locally developed internet-based intervention program currently targets procrastination behavior in Turkey. While these studies provide an important foundation for the expansion of internet-based psychological interventions at both the individual and societal levels, more research is needed to improve their acceptability and effectiveness.

Internet-based applications offer advantages in terms of time and cost efficiency, enhance access to mental health services, and serve as important tools for reaching wider populations (Dülsen et al., 2020). However, much of the literature reveals that these interventions are provided through paid software or become inaccessible after project completion, limiting their sustainability and scalability. In the present study, a guided intervention was designed using the widely accessible Google Docs infrastructure. The literature also notes that most internet-based programs offer unguided or minimally supported content (Özer & Ceyhan, 2021). In this context, implementing a guided internet-based system is believed to enhance intervention effectiveness. This study represents one of the pioneering practices in internet-based self-help interventions. While most existing programs are either paid or provide limited access, the developed system offers a free and continuously accessible intervention through Google Drive, thereby overcoming common barriers. With its guided and structured content, the program provides users with sustainable support and contributes to the field by offering a low-cost, accessible mental health service model.

The "Ertele-Me" program was developed based on the Cognitive Behavioral Therapy approach, synthesizing the theoretical frameworks of Ellis's Rational Emotive Behavior

Therapy and Beck's Cognitive Therapy (Ellis & Knaus, 1979; Beck, 2014). The program conceptualizes procrastination not merely as a time management deficit, but as a multidimensional pattern linked to perfectionism, fear of failure, and irrational beliefs involving "musts" that lead to the avoidance of task-related anxiety. The core therapeutic mechanism is structured according to Ellis's ABC model, targeting cognitive evaluations that prioritize immediate task-related relief at the expense of long-term goals. The design of the modules was further informed by evidence-based internet-based CBT interventions for procrastination, particularly the works of Rozental et al. (2014, 2015).

Accordingly, the primary objective of this pilot study is to develop and evaluate the feasibility and preliminary effectiveness of the 'Ertele-Me' program—a guide-supported, internet-based intervention—in reducing procrastination behaviors and improving associated psychological outcomes among university students. To achieve this objective, the study seeks to answer the following research questions:

Does the guided internet-based "Ertele-Me" program lead to a significant reduction in procrastination scores from pre-test to post-test within the experimental group?

Is there a significant difference in the post-test procrastination scores between the experimental group and the control group?

Are there statistically significant differences in post-test scores of secondary outcomes (depression, anxiety, stress, and time management) between the experimental and control groups?

Method

Research Design

This study employed a quasi-experimental pilot study design to evaluate the effectiveness of Ertele-Me, a guided internet-based intervention program based on Cognitive Behavioral Therapy (CBT), aimed at reducing procrastination behaviors among university students. A pretest-posttest control group design, a commonly used subtype of experimental methodology, was employed to assess the program's impact. Participants in both the experimental and control groups were evaluated using procrastination-related measurement tools administered before and after the intervention.

According to the literature, pretest-posttest control group designs are widely used in psychological research to assess an intervention's direct effects and enhance the statistical validity of the findings (Creswell & Creswell, 2018/2021; Cohen et al., 2002). This study seeks to make a unique contribution by examining the impact of internet-based CBT interventions on procrastination behaviors.

Participants

The study sample consisted of 26 university students enrolled at a public university during the 2023–2024 academic year. All participants met the inclusion criteria and voluntarily agreed to take part in the study. Out of the 72 initial applicants, 46 were excluded based on the established criteria and procedural compliance. The final sample consisted of 26 eligible participants.

Inclusion Criteria:

- Providing informed consent for voluntary participation.
- Being an undergraduate student aged 18 years or older.
- Having internet access and a Gmail-affiliated email address.

Exclusion Criteria:

- Currently receiving professional psychological or psychiatric treatment.
- Having a self-reported psychiatric diagnosis.
- Failing to complete the pre-test assessments or dropping out during the initial enrollment and baseline phase.

Participants meeting the inclusion criteria were assigned to the experimental (n = 13) and control (n = 13) groups based on their order of enrollment. To maintain balance between groups, participants were alternately assigned to each group in the order they completed the pre-test assessments.

In both groups, there were eight female and five male participants, indicating a higher proportion of female students. Participants' ages ranged from 18 to 26 years. The mean age in the experimental group was approximately 20.8 years, while the mean age in the control group was 23.4 years. The youngest participant in the experimental group was 18 years old, and the oldest was 24 whereas the control group's age range was between 20 and 26 years.

Regarding prior psychological support, 84.6% of participants in both groups reported that they had never received professional help. Only two students in each group (15.4%) had previous experience with psychological services, although none of them were receiving therapy at the time of the study.

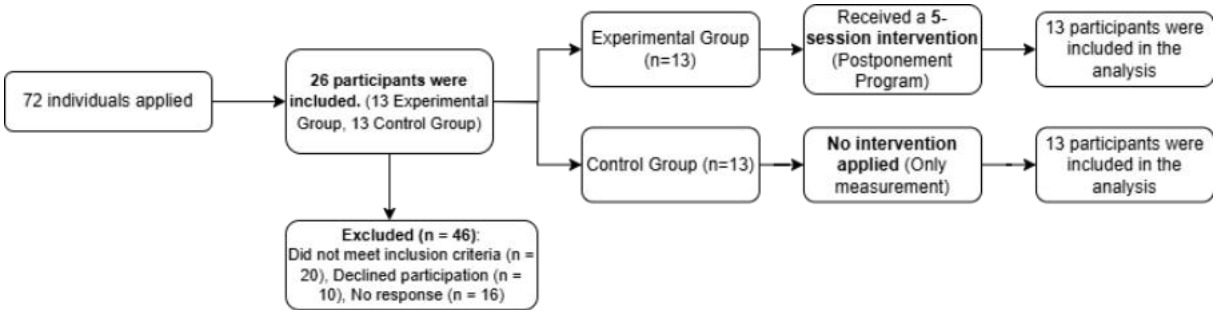


Figure 1.

Flowchart of The Study Procedure

Data Collection Tools

This study employed various measurement tools to collect participant data and assess key psychological and behavioral variables. These tools aimed to evaluate participants' demographic characteristics, levels of procrastination behavior, emotional states, and time management skills. The data collection instruments are detailed below:

Personal Information Form 1. The researcher developed this form to collect detailed demographic information, including participants' age, gender, academic program, year of study, history of psychological support, and any psychiatric diagnoses. The purpose of this form was to provide an overview of the participants' background and to define the study group's general profile.

Depression Anxiety Stress Scale-21 (DASS-21) 2. Originally developed by Lovibond and Lovibond (1995) and adapted into Turkish by Yılmaz et al. (2017), this scale measures levels of depression, anxiety, and stress. It consists of 21 items, with each of the three subscales (depression, anxiety, and stress) containing seven items. The scale uses a 4-point Likert-type scoring system to assess emotional symptoms experienced during the past week. Scores are calculated by summing the relevant items, with each subscale having its threshold for meaningful interpretation. The Cronbach's alpha coefficients for the depression, stress, and anxiety subscales were reported as .86, .80, and .86, respectively (Yılmaz et al., 2017).

Tuckman Procrastination Scale (TPS) 3. Originally developed as a 16-item unidimensional scale to assess procrastination tendencies (Tuckman, 1991), the Tuckman Procrastination Scale has been widely used across various populations. The Turkish adaptation of the scale was first conducted by Uzun Özer et al. (2009), resulting in a 14-item, five-point Likert-type version. Scale scores are calculated by averaging item responses, with higher scores indicating a stronger tendency to procrastinate. The scale demonstrates high internal consistency, with a reported Cronbach's alpha of .90 (Uzun Özer et al, 2009; Tuckman, 1991).

Time Management Questionnaire (TMQ) 4. Developed by Britton and Tesser (1991) and adapted into Turkish by Alay and Koçak (2002), this questionnaire evaluates

individuals' time management skills. It assesses competencies in planning, goal setting, prioritization, and organizing activities. Higher total scores indicate better time management abilities. The original scale reported a Cronbach's alpha of .86, while the Turkish version demonstrated an internal consistency coefficient of .88 (Alay & Koçak, 2002; Britton & Tesser, 1991).

Procedure

The study's implementation followed a systematic process consisting of three main stages: pre-test, intervention, and post-test.

Pre-Test: At the outset of the study, all participants in the experimental and control groups completed the Depression Anxiety Stress Scale (DASS-21), Tuckman Procrastination Scale (TPS), and Time Management Questionnaire (TMQ). These instruments provided baseline data to assess the participants' initial levels and served as a foundation for evaluating the impact of the intervention program.

Intervention Program: Participants in the experimental group received the Ertele-Me program, a five-week guided internet-based intervention grounded in Cognitive Behavioral Therapy (CBT). The program aimed to reduce procrastination and was delivered as one module per week, each requiring approximately 30–40 minutes to complete. The content focused on understanding procrastination, improving self-regulation and time management skills, and addressing procrastination-related excuses.

After completing each module, participants received guidance from a facilitator, which allowed them to reflect on the process, discuss difficulties, and consolidate the strategies they had learned. This guided support helped participants maintain their motivation and effectively apply the techniques introduced in the program. The content of the intervention modules that comprised the program is presented in Table 1 within the literature section.

Control Group: Participants in the control group were informed during the pre-test phase that the intervention would be made available to them at a later date. They received no treatment or intervention during the five-week study period. To maintain engagement and ensure fairness, all control group participants were granted free access to the complete Ertele-Me program materials immediately following the completion of their post-test assessments.

Each module was designed to target specific cognitive and behavioral mechanisms implicated in procrastination. Module 1 (What is Procrastination?) aimed at psychoeducation and awareness — targeting the irrational beliefs and low self-awareness that underlie procrastinatory behavior (Ellis & Knaus, 1979). Module 2 (Self-Regulation and Time Management) targeted deficits in self-regulatory capacity and goal-setting, consistent with the role of self-regulation in procrastination (Tuckman, 1991; Britton & Tesser, 1991). Module 3

(CBT and Coping with Procrastinatory Thoughts) addressed cognitive distortions and the procrastination cycle via the ABC model, targeting dysfunctional thought patterns and avoidance behavior (Beck, 2014). Module 4 (Behavioral Strategies) focused on behavioral activation and task initiation, targeting avoidance and delay through structured behavioral techniques. Module 5 (Maintaining Gains) targeted relapse prevention and the consolidation of adaptive coping strategies. This module-to-mechanism mapping reflects the program's theoretical coherence and supports its reproducibility.

Table 1.

Module Content

	Module	Content
1	What is Procrastination?	The concept of procrastination, causes of procrastination, its effects, prevalence, goal setting, and prioritization
2	Self-Regulation and Time Management	Self-regulation, setting rational goals, and time management
3	Cognitive Behavioral Therapy and Coping with Procrastinatory Thoughts	Cognitive Behavioral Therapy, procrastination assumptions, the procrastination cycle, examining procrastination-related evidence, self-motivation
4	Behavioral Strategies	Behavioral evaluation of procrastination, doing it now instead of delaying, behavioral strategies for overcoming procrastination
5	Maintaining Gains	Evaluating procrastination behavior, reviewing the procrastination cycle, assessing the sustainability of achieved gains

The content of the modules was structured to provide users with both informative and interactive experiences. As illustrated in Figure 2, each module includes explanatory texts that introduce the topic, accompanied by illustrations to provide visual support. Additionally, as Figures 3 and 4 exemplified, interactive sections were designed to encourage users' active participation. These sections allow users to write responses and personalize the process by selecting various options. Such components aim to enable users to engage in reflection, evaluation, and practical application directly. Moreover, as shown in Figure 5, animation-based content was incorporated to enhance users' attention, promote a clearer understanding of abstract concepts, and support active involvement in the learning process through visual and auditory elements.

MODÜL 1-Ertelemeyi Anlama

Merhaba;

Erteleme davranışı ile başa çıkmak amacı ile geliştirilen ERTELE-ME programının ilk modülüne hoş geldiniz. Bu modül aşağıdaki bölümlerden oluşmaktadır.

a. Erteleme kavramı
b. Ertelemenin nedenleri,
c. Ertelemenin etkilerini, yaygınlığı,
d. Hedef belirleme

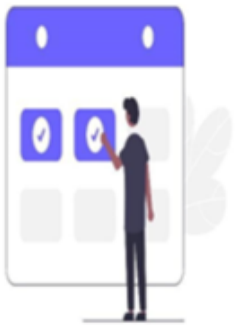
Bu program içerisinde kendi kendinize yapacağınız uygulamalar sayesinde ertelemeyi daha yakından tanıyacak ve erteleme davranışınız üzerine çalışabileceksiniz.

Asağıdaki linke tıklavarak animasvonu izleverek baslavabilirsiniz.

Figure 2.
Sample Module Introduction

Bu tanımların hepsi erteleme için geçerli olabilir. Peki, siz ertelemeyi nasıl tanımlarsınız? "Son dakikacılık" olabilir mi? Sizin için hangi davranışlar erteleme anlamına geliyor? Lütfen yazın. Erteleme dediğinizde aklınızda ne canlanıyor?

Figure 3.
Sample Module Introduction



Bu süreç sayesinde, erteleme davranışınızı oluşturan temel durumları fark edeceksiniz. Elbette neleri ertelediğinizi biliyorsunuz, ancak ertelediğiniz davranışlar üzerine düşünmek ve bu sorulara yanıt vermek, davranışlarınızın farkına varmanıza yardımcı olacaktır. Daha sonra, kendinize bir eylem planı oluştururken hangi adımları seçmeniz gerektiği konusunda bu bilgiler size rehberlik edecektir.

Yapmam Gereken Görevler	Zamanında Yaparım	Erteleerim	Eğer erteliyorsanız bunun yerine neler yapıyorsunuz?

Figure 4.
Sample Module Introduction

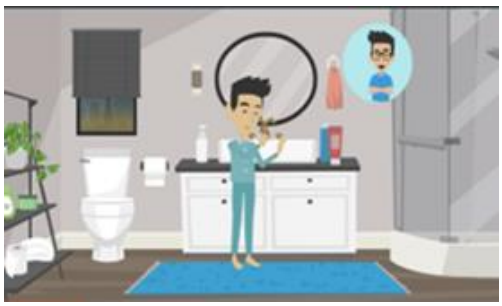


Figure 5.
Sample Module Introduction

Post-Test: Following the completion of the intervention program, all participants were reassessed using the Tuckman Procrastination Scale, the Depression Anxiety Stress Scale (DASS-21), and the Time Management Questionnaire. This stage aimed to evaluate the post-intervention changes among participants and to assess the effectiveness of the intervention program.

The assessment schedule was designed to capture changes over the course of the intervention. The baseline assessment was administered at Week 0, immediately before participants gained access to Module 1. To evaluate the intervention's impact, the post-test assessment was conducted at Week 5, immediately following the completion of the final (fifth) module.

Data Analysis

Due to the sample size being fewer than 30 participants in both the experimental and control groups, non-parametric statistical methods were preferred for data analysis. When the assumptions required for parametric tests cannot be met in small sample sizes, non-parametric methods provide more reliable results (Büyüköztürk et al., 2012). Accordingly, the Mann–Whitney U Test was used to examine the differences between the groups' pre-test and post-test scores, while the Wilcoxon Signed-Rank Test was employed to assess within-group changes. A total of 26 participants took part in the study, 13 in the experimental group and 13 in the control group, and the effectiveness of the Ertele-Me program on procrastination behavior was evaluated. A general overview of the scoring and evaluation points of the measurement tools used is presented in Table 2.

Table 2.

Study Design

	T_0	T_1
Demographic Information Form	X	
Tuckman Procrastination Scale	X	X
Time Management Questionnaire	X	X
Depression Anxiety Stress Scale-21 (DASS-21)	X	X

(T_0: Pre-Test, T_1: Post-Test)

Results

This section presents the results of the analyses conducted within the scope of the study. The primary aim of the research was to examine the effectiveness of Ertele-Me, an internet-based self-help intervention program designed to reduce procrastination behaviors among university students. The findings obtained in line with this objective are presented in Table 3.

Table 3.

Wilcoxon Signed-Rank Test Results for the Pre-Test and Post-Test Scores of the Experimental and Control Groups on the Tuckman Procrastination Scale (TPS)

Pairwise Comparisons	Ranks	*N*	Mean Rank	Sum of Ranks	*z*	*p*
Experimental Group Pre-Test vs. Post-Test	Negative Ranks	12	7.08	85.00	-2.766	.006
	Positive Ranks	1	6.00	6.00		
	Ties	0				
	Total	13				
Control Group Pre-Test vs. Post-Test	Negative Ranks	4	3.88	15.50	-1.564	.118
	Positive Ranks	7	7.21	50.50		
	Ties	2				
	Total	13				

*$p < .05$

In the experimental group, the difference between pre-test and post-test scores was found to be statistically significant (z = -2.766, p = .006). This finding indicates that participants in the Ertele-Me program showed a significant reduction in procrastination behaviors. However, as a within-group comparison, this change cannot be solely attributed to the intervention without considering alternative explanations. First, expectancy effects are possible, as participants who volunteered for a procrastination intervention likely expected to improve, which could create placebo-like effects. Second, natural maturation and time-related changes in the academic semester could have contributed to reduced procrastination. Without significant between-group differences, these alternative explanations cannot be ruled out. In contrast, no significant difference was observed in the control group between the pre-test and post-test scores (z = -1.564, p = .118). This suggests that procrastination behavior does not show a notable change through natural processes in the absence of intervention.

Table 4.

Wilcoxon Signed-Rank Test Results for the Experimental Group's Pre-Test and Post-Test Scores on DASS (Depression, Anxiety, and Stress Scale) and the Time Management Questionnaire

Pairwise Comparisons	Ranks	*N*	Mean Rank	Sum of Ranks	*z*	*p*
Anxiety Pre-Test vs. Post-Test	Negative Ranks	8	6.25	50.00	-0.865	.387
	Positive Ranks	4	7.00	28.00		
	Ties	1				
	Total	13				
Depression Pre-Test vs. Post-Test	Negative Ranks	7	6.29	44.00	-0.395	.693
	Positive Ranks	5	6.80	34.00		
	Ties	1				
	Total	13				
Stress Pre-Test vs. Post-Test	Negative Ranks	9	6.33	57.00	-1.421	.155
	Positive Ranks	3	7.00	21.00		
	Ties	1				
	Total	13				
Time Management Pre-Test vs. Post-Test	Negative Ranks	3	3.67	11.00	-2.413	.016
	Positive Ranks	10	8.00	80.00		
	Ties	0				
	Total	13				

*$p < .05$

As shown in Table 4, no statistically significant differences were found between the pre-test and post-test scores of the experimental group on the Anxiety, Depression, and Stress subscales. The Wilcoxon signed-rank test results were as follows. Anxiety (z = -0.865; p = .387), Depression (z = -0.395; p = .693), Stress (z = -1.421; p = .155). These findings indicate that the intervention did not produce statistically significant effects on these three psychological symptoms. However, for the Time Management Questionnaire (TMQ), the analysis revealed a statistically significant difference between the pre-test and post-test scores of the experimental group (z = -2.413; p = .016, r = 0.67). The effect size (r = 0.67) indicates a large effect, suggesting that participation in the intervention was associated with substantial improvements in time management skills among participants. For the DASS-21 subscales, effect sizes were small for anxiety (r = 0.24) and depression (r = 0.11), and medium for stress (r = 0.39), all non-significant.

Table 5.

Wilcoxon Signed-Rank Test Results for the Control Group's Pre-Test and Post-Test Scores on DASS (Depression, Anxiety, and Stress Scale) and the Time Management Questionnaire (TMQ)

Pairwise Comparisons	Ranks	*N*	Mean Rank	Sum of Ranks	*z*	*p*
Anxiety	Negative Ranks	6	6.25	37.50	-1.027	.304
Pre-Test vs. Post-Test	Positive Ranks	4	4.38	17.50		
	Ties	3				
Depression	Negative Ranks	5	7.60	38.00	-0.447	.655
Pre-Test vs. Post-Test	Positive Ranks	6	4.67	28.00		
	Ties	2				
Stress	Negative Ranks	5	5.20	26.00	-0.629	.529
Pre-Test vs. Post-Test	Positive Ranks	6	6.67	40.00		
	Ties	2				
Time Management (TMQ)	Negative Ranks	5	9.50	47.50	-0.668	.504
Pre-Test vs. Post-Test	Positive Ranks	7	4.36	30.50		
	Ties	1				

*$p < .05$

The control group did not show any significant differences in anxiety (z =-1.027, p = .304), depression (z = -0.447, p = .655), or stress (z = -0.629, p = .529). Likewise, no significant change was observed in time management scores (z = -0.668, p = .504). These results suggest

that, without intervention, participants' psychological symptoms and time management abilities remained stable.

Intergroup Comparisons

In order to examine the difference between the pre-test and post-test scores of the experimental and control group students on the Tuckman Procrastination Scale and to determine whether this difference is statistically significant, a Mann-Whitney U Test was conducted. The findings are presented in Table 6 below.

Table 6.
Mann-Whitney U Test Results for the Pre-Test and Post-Test Scores of the Experimental and Control Groups on the Tuckman Procrastination Scale

Group	*n*	Mean Rank	Sum of Ranks	*U*	*z*	*p*
Experimental Pre-Test	13	14.46	188.00	.545	-0.641	.521
Control Pre-Test	13	12.54	163.00			
Experimental Post-Test	13	11.15	145.00	.125	-1.569	.117
Control Post-Test	13	15.85	206.00			

*$p < .05$

According to the results of the Mann-Whitney U Test, there was no statistically significant difference between the pre-test scores of the experimental and control groups (U = .545, p = .521, r = 0.13), with a small effect size. Similarly, the comparison of post-test scores revealed no significant difference between the two groups (U = .125, p = .117, r = 0.31), although a medium effect size was observed. The medium effect size at post-test, despite non-significance, may suggest a trend that could reach significance with a larger sample, making this an important consideration for future adequately powered studies.

As presented in Table 7, the Wilcoxon Signed-Rank Test revealed a statistically significant difference between the pre-test and post-test scores of the experimental group for Procrastination (TPS) (z =-2.766, p = .006), with a large effect size (r = 0.77). Similarly, a significant improvement was observed in Time Management scores (z = -2.413, p = .016), also demonstrating a large effect size (r = 0.67). Regarding the DASS subscales (Anxiety,

Depression, and Stress), no statistically significant differences were found within the experimental group; however, a medium effect size was noted for Stress (r = 0.39), suggesting a potential clinical trend despite the lack of statistical significance.

Table 7.

Effect Sizes (r) for All Comparisons

Variable	Comparison	Z	p	r	Effect Size
Procrastination (TPS)	Exp. Pre-Post	-2.766	.006*	0.77	Large
	Control Pre-Post	-1.564	.118	0.43	Medium
	Groups Pre-test	-0.641	.521	0.13	Small
	Groups Post-test	-1.569	.117	0.31	Medium
Time Management	Exp. Pre-Post	-2.413	.016*	0.67	Large
Anxiety (DASS)	Exp. Pre-Post	-0.865	.387	0.24	Small
Depression (DASS)	Exp. Pre-Post	-0.395	.693	0.11	Small
Stress (DASS)	Exp. Pre-Post	-1.421	.155	0.39	Medium

Note. Effect sizes calculated as $r = Z/\sqrt{N}$. Interpretation: r = 0.10 (small), r = 0.30 (medium), r = 0.50 (large) (Cohen, 1988). *p < .05.

Conclusion, Discussion, and Recommendations

This study examined the effects of Ertele-Me, an internet-based self-help intervention program developed to reduce procrastination among university students. The findings revealed that participants in the Ertele-Me program showed a significant reduction in procrastination scores from pre-test to post-test. However, given the lack of statistically significant between-group differences at post-test (U = .125, p = .117), caution is warranted in attributing this change solely to the intervention. Alternative explanations such as natural fluctuations, Hawthorne effects, expectancy effects, or regression to the mean should be considered (Shadish et al., 2002). These preliminary findings from this pilot study suggest that the program shows promise and warrants further investigation with larger samples and enhanced experimental control. In particular, the improvement in self-regulation and time management skills among participants indicated that the intervention contributed to better task planning and completion. This study is unique in being the first self-help–based intervention program developed in Turkey specifically targeting procrastination behavior. Based on the principles of Cognitive Behavioral Therapy (CBT), the program was associated with positive within-group changes and, as a pilot study, provides preliminary evidence that may inform future research in this field.

Procrastination is widely acknowledged as a significant issue that adversely affects individuals' quality of life. In this context, expanding the availability and accessibility of guided internet-based interventions may enable a larger number of individuals to benefit from such services. Future studies with more extensive and more diverse samples and long-term follow-ups would increase the generalizability of these interventions. Given the limited availability of internet-based mental health services in Turkey and the financial and logistical barriers to accessing psychological support, there is a need for innovative solutions in this area. Traditional therapy approaches may not be accessible to all individuals due to time and location constraints, whereas internet-based interventions offer a flexible, cost-effective alternative with broad outreach potential. Most existing internet-based mental health projects in Turkey are either paid or accessible only for a limited time, creating significant barriers for low-income individuals. The system developed in this study, delivered through Google Drive, offers a continuously accessible and entirely free intervention. This removes economic barriers and facilitates access to psychological support services, particularly for students and those from lower-income groups. Moreover, the program's structured content and guided support help ensure the sustainability of participants' therapeutic engagement. Thus, this study makes an important contribution by offering a low-cost, accessible, and sustainable internet-based mental health intervention that addresses a significant gap in Turkey.

These findings align with the broader literature on procrastination interventions. Previous research has consistently demonstrated that structured, CBT-based programs can effectively reduce procrastination by targeting underlying cognitive and behavioral patterns (Rozental et al., 2015; Van Eerde & Klingsieck, 2018). The significant improvement in time management skills observed in the present study (z =-2.413, p = .016, r = 0.67) supports the theoretical framework proposed by Britton and Tesser (1991), who emphasized the critical role of time management in reducing procrastination. Importantly, while our within-group effects were substantial, they differ from Rozental et al.'s (2015) findings in that they did not achieve between-group significance, likely due to our smaller pilot sample. This highlights the need for adequately powered replication studies to confirm these preliminary and promising results.

In the literature, procrastination has been identified as a serious issue that negatively affects academic performance, quality of life, and mental health (Burka & Yuen, 1983; Steel, 2007). Academic procrastination, in particular, has been associated with elevated anxiety, fear of failure, and perfectionism (Kağan, 2009; Milgram et al., 1998; Sirois, 2013). Previous studies have also emphasized the role of time management and self-regulation skills as key determinants of procrastination (Britton & Tesser, 1991; Tuckman, 1991).

In this study, a significant improvement was observed in the Time Management Questionnaire scores of participants in the experimental group (z = -2.413, p = .016). This

suggests that participation in the Ertele-Me program was associated with improvements in time management skills, which may have contributed to more organized and planned behavior. However, no significant changes were found in levels of depression, anxiety, or stress ($p > .05$), indicating that the intervention primarily targeted behavioral changes rather than direct psychological symptoms. Consistent with this, Rozental et al. (2015) reported limited improvements in depressive symptoms despite effective procrastination reduction. It is important to note, however, that while Rozental et al. established these effects with significant between-group differences, the present pilot study observed these benefits primarily at the within-group level. Given the pilot nature of this study, the findings presented here should be regarded as preliminary. The observed within-group improvements, while promising, require confirmation through adequately powered randomized controlled trials with larger and more diverse samples before definitive conclusions about the program's effectiveness can be drawn.

Effect sizes provide important information about the practical significance of the observed changes. Within the experimental group, large effect sizes were observed for both procrastination reduction ($r = 0.77$) and time management improvement ($r = 0.67$), suggesting substantial within-group changes. However, the between-group comparison at post-test, while showing a medium effect size ($r = 0.31$), did not reach statistical significance ($p = .117$). This discrepancy between within-group effects and between-group comparisons highlights the preliminary nature of this pilot study. The medium effect size for the between-group difference, despite non-significance, may reflect insufficient statistical power due to the small sample size ($N = 26$). Based on this observed effect size, future studies would require approximately 84 participants per group to achieve 80% power at $\alpha = .05$ (calculated using G*Power). These effect size estimates provide valuable preliminary data for planning adequately powered randomized controlled trials.

The findings of this study are consistent with previous research. For instance, Andersson and Titov (2014) noted that guided internet-based interventions tend to be more effective than unguided ones. In the present study, guided support appeared to enhance participant engagement and support consistent module completion. Likewise, Barak et al. (2009) emphasized that user-friendly interfaces and the flexibility of internet-based programs enhance user accessibility.

Considering the limited number of studies in this area, this pilot research is notable for being among the first to demonstrate the feasibility and preliminary acceptability of implementing internet-based self-help interventions in the Turkish context. Programs that provide independence from time and location are especially valuable for university students dealing with busy academic schedules. However, the study also has certain limitations. Due to the small sample size, the generalizability of the findings is limited. Future studies should be

conducted with more extensive and more diverse samples to expand the knowledge base in this field. Considering the multidimensional nature of procrastination, including its cognitive, emotional, and behavioral aspects (Sirois, 2013, 2023), future interventions should adopt a more comprehensive approach to addressing these dimensions. Additionally, long-term follow-up studies are needed to assess the sustainability of such interventions. This pilot study provided preliminary evidence suggesting that internet-based, guided self-help interventions may be feasible and potentially effective for addressing procrastination in university students. However, applying these interventions to larger samples is essential for enhancing generalizability. Future research should also include different age groups to evaluate the effectiveness of the intervention across diverse populations. Longitudinal studies should be conducted to examine the long-term sustainability and lasting effects of internet-based programs.

It is also recommended that intervention programs be developed for other psychological challenges such as depression, perfectionism, social anxiety, and addiction. The effectiveness of these programs should be evaluated, and modules targeting the enhancement of self-regulation, time management, and stress coping skills should be integrated. Ensuring data privacy and security is a critical component of internet-based interventions. Collaboration with IT experts can help create safe environments for users to access these services. Integrating internet-based interventions into counseling services and promoting guided implementations is recommended for practitioners. Guided support increases participants' motivation and enhances program effectiveness. Gathering regular participant feedback and strengthening support mechanisms are also essential for maintaining engagement. University counseling centers, in particular, can play a key role in promoting these programs and ensuring wider student access.

This study is subject to several limitations. It was conducted with a limited sample group possessing specific characteristics, and the findings are confined to this population. Results were evaluated based on the variables and instruments used; other variables and methods were not included. The intervention program was based on a CBT-informed self-help approach and delivered solely in a guided format. Therefore, the assistance and techniques provided were limited to this framework. Moreover, since the program was delivered via Google Docs, its implementation is restricted to the capabilities of that digital platform. A further analytical limitation concerns the absence of a formal group × time interaction test. Effects were examined through separate within-group (Wilcoxon Signed-Rank Test) and between-group (Mann-Whitney U Test) comparisons rather than an interaction-based approach (e.g., mixed-model ANOVA or non-parametric alternatives such as the Aligned Rank Transform), which limits the extent to which differential change between groups can be

directly attributed to the intervention. This analytical constraint should be taken into account when interpreting the present findings, and future studies with larger samples are recommended to adopt interaction-based designs.

Declaration of Authors' Contributions:
The study was designed, conducted, and reported by the first author under the supervision of the second and third authors.
Compliance with Ethical Standards:
This study was approved by the Ethics Committee of Kırşehir Ahi Evran University, Social and Human Sciences Research and Publication Ethics Committee (Decision No: 2022/09/24, Date: 22.11.2022 The approval can be verified via the official document verification system using the code 9A95DABD-7F9D-49C5-9737-77EFED304230 at https://www.turkiye.gov.tr/kaeu-ebys).
Conflict of Interest:
No conflict of interest exists for this manuscript for any of the authors.
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This study was conducted as part of Fadime Avşar's master's thesis.
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Üniversite Öğrencilerinde Erteleme Davranışını Azaltmaya Yönelik İnternet Tabanlı Rehberli Kendine Yardım BDT Programının Etkililiği: Yarı Deneysel Pilot Çalışma

Özet

Bu araştırma, üniversite öğrencilerinde yaygın olarak gözlenen ve akademik başarı ile psikolojik iyi oluşu olumsuz etkileyen erteleme davranışını azaltmaya yönelik, bilişsel davranışçı terapi (BDT) temelli bir internet tabanlı müdahale programı olan "Ertele-Me"nin etkililiğini incelemeyi amaçlamaktadır. Erteleme davranışı, bireylerin görev ve sorumluluklarını irrasyonel gerekçelerle ertelemesiyle tanımlanmakta ve kısa vadede rahatlama sağlasa da uzun vadede stres, kaygı, suçluluk ve akademik başarısızlık gibi olumsuz sonuçlara yol açmaktadır (Beutel ve diğerleri, 2016; Simpson ve Pychyl, 2009). Literatürde ertelemenin öz düzenleme ve zaman yönetimi becerileriyle yakından ilişkili olduğu, ayrıca başarısızlık korkusu, düşük öz yeterlik ve mükemmeliyetçilik gibi psikolojik faktörlerle bağlantılı olduğu belirtilmektedir. Bu nedenle, erteleme davranışının yalnızca bireysel bir alışkanlık değil, çok boyutlu ve psikolojik açıdan önemli bir sorun alanı olduğu kabul edilmektedir (Milgram ve diğerleri, 1998; Sirois, 2013; Sirois ve diğerleri, 2003; Van Eerde, 2003). Bu bağlamda geliştirilen Ertele-Me programı, öz düzenleme ve zaman yönetimi becerilerini geliştirmeye, erteleme ile ilişkili düşünce kalıplarını tanımlamaya ve bunlarla başa çıkmaya yönelik beş modülden oluşmaktadır. Program, katılımcılara ertelemenin nedenlerini tanıma, işlevsiz düşüncelerle başa çıkma, davranışsal stratejiler geliştirme ve kazanımları sürdürme becerileri kazandırmayı hedeflemiştir. Her modül, bilişsel-davranışçı teknikler ve etkileşimli içeriklerle desteklenmiştir. Çalışmaya 72 üniversite öğrencisi başvurmuş, dahil edilme kriterlerine uygun 26 öğrenci olarak deney (N = 13) ve kontrol (N = 13) gruplarına atanmıştır. Deney grubuna beş hafta süren çevrim içi rehber destekli müdahale uygulanmış; kontrol grubuna ise herhangi bir müdahale sunulmamıştır. Veri toplama sürecinde Tuckman Erteleme Davranışı Ölçeği (TEÖ) (Tuckman, 1991), Depresyon, Anksiyete ve Stres Ölçeği (DASS-21) (Lovibond ve Lovibond, 1995; Yılmaz ve diğerleri, 2017) ve Zaman Yönetimi Ölçeği (ZYÖ) (Britton ve Tesser, 1991; Alay ve Koçak, 2002) kullanılmıştır. Uygulama öncesi ve sonrası yapılan ölçümler, deney grubunda erteleme davranışlarında anlamlı azalma ve zaman yönetimi becerilerinde iyileşme olduğunu ortaya koymuştur. Wilcoxon İşaretli Sıralar Testi sonuçlarına göre, deney grubundaki ön test ve son test TEÖ puanları arasındaki fark istatistiksel olarak anlamlı bulunmuştur (z = -2.766, p = .006). ZYÖ puanlarında da anlamlı bir artış gözlenmiştir (z = -2.413, p = .016). Buna karşın, DASS-21 alt ölçeklerinde (depresyon, anksiyete, stres) anlamlı bir değişiklik tespit edilmemiştir. Kontrol grubunda ise hiçbir ölçekte anlamlı bir değişim bulunmamıştır. Ayrıca gruplar arası karşılaştırmalarda (Mann-Whitney U

Testi) son test puanları açısından anlamlı bir fark gözlenmemiştir. Bu sonuçlar, müdahale programının bireysel düzeyde etkili olduğunu ve özellikle zaman yönetimi becerilerinin geliştirilmesinde katkı sağladığı ifade edilmiştir. Katılımcılar, her modülün ardından rehber ile süreci değerlendirerek stratejileri geri bildirim alma fırsatı sağlamıştır. Bu çalışmanın özgünlüğü, Türkiye'de erteleme davranışını başa çıkmak için geliştirilen bir internet tabanlı müdahale programının ilk örneklerinden biri olmasından kaynaklanmaktadır. Ayrıca, kullanılan müdahale tamamen ücretsiz ve Google Drive altyapısı üzerinden erişilebilir olarak tasarlanmıştır. Bu yönüyle çalışma, maliyet etkinliği ve erişilebilirlik açısından önemli bir model sunmaktadır. Geleneksel yüz yüze terapilere alternatif oluşturabilecek rehberli kendi kendine yardım uygulamaları, özellikle zaman ve mekan kısıtlılığı yaşayan bireyler için etkili bir destek mekanizması olarak değerlendirilmektedir. Programın düşük maliyetli, erişilebilir ve özellikle zaman yönetimi becerilerinin geliştirilmesinde etkili bir araç sunduğunu göstermektedir. Bu bulgular, literatürdeki benzer çalışmalarla da uyumludur (Andersson ve Titov, 2014; Barak ve diğerleri, 2009; Rozental ve diğerleri, 2015). Araştırmanın sınırlılıkları arasında küçük örneklem büyüklüğü ve kısa süreli izlem süresi yer almaktadır. Bulguların genellenebilirliğini artırmak için gelecekte daha büyük ve çeşitlendirilmiş örneklemlerle uzun vadeli çalışmalar yürütülmesi önerilmektedir. Ayrıca, müdahale programına psiko eğitsel içeriklerin yanı sıra duygu düzenleme ve motivasyon artırma gibi modüller de eklenerek etkisi artırılabilir. Sonuç olarak, Ertele-Me programı üniversite öğrencilerinin erteleme davranışlarını azaltmada etkili, düşük maliyetli ve erişilebilir bir çözüm sunmaktadır. Türkiye'de bu alanda yürütülecek yeni araştırmalar için önemli bir başlangıç noktası oluşturmaktadır. Programın, üniversite danışma merkezleri ve ruh sağlığı profesyonelleri tarafından kullanılarak daha geniş öğrenci gruplarına ulaştırılması, akademik başarıyı ve psikolojik iyi oluşu destekleyecek önemli bir adım olacağı varsayılmaktadır.