



The effect of self-help intervention based on acceptance and commitment therapy on depression, anxiety, stress and psychological flexibility levels in Turkish university students: a mixed model analysis

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Abstract

The aim of this study is to develop a self-help intervention based on acceptance and commitment therapy; to examine the effect of the self-help intervention on the depression, anxiety, stress, and psychological flexibility levels of university students; and to examine their experiences. In this study, we used a mixed explanatory basic design. In the quantitative part of the study, we used a 2 (experimental and control group) x 3 (pretest-posttest and follow-up test) experimental design. The participants consisted of 47 university students. The experimental group received a 7-week guided self-help intervention based on acceptance and commitment therapy, whereas the control group received no intervention. Participants completed a Personal Information Form, Depression Anxiety and Stress Scales-42, and Acceptance and Action Questionnaire-II. We conducted semi structured interviews to examine the experiences of participants in the experimental group. We analyzed the data using an independent samples *t* test, repeated measures ANOVA, one-way ANCOVA, and content analysis. According to the study's results, we found guided acceptance and commitment therapy-based self-help intervention decreased students' depression, anxiety, and stress levels and increased their psychological flexibility levels. The qualitative findings of the study revealed four general concepts: "difficulties experienced while implementing the intervention program," "prominent parts of the intervention program," "benefits of the intervention program," and "components of the intervention program." We discussed self-help experiences in light of the relevant academic literature.

Keywords Self-help · Acceptance and commitment therapy · College students · Depression · Anxiety · Stress · Psychological flexibility · Türkiye · Mixed method research

The transition to university represents a significant developmental period characterized by multiple simultaneous challenges, including first-time independence from family; adaptation to new urban environments and cultural contexts; and navigation of various personal, social, economic,

and academic stressors (Sheldon et al., 2021; Tanhan & Francisco, 2019; Tanhan & Young, 2022). Research indicates that these multifaceted challenges during the university transition period are significantly associated with higher levels of depression, anxiety, and psychological distress (Köksal & Topkaya, 2021). Studies show that the prevalence of mental health problems among university students is increasing (Lipson et al., 2019). Among these mental health problems, depression, anxiety, and stress are the most common (Ramón-Arhués et al., 2020). Students with mental health problems may experience problems such as difficulty in attending classes at school, problems in peer relationships, decreased academic performance, sleep problems, and loneliness (Alonso et al., 2018).

Free and systematic mental health services for university students in Türkiye are primarily provided through Guidance and Psychological Counseling Application and

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Research Centers (GPCARCs). However, these centers are not universally available across all universities (Camadan & Alpaydın, 2023). Even in institutions where GPCARCs exist, students face significant wait times due to an insufficient number of mental health specialists. In addition, studies show that university students are reluctant to seek mental health professionals for different reasons such as solving the problem personally, concerns about confidentiality, concerns that no one can help, fear of stigmatization, and economic costs (Bruffaerts et al., 2019; Topkaya, 2021). Considering the barriers to students receiving psychological help, different mental health interventions that mental health professionals can implement are necessary to reach students who need help (Lipson et al., 2019). At this stage, professional self-help interventions based on validated psychological approaches (e.g., cognitive therapy, acceptance and commitment therapy) stand out in overcoming students' mental health problems (Cuijpers & Schuurmans, 2007; Fledderus et al., 2012; Levin et al., 2017).

Self-help intervention is defined as a psychological treatment method in which the clients act independently on a standardized protocol (Cuijpers & Schuurmans, 2007). In this method, clients apply the intervention program developed with books, manuals, audio files, videos, or some combination of these formats (Gould & Clum, 1993). Many people prefer self-help intervention due to its lower economic cost, easier access (web, books, etc.), and the fact that it eliminates the risk of stigmatization by maintaining anonymity (Cuijpers & Schuurmans, 2007; Karyotaki et al., 2015). Self-help intervention is categorized into two different groups: guided (expert-assisted) self-help and unguided (nonexpert-assisted) self-help. Unguided self-help interventions involve no professional or nonprofessional support, and clients independently apply the self-help material (book, web-based application, etc.) on their own (Cuijpers & Schuurmans, 2007). In guided self-help, clients and the counselor communicate face-to-face, by phone, or by email (Cuijpers et al., 2010).

Research shows that guided self-help interventions are more effective than unguided self-help interventions are (French et al., 2017; Gellatly et al., 2007). Several other studies show that self-help interventions can be as effective as face-to-face psychotherapies in the treatment of mental health problems (Cuijpers et al., 2010; Gould & Clum, 1993). Researchers in a randomized controlled trial comparing Internet-delivered cognitive behavioral therapy (ICBT) to traditional face-to-face CBT for depression found no significant differences in treatment outcomes (Wagner et al., 2014). These findings align with Andersson et al.'s (2014) comprehensive meta-analysis that demonstrated comparable efficacy between guided ICBT and face-to-face CBT across multiple conditions, including social anxiety

disorder, panic disorder, depressive symptoms, body dissatisfaction, tinnitus, male sexual dysfunction, and specific phobia (spider phobia).

Researchers have observed that self-help interventions can be an effective method in treating mental problems such as depression (van't Hof et al., 2009), anxiety (Bluett et al., 2014), stress (Han & Kim, 2022), and increasing psychological flexibility (Thompson et al., 2021). Self-help interventions can be developed and applied based on different psychological counseling theories. Counselors frequently use acceptance and commitment therapy (ACT—Levin et al., 2017; Wersebe et al., 2018) to deal with mental health problems in self-help interventions. ACT's theoretical foundations are rooted in functional contextualism and relational frame theory, two philosophical and psychological frameworks that explain human language and cognition (Hayes et al., 2006). Functional contextualism is a philosophical framework that examines behavior through its contextual relationships and practical outcomes. This approach analyzes the environmental variables that control and maintain behaviors, with the explicit goal of developing precise, effective strategies for predicting and influencing actions in specific contexts (Biglan & Hayes, 1996). ACT explains the factors underlying an individual's psychological problems with the psychological inflexibility model, which comprises the following six interrelated dimensions (Hayes et al., 2006): (a) lacking contact with values, (b) cognitive fusion, (c) avoidance and impulsivity, (d) experiential avoidance, (e) attachment to the conceptualized self, and (f) loss of contact with present moment.

ACT conceptualizes human well-being and psychological vitality through the psychological flexibility model, which comprises six interrelated core processes: acceptance, cognitive defusion, contact with the present moment, self-as-context, values clarification, and committed action. In the ACT model, psychological flexibility is defined as the individual's ability to make more contact with the present moment and to change or persist in behavior in line with vital values (Hayes et al., 2006). A growing body of empirical evidence indicates that psychological flexibility serves as a protective factor against various psychopathological conditions, including mood disorders (depression), anxiety disorders, stress-related conditions, eating disorders, nicotine dependence, psychotic disorders, chronic pain, and substance use disorders (Fonseca et al., 2020; Landi et al., 2022; Pakenham et al., 2020; Ruiz, 2010). Meta-analysis studies show that ACT is an effective therapy method in the treatment of mental health problems in student and adult populations and increases individuals' psychological well-being (A-Tjak et al., 2015). Research indicates ACT-based self-help interventions effectively reduce depression, anxiety, and stress (Fledderus et al., 2012; Levin et al., 2017, 2020;

Muto et al., 2011; Wersebe et al., 2018) and increase psychological flexibility (French et al., 2017). A meta-analysis by French et al. (2017) of 13 studies ($N=2,580$) confirmed the effectiveness of ACT self-help in enhancing psychological flexibility. Thus, ACT practices offer a sustained approach to reducing distress and improving psychological flexibility.

In addition to ACT's six dimensions, self-compassion intervention, which researchers have frequently included in ACT-based self-help studies (Levin et al., 2018; McKay et al., 2020), is a component of the research intervention. Self-compassion has a buffering effect on depression and anxiety (Pullmer et al., 2019; Raes, 2010; Soysa & Wilcomb, 2015). In addition, avoidance and rumination (which can be considered as merging with thoughts) in the psychological inflexibility model play a mediating role in the relationship between self-compassion and depression (Krieger et al., 2013, 2016; Raes, 2010). Self-compassion is also significantly associated with psychological flexibility processes, including acceptance, dissociation, and making room for emotions (Marshall & Brockman, 2016).

In Türkiye, self-help interventions are a relatively new field with limited research. No self-help intervention research in Türkiye focuses on university students or aims to reduce their depression, anxiety, and stress symptoms and increase their psychological flexibility levels. In addition, to the best of our knowledge, there is no research on ACT-based self-help intervention and its effectiveness in Türkiye and insufficient information on the usefulness and preferences of Turkish university students regarding self-help intervention. As a result, there is a need for self-help interventions that will decrease the depression, anxiety, and stress levels of university students who have not received a clinical diagnosis and increase their psychological flexibility. The efficacy of self-help interventions fundamentally depends on their acceptability and feasibility among the target population. Systematic analysis of student feedback reveals critical success factors and potential barriers, thereby generating empirically grounded insights for optimizing future program design and implementation.

Our primary objective in this study was to evaluate the effect of ACT-based self-help intervention on university students' depression, anxiety, stress, and psychological flexibility levels. Our second objective was to examine students' self-help experiences. In line with these objectives, we sought answers to the following research questions:

(a) when the guided self-help intervention group based on the ACT approach is compared with the control group, is it effective in reducing university students' depression, anxiety, and stress levels and increasing their psychological flexibility levels?; (b) what are the experiences of the students who participated in the ACT-based guided self-help intervention?

Method

Research design

We used a mixed explanatory research design in this study. Our aim is to explain the quantitative findings obtained in the experimental process with qualitative findings by adding qualitative data to an experimental design process (Creswell & Poth, 2016). Figure 1 illustrates the research design's flow diagram.

Participants

The research participants consisted of 47 students at a university located in Türkiye's Central Black Sea Region in the 2022–2023 academic year. We selected the participants using the purposive sampling method. We conducted a priori power analyses using G*Power 3.1 (Faul et al., 2007) to determine the minimum required sample size. For the one-way ANCOVA with two groups and one covariate, assuming a medium effect size ($f=0.40$), power of 0.80, and $\alpha=0.05$, the required sample size was 52 participants. For the independent samples t test, assuming a large effect size ($d=0.80$), power of 0.80, and $\alpha=0.05$, a minimum of 42 participants was required. The repeated measures ANOVA calculation indicated that 43 participants would be sufficient to detect a medium effect size ($f=0.25$) with power of 0.95 and $\alpha=0.05$ (Faul et al., 2007). To recruit potential participants in the research, we created promotional materials about the ACT-based guided self-help program and posted them on the university's poster boards. We shared these promotional materials on the university's social media accounts and sent them to all students via SMS and email. As a result of the promotional activities, 259 students requested to participate in the guided self-help program. We evaluated all participants who applied according to the following inclusion

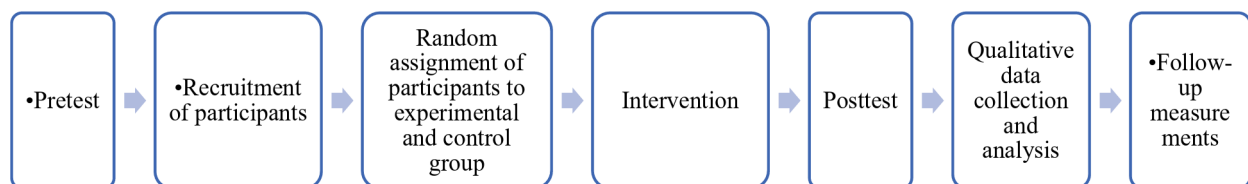


Fig. 1 Flow diagram of the research design

criteria: (a) being over 18 years of age and a university student; (b) not currently receiving professional mental health treatment from a psychologist, psychological counselor, or psychiatrist; (c) not having any psychiatric diagnosis in the past; (d) not currently taking any psychiatric medication; and (e) having symptoms of a mild or higher level in at least one of the depression, anxiety, and stress scores. We randomly assigned the 121 participants who met the inclusion criteria to the experimental group ($n = 61$) and the control group ($n = 60$) using the <https://www.randomizer.org/> web page.

Initially, there were 13 male (21.3%) and 48 female (78.7%) students in the experimental group and 14 male (23.3%) and 46 female (76.7%) students in the control group. As a result of early dropouts, we conducted the study's analyses with the participants who completed the pretest, posttest, and follow-up measurements. We examined whether there were statistically significant differences between those who dropped out and those who remained in terms of demographic characteristics and variables. We analyzed differentiation of dropout according to gender in the research group using the chi-square method. According to the results of the analysis, there was no significant relationship between gender and dropout ($\chi^2 = 0.688, p > .05$). We conducted an independent samples t test to examine the differences in depression, anxiety, stress, and psychological flexibility pretest scores and age differences between early dropout and non-dropout participants. There was no significant difference between the mean pretest scores of depression ($t[119] = 0.20, p > .05$), anxiety ($t[119] = 1.58, p > .05$), stress ($t[119] = 0.62, p > .05$), psychological flexibility ($t[119] = 0.52, p > .05$) of either category. There was also no significant difference in terms of age variable ($t[119] = 1.07, p > .05$). As a result, we conducted the analyses with 22 participants in the experimental group and 25 participants in the control group. There were four male (18.2%) and 18 female (81.8%) students in the experimental group and five male (20%) and 20 female (80%) students in the control group. The ages of the participants in the experimental group ranged between 18 and 28 years, with a mean age of 22.05 years ($SD = 2.69$). The ages of the participants in the control group ranged between 18 and 26 years, with an average age of 21.48 years ($SD = 2.14$).

Control group participants were informed that, due to capacity limits and random selection, they could not join the self-help intervention. They were encouraged to seek professional support if needed and were provided with campus mental health resource contacts. After completing study assessments, they gained access to the intervention. To gather in-depth data about participants' experiences during the intervention, we conducted individual semi structured interviews with eight participants from the experimental group who responded to email invitations. The interview

sample comprised six women and two men. Figure 2 illustrates the key stages involved in forming the experimental and control group.

This research adhered to the Declaration of Helsinki and ethical guidelines for human research. The study protocol and procedures were approved by Ondokuz Mayıs University's Ethics Committee (approval date: October 22, 2021; protocol number: 2021 – 815). All participants were informed about the study, provided written consent, and their data was handled with confidentiality and anonymity, complying with data protection regulations.

Measures

Personal information form

We used the Personal Information Form developed by the researchers to collect information about the participants' sociodemographic characteristics. In this form, we also asked participants to provide information about their gender, age, grade level, department of education, and whether they had received mental health treatment before.

Depression anxiety and stress scale (DASS-42)

We used Lovibond and Lovibond's (1995) Depression, Anxiety and Stress Scale (DASS-42) to measure participants' depression, anxiety, and stress levels. The scale adapted into Turkish by Bilgel and Bayram (2010) has three subscales: depression, anxiety, and stress. The scale has 14 items in each subscale and 42 items in total. Each item is scored between 0 (Did not apply to me at all) and 3 (Applied to me very much, or most of the time) on a 4-point Likert-type scale. A minimum score of 0 and a maximum score of 42 can be obtained in each subscale, and the scores considered within the normal range are 0–9 for depression, 0–7 for anxiety, and 0–14 for stress. Scores above these ranges indicate that the symptoms of depression, anxiety, or stress vary from mild to very severe, depending on the cut-off score. In this study, Cronbach's alpha was 0.94 for depression, 0.90 for anxiety, and 0.91 for stress in screening study. A sample item from the depression subscale is "I couldn't seem to experience any positive feeling at all" a sample item from the anxiety subscale is "I felt scared without any good reason" and a sample item from the stress subscale is "I found it difficult to relax".

Acceptance and action questionnaire-II

We used Bond et al.'s (2011) Acceptance and Action Questionnaire (AAQ-II) to assess the participants' psychological flexibility levels. Yavuz et al. (2016) conducted the

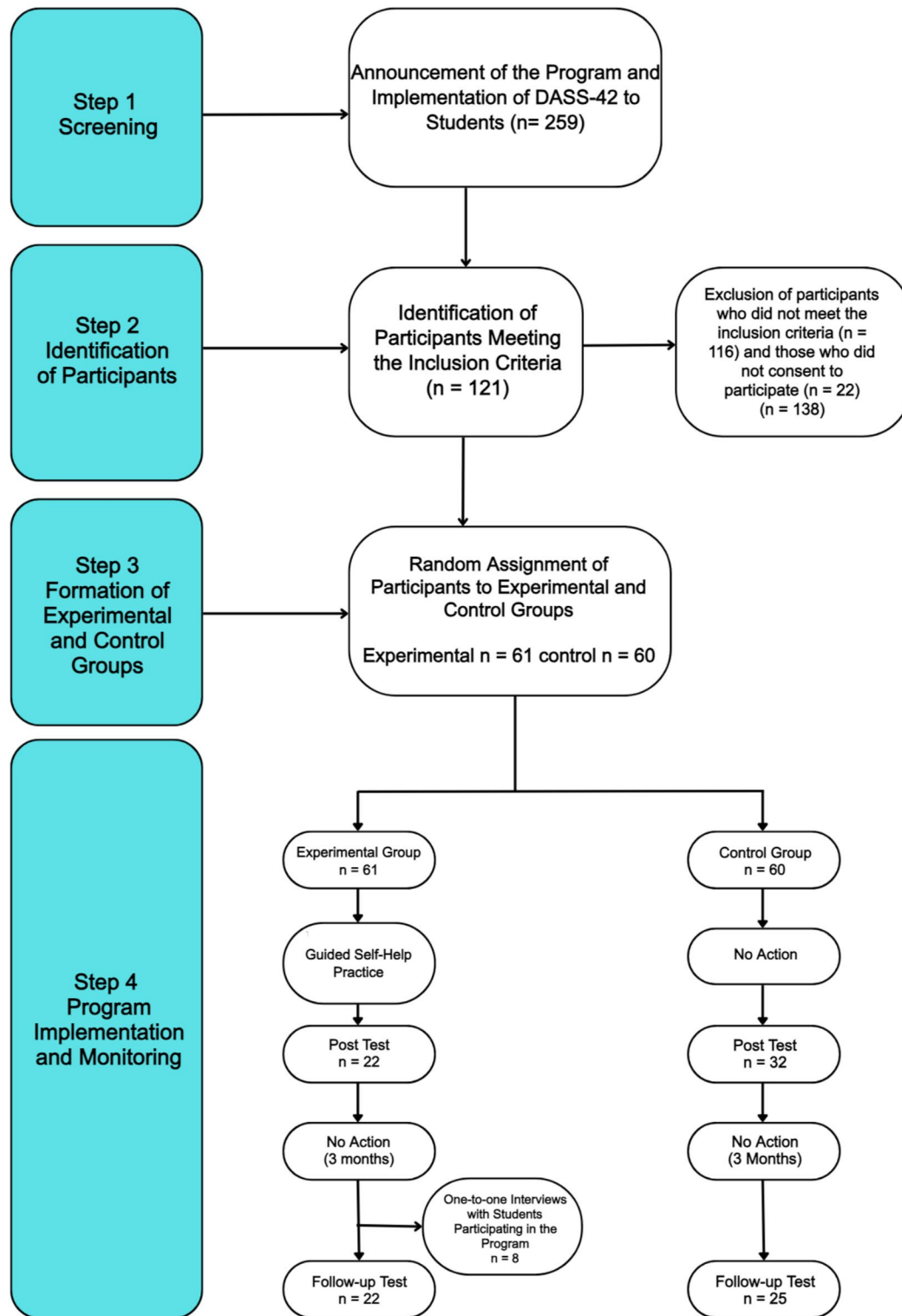


Fig. 2 Research process flow chart

adaptation, validity, and reliability study of the scale into the Turkish language. The Turkish AAQ-II comprises seven items structured as a unidimensional scale. Each item employs a 7-point Likert-type response format ranging from 1 (never true) to 7 (always true). The total score ranges from 7 to 49. All items are reverse-scored, with higher total scores indicating greater psychological rigidity and lower scores reflecting greater psychological flexibility. We determined the scale's Cronbach's alpha as 0.88 in the screening study. A sample item from the scale is "My painful memories prevent me from having a fulfilling life."

Semi structured interview form

We used an open-ended semi structured interview form consisting of 10 questions created by the researcher in individual interviews to better understand and explain the participants' ideas and experiences about the experimental process after the guided self-help intervention. The questions in the form are as follows:

- (1) What are the aspects of the self-help program that you find useful?
- (2) What are the aspects of the self-help program that you find useless?
- (3) Which problems in your life do you think you were able to cope with more effectively after the self-help program?
- (4) What were the changes you noticed in yourself after the self-help program?
- (5) How do you think the fact that the process was online and relatively anonymous rather than talking to someone face-to-face affected the process?
- (6) What were the issues you had difficulties or challenges with during the self-help program?
- (7) When you face difficulties in your life, which of the skills you learned during the self-help process do you use?
- (8) What do you think about the duration and length of the self-help program?
- (9) What were the factors that made it difficult for you to continue the process?
- (10) How useful did you find the email support and how did it affect you?
- (11) Would you participate in this self-help program again if you had the opportunity? (a) No, I would definitely not participate; (b) I would not participate; (c) I am not sure; (d) I would participate; (e) Yes, I would definitely participate.

Self-help intervention content and implementation process

The development of the intervention was informed by a comprehensive review of ACT literature, including both theoretical frameworks and evidence-based self-help manuals (Clifford, 2020; DuFrene & Wilson, 2012; Eifert & Forsyth, 2005; Forsyth & Eifert, 2016; Gordon et al., 2019; Gustafson, 2020; Harris, 2022; Hayes et al., 1999; Hayes & Smith, 2005; McKay et al., 2020; Yadavaia et al., 2014). The content of the intervention program included the six dimensions of ACT's model of psychological flexibility. Table 1 presents the sections of the intervention program, the aims of the sections, and a sample activity within the sections.

In each section of the intervention program, we covered a dimension in the psychological flexibility model (we added self-compassion as a different dimension). We prepared the intervention program in e-book format and created the content of each section of the program as a writable PDF file. We sent the content of each chapter to the participants as a weekly email and asked them to work on this chapter within a 6-day period. The chapters generally started with a self-awareness exercise. In each chapter, we created an out-of-session activity, which we examined in the next chapter. The content of the chapters included psychoeducation based on metaphors, activities that the participants could fill in on their own, behavioral experiments, self-actualization exercises (audio), and end-of-chapter evaluations. After working on the content for the 6 days, the participants sent the content to the researcher via email. The researcher prepared motivational and informative email content for each participant individually regarding the content they filled in (problems experienced while implementing the program, participants' questions, fillable activities) and sent emails with the new section content. For instance, the content of the third section, the cognitive defusion section, proceeded as follows:

- (1) The chapter starts with an audio self-help exercise (<https://youtu.be/gG9lsaU3fKk>), which the participant can access with a QR code or link.
- (2) A summary of the topic covered in the previous chapter is presented.
- (3) Psychoeducation was given using metaphors about the thought production of the human mind.
- (4) Psychoeducation was given on methods of dissociating from thoughts.
- (5) An audio exercise on dissociation from thoughts is presented (<https://youtu.be/ix5b7ceTUbq>).
- (6) An activity was created for the individual to use cognitive defusion outside the session.
- (7) An end-of-session evaluation was taken, which comprised open-ended and structured questions assessing

Table 1 Sections, objectives, and sample activities of the intervention program

Week	Objective	Sample Activity
1. Section 1: Preparation and Control Agenda	1. To provide participants with information about the self-help process and to enable them to set personal goals. 2. Performing Antecedents, Behavior, Consequences (ABC) functional behavioral analysis to make participants aware of the control methods used to cope with or control internal unwanted experiences and the effects of these control methods.	ABC Functional Behavioral Analysis To reveal the relationship between premises (emotions, thoughts, body sensations, etc.), behavior and outcome (Ramnero & Törneke, 2008).
Section 2: Contact with Values	1. To enable participants to discover their values, to realize the relationship between their values and their current behaviors, and to determine the behaviors that they can perform in line with their values.	Spider Web Activity There are 10 different life domains in this activity (family, friends, career, etc.). The person scores the importance of these 10 areas and their behaviors to improve these areas separately on a scale of 0–10. The greater the difference between the importance and the behavior, the clearer it becomes which area to prioritize (developed by the authors).
Section 3: Cognitive Defusion	1. To recognize the dominance of verbal content over behavior, its power to govern behavior, and the dysfunctionality of accepting unwanted thoughts. 2. To enable participants to make the value–thought connection by understanding the methods of cognitive defusion.	Exploring Cognitive Defusion Methods (Harris, 2022). Presenting examples of dissociation methods such as thanking the mind, using the sentence structure “I think...,” labeling thoughts, concretizing the mind.
Section 4: Acceptance	1. To enable participants to make room for unwanted emotions, thoughts, and bodily sensations by establishing the connection between emotion and value.	The Miracle Box (Hayes et al., 1999) Identifying the emotion they feel in an event that makes them uncomfortable, indicating whether they would like to get rid of this emotion, realizing which value this emotion is in contact with that is important to them, and finally indicating whether they would like to get rid of this emotion and the associated value. In this activity, students discover that the relationship between emotion and value is connected like the two sides of a coin.
Section 5: Awareness and Self	1. To enable participants to develop their skills of spontaneity by exploring the relationship between being in the present moment and emotions and thoughts. 2. To enable participants to experience the contextual self by realizing their judgments about their self.	Five Senses (Forsyth & ve Eifert, 2016) It is an exercise of awareness of the senses related to sight, smell, hearing, taste, and touch. It is the realization of a self-awareness exercise related to the observing self.
Section 6: Self-compassion	1. To analyze self-critical behavior, to realize the self-critical side of oneself, and to experience self-compassion.	The Compassionate Letter (McKay et al., 2020). The realization of the activity of letter writing from the point of view of a loyal friend who supports them with unconditional love no matter what.
Chapter 7: Value-oriented behaviors and a valuable life	To determine value-oriented behavior goals for life domains, change the behavior for possible setbacks in a valuable life process, and ensure the continuation of value-oriented behaviors.	The ship metaphor (Hayes et al., 1999) To discover the value-oriented journey and how thoughts and emotions on this journey can lead participants astray. Determine which stops will be short and long term on this journey.

participants' comprehension and engagement. Specifically, participants were asked to identify key points that captured their attention during the session, report any concepts they found unclear or challenging, and estimate the time required to complete the session.

We monitored participants through weekly follow-ups, during which they were required to submit their assigned section to the researcher. Any participant who failed to submit their section in a given week was classified as having withdrawn from the intervention program. For the guided support component, researchers developed a standardized email template focused on weekly ACT processes for each section. We evaluated participant responses specifically through the lens of ACT processes, and we prepared feedback based on these therapeutic principles. The email content incorporated therapeutic elements including positive reinforcement, support, and encouragement for participants' completed activities.

Data analysis

We used IBM SPSS Statistics version 23 software to analyze quantitative data. We performed an independent samples *t* test to compare students' depression, anxiety, stress, and psychological flexibility pretest scores in the experimental and control groups. We used one-way ANCOVA analysis to test whether there was a significant difference in the participants' posttest and follow-up scores in the experimental and control groups, respectively, when we controlled for pretest scores of depression, anxiety, stress, or psychological flexibility. We performed repeated measures ANOVA to examine the time-dependent change in student's depression, anxiety, stress, and psychological flexibility scores in the experimental and control groups. We examined the assumptions of normality, homogeneity of variances, homogeneity of regression slopes, and sphericity, which are the assumptions of the independent samples *t* test, one-way ANCOVA, and repeated measures ANOVA analyses, in the appropriate analyses and determined them to be met (Landau & Everitt, 2003). We reported the results of the analyses together with the effect size estimates and used the effect size classification that Cohen (1992) proposed.

In the qualitative part of the study, we conducted semi structured individual interviews to examine the experiences of the participants in the experimental group regarding the self-help intervention based on ACT. We audio-recorded the interviews with the permission of the participants and then transcribed them. We adopted the inductive content analysis method for systematic examination of qualitative data obtained from individual interviews (Patton, 2014). This method allows organizing and analyzing text data in

terms of code, category, and theme. A single researcher carried out data analysis and coded the transcribed raw data set by considering meaningful data units. The researcher organized the meaningful data units related to each code in the QDA Miner software. The researcher first coded the text data, created categories from the codes, and then sorted the categories into themes. To ensure methodological rigor, the researcher conducted member checking by providing participants with their interview transcripts and preliminary findings to verify the accuracy of the transcription and validate the researcher's interpretations of their experiences.

Validity and reliability

To ensure internal and external validity (Creswell & Poth, 2016; Patton, 2014), several measures were implemented. For internal validity, purposive sampling and inclusion/exclusion criteria were used to minimize subject differences, and participants were randomly assigned to groups. A larger initial sample size helped mitigate subject loss. External validity was enhanced by including diverse university students and delivering a guided self-help intervention with researcher-provided expert support. Intervention content was based on ACT principles, ensuring integrity. Qualitative credibility was addressed through participant confirmation of interview transcripts, expert review of coding and transcripts by a counseling expert, and intensive description using direct quotations within themes (Creswell & Poth, 2016; Patton, 2014).

Results

Quantitative results

Table 2 shows the results of the independent samples *t* test conducted to examine the differences in the depression, anxiety, stress, and psychological flexibility pretest scores of the participants in the experimental and control groups.

As seen in Table 2, there is a significant difference in the mean pretest scores of the participants in both groups for depression ($t[45] = 2.07, p < .05, d = 0.60$), but not for anxiety ($t[45] = 0.69, p > .05, d = 0.20$), stress ($t[45] = 0.46, p > .05, d = 0.13$) and psychological flexibility ($t[45] = 1.99, p > .05, d = 0.58$).

Table 3 shows the mean and standard deviation values of the pretest, posttest, and follow-up measurements of participants' depression, anxiety, stress, and psychological flexibility variables in the experimental and control groups.

We conducted a series of one-way ANCOVA analyses to examine whether there was a significant difference among the participants in the depression, anxiety, stress, and

Table 2 Independent samples T test results for pretest scores

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>d</i>
Depression							
Experimental Group	22	22.13	8.92	45	2.07	0.043*	0.60
Control Group	25	17.60	5.89				
Anxiety							
Experimental Group	22	16.45	7.96	45	0.69	0.495	0.20
Control Group	25	15.12	5.22				
Stress							
Experimental Group	22	23.36	7.94	45	0.46	0.646	0.13
Control Group	25	22.28	8.07				
Psychological Flexibility							
Experimental Group	22	36.91	6.27	45	1.99	0.052	0.58
Control Group	25	32.64	8.13				

We used the control group as the reference category in the calculation of Cohen's *d* effect size. $p < .05^*$

Table 3 Pretest, posttest, and follow-up scores of depression, anxiety, stress, and psychological flexibility in experimental and control groups

	<i>n</i>	<i>M</i>	<i>SD</i>
Depression			
Experimental Group Pretest	22	22.13	8.92
Experimental Group Posttest	22	12.72	9.42
Experimental Group Follow-up	22	15.40	9.59
Control Group Pretest	25	17.60	5.89
Control Group Posttest	25	18.24	7.57
Control Group Follow-up	25	20.48	8.87
Anxiety			
Experimental Group Pretest	22	16.45	7.96
Experimental Group Posttest	22	11.04	9.50
Experimental Group Follow-up	22	11.40	7.85
Control Group Pretest	25	15.12	5.22
Control Group Posttest	25	14.44	5.59
Control Group Follow-up	25	17.08	5.78
Stress			
Experimental Group Pretest	22	23.36	7.94
Experimental Group Posttest	22	16.60	9.65
Experimental Group Follow-up	22	16.81	7.97
Control Group Pretest	25	22.28	8.07
Control Group Posttest	25	23.36	6.53
Control Group Follow-up	25	24.88	5.86
Psychological Flexibility			
Experimental Group Pretest	22	36.90	6.27
Experimental Group Posttest	22	29.00	10.7
Experimental Group Follow-up	22	31.13	10.1
Control Group Pretest	25	32.64	8.12
Control Group Posttest	25	32.64	7.86
Control Group Follow-up	25	32.16	8.49

Higher scores on the scale used for the psychological flexibility variable indicate higher psychological rigidity, whereas lower scores indicate higher levels of psychological flexibility

psychological flexibility scores in the posttest and follow-up tests. Table 4 shows the results of the one-way ANCOVA analysis.

As seen in Table 4, when the pretest scores of the experimental and control groups were controlled, depression

($F[1, 44] = 12.15, p < .001$, partial $\eta^2 = 0.21$), anxiety ($F[1, 44] = 11.92, p < .001$, partial $\eta^2 = 0.21$), stress ($F[1, 44] = 12.95, p < .001$, partial $\eta^2 = 0.23$), and psychological flexibility ($F[1, 44] = 6.43, p < .05$, partial $\eta^2 = 0.13$) posttest scores favored the experimental group. In other words, while students' depression, anxiety, and stress levels in the experimental group were significantly lower than those of the students in the control group after the self-help intervention, their psychological flexibility levels were significantly higher than those of the students in the control group. Similarly, when we analyzed the participants' pretest scores, depression ($F[1, 44] = 10, p < .01$, partial $\eta^2 = 0.19$), anxiety ($F[1, 44] = 9.33, p < .01$, partial $\eta^2 = 0.18$), stress ($F[1, 44] = 25.89, p < .001$, partial $\eta^2 = 0.37$) and psychological flexibility ($F[1, 44] = 7.13, p < .05$, partial $\eta^2 = 0.14$) scores favored the experimental group.

We conducted a series of repeated measures ANOVA analyses in both groups to examine whether there was a significant change in the participants' pretest-posttest and follow-up scores of the variables over time. As a result of repeated measures ANOVA tests, we determined that participants in the experimental group had higher levels of depression ($F[2, 42] = 12.5, p < .001$, partial $\eta^2 = 0.37$), anxiety ($F[2, 42] = 15.48, p < .001$, partial $\eta^2 = 0.42$), stress ($F[2, 42] = 12.61, p < .001$, partial $\eta^2 = 0.38$) and psychological flexibility ($F[2, 42] = 9.60, p < .001$, partial $\eta^2 = 0.31$) scores. As a result of Bonferroni tests performed to determine the source of the difference, we determined that there was a significant difference between the depression pretest ($M = 22.13$) scores of the participants in the experimental group and the depression posttest ($M = 12.72$) and depression follow-up test ($M = 15.41$) scores, but there was no significant difference between the posttest and follow-up test. There was no significant change in the mean depression scores of the participants in the control group over time.

As a result of the post hoc Bonferroni *t* tests on anxiety scores, we concluded that there was a significant difference

Table 4 One-way ANCOVA results for posttest and follow-up scores

Source of Variance	Sum of Squares	df	Mean Square	F	<i>p</i>	Partial η^2
Depression Posttest						
Pretest	762.20	1	762.20	13.51	0.001***	0.23
Group	685.72	1	685.72	12.15	0.001***	0.21
Error	2482.72	44	56.42			
Depression Follow-up						
Pretest	937.04	1	937.04	14.27	0.001***	0.24
Group	656.99	1	656.99	10.01	0.003**	0.19
Error	2888.51	44	65.64			
Anxiety Posttest						
Pretest	1729.24	1	1729.24	82.71	0.001***	0.65
Group	249.3	1	249.3	11.92	0.001***	0.21
Error	919.86	44	20.9			
Anxiety Follow-up						
Pretest	846.05	1	846.05	32.65	0.001***	0.43
Group	241.64	1	241.64	9.33	0.004**	0.18
Error	1140.03	44	25.91			
Stress Posttest						
Pretest	995.49	1	995.49	22.05	0.001***	0.33
Group	584.94	1	584.94	12.95	0.001***	0.23
Error	1986.08	44	45.13			
Stress Follow-up						
Pretest	699.94	1	699.94	21.06	0.001***	0.32
Group	860.41	1	860.41	25.89	0.001***	0.37
Error	1461.97	44	33.22			
Psychological Flexibility Posttest						
Pretest	962.79	1	962.79	14.35	0.001***	0.25
Group	431.80	1	431.81	6.43	0.015*	0.13
Error	2952.97	44	67.11			
Psychological Flexibility Follow-up						
Psychological Flexibility Pretest	797.68	1	797.68	21.74	0.001***	0.33
Group	261.33	1	261.33	7.13	0.011*	0.14
Error	1613.88	44	36.67			

$p < .05^*$, $p < .01^{**}$, $p < .001^{***}$

between the anxiety pretest scores ($M = 16.45$) and posttest ($M = 11.04$) and follow-up test ($M = 11.41$) scores of the participants in the experimental group but no significant difference between the posttest and follow-up test. There was a significant difference in the anxiety scores of the participants in the control group depending on time ($F(2,48) = 4.15$, $p < .05$, partial $\eta^2 = 0.14$). As a result of the post hoc Bonferroni t tests, we determined that this difference was between the posttest ($M = 14.44$) and follow-up test ($M = 17.08$) scores.

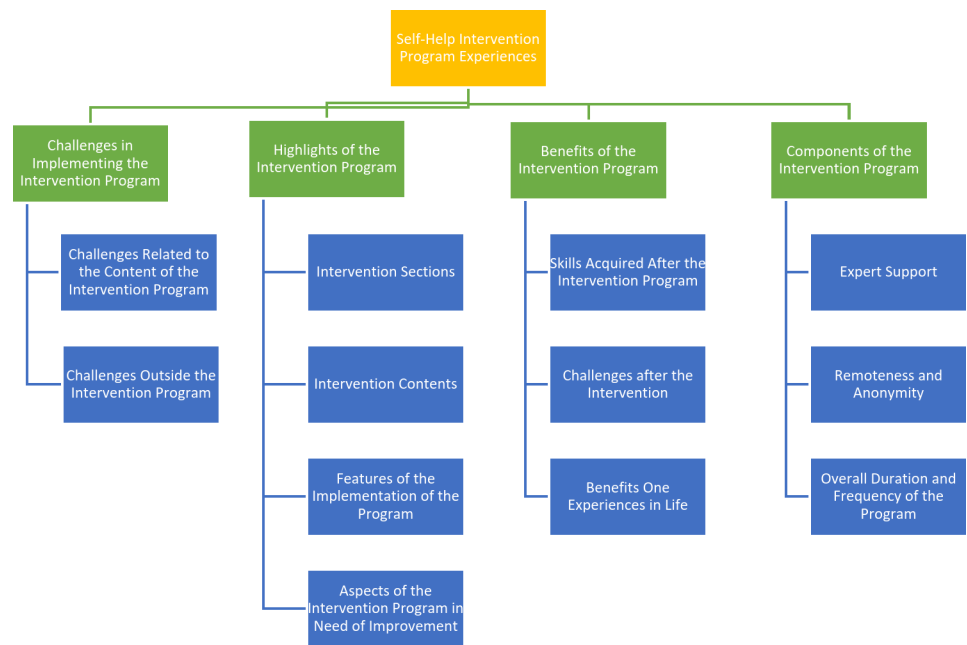
As a result of the post hoc Bonferroni t tests on stress scores, we determined that there was a significant difference between the pretest ($M = 23.36$) and posttest ($M = 16.91$) and follow-up test ($M = 16.82$) scores of the participants in the experimental group but no significant difference between the posttest and follow-up test scores. There was no significant change in the mean stress scores of the participants in the control group over time. Ultimately, as a result of the post-hoc Bonferroni t tests on psychological

flexibility scores, we determined that there was a significant difference between the pretest ($M = 36.91$) and posttest ($M = 29.00$) scores of the participants in the experimental group, a difference between the pretest and follow-up test ($M = 31.14$) scores, but no significant difference between the posttest and follow-up test scores. There was no significant difference in the scores of the participants in the control group over time.

Qualitative findings

We identified four main themes in terms of the participants' experiences with self-help interventions. Each theme has different subthemes within itself. Figure 3 presents the themes indicating the views on their experiences in the self-help process.

Fig. 3 Themes for self-help intervention program experiences



Challenges in implementing the intervention program

Within the first theme, difficulties experienced while implementing the intervention program, there are subthemes of difficulties related to the content of the intervention program and difficulties outside the intervention program. Within the difficulties related to the content of the intervention program, the participants expressed problems related to difficulties in implementing extracurricular activities, in self-evaluation, in filling in the program content, in reading long texts, in implementing audio self-awareness exercises, in contacting with moment practices, and in sending emails. The difficulties the participants experienced outside the intervention program include the intensity of their courses and exams. Participants' opinions on this theme are as follows:

"Awareness was difficult for me. It makes me very tired to spend time on it. But I try to get used to it by saying you can do it." (Participant 3).

"Sometimes I found it difficult to fill in the content by typing." (Participant 8).

"The self-evaluation parts were more difficult for me, it's like a confrontation." (Participant 5).

"I had difficulty in continuing the program during the midterm week." (Participant 1).

Highlights of the intervention program

Within the theme of the intervention program's prominent parts, there are subthemes of intervention sections, intervention contents, features of the implementation of the intervention program, and aspects of the intervention program that need to be improved. Regarding the intervention sections, participants expressed positive opinions about self-compassion, making room for emotion, contact with values, cognitive defusion, self-awareness, and contact with the present moment. Regarding the intervention content, metaphors, audio exercises, stories, out-of-section activities and in-section questioning attracted the participants' attention. Regarding the implementation of the intervention program, the participants cited the advantages of being anonymous, being remote, being short, being able to conduct it on your own, and being able to do it when you feel most comfortable. Regarding the aspects of the program that need to be improved, the participants stated that the expert support should be increased and the writing sections reduced. Participants' opinions on this theme are as follows:

"The emotion part was very good for my life. The parts about understanding my emotions and making room for them and valuing myself were impressive." (Participant 4).

"There was the values part, which was about important things for me. It was important to think about what are my values in life." (Participant 5).

“It felt like they were experiencing the same things I was experiencing in the stories. Afterwards, filling in the evaluation questions and activities, thinking about them, and elaborating on them was impressive.” (Participant 7).

“You can be afraid to come and talk. That’s why it was better for me from home. It was more useful to do it remotely. I felt more comfortable being on my own, doing it from home.” (Participant 2).

Benefits of the intervention program

Under the theme of benefits of the intervention program, there are subthemes of skills gained during the program, problems overcome after the intervention and benefits the person experiences in their life. In the subtheme of skills gained after the intervention program, the participants mentioned skills such as contact with the present moment, setting goals, self-compassion, self-awareness, cognitive defusion, acceptance, and managing behaviors. In the subtheme of problems coped with after the intervention, the participants stated that they were able to cope with different problems such as self-criticism, relationship problems, family relationships, public speaking, intense unwanted thoughts, anger, and loneliness. Within the subtheme of the benefits experienced in the person’s life, there are issues such as self-awareness, making room for emotions, positive change in daily life and being able to see things objectively, self-worth, discovering one’s values, developing empathy, and improving family relationships. Participants’ opinions on this theme are as follows:

“I am a person who procrastinates a lot. The reason I procrastinate is because of these negative thoughts. Thoughts that go on in my own mind. When I realized that they were just thoughts, it became easier for me to stop procrastinating and take action.” (Participant 2).

“Now I’ve set myself on a values-oriented path. I can say that I completely focus more easily. I mean, I stick to that plan I want.” (Participant 4).

“I used to think that I had anxiety because I would suddenly feel out of breath, when I faced a problem I would realize that I couldn’t solve it and suddenly I would feel like I was having an attack. That’s why I think things are different now, it doesn’t happen to me anymore. Because I am aware of what I am going through and it is different because I accept it.” (Participant 3).

“I was cruel to myself. I think I threw it away, I’m not the only one going through some things.” (Participant 8).

Components of the intervention program

Within the theme of the components of the intervention program, there are subthemes of expert support, remoteness and anonymity, and the program’s general frequency and duration. Regarding the expert support provided in the self-help process, the participants said that it is motivating, gives a feeling of being taken care of, ensures staying in touch, makes you feel good, and facilitates continuation. However, they felt that the support was not customized enough and was insufficient, aspects that need to be improved. Regarding anonymity, the participants stated that they expressed themselves comfortably, and that being remote created the problem of not being able to express themselves sufficiently in writing, it was difficult to follow up, and they had a tendency to procrastinate. At the same time, remoteness created advantages such as being able to do it at the appropriate time. Finally, regarding the program’s general duration and frequency, although some participants felt that 7 weeks was ideal, others felt that it was short. Regarding the program’s frequency, participants felt that two episodes per week and one episode per week were ideal. Participants’ opinions on this theme are as follows:

“It was really nice that someone got back to me, read me, cared about me. If I just sent it and didn’t get a response, I might have thought, why would I do that? So I think it was the feedback that was effective.” (Participant 5).

“I used to get excited when something came to my email. It was important for me to be in touch.” (Participant 1).

“I don’t know if I would have been able to continue without expert support. I think I would have quit in the second third at most. Because knowing that someone is reading this motivates me more. I am taken into consideration, and this contributes to my continuation.” (Participant 2).

“Expert support could be increased. Maybe telephone communication would have been a little more useful, frankly. Written language may not be very suitable for some things.” (Participant 6).

Discussion

In this study we examined the effectiveness of a self-help intervention based on ACT and experiences of this intervention among university students in Türkiye. The findings of the study revealed that a seven-part guided self-help intervention focusing on the six core processes of ACT and self-compassion had positive effects on students' mental health. We found that ACT-based guided self-help intervention was effective in reducing students' depression, anxiety, and stress levels in the experimental group compared to those in the control group. We determined that the gains the participants in the experimental group achieved were maintained in the 3-month follow-up measurements after the intervention. In addition, we found anxiety levels of the participants in the control group increased in the 3-month follow-up period. The findings of this study align with the findings of previous ACT-based self-help studies aimed at reducing depression, anxiety, or stress in university students (Levin et al., 2020; Muto et al., 2011). Researchers have generally agreed that interventions carried out through processes specific to the psychological flexibility model are effective in alleviating individuals' depression (van't Hof et al., 2009), anxiety (Bluett et al., 2014), and stress (Han & Kim, 2022) and can reduce depression, anxiety, and stress by focusing on accepting emotional difficulties and living a life in line with values, with awareness of current life.

Another finding was that ACT-based guided self-help intervention was effective in increasing students' psychological flexibility levels, an effect maintained 3 months after treatment. These results are consistent with other research results in the literature (Gloster et al., 2020; Levin et al., 2020; Muto et al., 2011; Thompson et al., 2021). According to ACT theory, psychological flexibility is a skill that can be developed (A-Tjak et al., 2015), and meta-analyses show that ACT-based interventions are an effective method for developing psychological flexibility (Gloster et al., 2020). ACT promotes healthy behavioral changes and leading a life in line with one's values by providing defusion, acceptance, awareness, living in the present moment, and reframing language and beliefs. It can be argued that guided self-help interventions including the six dimensions of ACT and self-compassion help to increase university students' psychological flexibility levels.

Our study categorized participants' self-help experiences into four themes: challenges in implementation, key aspects of the program, perceived benefits, and intervention components. Participants faced difficulties related to intervention content and external factors. Applying out-of-session activities was particularly challenging, as previously noted in studies examining value-driven behavioral execution (Gunawan & Oriza, 2022). From an ACT perspective,

psychological distress may stem from avoidance of difficult internal experiences (Hayes et al., 2006), making it challenging for participants to engage in meaningful activities. Additionally, difficulties with self-assessment, reading long texts, and maintaining concentration align with prior findings that students struggle with cognitive effort-intensive tasks (Gericke et al., 2021). Academic workload further compounded these difficulties (Fleischmann et al., 2018). To enhance engagement, interventions could incorporate structured psychoeducation, multimedia resources, and simplified written exercises. Furthermore, integrating motivational interviewing and periodic guided support may foster commitment and adherence.

Participants highlighted key sections of the intervention, particularly self-compassion, making room for emotions, and contact with values. Notably, self-compassion received more attention than elements of the psychological flexibility model, reinforcing its well-documented role in reducing depression, anxiety, and stress (MacBeth & Gumley, 2012). Self-compassion also intersects with psychological flexibility through mindful acceptance and cognitive defusion (Marshall & Brockman, 2016). ACT-based self-help interventions may thus benefit from incorporating dedicated self-compassion modules. Additionally, metaphors, narratives, and structured questioning emerged as particularly effective tools for cognitive defusion, helping participants observe thoughts without over-identification. These strategies facilitate a shift in perspective, fostering greater behavioral flexibility and emotional resilience.

Audio exercises played a crucial role in promoting self-awareness, consistent with prior findings that auditory formats enhance experiential learning (Lantto, 2021). Extracurricular activities were also highly impactful, as they allowed participants to actively apply learned skills in real-life situations. Participants valued the autonomy, anonymity, and accessibility of self-help interventions, echoing previous research indicating that such features reduce barriers to mental health care (Cuijpers & Schuurmans, 2007). Studies with university students have similarly found that anonymity enables more open self-expression, particularly through writing rather than face-to-face communication (Oti et al., 2022). Despite these benefits, students also expressed a need for increased expert support, a finding consistent with studies highlighting the motivational role of guided assistance (French et al., 2017).

Following the intervention, participants reported acquiring skills in mindfulness, goal setting, self-awareness, and cognitive defusion, which they applied to various challenges, including self-criticism, relationship difficulties, and exam anxiety. These findings reinforce the transdiagnostic applicability of ACT (Hayes et al., 1999) and align with previous research on ACT-based self-help (Lantto, 2021;

Lappalainen et al., 2015). By developing these skills, participants gained greater emotional regulation and adaptability in different life contexts. This supports the notion that psychological flexibility, as promoted by ACT, is a critical factor in mental well-being and problem-solving.

Regarding program components, participants found expert support to be motivating and beneficial. Personalized guidance fostered a sense of connection and accountability, facilitating greater adherence (Fleischmann et al., 2018). The anonymity of the intervention was also valued, as it mitigated concerns about stigma and encouraged more candid self-expression (Gericke et al., 2021; Oti et al., 2022). However, while remote accessibility provided flexibility, it also introduced challenges such as procrastination and limited real-time feedback, issues previously identified in self-help interventions (Gericke et al., 2021). Participants noted that while they appreciated being able to complete activities at their own pace, this flexibility sometimes resulted in delays or disengagement. Future interventions may address this issue by incorporating regular check-ins, progress tracking, or automated reminders.

The duration and frequency of the program were also evaluated. Most participants (77.3%) considered the seven-week duration sufficient, though a minority (22.7%) suggested a longer period. Research indicates that self-help interventions lasting 5–7 weeks tend to yield moderate effects, whereas shorter interventions (< 4 weeks) produce smaller effects, and longer programs (> 9 weeks) do not necessarily enhance outcomes (Heber et al., 2017). Weekly sessions were deemed appropriate, consistent with ACT-based interventions for university students (Klimczak et al., 2023). Given that ACT encourages behavioral experimentation, the weekly structure likely provided sufficient time for participants to implement new strategies while maintaining engagement. Some participants suggested increasing session frequency to twice per week, which could be explored in future iterations to enhance retention and application of skills.

A significant challenge in this study was participant attrition, with only 36.1% completing the program. This completion rate is lower than those reported in previous ACT-based self-help studies (Levin et al., 2016, 2020; Muto et al., 2011), where financial incentives contributed to higher retention. However, dropout rates in web-based ACT interventions vary widely, ranging from 0.5 to 89% (Fleming et al., 2018; Larsson et al., 2022; Viskovich & Pakenham, 2020). Factors contributing to attrition included time constraints, lack of motivation, and emotional distress. Although reminder emails were utilized, many participants reported infrequent email use, highlighting the need for alternative engagement strategies such as SMS reminders or app notifications. Additionally, requiring participants to

submit completed sections to experts via email may have inadvertently increased the burden, contributing to dropout. Future research should examine ways to streamline submission processes and provide alternative support mechanisms. Early dropout remains a significant challenge in self-help interventions, warranting further exploration (Karyotaki et al., 2015). Addressing potential barriers, such as perceived effort, accessibility, and engagement, could improve adherence rates. Strategies such as gamification, peer support forums, or interactive feedback may help maintain motivation and commitment. Understanding the nuanced reasons for participant withdrawal will be crucial for refining self-help interventions and maximizing their effectiveness.

Overall, our findings support the feasibility and effectiveness of ACT-based self-help interventions for university students. While challenges such as implementation difficulties, attrition, and procrastination remain, targeted modifications—such as enhanced multimedia resources, structured support mechanisms, and flexible engagement strategies—can enhance accessibility and impact. Future research should continue to refine these interventions, ensuring they meet the diverse needs of participants while maintaining the core principles of psychological flexibility and self-compassion.

Limitations

This study has several limitations. Firstly, the participant group was mostly female, which restricts the generalizability of findings to the wider university student population. Secondly, a significant dropout rate, a common challenge in self-help interventions, was observed. Reasons for dropout included perceived program unsuitability, time constraints, and emotional distress, highlighting the need for more personalized and flexible intervention designs. Further investigation into dropout causes is warranted. Thirdly, email-based guidance, provided by a single individual, may have limited the depth and responsiveness of support offered. Fourthly, qualitative interviews were conducted solely with participants reporting positive changes, potentially biasing the representation of experiences and overlooking potential drawbacks.

Fifthly, the use of a passive control group limits the ability to isolate the specific effects of ACT components. The observed improvements may be influenced by nonspecific factors like accountability and regular engagement with materials. Future studies should incorporate active control groups to address this. Sixthly, the intervention group exhibited higher initial depression levels, despite random assignment, possibly due to higher-depression participants dropping out of the control group. This initial difference must be considered when interpreting depression-related outcomes. Seventhly, reliance on self-report measures

introduces potential biases, including social desirability and recall bias, which could inflate observed relationships. Multi-method assessments, incorporating behavioral and physiological data, are needed to strengthen findings. Finally, the exclusion of participants with prior psychiatric diagnoses limits the applicability of the intervention to clinical populations. Future research should explore the intervention's effectiveness in diverse clinical samples.

Practical implications

Despite our study's limitations, the findings have important practical implications for mental health professionals and researchers. By using self-help intervention in university counseling centers, effective, scientific psychological support can be provided to more students with less workforce. These interventions can be used in addition to face-to-face counseling sessions with university students. The self-help materials can be made available to a large student body and used as a preventive intervention to increase students' adjustment levels and protect and maintain their mental health. The user experiences obtained from this study can guide future self-help interventions. As indicated in this study and the literature, early cessation is common in self-help interventions. Future researchers could investigate why university students drop out of self-help interventions early. According to the research findings, we determined that increasing expert support would lead to more effective results. In future studies, the number of expert support could be increased (2–3 times a week), the method of expert support changed (telephone or face-to-face interview), and standards on how to provide the most appropriate expert support developed.

Conclusion

This study indicates that an ACT-based guided self-help program effectively reduces depression, anxiety, and stress levels among university students, while simultaneously fostering their psychological flexibility. Our research demonstrates that techniques like voice exercises, metaphors, narratives, and self-reflection prompts can be valuable components of ACT-based self-help interventions. Our findings also suggest that conducting sessions once per week is optimal for participant engagement and skill development in these interventions. We found that guided support enhances motivation, promotes program adherence, cultivates a sense of being cared for, and facilitates program continuation. As a transdiagnostic approach, ACT interventions can be particularly beneficial to university students by empowering them to develop robust coping skills across various challenges.

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Data availability Data underlying this article is available from Open Science Framework (<https://osf.io/b86w4/>).

Declarations

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. **Note:** This study is based on the first author's doctoral thesis.

Informed consent Online informed consent was obtained from all individual participants included in this study.

Conflict of interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

- A-Tjak, J. G., Davis, M. L., Morina, N., Powers, M. B., Smits, J. A., & Emmelkamp, P. M. (2015). A meta-analysis of the efficacy of acceptance and commitment therapy for clinically relevant mental and physical health problems. *Psychotherapy and Psychosomatics*, 84(1), 30–36. <https://doi.org/10.1159/000365764>
- Alonso, J., Mortier, P., Auerbach, R. P., Bruffaerts, R., Vilagut, G., Cuijpers, P., Demyttenaere, K., Ebert, D. D., Ennis, E., Gutiérrez-García, R. A., Green, J. G., Hasking, P., Lochner, C., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Zaslavsky, A. M., Kessler, R. C., & WHO WMH-ICS Collaborators. (2018). Severe role impairment associated with mental disorders: Results of the WHO World Mental Health Surveys International College Student Project. *Depression and Anxiety*, 35(9), 802–814. <https://doi.org/10.1002/da.22778>
- Andersson, G., Cuijpers, P., Carlbring, P., Riper, H., & Hedman, E. (2014). Guided Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: A systematic review and meta-analysis. *World Psychiatry*, 13(3), 288–295. <https://doi.org/10.1002/wps.20151>
- Biglan, A., & Hayes, S. C. (1996). Should the behavioral sciences become more pragmatic? The case for functional contextualism

- in research on human behavior. *Applied and Preventive Psychology*, 5(1), 47–57. [https://doi.org/10.1016/S0962-1849\(96\)80026-6](https://doi.org/10.1016/S0962-1849(96)80026-6)
- Bilgel, N. G., & Bayram, N. (2010). Turkish version of the depression anxiety stress scale (DASS-42): Psychometric properties. *Archives of Neuropsychiatry*, 47(2), 118–126.
- Bluett, E. J., Homan, K. J., Morrison, K. L., Levin, M. E., & Twohig, M. P. (2014). Acceptance and commitment therapy for anxiety and OCD spectrum disorders: An empirical review. *Journal of Anxiety Disorders*, 28(6), 612–624. <https://doi.org/10.1016/j.janxdis.2014.06.008>
- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the acceptance and action Questionnaire-II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, 42(4), 676–688. <http://doi.org/10.1016/j.beth.2011.03.007>
- Bruffaerts, R., Mortier, P., Auerbach, R. P., Alonso, J., Hermosillo De la Torre, A. E., Cuijpers, P., Demyttenaere, K., Ebert, D. D., Green, J. G., Hasking, P., Stein, D. J., Ennis, E., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Vilagut, G., Zaslavsky, A. M., Kessler, R. C., & WHO WMH-ICS Collaborators. (2019). Lifetime and 12-month treatment for mental disorders and suicidal thoughts and behaviors among first year college students. *International Journal of Methods in Psychiatric Research*, 28(2), e1764. <https://doi.org/10.1002/mpr.1764>
- Camadan, F., & Alpaydin, F. (2023). An examination on Psychological Counseling and Guidance Practice and Research Centers in Türkiye. *Western Anatolia Journal of Educational Sciences*, 14(1), 654–675. <https://doi.org/10.51460/baebd.1276204>
- Clifford, G. P. (2020). *Acceptance and commitment therapy (A.C.T.): Workbook to get out from anxiety, relieve depression, and break free from stress and worry, for a newfound mental health*. Simone Vigorito.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155–159. <https://doi.org/10.1037/0033-2909.112.1.155>
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE.
- Cuijpers, P., & Schuurmans, J. (2007). Self-help interventions for anxiety disorders: An overview. *Current Psychiatry Reports*, 9(4), 284–290. <https://doi.org/10.1007/s11920-007-0034-6>
- Cuijpers, P., Donker, T., van Straten, A., Li, J., & Andersson, G. (2010). Is guided self-help as effective as face-to-face psychotherapy for depression and anxiety disorders? A systematic review and meta-analysis of comparative outcome studies. *Psychological Medicine*, 40(12), 1943–1957. <https://doi.org/10.1017/S0033291710000772>
- DuFrene, T., & Wilson, K. (2012). *The wisdom to know the difference: An acceptance and commitment therapy workbook for overcoming substance abuse*. New Harbinger.
- Eifert, G. H., & Forsyth, J. P. (2005). *Acceptance and commitment therapy for anxiety disorders: A practitioner's treatment guide to using mindfulness, acceptance, and values-based behavior change*. New Harbinger Publications.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. <https://doi.org/10.3758/BF03193146>
- Fledderus, M., Bohlmeijer, E. T., Pieterse, M. E., & Schreurs, K. M. G. (2012). Acceptance and commitment therapy as guided self-help for psychological distress and positive mental health: A randomized controlled trial. *Psychological Medicine*, 42(3), 485–495. <https://doi.org/10.1017/s0033291711001206>
- Fleischmann, R. J., Harrer, M., Zarski, A. C., Baumeister, H., Lehr, D., & Ebert, D. D. (2018). Patients' experiences in a guided Internet- and App-based stress intervention for college students: A qualitative study. *Internet Interventions*, 12, 130–140. <https://doi.org/10.1016/j.invent.2017.12.001>
- Fleming, T., Bavin, L., Lucassen, M., Stasiak, K., Hopkins, S., & Merry, S. (2018). Beyond the trial: Systematic review of real-world uptake and engagement with digital self-help interventions for depression, low mood, or anxiety. *Journal of Medical Internet Research*, 20(6), e9275. <https://doi.org/10.2196/jmir.9275>
- Fonseca, S., Trindade, I. A., Mendes, A. L., & Ferreira, C. (2020). The buffer role of psychological flexibility against the impact of major life events on depression symptoms. *Clinical Psychologist*, 24(1), 82–90. <https://doi.org/10.1111/cp.12194>
- Forsyth, J. P., & Eifert, G. H. (2016). *The mindfulness and acceptance workbook for anxiety: A guide to breaking free from anxiety, phobias, and worry using acceptance and commitment therapy*. New Harbinger.
- French, K., Golijani-Moghaddam, N., & Schröder, T. (2017). What is the evidence for the efficacy of self-help acceptance and commitment therapy? A systematic review and meta-analysis. *Journal of Contextual Behavioral Science*, 6(4), 360–374. <https://doi.org/10.1016/j.jcbs.2017.08.002>
- Gellatly, J., Bower, P., Hennessy, S. U. E., Richards, D., Gilbody, S., & Lovell, K. (2007). What makes self-help interventions effective in the management of depressive symptoms? Meta-analysis and meta-regression. *Psychological Medicine*, 37(9), 1217–1228. <https://doi.org/10.1017/s0033291707000062>
- Gericke, F., Ebert, D. D., Breet, E., Auerbach, R. P., & Bantjes, J. (2021). A qualitative study of university students' experience of Internet-based CBT for depression. *Counselling and Psychotherapy Research*, 21(4), 792–804. <https://doi.org/10.1002/capr.12465>
- Gloster, A. T., Walder, N., Levin, M. E., Twohig, M. P., & Karekla, M. (2020). The empirical status of acceptance and commitment therapy: A review of meta-analyses. *Journal of Contextual Behavioral Science*, 18, 181–192. <https://doi.org/10.1016/j.jcbs.2020.09.009>
- Gordon, T., Borushok, J., & Polk, K. (2019). *The ACT approach: A comprehensive guide for acceptance and commitment therapy*. PESI.
- Gould, R. A., & Clum, G. A. (1993). A meta-analysis of self-help treatment approaches. *Clinical Psychology Review*, 13(2), 169–186. [https://doi.org/10.1016/0272-7358\(93\)90039-o](https://doi.org/10.1016/0272-7358(93)90039-o)
- Gunawan, F. Y., & Oriza, I. I. D. (2022). Web-based guided self-help acceptance and commitment therapy (ACT) to increase self-compassion and psychological flexibility in psychology undergraduates suffering emotional distress: A feasibility study. *ANIMA Indonesian Psychological Journal*, 37(1), 38–80. <https://doi.org/10.24123/aijp.v37i1.3033>
- Gustafson, C. (2020). *Reclaim your life: Acceptance and commitment therapy in 7 weeks*. Rockridge.
- Han, A., & Kim, T. H. (2022). Efficacy of internet-based acceptance and commitment therapy for depressive symptoms, anxiety, stress, psychological distress, and quality of life: Systematic review and meta-analysis. *Journal of Medical Internet Research*, 24(12), e39727. <https://doi.org/10.2196/39727>
- Harris, R. (2022). *The happiness trap: How to stop struggling and start living*. Shambhala.
- Hayes, S. C., & Smith, S. (2005). *Get out of your mind and into your life: The new acceptance and commitment therapy*. New Harbinger.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy*. Guilford Press.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44(1), 1–25. <https://doi.org/10.1016/j.brat.2005.06.006>

- Heber, E., Ebert, D. D., Lehr, D., Cuijpers, P., Berking, M., Nobis, S., & Riper, H. (2017). The benefit of web- and computer-based interventions for stress: A systematic review and meta-analysis. *Journal of Medical Internet Research*, 19(2), e32. <https://doi.org/10.2196/jmir.5774>
- Karyotaki, E., Kleiboer, A., Smit, F., Turner, D. T., Pastor, A. M., Andersson, G., Berger, T., Botella, C., Breton, J. M., Carlbring, P., Christensen, H., de Graaf, E., Griffiths, K., Donker, T., Farrer, L., Huibers, M. J. H., Lenndin, J., Mackinnon, A., Meyer, B., & Cuijpers, P. (2015). Predictors of treatment dropout in self-guided web-based interventions for depression: An 'individual patient data' meta-analysis. *Psychological Medicine*, 45(13), 2717–2726. <https://doi.org/10.1017/s0033291715000665>
- Klimczak, K. S., Twohig, M. P., Peacock, G. G., & Levin, M. E. (2023). Using peer-support coaching to improve adherence to online ACT self-help for college mental health: A randomized controlled trial. *Behaviour Research and Therapy*, 160, 104228. <https://doi.org/10.1016/j.brat.2022.104228>
- Köksal, B., & Topkaya, N. (2021). Üniversite öğrencilerinin yaşadığı sorunlar ve sorun alanlarının depresyon, anksiyete ve stresle ilişkisi. *Türk Eğitim Bilimleri Dergisi*, 19(2), 926–949. <https://doi.org/10.37217/tebd.933931>
- Krieger, T., Altenstein, D., Baettig, I., Doerig, N., & Holtforth, M. G. (2013). Self-compassion in depression: Associations with depressive symptoms, rumination, and avoidance in depressed outpatients. *Behavior Therapy*, 44(3), 501–513. <https://doi.org/10.1016/j.beth.2013.04.004>
- Krieger, T., Berger, T., & Holtforth, M. (2016). The relationship of self-compassion and depression: Cross-lagged panel analyses in depressed patients after outpatient therapy. *Journal of Affective Disorders*, 202, 39–45. <https://doi.org/10.1016/j.jad.2016.05.032>
- Landau, S., & Everitt, B. S. (2003). *A handbook of statistical analyses using SPSS*. Chapman and Hall/CRC.
- Landi, G., Pakenham, K. I., Crocetti, E., Tossani, E., & Grandi, S. (2022). The trajectories of anxiety and depression during the COVID-19 pandemic and the protective role of psychological flexibility: A four-wave longitudinal study. *Journal of Affective Disorders*, 307, 69–78. <https://doi.org/10.1016/j.jad.2022.03.067>
- Lantto, K. (2021). *An online guided ACT intervention for students: What are the student experiences, and do they differ depending on anxiety level?* [Master's thesis]. The University of Jyväskylä, Finland. <https://jyx.jyu.fi/handle/123456789/77009>
- Lappalainen, P., Langrial, S., Oinas-Kukkonen, H., Tolvanen, A., & Lappalainen, R. (2015). Web-based acceptance and commitment therapy for depressive symptoms with minimal support: A randomized controlled trial. *Behavior Modification*, 39(6), 805–834. <https://doi.org/10.1177/0145445515598142>
- Larsson, A., Hartley, S., & McHugh, L. (2022). A randomised controlled trial of brief web-based acceptance and commitment therapy on the general mental health, depression, anxiety and stress of college students. *Journal of Contextual Behavioral Science*, 24, 10–17. <https://doi.org/10.1016/j.jcbs.2022.02.005>
- Levin, M. E., Hayes, S. C., Pistorello, J., & Seeley, J. R. (2016). Web-based self-help for preventing mental health problems in universities: Comparing acceptance and commitment training to mental health education. *Journal of Clinical Psychology*, 72(3), 207–225. <https://doi.org/10.1002/jclp.22254>
- Levin, M. E., Haeger, J. A., Pierce, B. G., & Twohig, M. P. (2017). Web-based acceptance and commitment therapy for mental health problems in college students: A randomized controlled trial. *Behavior Modification*, 41(1), 141–162. <https://doi.org/10.1177/0145445516659645>
- Levin, M. E., Potts, S., Haeger, J., & Lillis, J. (2018). Delivering acceptance and commitment therapy for weight self-stigma through guided self-help: Results from an open pilot trial. *Cognitive and Behavioral Practice*, 25(1), 87–104. <https://doi.org/10.1016/j.cbpra.2017.02.002>
- Levin, M. E., An, W., Davis, C. H., & Twohig, M. P. (2020). Evaluating acceptance and commitment therapy and mindfulness-based stress reduction self-help books for college student mental health. *Mindfulness*, 11(5), 1275–1285. <https://doi.org/10.1007/s12671-020-01344-3>
- Lipson, S. K., Lattie, E. G., & Eisenberg, D. (2019). Increased rates of mental health service utilization by U.S. College students: 10-year population-level trends (2007–2017). *Psychiatric Services*, 70(1), 60–63. <https://doi.org/10.1176/appi.ps.201800332>
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional States: Comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. *Behaviour Research and Therapy*, 33(3), 335–343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, 32(6), 545–552. <https://doi.org/10.1016/j.cpr.2012.06.003>
- Marshall, E. J., & Brockman, R. N. (2016). The relationships between psychological flexibility, self-compassion, and emotional well-being. *Journal of Cognitive Psychotherapy*, 30(1), 60–72. <https://doi.org/10.1891/0889-8391.30.1.60>
- McKay, M., Greenberg, M. J., & Fanning, P. (2020). *The ACT workbook for depression and shame: Overcome thoughts of defectiveness and increase well-being using acceptance and commitment therapy*. New Harbinger.
- Muto, T., Hayes, S. C., & Jeffcoat, T. (2011). The effectiveness of acceptance and commitment therapy bibliotherapy for enhancing the psychological health of Japanese college students living abroad. *Behavior Therapy*, 42(2), 323–335. <https://doi.org/10.1016/j.beth.2010.08.009>
- Oti, O., Pretorius, C., & Pitt, I. (2022). Experience of students in using online mental health interventions: A qualitative study. *ICT for health. Accessibility and Wellbeing*, 124–144. https://doi.org/10.1007/978-3-031-29548-5_9
- Pakenham, K. I., Landi, G., Boccolini, G., Furlani, A., Grandi, S., & Tossani, E. (2020). The moderating roles of psychological flexibility and inflexibility on the mental health impacts of COVID-19 pandemic and lockdown in Italy. *Journal of Contextual Behavioral Science*, 17, 109–118. <https://doi.org/10.1016/j.jcbs.2020.07.003>
- Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications.
- Pullmer, R., Chung, J., Samson, L., Balanji, S., & Zaitsoff, S. (2019). A systematic review of the relation between self-compassion and depressive symptoms in adolescents. *Journal of Adolescence*, 74, 210–220. <https://doi.org/10.1016/j.adolescence.2019.06.006>
- Raes, F. (2010). Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety. *Personality and Individual Differences*, 48(6), 757–761. <https://doi.org/10.1016/j.paid.2010.01.023>
- Ramón-Arhués, E., Gea-Caballero, V., Granada-López, J. M., Juárez-Vela, R., Pellicer-García, B., & Antón-Solanas, I. (2020). The prevalence of depression, anxiety and stress and their associated factors in college students. *International Journal of Environmental Research and Public Health*, 17(19), 7001. <https://doi.org/10.3390/ijerph17197001>
- Ramnero, J., & Törneke, N. (2008). *The ABCs of human behavior: Behavioral principles for the practicing clinician*. New Harbinger.
- Ruiz, F. J. (2010). A review of acceptance and commitment therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology and Psychological Therapy*, 10(1), 125–162.

- Sheldon, E., Simmonds-Buckley, M., Bone, C., Mascarenhas, T., Chan, N., Wincott, M., & Barkham, M. (2021). Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. *Journal of Affective Disorders*, 287, 282–292. <https://doi.org/10.1016/j.jad.2021.03.054>
- Soyas, C. K., & Wilcomb, C. J. (2015). Mindfulness, self-compassion, self-efficacy, and gender as predictors of depression, anxiety, stress, and well-being. *Mindfulness*, 6(2), 217–226. <https://doi.org/10.1007/s12671-013-0247-1>
- Tanhan, A., & Francisco, V. T. (2019). Muslims and mental health concerns: A social ecological model perspective. *Journal of Community Psychology*, 47(4), 964–978. <https://doi.org/10.1002/jcop.22166>
- Tanhan, A., & Young, J. S. (2022). Muslims and mental health services: A concept map and a theoretical framework. *Journal of Religion and Health*, 61(1), 23–63. <https://doi.org/10.1007/s10943-021-01324-4>
- Thompson, E. M., Destree, L., Albertella, L., & Fontenelle, L. F. (2021). Internet-based acceptance and commitment therapy: A transdiagnostic systematic review and meta-analysis for mental health outcomes. *Behavior Therapy*, 52(2), 492–507. <https://doi.org/10.1016/j.beth.2020.07.002>
- Topkaya, N. (2021). Predictors of attitudes toward seeking professional psychological help among Turkish college students. *Children and Youth Services Review*, 120, 105782. <https://doi.org/10.1016/j.childyouth.2020.105782>
- van't Hof, E., Cuijpers, P., & Stein, D. J. (2009). Self-help and Internet-guided interventions in depression and anxiety disorders: A systematic review of meta-analyses. *CNS Spectrums*, 14(S3), 34–40. <https://doi.org/10.1017/S1092852900027279>
- Viskovich, S., & Pakenham, K. I. (2020). Randomized controlled trial of a web-based acceptance and commitment therapy (ACT) program to promote mental health in university students. *Journal of Clinical Psychology*, 76(6), 929–951. <https://doi.org/10.1002/jclp.22848>
- Wagner, B., Horn, A. B., & Maercker, A. (2014). Internet-based versus face-to-face cognitive-behavioral intervention for depression: A randomized controlled non-inferiority trial. *Journal of Affective Disorders*, 152, 113–121. <https://doi.org/10.1016/j.jad.2013.06.032>
- Wersebe, H., Lieb, R., Meyer, A. H., Hofer, P., & Gloster, A. T. (2018). The link between stress, well-being, and psychological flexibility during an acceptance and commitment therapy self-help intervention. *International Journal of Clinical and Health Psychology*, 18(1), 60–68. <https://doi.org/10.1016/j.ijchp.2017.09.002>
- Yadavaia, J. E., Hayes, S. C., & Vilardaga, R. (2014). Using acceptance and commitment therapy to increase self-compassion: A randomized controlled trial. *Journal of Contextual Behavioral Science*, 3(4), 248–257. <https://doi.org/10.1016/j.jcbs.2014.09.002>
- Yavuz, F., Ulusoy, S., Iskin, M., Esen, F. B., Burhan, H. S., Karadere, M. E., & Yavuz, N. (2016). Turkish version of Acceptance and Action Questionnaire-II (AAQ-II): A reliability and validity analysis in clinical and non-clinical samples. *Bulletin of Clinical Psychopharmacology*, 26(4), 397–408. <https://doi.org/10.5455/bcp.20160223124107>

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