

Utilizing ACT Daily as a Self-Guided App for Clients Waiting for Services at a College  
Counseling Center: A Pilot Study

Jack A. Haeger<sup>1</sup>, Carter H. Davis<sup>1</sup>, Michael E. Levin<sup>1\*</sup>

<sup>1</sup>*Department of Psychology, Utah State University, Logan, UT, USA*

\* Corresponding author. Utah State University, 2810 Old Main Hill, Logan, UT 84322,  
United States. Phone: +001 (541) 531-3892; Fax: +001 (435) 797-1448, E-mail address:  
[Michael.Levin@usu.edu](mailto:Michael.Levin@usu.edu).

### Abstract

**Objective:** Considering increasing demands for mental health services at college counseling centers (CCCs), there is a need for cost-effective solutions that avoid depleting stressed CCC resources. This study examined if ACT Daily, a mobile application based on acceptance and commitment therapy (ACT), could serve as an effective self-guided intervention.

**Participants:** 11 individuals on a CCC waitlist suffering from anxiety/depression participated in the study over 2 weeks.

**Methods:** This study implemented a pre-post, open trial design of ACT Daily. Assessments were completed at baseline and 2-week post assessment.

**Results:** Results indicated that ACT Daily was acceptable and that participants improved on depression and anxiety symptoms as well as psychological inflexibility processes over the 2 weeks. App data further indicated significant in-the-moment improvements on depression, anxiety and psychological inflexibility immediately following skill coaching, with these effects becoming larger over time.

**Conclusions:** Mobile apps like ACT Daily could serve as an effective, pre-therapy tool for depressed/anxious students.

*Keywords:* acceptance and commitment therapy, anxiety, depression, college counseling centers, mHealth

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Research has found up to 50% of college students have a diagnosable psychological disorder in a given year.<sup>1</sup> A large scale survey of 79,266 students found that 32% reported feeling so depressed that it was difficult to function and more than half endorsed having overwhelming anxiety.<sup>2</sup> Despite escalating rates of severe psychological problems and demand for services,<sup>3,4</sup> 69% of CCC directors reported that their resources have failed to expand appropriately.<sup>4</sup> For example, the ratio of counselors to clients, with an average of 1 counselor to every 2,081 students, has widened in recent years by almost 500 students.<sup>4</sup> As a result, directors have highlighted issues such as counselor burnout and increasing waitlists.<sup>4</sup> Long waitlists are particularly problematic due to their adverse impact on client attrition, often resulting in decreased client follow through on recommended counseling.<sup>5</sup> These difficulties have been echoed throughout the field,<sup>6,7</sup> indicating this is a growing, pervasive issue requiring cost-effective and innovative solutions.

One strategy to address the challenges associated with waiting lists in college counselling centers is to offer self-guided resources for those waiting to receive services. Mobile apps are particularly promising given their potential for wide implementation, with smartphone penetration in the US reaching 72% in 2014.<sup>8</sup> Thus, mobile health (mHealth) applications focused on the prevention and treatment of mental health issues have the potential to be easily disseminated to massive amounts of users. Furthermore, a recent survey of US citizens reported that 89% of college-aged users (18-24 years old) pick up their phone to use it within 15 minutes of waking.<sup>9</sup> Thus, smartphone technology provides a unique vehicle for delivering therapy to students that is typically reserved for a single, hour-long session each week. A recent systematic review found that mHealth apps are effective in significantly reducing depression, stress, and substance use while increasing intervention

accessibility.<sup>10</sup> Notably, no apps have been tested to date for individuals on waiting lists at college counselling centers, providing an opportunity to utilize this technology to fill a critical gap in the delivery of mental health services.

Despite these positive findings and potential benefits, many of the available psychotherapeutic mHealth apps on the market suffer from a shortage of scientific evidence and most are not rooted in evidenced-based treatment or theory.<sup>10</sup> Two of the most highly comorbid disorders are also the most prevalent diagnoses in college students: depressive and anxiety disorders.<sup>2,11</sup> Because of their high rate of comorbidity and overlapping therapeutic techniques used to treat these disorders,<sup>12,13</sup> it appears that anxiety and depressive disorders potentially share common pathological processes and might benefit from targeting a core collection of transdiagnostic mechanisms of change.

One such transdiagnostic pathological process that applies across anxiety, depression, and a variety of other disorders is psychological inflexibility (PI). PI is the phenomenon wherein inner experiences (i.e., thoughts, feelings, urges, sensations) take excessive priority over chosen values and direct contingencies in guiding behavior.<sup>14,15</sup> Numerous studies have discovered that PI is a strong predictor of depressive and anxiety disorder symptomatology,<sup>14,16,17</sup> even after accounting for other known predictors including emotion dysregulation and anxiety sensitivity.<sup>18,19</sup> High levels of PI have also been linked to decreased overall well-being and increased dropout rates, an issue that is all too familiar within CCCs.<sup>20,21</sup>

Acceptance and Commitment Therapy is an evidence-based treatment (EBT) that explicitly targets PI by fostering its psychologically-healthy opposite, psychological flexibility, or the ability to accept psychological experiences as they arise in the moment while taking meaningful action.<sup>15</sup> ACT reduces PI through core components including acceptance, cognitive defusion, present moment awareness, and

values.<sup>16,17</sup> Recent meta-analyses have reported that ACT is as effective or potentially even more effective than other EBTs for anxious and depressive disorders.<sup>22-24</sup> Thus, an ACT intervention utilizing the accessibility of mHealth could be especially useful when targeting highly prevalent and frequently comorbid anxiety and depression problems prevalent amongst college students, most of whom already rely heavily on mobile technology in their daily lives.

The ACT Daily app was designed to reduce PI by implementing a high frequency/low intensity tailored ACT skill coaching program that can be conveniently carried with the user on a smartphone. The app features training on four core ACT components including acceptance, cognitive defusion, present moment awareness, and values connection. ACT Daily was originally designed as an adjunctive tool for clients actively participating in face-to-face ACT therapy and assumes some prior acquisition of basic ACT concepts (*citation removed for blind review*), raising the question of whether the app could be used as a stand-alone intervention for student clients on a waitlist. This study tested an adaptation of ACT Daily by implementing the application in a purely self-guided format, in which clients used an introductory website to learn the core ACT concepts that are applied in the form of skills within the app. ACT Daily could be an especially useful tool for clients who are waiting for services, given that it aims to provide some initial support to these clients and a chance to start engaging in practicing psychological skills with brief, targeted opportunities designed not to be overwhelming. Moreover, ACT Daily may have a positive impact on client motivation, readiness for therapy, and willingness to engage in therapy without requiring additional funding, time, or effort from counselors and staff.

This study aimed to pilot test an initial prototype of the ACT Daily mobile app with depressed and/or anxious student clients currently on the waitlist of a CCC at a large

university in the Western United States. We sought to address the question of whether ACT Daily might serve as an effective, brief self-guided intervention for individuals suffering from anxiety or depression who are waiting for services at a CCC in an open trial (pre-post) design. Specifically, we aimed to determine 1) the acceptability of ACT Daily among student clients waiting for in-person psychological services, 2) the effects of ACT Daily on depression and anxiety symptoms, and 3) the effects of ACT daily on psychological inflexibility.

## Method

### *Participants*

The study included a sample of 11 college student clients on the waitlist at the local CCC. Therapists at the CCC were oriented to the study by the researcher and were given flyers to provide to potentially eligible and interested clients during intake sessions. All 11 students who contacted the researcher were eligible, enrolled, and completed all study procedures (i.e., no study dropouts). All study procedures were approved by the local Institutional Review Board.

The sample was composed of 9 women and 2 men, with an average age of 23.55 ( $SD = 5.11$ , age range: 20-38). The sample identified as being Non-Hispanic, White (91%) with only 1 participant describing themselves as Hispanic/Latino. Most participants were undergraduates (91%), and 1 participant was in graduate school (9%). Most participants reported a gross annual income lower than \$20,000 (54%). The majority of participants had previous experience in therapy ( $n = 7$ ), with 4 participants seeking treatment for the first time. None of the participants endorsed engaging in face-to-face therapy during the 2-week study period.

Eligibility criteria included being 18 years of age or older, current university enrollment, placement on the CCC waiting list with at least 2 weeks before their first

scheduled face-to-face therapy appointment, having a presenting problem of depression and/or anxiety, fluency in English, and clinical stability (i.e., not currently suicidal or experiencing manic or psychotic symptoms). The study did not actively screen participants for depression and anxiety, and instead relied on the CCC clinician's discretion to provide materials to individuals with these presenting problems. This methodology was followed to mimic real-world settings in which CCC clinicians may not make a formal diagnosis during their brief initial consultation meeting before placing clients on the waitlist and clients with a range of presenting problems (both in severity and form) may be referred to an app resource. Based on empirically derived cutoff scores from the Depression, Anxiety, and Stress Scale (DASS)<sup>25</sup>, 100% of participants fell within moderate or higher scores on either depression or anxiety (i.e., DASS-D > 13, DASS-A > 9), indicating that a clinical sample was targeted within this study.

### ***Procedures***

Interested participants contacted the researcher who screened for study eligibility. After providing informed consent, participants completed a series of baseline questionnaires through an online survey platform which assessed demographics, mood/anxiety symptoms, and processes associated with PI and ACT components. Participants then completed a 30-minute, self-guided online ACT training session and were instructed in how to install the ACT Daily mobile application on their smartphone. Participants were asked to use the app for the following 2 weeks. The researcher completed a brief check in call with the participants two days after enrollment to address any potential technological issues. Participants who did not currently own a compatible smartphone at the time of enrollment were provided one.

Two weeks after this initial in-person meeting, participants completed an online post-assessment. After completing the post-assessment, participants engaged in a 30-minute phone interview concerning their overall experience with the application, usability patterns, and

improvement recommendations. Participants were entered into a drawing for a \$100 gift card that was awarded at the end of the study.

### ***Intervention***

Immediately after the baseline assessment and prior to using ACT Daily, participants completed a self-guided web-based training orienting them to ACT Daily and the four ACT components covered in the app. This included brief experiential exercises, metaphors, interactive assessments, and didactic content to provide a basic conceptual understanding of ACT to support effective use of skills taught in the app. Participants also watched a brief training video aimed to sufficiently prepare them to use ACT Daily on their own.

ACT Daily was designed to prompt the user randomly three times per day to fill out a brief ecological momentary assessment (EMA) check-in that screened for current anxiety/depression, along with current PI via the four ACT components targeted by the app. In addition to being prompted randomly three times a day, the user had the option to “check-in” by clicking on the app from the home screen, which would allow them to complete an assessment at their own discretion.

After completing the EMA pre-assessment, ACT Daily prompted the user to choose one of three options (“quick skills,” “browse skills,” or “end session”). When users selected “quick skills,” they were immediately presented with a brief skill coaching session automatically chosen by the application based on the user’s pre-EMA responses. The selected quick skill was tailored based on EMA responses so that the most elevated aspect of PI was matched to the relevant ACT component (i.e., acceptance skills if elevated highest on “fighting feelings,” defusion for “stuck in thoughts,” present moment for “on autopilot,” and values for “disconnected from values”). Tailoring ACT components based on user’s in-the-moment PI has been found to increase the effectiveness of ACT-based apps (*citation removed for blind review*).

When the user clicked on “browse skills,” the app presented the user with a list of different skill menus, each one focusing on a core component of ACT measured by the pre-assessment, and with the most relevant tailored ACT component highlighted (i.e., the component the app suggests the user practice). All ACT Daily skills were designed to be short, lasting anywhere from under one minute for “quick skills” (such as labeling one’s thoughts as just thoughts) to 3-5 minutes for “depth skills” (such as mindful breathing or a goal setting exercise).

Users could also select “end session”, which would log the user’s pre-EMA scores and close ACT Daily, effectively ending the user’s session without requiring the user to complete a skill. After completing a skill, users were prompted to complete another EMA assessment including the same questions as the pre-EMA as well as an additional question inquiring about the helpfulness of the skill.

### ***Measures***

Participants were given the *Depression, Anxiety and Stress Scale (DASS)* at baseline and post-assessment as the primary outcome measure.<sup>25</sup> The DASS consists of subscales assessing depression, anxiety, and stress on a scale of 0 to 3, with higher scores indicating more frequent symptoms. The DASS has been found to have good reliability in past research.<sup>25</sup> The Cronbach’s alpha for the DASS subscales were Depression  $\alpha = .78$ , Anxiety  $\alpha = .78$ , and Stress  $\alpha = .80$ .

The *Acceptance and Action Questionnaire-II (AAQ-II)* was used as the primary self-report measure of overall PI.<sup>14</sup> The AAQ-II asks participants to rate items relating to PI on a 7-point scale, with higher scores indicating higher PI. The AAQ-II has been found to be predictive of depressive/anxiety disorders and mediates treatment effects with ACT.<sup>16,26</sup> The Cronbach’s alpha for the AAQ-II was  $\alpha = .79$ .

The *Cognitive Fusion Questionnaire* (CFQ) measured cognitive fusion, an important subprocess of PI most relevant to the cognitive defusion ACT component.<sup>27</sup> The CFQ is comprised of items rated on a 7-point scale, with higher scores indicating greater cognitive fusion, and has been shown to be reliable and valid.<sup>27</sup> The Cronbach's alpha for the CFQ was  $\alpha = .92$ .

The *Philadelphia Mindfulness Scale* (PHLMS) was used to assess two ACT components: present-moment awareness and acceptance of difficult thoughts and feelings.<sup>28</sup> Both subscales consist of items rated on a 5-point scale, with higher scores indicating greater levels of acceptance and awareness. The acceptance subscale of the PHLMS has shown good validity with established measures of depression and anxiety.<sup>29</sup> The Cronbach's alpha for the PHLMS subscales were PHLMS-Awareness  $\alpha = .88$  and PHLMS-Acceptance  $\alpha = .94$ .

We administered the *Valuing Questionnaire* (VQ), a measure of valued living, another sub-process for PI that is particularly related to the values component of ACT.<sup>30</sup> The VQ divides the construct of valued living into two subscales: progress towards valued living, and obstructions to valued living. Each subscale consists of items rated on a 7-point scale, with higher scores indicating greater progress towards values on the progress subscale, and higher scores indicating greater obstruction to valued living on the obstruction subscale. The VQ has shown good reliability and validity,<sup>30</sup> and the Cronbach's alpha for the VQ subscales were VQ-Obstruction  $\alpha = .81$  and VQ-Progress  $\alpha = .83$ .

We used the *Emotional Self-Awareness Scale: Recognition Subscale* (ESAS) to measure the ability to recognize one's own emotions, a process closely related to the mindfulness component of ACT.<sup>31</sup> The scale consists of items rated on a 4-point scale, with higher scores reflecting greater levels of emotional self-awareness, and has shown good reliability and validity.<sup>31</sup> The Cronbach's alpha for the ESAS was  $\alpha = .91$ .

In addition to the above measures, the post-assessment also included the *System Usability Scale* (SUS) as a measure of program acceptability/usability. The SUS comprises items rated on a 5-point scale, with higher scores indicating greater user satisfaction with an interactive program.<sup>32</sup> The SUS has shown to effectively discern the level of usability across programs.<sup>32</sup> The Cronbach's alpha for the SUS was  $\alpha = .84$ .

The ACT Daily app additionally collected EMA data from self-monitoring assessments randomly scheduled during the day throughout the 2-week intervention period as well as immediately following each app skill coaching session. This data included 6 items assessing self-rated current levels of depression, anxiety, fighting feelings (i.e., acceptance), stuck in thoughts (i.e., defusion), on autopilot (i.e., present moment), and disconnected from values (i.e., values). The data was collected before and after each skill coaching session, with an additional item on the posttest asking the participant how helpful the coaching session was. The 6-item measure (7 items on the post-assessment) was rated on a 100-point scale with higher ratings indicating increased levels of depression/anxiety and PI. The application also automatically tracked program usage.

### ***Data Analysis***

ACT Daily acceptability was assessed by comparing descriptive statistics to the following benchmarks: a high level of program usage (e.g., an average of at least 14 skill coaching sessions used over the course of the study), a high degree of system usability (e.g., mean SUS score of 80 or higher), and high program satisfaction (e.g., average rankings of 4 "slightly agree" or higher on program satisfaction items).

Paired samples *t*-tests compared baseline to post scores (two weeks later) on all self-report measures, examining potential improvements on depression and anxiety symptom outcomes and PI process measures. Effect sizes on pre-post outcome measures were

calculated with Hedges'  $g$ , which can be interpreted with Cohen's guidelines of a small (0.2), medium (.5), and large (0.8) effect sizes.<sup>33</sup>

Pretest-posttest EMA data from ACT Daily were analyzed using a latent change score approach.<sup>34</sup> Separate latent change score models were run for each of the six EMA outcomes measured before and after the skill coaching session. Models were estimated with a hierarchical error structure to account for the nesting of observations within participants and correlated error terms due to repeated observations.<sup>35</sup> Within each model, the expected value of the latent change across EMA responses and across participants was first estimated without covariates, such that any variance in the posttest that was not explained by the pretest would be accounted for by the latent change score or residual change for a given participant. Day of participation was then added to each of the models as a covariate of the latent change scores. The coefficient of day predicting latent change scores was modeled as a random slope (i.e., slopes were allowed to vary between participants). A statistically significant slope would indicate that the effects of the ACT Daily app skills changed linearly from day 1 to day 14 of the study.

## **Results**

### ***ACT Daily Acceptability***

On average, participants utilized the ACT Daily coaching skills at least once per day, resulting in a mean use of 14.3 times during the 2-week treatment period across all participants. Only 2 participants used less than one skill per day, both of whom were provided with Android smartphones as they did not have their own smartphone compatible with the app. These 2 participants noted that they would have used the app more often if it was available on their personal phone, which was an iPhone.

System usability ratings were within the "excellent" range ( $M = 90$ ,  $SD = 0.66$ ) based on previous SUS research.<sup>32</sup> Additionally, individual program satisfaction ratings on the PSQ

displayed positive responses to the app's ease of use ( $M = 5.91$ ,  $SD = 0.30$ ), overall satisfaction ratings ( $M = 5.36$ ,  $SD = 0.51$ ), practice of previously learned skills ( $M = 5.36$ ,  $SD = 0.81$ ), and if they would recommend the app to others ( $M = 4.91$ ,  $SD = 1.30$ ).

### ***Pre-Post Changes on Outcome and Process Measures***

All 11 participants completed both the pre- and post- study assessments (i.e., no participant dropout was observed). Overall, paired samples  $t$  tests indicated significant improvements in depression (DASS-D), anxiety (DASS-A), stress (DASS-S), psychological flexibility (AAQ-II), valuing progress (VQ-Progress), valuing obstruction (VQ-Obstruction), cognitive fusion (CFQ), and emotional self-awareness (ESAS), with medium-to-large effect sizes (Hedges'  $g = .73 - 2.73$ ) (see Table 1). The only measure that did not improve significantly from pre-to-post was the PHLMS-Awareness subscale, which assessed present moment awareness,  $p = 0.63$ .

Seven participants (64%) moved from the clinical to nonclinical range on both the depression and anxiety subscales on the DASS (i.e. scores were reduced to 9 or below for depression, or 7 or below on anxiety, indicating mild or lower symptom severity). Furthermore, 100% of participants fell within the moderate range or lower for anxiety severity at post and 82% of participants fell within the moderate range or lower for depression severity. Reliable change indexes (RCIs) were reported in terms of the percent of the sample demonstrating reliable improvements ( $t$  score  $> 1.96$ ) over the 2-week treatment period (see Table 1).

### ***EMA Data***

Hierarchical linear modeling using latent change scores, with coaching data nested by participant, was used to examine changes in ACT Daily EMA scores from before and after each coaching session. A total of 157 observations were available with both pre and post skill

coaching self-monitoring data. Availability of ecological momentary assessment data for analysis varied by user, with users who engaged with the app more frequently providing more data. As discussed above, two users who had to be provided with smartphones for the study generated less data. The results of these models indicated significant, small in-the-moment improvements across all outcome and PI domains immediately following each app coach session (see Table 2).

In the second model of this analysis, a count variable (days elapsed in the study) was included as a covariate of the latent change scores. The slope of the regression of the latent change score on days elapsed was used to account for linear changes in intervention effects over time. The random slope of the regression of change scores on days elapsed was modeled to account for individual differences in the intervention effects over time. These models indicated significant time effects across all outcome and PI domains (see Table 3). These time effects were such that the in-the-moment improvements immediately after each skill coaching session increased over days using the app. This pattern of results may support a “practice effect,” in which the user not only learns new skills but also strengthens their skills through repeated practice over time.

### **Discussion**

This study aimed to explore the acceptability and potential efficacy of a mobile app (ACT Daily) to provide a brief, self-guided intervention for anxious and depressed student clients on the waitlist at a CCC. To-date, minimal research has been conducted on ACT-based mobile apps and no research has specifically focused on mobile ACT interventions targeting college students waiting to receive services at CCCs.

Notable effects were observed across pre-post outcome measures, with all but one measure exhibiting medium-to-large effects. A systematic review of mHealth research identified a wide range of effect sizes on outcome measures (Cohen’s  $d = 0.29 - 2.28$ ).<sup>10</sup>

However, when studies were limited to those assessing standalone mHealth apps without added support from mental health professionals (i.e., following an intervention methodology similar to the current study), effects dropped to small-to-medium (Cohen's  $d = 0.29 - 0.59$ ). Interestingly, most mHealth interventions included in this review were 4 weeks or longer, roughly twice as long as ACT Daily. Only the longer, therapist-supported interventions displayed large effects (Cohen's  $d = 1.56 - 2.28$ ), while shorter interventions provided smaller effect sizes across the board. The effectiveness of ACT Daily is comparable to other mHealth interventions utilizing ACT, such as those targeting smoking cessation, general wellbeing, and social anxiety.<sup>36-38</sup> Thus, ACT Daily's observed effects are impressive for such a brief self-guided mHealth app, but are not unprecedented for this technology.

Findings support that ACT Daily is acceptable and usable as a standalone program for depressed/anxious clients waiting for therapy. Additionally, the program appears to successfully promote core ACT processes involved in psychological flexibility. The one exception was the measure of present-moment awareness (the PHLMS-awareness subscale), which moved in a positive direction, but remained insignificant. Similar results have been observed in recent ACT intervention studies that have relied on the subscale as a measure for present moment awareness, often culminating in inconsistent results.<sup>39-41</sup> Given that 30% of participants reported that the most important thing they learned from ACT Daily was building mindfulness/present moment awareness skills, the lack of significant improvement may be related to a measurement issue.

Results supported in-the-moment effectiveness of ACT Daily's skill coaching sessions, with significant in-the-moment improvements immediately following skill coaching sessions on depression, anxiety, and the four ACT components covered within the app. Importantly, some individuals reported being already familiar with ACT skills covered within the app, but had never fully committed to using them in real-life, suggesting that ACT Daily

may help to better implement skills in everyday situations. ACT Daily also appeared to positively impact both emotional self-awareness and psychological symptoms, indicating that the program could serve as a beneficial pre-therapy tool that prepares participants for face-to-face. ACT Daily may also have the potential to decrease the overall size of the waitlist by providing a brief, yet effective intervention that is impactful enough to treat certain, less severe cases. Finally, the results suggest that an adjunctive, introductory website can feasibly supplement a skills-based mobile app. Importantly, splitting up the conceptual training component from the skills component allows for apps to remain “light” and streamlined, which may have a positive impact on user satisfaction and retention.

Because of the study’s small sample size and open-trial design, several limitations should be noted when interpreting these results. First, the sample was largely female and White. To increase generalizability of findings, future studies of ACT Daily should recruit larger and more diverse samples of college students. Likewise, the heterogeneity of the sample in regards to therapy and medication use should also be considered and potentially controlled for in future, larger-scale trials. Differing levels of utilization of ACT Daily within the sample, such as having two users who used the app less than once per day, may additionally impact the generalizability of these results. To improve feasibility, it would be beneficial to design future iterations of ACT Daily to be compatible across smartphone platforms, given that users who were unable to use their personal devices demonstrated significantly less engagement. Other relevant sources that may have contributed to study results include regression to the mean due to repeated observations, demand characteristics, and spontaneous remission. While this study did not control for all of these confounding variables, demand characteristics may have been partially mitigated by facilitating strict confidentiality policies and assuring participants that outcomes would not be shared with CCC clinicians. Although spontaneous remission cannot be accounted for in full, potential

remission associated with the elimination of end-of-semester environmental stressors was unlikely (e.g. only one participant enrolled in the study before finals and completed their post assessment during break).

While these concerns remain relevant and may limit the generalizability of these findings, this preliminary study provides evidence for ACT Daily as a feasible and acceptable low-intensity intervention for individuals waiting to receive services at CCCs. While the small sample size and lack of control group limits our ability to make generalizations about the clinical outcomes of this study, the pattern of results signal the potential efficacy of the intervention which should be further investigated in a randomized controlled trial. These include a series of large effect sizes and RCI rates on pre-post measures, significant improvement across pre-post EMA scores calculated from a substantial set of observations, and generally positive qualitative outcomes. Taken together, these findings point to ACT Daily's potential usefulness, acceptability, and effectiveness within this population of anxious/depressed college students waiting for treatment. Further research is warranted regarding what kinds of apps are most effective for this population (i.e. guided vs. non-guided, tailored vs. non-tailored, etc.), whether the clinical utility of apps translates onto other psychological issues encountered by college students besides anxiety and depression, and whether the usefulness of apps is affected by concurrent engagement in psychotherapy or psychiatric medication use. Additionally, future iterations of the program would benefit from incorporating individual characteristics and preferences such as prior knowledge of psychological coping skills. In establishing viable evidence for this intervention, it becomes clear that providing students on counselling center waitlists with self-help resources such as ACT Daily could be an important means of bridging the increasing gap between those in need of psychological help and the availability of in-person services on college campuses.

Table 1. Descriptive Statistics and Paired Sample t-Test Results from Baseline to Post (2 weeks later) on Self-Report Measures

Measure	Pretest		Posttest		<i>t</i>	Hedges' <i>g</i>	RCI (% Improved)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
DASS-Depression	20.55	8.72	11.72	7.81	2.40**	1.08	55%
DASS-Anxiety	14.88	9.05	8.73	4.76	2.23**	0.73	27%
DASS-Stress	22.36	9.20	15.09	8.01	2.28**	0.81	55%
AAQ-II	30.81	6.14	26.82	5.86	2.51**	0.64	36%
VQ – Obstruction	25.00	5.08	17.73	5.42	3.64**	1.33	82%
VQ – Progress	18.09	5.43	22.36	4.29	2.24**	0.84	64%
CFQ	35.82	7.21	26.91	5.41	5.48**	1.34	82%
PHLMS – Awareness	35.27	7.56	34.27	3.66	.50	0.17	27%
PHLMS - Acceptance	23.45	9.23	29.73	6.16	2.41**	0.77	45%
ESAS	13.63	5.48	17.00	2.76	2.96**	0.75	36%

*Note.* DASS = Depression, Anxiety and Stress Scale, AAQ-II = Acceptance and Action Questionnaire – II, VQ = Valuing Questionnaire, CFQ = Cognitive Fusion Questionnaire, PHLMS = Philadelphia Mindfulness Scale, ESAS = Emotional Self-Awareness Scale: Recognition Subscale. RCI = Reliable change index, reported in terms of the percent of the sample demonstrating reliable improvements (*t* score > 1.96) over the 2-week app testing period.

\*  $p < .05$  (2-tailed), \*\*  $p < .01$  (2-tailed).

Table 2. Latent Change Model Results

Variable	Pretest		Posttest		$E(\Delta Y)$	SE	$P$	Cohen's $d$
	$M$	$SD$	$M$	$SD$				
Anxiety	41.46	26.26	38.11	23.13	-6.432	1.140	<.001	0.34
Depression	34.07	23.60	33.23	21.96	-3.154	0.440	<.001	0.43
Fighting feelings	31.13	25.11	27.20	21.59	-5.548	1.531	<.001	0.22
Stuck in thoughts	32.97	25.37	29.55	22.11	-4.616	0.970	<.001	0.29
On autopilot	32.65	26.39	28.55	21.78	-6.085	2.037	.003	0.18
Disconnected from values	32.75	25.53	30.71	19.84	-4.24	0.892	<.001	0.29

$E(\Delta Y)$  = Latent change score estimate. Pretest = EMA self-monitoring data immediately before app skill coaching; Posttest = EMA self-monitoring data immediately after app skill coaching.

Table 3. Random Slopes Model Testing Changes in the Strength of In-The-Moment Effects Over Days Using the App

Variable	Coefficient	<i>SE</i>	<i>p</i>	Cohen's <i>d</i>
Anxiety	0.686	0.110	<.001	0.37
Depression	0.270	0.088	.002	0.19
Fighting feelings	0.550	0.176	.002	0.19
Stuck in thoughts	0.478	0.069	<.001	0.42
On autopilot	0.753	0.236	.001	0.19
Disconnected from values	0.434	0.150	.004	0.18

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