Choosing ACT or CBT: A Preliminary Test of Incorporating Client Preferences for Depression Treatment with College Students

**Introduction**

College students are markedly at risk for depression. In a recent survey of over 50,000 students in the United States, 22% reported a lifetime diagnosis of depression (American College Health Association, 2019). Additionally, research suggests that students have higher depression than the general population (Beiter et al., 2015), and about a quarter of students meet criteria for suicide risk (ACHA, 2019). Traditional mental health interventions for students (i.e., in-person counseling) struggle to keep up with the demand for services on college campuses. A recent study indicated an average of one counselor position per 1,064 students, a discrepancy that often forces providers to place students on a waitlist or limit the number of therapy sessions they can receive (Association for University and College Counseling Center Directors, 2019).

To promote student wellbeing in an efficient manner, self-guided interventions for depression can be used, such as cognitive behavioral therapies (CBTs), which is a group of well-established treatments for depression that can be delivered in online formats (Karyotaki et al., 2021). However, a persistent issue in online CBTs is a high rate of dropout, with up to 74% of users not fully completing treatment (Karyotaki et al., 2015; Richards & Richardson, 2012). An understudied approach to promoting engagement with online CBTs is allowing clients to choose the specific intervention they use.

Within the broader family of CBTs are in fact multiple evidence-based approaches to choose from. Traditional CBT (tCBT) emphasizes cognitive restructuring along with behavioral activation techniques. Another popular approach is acceptance and commitment therapy (ACT), which focuses on mindfulness and acceptance practices in addition to behavioral activation. ACT and tCBT approach the treatment of depression in distinct ways (A-Tjak et al., 2021). tCBT focuses on identifying and restructuring thoughts that contribute to cycles of depressed feelings and associated behaviors such as social withdrawal. Conversely, treatment using ACT brings awareness to the role of entanglement with depressive thoughts and feelings while teaching skills to engage in meaningful activities while still experiencing them. While both self-help ACT (Sierra, 2018) and tCBT (Webb, Rosso, & Rauch, 2017) have shown effectiveness in treating depression, there is a lack of research comparing these approaches for college students specifically or examining the effects of allowing clients to choose between these two distinct approaches for their treatment. Prior research comparing ACT and tCBT suggest these approaches have equivalent positive effects on depression (Twohig & Levin, 2017), raising the key question of whether it’s more important for clients to select a modality they personally prefer and are likely to commit to.

In a meta-analysis of 53 in-person therapy trials, clients receiving their choice of therapy had both lower rates of treatment dropout and better overall outcomes (Swift et al., 2018). In a recent study testing a tCBT intervention compared to yoga and stress education for generalized anxiety, clients were asked about their treatment preference prior to randomization but did not actually get to select their intervention. The effect of treatment preference differed by modality, with participants who did not receive their preference showing better outcomes if they were randomized to CBT, and participants who both preferred and received yoga more likely to dropout of treatment (Szuhany et al., 2022). Overall, there is a lack of research in which a choice of intervention is explicitly offered and compared to a randomized condition, and self-help treatments are especially understudied in regards to client choice effects.

The issue of client choice is also a practical one related to how self-help treatments are disseminated on college campuses. Universities may debate which programs are most worthwhile to give their students, or whether the more important factor is to offer a variety of choices. Allowing clients a choice of treatment is a common clinical perspective, but one rarely tested empirically. Clarifying the role of this overlooked component of self-help implementation (i.e., whether to assign a specific resource or give a choice between resources), such as whether it may increase adherence and outcomes, would help in delivering the most effective care to college students and other populations with a high need for support but limited resources.

The present study tested the feasibility, acceptability, and efficacy of ACT and tCBT self-help books for depression, accessed through the university’s online library, in a randomized trial with college students. Specifically, we examined the role of client choice on treatment adherence and clinical outcomes by including an experimental condition in which participants were allowed to choose their treatment, relative to conditions where either ACT or tCBT was randomly assigned. We predicted that students who had a choice of intervention would show greater adherence than those who were randomized, as well as greater satisfaction with their book. Based on prior research comparing ACT and tCBT for depression (Twohig & Levin, 2017), we predicted that we would not observe significant differences on clinical outcomes based on the intervention itself (ACT or tCBT), but rather depression (primary outcome) and anxiety symptoms (secondary outcome) would improve over time in both conditions. We predicted, however, that having a choice of book would lead to greater improvements in depression and anxiety for both interventions compared to randomized students.

**Methods**

**Participants**

We recruited a sample of 142 students who met the following criteria: 1) 18 years of age or older; 2) being a current student at the authors’ university in the Mountain West region of the USA; 3) not having participated in previous self-help studies conducted by the authors; 4) being interested in using a self-help book; and 5) scoring at least a 10 on the depression subscale of the Depression, Anxiety, and Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995), which is the cutoff for moderate depression. The most common referral source was an online university research study pool (37.6%) followed by advertisements on an online student portal (36.2%). Other sources (26.2%) included community flyers, class announcements, and referrals from campus providers. Students had the option to receive research participation credits for joining the study. Recruitment took place over 13 months from January 2019 through February 2020. Three participants were removed from analysis who self-identified as randomly responding to half or more questions on any survey, leaving a final sample of 139 students for analysis (see Figure 1 for participant flowchart).

**Procedures**

The study was preregistered through ClinicalTrials.gov (*identifier removed for masked review*). All procedures were completed online, including assessments as well as access to self-help eBooks provided by the university library. Assessments were administered through Qualtrics, a secure online survey platform. After completing informed consent, students completed a questionnaire to determine eligibility, followed by a baseline assessment. Following baseline, participants were automatically randomized through Qualtrics in blocks of nine with a 3:3:3 allocation ratio to one of the following conditions: an ACT book, a tCBT book, or a choice between the two books. In Qualtrics, block randomization is conducted by computerized random number generation and allocation is concealed to the researcher. Participants were not masked to condition considering that they were implicitly aware of which book they received (or if they had the choice of book) and all questionnaires were completed through online self-report and without researcher supervision. Potential baseline differences between groups were tested to confirm that randomization was successful.

Students in the choice condition were presented with a brief description of each book (see supplemental materials) and were asked to select one to use for the study. Thus, four groups of participants were ultimately created: ACT-Randomized, ACT-Choice, tCBT-Randomized, and tCBT-Choice. Students were given a 10-week reading schedule which designated 1-2 new chapters each week. Both books were delivered in the same eBook format through the university library. Students were asked to not use other self-help resources during the study, but they could participate in face-to-face therapy. We contacted participants via email twice per week to prompt them to read that week’s chapters.

**Interventions**

Students who chose or were randomized to ACT used *The Mindfulness and Acceptance Workbook for Depression: Using Acceptance and Commitment Therapy to Move Through Depression and Create a Life Worth Living* (Strosahl & Robinson, 2008). Participants who chose or were randomly assigned to tCBT read *The Cognitive Behavioral Workbook for Depression: A Step-by-Step Guide to Overcoming Depression* (Knaus, 2006). While the two books diverged on therapeutic approach, they were comparable on other factors. The books were nearly equal in length (328 pages for ACT, 336 pages for tCBT), and while the tCBT book contained more chapters than ACT, our reading schedule was designed so that the total number of pages students read each week was nearly equivalent. Additionally, both books were from the same publisher and used a similar format in presenting ACT or tCBT coping skills.

**Measures**

Students were sent a midtreatment survey 5 weeks after baseline, a posttreatment assessment 10 weeks after baseline, and a final follow-up survey 3 months following posttreatment (22 weeks after baseline). Participants received multiple email and phone prompts to complete study assessments.

***Adherence and satisfaction***

Adherence to interventions was assessed from participants’ self-reported number of chapters read at posttreatment, which were then converted to a percentage out of the total number of chapters in their assigned book. Students additionally rated their satisfaction with various aspects of the intervention on a 6-point scale from “Strongly disagree” to “Strongly agree,” with items used previously to evaluate program acceptability with online self-help (Krafft et al., 2020; Levin et al., 2020).

***Mental health outcomes***

We measured depression (primary outcome) and anxiety symptoms (secondary outcome) using the relevant subscales of the DASS-21. On each subscale, items are rated from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”), with higher scores suggesting higher symptom severity. The DASS-21 has been shown to be reliable and valid with college students (Zanon et al., 2020). Internal consistency was good to excellent in this sample (Cronbach’s α = .93 for depression and .83 for anxiety).

**Analytic Plan**

We determined a target sample size based on a priori power analysis conducted in G\*Power, which calculated that a sample size of 150 would provide adequate power (0.80) to detect small effect size differences between groups (*d*=0.20). We predicted that the differences between book conditions may be relatively small based on prior studies (e.g., Krafft et al., 2020; Levin et al., 2020). Although we recruited close to this target sample size (n=139), there was notable attrition (n=65 at posttreatment). As a result, this study had limited statistical power examining treatment effects and results should be interpreted as preliminary, particularly in terms of interpreting non-significant findings.

As an initial analysis, we examined demographic variables and treatment status by group and assessed for potential baseline differences using chi-square and one-way ANOVA tests. We also examined levels of mental health variables at baseline and performed a series of one-way ANOVA tests to determine whether baseline clinical variables were predictors of adherence to assessments.

Next, data from participants in the choice condition were assessed to understand trends in preferences between the two interventions, reasons for choosing a particular book, and whether book choice was associated with any demographic or baseline clinical factors, according to chi-square tests. We also assessed the reasons participants in the choice condition chose a particular book, based on a list of possible reasons, as well as how strongly they felt about the book they chose based on their response to a three-point scale ranging from “not at all” to “very much so.”

We additionally examined self-reported rates of adherence to books in each group and ran two-way ANOVA tests to evaluate whether assignment method predicted intervention adherence. Furthermore, satisfaction with books was examined and two-way ANOVA tests used to determine whether assignment method predicted satisfaction with books. We also tested whether pre to posttreatment changes in depression and anxiety were correlated with adherence to books to understand whether or not clinical outcomes were associated with adherence.

To test the effect of book and assignment method on mental health outcomes (depression and anxiety), a series of mixed-effects models was used for each outcome with the full intent-to-treat sample at all four time points. Each model included a random intercept at the participant level to account for individual-level variation on outcomes, as well as random slopes to account for individual-level variation in the slopes of outcome variables over time. We assessed main effects for time, book, and assignment method, in addition to two-way interactions of time by book, time by assignment method, and book by assignment method. Finally, we tested a three-way interaction between time, book, and assignment method to determine if assignment method moderated the relationship between time and book. All models were created with the lmer() function in R (Kuznetsova et al., 2017). To allow for interpretation across different scales and estimate effect sizes, regression coefficients for outcome variables were standardized.

Given the notable amount of missing data in the sample, maximum likelihood was used for all parameter estimates in our mixed effects models of outcome variables. This method allows for an intent to treat analysis using all available data, even when some observations are missing. This approach to missing data uses an iterative method to test various parameter estimates by imposing distributional assumptions on incomplete variables until finding a set of parameters which maximizes the likelihood function (Grund et al., 2019). The maximum likelihood method can provide accurate model estimations even when handling high levels of missingness (Newman, 2003).

**Results**

**Participant demographics**

See Table 1 for complete demographic information by treatment group. The sample of 139 students (after three were removed from analysis due to random responding) was largely female (78.4%), white (92.8%), non-Hispanic (91.4%), and attending classes in-person (77.7%) as opposed to distance learners. Most students were not currently taking psychiatric medications (61.2%), nor presently in psychotherapy (82.7%). This suggested that our sample of students was largely unengaged in mental health treatment. At the same time, our sample was notable for its high level of depression symptomatology, with 49 students (34.5%) in the moderately severe or severe clinical range at baseline. No significant differences were detected between groups on demographic variables or treatment status (all *p*s > .05).

**Adherence to assessments**

Overall, retention in the study was low: 51.8% of students completed the midtreatment assessment, 44.6% completed posttreatment, and 49.6% completed the follow-up assessment (see Figure 1). There were no significant differences in attrition between the four groups according to chi-square tests (*p* = .93 for midtreatment, *p* = .82 for posttreatment, and *p* = .06 for follow-up). Additionally, neither baseline depression nor baseline anxiety was predictive of missingness at any of the three timepoints (all *p*s > .10).

**Book choices**

There was a somewhat greater preference for ACT in the choice condition: 29 students selected the ACT book (61.7%), while 18 selected tCBT (38.3%). According to chi-square tests, age, gender identity, race/ethnicity, and therapy/medication use were not predictors of choosing a particular book (all *p*s > .10). Likewise, levels of baseline depression or anxiety were not associated with students choosing one book over the other (all *p*s > .10). The two most common reasons that students indicated for choosing a particular book were “I like the particular approach the book uses” and “I thought it would be more helpful.” After choosing a book, students rated how strongly they felt about their choice on a three-point scale ranging from “not at all” to “very much so.” Notably, all students indicated that their preference was either “very much” (*n* = 21; 44.7%) or “a little” strong (*n* = 26; 55.3%), with no students indicating they did “not at all” feel strongly about choosing ACT or tCBT.

**Adherence to books**

Comparing students in each of the four combinations of intervention and assignment method, those in the ACT-Randomized group read an average 70.9% of chapters (*SD* = 30.0) compared to 44.7% (*SD* = 34.2) in the ACT-Choice group. Those in the tCBT-Randomized group read a mean 55.9% (*SD* = 32.2) of chapters, whereas students in the tCBT-Choice group read an average 22.6% of chapters (*SD* = 27.6). Important to note is that adherence data was only available for the 44.6% of participants who completed the posttreatment survey, whose combined overall adherence rate across all treatment groups was 54.3%. We can infer that the true adherence rate was lower since participants who dropped out by posttreatment are presumably less likely to have adhered to treatment.

Among participants who did complete posttreatment, a two-way ANOVA test found a significant main effect for assignment method in predicting chapters read, favoring students who were randomized to a book, *F*(1, 58) = 11.52, *p* = .001. In the same two-way ANOVA, intervention (i.e., ACT or tCBT) was not a significant main predictor of adherence, *F*(1, 58) = 2.35, *p* = .13, nor was the interaction between intervention and assignment method, *F*(1, 58) = 0.17, *p* = .68. Students who received either ACT or CBT at random had significantly greater adherence (*M* = 63.4% *SD* = 4.9) compared to students who chose their book (*M* = 33.4%, *SD* = 7.2), according to a post hoc comparison made using the Tukey HSD at a 95% confidence level (*p* = .001). This finding suggests that randomization, and not choice, predicted better adherence to self-help books, contradictory to our predictions. Additionally, neither changes in depression (*r* = 0.04, *p* = .77) nor anxiety (*r* = 0.07, *p* = .62) over the course of treatment were significantly correlated with adherence.

**Satisfaction with books**

Students rated their satisfaction with various aspects of the self-help books on a 6-point scale, with values of 4 and higher indicating that students were at least somewhat satisfied. According to two-way ANOVA tests, there were no differences between the four groups on any satisfaction items (all *p*s > .10), suggesting that students were equally satisfied with the book they read regardless of the approach and whether they chose it or were randomly assigned. The four groups rated overall satisfaction similarly high (ACT-Randomized M = 4.9, SD = 1.1; ACT-Choice *M* = 4.7, *SD* = 1.3; tCBT-Randomized *M* = 4.6, *SD* = 0.9; tCBT-Choice *M* = 4.8, *SD* = 0.5). Additionally, all groups indicated they would likely recommend the self-help book they used to other students with depression (ACT-Randomized M = 5.0, SD = 1.2; ACT-Choice M = 4.7, SD = 1.4; tCBT-Randomized M = 4.5, SD = 1.3; tCBT-Choice M = 4.5, SD = 1.9). Students were overall less satisfied, however, with the online format of the books when asked if they would have rather used a printed copy (ACT-Randomized M = 3.1, SD = 1.6; ACT-Choice M = 3.2, SD = 1.8; tCBT-Randomized M = 2.6, SD = 1.4; tCBT-Choice M = 2.8, SD = 1.5).

**Mental health outcomes**

*Depression*. Descriptive statistics of outcome variables at each timepoint are presented in Table 2. A significant effect for time was found for depression (*β* = -0.46*, p* < .001; see Table 3 for all outcome models), indicating that depression scores decreased an average of 0.46 SDs per timepoint across all groups. The two-way interaction of time by book was significant for depression (*β* ***=*** 0.19, *p* = .041), such that students receiving the ACT book saw average reductions in depression of 0.19 SD greater per timepoint compared to those receiving the tCBT book. This suggests an overall advantage for ACT in reducing depression compared to tCBT. The two-way interaction of time by assignment method was not significant for depression outcomes (*p* = .052). Finally, the three-way interaction of time, book, and assignment method was significant for depression (*β* ***=*** -0.33, *p* = .036). This suggests that when participants had a choice of treatment, the tCBT book produced greater improvements in depression over time, with the ACT book performing better for those who were randomized (i.e., choosing tCBT does better than choosing ACT, while being assigned ACT does better than being assigned tCBT).

We further examined this three-way interaction on depression outcomes with a series of post hoc tests of Cohen’s *d* effect sizes. These tests revealed that students who chose the tCBT book saw a large between-group effect of reduced depression during treatment (*d* = -1.30, 95% CI [-2.30, -.31]), as did students who chose ACT (*d* = -.94, 95% CI [-1.62, -.27]). A small effect size suggesting increased depression between post and follow-up was detected for students who chose ACT (*d* = .26, 95% CI [-.47, .99]), compared to a negligible effect over the same time period for those who chose tCBT (*d* = .04, 95% CI [-1.04, 1.12]). Among randomized students, the ACT group saw a large effect during treatment (*d* = -1.18, 95% CI [-1.75, -.60]), as did the tCBT group (-.98, 95% CI [-1.54, -.42]). From posttreatment to follow-up, students randomized to tCBT experienced a negligible effect for depression (*d* = .20, 95% CI [-.40, .79]), whereas those randomized to the ACT book had small effects indicating decreased depression over the same period (*d* = -.37, 95% CI [-1.07, .33]). This would suggest that improvements in depression were largely similar across groups during the 10-week treatment period. During the follow-up period, however, students who were using the ACT book diverged based on assignment method: students who chose ACT saw depression increase somewhat over this time, whereas those who were randomized to ACT built on gains made during the treatment period, though at a slower rate.

*Anxiety.* Similar to depression, we found a significant time effect for anxiety (*β* ***=*** -0.41, *p* < .001), indicating that anxiety scores decreased by approximately 0.41 SDs per timepoint across all groups. The interaction of time by book was not significant for anxiety (*p* = .11), though the interaction of time by assignment method was (*β* ***=*** 0.24, *p* = .035). Anxiety decreased 0.24 SD more per timepoint (*p* = .035) for students who were randomized to a book compared to those who chose one. Thus, randomization appeared to have a surprising positive effect on reducing anxiety compared to choosing a book. The three-way interaction of time, book, and assignment method did not significantly predict anxiety (*p* = .22). This indicates that, unlike depression, neither ACT or tCBT had a particular advantage in reducing anxiety, nor did books show differential effects based on whether a student chose that book or was randomized to it.

**Discussion**

We expected that allowing students to choose the treatment they received would lead to greater adherence and clinical outcomes for depression and anxiety. Surprisingly, we found that students who chose their self-help book adhered to the intervention less and experienced smaller reductions in anxiety than those randomly assigned either book. The association between choice and adherence held true above and beyond any discrepancies in adherence between books based on therapeutic modality. While previous studies of online CBTs which have provided clients with options for selecting treatment modules have shown inconclusive effects on adherence (Andersson et al., 2011), it is notable that the discrepancy in our study was far more pronounced. Interestingly, students indicated equally high satisfaction in their self-help book regardless of whether they were randomized to it or given a choice. While one may expect satisfaction with a treatment to correspond with adherence to it, this did not appear to be the case in our sample.

While these results were unexpected, there are a number of potential rationales for why such an effect may have occurred. In the common factors model of psychotherapy (Wampold, 2015), an emphasis is placed on the therapist and client reaching an agreement on the issues to be addressed and an appropriate strategy for treating them. In our study, students were given a choice between two treatments immediately after enrolling and reading only brief descriptions. It is possible that if students had the opportunity to understand the differences more clearly, or to consult with a therapist regarding which option was a better fit for them, we may have seen different results. In other words, this may have allowed for stronger agreement between client and treatment. It is possible that many students simply did not choose the “right” book for them, with previous evidence suggesting that even therapists themselves may not always be able to distinguish between ACT and tCBT (Storaasli et al., 2007).

Our unexpected findings regarding choice and adherence also suggest that when implementing self-help programs on college campuses, providing students with a viable, evidence-based treatment for depression may be more important than offering a variety of options. This approach may serve students who feel overwhelmed by numerous treatment options and thus lessen an additional barrier to initiating care. Selecting one primary intervention to distribute to a student population may additionally benefit institutions themselves, who would not need to purchase access to several resources.

In addition to these unexpected results regarding adherence, students using the ACT book had slightly greater clinical improvements in depression over time compared to those using tCBT, equal to about one-fifth of a standard deviation. This effect did not hold true for anxiety outcomes. The small discrepancy between treatments is largely consistent with prior comparisons between ACT and tCBT, which have tended to show minimal differences between these interventions on depression outcomes (A-Tjak, 2021; Twohig & Levin, 2017). In our study, we additionally saw differential effects of treatment depending on whether they were randomized or chosen, but only during the follow-up period. Taken together, these data indicate a potential small advantage for using ACT for college students with depression, though further study should examine individual differences (such as depression subtype) to clarify the appropriateness of providing ACT over tCBT self-help.

**Limitations**

There was a notable amount of dropout within the sample, with less than half of study participants completing the posttreatment assessment. While these rates of dropout are concerning, they are within the range of other self-help interventions for depression. For instance, a recent meta-analysis of mobile self-help interventions for depression found an overall dropout rate of 47.8% (Torous et al., 2020). However, our difficulty with retaining participants means that our results carry the risk that findings may not replicate in other contexts. Considering our unexpected findings regarding the role of random versus chosen assignment to a self-help intervention, it would be especially important to try and replicate this effect with larger samples.

In addition to a high rate of missing data, methodological limitations may restrict the generalizability of the effects of client choice that were found in our study. Study participants were randomized into three initial groups of equal size: receive the tCBT book, receive the ACT book, or make a choice between the two books. In analyses, however, we compared groups using a 2x2 factorial design (i.e., ACT-Randomized, ACT-Choice, tCBT-Randomized, and tCBT-Choice) instead of comparing the initial three groups. Since these three initial groups were roughly equal in size, there was a discrepancy between the number of students reading a certain book who were randomized to it versus those who chose to read the same book. This, in turn, limited our ability to infer group differences when examining interactions involving both book and assignment method.

Mixed effects models can provide accurate parameter estimates even when working with relatively small group sizes (Maas & Hox, 2005), which meant that we were still able to model overall linear trends. However, our initial determination of target sample size was based on an a priori power analysis assuming a simpler three-group comparison as opposed to the mixed effects model we ultimately used. We had initially planned to combine ACT-Randomized with ACT-Choice participants and compare these to the combined group of CBT-Randomized and CBT-Choice, followed by examining whether students in the choice condition for either intervention displayed different trends in outcome variables. However, instead of this series of subgroup analyses, we decided to use a mixed effects model after receiving statistical consultation. We decided that this analytic approach allowed us to fully assess the effects of intervention, assignment method, and the potential interaction between these two factors.

This change in analytic approach, combined with a high dropout rate, meant that one subgroup (tCBT-Choice) had only seven data points at posttreatment, which restricted our ability to detect meaningful post hoc effect sizes between groups. To avert this issue, randomization should have allocated students into two initial groups, randomized or choice, with participants subsequently being divided into either ACT or tCBT by random assignment or their own choosing, so that the four groups were more equally balanced for a 2x2 factorial analysis.

Likewise, additional steps could have been taken to minimize the risk of bias in the choice condition. We relied on basic summaries of key intervention concepts to distinguish the ACT and tCBT books. However, additional measures could have been taken to ensure the descriptions presented to students were accurate and comparable. For instance, contacting the book authors to review our brief descriptions could have helped make them more reflective of the whole intervention. Finally, the use of a control group would have further clarified the effects of the self-help treatments, for instance by offering a nonclinical eBook to test whether structured reading on its own produces any meaningful effects. The issue of client choice is severely understudied in the area of self-help interventions, and having few reference points to guide our methodology in this trial contributed to these errors which should be addressed in future studies.

Overall, the significant reductions observed in clinical outcomes are notable for low-intensity interventions given to students with relatively high baseline symptoms. However, the challenges faced with low treatment adherence, as well as study dropout, point to the difficulties of engaging this population over time. We attempted to increase adherence by offering a subset of participants a choice between an ACT and tCBT intervention. We found, unexpectedly, that students who chose their self-help book performed worse than those who were randomly assigned one. While our findings should be considered preliminary in nature due to notable participant dropout and how this impacted statistical power, they may point to an overall trend worthy of further investigation. Specifically, that simply providing students with high quality self-help resources may be more important than providing choices between different therapeutic approaches.

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**Table 1**

*Participant demographics by group*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ACT-Randomized (n=45)  M(SD)/% | ACT-Choice (n=29)  M(SD)/% | CBT-Randomized  (n=47)  M(SD)/% | CBT-Choice  (n=18)  M(SD)/% |
| Age | 23.2 (6.7) | 24.1 (7.8) | 23.6 (6.5) | 21.6 (3.7) |
| Gender | 73.3% female  26.7% male | 75.9% female  24.1% male | 80.9% female  17% male  2.1% nonbinary | 88.9% female  5.6% male  5.6% nonbinary |
| Race | 93.3% white  2.2% multiracial  4.4% Native Hawaiian or other Pacific Islander | 93.1% white  6.9% multiracial | 89.4% white  4.3% multiracial  4.3% American Indian/Alaska Native  2.1% Black | 100% white |
| Ethnicity | 11.1% Hispanic/Latinx | 10.3% Hispanic/Latinx | 8.5% Hispanic/Latinx | 0% Hispanic/Latinx |
| Current therapy | 13.3% yes | 24.1% yes | 17% yes | 16.7% yes |
| Current psychiatric medication | 33.3% yes | 44.8% yes | 40.4% yes | 38.9% yes |

**Table 2**

#### Descriptive statistics of mental health outcome variables by condition at each timepoint

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ACT-Randomized (n=45 *a*)  M(SD) | | | | ACT-Choice (n=29)  M(SD) | | | |
|  | BL | MT | PT | FU | BL | MT | PT | FU |
| DASS-21 Depression | 12.4 (5.5) | 6.2 (4.5) | 5.9 (5.6) | 4.1  (3.7) | 11.8 (5.7) | 7.8 (4.8) | 6.3 (6.0) | 8.0  (6.7) |
| DASS-21 Anxiety | 9.7  (5.6) | 5.7 (3.9) | 5.0 (4.1) | 3.9  (3.3) | 9.0 (5.0) | 5.5 (4.5) | 5.2 (4.7) | 6.4  (6.2) |
|  | CBT-Randomized (n=47)  M(SD) | | | | CBT-Choice (n=18)  M(SD) | | | |
|  | BL | MT | PT | FU | BL | MT | PT | FU |
| DASS-21 Depression | 10.9 (5.5) | 7.9 (4.7) | 5.8 (4.5) | 6.6  (4.2) | 12.8 (4.9) | 10.4 (6.4) | 6.6 (4.4) | 6.8  (5.7) |
| DASS-21 Anxiety | 7.8  (4.4) | 5.6 (4.0) | 3.7 (2.8) | 4.2  (3.7) | 9.0 (4.7) | 7.6 (5.4) | 5.6 (4.5) | 6.6  (6.1) |

*Note:*

*a* Refers to the sample sizes at baseline. Sample sizes for the other three timepoints are as follows:

**MT (midtreatment):** ACT-Randomized n=24, ACT-Choice n=15, CBT-Randomized n=25, CBT-Choice n=8

**PT (posttreatment):** ACT-Randomized n=20, ACT-Choice n=15, CBT-Randomized n=20, CBT-Choice n=7

**FU (follow-up):** ACT-Randomized n=15, ACT-Choice n=17, CBT-Randomized n=28, CBT-Choice n=9

**Table 3**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Time *β* | Book *β* | Assignment method *β* | Book\*  Assignment method *β* | Time\*Book *β* | Time\*  Assignment method *β* | Time\*Book\*  Assignment method *β* |
| *Outcome a,b* |  |  |  |  |  |  |  |
| DASS-21 Depression | -0.46\*\*\* | -0.19 | -0.11 | 0.45 | 0.19\* | 0.20† | -0.33\* |
| DASS-21 Anxiety | -0.41\*\*\* | -0.31 | -0.17 | 0.37 | 0.16 | 0.24\* | -0.21 |

#### Mixed effects models predicting mental health outcomes

*Note:*

*a* The reference groups for *β* coefficients were Book: ACT book and Assignment Method: Randomized. Therefore, *β* coefficients reflect estimated differences when a participant read the CBT book and/or chose their treatment.

*b* All *β* coefficients were standardized.

†p< .10, \*p < .05, \*\*\*p < .001

**Figure 1**

Flow of participants in study

**Diagram

Description automatically generated**