

Effects of Digital Therapy Interventions on Student Stress

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Chow and colleagues investigated whether embedding cognitive-behavioral therapy (CBT) techniques into a Time Well Spent (TWS) smartphone app would prompt graduate-student knowledge workers to reconceptualize their time use more holistically. Over four weeks, 24 participants were randomly allocated to (a) a CBT-infused TWS logging condition or (b) a productivity-only logging baseline. Mixed-methods analyses—including thematic coding (Braun & Clarke, 2006) and descriptive statistics—revealed that intervention participants reported broader definitions of productive time, demonstrated sharper emotion-activity awareness, and more frequently reframed negative work moments.

Hwang and colleagues conducted a ten-week randomized controlled trial ($N = 126$) examining *BetterLife*, a smartphone CBT app for occupational stress. Relative to wait-list controls, app users showed significant reductions in perceived stress and gains in work engagement, although changes in depression and anxiety did not reach statistical significance. Analyses employed ANCOVA, logistic regression, and two-way repeated-measures ANOVA, demonstrating large between-group effects on stress. These findings confirm that digital CBT can meaningfully reduce stress outside traditional therapy.

Proposed Research Hypothesis

Undergraduate students who complete the eight-week *MindTune* smartphone-based CBT program will report significantly lower perceived stress at post-test than students in the wait-list control group. Undergraduate students who complete *MindTune* will report significantly stronger holistic time-management intentions at post-test than students in the wait-list control group.

Methods

This proposal outlines a study to evaluate the effectiveness of a hypothetical smartphone-delivered Cognitive Behavioral Therapy (CBT) intervention, tentatively named "MindTune," inspired by the intervention described in Hwang et al.'s 2022 study. While the app in the cited study is not publicly available at the time of writing, *MindTune* would be designed with comparable features to reduce stress and improve holistic time management strategies among undergraduate students.

Proposed Research Hypothesis

College students who participate in digital CBT intervention will report (a) significantly lower levels of perceived stress and (b) significantly higher levels of holistic time management intentions at the end of the experiment, compared to students in the waitlist control group.

Participants

The target population for this study will be 60–80 undergraduate students (ages 18–25) enrolled at Southern Oregon University. Eligibility criteria include (a) ownership of an iOS or Android smartphone, (b) self-reported moderate to high stress and (c) English proficiency. Students currently receiving psychotherapy will be excluded.

Participants will be stratified by gender and baseline stress level prior to assignment. Each participant will then be randomly assigned in a one-to-one ratio to one of two groups. The CBT intervention group, which will include approximately 30 students, will receive immediate access to *MindTune* and be asked to complete one 10- to 15-minute module each week for eight consecutive weeks. The wait-list control group, also consisting of approximately 30 students,

will not receive any modules during the eight-week study period but will be granted full access to *MindTune* following completion of the post-test assessment.

Design

This study employs a mixed experimental design with one between-subjects factor, which is the experimental condition comparing students who use the *MindTune* CBT app to those in a wait-list control group, and one within-subjects factor representing time, measured at both pre-test and post-test.

The independent variable is group assignment, comparing students who receive the *MindTune* CBT intervention to those in a wait-list control group. The within-subjects factor is time, with measures collected at both pre-test and post-test. The two dependent variables are (1) perceived stress, assessed using the Perceived Stress Scale-10 (PSS-10; Cohen et al., 1983), and (2) holistic time-management intentions, measured by the Goal-Setting/Planning subscale of the Time Management Behavior Scale (TMBS-GS; Macan et al., 1990).

Measures

Perceived Stress

Self-reported stress will be assessed with the 10-item Perceived Stress Scale (PSS-10; Cohen et al., 1983). Participants indicate how often they experienced each symptom of stress over the previous month on a 5-point scale (0 = Never to 4 = Very often). Item responses are summed to yield a total score ranging from 0 to 40; higher scores reflect greater perceived stress. The PSS-10 demonstrates strong internal consistency in college samples ($\alpha \approx .78\text{--}.91$). A representative item is, “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?”

Holistic Time-Management Intentions

Intentions to engage in holistic time-management strategies will be measured with the Goal-Setting/Planning subscale of the Time Management Behavior Scale (TMBS-GS; Macan et al., 1990). The subscale comprises eight statements rated on a 5-point Likert scale (1 = Strongly disagree to 5 = Strongly agree). Higher scores indicate stronger intentions to use proactive, goal-oriented time-management behaviors. Internal consistency for the subscale is adequate ($\alpha \approx .80$). An illustrative item is, “I review my goals to see if I’m on target for completion.”

All questionnaires will be administered online via Qualtrics. Demographic information (e.g., age, gender, academic major) will also be collected at baseline to characterize the sample.

Procedures

The study will be conducted over a ten-week period and divided into three distinct phases.

Week 0 – Screening and Baseline Assessment

Participants will complete an eligibility screening to determine inclusion. Those who meet criteria will provide informed consent and complete baseline measures, including the Perceived Stress Scale-10 (PSS-10) and the Time Management Behavior Scale – Goal-Setting/Planning subscale (TMBS-GS). Participants will then be randomly assigned to either the CBT intervention group or the wait-list control group.

Weeks 1–8 – Intervention Phase

Participants in the CBT intervention group will be granted immediate access to *MindTune* and instructed to complete one module per week. Each module will require approximately 10 to 15 minutes and will include educational content on stress, cognitive restructuring, behavioral activation, and mindfulness components. Module completion will be monitored automatically through the app. Participants in the wait-list control group will receive monthly study-status emails but will not receive access to the intervention during the study period.

Weeks 9–10 – Post-Test and Debriefing

All participants will complete post-test assessments using the same measures as the baseline. Upon completion, wait-list participants will receive full access to *MindTune*, and all participants will be debriefed and provided with information on campus mental health resources.

Expected Results

Independent-samples t-tests are expected to reveal a statistically significant reduction in perceived stress for the intervention group relative to the control group.

Likewise, participants in the intervention condition are predicted to score higher on the holistic time management intentions scale than controls.

Discussion

If confirmed, these results would support the effectiveness of a brief, app-based CBT program in simultaneously lowering stress and fostering holistic time-management intentions among college students. The findings would contribute to the growing evidence that digital

mental-health tools can deliver clinically meaningful benefits outside traditional therapy, offering student-wellness centers a scalable, low-cost option.

Still, there are some limitations that may affect how broadly the results can be applied. These include the use of only one university sample, reliance on students' self-reported responses, and a relatively short follow-up period of eight weeks. Future studies should repeat this type of study with participants from different backgrounds, look for ways to measure stress using physical indicators like saliva or fitness trackers, and explore whether any benefits from the program last over time.

References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Chow, K., Fritz, T., Holsti, L., Barbic, S., & McGrenere, J. (2023, November 29). Feeling Stressed and Unproductive? A Field Evaluation of a Therapy-Inspired Digital Intervention for Knowledge Workers. *ACM Transactions on Computer-Human Interaction, 31*(1), 1-33. <https://doi.org/10.1145/3609330>
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396.
<https://doi.org/10.2307/2136404>
- Hwang, H., Kim, S. M., Netterstrøm, B., & Han, D. H. (2022). The efficacy of a Smartphone-Based App on Stress Reduction: Randomized controlled trial. *Journal of Medical Internet Research, 24*(2), 1-16. <https://doi.org/10.2196/28703>
- Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology, 82*(4), 760–768. <https://doi.org/10.1037/0022-0663.82.4.760>