



# Designing and Evaluating an Asynchronous Remote Communication Approach to Behavioral Activation for Adolescent Depression

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## Project Overview

National data indicate 7.5-12% adolescents are diagnosed with depression (MDD) each year. This project will research innovations capitalizing on the near ubiquitous use of technology platforms among adolescents for improving the usability of EBPs.

This research aimed to address critical barriers in EBPI usability by engaging patient and clinician target users to adapt an EBPI for adolescent MDD, Behavioral Activation (BA), to a novel technology platform that uses asynchronous remote communities (ARC) to optimize patient engagement, improve access to care, and lower clinician burden. Specifically, we aimed to use an ARC approach 1) discover target user needs, design constraints, and experiences with ARC; 2) design and build an ARC platform prototype (ActivaTeen) for BA delivery with adolescents; and 3) test the feasibility and usability of ActivaTeen with groups of adolescent and clinician target users.

## Population/Sample

**Discover phase:** 10 mental health clinicians (31-50 years of age), including therapists, primary care, and school counselors, who work with teens with depression, and 8 teen participants (between 15 and 19 years of age). All teens endorsed current depression symptoms in the Mild to Moderately severe range.

**Design/Build phase:** clinical psychology experts, one Undergraduate and three Masters' students in human centered design & engineering, two child psychologist experts

**Test Phase:** 3 clinicians (ages 29-41) and eleven teens (ages 13-19). All teens endorsed depression symptoms in the Mild to Moderately Severe range.

## Key Findings

**Discover Phase:** (1) Clinicians and teens perceived benefits in using the ARC platform to support logging mood and activities and engaging with BA content and (2) both teens and clinician participants wanted interactive online support as a supplement (versus replacement) to in-person therapy, (3) clinicians highlighted concerns about managing boundaries around expectations of constant asynchronous access and crisis support, and (4) both teens and clinicians raised the importance of privacy and data security. Teens did not want a chatbot to replace or emulate a human but envisioned its function as an interactive tool for self-reflection and completion of therapy goals. Overall, participants indicated a low burden and high adaptability of the internet-based intervention.

**Design/Build Phase:** We implemented and refined a prototype for the Test phase.

**Test Phase:** ActivaTeen was found to be feasible, usable, and acceptable across qualitative and quantitative measures. Three main themes emerged from our qualitative analysis of the weekly feedback and interview data including that ActivaTeen supported teens in moving from avoidance to action by (1) set and follow

through with meaningful goals (2) scaffolding interactions with clinicians asynchronously through direct messaging; and (3) scaffolding peer communities to share insights, goals, and challenges and general peer support. Quantitative surveys indicated low burden and high acceptability/feasibility for the online intervention. Participants reported high acceptability, intervention appropriateness, and feasibility of intervention.

## Measures used

- [Acceptability of Implementation Measure](#)
- [Feasibility of Implementation Measure](#)
- [Intervention Appropriateness Measure](#)
- [User Burden Scale](#)
- [Patient Health Questionnaire 9 item scale](#)

## Methods

**Discover Phase:** We used low fidelity prototypes for ActivaTeen to conduct two separate ARC studies on Slack across 10 weeks with mental health clinicians and teens. We gave teens and clinicians weekly prompts sent to a Slack channel to evaluate target user feedback on potential ActivaTeen features. There were also structured activities that involved moderated direct message (DM) discussions between teens.

**Design/Build Phase:** Design and child clinical psychology experts used advanced prototype and provided feedback on usability and functionality. See Jenness et al., 2022 for more details.

**Test Phase:** Conducted an ARC for 8 weeks where both teens and clinicians were asked to use each module of ActivaTeen interleaved with one week of reflection and feedback on the module. We also created a DM group in which a teen and clinician interacted with each other in mock therapy scenarios (e.g., reflecting on their logging data in week 4 and reviewing set goals and barriers). Across all weeks, teen participants interacted with each other by commenting on other teen's posts and utilizing emoji reactions to each other's posts. Across both the Discover and Test phases, we collected survey responses, Slack transcripts and exit interviews. Analysis of qualitative data included inductive thematic analysis and affinity modeling with multiple researchers independently and collaboratively coding the data to extract salient themes.

## Next steps

The complete study overview couched within the DDBT model can be found in Jenness et al., 2022, but due to space limitations, we were unable to fully summarize and include the qualitative data from Aim 3. We plan to write-up the full qualitative findings from Aim 3 in a final publication from our data.

We have organized and submitted a symposium for ISRII focused on asynchronous approaches to support EBPIs for anxiety/depression treatment across the lifespan. We are currently conducting an R34 pilot trial to port our Slack app to HIPAA compliant Microsoft Teams and test in a randomized control trial comparing BA with and without ActivaTeen support.

## Recommended readings

Bhattacharya, A., Liang, C., Zeng, E. Y., Shukla, K., Wong, M. E., Munson, S. A., & Kientz, J. A. (2019, June). [Engaging teenagers in asynchronous online groups to design for stress management](#). In Proceedings of the 18th ACM International Conference on Interaction Design and Children (pp. 26-37).

Bhattacharya, A., Nagar, R., Jenness, J., Munson, S. A., & Kientz, J. A. (2021). [Designing Asynchronous Remote Support for Behavioral Activation in Teenagers With Depression: Formative Study](#). JMIR Formative Research, 5(7), e20969.

Jenness, J. L., Bhattacharya, A., Kientz, J. A., Munson, S. A., & Nagar, R. R. (2022). [Lessons learned from designing an asynchronous remote community approach for behavioral activation intervention for teens](#). Behavior Research and Therapy, 151, 104065.