

**MHSA Innovation Technology Suite: Help@Hand Evaluation
Quarterly Report
March 2019 – May 2019
June 2019**

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Executive Summary

The Help@Hand Project (also known as the Innovation Technology Suite Project or INN Tech Suite Project) is a three-year demonstration project, funded and currently directed by the following Mental Health Plans in the State of California: Kern, Inyo, Los Angeles, Marin, Modoc, Mono, Monterey, Orange, Riverside, San Francisco, San Mateo, Santa Barbara, and Tehama Counties; Tri-City; and City of Berkeley. This report includes work with Cohort #1 (Kern, Los Angeles, Modoc, Mono, and Orange); to date, evaluation activities do not include Cohort #2. This California statewide collaborative project is designed to bring interactive technology-based mental health solutions into the public mental health system through a highly innovative set, or “suite”, of mobile applications.

This report encompasses evaluation activities, learnings, and findings from the second quarter of the evaluation (March 2019 – May 2019). Detailed descriptions of the activities performed during the quarter, evaluation methodology, data collected and analyzed, and resulting learnings and findings can be found in the full body of the report. Importantly, at this stage in the evaluation, learnings and findings are compiled from very small sample sizes and any findings are preliminary. Learnings and findings must also be understood in context, as the location and purpose of the site visits described in this report are very different.

The primary focus of CalMHSA and the Counties in the second quarter was to build capacity in the Tech Suite in order to establish minimally viable products for the two Tech Suite Apps. This effort was three-fold: 1) working across Counties within the Collaborative to support the development of a shared vision, align learning objectives, share lessons learned, and identify future areas for collaboration; 2) working with individual Counties to create the necessary infrastructure needed to support future implementation (e.g. workforce training, App(s) integration in workflows, clinical buy-in); and 3) working with App vendors through user testing to further adapt the Apps and create materials to support implementation.

During this period, evaluation activities included working with CalMHSA to coordinate efforts between implementation and evaluation activities. The UCI Team continued to meet with key stakeholders from Cohort #1 and the two approved App products to understand their project planning and implementation, as well as to begin discussing data sharing challenges (e.g. creating data use agreements) and planning for anticipated data collections. The UCI Team conducted site visits in Modoc and Kern Counties, interviewed and surveyed Peers across the Collaborative, continued to conduct market surveillance and heuristic evaluations, and convened the Tech Suite Evaluation Advisory Board to provide an update on evaluation activities. Key learnings and findings during the current evaluation quarter are described in the sections below.

Implementation Core

The Implementation Core Evaluation aims to assess system, county, and user level factors that are likely to influence the adoption, reach, and maintenance of the Help@Hand program. In this quarter, the Implementation Core continued market surveillance efforts to identify and assess comparator apps in the marketplace. In the previous quarter, UCI identified 61 marketplace apps comparable to 7 Cups and

Mindstrong, based on their descriptions and high-level features. In this quarter, UCI began a detailed feature review of those apps. Of the 15 comparator apps reviewed during this quarter, none had the same set of features to one another. The Table below shows the features reviewed and the number of comparator apps that included each feature. The app review process is ongoing, and more apps will be reviewed within the next evaluation period.

Feature	# Comparators	7 Cups	Mindstrong
Chatroom	6	Yes	No
Forum	7	Yes	No
1-on-1 Support	9	Yes	Yes
24/7 Support	7	Yes	Yes
Link to Services	1	No	Yes
Content Programs	6	Yes	No
AI Chatbot	5	Yes	No
Passive Sensor Data	10	No	Yes
Digital Phenotyping	0	No	Yes
Assessment	11	Yes	No
Interactive Tools	14	Yes	No
Didactic Content	13	Yes	No

The Implementation Core also conducted surveys and interviews with County Leadership, Clinicians, and Peers as part of a site visit to Modoc County Behavioral Health in March 2019. Providers and leadership at Modoc County Behavioral Health liked the ability of Help@Hand to extend clinical support to clients outside of regular clinic hours and facilitate provider feedback from ongoing client updates. Lack of access to smartphones among clients presents a challenge to implementation. Addressing this lack of access, along with offering additional training for new staff and those using the apps will benefit the implementation.

There is variability across Counties in plans to deploy Peers, as well as expectations for activities Peers will engage in as part of their job function. Furthermore, the role of Peers in the Tech Suite continues to evolve, and UCI is working to adapt the evaluation to capture those changing roles. Incorporating effective ways to include peers in evaluation activities will strengthen the relevance of the evaluation findings.

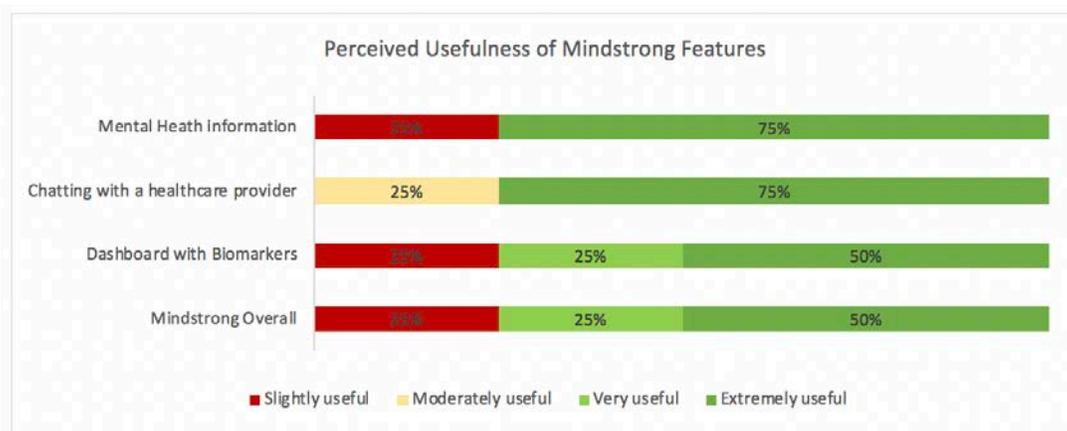
User Core

The User Core Evaluation aims to assess factors that are likely to influence the user experience and usability of the technology for clinicians, patients/clients/users, and listeners. In this quarter, the User Core conducted a heuristic evaluation of Mindstrong, similar to the heuristic evaluation conducted for 7 Cups in the previous quarter. As part of the heuristic evaluation, expert evaluators trained in human-computer interaction found the client-facing portion of Mindstrong easy to use, but recommended potential improvements as well. The Mindstrong user experience could improve by providing users with more feedback within the app, specifically to build understanding of how Mindstrong should be used, what data is collected, and what the biomarkers mean.

The User Core also conducted surveys, focus groups, and interviews with potential Help@Hand users in Modoc County to understand factors that may influence adoption amongst current non-users of the technology. We found that individuals were excited and optimistic about the potential of mental health apps to provide in-the-moment support, but some expressed concerns regarding stigma and privacy, limited smartphone or Internet access, and the financial costs related to getting and maintaining access, which may hinder their use of the apps. Help@Hand should consider how to address concerns related to privacy, stigma, and access to effectively promote adoption of mental health apps, especially in smaller and/or rural communities.

During a site visit to Kern County, the User Core conducted interviews and surveys with individuals who had used Mindstrong in the County. Early findings show potential for Mindstrong to be useful for some clients. However, more inquiry is needed to understand the perspectives of different types of users.

Figure 17 reproduced from page 40. Perceived Usefulness of Mindstrong Features (N=4)



Outcomes Core

The Outcomes Core aims to assess the effectiveness of Help@Hand in achieving the following learning objectives:

1. Detect and acknowledge mental health symptoms sooner;
2. Reduce stigma associated with mental illness by promoting mental wellness;
3. Increase access to the appropriate level of support and care;
4. Increase purpose, belonging, and social connectedness of individuals served; and,
5. Analyze and collect data to improve mental health needs assessment and service delivery.

UCI has finalized the item wording for proposed additional questions on the California Health Interview Survey (CHIS) and the items went through cognitive testing in preparation for the CHIS 2019-2020 cycle. UCI also continues to work with 7 Cups to develop a measurement strategy for assessing the desired outcomes, with final agreement expected in the next quarter.

Conclusions

The evaluation plan was designed with the expectation that the two current Help@Hand apps would be in the early stages of implementation at this point. However, due to barriers described within this report, there have been significant delays in the roll-outs of 7 Cups and Mindstrong into participating Mental Health Plans. The Collaborative has made the joint decision to initiate a new Request for Statement of Qualifications (RFSQ) which will allow additional vendors to become eligible to participate in the Help@Hand program.

In line with recommendations from the Evaluation's Advisory Board during a June 2019 meeting to discuss Quarter 2 progress, the Evaluation Team is strengthening their efforts in the following two areas: 1) development of a longitudinal, retrospective and prospective data collection strategy designed to inform the counties understanding of organizational factors that contribute or impede progress of the Help@Hand program; and 2) development of a proposal to conduct a "deep dive" into factors likely to influence user adoption of apps chosen for adoption (or likely to be chosen). For the former, we envision conducting interviews and surveys that could be repeated at regular intervals as a measure of the "pulse" of the program and that may allow the collaborative to consider redirection of some of its foci as the program evolves.

Based on feedback, the Evaluation Team is also working with CalMHSA and the participating Mental Health Plans to improve presentation and dissemination of evaluation reports. We plan to work with a technical writing consultant to ensure that the evaluation messaging is communicated effectively.

As the Collaborative has expanded to include Mental Health Plans in Cohort #2, the Evaluation Team is actively planning the evaluation of Cohort #2 for the Help@Hand program. Our plan relies on expanding and adapting the plans and tools developed for the Cohort #1 evaluation to meet the needs and circumstances of Cohort #2. As part of this effort and given the new RFSQ process and pilots, we are also re-positioning the evaluation to address these new programmatic efforts.

Introduction

The Help@Hand Project is a three-year demonstration project, funded and currently directed by the following counties in the State of California:

Cohort #1:	Los Angeles County, Orange County, Kern County, Modoc County, Mono County
Cohort #2:	Inyo County, Marin County, Monterey County, Riverside County, San Francisco County, San Mateo County, Santa Barbara County, Tehema County, Tri-City, and City of Berkeley

This California statewide collaborative project is designed to bring interactive technology-based mental health solutions into the public mental health system through a highly innovative set, or “suite”, of mobile applications.

The intended outcomes of this project are to accomplish the following five learning objectives:

- (1) Detect and acknowledge mental health symptoms sooner;
- (2) Reduce stigma associated with mental illness by promoting mental wellness;
- (3) Increase access to the appropriate level of support and care;
- (4) Increase purpose, belonging, and social connectedness of individuals served; and,
- (5) Analyze and collect data to improve mental health needs assessment and service delivery.

UC Irvine (UCI) is conducting a comprehensive formative evaluation of the Help@Hand Project which involves UCI observing and evaluating the Tech Suite as it happens in order to provide real-time feedback and learnings through the project period. The evaluation encompasses an examination of the project’s target audience, implementation, user experience, outcomes, stakeholder participation, and collaboration readiness. Evaluation findings will be reported on a quarterly basis. The following report presents activities and findings for Quarter 2 (March-May 2019) of the project.

Summary of Activities

Tech Suite Activities

March 2019

- [March 5, 2019] CalMHSA introduced “The Forecast,” the Help@Hand Project’s biweekly update. Each issue features news about the project and updates related to technology, implementation, Peers/community outreach, and communication initiatives. (Source: CalMHSA’s “The Forecast”)
- [March 5, 2019] Kelechi Ubozoh presented an overview of Help@Hand and its Peer Model at the MHSA Partners Meeting. (Source: CalMHSA’s “The Forecast”)
- [March 7, 2019] Leadership committee adopted a new vision statement for Help@Hand. The new vision statement is to “Save lives and improve the wellbeing of Californians by integrating promising technologies and lived experiences to open doors to mental health support and wellbeing.” (Source: CalMHSA’s “The Forecast”, Leadership Committee minutes)
- [March 13, 2019] Kelechi introduced the Tech Suite Peer Model at the California Coalition for Mental Health membership Meeting (Source: CalMHSA’s “The Forecast”)
- [March 14, 2019] Change Control Board (CCB) held its first meeting and approved the 7 Cups product roadmap and timeline. (Source: CCB minutes)
- [March 20, 2019] MMCH Stakeholder Meeting. (Source: CalMHSA SharePoint Calendar)
- [March 21, 2019] Product demonstration of the 7 Cups updates was provided during the CCB meeting. Counties gave feedback on the updates which informed the 3/28 collaborative testing workshop. (Source: CalMHSA’s “The Forecast”, CCB minutes)
- [March 21, 2019] Approval to move forward with testing timeline (Source: Leadership Committee Minutes)
- [March 28, 2019] CalMHSA hosted 7 Cups collaborative testing workshop. The purpose of the workshop was to walk through the testing process, test the latest release of 7 Cups, and discuss any issues. It was also an opportunity to share lessons learned with CalMHSA, other cohorts, as well as 7 Cups, who were present to support and answer questions. (Source: CalMHSA’s “The Forecast”, CCB minutes)
- [March 29, 2019 – April 11, 2019] Counties tested 7 Cups to validate if 7 Cups meets the minimal viable product and identify any defects. Testing included a focus group in Marin County on March 29, 2019 and another focus group in Tri-City on April 2, 2019. (Source: CalMHSA SharePoint Calendar)
- CalMHSA worked with Mindstrong to make progress on the user stories in order to have a demonstration and validation period for Mindstrong in April. (Source: CalMHSA’s “The Forecast”)
- CalMHSA began developing a process for gathering, screening, and onboarding new technology. (Source: CalMHSA’s “The Forecast”)
- CalMHSA launched a SharePoint site to ensure all information is easily available. The site provides easy access to important documents, calendars, and other information. (Source: CalMHSA’s “The Forecast”, Leadership Committee minutes)
- CalMHSA began having implementation meetings with both Cohorts 1 and 2. CalMHSA also began launching monthly collaboration meetings intended to facilitate discussion and shared learning among Help@Hand members. One meeting is for Tech Leads and the other is for Peer Leads. (Source: CalMHSA’s “The Forecast”)
- CalMHSA continued to talk to counties and cities about the goals of their peer workforce as well as collaborating with them as a thought partner. (Source: CalMHSA’s “The Forecast”)

- CalMHSA, Counties, and CBHDA worked on Reversion dollars and creating Budget Trailer language to help extend available time. (Source: CalMHSA's "The Forecast", Leadership Committee minutes)
- Help@Hand received national media attention with two Counties contacted by the *New York Times*. CalMHSA worked with the Counties to develop a response and talking points. (Source: CalMHSA's "The Forecast")

April 2019

- [April 11, 2019] Counties had a vote on 7 Cups continuation for the Tech Suite during the CCB meeting. Some Counties voiced that they feel voting was premature and wished to defer it to a later date. The CCB confirmed that no counties wished to off-board 7 Cups but were not ready to implement it in its current state. (Source: CCB minutes)
- [April 18, 2019] New Request for Statement of Qualifications shared with Leadership Committee. (Source: Leadership Committee minutes)
- [April 18, 2019] Leadership committee voted Help@Hand as the new brand name for the Tech Suite. (Source: Leadership Committee minutes)
- [April 22, 2019] Orange County had an on-site meeting with Mindstrong. (Source: CalMHSA SharePoint Calendar)
- [April 23-24, 2019] MHSA Bootcamp. (Source: CalMHSA SharePoint Calendar)
- [April 24, 2019] Orange County had an on-site meeting with 7 Cups. (Source: CalMHSA SharePoint Calendar).
- [April 25, 2019] CalMHSA received a request for a brief pause on fiscal expenditures until a fiscal reconciliation was completed. The reconciliation was conducted and an update was brought to the Leadership Committee. The reconciliation included all expenditures for Help@Hand. The pause did not impede progress toward county road maps for implementation. (Source: CCB minutes)
- [April 29, 2019] San Mateo had a 7 Cups demonstration. (Source: CalMHSA SharePoint Calendar)
- [April 30, 2019] CAMHPRO Stakeholder Meeting. (Source: CalMHSA SharePoint Calendar)
- CalMHSA worked actively with 7 Cups on possible solutions to address issues. CalMHSA also worked with Mindstrong to find more cost-effective models. (Source: Leadership Committee)
- CalMHSA will be coordinating an in-person meeting with the MHSA coordinators through the end of the year. (Source: CalMHSA's "The Forecast")

May 2019

- [May 7, 2019] Santa Barbara County hosted the SoCal Help@Hand Peer Summit. The purpose of the summit was to connect neighboring county Peer leaders about defining roles for Peers, discussing solutions around peer chat, assessing project training needs, and partnering with UCI on Peer involvement with evaluation. (Source: CalMHSA's "The Forecast," Leadership Committee minutes, CCB minutes)
- [May 21, 2019] During the Tech Lead Collaboration meeting, Patrick Harbison reviewed troll on 7 Cups website towards a LA County director and discussed ways to address similar incidents in the future. (Source: Tech Lead Collaboration minutes)
- [May 31, 2019] CalMHSA submitted a status report for the project to the Innovation and Technology Subcommittee of the MHS OAC (Source: CalMHSA Report to the Innovation and Technology Subcommittee of the MHS OAC)

- [May 31, 2019] Orange County in-person meeting in Sacramento to discuss County specific implementation strategy.
- Although product development remained on a temporary pause as CalMHSA actively worked with vendors to recalibrate and finalize contracting details, CalMHSA continued to work with several counties to prepare for a pilot launch of 7 Cups in the coming months. (Source: CalMHSA's "The Forecast")
- The Request for Statement of Qualification (RFSQ) process for sourcing and vetting new Help@Hand products neared completion. (Source: CalMHSA's "The Forecast")
- CalMatters hosted a panel called "Hope on the Horizon? Reimagining Mental Health in California" with California State Senator Jim Beall, Mindstrong Health President Tom Insel, Kerry Morrison, and CalMHSA's Peer and Community Engagement Manager Kelechi Ubozoh. (Source: CalMHSA's "The Forecast")
- CalMHSA began planning feedback sessions with county community members to support the development of Digital Health Literacy curriculum and to solicit feedback that will allow the development of tailored solutions to stakeholders. Feedback sessions will be held during Summer 2019. (Source: CalMHSA's "The Forecast")

Evaluation Activities

March 2019

- [March 1, 2019] UCI met with Orange County to discuss updates with Orange County's implementation and evaluation.
- [March 5, 2019] UCI met with Mindstrong and Los Angeles County to discuss electronic health records data. All parties agreed to have data updates every 3-6 months.
- [March 6, 2019] UCI hosted the Evaluation Advisory Board call to discuss updates, accomplishments, and issues from Quarter 1. Plans for Quarter 2 was also discussed.
- [March 8, 2019] CalMHSA met with UCI to introduce teams, discuss the project roadmap, and to understand the matrix of roles and responsibilities.
- [March 12, 2019] UCI began conversations with Strong 365, an information and resource hub built to empower people to stay in the fight for mental wellness, on how they can support the evaluation efforts of Help@Hand.
- [March 12, 2019] Implementation Team interviewed Modoc County's Tech Suite leadership as part of the site visit to Modoc County Behavioral Health Department.
- [March 14, 2019] UCI began participating in the CCB.
- [March 18, 2019] Implementation and User Teams conducted a full day site visit to Modoc County Behavioral Health Department and Sunrays of Hope.
- [March 22, 2019] UCI met with Strong 365 to discuss recruitment and ways to support the Help@Hand evaluation.
- [March 28, 2019] UCI participated in the 7 Cups collaborative testing workshop.
- User Team revised data collection instruments aimed to understand users.
- UCI Team provided feedback on CalMHSA's Informed Consent document which was intended to provide standardized language for all technologies falling under Help@Hand.

April 2019

- [April 5, 2019] UCI met with Cambria's Jennifer Martindill and Kim Tarabetz to discuss Cambria's implementation assessment and plan as well as UCI's evaluation plan. Discussion on how UCI and Cambria can better coordinate communication and other efforts was also discussed.

- [April 10, 2019] UCI met with LA County and CalMHSA to discuss LA's implementation updates, UCI's evaluation updates, and coordinate next steps for the evaluation.
- [April 12, 2019] UCI met with Orange County and CalMHSA discuss Orange County's implementation updates, UCI's evaluation updates, and coordinate next steps for the evaluation.
- [April 12, 2019] "Mental Health Application Guide Considerations Influenced by Kern Behavioral Health and Recovery Services Resource Apps" shared with Kern County. The resource can be found in Appendix E.
- [April 15, 2019] UCI met with Mindstrong and CalMHSA to discuss Mindstrong's implementation updates, UCI's evaluation, and how to coordinate data collection within the Mindstrong app.
- [April 18, 2019] User Team conducted a site visit to Kern County's Behavioral Health and Recovery Services to interview and survey Mindstrong users.
- [April 29, 2019] Finalize the wording of the added items to the California Health Interview Survey in partnership with UCLA's Center for Health Policy Research.
- [April 30, 2019] UCI interviewed the Peer Lead of LA County to elicit a description of the Peer component of their Tech Suite Implementation.
- [April 30, 2019] UCI team hired John Bunyi, a Junior Specialist who will work predominately with the Implementation Team.
- Collected and analyzed satisfaction surveys from the 7 Cups collaborative testing workshop.
- Began developing an organizational survey that will be used for a stakeholder evaluation.
- Responded to Orange County's Security Requirements Questionnaire as a first step in preparing for the data transfer of electronic medical records and claims data from the County to the Evaluation Data Repository.
- Held ongoing discussions with Orange County and CalMHSA about the data transfer from the County to the Evaluation Data Repository and the legal agreements between Orange County, CalMHSA, and UCI to allow sharing of protected health information (PHI) and personally identifiable information (PII).

May 2019

- [May 7, 2019] UCI attended the Peer Summit held in Santa Barbara.
- [May 9, 2019] Jennifer Martindill and Kim Tarabetz of Cambria began joining UCI's internal team meeting every other week for 30 minutes in order to share updates and coordinate efforts.
- [May 10, 2019] Feature review for market analysis finalized and operationalized. Began to pilot.
- [May 17, 2019] UCI met with CalMHSA to begin planning the scope of work for the Cohort 2 Evaluation.
- [May 21, 2019] UCI began participating in the Tech Lead Collaboration meeting.
- [May 22, 2019] Peer survey deployed to peers in Los Angeles County.
- [May 30, 2019] Completed market analysis full feature review of 15 apps.
- [May 30, 2019] Orange County met with UCI and Cambria to prepare for Orange County's meeting in Sacramento.
- Provided feedback on CalMHSA's RFSQ for Innovation Technology-Based Mental Health Solutions.
- Started planning for the Implementation Team's post-implementation site visit to UCLA Harbor Clinic which is set for June 2019.

- Continued to have discussions with Orange County and CalMHSA about the data transfer from the County to the Evaluation Data Repository and the legal agreements between Orange County, CalMHSA, and UCI to allow sharing of PHI and PII.
- Began planning UCI's team retreat to plan Cohort 2 Evaluation.
- Began planning the Conceptualizing and Measuring Mental Illness Stigma for Evaluation Conference.

Ongoing Activities

- Weekly Implementation Evaluation Core meetings
- Weekly User Experience Evaluation Core meetings
- Weekly UCI Team meetings
- Weekly 7 Cups meetings
- Bi-weekly Leadership Meetings
- Change Control Board which met weekly between March-April 2019 and bi-weekly as of May 2019
- Bi-weekly Tech Lead Collaboration Meeting

Methodology

Implementation Core

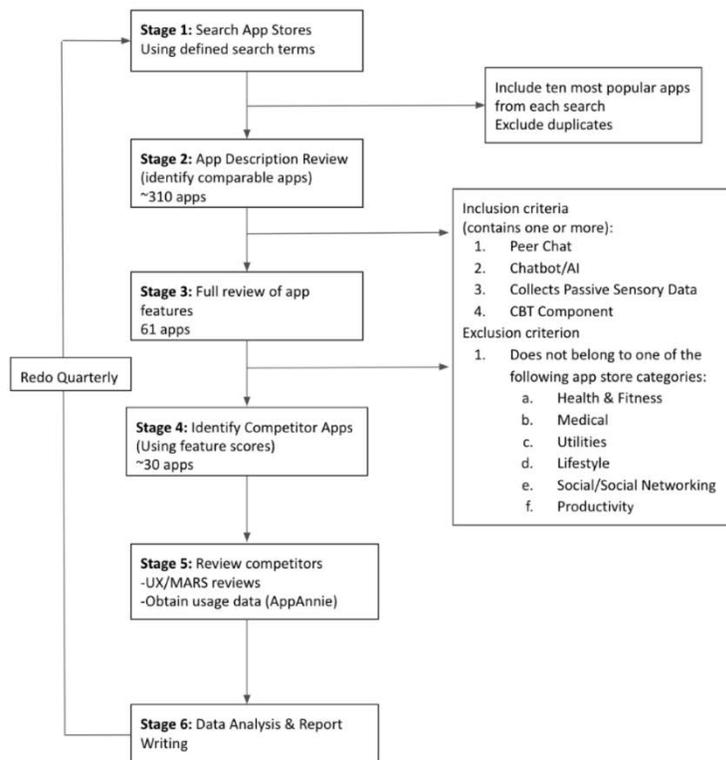
Market surveillance

The market surveillance identifies mental health apps, monitors changes in app marketplaces overtime, and evaluates mental health apps to conduct an in-depth understanding of the app space defined by the Help@Hand Project. The market surveillance has three main objectives:

1. To survey the app marketplace in which the Help@Hand apps place, to understand what other options users have to choose from when they search for these apps;
2. To identify apps which are comparable to the Help@Hand apps; and
3. To identify baseline app usage data to compare Help@Hand apps to other comparators, in order to understand overall relative engagement and use of Help@Hand apps.

Figure 1 provides a detailed framework of the market surveillance (see the Evaluation Plan for a full description of the framework).

Figure 1: Framework for market analysis



Stage 1 and Stage 2 were completed during Quarter 1. Thirty-one keywords which are linked to the Help@Hand apps (as determined using market data and analytics platform AppAnnie) were searched on the Google Play and iTunes app stores. The top ten results from each keyword search were obtained which resulted in 276 apps when duplicates were excluded. Using the inclusion & exclusion criteria defined in Figure 1, each of these apps were reviewed at the app description level resulting in the inclusion of 61 apps. With the hire of a Junior Specialist in Quarter 2, we were able to continue to Stage 3 involving a more detailed review of features of those 61 competitor apps. Our review involved determining which

features are important to explore in each of these apps and operationalizing how to review each one. Table 1 details the full list of features and their explanations. We piloted the feature review with several test apps before proceeding with a full feature review of the competitor apps identified in Stage 2.

Table 1: Full list of features reviewed in competitor apps

Feature	Explanation
Chatroom	Space where users can chat with one another in real time in instant messaging format
Forum	Space where users can join public conversations and post where other users can see
1 on 1 support	1-on-1 support, specific to the individual, most likely delivered through a chat or messaging medium
24/7 support	User can interact with other users (peers or professionals) in a supportive capacity 24/7
Link to offline services or people	App actively connects the user with other services or people outside of the app, for example, notifies therapist if user is in a crisis
Artificial intelligence or chatbot	User can have a conversation with an AI chatbot
Passive sensor data collection	App passively collects sensor data (without user entry), which may include activity, health information, information on how the user interacts with their phone, (e.g. keystrokes), or location. If so, record which sensor data.
Digital phenotyping	Passively collected sensory data is used to assess, measure or predict health status or wellbeing
Assessment of symptoms or condition	User can answer questions or input data to assess their current symptoms, conditions, or overall health status
Programs with linear content	Programs in which users progress through stages or steps in a linear way, with each stage or step building on content from the last
Interactive Tools (separate from programs)	Other parts of the app, outside of programs with content, which the user can interact with
Didactic Content	Psychoeducation or other information and educational content

Environmental Scan

We established Google Alerts (automated emails compiling recent news stories) based on keywords related to Help@Hand (e.g., 7 Cups, Mindstrong, mental health apps, mental health, etc.) and the Cohort 1 counties (e.g., Los Angeles, Orange, Kern, Modoc, Mono) to collect news stories related to the Tech Suite specifically and mental health relevant events. In addition, we obtained the local newspaper during our site visit at Modoc County for use as source material for the environmental scan. Collection of social media data or other newspapers has not begun since we have been unable to hire members of our team to support the environmental scan.

Surveys and Interviews: County Leadership, Clinicians, Peers

Across site visits during the evaluation period, we used a semi-structured interview guide (i.e., a guide with preset questions that also allows flexibility for the interviewer to ask additional questions as needed) to collect qualitative data. We also used a survey consisting of standard and validated measures of organizational climate, leadership, attitudes towards evidence-based practices, and perceived acceptability, appropriateness, and feasibility of Help@Hand products (i.e., 7 Cups and

Mindstrong) to collect quantitative data. Each interview was 30 minutes, while the survey took 45-60 minutes to complete. In total we completed 11 interviews and collected 16 surveys with County leadership, clinicians, and Peers during our site visit to Modoc County Behavioral Health Department in March 2019.

For the site visit, we used the rapid assessment procedure-informed clinical ethnography (Damschroder et al) to summarize our findings in the context of the Consolidated Framework for Implementation Research. (Palinkas et al) The Consolidated Framework for Implementation Research is one of our organizing frameworks for guiding and understanding the findings from our evaluative efforts.

Peer Program

Qualitative data from interviews with Peer Leads at each county were content-analyzed and will be used to populate a summary table that will permit comparison of the structure and function of the Peer component to the Tech Suite across counties. In addition, the Peer survey was formatted in REDCap, a secure web application for building and managing online surveys and databases. Data from the Peer survey was summarized using means and standard deviations for quantitative items and content analysis for qualitative items.

User Core

Heuristic Evaluation: Client-Facing Mindstrong App

In the last quarter we conducted a heuristic evaluation of 7 Cups. In this quarter we did the same for Mindstrong. The purpose of the heuristic evaluation of Mindstrong is to identify potential issues that could affect user adoption and abandonment of the technology. We conducted heuristic evaluations of Mindstrong with human-computer interaction (HCI) experts in April 2019. A heuristic evaluation is an informal method of assessing whether technologies follow established usability guidelines often conducted by individuals with usability experience (Nielsen, 1994). Because heuristic evaluations are particularly useful at identifying major issues (Nielsen, 1992), they provide important information to improve the Tech Suite. Heuristics which guided the evaluation of the experts were taken directly from Nielsen and Molich (1990) and are:

- *Visibility of system status:* Always keeping users informed regarding what is happening
- *Match between the system and real world:* Using language/concepts familiar to the user
- *User control and freedom:* Being able to exit screens easily and supporting undo/redo
- *Consistency and standards:* Following clear conventions
- *Error prevention:* Check or eliminate errors through confirmations before action
- *Help users recognize, diagnose, and recover from errors:* Ensure errors are in plain language for users to easily understand the issues and provide solution
- *Help and documentation:* Help information should be easy to find, searchable, not too long, and list concrete steps relevant to the user's task
- *Recognition rather than recall:* Making information visible
- *Flexibility and efficiency of use:* Tailoring to the level of the user
- *Aesthetic and minimalist design:* Removing unnecessary or irrelevant information.

The evaluation was done on both Android and iPhone devices. The Mindstrong app was evaluated by ten individuals who have studied and worked in the field of human-computer interaction (HCI). Five evaluators had PhDs in the HCI field, and three were advanced graduate students holding master's degrees, with three or more years of experience beyond the bachelor's degree in the HCI field and with

work experience in industry in the area of user experience. Two evaluators were honors undergraduates majoring in HCI, and their evaluations were checked by PhDs in HCI.

Surveys, Interviews, Focus Group: Potential Help@Hand Users

On March 18, 2019, we conducted surveys, interviews, and a focus group with potential Tech Suite users in Modoc County to assess factors that may influence adoption and continued use of mental health apps and websites. Our survey instruments and interview protocols investigated mental health technology use, interest in using mental health websites and apps, awareness of Mindstrong and 7 Cups, access, stigma, privacy, and community needs. All of these factors can be used to help inform counties on how to promote adoption of current and future mental health technologies. The interview protocols were semi-structured, which allowed for emergent themes. A detailed description of the measures can be found in Appendix B.

Surveys and Interviews: Mindstrong Users

On April 18, 2019, we conducted surveys and interviews with Mindstrong users in Kern County. The goal of the survey was to investigate technology acceptance (performance expectancy, social influence, facilitating conditions), perceived usefulness, impact on well-being, perceived effectiveness for mental health management and recovery, usability, privacy, therapeutic alliance, social connectedness, and stigma. The purpose of the semi-structured interviews was to investigate how and why Mindstrong is used and explore in more depth participants' experiences with Mindstrong. A detailed description of the measures can be found in Appendix B.

Outcomes Core

California Health Interview Survey (CHIS)

The item wording for the proposed additional questions to be added to the CHIS were finalized. In September 2018, the proposed questions first went through a round of in-person cognitive testing for both the adult and teen questions. Feedback was received from UCLA in late September, and items then went through a round of cognitive testing for a web questionnaire in preparation for the CHIS 2019-2020 cycle. See Appendix C for final set of approved questions.

7 Cups

We have been working to develop to measurement strategy for assessing the primary outcomes of Help@Hand, and are in the final stages of selecting the items. However, given the 'pause' that was instituted in May, we are waiting to have final agreement on these items, and will include these in the next quarterly report.

Data Repository

There was no data collection or analysis activities for the Data Repository during this evaluation period.

We had discussions with Orange County about their data needs and responded to their Security Requirements Questionnaire. We held several discussions with CalMHSA on the need to update the CalMHSA Participation Agreements with the counties (BAAs) to allow us to proceed with the process of obtaining PHI data.

Stakeholder Evaluation

Evaluation of Collaborator Readiness

To gauge the readiness of collaborators, a post meeting survey to evaluate partnership satisfaction, openness, and organization and structure of meetings. The *Group Collaborative Process Survey* was sent to county participants of the March 28, 2019 7 Cups collaborative testing workshop. The survey was sent via email to attendees with a link to the RedCap survey platform. All responses are anonymous, and participants will not be followed longitudinally.

The scales of partnership satisfaction, openness, and organization and structure of meetings are averages made up of items whose values range from “1=strongly disagree” to “5=strongly agree”. Descriptive statistics, such as means, standard deviations, and Cronbach’s alphas, for each scale were calculated. Frequency measures, means, and standard deviations for each item in the three scales were additionally obtained. Lastly, participants had the option of making comments at the end of the survey. Themes that were mentioned in the comments were noted.

Lessons Learned Reported and Collected from Counties and Vendors

An additional data collection strategy involved reaching out to Counties and Vendors to understand their perceived lessons learned. The UCI evaluation team asked Cohort 1 Counties, 7 Cups, and Mindstrong to share their milestones/accomplishments, lessons learned, and recommendations via email.

Preliminary Learnings and Findings

Below are preliminary learnings emerging from the data collection described above. Given the small samples sizes, findings should not be generalized beyond the settings in which the data were collected, but rather should be used for the purpose of making specific observations that might lead to insight when interpreted in context.

Implementation Core

Market surveillance

During Quarter 2, we completed a full feature review with 15 of the 61 competitor apps. Findings from the review of these 15 apps are outlined in Table 2. An explanation of each of the features can be seen in the Methodology section in Table 1. Based on the review, we can see that the app landscape is varied, and every app reviewed had a unique set of features. For reference, the presence of these features in the current Help@Hand apps (i.e., 7 Cups and Mindstrong (MS)) are outlined at the bottom of Table 2.

Table 2: Features present in 15 apps reviewed

	Chatroom	Forum	1-on-1 support	24/7 support	Link to services	Content Programs	AI chatbot	Passive sensor data	Digital phenotyping	Assessment	Interactive Tools	Didactic Content
App #1		•	•	•			•	•		•	•	•
App #2			•				•	•		•	•	•
App #3	•	•		•	•	•		•		•	•	•
App #4			•				•	•		•	•	•
App #5						•		•		•	•	•
App #6	•	•	•	•			•				•	•
App #7	•	•	•	•				•			•	
App #8	•		•	•		•		•		•	•	•
App #9								•		•	•	•
App #10			•			•	•	•		•	•	•
App #11	•	•	•	•				•		•	•	
App #12	•		•			•				•		•
App #13		•				•				•	•	•
App #14											•	•
App #15		•		•							•	•
7 Cups	•	•	•	•		•	•			•	•	•
MS			•	•	•			•	•	•		

Besides Mindstrong, none of the apps reviewed offered digital phenotyping. When passive sensory data was collected, it consisted of clicking and geolocation tracking and was used primarily for improving the app's functionality rather than health purposes. Of the 6 apps with a chatroom, 5 were moderated by the app developer team and/or other users. Of the 9 apps with 1-on-1 support, 5 offered support through a peer, 2 offered support through a licensed professional (i.e., LCSW, LMFT, PsyD, etc.), and 6 offered

support through someone else (i.e., AI, professional certified coaches, etc.). In 9 cases the support was synchronous, with one of those apps offering both synchronous and asynchronous support. Only one app that was reviewed provided an active connection to offline services of people and used geolocation data to help link the user with local therapists.

Environmental Scan

There were no learnings/findings for the environmental scan during this evaluation period.

Surveys and Interviews: County Leadership, Clinicians, Peers

Overall, the individuals whom we interviewed and surveyed at Modoc County Behavioral Health Department reported both favorable and constructive evaluations about using Mindstrong and 7 Cups in their clinic and setting. Providers and leadership liked the ideas of extending clinical support, especially crisis support, to clients outside of the regular clinic hours and to providers for ongoing client updates. At the same time, providers expressed concerns about both the mismatch between the apps and their clientele's clinical needs or presentations (e.g., those in treatment for substance use or experiences of paranoia) and also social and economic issues that might limit the engagement with and utility of the apps (e.g., lack of smartphones among clients). Due, in part, to the mismatch, providers reported challenges in onboarding clients to use the Tech Suite apps. In addition, providers reported a desire for greater understanding of how the apps work, how they are applicable to their current and expected workflow, and with whom to consult for additional training or questions. The peers whom we surveyed had received formal training to prepare them for onboarding clients to the Tech Suite, and were satisfied with the training, but had mixed confidence in their ability to onboard clients as well as in the usefulness and appropriateness of the Tech Suite for clients/users. Below are the common barriers and common facilitators that were identified.

Common Barriers

The individuals surveyed (i.e., leadership, providers, peers) discussed some logistical or operational challenges with implementing the Tech Suite including knowing who to turn to with questions and where to access examples of the clinical successes of the Tech Suite; challenges with fit between Tech Suite products and client needs and resources (e.g., access to smartphones or data plans); the initial training and support provided was helpful but became more challenging when app vendors left the sites and began to manage things remotely; difficulty accessing additional or ongoing training/consultation opportunities for clinicians on how to utilize the app; reluctance from clients in treatment for substance abuse due to concerns about privacy/security breaches and potential activity tracking by law enforcement.

Common Facilitators

Initial trainings by the app vendors and when app vendor staff were in the clinic were helpful to support onboarding and explain to providers and clients how to use the apps. Providers who had previous experience using the apps (primarily 7 Cups) were generally more positive about potential benefits of the apps. Providers reported it was helpful to have physical (e.g., 7 Cups tent cards) and procedural (e.g., discussion about the Tech Suite in monthly team meetings) reminders about introducing or checking-in with clients about app use.

Peer Program

The Peer component of the Tech Suite in Cohort 1 experienced a slow implementation due to unanticipated shifts in how this component is being utilized by the counties to support Help@Hand.

Originally, a Peer training was offered by 7 Cups to support the onboarding of community members to the application, but with delays in the roll-out of 7 Cups and an evolving vision of how the Peers could best support the Tech Suite, deployment of the Peers has been gradual. In addition, there is variability across the counties in terms of how Peers are recruited, employed, trained and supervised.

Peers have more familiarity with and greater confidence in 7 Cups as compared to Mindstrong. They also have numerous recommendations for improving the 7 Cups user experience and expressed some doubts about the potential for providing social support via a digital interface.

User Core

Heuristic Evaluation: Client-Facing Mindstrong App

The human-computer interaction (HCI) experts who conducted the Mindstrong heuristic evaluation identified 9 themes based on the heuristic evaluations. Below we discuss in detail our findings related to setting up the app and logging in, how the system displays status, user data input and collection, the messaging feature, the biomarkers, user interaction and navigation, recovery from errors, the system design, and system documentation. In general, the evaluators felt that the app was generally easy to use and felt that the design was pleasing. There are some ways that the app could be improved for usability. Some evaluators encountered problems at time of setup. As it takes some days to generate data for users, it would be helpful to inform users of the status of their data processing. The language used in the messaging feature conforms well to natural language understanding, but some of the terms used in explaining the biomarkers may be difficult for people without much education to understand. Better documentation should be provided. Since smartphone use data is used to generate the biomarkers, it would be helpful to users to provide a general easy-to-understand explanation of how the biomarkers are computed. This could help users to build trust in the system.

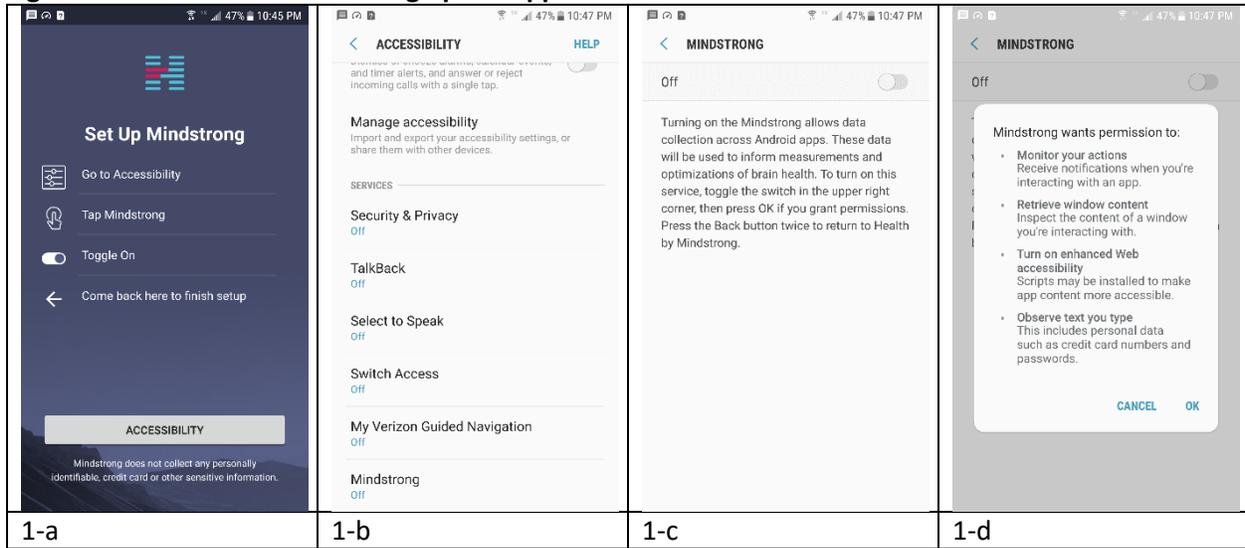
1) Setting up the app and logging in

Some evaluators expressed that there is confusion in configuring the app for the first time. After the app is installed, and with a partner code provided, one taps “have a partner code” where it asks one to enter the account, password and partner code. After using the given gmail, password, and partner code, a message stated “invalid partner code”. The process was repeated several times and the partner code was double checked. It turns out that one should use their phone number to start the account creation process. It is not clear if this problem was unique to the particular partner codes that were issued for the evaluation.

An illustration of the difficulty experienced is described by one evaluator: “After I verified my phone number and access code, for instance, I was asked to set up the app (see the screenshot below). There were instructions on how to do so (i.e., “Go to Accessibility” → “Tap Mindstrong” → “Toggle On”). However, I first thought that these are not instructions, but clickable menus (of course, they are not clickable). Also, I could not figure out the purpose of this setting procedure. Thus, I just clicked an “ACCESSIBILITY” button. It allowed me to go to an Android setting menu. There I realized that this is a process allowing the app to access my behavioral data generated while using the phone.” See the screenshots in Figures 1 a-d.

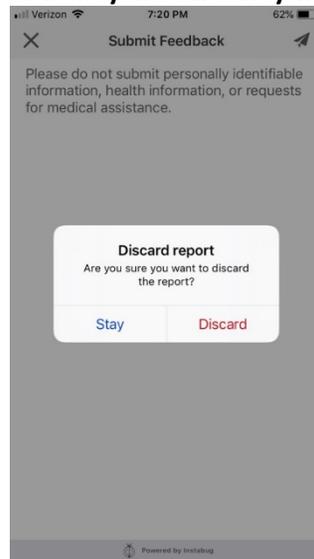
This evaluator’s experience suggests that it would be better to explain the set-up procedure in a clearer manner (some users who are not familiar with the Android privacy setting would likely have trouble configuring the app). Some users who do not have much experience using smartphone technology may have difficulty with the setup.

Figure 2a-2d. Difficulties in setting up the app



When logging in, the app allows one to enter the pin number or use one’s thumbprint to access the app. If the app does not recognize the fingerprint, the app automatically asks for the pin, ensuring the user has directions to get into the app. When inserting the pin, the user is given an option to delete their pin if the wrong number is mistakenly pressed. For example, when submitting feedback about the Mindstrong App, the app asks if one really wants to discard it or continue giving the feedback (see Figure 2). Having these clearly marked exits on a clean interface is very useful and allows for the most control.

Figure 3. Asking the user if they are sure they want to discard a report



2) Showing system status

The app generally does a good job of making system status visible. The use of spinners indicates loading old data from the chart. There were a few instances where upon switching to Mindstrong from another app, Mindstrong would hang on the last-used page of the app for a couple of seconds before asking the user to re-enter their PIN. Another good way of showing system status is that the app provides a push notification when a new biomarker measurement is available.

The system however does not convey how long it will take to process data. There is no progress bar that shows how much longer it will take to finish its calculations. However, on first use, the messaging tab appears completely empty. An indication that content will come after a few days of use would help provide feedback to the user that the app is being used in the correct way. The evaluators expressed that when there was not yet data, there was a blank screen rather than any chart, which was confusing.

The app shows the status such as "loading", "saving", "checking" and "searching". However, it can be improved by showing further feedback when the app is showing a status for too long (e.g. if there is an internet connection error). One expert was not able to save anything because the app kept showing "loading", "saving", "checking" or "searching" until the back button was tapped to cancel.

3) Data collection

The evaluators were concerned that the app does not clearly explain what data is being collected, and how the biomarkers are being computed. Some experts further expressed skepticism on how the data is generated. The system runs in the background and thus does not keep the user informed well on what is happening in terms of collecting data. Some expressed that the biomarker chart is a bit dubious as they did not understand how it computes the trends based on their app usage data. Since it has access to app data, which app usage contributes to the trend? The evaluators felt that users need to understand how their biomarkers are being measured in general, i.e. they should receive a basic explanation of the algorithm in a clear and simple way. Without this, the evaluators felt that the users might distrust the app. This could be explained in language that is understandable to most users.

It is not clear for which data the app has access. While the "About Mindstrong" information explains that content and personal information is not collected, the evaluators nevertheless questioned whether the app has access to their data stored in their phone, e.g. photos or contacts. This needs to be confirmed explicitly to the user that the app does not have access to any of the data in their phone.

The app asks the user about their status using a 5-pt Likert scale (e.g., How is your work?). How much do the responses to these questions in the messaging feature contribute to the biomarker results? Some evaluators questioned if the app is utilizing these responses for validating the biomarkers or if they were used for computing biomarkers. It is not clear if the app is utilizing both the app usage log (and inputted text) and survey answers to quantify biomarkers. An explanation of the purpose of the status questions should be presented to users.

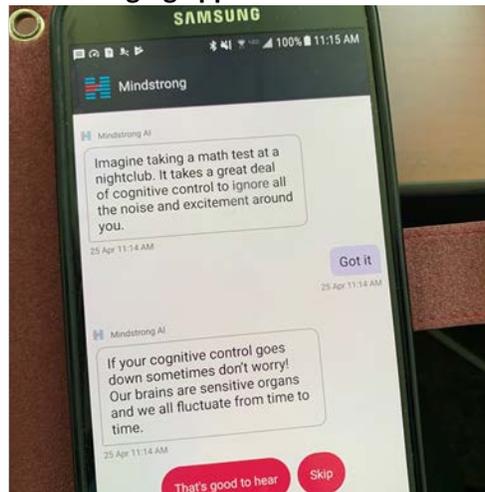
4) Messaging feature

The messaging feature of this app is very easy for users to understand. The look and feel of the messaging feature appears the same as many text messaging apps users already use on their phones. During this messaging, the user has options to read more about biomarkers, allowing the user to reacquaint themselves with the biomarkers without going into a different menu. This natural order of information does not feel forced on the users and simulates how a user would ask a question if they are confused. The responses that the app creates for the user is what a user would say, rather than a robotic response. For example, Figure 3 shows a sample of the messaging app, and the system responds with "Tell me more" or "Got it" instead of "Provide more information." Having responses that are similar to what users would say should increase the comfort level of the user. This app matches the system and the real world extremely well.

When the app is in the process of collecting data, the first chart tab shows a notification of this and tells the user to check back later. However, during this data collection phase the ‘messaging’ tab just shows a blank white screen which is confusing with regard to what this tab is for. When data is collected however, users can easily view and explore their data on the main ‘chart’ tab, and then get more information through the messaging tab, as expected.

The evaluators felt that the messaging feature is very responsive and helpful. The system initiates user interaction with questions such as “How is your mood?” and claims like “You can feel positive or negative about yourself, your situation or how things are going. This can in turn affect how you behave.” Additionally, the conversational style of messaging allows for information to appear in a natural and logical order. The messaging also helps to understand the concepts and terms.

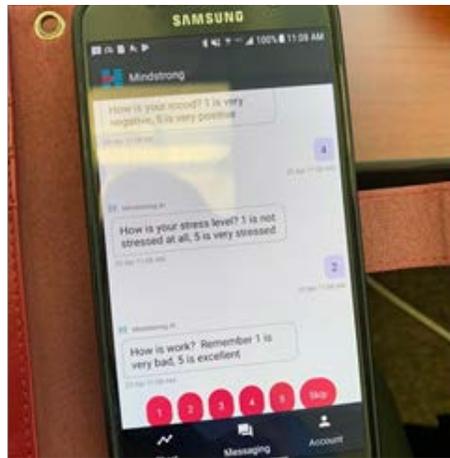
Figure 4. Example of messaging app with information about the biomarkers



The “Messaging” menu is a rule-based question-answer system giving users some background information (e.g., the definition of biomarkers). One evaluator first thought that this would be actual communication with a healthcare professional (i.e. a human). It is possible that some users may also believe this. A suggestion is that this functionality could clearly be labeled as a chatbot (e.g., “Mindstrong Chatbot”). At any rate, natural communication between users and the system is desirable.

The “log how I’m doing” feature in the messaging app records Likert scales with buttons labeled 1-5, but the endpoints of the scale change between questions. Using a more typical presentation of a Likert scale could help clarify that the scale changed. In Figure 4, each question has a rating scale from 1-5, 1 being negative and 5 being positive. For the stress question, this does not follow the rule. This is very minor because it does make more sense to have 1 being not stressed and 5 being more stressed. The questions could be re-worked to use a consistent scale. The framing of the stress question could be changed so the user does not accidentally mix up the scales for the questions. Also, the hunger scales are presented by a slider and scores, which is redundant and confusing.

Figure 5. Use of inconsistent Likert scales



5) Biomarkers

Some of the concepts in the app may not be familiar to users depending on their training and education. The biomarker chart itself follows fairly common practices in scientific communication. It includes a rolling average and effectively an error range for when a biomarker is outside of the “normal” range. For users who are adept at reading graphs, they would not have any trouble reading the dashboard. However, the concepts of personal baseline or moving average may not be known to some users. Users may also have trouble understanding the zones (error bars) generated around the circles on the dashboard.

Platform conventions seem to be followed well. Words, descriptions and terms for describing the six biomarkers are consistent across the charts and messaging tab. Also, all six biomarkers can be accessed and viewed in the same manner within the charts tab. The biomarkers use extremely scientific names—executive function, cognitive control, working memory, processing speed, and emotional valence. The chart view includes a few sentences explaining each of the biomarkers immediately below the chart in plain English which are very helpful and the included examples make them easier to understand. Although the names map to very scientific concepts, the app offers some help for making sense of those concepts. But even so, the biomarkers are abbreviated to two letters for selection on the graph (EF, CC, etc.) which might be confusing for some users, especially if they do not have advanced education. So even as someone starts to learn what executive function means in practice, it may be difficult to associate that with the abbreviation the interface presents. Icons explaining the concept, for example, may be easier to recall and interpret alongside the longer-form definitions.

The messaging tab imitates a chat with a conversational agent named “Mindstrong AI”, which provides useful information about the biomarkers and a way to log how you’re doing (see Figure 4 above). All of the interaction is closed-form, selecting from a couple of buttons in a fairly shallow dialog tree. One expert evaluator questions if the information about the biomarkers could better be presented in some other form.

One evaluator felt that on the “Your Biomarkers” page, which shows how biomarkers change on a daily basis, there should be labels for the Y axis. Values of the graph could help users judge the degree to which the biomarkers changed negative or positive per day. For example, a large visual drop may actually just be a small difference numerically. See Figure 5.

Figure 6. The biomarker page does not have a label for the Y-axis.



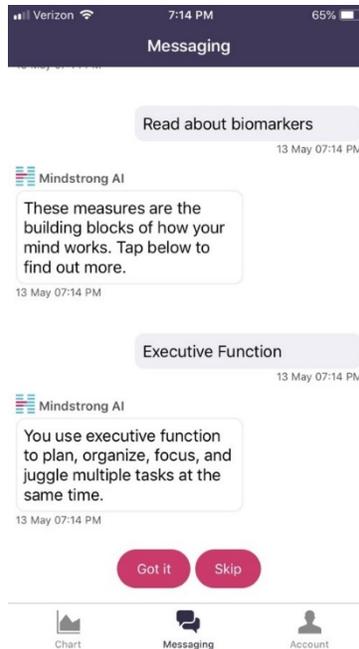
6) User interaction and navigation

Overall the app is quite intuitive to understand once data is collected. The charts page has good flexibility to allow the user to navigate or explore the data, and the drag and pinch technique to zoom in and out is quite intuitive. Being able to see where your messaging history aligned by tapping an associated date on the charts is a frequent use case and is generally quite straightforward. The app frequently asks for one's PIN when navigating back to the chart tab. The PIN entry page takes over the app, so it's impossible to navigate back to settings or messaging when this tab is clicked on accidentally without first re-entering one's PIN.

In general, the user has a lot of control and freedom within the app. If a user clicks on an unwanted chart or diagram, it is very easy to just exit and select a new chart. This makes it easy to quickly navigate through the charts, gaining more information about the different biomarkers and system information.

The messaging dialog does a great job of including "emergency exits", including a "skip" button on every dialog choice (see Figure 6). There are 9 questions that the Mindstrong AI asks and if one decides to skip any question, the AI will stop giving the rest of the questions. The "skip" option allows the user to avoid the frustration of being on a set path and to stop at any point if they feel uncomfortable with the statement or questions. However, it does not offer an "undo" option if the user entered the wrong response. With these buttons, it's easy to go back to the main menu for the chat. A challenge is that in the "log how I'm doing" feature, the skip button goes back to the main menu rather than skipping only that individual Likert scale item. Messages from the system are an appropriate length so navigating to access new information is not burdensome for the user.

Figure 7. The "skip" function in the messaging dialogue



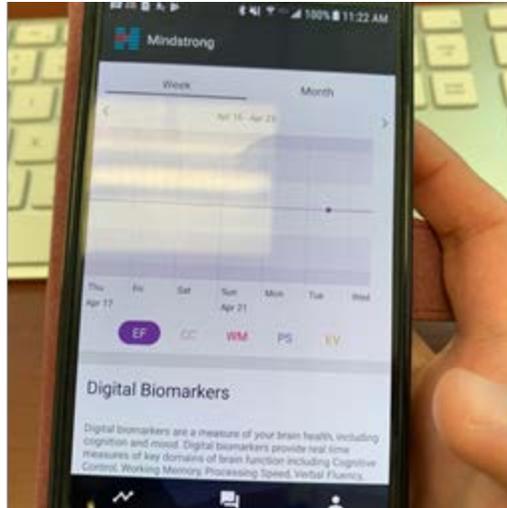
The “Fingerprint & Passcode” lacks a clearly marked exit for users to leave the unwanted state without having to go through an extended dialogue. When “Fingerprint & Passcode” on the settings page is tapped, there is no way to cancel one’s action and exit. When one creates a passcode it appears to be the only way to get out of the passcode setting and then switch off the option (one needs to enter the passcode to switch off).

The app uses preset buttons that the user can access with abbreviations for the biomarkers which allows the user to easily recognize the biomarker they want to look at rather than recall it. The app shows the explanations of each biomarker which enables the users to easily grasp its meaning by reading textual descriptions displayed right under the corresponding chart. This design helps minimize the number of objects and pages that the user has to navigate, speeding their information processing up substantially.

The arrows on either end of the week view make it easy to go navigate between weeks, but it’s not immediately clear that the chart supports other actions as well. You can swipe left and right on the chart, as well as click to create a vertical line which labels the day which was clicked on. These features may perhaps be easily discovered, but there’s little indication that there are other ways of interacting with the graph.

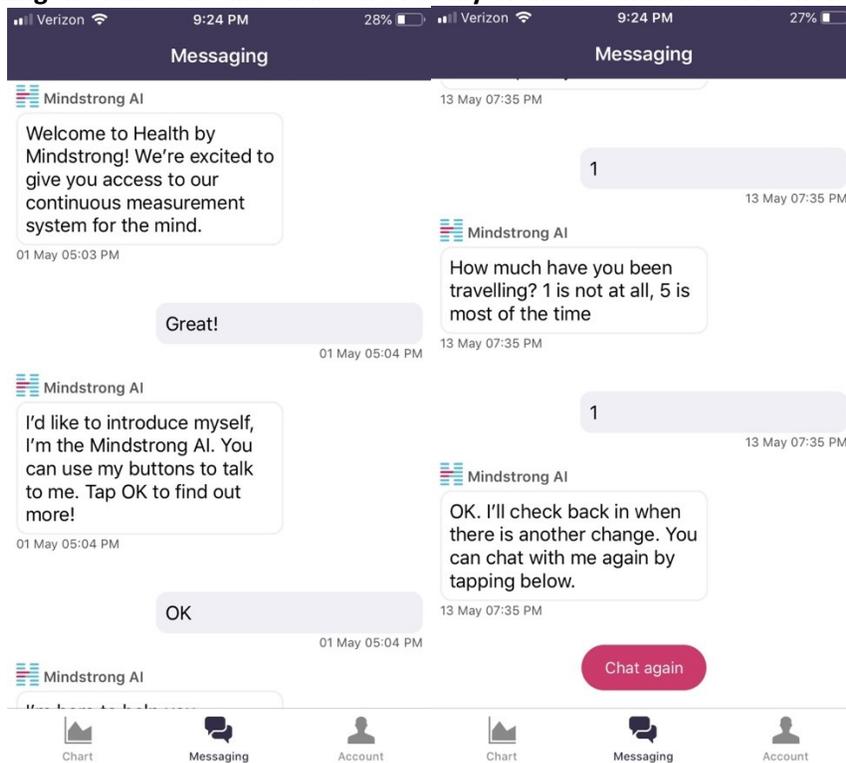
The abbreviations also offer no affordances that they are clickable, which is the mechanism for switching which biomarker is being examined. They also have fairly small target sizes (see figure 7). That said, it’s easy to undo an error if the wrong one is clicked on—there does not appear to be a load time between charts.

Figure 8. The abbreviations are a fairly small target size



The app uses a recognition-based system in the messaging tab to get more information about the biomarkers (demonstrating good consistency and standards). The app keeps every message that the user has input to the AI in the messenger app. For example, the user does not have to remember past responses when using the messenger app. The app dates the messages with the time for precise measurements and recall for the user to use. These past messages are very easy to navigate and find as the user only has to swipe up. Overall, the app does a very good job enabling the user to look back at past actions in a very accessible way. See Figure 8.

Figure 9. The simple chart with multiple tabs minimizes the user’s memory with a clear interface. Details regarding the functions and charts are readily available underneath it on the same screen.



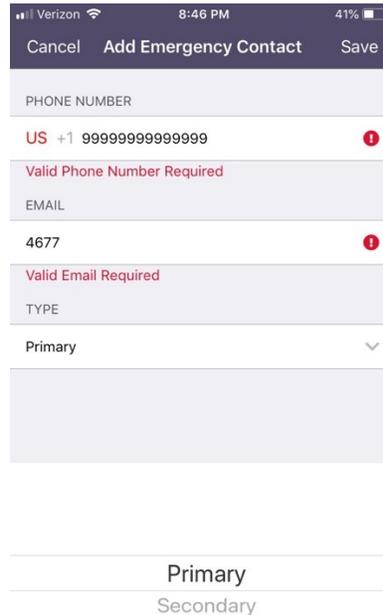
Accelerators are features that can adapt to the level of knowledge of the user by speeding up interactions for the expert user. This can facilitate interaction with frequent actions. There are no accelerators in the “log how I’m doing” chat dialog. People may be interested in logging specific scales, such as how well they slept, rather than going through the entire battery of questions. Adding accelerators in this chat dialog could be useful for experienced users.

Since Mindstrong tends not to focus on input, there is very little that can increase efficiency of use. The one instance noticed is that the health plan autocompleted from a list of possible options in the log-in flow. Another potential shortcut is allowing the user to click on any mark in the biomarker section and the app provides more detailed information that experienced users would appreciate.

7) Recovery from errors

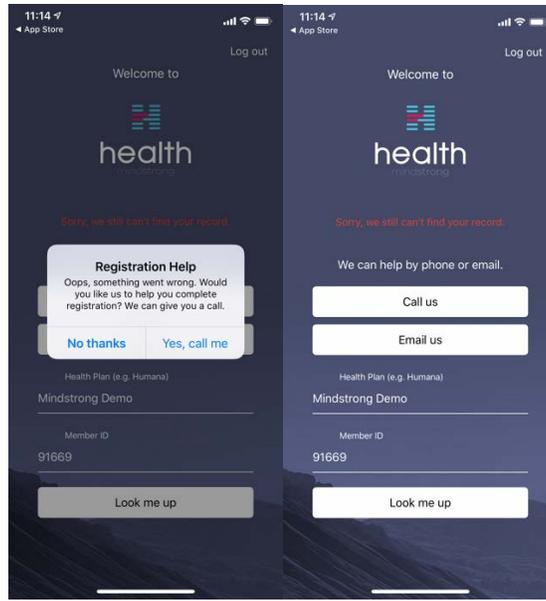
The experts felt that the app does a good job of helping users diagnose and recover from errors. There is in general little variation of types of input that users can enter into the app which minimizes the chance for errors. The app clearly presents what the issue is and offers constructive solutions (e.g., offering technical support for logging in). The user will not have a problem accidentally inputting a variable that the system won’t accept. This smooths the process for the user substantially and the app specifically tells the user what they have done wrong as shown below. One expert tried to input wrong numbers and variables into creating an emergency contact and the system correctly identified errors that one could recover (see Figure 9).

Figure 10. The user is notified when erroneous information is entered



The log-in flow does a good job of presenting useful error messages, e.g. “sorry, we still can’t find your record” while giving ways out with a number to call and an email address to contact (see Figure 10). It uses system-level dialogs to present much of this information, which is useful to draw attention beyond just the interface changing.

Figure 11. An example of providing users with contact information for help



For one expert, the messaging tab stopped responding and the app crashed unexpectedly with no warning. The messaging tab only allows users to ask about preset topics, which on the one hand limits user freedom, but also ensures the system won't encounter input it won't understand. Furthermore, the affordances of the app are quite limited, and in the experts' experimentation, there were no actions that resulted in unintended consequences or errors. For example, when entering entries for the "Emergency Contacts" menu, the app checks whether the inputted phone number or e-mail address is valid or not. One expert submitted blank feedback and it still went through. The system should have notified the user that what they were submitting was empty.

The following messages are examples of adequately presenting users with clear instructions which can help the user avoid errors.

- "Tap below to read about your biomarkers of how you're doing."
- "OK. I'll check back in when there is another change. You can chat with me again by tapping below."
- "Choose another! Or skip to continue our chat."
- "You'll notice there's no data yet. It takes 24 to 48 hours for us to get enough. Keep using your phone as usual - I'll let you know when it appears."

On the messaging tab, when one enters a nonsensical query or request, the user is presented with a message stating that the system doesn't understand and provides options for common questions which is good. The presence of selectable options for the biomarkers and other common requests on the messaging tab is very good for helping guide the user in the correct path of action.

Multiple experts reported that each time they click on 'Great' on the bottom of the messaging feature, the app crashes and one has to reopen it. When the app crashed on the messaging tab, there were no signals from the app indicating that there was a problem, and it just crashed quickly and without warning.

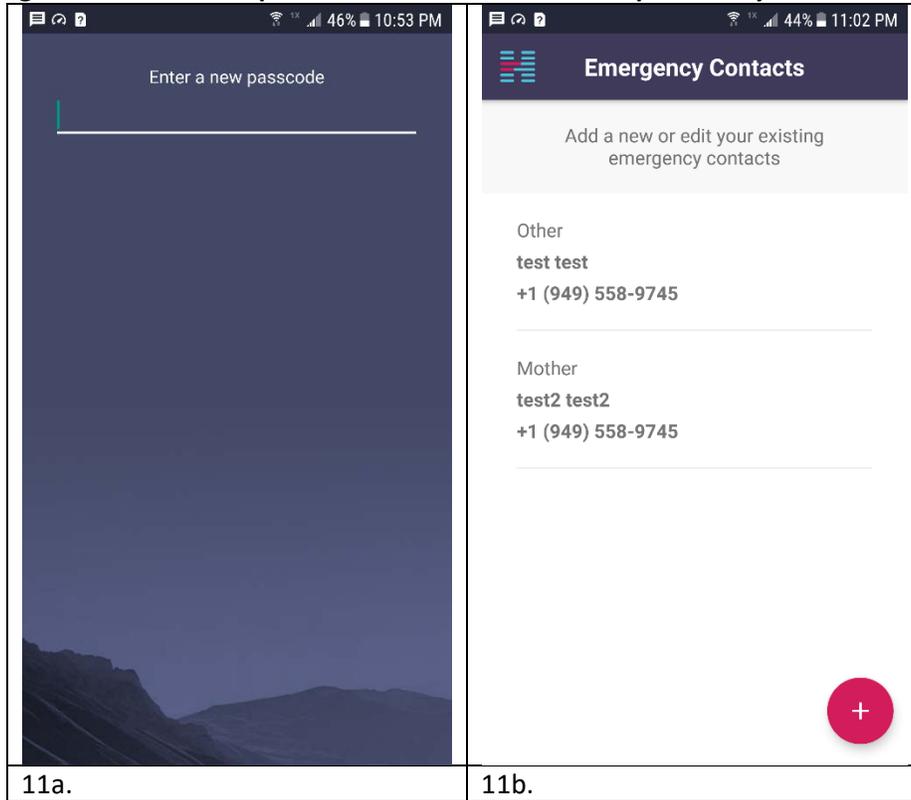
The following were additional errors discovered by the experts:

- The "Passcode setting" screen was prompted when a home button was pressed to go to different apps. As can be seen in screenshot Figure 11-a, no instructions were given. Even

though the passcode was not configured, it asked the user to enter it. The “Passcode setting” procedure should be explained and done in the very first stage of using the app.

- The “Chat again” button on the “Messaging” menu is not responsive at all when the phone was not connected to the Internet (e.g., neither 3G/4G nor Wi-Fi). The app should notify users that an Internet connection is required.
- On the “Emergency Contacts” menu, one was allowed to create entries with the same phone number (see Figure 11-b). The app should query users to make sure that indeed the different contacts have the same number.
- On the “Emergency Contacts” menu, a check mark icon (✓) appeared on the top right corner of the screen after all the necessary information was entered. This icon is not very prominent and the expert did not notice this icon, and the expert spent some time trying to figure out how to submit a new contact. So, it would be better to make this icon more visible or change its position.

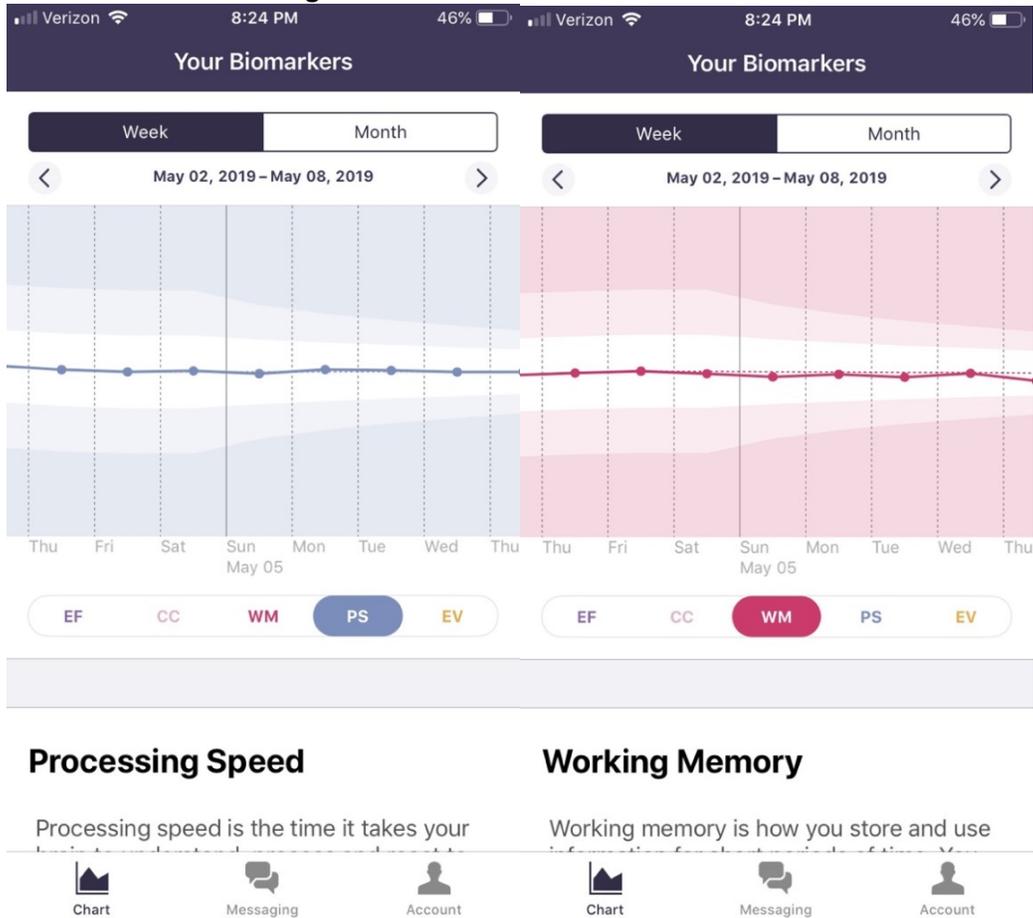
Figure 12a-12b. Examples of the interface which can potentially lead to errors



8) System design

Within the system, the design of the app is very consistent with the color, placement of text, and design of the messenger system. The color of dark purple, red, white and gray are very consistent and help the user guide their eyes to information. On the biomarkers page, whenever the user chooses a different biomarker, the shape of the graph is consistent with other biomarkers and the descriptions of the biomarker and graph does not change. Each biomarker also has a specific color that also changes the color of the graph, signifying a different biomarker if the user accidentally chooses it. This is shown in Figure 12.

Figure 13. View of different biomarkers



Nearly all experts felt that the aesthetic of the app is very good. The design is very minimalistic, sticking to a few basic colors that are very easy to look at and used to great effect. All information serves a purpose. The app looks nice overall, making good use of the screen space while still providing enough information for someone to make sense of their data.

There seems to be a good balance of just showing enough information, but not extra unneeded information. The app does not seem to have any extraneous or unnecessary features or pages, with the charts and messaging tabs being the core of the functionality. All charts are displayed in a straightforward and generally easy to understand manner, and the messaging system acts like a standard text messaging system familiar to most users so it is quite intuitive. All text presented for the chart is relevant to the biomarker that the user is looking at. While it is very helpful having each biomarker and graph explained, a user could get overwhelmed with that amount of information. A small change could be to have the information be included in a drop-down window. A user could touch the keyword if they needed more information (see next section)..

9) Documentation: Understanding the system

The documentation explaining the Anatomy of the Chart is useful, but it may be written in language that is too complicated for a person without much education. As described earlier, 'moving average' or 'personal baseline' may not be understandable to the average user. It would be desirable if these definitions could be provided easily, e.g. if a user hovers over the words. A link to "learn more" can be

added at the end of each explanation of a biomarker. A more interactive experience could be provided by just clicking the chart (e.g., solid circle).

Links to learn more about Mindstrong, privacy and security information, HIPAA, a support phone number and email address, and terms of service information is easily accessible from the account page and is laid out in a clean design that is not confusing to the user. There is, however, very little other documentation about the app, either within the app or online. It would be useful to provide more thorough help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too extensive.

Heuristic Evaluator Recommendations

- Setup instructions for those receiving partner codes need to be made clearer, as some evaluators had difficulty in the setup. Mindstrong should check that the partner codes function correctly. It is not clear if the problems were unique to the particular partner codes issued to the evaluators.
- The abbreviations may be hard for some users to understand. Consider using icons instead of, or with, abbreviations for the biomarkers. The abbreviations may be hard for some users to understand.
- Allow an “undo” function for the Likert scale items.
- Ensure that all Likert scales are uniform in scales. Provide a message on the biomarker screen while one is waiting for their data, to indicate that the data is still being processed.
- Feedback should be given when the app is very slow.
- The Touch ID/passcode issue with the iPhone needs to be resolved. The Passcode setting needs to be better explained.
- Clicking on ‘Great’ in the messaging app crashes the app, and this bug needs to be fixed.
- Consider incorporating accelerators in the “log how I’m doing” chat dialog to speed up these operations for experienced users.
- It is worth testing the app against devices with different hardware specifications (e.g., screen size). For instance, some commercial Android apps are not optimized for Android tables.
- A drop-down window that provides more information about each biomarker could be beneficial for users.

Surveys, Interviews, Focus Group: Potential Help@Hand Users

We conducted surveys (n=31), a focus group (n=14), and interviews (n=7) with community members in Modoc County. A local community-based organization recruited participants using a convenience sampling. Participants were given \$20 for their time and feedback. In order to respect participant confidentiality, we use approximate numbers for reporting. We report preliminary findings on mental health technology use, interest in using mental health websites and apps, awareness of Mindstrong and 7 Cups, and factors that may influence mental health technology use (e.g., stigma and privacy). It is important to note that data presented only pertains to one county and is not generalizable to other counties.

In general, the surveys, focus groups, and interviews in this sample revealed that few people were actually using either 7 Cups or Mindstrong at the time of the site visit. Because this data was collected before the “hard launch” of these technologies, many participants reported not knowing specific details about Mindstrong or 7 Cups, although some had heard about them. The surveys revealed a potential opening for the introduction of mental health apps, as two-thirds to three-quarters of participants

reported interest in using them. Participants felt mental health apps could be beneficial. For example, a reported possible benefit of 7 Cups was the capability to provide anywhere, anytime support (i.e., having someone with who to speak). Potential barriers to adoption included access to smartphones, poor Internet access, and related financial costs. Other factors that could influence adoption and use of these technologies included stigma and privacy, how empathetic and personalized the support was, and the method of support. Participants reported a moderate amount of internalized stigma about mental health issues and had related concerns about the privacy and confidentiality of their data in using the technologies. Users expressed a preference that Listeners in 7 Cups be more empathetic, but we caution that this is a small sample. Further data collection will clarify these issues. Most users in the sample reported learning about the technologies through other individuals, as opposed to advertising.

Participant Demographics

We collected information about our participants in order to understand who this data represents. There was a fairly even age breakdown with age groups having between 3 and 8 participants represented. Age groups included 18-24, 25-34, 35-44, 45-54, 55-64, and 65-74. Additionally, we had an almost even gender breakdown (female=16, male=14). Participants mostly identified as White (n=24), followed by Hispanic, Latinx, or of Spanish origin. In terms of highest level of education, the majority of participants (n=13) reported having a high school diploma or equivalent, followed by less than a high school degree. Of the 28 who answered the annual household income question, most (n=17) reported making less than \$10,000 per year, followed by \$10,000-\$19,999.

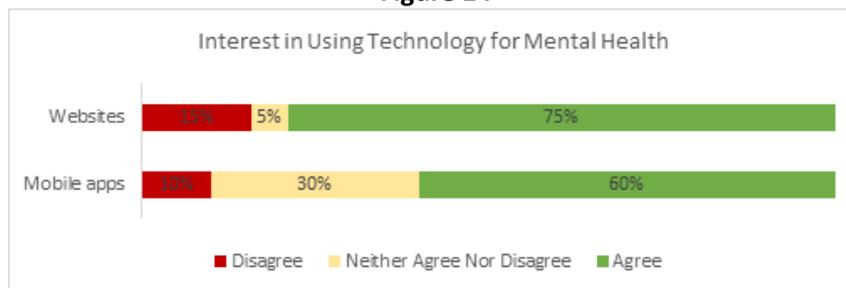
Mental Health Technology Use

In terms of actual use, all 31 participants who were surveyed explained which technologies they currently use and have used for mental health. Most participants had not used (n=22) and did not currently use (n=25) any technologies to support or manage their mental health. Six participants had used 7 Cups in the past, and less than 5 currently use it. For Mindstrong, less than 5 participants reported using it in the past, and less than 5 reported currently using it.

Interest in Using Websites and Apps for Mental Health

In order to understand whether or not participants wanted to use tools like Mindstrong and 7 Cups, we asked general questions about their interest in websites and apps for mental health. On a scale from 1-Strongly Disagree to 5-Strongly Agree, the average interest score for websites was 3.9 (SD=1.2) and for apps was 3.7 (SD=1.1), which indicates that participants were generally interested in using technology to manage their mental health. As Figure 14 shows, approximately 75% of the sample somewhat or strongly agreed that they were interested in websites, and approximately 60% somewhat or strongly agreed that they were interested in apps.

Figure 14



This was echoed in the focus group (n=14) about perceptions of 7 Cups. There was a general sense that 7 Cups and similar technologies held a lot of promise. Overall, people seemed receptive to using these types of technologies to support their well-being. For example, one respondent (S9) expressed how a technology could provide one with help at any time:

"I think I will look into it [7 Cups]. I think it sounds like a positive thing. I don't know a lot about it, so I can't say I'm too knowledgeable, but, I mean, I'm interested... And talking in front of people is hard for some people, as well as in a small community. I don't want everyone knowing my feelings, but maybe that one person that knows my feelings can offer something to help. You're talking about 3:00 in the morning, you need someone to talk to. I've definitely been there. Definitely. And I just needed that one person to talk to. And it makes a lot of difference..."

Similarly, S10 discussed 7 Cups as a potential option for support:

"Like myself, I choose not to use the app because I have a lot of apps already on my phone, and I do other things that I do for my wellness, but I know like at the time it came up that, hey, I needed something different because obviously what I'm doing now isn't working for me, then I know that I have that option and that I can come to a center like [location] and get that help and to put that on my phone and how to navigate through things."

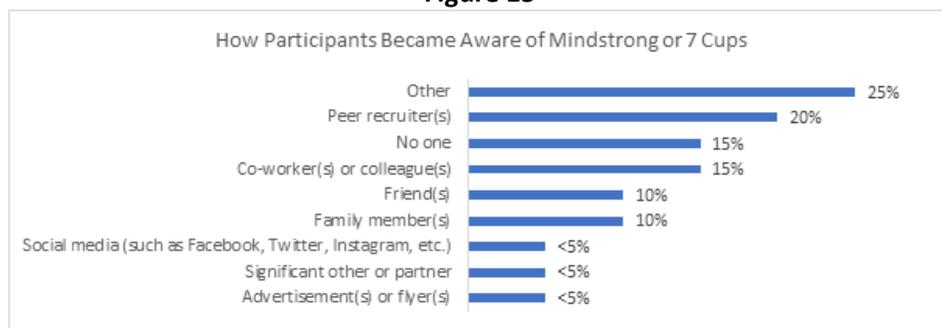
From S1's perspective, 7 Cups offered different avenues of support for the community. However, the challenge was in making people aware that it is available and assisting them in setting it up:

"We know it [7 Cups] works because it's been working even without the Innovation. It's its own product that works worldwide. I wish I would have known about it before. In fact, I would have spent more money on advertising than anything else, promoting it to the people and the clinicians, I would have said, "Clinicians, when you see a need and you see a fix, and put them together. Hey, you have a phone? Let me try to help you out and set it up [inaudible]."

Awareness of Mindstrong or 7 Cups

Out of all of the ways participants became aware of Mindstrong or 7 Cups, the most known route was through the peer recruiters, as shown in Figure 15. Over half of the participants became aware of the technology through another individual (peer, colleague, friend, family member); whereas fewer reported learning about the technology through media, such as social media and advertisements.

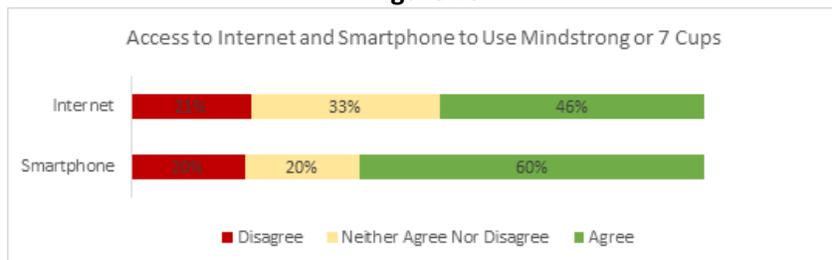
Figure 15



Access to Mindstrong or 7 Cups

In both the surveys and the focus group, the difficulty in getting access to a smartphone and a stable Internet connection, as well as cost, were discussed as potential obstacles for some in using Mindstrong or 7 Cups. For example, approximately 21% somewhat or strongly disagreed that they have access to a stable internet connection using a scale from 1-Strongly Disagree to 5-Strongly Agree (mean=3.3, SD=1.3). While the majority of people reported having access to a smartphone, approximately 20% somewhat or strongly disagreed that they have smartphone access (mean=3.7, SD=1.4).

Figure 16



Even though most people reported having access to a smartphone and many reported having access to the Internet, these topics were discussed in detail during the focus group about 7 Cups. For instance, S9 talked about the Internet being unreliable in their location:

"Well, at my house-- I live like [distance redacted] miles out of town. I don't have any Internet service. I don't have a phone at my house..... Especially up here, where the Internet does kind of-- it's funky sometimes. It'll go out, especially in the wintertime."

S1 also mentioned how access to appropriate hardware is somewhat dependent on government programs and changes over time, which limits what community members can do with these resources. For example, many people in the county may have access to a cell phone but not a smartphone compatible with apps due to the types of resources offered:

"I mean, you had the Obama phones. And then, all of a sudden, there's a switch in government. And then, now, it's another kind of phone. The contracts end. Also, if you can access there, you can't really talk. It's more of a text, and it's not very private."

This participant also discussed how people in the county may be able to get access to Internet-connected devices during operating hours, but that it is not helpful when people need support after hours. This bolsters the idea expressed by the participant earlier who reported that 7 Cups is beneficial for providing help at all hours.

"It's also not convenient; like in my case, I need to talk at 3:00 in the morning. I'm fine here at [location]. It's just when the [location] is closed, what do I do?" [S1]

In addition to Internet and smartphone access issues, nearly 70% of participants reported cost as a barrier to using Mindstrong or 7 Cups. On a scale from 1-Strongly Disagree to 5-Strongly Agree, the average score was 3.9 (SD=1.3), which indicates participants had financial concerns over the use of these technologies. We note that this is a small sample and warrants further study.

Stigma & Privacy

Participants were asked 9 questions about mental health stigma on a scale from 1-Strongly Disagree to 4-Strongly Agree from the Internalized Stigma of Mental Illness Inventory (ISMI-9) (Hammer & Toland, 2016). This was then scored by adding the score for each item and dividing the sum by the total number of questions answered. The mean score was 2.6, which indicates moderate internalized stigma (Hammer & Toland, 2016; Lysaker et al., 2007).

During the focus group, participants also talked about having concerns about sharing their mental health experiences within their small community, which not only includes elements of stigma but also expresses concerns about privacy. For example, S1 said:

"There's been one concern and that is that we're in a small community and like I know [person 1 is] a Listener, but what if I didn't want to tell [person 1] what I'm up to. [Person 1] doesn't have to say he's [person 1]. His name is [user name 1], what? ... So there's no way that I would know that it's [person 1]. And then, all of a sudden, I'm talking about [person 2]. I log on. Then, I talk to [user name 1] about [person 2]. And then, he knows that I'm talking about her. How do you make it so that-- how do you have protection? That's the only thing that I would worry about."

Another expression of privacy concerns was from S10 who questions the reliability of volunteers in protecting private information. There could be an intentional or even accidental loss of confidentiality of users' mental health information:

"So how about ethics and boundaries? I mean, is something there that would prevent that [loss of anonymity] from happening? Even though they are volunteers. They're volunteers, so wouldn't there still be something that would prevent them from crossing that line? So my question would be, how would you filter that then? How would that get filtered if you're in a small county and if it's to really get more services without-- with the anonymous. Stigma is so bad, I mean, really bad in small communities because well everybody knows everybody's business, unfortunately."

Community Needs

Primarily through the focus group, a number of community needs emerged, included timely support, empathetic and personalized support, and different methods of support.

Timely Support

Users also expressed an opportunity for mental health technologies like 7 Cups to be able to provide support at the time it is needed rather than waiting for limited opening hours in the health department. For instance, S1 discussed the limitations of county behavioral health services illustrating a need for after hours and weekend support:

"Just to bring you back on that. I mean, the [county behavioral health], the health department, works on a four-day schedule. So they're closed Friday, Saturday, Sunday. So when you all were coming here, I'm like, you know what? We planned something on Thursday. But be flexible that by Monday, things happen over the weekend. And it happens a lot. So I think it is good to have something for the weekend at least. Because I mean, I would say-- [person 1], I don't know if you agree, but we pride ourselves at the [location] that if you come here, we support each other here. We have a big group, a lot of teamwork and just help each other... It's harder on the weekends. Just imagine middle of winter, snow, Sunday night, and you have an urge to chat to somebody."

This same participant also perceived there to be limitations in the current after-hours support, such as crisis lines, specifically noting that while the participant felt something was a crisis from their perspective, that the crisis line listener might feel that the concern did not rise to the level of crisis. In contrast, the participant noted that a 7 Cups listener was always available for any level of concern.

Empathetic, Personalized Support

Both users and non-users discussed the need for empathetic, personalized support. The 7 Cups users identified some concerns about Listeners. First, not all Listeners may have appropriate experience to handle users' issues. This could be a function of age, life experience, or ability to empathize with others. For instance, S1 described an experience with a Listener that they felt was too young to understand and provide adequate support:

"It's just that I called, and I was talking to somebody, and he's a Listener, young kid. And I go, 'You know what? I was living in [city].' '[City]? I love [city] Can you tell me more about [city]?' I'm like, 'No. That's not what I was talking about. I'm not trying to tell you my experience in [city]. I'm telling you I'm in a situation here, okay?' So I need somebody that's been there, done that, to give me some advice."

S9 expressed how important it is for people giving support to understand what the person is experiencing and empathize with them while providing genuine responses:

"As long as you're-- if you were reaching out to somebody, not necessarily through a text or a call, as long as there's somebody on the other end putting their-- like you said, the automated things they do, you need someone that's going to understand what's going on and empathize. I mean, everyone's battling their own issues, and everyone possibly has their own little mental things going on. Like me just a little bit ago breaking down. That was really hard for me to even say that, but I mean, it's the truth, and so that's a-- well, that's... For me, it would be really either/or. I mean, so long as-- I would just really want to make sure that-- and this is, again, just my own opinion. I don't want to talk to somebody that's going to really just give me out of a textbook. I want somebody who actually knew or had been in a similar situation or isn't afraid to share [inaudible]. But something out of a textbook? I can just go get a book and read it myself. I want somebody that is generally is there and understands. It's not just doing a job and reading off, 'Well, it looks like you have this.' 'No, that's not what I wa--' you know?"

Additionally, S1 discussed how getting support from people one does not know well, such as through 7 Cups makes it difficult to get the personalized feedback needed for different experiences:

My experience with [diagnosis] is that it depends.... I almost expect too much from 7 Cups, like they can't handle it because humans can gauge me. And I know if I talk to [person 1], I'm going to get this. But if I talk to [person 2], I'm going to get that kind. [Person 3 is] going to me tell me that way. So I can kind of pick, but the bot can't tell... Well, in my experience of [diagnosis], I [experience different levels of symptoms]. So sometimes I'm way out there, and sometimes I'm okay. I don't control that, that much. I can react to it, but I don't-- what preloads that, I don't know what gets me going. That was the problem that I had with 7 Cups is that they'd always expected me to be at this level or that level. Well, so I was like, 'No. I'd just rather talk to [person 1] because [person 1] can know if I'm [experiencing symptoms] [laughter].'"

Preferred Methods of Support

The users also expressed different ways that they would prefer to receive support. 7 Cups offers primarily one-on-one, remote support, and Mindstrong offers a conduit to a therapist. It is important to consider that the technologies cannot offer the range of support that users may prefer. Across the group, participants reported a number of different preferred methods, including group support (S3), texting or chatting, especially late at night (S3, S10), and hugs (S9).

Surveys and Interviews: Mindstrong Users

We conducted surveys (n=4) and interviews (n=4) with individuals who had used Mindstrong in Kern county. Kern County piloted Mindstrong among a group of high functioning clients who are transitioning to the community. Of the 23 users, 13 were contacted over the phone and asked to participate in a survey and/or interview. Nine users were scheduled, but only four users attended their scheduled interview. Those who attended their scheduled interview received a monetary incentive. It is important to note that this report does not assess the validity of Mindstrong but rather focuses on users' perceptions of and reported use of Mindstrong. Data also pertains to users in 1 county and cannot be generalized to other counties. Given the small sample size, the findings reported here are preliminary and no conclusions can be drawn at this time. For this update, we report preliminary descriptive statistics from the quantitative survey and high-level preliminary themes from the qualitative interviews.

In general, we found that participants viewed Mindstrong rather positively. However, we caution that this is a small sample size, and there may be sample bias in terms of the individuals who agreed to discuss their experiences of Mindstrong. In other words, these participants by nature may be more accepting of and interested in Mindstrong than participants who did not choose to speak with us. A number of factors may influence the adoption and use of Mindstrong, including, stigma, social connectedness, and therapeutic alliance but more work needs to be done to understand this. All features, such as the dashboard with biomarkers, chatting with a healthcare provider, and mental health information, were viewed as useful. Mindstrong's ability to initiate contact with a clinician and act as a conduit to communication and support by the users' care team was particularly important. Biomarkers can be useful but only if participants are able to interpret, reflect, and act on the data in meaningful ways.

Participant Demographics

We collected information about our participants in order to understand who our data represents. Participants reported age ranges between 18-24 and 45-54 years old. We had an even breakdown of those that identified as female and male. Three participants identified as White, and one identified as Hispanic, Latinx, or of Spanish origin. In terms of annual household income, participants reported ranges from under \$10,000 to \$20,000-\$29,000.

Factors that Influence Mindstrong Adoption and Use

Technology Acceptance

In this section, we report on general perceptions of mental health apps. Our scales are taken from the Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh et al., 2012), including technology acceptance in terms of the following three dimensions: Performance Expectancy, Social Influence, and Facilitating Conditions (Table 3). On a scale from 1-Strongly disagree to 5-Strongly agree, the overall technology acceptance ratings for users ranged between 3.3 and 4.4. The ratings indicate that the users had in general a good acceptance of mental health apps generally, which may contribute to their acceptance of specific apps like Mindstrong.

Stigma

Participants were asked 9 questions about mental health stigma on a scale from 1-Strongly Disagree to 4-Strongly Agree from the Internalized Stigma of Mental Illness Inventory (ISMI-9) (Hammer & Toland, 2016). This was then scored by adding the score for each item and dividing the sum by the total number of questions answered. Of the four participants, two participants reported minimal to no internalized stigma, one reported moderate stigma, and one reported severe internalized stigma.

Interpretation of ISMI-9 Scores (4-category method used by Lysaker et al., 2007):

1.00-2.00: minimal to no internalized stigma

2.01-2.50: mild internalized stigma

2.51-3.00: moderate internalized stigma

3.01-4.00: severe internalized stigma

Social Connectedness

We used the Social Connectedness Scale (4 items) (Lee & Robbins, 1995) to measure participants' sense of social connectedness on a scale from 1-Strongly disagree to 6-Strongly agree. Higher scores indicate less social connectedness. Of the four participants, two scored 1.0 and two scored between 5.0 and 6.0, indicating a wide range of social connectedness.

Privacy

We measured users' perceived privacy of their data and personal information when using the Tech Suite. Six items were taken from Xu et al. (2012). In order to reduce participant burden, ratings were measured on a 5-point Likert scale, ranging from 1-Strongly Disagree to 5-Strongly agree rather than a 7-point Likert scale as in Xu et al. (2012). Scores were computed by taking the mean of the individual items, and thus, possible scores range from 1 to 5. Higher scores indicate more privacy concerns. The privacy scores ranged from 1 to 3.5, meaning some participants had low privacy concerns and others had moderate privacy concerns.

Therapeutic Alliance

The Therapeutic Alliance Scale (Accurso et al., 2013) measures the degree to which a person assesses their therapeutic relationship to have a positive working relationship. The scale ranges from 1 to 4 with 12 items, possible scores range from 12 to 48, and higher scores indicate a higher therapeutic alliance. Participants' therapeutic alliance scores ranged from 26 to 48, with three participants scoring between 40 and 48. This indicates that most users had a high therapeutic alliance.

Use of Mindstrong

We asked participants questions related to their use of Mindstrong, including why they decided to use it, how long they used it, and their pattern of use. Of the four participants, one reported using Mindstrong daily, two used it several times a week, and one reported using it rarely. Most commonly, participants reported using Mindstrong because their healthcare provider encouraged them to use it, followed by wanting support to improve their mental health. It was less common for participants to report that they tried Mindstrong because they like trying new technologies. Duration of use ranged from 3 to 8 months. (It is important to note that at this site Mindstrong has been discontinued.)

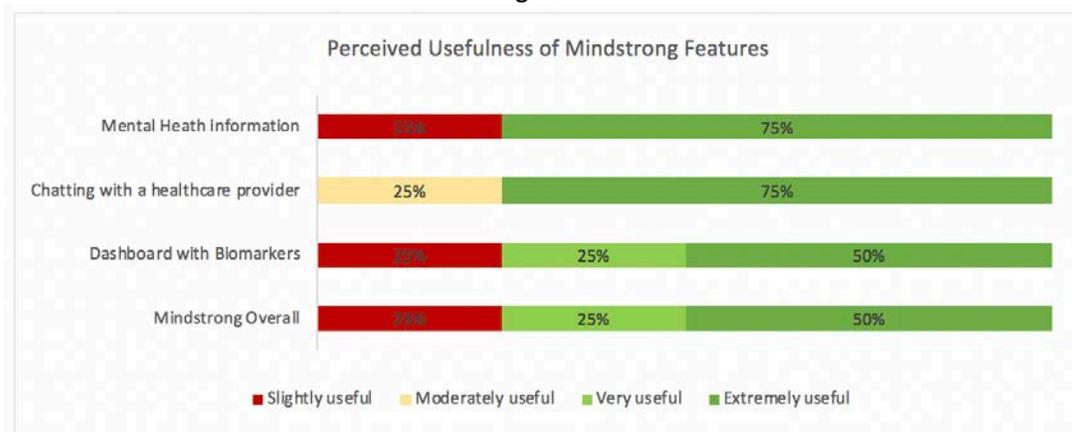
Irrespective of Mindstrong being currently discontinued at this clinic, the majority of participants reported having stopped using Mindstrong at some point. This was most commonly due to lack of access. For example, some participants discussed getting a new phone and having trouble getting an access code to Mindstrong. Some also discussed how they were unable to use Mindstrong during

hospitalizations. Others had stopped actively using the app even though they did not delete it from their phone.

Perceptions of Mindstrong
Usefulness of Features

On a scale from 1-Not at all useful to 5-Extremely useful, two participants found Mindstrong to be extremely useful, one found Mindstrong very useful, and one felt that it was slightly useful. We also asked participants to rate the usefulness of specific features. Chatting with a healthcare provider was rated the highest as a useful feature, followed by mental health information on the app, and the dashboard with biomarkers.

Figure 17



1) Dashboard with biomarkers: Facilitating reflection

Some participants reported that Mindstrong provided them with tangible data related to their mental health that they would not otherwise have. This helped because it gave them something concrete to better understand their experiences and functioned as a tool to engage in reflection. For example, one participant said:

“...with its [Mindstrong’s] potential usage of being able to help an individual educate themselves in their basic everyday walk of life and how they mentally walked through that day, that’s potentially a lot of beneficial information. Because on your days that are really bad, you can actually kind of go back on those days, think about what was bad, and potentially help yourself to have less days that are like that by working through what you really struggled with on those days and, in a practical sense, finding a way to overcome that really at any given point. And that’s a boon that I can’t even fathom for myself, so the potential is limitless, I feel.

...It was like here’s the blueprint of my mind. Here’s the positive and the negative evaluations, the processing of the information. It was a higher power day. It’s like, okay, some days have higher valences than others. And it’s like I was actually able to recall, ‘Yeah. No. That was definitely a day that I was feeling low.’ So it was like, ‘Okay. Why was I feeling low? What was it that was really harnessing that energy that even allowed it to show on this graph?’ And I took a step back every time. I tried to. And of course, there were some days that I wasn’t able to process it all. But no, I still spend every day-- just check on it here or there. Just see what it said, and then just kind of track my mind and see how it all kind of matched up. And there was a lot of accuracy. It brought

a lot of light to my own introspection, and it helped me kind of look in my own mind in a way and think, 'Okay. It seems like I've actually got an understanding as to how I process information. Let's actually better myself now.' And I kind of feel like it helped me find that path entirely." [P2]

It is important to note that not all participants found the biomarker data to be actionable. In other words, the biomarkers did not facilitate reflection and lead to meaningful insights, which users could actually use. For example, P4 stated:

"I think it [Mindstrong] helps the therapists more than it helps me. It's informative to me. I enjoy the information, actually. It's just that I don't have to deal with it as much as the therapists know what to do with it."

We anticipate that these perspectives are more common than what is currently represented in the data due to the small sample size.

2) Chatting with a healthcare provider: Facilitating connection

Participants discussed how Mindstrong acted as a conduit to connect with a clinician, which provided access to more support when users needed it the most. Mindstrong initiated interactions which helped break the barrier that seems to exist when one needs support but is reluctant to seek it. For example, P3 said:

"I think that the care was when I would experience those bad times and that [my therapist] would call me; to me that was getting access to sooner care... I'm not really one to want to bother him all the time. So if I would-- I mean, that day I didn't feel like I wanted to call him but he did call me." [P3]

Other participants talked about the app-initiated connection as beneficial:

"I really liked the interaction with the clinicians. It was just I was going through such a difficult time at that period of my life. And to be able to just touch base with them, have them touch base with me, to see how I was doing when my biomarkers were a little wonky. Or if they could see something was going on with my biomarkers, they would contact my therapist and my therapist was, 'Hey. You doing okay?' And I would say, 'No, I'm not doing okay.' And they would call me and then I'd have an extra therapy session or something along those lines. So it's definitely helpful as far as form of extra support when I was struggling." [P1]

Similarly, P2 discussed how their care team would reach out to them when they needed support, which was a result of the biomarkers.

"There was one day I rock-bottomed out. I think I was on the line with the crisis center three times that day. One of the hardest days I ever had to live through, and it was like a culmination of the worst triggers and the worst dreams that woke up into the worst day. And it was just like I had to exist through it. And the next day, it showed up in the negative valence and it had dropped dramatically. It was the lowest point I believe that it had ever gotten. And I think it was the day following, after the information was able to finally process, I got a call from my team back when I was with [redacted] because they were monitoring all of that information. And so while I was going through my own hardships, I was able to be checked on days after when I was going through

some of the worst times. And maybe I was feeling a little bit better after I got that-- a few days after when I got that phone call. But there were some times where I wasn't and it was just like, 'Yo--' and I broke down. I broke down hard so many times. So many times. And it was another instance as to how that program has a very powerful foundation because that information was able to be tracked by my mental wellness team, and they were able to see, 'He wasn't doing too hot here. We need to check up on him.' What other program has ever been able to do that?" [P2]

It is important to note that some participants expressed that although they feel supported using Mindstrong, they felt it was not genuine caring but rather a requirement of their job:

"Yeah (I feel supported). It just mostly feels like it's their job to do it, though. Like if they don't do it, then they're not doing their job that they signed up for, therefore they'll probably get penalized for that. But genuine support, I mean, it's good to have somebody to talk to you that isn't a friend or family, that's just an anonymous entity. You know?" [P4]

Therefore, one participant talked about their past experience using other platforms to connect with people and interest in chatting with others with lived experience instead of just clinicians:

"There's a website called Hot Tea or something. It was just like an anonymous venting site where you could just talk to somebody on the other end of a keyboard and just they get to tell you, 'Well, maybe you could do this,' or like, 'Sometimes people feel this. It's okay to feel this. Maybe you could try this,' or whatever... It was a long time ago. It was before I even considered therapy. I think there were people from all over the world because some of the grammar was weird with some of them. But I enjoyed that. It was just random people, instead of clinicians or something... Yeah, that sounds cool, actually. Like a platform for a bunch of clients maybe?" [P4]

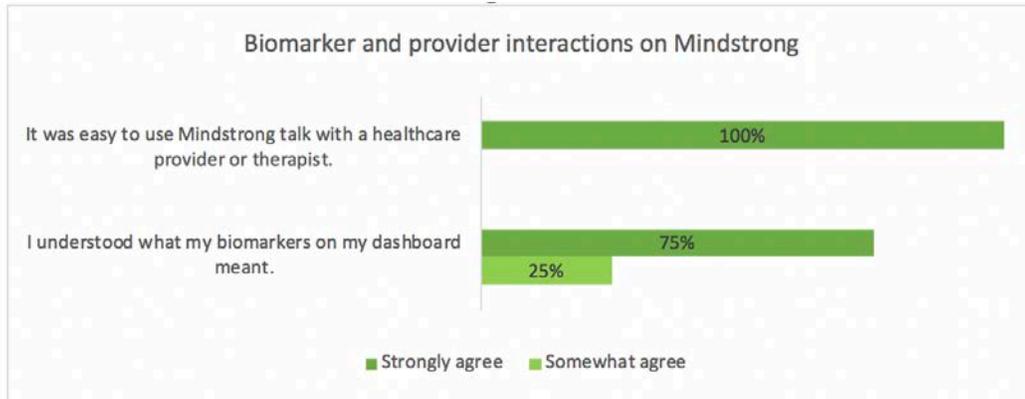
Although this was less common among our sample, we expect that this may be more prevalent with larger sample sizes.

Usability

Using the 10-item System Usability Score (SUS) (Brooke, 1996), we asked participants to rate the degree of usability of Mindstrong. Higher scores indicate better usability than lower scores. As a benchmark, a 2015 *International Journal of Human-Computer Interaction* publication of four experiments with 3,575 participants on the usability of the top 10 apps on both phones and tablets with two operating systems, iOS and Android, found the average usability score for these apps was 77.7, with an approximate 20-point spread (67.7–87.4) between the highest and lowest rated apps (Kortum et al., 2015). Mindstrong's usability scores ranged from 72.5 to 100. Participants did report some issues that seemed to improve over time, such as system bugs or crashes.

On a scale from 1-Strongly disagree to 5-Strongly agree, we also asked participants about the dashboard and interactions with healthcare providers on the app. In our small sample, all participants strongly agreed it was easy to use Mindstrong to talk with a healthcare provider or therapist. Overall, participants felt they could understand their biomarkers with all participants somewhat agreeing or strongly agreeing.

Figure 18



Perceived Impact on Outcomes

In addition to usefulness, we also asked participants their thoughts about how using Mindstrong related to outcomes on a scale from 1-Strongly disagree to 5-Strongly agree, as shown in Table 6. Most notably, all participants somewhat agreed or strongly agreed that Mindstrong helped them get access to support sooner than they would have if they did not use the app. This was echoed during the interviews. For instance, P1 stated:

“I had more care because of it [Mindstrong] when I needed it... It's hard for me to reach out when I'm struggling because you're in the midst of struggling through something. And so, it's hard to see outside of that to be able to reach out to someone to tell them what's going on. So this [Mindstrong] made it easier for them to see when something was going up and down and then reach out to a therapist for me. And then have me go in and get the extra help that I needed. When, in the middle of the process, it's more difficult to do that.”

Some participants also described how Mindstrong gave them the perception that they had access to care at all times:

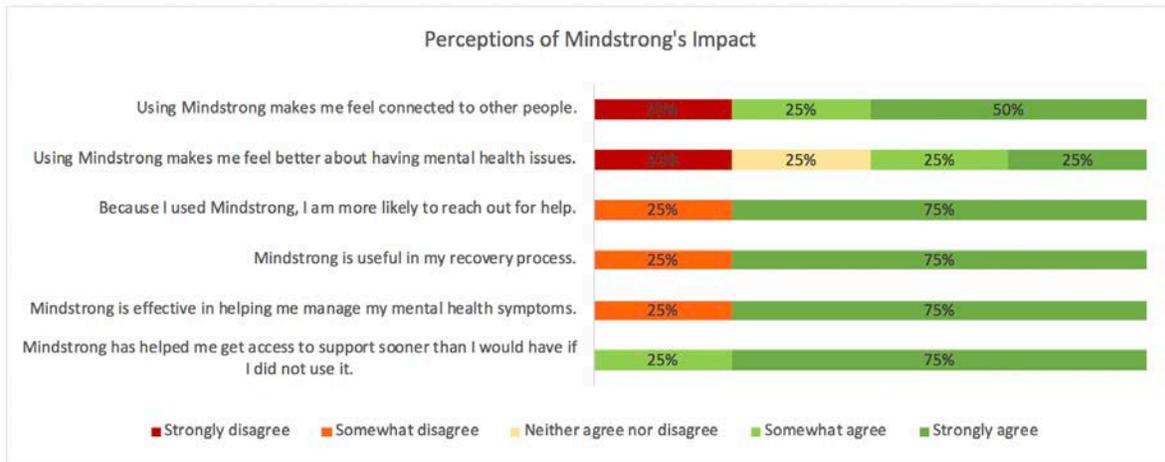
“I pretty much felt like I was getting 24/7 therapy care, is what I felt like. So rather than have to wait for an appointment. So it's just easier if you could use it and then you could say, ‘Okay, I need to talk to somebody today. I need to talk to somebody now.’ Even though my therapist was a phone call away where we could talk for a few minutes, but if I really needed to express something I was able to go on the app and just express that to the person that was there. And it was usually the same girl. I can't remember her name now, but she was real helpful, so.” [P3]

In addition to care, P2 discussed how Mindstrong provided access to crisis resources, such as phone numbers, which are difficult to find during crisis situations:

“There were actually several occurrences that I would be in the process of a breakdown, and a couple hours into my breakdown I'd get a kick from-- or a ping from the app. And it would be the automated services registering that there was something going on. So I would respond to the automatic services which would then direct me to their in-house techs who I would then speak with, which would then go about the process of helping me find who I need to speak with. There were several times that I contacted the places, but I could never remember their fricking numbers, and Mindstrong had their numbers readily available at any point that I needed them.”

Although responses were mixed, participants also reported that Mindstrong helped them manage mental health symptoms, it was useful for recovery, and it made them more likely to reach out for help. Participants felt that Mindstrong had less of an impact on their feelings about having a mental health condition and feelings of connectedness.

Figure 19



From the Outcome Rating Scale (ORS) (Miller & Duncan, 2003), we also asked participants to recall how well they had been doing before using Mindstrong and how well they are doing after using Mindstrong in the following areas of their life: overall (general sense of well-being), individually (personal well-being), interpersonally (family, close relationships), and socially (work, school, friendships). The highest possible score is 40, and a higher score indicates better well-being. Participants reported a range of perceived well-being before using Mindstrong from 2.9 to 14.4. After using Mindstrong, participants reported a range of perceived well-being from 4.8 to 40.0. It is important to note that 3 of 4 participants reported increases in well-being and 1 of 4 reported decreases in well-being after using Mindstrong.

Support After Mindstrong

It is unclear how long participants are supposed to use Mindstrong and what happens after Mindstrong is no longer available. Some participants expressed wanting to use Mindstrong again (P2, P3). For instance, P3 said:

“I actually liked having the Mindstrong. If I could have it again right now, I would. And I would just use it forever until I’m not here anymore, so [laughter]. But if I could use it again-- I really wanted to get it back.”

In the cases where Mindstrong is not available to clients or clients change care, participants suggested the possibility of having recommendations for next steps. For example, P1 stated:

“I’m transitioning from the current behavioral health team to a community team into the community. So I haven’t met with my therapist yet, but when I meet with my therapist, I think I’ll ask what sorts of resources are out there. Also do some search on the internet to see. But I probably don’t want to be bombarded with a lot of information what’s out there on the internet to know which one to use. I think it’d be nice if Mindstrong had a-- ‘You’re ending with Mindstrong. You might want to try this program.’ Or, ‘We recommend this program.’ Or, ‘This is a program that’s been shown to be useful.’

At this particular site, Mindstrong is no longer being used. This brings up important questions about how to best support users' wants and needs, especially after Mindstrong.

Outcomes Core*California Health Interview Survey (CHIS)*

There was no data collection or analysis activities during this evaluation period.

7 Cups

There was no data collection or analysis activities during this evaluation period.

Data Repository

There was no data collection or analysis activities for the Data Repository during this evaluation period.

Stakeholder Evaluation

Evaluation of Collaborator Readiness

The *Group Collaborative Process Survey* performed to evaluate the March 28, 2019 7 Cups collaborative testing workshop had had a 68% response rate. Of the 25 county members who were sent the survey, 17 responded. The scale results from the three scales, their items, and the survey comments are as follows: partnership satisfaction ($\alpha=0.85$, mean=3.55, sd=0.61), openness ($\alpha=0.92$, mean=4.0, sd=0.7), and organization and structure of meeting ($\alpha=0.81$, mean=3.56, sd=0.55).

Partnership Satisfaction

Participants at the 7 Cups collaborative testing workshop were only slightly above neutral in their overall partnership satisfaction rating. The items that created the satisfaction score only ranged from 3.41-3.88. There are a few items from the partnership satisfaction scale worth mentioning based on their frequency distribution. One of the questions stated, "I had a sense of ownership in what the group did and had accomplished during this meeting", where 11 either agreed or strongly agreed, 4 were neutral, and only 2 disagreed or strongly disagreed. Another notable question stated, "Group members worked well together to solve challenging issues during this meeting" where 12 either agreed or strongly agreed and only 5 were neutral. However, only 7 individuals agreed and 1 individual strongly agreed with the item "I was generally satisfied with the activities and progress of this meeting".

Openness

Attendees score for openness was positive with a mean of 4.0 and standard deviation of 0.7. The items that make up this scale ranged in in averages responses from 3.63-4.13. None of the respondents strongly disagreed with any of the openness items. Two notable statements 14 individuals either agreed or strongly agreed with were "I could talk openly and honestly at this group meeting" and "I felt that my input was valuable and useful to the group during this meeting", both additionally had 2 neutral and 1 disagree each. All but one item in the openness scale had a majority either agreeing or strongly agreeing with the statement. The one item that only had 9 agree or strongly agree was "I had a sense of ownership in what the group did and accomplished during this meeting".

Organization and structure of meetings

Like partnership satisfaction, the scale for organization and structure of the meeting had an overall average slightly above neutral. Compared to the other two scales, organization and structure of the meeting had a wide range of opinions among the items with means ranging from 2.67-4.0. For example, only 5 individuals agreed or strongly agreed to the statement "This group meeting was well organized", 6 were neutral and 6 either disagreed or strongly disagreed. In addition, the prompt "I believe that we adequately addressed all of the agenda items at this group meeting", only had 3 agree, 8 neutral, and 6 disagree or strongly disagree. In contrast, the statement "One member dominated at this group meeting" had 14 disagree or strongly disagree and 3 neutral respondents.

Review of the Comments

Of the 17 participants, 10(58.8%) wrote a comment reflecting on the workshop. The positive comments included: participants liked the ability to do hands-on testing, enjoyed having representatives to help them with the programs, and applauded the flexibility of Cambria when there were technical difficulties. However, some thought that they were overwhelmed with the testing, noted it was a noisy environment, and commented that they wished they knew who to direct questions to. One stated that, "I would have liked to walk away with a better sense of how I would operationalize the testing." It was noted that a guide or handout with step-by-step instructions on how to use Jira would have been helpful.

Lessons Learned Reported and Collected from Counties and Vendors

Cohort 1 Counties reported the following lessons learned:

- *Culture of Collaboration:* There continues to be a need to make specific efforts to strengthen the collaborative culture between Counties participating in the Help@Hand Project in order to better foster learning. It was noted that it is important to create an environment where counties and vendors can openly discuss challenges, concerns and issues
- *Understanding Needs of Target Audience:* Continue to collect understanding of unmet needs for target audience to help inform technology selection, piloting, and scaling.
- *Technology Selection:* Even more due diligence is required around product functionalities and offerings to confirm they meet county expectations and needs prior to contracting. Proposed apps need to be thoroughly vetted prior to piloting with clients, especially since a prime role of county mental health organizations are to assure the provision of safe products for the vulnerable populations served. In addition, there needs to be more careful exploration of the turn-key capabilities of a product before launching it as recommended by the County. A possible consideration is to refocus technology selection from customization and development to employment of technologies currently in use in health and academic settings. Lastly, all vendors should be held to equitable standards.
- *Communication:* Establish a central point-person as the lead project manager and leadership representative to triage and delegate tasks to team members and govern implementation and contracting. Also, all stakeholders should frequently define terms to ensure shared understanding. Counties should communicate with vendors to ensure consistent messaging.
- *County Implementation:* Shared vision and support from executive leadership is vital. In addition, several counties emphasized creating checklists of pre-launch activities, prioritizing the planning of efforts over launching, and having the ability to course correct when needed. It was also noted to involve tech experts in the planning, development, and management of efforts. A challenge for many counties is having a small team to manage so many details.
- *Training and Monitoring:* Ensure more training and monitoring is done for implementation sites to allow for greater iteration and engagement opportunities. In addition, feedback from clinicians/peers should be gathered early to assess interest/readiness of app use.
- *Success Metrics:* Articulate success metrics and plan for collection ahead of pilot implementation (identify the quantitative and qualitative metrics to measure effectiveness with digital mental health and wellness applications). It was also noted that counties must continually manage expectations at all levels.

Cohort 1 Counties Recommendations

- *Culture of Collaboration*
 - Define what it means for counties to collaborate
 - Facilitate meaningful collaboration and sharing among counties (facilitate a shared understanding of what collaboration means to the collaborative)
 - Facilitate more open sharing, communication and learning across counties and among counties and vendors (include tech, evaluation, marketing vendors and CalMHSA)
 - Bring lessons learned from other organizations that have created tech suites back to this collaborative
 - Plans and frequency of coordinated calls between counties
- *Understanding Needs of Target Audience*

- Eliminate barriers to individuals' participation in the tech suite by spending time understanding what those potential barriers might be
- *Technology Selection*
 - Engage expertise in digital health contracting and technical due diligence early and throughout the RFSQ process
 - Stay up to date on the mobile digital health technologies and allow for new technologies to be a part of the selection on on-going basis
 - Compare products on the Tech Suite bench to what is available in the digital mental health and wellness market
 - Consider piloting technologies that require only minimal customization to the public mental health space, rather than product development
 - Develop a systematic process for testing vetting apps including issues related to user safety
 - Execute vendor contracts linked to clear milestones of project success
- *Communication*
 - Assess flow of communication
 - Provide frequent status updates
 - Ensure all information is provided to the counties in a timely manner so that counties can drive decision making and apply learnings in an expedited manner
- *County Implementation*
 - Consider a phased approach to roll-out, starting with only 1 or 2 counties per technology, with clear success metrics
 - Consider how the planning, development, and implementation process can be streamlined and sustained in the future, particularly related to security vetting and compliance
- *Funding Considerations*
 - Iterate on project budget to ensure it reflects the vision for a suite (or menu) of technologies to increase access to mental health and wellbeing and ensure transparency to counties about budget and costs of deliverables requested
 - Despite pressure around reversion, ensure appropriate due diligence and clarity around the process and timeline before pushing timelines forward

Mindstrong and 7 Cups were both asked to share preliminary learnings for inclusion in this report. The information they provided is included in Appendix D.

Recommendations for Actions and Modifications

Recommendations to CalMHSA

- Create opportunities to share resources related to the Tech Suite products.
- Identify communication strategies between app vendors and clinical leadership to streamline coordination of initial and ongoing training needs.
- Additional definition of the peer role could help peers' confidence in supporting the Tech Suite.
- Compile a general guideline for product testing for the counties to utilize as they continue to test 7 Cups, Mindstrong, and other possible apps they would eventually wish to add to the Tech Suite.
- Provide counties with instructions and screenshots of Jira to help them visualize the submission process with the introduction of this new technology.

Recommendations to Tech Suite Counties

- Continue and expand practices (e.g., regular check-ins about all Tech Suite app users and onboarding procedures) that facilitate coordination and communication among individuals involved with the implementation of the Tech Suite.
- Identify practices to align workflow activities across county-specific projects and/or other required documentation procedures to reduce competing time and work demands.
- Align the needs of the clients (e.g., access to smartphones or data plans) and resources (fiscal and administrative) of the clinical settings with the requirements of the Tech Suite.
- Consider whether infrastructure changes (e.g., availability of smartphones and data plans) could be made to facilitate use of products.
- Support clinical champions (e.g., protected time, training, a formal title/designation) to assist in the implementation of the Tech Suite products (e.g., through specialized product training to facilitate ongoing and local consultation).
- Consider targeted efforts to support development of local clinical expertise through models such as train-the-trainer or developing local clinical champions.
- Counties need to consider how to overcome barriers to adoption through mechanisms such as providing access to smartphones, as well as Internet, and covering related financial costs.
- Addressing people's concerns about privacy and confidentiality of their data will be important for improving rates of adoption.
- Word-of-mouth and peer/family networks might be good avenues to explore for introducing the technologies.
- Consider developing a process that includes next steps or suggestions when Mindstrong is removed from clinics and/or when clients' care needs change.

Recommendations to Vendors

Recommendations for All Vendors

- The app vendors could provide more training materials for providers focused on hands-on use of the apps, introducing the apps to clients, and screening/eligibility materials for providers to better identify clients who may benefit from the apps.
- Consider tailoring apps for youth clients (18 years and younger) who may be more receptive to using mental health technologies and for group settings to reach more clients.
- Provide more experiential training opportunities for providers and peers to become more comfortable onboarding and using the apps with their clients.

Recommendations for Mindstrong

- Provide feedback that the app is being used in the correct way after a couple of days of use.
- Explain exactly what data is being collected and accessed and what is not.
- Provide more documentation on how the app should be used, a FAQ page, explanations on the biomarkers in a language that could be understood by people without advanced education.
- Provide a clear and simple basic explanation of how the machine learning algorithm computes the biomarkers. This can help users develop trust in the system.
- Offer clearer indications of how the users can interact with the graphs. While the interface affordances may be self-evident to experienced users, it may be less intuitive for users with less technology experience.

Recommendations for 7 Cups

- Consider challenges of small communities and counties in connecting with Listeners in their area. Privacy and stigma may prevent users from seeking support.

Recommendations to Evaluators

- Continue to work with the counties to review and tailor interview guides and surveys prior to site visits.
- Obtain administrative data on clinics prior to site visits to determine issues of clinic size, demographics, complexity that may allow us to better determine which clinics to conduct site visits at, i.e., “purposive sampling.”
- Involve peers in the process of developing data collection instruments.

Planned Activities for Next Evaluation Period

The following are planned activities for the next quarter:

- Host the CalMHSA Advisory Board Meeting on June 25, 2019.
- Continue with market surveillance analysis.
- Hire staff to conduct the environmental scan.
- Conduct a post-implementation site visit to UCLA Harbor Medical Clinic on June 10, 2019.
- Interview Peer Leads in Modoc and Orange Counties to ascertain the structure and function of the Peer component of the Tech Suite in the pre-implementation phase.
- Survey Peers in Orange County.
- Begin developing a process where peers can provide feedback on data collection instruments and potentially be involved with recruitment efforts.
- Perform a heuristic evaluation of the clinician-facing portion of Mindstrong.
- Work with counties to obtain administrative data on clinics in order to understand clinic size, demographics, and complexity which can inform which site visit methodology.
- We will continually revise and refine our data collection instruments to collect quality data without burdening our participants. Additionally, new data collection instruments will be developed based on programs targeted (i.e., surveys and interview protocols appropriate for youth and adolescents).
- We will coordinate with the 7 Cups team in implementing updates to 7 Cups, such as choosing and testing survey items to be added within the app to assess stigma and social connectedness, and providing feedback regarding our recommendations from the heuristic evaluation.
- We will also work with the 7 Cups team to create a recruitment/sample pool of potential participants.
- Need to complete negotiations and sign contract with CalMHSA.
- Need to complete negotiations and sign DUA with Mindstrong.
- Need to complete negotiations and sign DUA with 7 Cups.
- Need to complete negotiations and sign DUA with Cohort #1 Counties.
- Need to finalize Non-Human Subject Determination and/or IRB requirements.
- Plan and develop the Cohort 2 evaluation plan.
- Plan the “Conceptualizing and Measuring Mental Illness Stigma for Evaluation” Conference.

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Appendix A: County Specifics

Kern County

Tech Lead(s)	<ul style="list-style-type: none"> Lamar K. Brandysky, LMFT
Team Size/ Structure	<ul style="list-style-type: none"> Project Lead, Peer Lead, 2 Peers (currently have 2 vacant positions)
Products In Use/ Planned	<ul style="list-style-type: none"> Mindstrong 7 Cups Plan to pilot new apps as they become available
Implementation Approach	<ul style="list-style-type: none"> Mindstrong- Pilot completed, Phase II on hold 7 Cups- Pilot completed, Currently on hold
Target Audience(s)	<ul style="list-style-type: none"> Clients with serious mental illness served by Kern Behavioral Health
Other Unique Qualities	<ul style="list-style-type: none"> Mindstrong and 7 Cups were vetted by a peer focus group. Peer focus group meets weekly to provide insight and real-life experience with apps.
Implementation Champions (clinics)	<ul style="list-style-type: none"> Consumer Family Learning Center Peers and the Self-Empowerment Team
Milestone(s)	<ul style="list-style-type: none"> Mindstrong and 7 Cups were vetted by focus group of peers Multiple challenges with Mindstrong and 7 Cups were identified and communicated to CalMHSA Planned Mindstrong implementation with DBT team. Effort is on hold at this time. Created a brochure of publicly available apps for county-wide distribution

Los Angeles County

Tech Lead(s)	<ul style="list-style-type: none"> Ivy Levin, LCSW Alex Elliott, MSW
Team Composition	<ul style="list-style-type: none"> Project Sponsor (Jonathan Sherin) Program Lead/Project Manager (Katherine Steinberg) Peer Lead (Keris Myrick) Communications Lead (Mimi McKay) Technical Leads (Mirian Avalos and Jim Spallino) Clinical/Evaluation Lead (Lisa Benson) Clinical and Tech Leads (Ivy Levin and Alex Elliott) Privacy SME (Ginger Fong) Security SME (Vahe Haratounian) Peer Workforce (Painted Brain) DBT Clinical Champion (Lynn McFarr)
Products In Use/ Planned	<ul style="list-style-type: none"> Mindstrong Health More to be determined
Implementation Approach	<p>Mindstrong: integrate Mindstrong biomarker data into clinical practice, initially in DBT clinic, for current clients in order to engage, educate, and activate current clients by</p> <p>a) supporting proactive rather than reactive engagement with clients</p>

	<p>b) offering useful monitoring of clients between visits</p> <p>c) increasing understanding of symptoms for both providers and clients</p> <p>Future Implementation Approaches to be determined</p>
Target Audience(s)	<ul style="list-style-type: none"> • Transitional age youth and college students • County employees • People with complex needs potentially with multiple and repeated hospitalizations • Individuals and family members who may not be comfortable accessing care pathways within the Community Mental Health System seeking de-stigmatized access to care and supports for well-being. • Existing mental health clients seeking additional sources of support or seeking care/support in a non-traditional mental health setting
Other Unique Qualities (about your implementation, target audience, or other aspect of your Tech Suite program)	<ul style="list-style-type: none"> • Modified Mindstrong Health app for use in Dialectical Behavioral Therapy (DBT) • Diary card added to Mindstrong app for DBT pilot • Not using Mindstrong clinical services • Objectives/Target Audience: <ul style="list-style-type: none"> • Primary Objective: LAC Tech Suite will focus on engaging college, graduate, and vocational students with a set of technology applications that aim to meet their mental health and wellbeing needs and/or assist in linking them to appropriate levels of care and supports • Secondary Objective: LAC Tech Suite will improve mental health and wellbeing of LA County Employees by increasing access and engagement to digital technologies supporting mental health and wellbeing • Tertiary Objective: LAC Tech Suite will improve mental health and wellbeing of LA County Residents by increasing access and engagement to digital technologies supporting mental health and wellbeing • Quaternary Objective: LAC Tech Suite will improve engagement among individuals with clinical conditions such as personality disorder or schizophrenia through digital mental health and wellbeing tools
Implementation Champion Clinic(s)	<ul style="list-style-type: none"> • Harbor UCLA DBT program for Mindstrong
Milestone(s) (between Mar-May 2019)	<ul style="list-style-type: none"> • Mindstrong continues to be used at Harbor UCLA DBT Clinic • LACDMH 7 Cups use remains on hold • LACDMH hired a Consultant Project Manager • Refined target population and objectives of Tech Suite for LAC • Developed a framework for consideration of continued/expanded use of Mindstrong

	<ul style="list-style-type: none"> • Articulated user stories and criteria for essential components of a 7Cups minimally viable product to pilot in college environment • Contracted with and launched work with Painted Brain as peer workforce
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Modoc County

Tech Lead(s)	<ul style="list-style-type: none"> • Rhonda Bandy, PhD
Team Size/ Structure	<ul style="list-style-type: none"> • Modoc County Behavioral Health (MCBH) Branch Director, MCBH MHSA Coordinator, Behavioral Health Peer Specialist
Products In Use/ Planned	<ul style="list-style-type: none"> • Mindstrong • 7 Cups
Implementation Approach	<ul style="list-style-type: none"> • Mindstrong for current clients • 7 Cups as a public wellness and prevention approach
Target Audience(s)	<ul style="list-style-type: none"> • Current clients • County residents
Other Unique Qualities	<ul style="list-style-type: none"> • Mindstrong is available to all behavioral health clients in the County. • Phone will be offered to clients who do not have a phone.
Implementation Champions (clinics)	<ul style="list-style-type: none"> • Modoc County Behavioral Health
Milestone(s)	<ul style="list-style-type: none"> • Conducting “soft-launch” with the implementation of the Health and the Care aspects of Mindstrong. Modoc chose not to utilize Mindstrong’s psychiatric services. • Planning final step of full launch which involves determining how to make phones and internet available to clients as they present a need for Mindstrong.

Mono County

- All Tech Suite involvement is currently on hold.

Orange County

Tech Lead(s)	<ul style="list-style-type: none"> • Sharon Ishikawa, PhD • Flor Yousefian Tehrani, PsyD, LMFT
Team Size/ Structure	<ul style="list-style-type: none"> • Peer Lead, 2 Peers at 7 Cups, 2 staff support to facilitate community feedback meetings
Products In Use/ Planned	<ul style="list-style-type: none"> • Mindstrong: Health, Health Services and Care • 7 Cups, contingent upon addressing issues identified during soft launch
Implementation Approach	<ul style="list-style-type: none"> • Assessing and creating readiness at the system and program level • Tech leads act as the liaisons between the 2 levels • Collaborative process including with vendor
Target Audience(s)	<p>Mindstrong:</p> <ul style="list-style-type: none"> • Individuals 13+ engaged in the crisis services continuum • Transitional age youth (ages 13-25) engaged in the Program for Assertive Community Treatment (PACTs)

	<ul style="list-style-type: none"> Additional programs to be added later (Full Service Partnerships, Recovery Centers, etc.) <p>7 Cups:</p> <ul style="list-style-type: none"> To be determined
Other Unique Qualities	<ul style="list-style-type: none"> Serving individuals regardless of insurance type/status
Implementation Champions (clinics)	<ul style="list-style-type: none"> CYBH PACT County Crisis Assessment Teams
Milestone(s)	<p>Mindstrong:</p> <ul style="list-style-type: none"> PACT: Pre-implementation; tentative MS launch date in Spring 2020 Crisis services continuum pre-implementation; tentative MS launch date in Jan 2020 for adult programs Additional programs: waiting for lessons learned by above programs

Appendix B: User Core Measures

Technology Acceptance

Eleven items and scales (from 1-Strongly disagree to 5-Strongly agree) were taken from the Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh et al., 2012), including technology acceptance in terms of the following three dimensions:

- performance expectancy: "The degree to which using a technology will provide benefits to users' in performing certain activities" (Venkatesh et al., 2003)
- social influence: "The extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology" (Venkatesh et al., 2003)
- facilitating conditions: "Users' perceptions of the resources and support available to perform a behavior" (Venkatesh et al., 2003)

For each dimension, we averaged the ratings, and an overall technology acceptance rating was developed by computing the mean of across the three dimensions. Higher scores indicate greater technology acceptance.

Stigma

Participants were asked 9 questions about mental health stigma on a scale from 1-Strongly Disagree to 4-Strongly Agree from the Internalized Stigma of Mental Illness Inventory (ISMI-9) (Hammer & Toland, 2016). This was then scored by adding the score for each item and dividing the sum by the total number of questions answered. Higher scores indicate a higher degree of stigma. We interpreted the scores following the method used by Lysaker et al. (2007):

Interpretation of ISMI-9 Scores: 4-Category Method

- 1.00-2.00: minimal to no internalized stigma
- 2.01-2.50: mild internalized stigma
- 2.51-3.00: moderate internalized stigma
- 3.01-4.00: severe internalized stigma

Social Connectedness

In order to assess social connectedness, we used 4 items from the Social Connectedness Scale (Lee & Robbins, 1995), on a scale from 1-Strongly disagree to 6-Strongly agree. The score was computed by taking the average across the 4 items. Higher scores indicate less social connectedness.

Privacy

We measured users' perceived privacy of their data and personal information when using the Tech Suite. Six items were taken from Xu et al. (2012). In order to reduce participant burden, ratings were measured on a 5-point Likert scale, ranging from 1-Strongly Disagree to 5-Strongly agree rather than a 7-point Likert scale as in Xu et al. (2012). Scores were computed by taking the mean of the individual items, and thus, possible scores range from 1 to 5. Higher scores indicate more privacy concerns.

Therapeutic Alliance

The Therapeutic Alliance Scale (Accurso et al., 2013) consists of 12 items and measures the degree to which a person assesses their therapeutic relationship to have a positive working relationship. The scale ranges from 1-Not like me to 4-Very much like me. Possible scores range from 12 to 48, and higher scores indicate higher therapeutic alliance.

Use

Use was assessed by using both quantitative and qualitative measures. Quantitatively, we asked questions regarding frequency of use and routineness of use. Qualitatively, we asked questions regarding how and why they use the Tech Suite.

Usefulness of Features

On a scale from 1-Not at all useful to 5-Extremely useful, we asked participants to rate the Tech Suite as well as specific features. Higher scores indicate more perceived usefulness.

Usability

Using the 10-item System Usability Score (SUS) (Brooke, 1996), we asked participants to rate the degree of usability of the Tech Suite. Scores are provided out of 100 and higher scores indicate better usability than lower scores. As a benchmark, a 2015 International Journal of Human-Computer Interaction publication of four experiments with 3,575 participants on the usability of the top 10 apps on both phones and tablets with two operating systems, iOS and Android, found the average usability score for these apps was 77.7, with an approximate 20-point spread (67.7–87.4) between the highest and lowest rated apps (Kortum et al., 2015). On a scale from 1=Strongly disagree to 5=Strongly agree, we also asked participants questions related to the usability of specific features.

Perceived Impact on Outcomes

We asked participants their thoughts about how using the Tech Suite relates to outcomes on a scale from 1=Strongly disagree to 5=Strongly agree, such as getting access to support sooner, managing mental health symptoms, being useful in recovery, likelihood of reaching out for help, feeling better about having mental health issues, and feeling connected to other people.

Additionally, we included the Outcome Rating Scale (ORS) (Miller & Duncan, 2003) to assess well-being. We asked participants how well they have been doing before using the Tech Suite and after using Tech Suite in the following dimensions: overall (general sense of well-being), individually (personal well-being), interpersonally (family, close relationships), and socially (work, school, friendships). Scores across these dimensions are summed. The highest possible score is 40, and a higher score indicates better well-being.

Appendix C: Added Items to the California Health Interview Survey

Web Version:

"Mental Health and Technology" [Mental Health and Technology] -

"AG44" [AG44] -

The next questions are about your use of technology.

People may use the internet for streaming video/music, playing games, checking social media, using apps, browsing the web, etc, on a computer or on a phone or mobile device.

On a typical day, how often do you use the internet?

- 01 Almost constantly
- 02 Many times a day
- 03 A few times a day
- 04 Less than a few times a day

"AG45" [AG45] - On a typical day, how often do you use a computer or mobile device for social media?

Social media may include Facebook, Instagram, Twitter, Snapchat, YouTube, etc

- 01 Almost constantly
- 02 Many times a day
- 03 A few times a day
- 04 Less than a few times a day

"AG46" [AG46] - In the past 12 months, have you tried to get help from an on-line tool, including mobile apps or texting services for problems with your mental health, emotions, nerves, or your use of alcohol or drugs?

- 01 Yes
- 02 No

If = 2, -3 go to AG48

"AG47" [AG47] - How useful was this?

- 01 Very
- 02 Somewhat
- 03 Not at all

"PN_AG48" [PN_AG48] -

PROGRAMMING NOTE AG48: IF AG46 =2 AND AF81 = 1 THEN CONTINUE WITH AG48 ELSE SKIP TOAG49

"AG48" [AG48] - What is the MAIN REASON you did not try to get help from an on-line tool, including mobile apps, or texting services?

- 1 Got better/ no longer needed
- 2 Wanted to handle problem myself
- 3 Don't own a smartphone or computer or don't have enough space to download new apps
- 4 Didn't know about these apps
- 5 Don't trust mobile apps
- 6 Concerns about privacy and security of data
- 7 Don't think it would be helpful or work
- 8 Cost
- 9 Don't have time
- 10 Received traditional/ face-to-face services
- 11 Don't think I needed it
- 12 Don't have enough space to download new apps
- 91 Other (Specify: _____)

"AG49" [AG49] - In the past 12 months, have you connected online with people that have mental health or alcohol/drug concerns similar to yours through methods such as social media, blogs, and online forums?

Include online forums or closed social media groups on specific issues, doing hashtag searches on social media, or following people with similar health conditions

- 01 Yes
- 02 No

"AG50" [AG50] - In the past 12-months, have you used online tools to find, be referred to, contact, or connect with a mental health professional?

For example, by texting, on-line messaging, video chat, or a mental health or health-related mobile app

- 01 Yes
- 02 No

CATI Version:

"Mental Health and Technology" [Mental Health and Technology] -

"AG44" [AG44] - The next questions are about your use of technology.

People may use the internet for streaming video/music, playing games, checking social media, using apps, browsing the web, etc, on a computer or on a phone or mobile device.

On a typical day, how often do you use the internet?

Would you say...

- 01 Almost constantly,
- 02 Many times a day,
- 03 A few times a day, or
- 04 Less than daily?
- 7 REFUSED
- 8 DON'T KNOW

"AG45" [AG45] - On a typical day, how often do you use a computer or mobile device for social media?
Would you say...

[IF NEEDED: "Social media may include Facebook, Instagram, Twitter, Snapchat, YouTube, etc.]

- 01 Almost constantly,
- 02 Many times a day,
- 03 A few times a day, or
- 04 Less than a few times a day?
- 7 REFUSED
- 8 DON'T KNOW

"AG46" [AG46] - In the past 12 months, have you tried to get help from an on-line tool, including mobile apps or texting services for problems with your mental health, emotions, nerves, or your use of alcohol or drugs?

- 01 YES
- 02 NO
- 7 REFUSED
- 8 DON'T KNOW

If = 2,-7,-8 goto AG48

"AG47" [AG47] - How useful was this?

- 01 VERY
- 02 SOMEHWAT
- 03 NOT AT ALL
- 7 REFUSED
- 8 DON'T KNOW

"PN_AG48" [PN_AG48] -

PROGRAMMING NOTE AG48: IF AG46 =2 AND AF81 = 1, THEN CONTINUE WITH AG48 ELSE SKIP TOAG49

"AG48" [AG48] - What is the main reason you did not try to get help from an on-line tool, including mobile apps, or texting services?

- 1 GOT BETTER/NO LONGER NEEDED
- 2 WANTED TO HANDLE PROBLEM ON OWN
- 3 DON'T OWN A SMARTPHONE OR COMPUTER OR DON'T HAVE ENOUGH SPACE TO DOWNLOAD NEW APPS
- 4 DIDN'T KNOW ABOUT THESE APPS
- 5 DON'T TRUST MOBILE APPS
- 6 CONCERNS ABOUT PRIVACY AND SECURITY OF THE DATA

- 7 DON'T THINK IT WOULD BE HELPFUL OR WORK
- 8 COST
- 9 DON'T HAVE TIME
- 10 RECEIVED TRADITIONAL/FACE-TO-FACE SERVICES
- 91 DON'T THINK I NEEDED IT
- 12 DON'T HAVE ENOUGH SPACE TO DOWNLOAD NEW APPS
- 13 Other (Specify: _____)
- 7 REFUSED
- 8 DON'T KNOW

"AG49" [AG49] - In the past 12 months, have you connected online with people online that have mental health or alcohol/drug concerns similar to yours through methods such as social media, blogs, and online forums?

[IF NEEDED: "Examples include online forums or closed social media groups on specific issues, doing hashtag searches on social media, or following people with similar health conditions."]

- 01 YES
- 02 NO
- 7 REFUSED
- 8 DON'T KNOW

"AG50" [AG50] - In the past 12-months, have you used online tools to find, be referred to, contact, or connect with a mental health professional?

[IF NEEDED: "Examples of online tools include texting, on-line messaging, video chat, or a mental health or health-related mobile app."]

- 01 YES
- 02 NO
- 7 REFUSED
- 8 DON'T KNOW

Appendix D: App Vendor Provided Q2 Milestones and Accomplishments



Mindstrong Q2 Preliminary Learnings and Findings

- **County Launches:** Mindstrong continued support of launches in Modoc and Los Angeles County clinics. Mindstrong also assisted in off-boarding clients from the application in a Kern County clinic (which closed down for reasons unrelated to Mindstrong use).
 - Within the DBT version of the application, preliminary data suggest variability (measured as standard deviation) in cognitive control, executive functioning, and processing speed identified risk of self-harm/suicide attempts.
 - There exists continued need to socialize with county clinicians that, like any medical screening test, positive results require work up.
 - A number of obstacles have been uncovered, including continuous clinician training needs, lack of reimbursement for additional implementation-related activities, and difficulty in establishing and maintaining staff buy-in, among others. As a result of these learnings, Mindstrong is being offered as a full contract provider service for crisis prevention.
- **Planning Activities:** Mindstrong continued engaging in planning activities with Orange County and initiated planning with Riverside and Inyo County.
 - CIBHS training for Mindstrong clinicians on Evidence-Based Practices developed and slated for execution pre-Orange County launch.
 - Rapid launch, learning, and iteration cycles are essential to successfully implementing any new technology in a complex healthcare environment such as mental health. This approach led to the new insights on high-value opportunity to work in crisis prevention and early intervention for patients with serious mental illness.
- **Peers and Consumers:** Mindstrong clinicians and Product team engaged in training with CalMHSA regarding the history and implications of the consumer movement to working in mental health in California. Mindstrong also hired a Peer and Community Engagement Liaison to further ensure consideration of consumer perspectives in solution development and deployment.



7 Cups Q2 Milestones and Accomplishments UCI External Advisory Report

Overview

Since the onset of the Tech Suite Initiative in July 2018 through May 31 2019, we have reached and provided support to 187,478 people across the four Cohort 1 counties with no marketing or targeted outreach. Based on preliminary data, we know these are hard-to-reach people who have rarely sought care before and have very low levels of existing social support. In addition, we have observed that the majority of Cohort 1 County users are coming to 7 Cups with concerns about anxiety, depression, and

managing emotions. We have substantial positive momentum on the initiative and are making progress toward the Learning Objectives of the Tech Suite. Our report below summarizes our work this quarter across research and evaluation, product customizations, safety, quality, and security. In particular, we focused on the following areas:

- Increasing the quality, speed, and effectiveness of care
- Building a data pipeline to better measure health outcomes
- Improving user safety and the underlying security infrastructure
- Customizing access to meet varying county needs
- Developing comprehensive trainings for Peer support
- Redesigning 7 Cups' existing wellness test to meet the Evaluation Learning Objectives
- Preparation for implementation in Cohort 2 counties
- Development of UX designs for Older Adults

Recall that our efforts in Q1 were surrounding the development of customized configurations for the counties, as well as developing background knowledge of expertise across UCI and 7 Cups. Having built those foundations, this quarter, we focused on scaling and evolving 7 Cups to be implemented at the population level to provide access to care with safety, quality, and measurable outcomes.

Recommendations:

Based on our progress and lessons learned to date, we recommend the following three program enhancements:

1. **Increased in-person collaboration**- a quarterly workshop hosted in rotating locations (Northern and Southern CA) to include stakeholders across vendors and Counties to openly present status and issues, and to collaboratively problem-solve.
2. **Safety and Reporting workshop** - a major focus on Safety and Reporting to immerse county stakeholders in existing 7 Cups practices, introduce expert perspectives, and collaborate on new solutions.
3. **Quarterly Statement of Work (SoW)** - a written Statement of Work developed at the beginning of each quarter between 7 Cups and CalMHSA defining product development and builds. Any changes to the SoW will be captured in a formal Change Order (CO).
4. **Shared Jira ticketing system** - increase access CalMHSA's Jira tickets systems in order to increase specificity and clarity regarding engineering builds and deployment.

Detailed Progress

Research and Evaluation Infrastructure

Since our foundational Q1 meeting with UCI, we've had 10 weekly work sessions to redesign the outcomes assessment and methodology to meet the Tech Suite learning objectives. These meetings follow a structured agenda allowing each of the component UCI evaluation teams to present progress or address issues, with alternating presentations from the 7 Cups Research and Product teams.

One of our major accomplishments this quarter has been developing the research and evaluation infrastructure to better measure health outcomes, particularly in response to the presenting issues we've observed on the site, as well as to meet the evaluation learning objectives. Through an iterative process of nomination and critique across the UCI and 7 Cups' research teams, a set of psychometrically valid tests were selected to meet agreed upon criteria including: user burden, psychometric evaluation, relevance and adaptation to an online emotional support platform as well as to the learning objectives, and balance and elimination of redundancy between existing wellness test measures. The final set of measures has been reviewed by all teams, and passed to 7 Cups Product team to create test logic and UX design.

We've made substantial strides in building a data pipeline to better structure and store the data generated on 7 Cups to provide to our partners at UCI for evaluation. This has involved several enhancements to our test engine, which allows us to assess and monitor users' symptoms, which we updated to enable the addition of new question sets and metadata in collaboration with UCI.

We've invested significantly this quarter in our event tracking and instrumentation across the platform. We created a data warehouse on AWS S3 with well defined schemas and documented data structure to increase access and collaboration. Additionally, we labeled all events in our own analytics system to create a data dictionary that will allow the interdisciplinary research team at UCI to understand each activity on 7 Cups.

Product Customizations

In order to provide the counties a stronger delineation between the public-facing system and a closed, branded system for referred clients- and to meet the differential customization requirements of each county, we created 12 new configuration options that can combine in 60 different ways across 3 different platforms (iOS, Android and Web). These support counties' custom preferences for:

- The role of Noni
- Access to only Peer competent listeners
- Access to only staff moderated chat rooms

Additionally, across both the Website and apps, we created customized versions of the platform for each county. Counties chose welcome messages (what each new person in their county viewed when visiting the site or app), designed county "homes" on the site to reflect each specific county, identified and iterated upon the display of local resources so that users on site and app could better find support services on the ground, and modified crisis response numbers and messaging.

Customizations also included wrapping and initial translation of navigation and functionality for 6 languages (phase 2 will include another 6 languages). There are many more enhancements in process to increase the speed, user experience, and personalization of the app. Additionally, we are conducting studies to better understand usability and efficacy for older users.

Safety

We have implemented a number of measures to increase safety and address related concerns. Our enhancements to safety this quarter span three major areas: Access, Identification, and Evaluation. We reduced access for “guest” and unverified users (e.g. users who come to the site without signing up with an email address). We increased the bar for participation of new listeners who must participate in five 1-1 chats prior to accessing group chats, a more public area of the platform. We have moved from a reactive approach using a list of “censor” words that optimize our human flagging process to far more advanced monitoring via computational linguistic models. We conducted interviews and ran a brief survey to surface additional safety and reporting concerns from our users’ perspectives. We continue to run experiments now to balance the tension between making it too difficult for people to get help, while also increasing safety and addressing user concerns.

Quality

Increasing quality has been a major area of focus in the last year that spans engineering, product performance, usability and volunteer training:

QA testing: Collaborating with CalMHSA, we began creating automated testing deployment workflows and increased QA processes overall. During our last sprint (through May 3rd), we had a 92% success rate in the release of our functionality.

Performance: We’ve made significant improvements to the underlying technical engine that powers 7 Cups. This impacts the speed with which the website and app can support users, display content, and connect them with others.

Usability: We made several UX updates to make navigating the service easier. We overhauled the flagging and reporting system on both technical and service-delivery levels. We added new search functionality to make it easier for members to find listeners with direct lived experience with their issue.

Volunteer training: Listener quality has been and continues to be a major area of our focus. The community management team re-oriented around quality by developing new training, certification and mentoring programs to increase quality in forums, 1:1 emotional support, and group support. We implemented new training for Listeners through our emotional support bot, Noni to help practice mock chats and increase experience. We also introduced capabilities for users to select listeners with additional training, or “VIP listeners.”

Live Moderation: We introduced a new program with specialized training for paid staff moderators who now moderate all county group support chat rooms 24x7.

Security

Prior users and institutions did not require the same level of security as work with the counties requires. Consequently, we invested heavily in increasing our security infrastructure to help meet these objectives. We implemented an official security policy, identified and required all employees to complete a cyber safety training, introduced new onboarding procedures, audited devices, conducted a physical site audit, increased password hashing algorithms, and migrated to AWS Shield and WAF for public network security.

Appendix E: Mental Health Application Guide Considerations Influenced by Kern Behavioral Health and Recovery Services Resource Apps

The following resource was shared with Kern Behavioral Health and Recovery Services (BHRS). Kern BHRS requested that the UCI evaluation team share criteria and processes to consider when selecting apps. The criteria and processes shared are based on PsyberGuide practices. The following document should be used to illustrate a potential process that could be developed by the Counties and/or Help@Hand leadership if interested. The document should not be used as a general guideline or general recommendation for a particular process or for a particular set of apps.



Mental Health Application Guide Considerations Influenced by Kern Behavioral Health and Recovery Services Resource Apps

April 12, 2019

Report by: Robert Montgomery, Martha Neary, & Stephen Schueller

OVERVIEW

During the UCI Evaluation Team's Dec. 2018 visit to Kern Behavioral Health and Recovery Services we were provided a brief booklet outlining different apps that might be useful for their clients. The purpose of this document is to introduce considerations in the selection of apps for such a resource document and to suggest a structured method for the evaluation of mental health apps and creation of app guides.

This document will cover the following areas:

1. Guide Content
2. Application Selection and Evaluation
3. Design, Formatting, and Delivery
4. Appendix
 - A. App Selection Example
 - B. Specific App Considerations for Kern Behavioral Health and Recovery Services Resource Apps Guide
 - C. App Ratings Framework Information

Part 1: Guide Content

There are several broad questions to consider in the early stages of planning which will inform the direction and decision-making surrounding the guide.

1. What is the overall purpose of the guide?
2. Who is the intended audience?
3. In what context(s) is the guide being offered?
4. What obstacles might impede the goals of the guide?

With answers to these questions in mind, more specific content questions can be discussed:

1. What categories of mental health apps are relevant for the specific audience?
 - a. Consider how you are presenting the categories. For instance, "PTSD" is a clinical term that may not resonate with all potential consumers. "Trauma-Focused" may be more appropriate.
 - i. For example:
 1. Anxiety
 2. Stress
 3. Mood Disorders



4. Trauma-Focused
 5. Mindfulness
 6. Activity
 7. Sleep
 8. Education
-
2. How many apps per category would you like to recommend?
 - a. Try to strike a balance between variety and simplicity. Two to three apps per category may be enough to provide options for various consumers' needs without becoming overwhelming.

 3. What information needs to be displayed in the guide for each app?
 - a. Suggestions include:
 - i. What platform is the app available on? (i.e., Android vs. iOS)
 1. Consumers only have access to apps that run on the smartphone they currently own and are unlikely to purchase a new phone just to use a single app. Apps that are available for both Apple and Android are therefore generally preferable to single-platform apps.
 - ii. Price (free, paid, subscription, in-app purchases)
 1. Although consumers value provider recommendations, our research has shown that cost is an important factor in the decision to download an app. Many consumers like to “try before they buy” and may not take a chance on an app that requires immediate purchase.
 - iii. Description of app (ideally unbiased)
 1. We recommend not using the descriptions straight from the app store. These are intended to ‘sell’ the app and often contain bias. Additionally, this terminology may not be appropriate for your aims. Use language, tone, and descriptions that fit your organization and your audience.
 - iv. Links to external/expert reviews (if applicable)

Part 2: App Selection and Evaluation

Resources

It can be difficult to locate reliable and unbiased information regarding mental health apps. Fortunately, there are several resources which can provide support in this area.

1. Online App Guides

There are a number of websites that act as clearinghouses for mental health apps, for example [MindTools](#), [ORCHA](#), and [PsyberGuide](#). Members of the UCI Evaluation Team, Dr. Stephen Schueller and Martha Neary run PsyberGuide with funding from [One Mind](#).



PsyberGuide provides unbiased, expert reviews about mental health apps and other digital mental health tools. PsyberGuide evaluates apps based on three criteria, Credibility, User Experience, and Transparency of Privacy Practices. These reviews can help providers discover new apps and refine the list of recommended apps based on accurate and reliable information. PsyberGuide partners with a range of mental health organizations and advocacy groups to produce information on mental health apps for various audiences. Some of these are linked below and may serve as useful templates:

- [What Are The Best Apps for Depression?](#)
- [Mobile Apps for OCD Management](#)
- [Anxiety and Depression Association of America – Mental Health Apps](#)

Visiting the app guide at www.psyberguide.org may help inform your app choices. Your organization may also want to adopt some of our rating processes in your own evaluation process. There are also other app rating frameworks available, like [The American Psychiatric Association App Evaluation Model](#).

More information on key points to consider when evaluating apps is available in the **appendix** at the end of this document.

2. The [Apple App Store](#), [Google Play Store](#) and app websites are also direct sources of information about apps. However, information provided by app developers themselves may be biased, and so should be interpreted with caution.

Guidelines for App Selection

1. Select relevant categories of mental health apps
2. For each category, search PsyberGuide, the app stores, or other outlets to compile a broad list of apps:
3. Refine the list, with audience needs in mind. Consider:
 - a. Availability
 - i. Apps only available on one platform (iOS, Android) have a more limited audience
 - b. Price
 - i. Users often prefer to test out an app before paying. Free apps, and apps with free trials generally have the best uptake
 - c. Reviews
 - i. Apps with higher reviews are, of course, generally preferable. Attempt to balance expert reviews with user reviews, if possible
 - d. Content
 - i. Relevance:
 1. Is content relevant to the category and aims of your institution?
 - ii. Variety:



1. Offer multiple options covering different theoretical/clinical perspectives
2. Eliminate redundancies: If multiple apps seem to possess similar features, we might choose to eliminate redundant apps to save space or preserve variety

Part 3: Design, Formatting, Delivery

Design choices depend on a variety of factors. For aesthetic considerations, we recommend consulting with team members or professionals with design experience. However, we can make some suggestions that may help shape this process.

1. How will the guide be delivered?
 - a. Pamphlet, brochure, handout
 - i. How many pages?
 - ii. In color?
 - iii. Distribution method
 1. Handouts at welcome desk?
 2. By clinicians?
 - b. Hosted on organization website
 - i. On a unique page?
 - ii. Links to/from other areas of website?
 - c. Newsletter
 - i. PDF included in newsletter email?
 - ii. App Guide Content included directly in body of email?
2. The delivery medium will lead to a variety of choices regarding:
 - a. How much information you choose to provide on each app
 - i. How to display said information
 1. Size, shape, font, etc.
 - b. Presence of live links to online resources
 - c. Choice of color scheme (or absence thereof)
 - d. Size, shape, and format of each

Next, we provide three examples of real-world App Guides designed by the PsyberGuide team to convey recommendations in different contexts.



Design Example 1: A Mobile App Toolkit for Trauma Survivors

This is a fairly comprehensive guide. It includes a lot of information, concisely articulated. This falls closer to the “detailed” end of the guide spectrum.

Note the inclusion of:

1. Category of app and intended audience
2. Availability (Android/iOS)
3. Price
4. Brief, unbiased description
5. Rating information (this may be more than is necessary for your organization, but is included here for illustrative purposes)
6. Link for further information

Managing Symptoms, Stress, and Sleep:
A Mobile App Toolkit for Trauma Survivors



The image is a screenshot of a mobile app toolkit for trauma survivors. It features three app cards: PTSD Coach, Calm, and Dream EZ. Each card includes the app's icon, name, a brief description, a 'Free' price tag, and two metrics: Credibility and User Experience, both rated out of 5.00. PTSD Coach has a credibility of 4.65 and user experience of 3.90. Calm has a credibility of 2.85 and user experience of 4.17. Dream EZ has a credibility of 3.20 and user experience of 3.37. All three apps are available on both Android and iOS. The background of the screenshot shows a sunset over a landscape. At the bottom, there is a logo for 'PsyberGuide: A Project of One Mind' with social media icons and the website 'psyberguide.org'.

App Name	Description	Credibility (out of 5.00)	User Experience (out of 5.00)	Availability
PTSD Coach	PTSD Coach offers multiple features for addressing reactions to trauma. It provides educational information about PTSD, a checklist to help with diagnosis, skills for managing symptoms, and resources for obtaining support.	4.65	3.90	Android, iOS
Calm	Calm is a mindful meditation app that features specific "playlists" of guided meditations for specific experiences, including sleep disturbance, anxiety, and an "Emergency Calm" track for users experiencing panic or heightened anxiety.	2.85	4.17	Android, iOS
Dream EZ	Dream EZ is designed to help users manage nightmares associated with stressful events. Users are encouraged to visualize and describe a nightmare via audio recording, then rewrite the plot and ending and record the rescripted dream.	3.20	3.37	Android, iOS

PsyberGuide
A Project of One Mind
f t @ in p | psyberguide.org

Example 2: Mobile Apps for Obsessive-Compulsive Disorder

This is a simpler and more streamlined guide. However, it still contains a moderate amount of relevant information for potential consumers.

Note the inclusion of:

1. Category of app and intended audience
2. Availability (Android/iOS)
3. Price
4. Rating information (this may be more than is necessary for your organization, but is included here for illustrative purposes)
5. Link for further information

In this guide, there are no app descriptions. The title conveys that these are all apps aimed at Obsessive-Compulsive Disorder, and the names of each individual app give consumers some idea of what the content they could expect to find in each.

An App For That?
Mobile Apps for Obsessive-Compulsive Disorder

	 AnxietyCoach	 iCBT	 Talkspace	 Vital Tones OCD
 Credibility Out of 5.00	3.57	2.50	3.57	1.43
 User Experience Out of 5.00	Not Yet Available	2.51	Not Yet Available	Not Yet Available
 Data Transparency	Unacceptable	Unacceptable	Not Yet Available	Acceptable
 Platforms Available				
 Cost	\$4.99	\$5.99	Free (requires in-app subscriptions)	Free

To learn more about these scores, visit PsyberGuide.org

 International OCD Foundation

 **PsyberGuide**
A PROJECT OF ONE MIND

Example 3: A Mobile App Wellness Kit for Student Life

This example is our simplest presentation. It was designed to quickly and clearly make suggestions of apps that may target common areas of interest relevant to university students.

Note the inclusion of:

1. Category of app and intended audience
2. Availability (Android/iOS)
3. Link for further information

In this guide, there are no app descriptions, prices, or ratings. However, ratings did play a role in the selection of which apps to include in the guide. Not all of the information that is used to

create and evaluate a guide needs to be included in the guide. What does the audience need to know?

#SelfCareIsWellness

Learn More at PsyberGuide.org

A Mobile App Wellness Kit for Student Life

Manage The Moment

- ReachOut Breathe (iOS)
- Mend (iOS)

Find Your Focus

- Insight Timer (Android, iOS)
- Headspace (Android, iOS)

Game Your Goals

- MoodMission (Android, iOS)
- SuperBetter (Android, iOS)

Look after You

- iSleep Easy Free (iOS)
- Virtual Hope Box (Android, iOS)

Track Yo'self

- Catch It (Android, iOS)
- Pacifica for Stress (Android, iOS)



PsyberGuide
A PROJECT OF ONE MIND

Disclaimer
Mental Health Apps are not a substitute for traditional psychotherapy, nor should they be used as intervention during a psychiatric emergency. If you or someone you care about needs additional support, visit the Walk-in Urgent Care Services in the Counseling Center, Monday through Friday 8:00am-4:30pm. For Urgent Care needs after office hours and on the weekends, call 949-824-6457, and select option #2 to immediately speak with a mental health counselor.



APPENDICES

APPENDIX A. App Selection Example

To illustrate this process, we can look at the category of “mindfulness” apps and walk through the above steps for how we might create and refine a list of recommended apps.

Step 1: Select Relevant App Categories

Assume we have narrowed and selected our categories based on the intended audience.

Step 2: Create an Initial List of App Options

For the category of mindfulness, we will search PsyberGuide, the app stores, and other resources for suggestions. We might look for the best rated, most popular, those recommended by friends or colleagues, or even those we’ve tried ourselves.

After our search, say we arrive at the following preliminary list of options:

- Headspace
- Calm
- 10% Happier
- Insight Timer
- Stop, Breathe & Think
- Simply Being

Perhaps we only have space for 2-3 mindfulness apps in our guide. How do we refine our list?

Step 3: Refine

First, let’s look at the availability of each app. This is a quick way to narrow the list, as it is likely we’ll want our recommendations to be available on both iPhone and Android to reach the widest audience possible.

AVAILABILITY

- [Headspace](#) (iOS/Android)
- [Calm](#) (iOS/Android)
- [10% Happier](#) (iOS/Android)
- [Insight Timer](#) (iOS/Android)
- [Stop, Breathe & Think](#) (iOS/Android)
- [Simply Being](#) (iOS/Android)

Each of these apps is available at both stores. Great, but it doesn’t help us refine. Let’s move on.

PRICE

- Headspace
 - Free:



- Access to a single course (based on your interest and level of experience) consisting of approximately 10 sessions
 - Paid Subscription: \$12.99 monthly, or \$94.99 per year
 - Unlimited access to all meditations (100s available for different targets)
- Calm
 - Free:
 - One meditation session per day, 2 – 30 minutes.
 - Paid Subscription
 - 7-day free trial
 - \$69.99 per year: Unlimited Access to 100+ guided meditations on sleep, anxiety, focus, stress, gratitude
- 10% Happier
 - Free:
 - Can download app and access a limited number of basic guided meditations and video instructions from meditation experts
 - Paid Subscription
 - \$9.99 monthly, \$99.00 per year: Unlimited access to 500+ guided meditations and videos
- Insight Timer
 - Free
 - Access to free library of 1000+ guided meditations on a range of topics
 - Can filter by time, topic, male/female voice, music, and spiritual content (yes/no)
 - Paid Subscription
 - 7-day free trial, then \$59.99 per year
 - unlimited access to all meditations (15,000+), meditation courses (150+), a premium daily meditation, option to download (for use offline), and playback control
- Stop, Breathe & Think
 - Free:
 - Access to library of 30+ free activities, including short, guided meditations, yoga and acupressure videos.
 - App makes recommendations of which meditation to try based on a check-in of your current state and emotions
 - Paid Subscription
 - \$9.99 per month, discounted to \$58.99 per year.
 - Unlimited journaling, access to additional 85 activities, longer versions of meditations
- Simply Being
 - No Free version
 - Paid: \$2.00
 - Customizable meditations from 5-30 minutes, guided or unguided, toggle music/nature sounds, read instructions



With the price information, we can perhaps narrow further.

- Simply Being has no free version, which likely reduces the appeal for users who prefer to try before they buy. *We might consider eliminating that choice.*
- Insight Timer has free access to a much larger library of meditations than are offered by any of the other apps. Points in favor.
- The model of offer a limited version for free with the option to upgrade is common across all the other apps. We may need more information before cutting further.

REVIEWS

Reviews are another source of information which can help you tailor your recommendations. PsyberGuide has reviewed some of these apps, so we'll look there. Further explanation of the evaluation criteria is available here: <https://psyberguide.org/about-psyberguide/> as well as later in the appendix. Note that ratings are on a 5-point scale.

- [Headspace Review](#):
 - Credibility 4.64, User Experience 4.74, Transparency Questionable
- [Calm Review](#)
 - Credibility 2.85, User Experience 4.17, Transparency Questionable
- 10% Happier – No PsyberGuide Review Available
- [Insight Timer Review](#)
 - Credibility 2.5, User Experience 4.73, Transparency Unacceptable
- [Stop, Breath & Think Review](#)
 - Credibility 2.5, User Experience 4.75, Transparency Unacceptable

Based on the available PsyberGuide Reviews we can make another round of evaluations.

- Headspace is the best rated
- Insight Timer and Stop, Breath & Think have comparable reviews – lower on the credibility end, but quite highly rated on User Experience
- Calm is slightly higher on Credibility, but slightly lower in User Experience
- 10% Happier is not yet rated. If we had no other credible review sources, we might consider eliminating for lack of information. For our current example, *let's eliminate it.*

CONTENT

We can now get somewhat more granular about the comparisons. After making the easy eliminations based on availability, price, and ratings, we will consider the nuances of the difference between the apps.

- Headspace and Calm occupy a similar space. They have similar content offerings, however Headspace is better rated, despite being slightly more expensive. We might opt for **Headspace** over Calm, here, to fill the niche of a well-produced, subscription-based meditation app tailored toward mental health.
- Insight Timer vs. Stop, Breathe & Think. These two apps offer different approaches. Insight Timer has a large library of free meditations, but is generally more geared toward spiritual, religious, and educational goals than mental health specifically. Stop, Breathe,



& Think has a unique “check-in” feature, that allows it to tailor guided meditation recommendations based on your mood and emotional state. This seems very relevant to a Mental Health Service Provider, and so we might favor it over Insight Timer if we need to eliminate another.

CONCLUSION

Following this process, we have moved from the category of app all the way through to selection of 2 to 3 final options. The information we provide for the selected apps might include the following:

Mindfulness:

1. [Headspace](#)
 - a. Available for Android and IOS
 - b. Price:
 - Free trial of 10 basic meditation sessions
 - Subscription: \$12.99 monthly, or \$94.99 per year for unlimited access to a variety of guided meditations and courses
 - c. Description: (excerpted from PsyberGuide): Headspace is an app aimed to bring the principles of mindfulness meditation to users’ lives, and hopes to improve concentration and mood, reduce anxiety, and increase productivity. The Headspace subscription library includes single meditations, session packs, meditations for children, and animated meditations. Users can choose programs and progress through Headspace at their own pace. Additional features include meditation reminders, tracking your practice statistics, and inviting a buddy to join and meditate with.

2. Stop, Breathe & Think
 - a. Available for Android and IOS
 - b. Price
 - i. Free: Access to library of 30+ free activities, including short, guided meditations, yoga and acupressure videos.
 - ii. Subscription \$9.99 per month, discounted to \$58.99 per year. Access to unlimited journaling, additional 85 activities, longer versions of meditations
 - c. Description (excerpted from PsyberGuide): Stop, Breathe & Think is a web-based program and multi-platform mindfulness app. The app guides users through the basic steps of mindfulness: identifying thoughts and emotions in the moment while practicing meditative techniques to achieve a relaxed state. Stop, Breathe & Think first has users rate their mood in a unique “check-in” system and then identifies one or more brief mindfulness meditation exercises that might be helpful. Each exercise specifically focuses on teaching users to bring “kindness and compassion” to their everyday interactions. The program lets users track their general mood over time, which may help identify trends and patterns



APPENDIX B. Specific App Considerations for Kern Behavioral Health and Recovery Services Resource Apps Guide

Based on the draft of Kern Behavioral Health and Recovery Services Resource Apps Guide we reviewed both the categories of apps as well as the specific apps included, the following table provides a starting place for additional apps to consider:

Applications by Category:

Category	Example Apps
Anxiety	ReachOut Breathe Catch It
Stress	Happify Wysa Pacifica for Stress
Sadness	Super Better Mood Mission Virtual Hope Box What's Up My3 Support Network (Suicide Prevention Safety Planning Tool)
Trauma Focused	PTSD Coach WhatsMyM3
Meditation	Headspace Insight Timer Stop, Breathe & Think
Activity	SWORK-it My Fitness Pal Daily Yoga
Sleep	iSleep Easy Free Sleep Time+ Sleep Cycle
Education/Recreation	Brain HQ Cognifit Lumosity Peak



In addition, our review of the apps included in Kern Behavioral Health and Recovery Services' initial app guide draft indicated that some included apps may warrant reconsideration. The following table defines some reasons that negatively impact successful adoption and use of mental health apps, as well as apps that should be reconsidered for those reasons.

Reason for Reconsideration	Example Apps	App-Specific Details
Cost/Subscription Requirements	Simply Being	No free option, requires \$2.00 purchase
	Mood Path	No free option, requires \$5.99 monthly subscription purchase
	Lake Coloring Books	Free download, but appears to require paid subscription to access additional coloring activities
	Coloring Therapy for Adults	Requires subscription
	Yoga Studio	Subscription purchase required to access classes, although there is a free yoga pose library that could be potentially useful
Limited Availability	Coloring Therapy for Adults	App Store only, not available on Google Play
Lack of Evidence Base for Mental Health Benefits/Incomplete Alignment with County Goals	Lake Coloring Books	
	Coloring Therapy for Adults	
	Fooducate	Nutrition-focused
	Noom	Nutrition-focused
	Edex	Education-focused; Inclusion should depend on space and comparative relevance to County's goals



APPENDIX C: App Ratings Frameworks Information

Detailed information on the rating system used by PsyberGuide is available below:

1. Credibility

This refers to the amount of research there is to support the use of the app, and how likely it is to work.

- Is there research supporting the app?
- Does the funding for this research come from a credible, unbiased source?
- Is the app developed by a credible team with clinical expertise?
- Is the app maintained well and regularly updated?

2. User Experience

Even if an app has strong research support and is credible, in order for a user to use it long enough to reap its benefits, a positive user experience is crucial. People are unlikely to use apps that are boring, confusing, or buggy. Consider the following questions:

- Is the app fun and interesting to use?
- Is the app customizable and interactive?
- Does the app function and perform well with working features and no technical problems?
- Is it easy to learn how to use the app? Is moving between screens intuitive?
- Is the app visually appealing with high quality graphics and a clear layout?
- Is the information in the app accurate, well-written, relevant, comprehensive and concise?

The Mobile App Rating Scale¹ (developed by Stoyanov and colleagues at Queensland University of Technology) is a publicly available tool for assessing the User Experience of health apps and provides additional guidelines and points to consider in your evaluation.

3. Transparency of Data

App developers should be transparent and clear about how they handle and store user data. At the very least, make sure the app actually has a privacy policy, which will be linked in the iTunes or Google Play store. If an app collects identifiable information (e.g. names, email addresses, birth dates), it should also provide the option of a pin entry or log-in process.

¹ Stoyanov SR, Hides L, Kavanagh DJ, Zelenko O, Tjondronegoro D, Mani M. (2015). Mobile App Rating Scale: A New Tool for Assessing the Quality of Health Mobile Apps. JMIR Mhealth Uhealth 2015;3(1):e27. DOI:10.2196/mhealth.3422