



Team

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The members of our team participated in each aspect of the design process to ensure everyone's ideas influenced every step of the design. In a sense, we are all researchers, interviewers, task developers, artists, and authors.

Problem and Solution Overview

According to the National Alliance on Mental Illness, over 40 million adults suffer from mental illness in any given year in the United States alone. Due to various factors such as the expense of treatment and the stigmas that often surround mental health, pursuing treatment can prove challenging. As a result, the most common treatment for mental health problems is no treatment at all. Mental illnesses can seriously impact the quality of life for people who endure them by impeding their ability to concentrate, perform the daily tasks most people take for granted, and interact with others. Despite the pervasiveness and effect of mental health problems in the United States, people can manage their symptoms and improve their quality of life. Our designed system may facilitate these endeavors by helping people monitor their mental health. Our system helps people track their mental health by giving them a single platform to record their mood, sleep, diet, and exercise. For those already seeing a therapist for treatment, our system can help them and their therapist analyze their progress over time. For those who do not have a therapist, our system can recommend a compatible therapist if they need more support with their mental health than our system can provide. Perhaps with more information about their current state of health and more ways to connect with a therapist, people with mental illnesses may find some relief from their symptoms by using our system.

Initial Paper Prototype

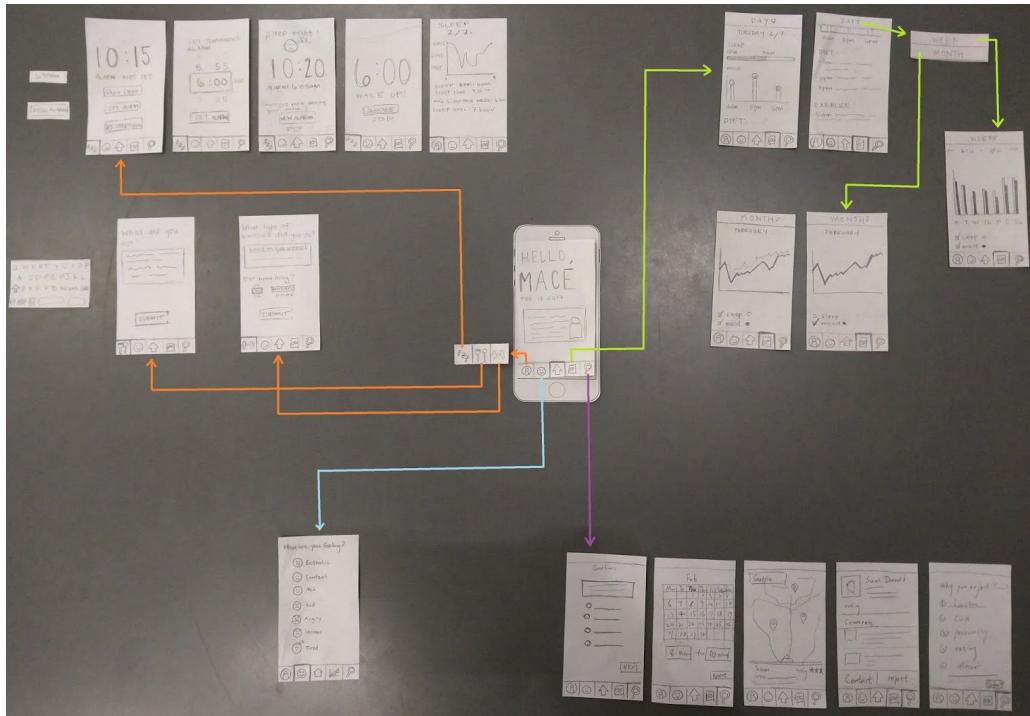


Figure 1. Overview of the Initial Paper Prototype for the Mobile App.

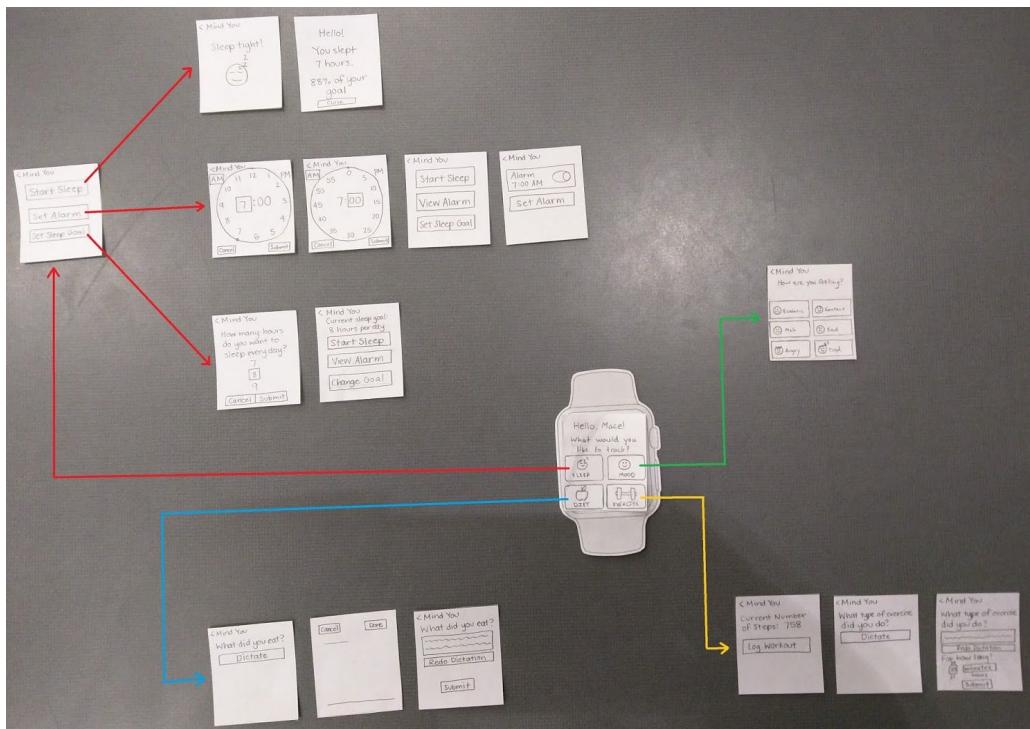


Figure 2. Overview of the Initial Paper Prototype for the Watch App.

Task 1: Tracking

The task of tracking can be performed on both the mobile app and the watch app. However, data must be viewed on the mobile app.

Mood tracking

With the phone app, people can tap the mood button in the navigation bar and then press the emoticon that best represents their current mood. The process on the watch is the same.

Sleep tracking

On the phone, people must first tap the track button in the navigation bar and then select the sleep tracker. Here, they have the option to set a daily sleep goal, set an alarm, and start the sleep tracker. Once they start the sleep tracker, the phone will enter sleep mode. Then, when the alarm goes off the next morning they can choose to snooze or wake up. Finally, after they wake up, a screen with an overview of their sleep for that night is shown.

For the watch, people must tap the sleep button. Clicking “Set Alarm” will let them set the hour, minute, and AM/PM options for an alarm. Next, they can set a daily sleep goal by pressing the “Set Sleep Goal” button. Finally, when they are ready to go to bed, they can tap “Start Sleep” which brings them into sleep mode. When they wake up, they will be presented with an overview of how well they slept that night.

Diet tracking

With the phone app, people can tap the track button and select the diet tracker from the sub-navigation menu. Next, they can write down what they ate in the text box and then submit it. To perform this task on the watch, people can press the diet tracking button, tap “Dictate”, and say what they ate. Afterward, they can edit the response if necessary and submit the entry.

Exercise tracking

On the phone, people can press the track button in the navigation bar and then select the exercise tracker. Here, they can write about the activity they did and specify the length of time. On the watch, they can press the exercise button, tap “Dictate”, and describe what activity they performed. Finally, they would input how long they exercised and submit the entry.

Viewing data

The data view is only available on the phone app. To navigate there, people can click the data button in the navigation bar. The app will then display the data they have tracked during the current day. They can use the dropdown menu at the top of the screen to switch between the

day view, week view, and month view. Swiping horizontally on these screens reveals the data for the previous days, weeks, and months, respectively. In the week and month views, there are checkboxes below the graph can be toggled to specify what data should be displayed.

Task 2: Finding a Therapist

People can only search for a therapist on the mobile app. To do this, they tap the “Therapist Finder” button on the navigation bar. The first time they use it, they will be asked a list of questions that will be used to find therapists that are a good match for their needs. After they complete the survey, they can specify a date and time range that they would be able to meet a therapist. Next, a map will be shown of the area surrounding their current location with a set of pins for the locations of the therapists that have been recommended for them. There will also be a list view of the therapists displayed at the bottom of the screen which can be slid upward to reveal a longer list. When a therapist is selected, a page with more detailed information like ratings and comments will appear. Here, they have the option to contact the therapist or reject the suggestion. If they reject a therapist, the app will prompt them to specify their reasons for doing so. Then, they can continue searching for a match.

Testing Process

We first conducted heuristic evaluations with team members from Wishing Well and LocalWay. After making some minor revisions based on our feedback, we then conducted three usability tests.

Usability Testing

Our first usability test participant is a UW medical anthropology student. We conducted the test at her home. We thought the participant would be a good match for our usability test because she is a college student and does not have any experience with prototyping or usability testing. We thought it was appropriate to conduct the test at her home because it was both convenient for the participant and it resembled a real setting where our design will be used.

Our second participant is also a UW student; she is a senior in computer science. We conducted the test in the CSE lab, which was a good environment because there was a lot of table space to conduct the test. We saw the participant as a good match for our usability test because she is a busy college student who takes rigorous classes and also works as a teaching assistant. Given her workload, it could be helpful for her to use an app to help track her mood and daily activities.

Our third participant is also a computer science student in his senior year at UW. He is a TA for a CSE class and a part-time researcher. He has a busy schedule so it is helpful for him to track his daily activity and mood. We also performed this test in the CSE lab.

After introducing our design and its purpose, we asked our three participants to perform the following tasks:

- Log mood on the watch
- Log mood on the app
- Set an alarm and go to sleep on the watch
- Log a food entry on the app
- Log an exercise entry on the watch
- View weekly data
- Access the therapist finder and find a compatible therapist
 - Toggle between the map and list view
 - Select a therapist and reject them

After conducting the usability test with each participant, we did a quick debrief about the design and their experience. We discussed the following:

- What was confusing about the design?
- What did you like about the design?
- How could the design be improved?
- Did you find it easy and clear how to navigate through the design to complete each task?

- Do you see yourself using this design if you ever need to?

As for refining our testing process, we based our usability tests on our heuristic evaluations and the general tasks we asked our participants to perform. With each usability test, we found it best when the tasks were clear and specific. For example, with our first participant, we were very general and simply asked them “Use the therapist finder and find a therapist”, but our intention was for them to access the therapist finder, navigate to a specific therapist, and then to reject the therapist. By our last participant, we refined the directions we gave and tried to break down each task clearly without giving away *how* the task should be done.

Testing Results

From our heuristic evaluations, we identified three major issues with our design. The first was unclear and inconsistent iconography. The participants had difficulty identifying the correct icon to press when trying to navigate to the tracking or therapist finder screen. Our tracking icon was a person, so a participant thought it meant profile, while our therapist finder icon was a magnifying glass, which a participant thought meant search. We also had inconsistencies between our watch and phone app where the phone app separated mood tracking from other tracking, while the watch app included them together. We revised the icons to better represent the function with which they are associated and added labels to the buttons to clarify their purpose. Finally, we grouped all of the tracking buttons together to make them consistent with the watch.

The second issue we encountered was related to the questionnaire screen. The purpose of the questionnaire screen was initially unclear. The participant was confused as to whether she was answering questions or whether she was looking at a form for her to ask questions. We revised our prototype by providing a brief introduction on the questionnaire screen explaining its purpose. A few example questions were also included to give some insight on what the questionnaire might be like.

The last issue we found from our heuristic evaluation was within the therapist rejection screen. The paper prototype was not very clear as to whether the form contained radio buttons or checkboxes. This was a simple fix; we just re-drew the screen to have checkboxes and instructions to check all responses that apply.

From our first usability test, the most significant issue we encountered was related to the therapist listing screen. We initially had a single screen with a map view of the therapists. The participant was unsure how to move forward with selecting a therapist and how to view a specific therapist. We decided to create separate list and map views. We also added a toggle to switch between the two. In the list view, therapists can be sorted by cost, location, or schedule to allow the user to choose the most important factor when finding a therapist. Our first participant was hesitant about the dictation button on the watch app. This was a simple issue, and we added a microphone icon to the button to make it easier to identify.

We did not uncover too many issues with our second participant. When setting the alarm on the watch app, the participant found it odd that the button said "Submit" so we changed it to "Set". Also, it was unclear to the participant how to toggle between day, week, and month data on the phone app so we bolded the toggle button to better resemble a drop-down list.

In our last usability test, the participant was confused how to set an alarm when asked to set an alarm and go to sleep. After some consideration, we decided that the alarm function was not necessary and that we should just focus on tracking sleep. We figured people could use other means to set an alarm. The last issue we encountered was related to tracking exercise. When the participant dictated the type of exercise they performed on the watch, they also specified the

length of time they spent doing that exercise. As a result, we decided that if the user includes the length of time as part of the dictation, the app will automatically set the time input box according to what they said.

Aside from our usability tests, we also received design critique during section. We discussed how we might want to consider reducing the number of times a person must tap the screen of the mobile app before they can start tracking something. For example, with our prototype from the first usability test, people would need to click two buttons before they could track anything: the track button in the lower left corner of the screen and then the subsequently appearing button that corresponded to what factor they wanted to track. To reduce repetitive clicking, we made the home screen of the app the tracking screen. That way, when people open the app, the tracking features are immediately available, and they do not have to click two buttons if they want to track their mood, for instance. While using our design, people will likely spend most of their time tracking so it makes sense to have the screen they use the most often be the home screen.

Overall, we received really helpful and useful feedback from our heuristic evaluations, usability tests, and section design critique. Our usability test participants thought our design as a whole was intuitive, straightforward, and easy to navigate. The biggest revisions we made to our design include revamping the therapist finder feature, removing the alarm clock when tracking sleep, and using the tracking screen as the home screen on the phone app.

Final Paper Prototype

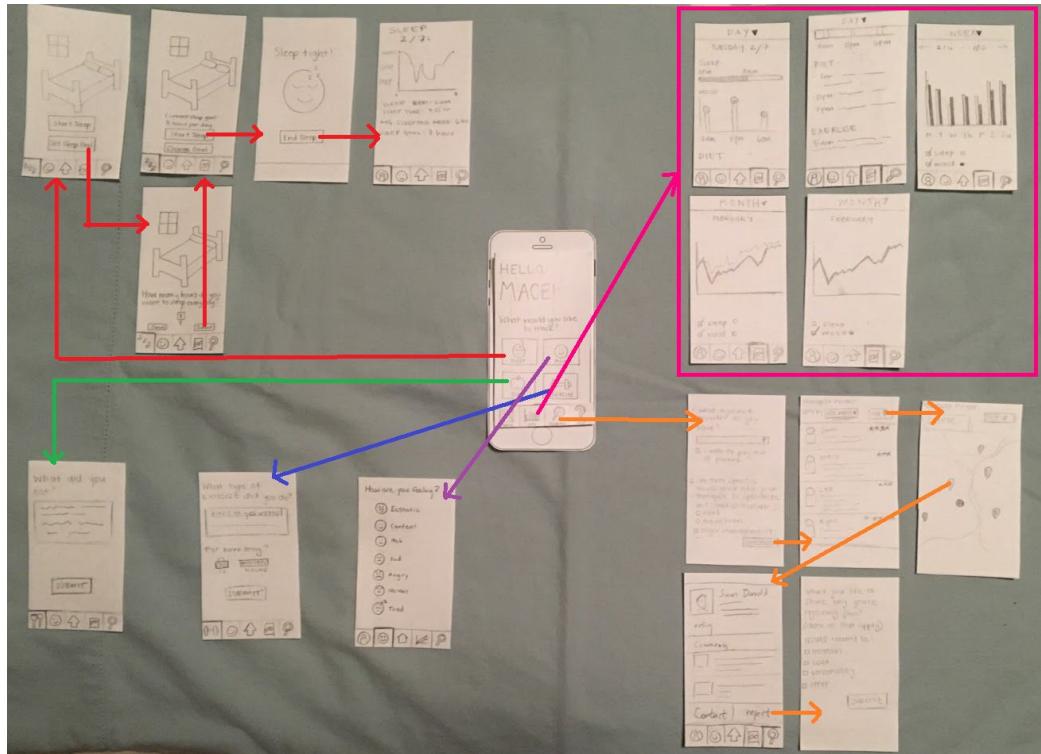


Figure 3. Overview of the Final Paper Prototype for the Mobile App.

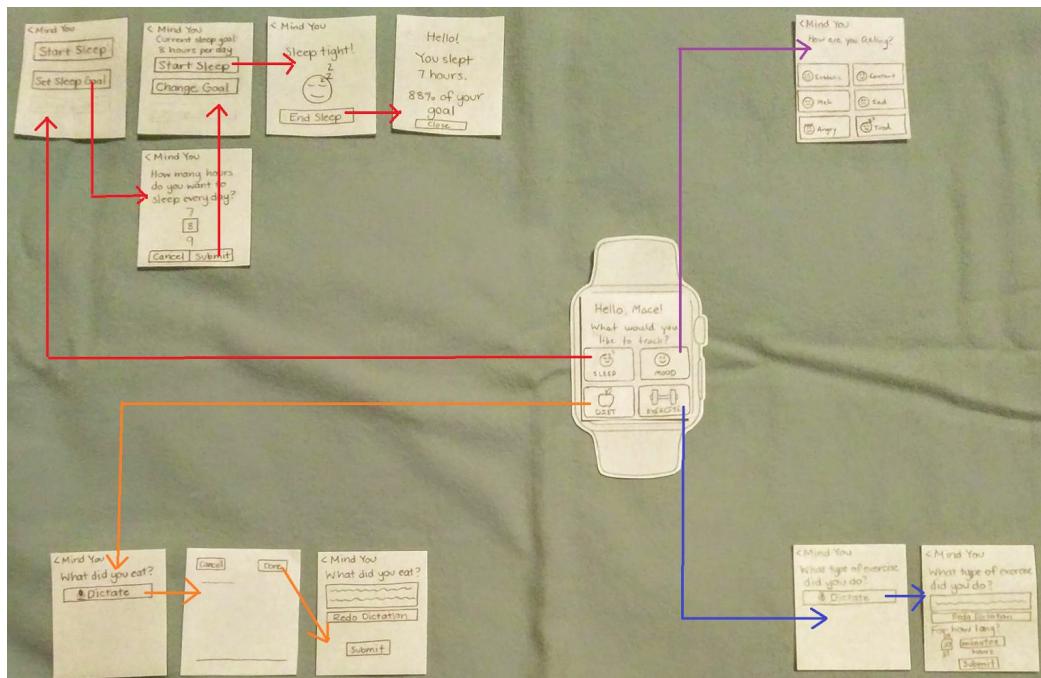


Figure 4. Overview of the Final Paper Prototype for the Watch App.

Task 1: Tracking

Like before, people can perform tracking on both the mobile app and the watch app, but they can only view their data on the mobile app.

Mood tracking

On the phone, people can tap the mood button on the home screen, which also serves as the tracking screen, and then press the emoticon that best represents their current mood. The process is the same on the watch.

Sleep tracking

On the phone, people can tap the sleep tracking button from the home screen, which brings them to the sleep tracking mode. Next, they can set a goal for how long they would like to sleep each night. Once a goal has been set, it can be modified at any time by going back to sleep tracking mode and pressing the “Change Goal” button. When the user presses the “Start Sleep” button from the main sleep tracking screen, they will enter sleep mode. The watch automatically tracks their sleep patterns throughout the night. When they wake up the next morning, they can tap the “End Sleep” button, and the app will then show them a detailed overview of how well they slept throughout the night. On the watch, the process is similar. However, when people track their sleep with the watch, the watch app will show them a simpler overview of how well they slept.

Diet tracking

Using the mobile app, people can tap the diet button on the home screen. On the next screen, they can enter what they ate either by typing on the keyboard or speaking into the microphone on their phone. They can then submit the entry. On the watch, the process is similar, but people can only enter information about the food they ate by clicking the microphone button that says “Dictate” and speaking into the microphone. When they finish the dictation, the watch app will show them a transcript of what they said. If needed, they can edit the information by pressing the microphone button that says “Redo Dictation” before submitting.

Exercise tracking

With the mobile app, people can press the exercise button on the home screen. On the next screen, they can enter information about a workout they completed by typing on the mobile keyboard or speaking into the microphone. Then, they can use the sliders on the page to input the length of time for which they exercised and submit the entry. On the watch the process is similar. However, to enter information about the type of workout they did, they must click the microphone button that says “Dictate” and speak into the microphone on the watch. Like the case of logging a food entry, the watch app will show them a transcript of what they said when they finish the dictation. If necessary, they can edit the information by pressing the microphone

button that says “Redo Dictation” before indicating the length of time on the slider and submitting the entry.

Viewing data

By clicking the data button from the navigation bar of the mobile app, people can view the information they have tracked throughout the day. A dropdown menu at the top of the screen allows them to switch between the day view, week view, and month view. By swiping horizontally on the week view and month view, people can view their data from previous weeks and months, respectively. They can toggle the checkboxes below the graphs to determine what types of data the graph displays.

Task 2: Finding a Therapist

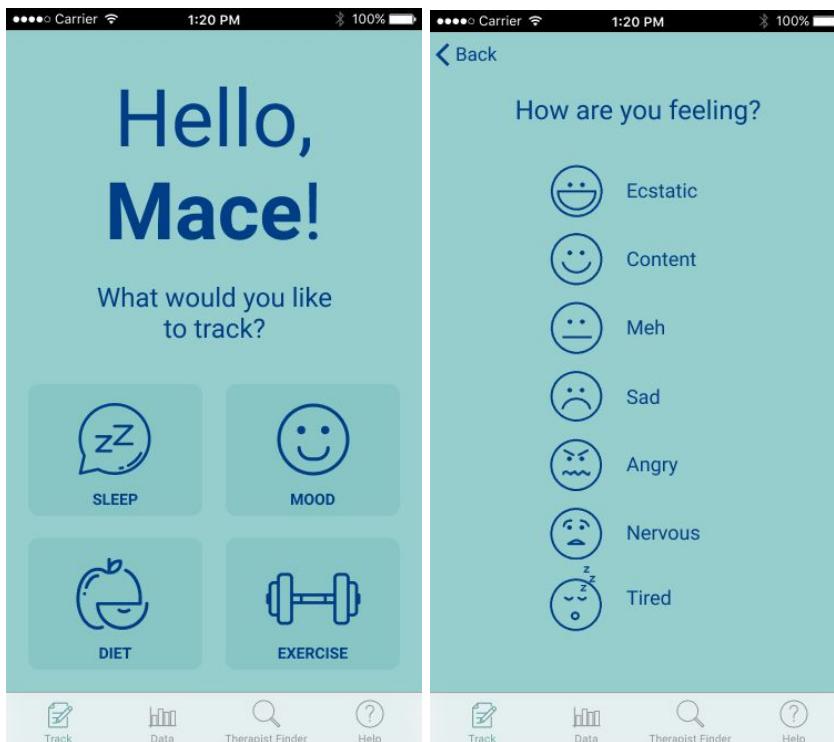
On the phone, people can tap the therapist finder button on the navigation bar. The first time they do this, the app will prompt them to fill out a questionnaire that will be used to help determine which therapists may be compatible with their needs. Once the questionnaire is completed, the app will display a list of therapists ordered by how well they match people’s needs. People can then sort the list by distance, cost, or availability if they prefer. In addition, people can switch to a map view to see the location of each therapist. After clicking on a marker on the map, a popup will appear at the bottom of the screen with a summary of information about the therapist who practices there. After people slide upward on this popup from the map view or click one of the items in the list view, the app will show them a more detailed page of that therapist’s information. From there, they can view the therapist’s contact information by clicking the contact button or reject the therapist by clicking on the reject button. If people reject a therapist, the app will prompt them to specify their reasons for doing so, which will help the system refine the therapists suggested in the future. The app will then return them to the list view, which will display a modified list of suggested therapists.

Digital Mockup

Task 1: Tracking

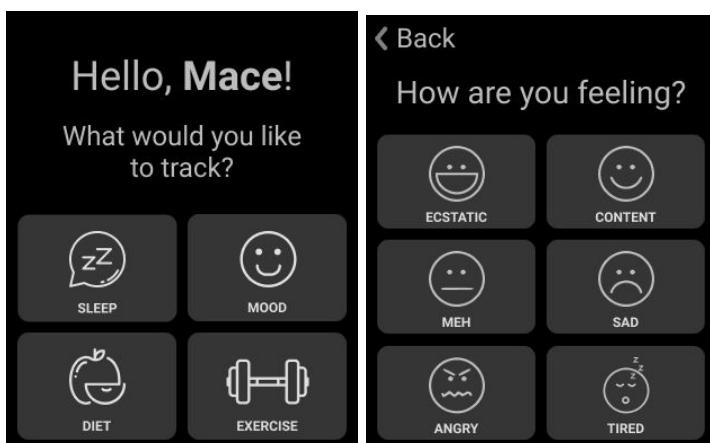
Mood tracking

On the phone:



The person taps the mood tracking button and then presses the emoticon that best represents their current mood.

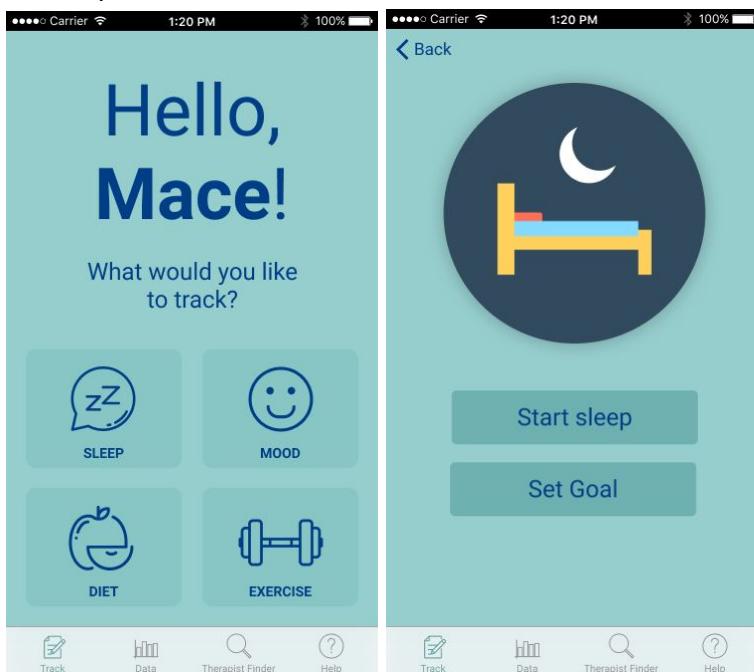
On the watch:



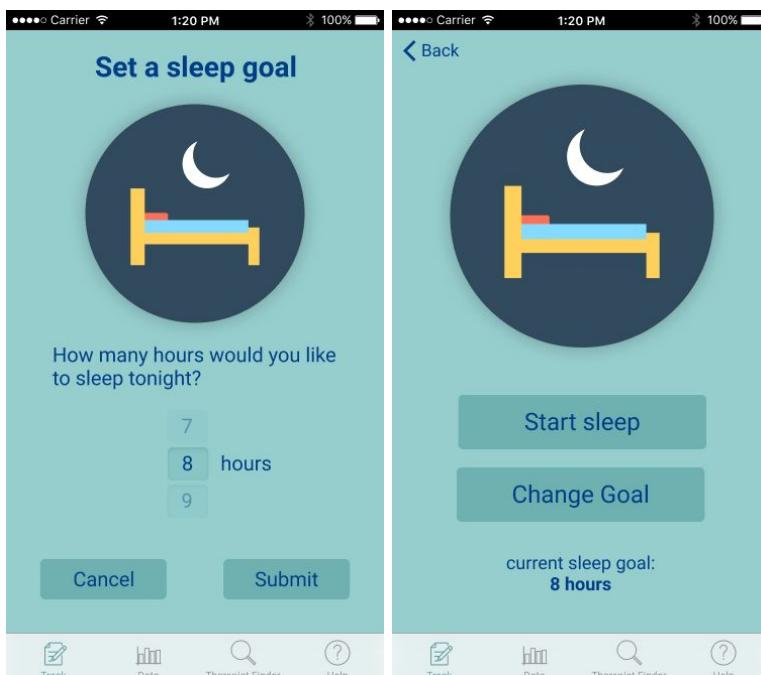
The person taps the mood button and selects the option that best describes their current mood.

Sleep tracking

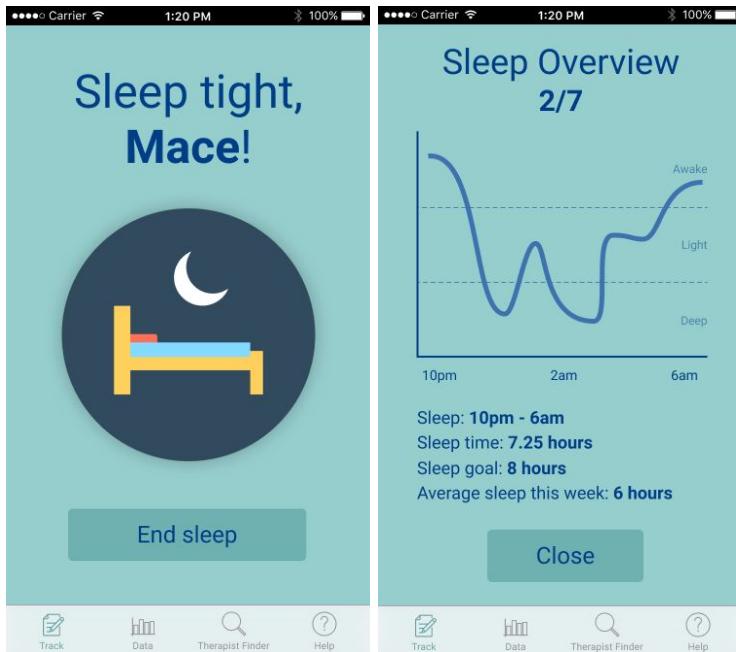
On the phone:



The person taps the sleep tracking button, which brings them to the sleep tracking mode.

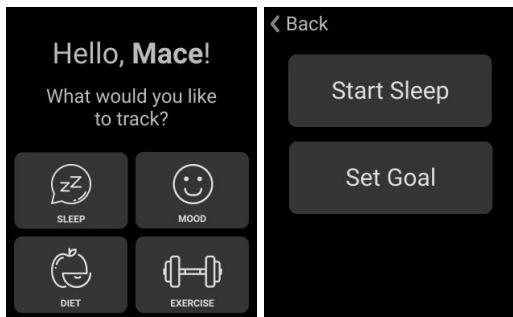


Next, they can set a goal for how long they would like to sleep each night. Once a goal has been set, it can be modified at any time by going back to sleep tracking mode and pressing "change goal".

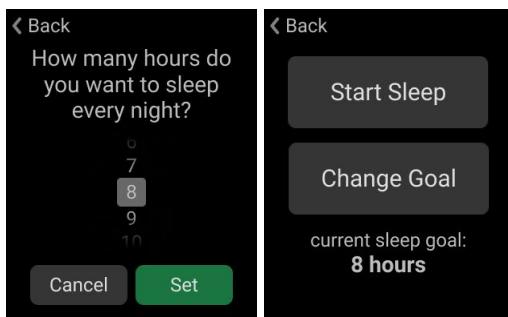


Once the person presses the “start sleep” button, they will enter sleep mode. When they wake up the next morning, they can tap “end sleep” and it will then show them a detailed overview of how well they slept throughout the night.

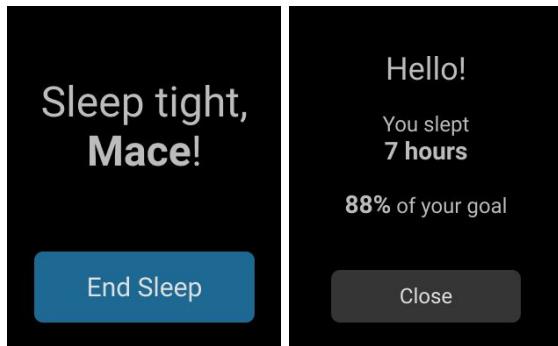
On the watch:



The person taps the sleep button which opens the sleep tracker menu.



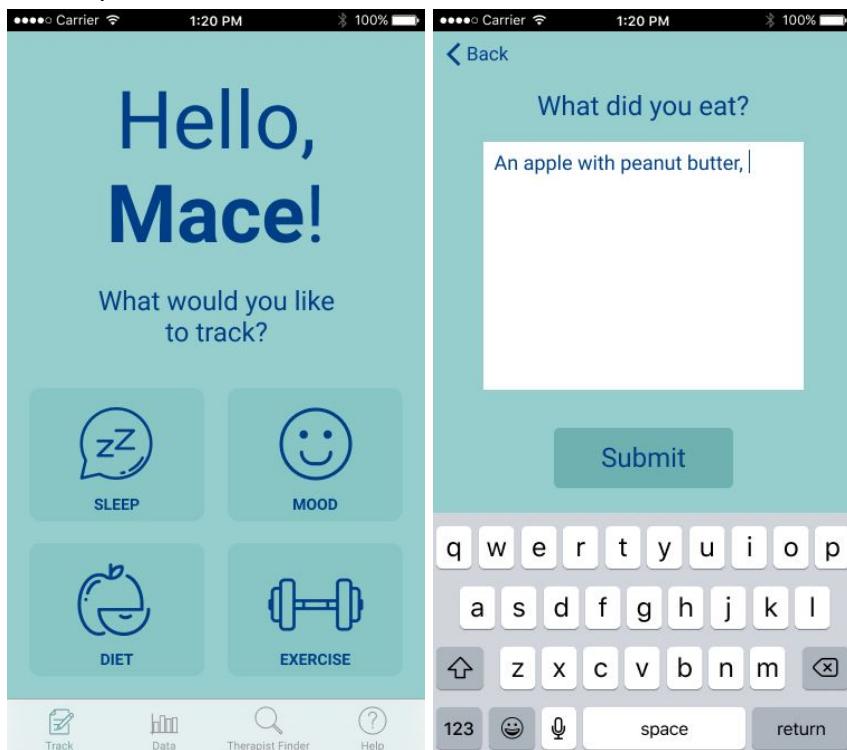
The “set goal” button can be pressed to set a goal for the amount of hours to sleep everyday. This setting can be changed at anytime by navigating back to sleep tracking mode and pressing the “change goal” button.



Once, the person taps the “start sleep” button, they will enter sleep mode. The next morning when they wake up, the watch will show them a simple overview of how well they slept that night.

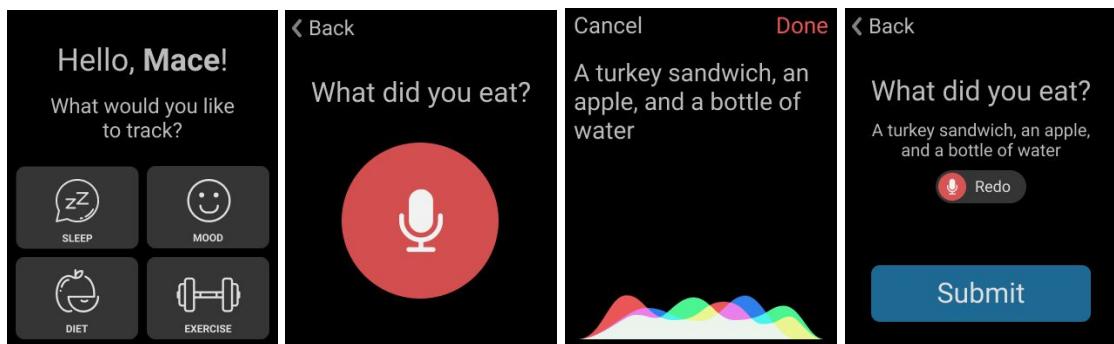
Diet tracking

On the phone:



First, the person taps the “diet” button which brings them to diet tracking mode. Here they can enter what they ate and then submit it.

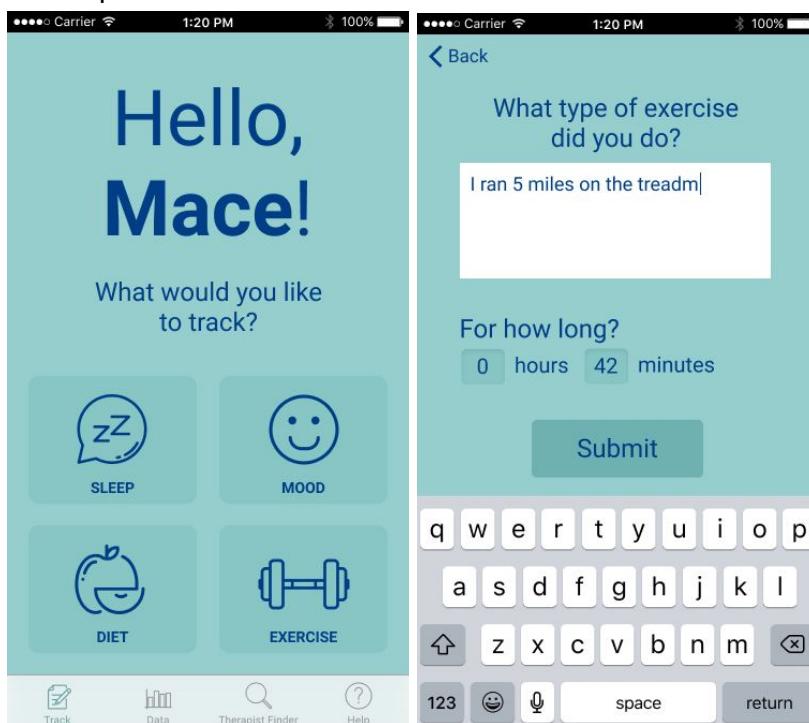
On the watch:



The person taps the “diet” button which opens the diet tracker menu. Pressing the microphone button will allow them to describe what they ate. After they are done, they can either edit the information by clicking “redo” or submit the meal.

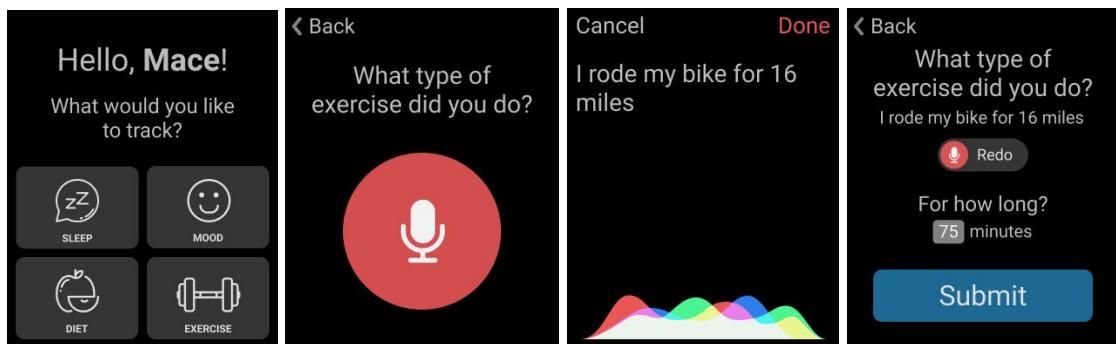
Exercise tracking

On the phone:



Pressing the “exercise” button will bring the person into exercise tracking mode. They can then write about the activity they did and specify the duration.

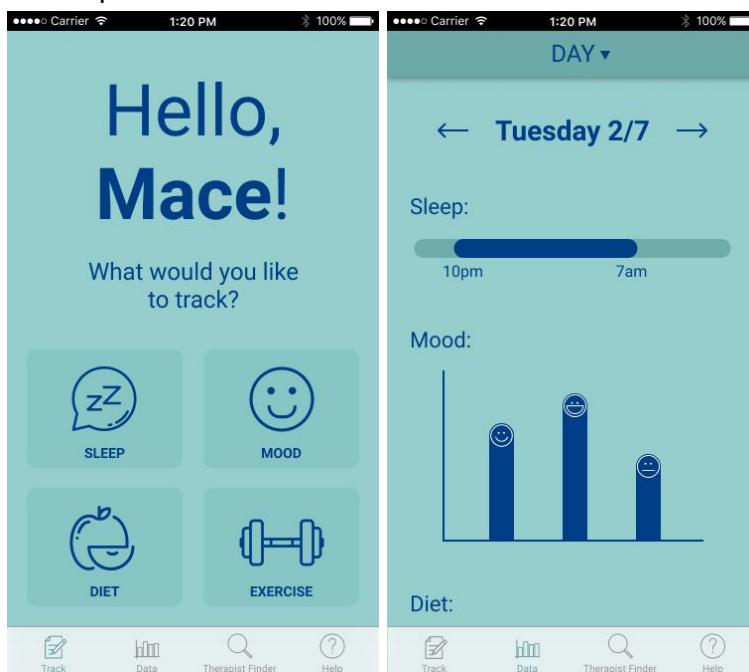
On the watch:



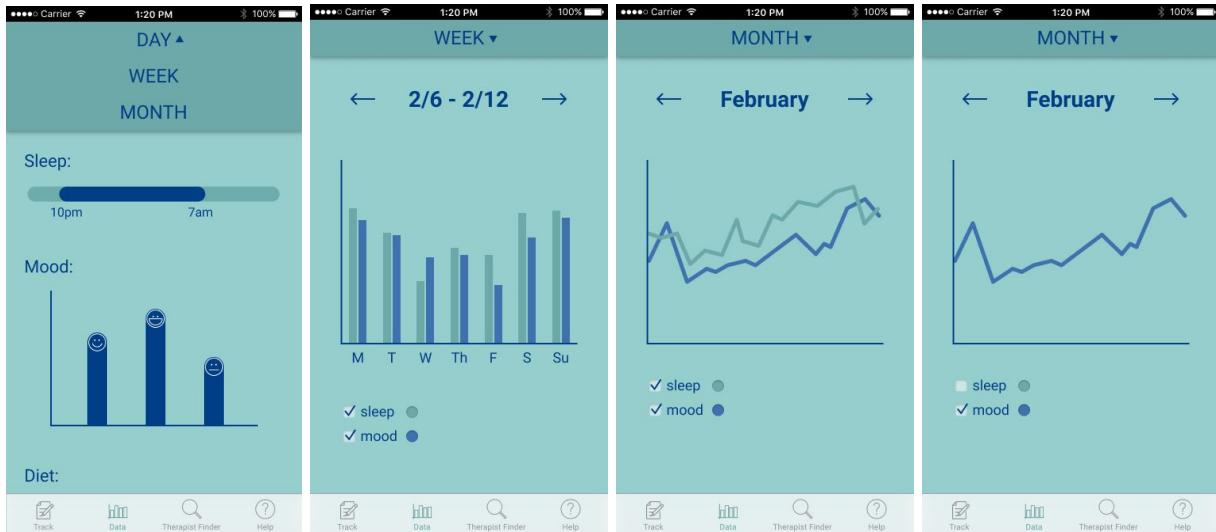
The person taps the exercise button which opens the exercise tracker menu. Pressing the microphone button will allow them to describe what activity they performed. Then they can input how long they exercised and submit it.

Viewing data

On the phone:

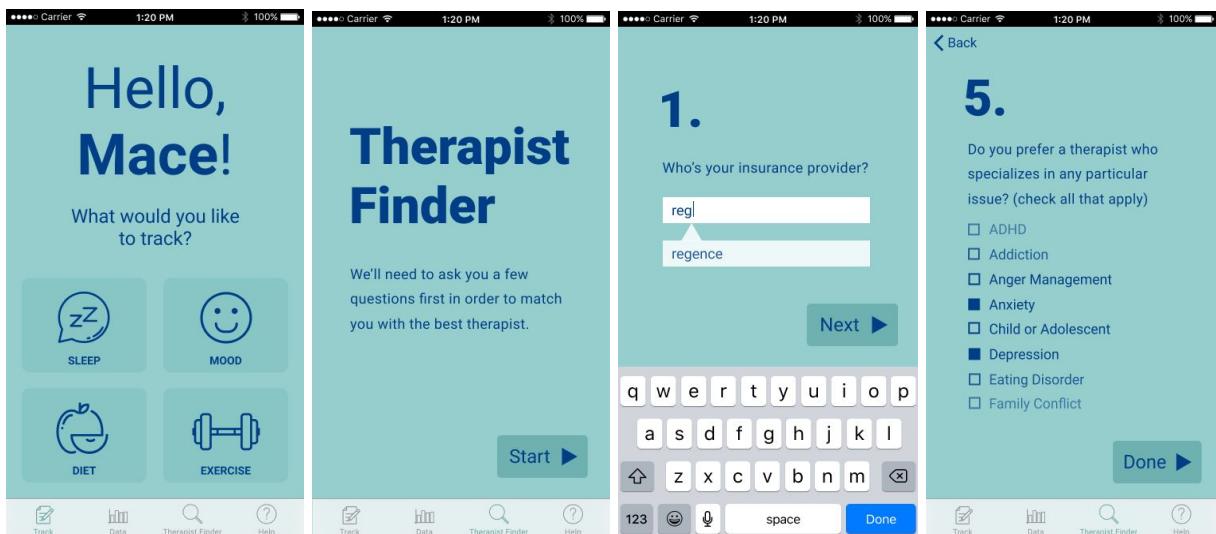


Clicking on the “data” button from the home screen shows the person various pieces of information about the things that have been tracked about them for the day.

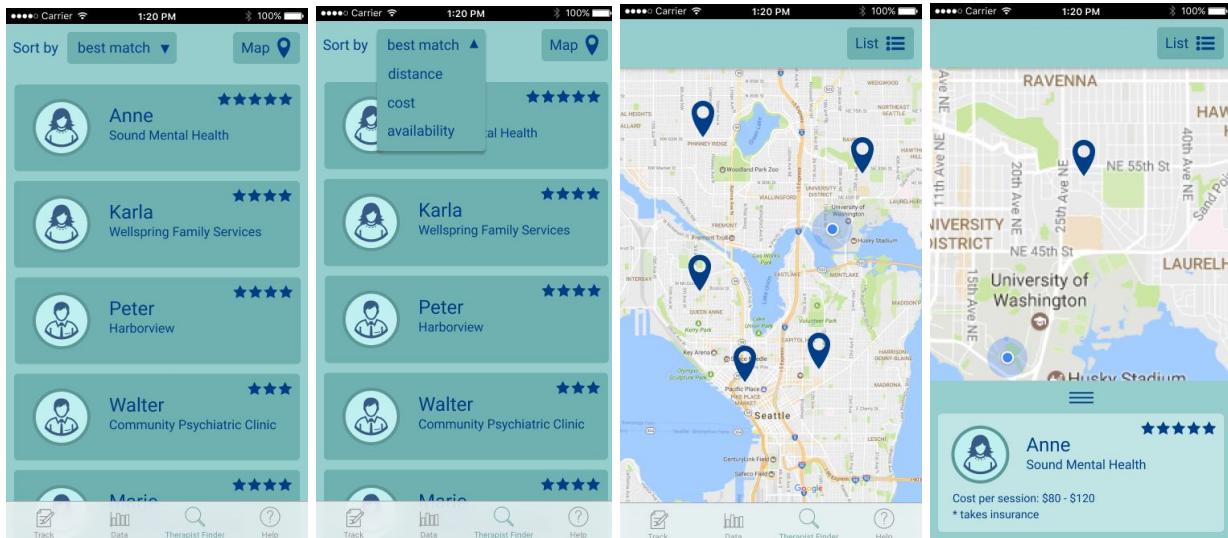


There is a dropdown at the top of the screen which can be used to switch between the day view, the week view, and the month view. Swiping horizontally on the week view and the month view will let you see data from the previous weeks and months respectively. The checkboxes for each type of data can be toggled to determine whether they are displayed in the graphs or not.

Task 2: Therapist Finder



The person taps the “therapist finder” button on the menu bar to get into therapist finder mode. The first time they do this, they will be prompted with a questionnaire which will be used to find a therapist that is compatible with their needs.



A list of therapists will be displayed once the questionnaire is complete, ordered by how well they match the needs of the person. The list can also be sorted by distance, cost, and availability. In addition, there will be a map view where you can see the location of each therapist. Clicking a marker on the map will bring up a popup with a summary of that therapist's information.

Once a therapist is selected from either the list view or the map view, the person will be taken to a more detailed page of that therapist's information. Here the person can choose to either contact them or reject them. Rejecting the therapist will prompt the person to specify why they weren't a good match. They will then be returned to the list view with a list of suggested therapists that has been modified based on the feedback about why the person rejected the first therapist.

Changes from our Final Paper Prototype

Therapist Finder Questionnaire

We originally designed a questionnaire screen that would have a popup start alert hovering over the entire questionnaire. However in our digital prototype, we decided to have the start page be a separate screen, clearly outlining its purpose. We also decided to put each question on its own screen rather than having the entire questionnaire on a single screen and having people scroll through it. We thought this would be more intuitive and less overwhelming for them.

Therapist Finder Screen

For the screen where people specify why they have rejected a therapist, we added an “I do not wish to respond” button for the people who do not want to give any reasons.

Tracking Screens

In our digital mockup for the tracking screens, we added a back button to allow people to navigate back to the main tracking screen. For the exercise tracking screen, we added both an hour and a minute slider to make the time input more precise.

Dictation Button

For the watch screens where someone can track diet and exercise, we changed the buttons that said “Dictate” to a large button with a microphone and the buttons that said “Redo Dictation” to buttons that have a microphone with “Redo” next to it. We felt this would be more intuitive to people because they do not have to know what dictate means; they can simply see the microphone and know they should speak into the watch.

Discussion

After going through the process of iterative design, one of the main takeaways we had was that it is best to uncover design problems as early as possible. This is because the longer a problem lingers, the harder it becomes to fix. We also learned that there are often things that are missed in the initial design, in part due to pre existing biases as well as the fact that no one can consider every possible issue from the very beginning.

Overall, we found this process very effective and it ended up shaping our final design in many different ways. Throughout the heuristic evaluation sessions for example, we revealed three major flaws in our design: inconsistent iconography, unclear questionnaire purpose, and unclear rejection screen input. To fix these issues, we revised the icons to better represent the function with which they are associated. Additionally, we added instructions to help people understand the questionnaire's purpose. And finally, we switch from radio button to checkbox to make the rejection options more clear. Then in our usability testing, we uncovered several more problems with our design. First, we found out that our participants were confused about the screen with both the list of therapist recommendations and the map view, so we split them to two different screens. In our third usability test, we found out the participant didn't associate sleep tracking with the alarm function when we asked them to track their sleep. Afterwards, we discussed this confusion and came to the conclusion that having an alarm function was not necessary to our design, so we removed it completely. We also changed a lot of iconography issues and wording problems as a result of our usability testing. All of this feedback helped us finalize our design before we began converting it to a digital mockup.

The most notable change to our tasks as a result of the usability testing was the removal of setting an alarm from our sleep tracking task. After the third usability test, we came to the conclusion that an alarm feature was not necessary so we removed it from our design completely. Other than that, our two main tasks have stayed pretty much the same.

If we had had more time, we would have wanted to do more iterations upon our design. Specifically, we think a usability test using the digital mockups as well as the paper prototype would have provided us with some additional insight. In a usability test with the digital mockups, participants might be less distracted by unclear drawings and therefore interact with the system more easily. We would also potentially receive valuable and direct feedback about other aspects of the interface that tests with the paper prototype would not reveal, such as the aesthetics of the apps and the usefulness of the more detailed content in our digital mockup screens.

Appendix

Usability test introduction

"We are designing a phone and watch app that helps people manage their mental health. The main feature of our app is that people can track their mood and various other aspects of their life, such as their sleep, diet, and exercise habits. Our goal is that people will be able to track how their mood and mental health changes as they change their everyday lifestyle.

Furthermore, we provide people the ability to find therapists best suited for them. We have today a paper prototype of our phone and watch app. We will ask you to perform various tasks on both devices. Do your best to complete the tasks. We are learning about how our design can be improved from you."

Instructions

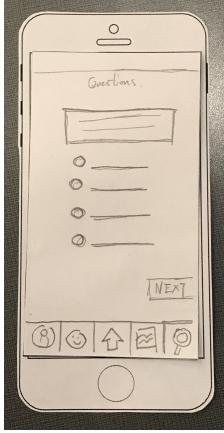
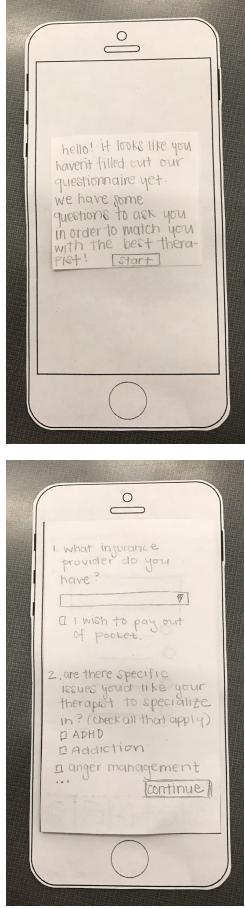
- Log mood on the watch
- Log mood on the app
- Set an alarm and go to sleep on the watch
- Log a food entry on the app
- Log an exercise entry on the watch
- View weekly data
- Access the therapist finder and find a compatible therapist
 - Toggle between the map and list view
 - Select a therapist and reject them

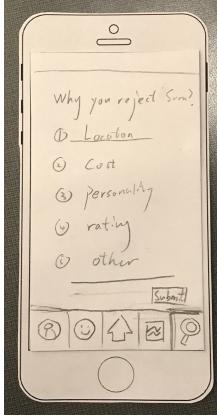
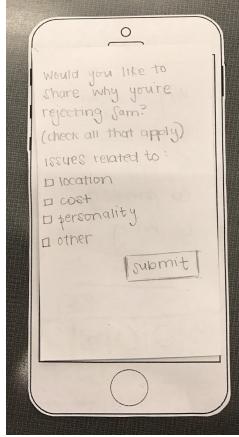
Debrief questions

- What was confusing about the design?
- What did you like about the design?
- How could the design be improved?
- Did you find it easy and clear how to navigate through the design to complete each task?
- Do you see yourself using this design if you ever need to?

Heuristic evaluations feedback

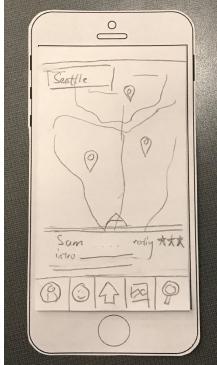
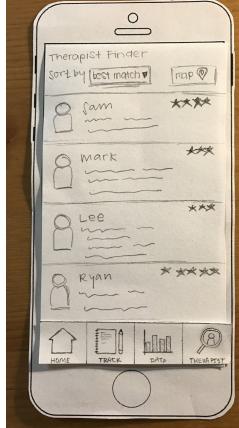
Image	Incident	Severity	Revision	Revised Image
	There were multiple occasions where the people evaluating our paper prototype were confused about what the	2	We revised the icons to better represent the function with which they are associated and we also added labels	

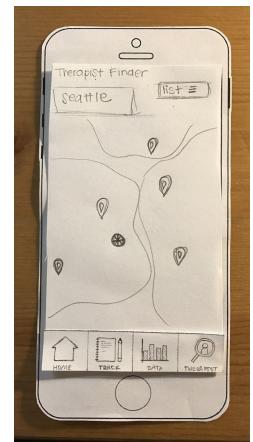
	<p>icons on our menu bar meant.</p> <p>Heuristic violated: consistency and standards</p>		<p>to the buttons to make sure it is especially clear what they are for. Finally, we grouped all of the tracking buttons together to make it consistent with the watch.</p>	
	 <p>It was unclear what the purpose of the questionnaire screen was for. The participant was confused as to whether she was answering questions or whether she was looking at a form for her to ask questions.</p> <p>Heuristic violated: aesthetic and design</p>	1	<p>The questionnaire screen will have a brief introduction explaining its purpose. A few example questions are also included to give some insight on what the questionnaire might be like.</p> 	

	<p>When a user rejects a recommended therapist, the app will ask them why. It was unclear to the participant whether the form contained radio buttons or checkboxes.</p> <p>Heuristic violated: consistency and standards</p>	<p>1</p>	<p>The rejection form will have checkboxes and we will include instructions to select as many choices as the user sees fit.</p>	
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Usability tests feedback

Participant #1

Image	Incident	Severity	Revision	Revised Image
	<p>The participant was unsure how to move forward with selecting a therapist. She was confused about whether to select the therapist on the bottom or select points on the map.</p>	<p>2</p>	<p>We decided to revamp the therapist results screen by first displaying a list view of matching therapists, sorted by best match. We allow the users to sort by cost, availability, or location. There is also a map view that the user can switch to.</p>	



The participant thought the icons were very clear and didn't have any troubles accessing the screen that she was looking for.

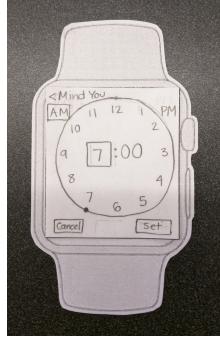
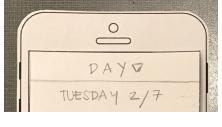
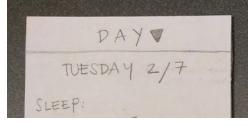
N/A

N/A

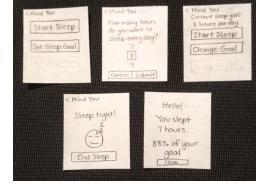
N/A

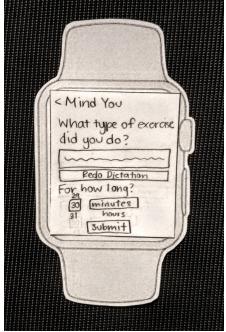
	<p>The participant thought it would be more useful if their was a microphone icon that accompanied the “dictate” button to make it more obvious that they would be recording their food entry.</p>	<p>1</p>	<p>We added a microphone icon to all dictation buttons.</p>	
 	<p>The participant liked the consistency between the phone and watch app when asked to log her mood on both devices.</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>

Participant #2

Image	Incident	Severity	Revision	Revised Image
	The participant was confused by what the submit button would do on the watch alarm screen.	1	To address this, we changed the word "submit" to "set". We thought this term was a better representation of what the button is supposed to do.	
	When we asked the participant to view their weekly tracking data, they weren't sure how to get from the day view to the week view.	1	We fixed this by making the drop down button at the top of the screen stand out a little more.	

Participant #3

Image	Incident	Severity	Revision	Revised Image
	When asked to set an alarm and begin tracking their sleep, the participant was confused because they did not see a way to set an alarm from the home page.	2	After some consideration, we decided that the alarm function wasn't necessary and that we should just focus on tracking sleep. We figured people could use other means to set an alarm.	

	<p>When the participant dictated the type of exercise they performed on the watch, they also specified the length of time they spent doing that exercise.</p>	<p>1</p>	<p>If the user includes the length of time as part of the dictation, the app will automatically set the time input box according to what they said.</p>	<p>N/A</p>
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