

Addressing Mental Health with Wearable Tech

My Roles

Researcher, Designer

Project Brief

I worked on a cross-disciplinary team to research and ideate a product idea to improve mental health outcomes using wearable technology. We worked closely with the digital team at Express Scripts as we conducted research and created initial prototypes. Our final product idea and recommendations were pitched to the organization's senior product leadership team.



Project Scope: Double Diamond Framework

The primary focus of this project was to “design the right thing” rather than “designing things right.” My role in this project was to frame the problem through research and synthesis.

After collecting data during the research discovery phase and narrowing down the scope of the problem, I worked with my team to lightly delve into the design phase to begin prototyping wireframes of our product solution.



Problem Statement

How might we create wearable experiences that help consumers manage their health adherence over time?

Understanding the Problem Space

Mental health is a big problem for college students.

20% of US adults were affected by mental illness in 2019 (51.5 million people), with **11.8%** of young adults in the **18-25 demographic** suffering from major depressive episodes.

1 out of 5 US adults suffer from mental illness, but only **44.8%** of those who suffer from mental illness reported seeing a mental health professional in the last year.¹

60–70% of people who have depression will tend to have another disorder like anxiety.²



1. "Mental Health by the Numbers," National Alliance on Mental Health (NAMI), <https://www.nami.org/mhstats>.

2. Oliver G. Cameron, MD, PhD. "Understanding Comorbid Depression and Anxiety" *Psychiatric Times*, 24 no. 14 (December 2007). <https://www.psychiatrictimes.com/view/understanding-comorbid-depression-and-anxiety>.

Project Goal

Create a mobile application that works with a wearable device to help users monitor and maintain their mental health over time.

Stakeholder Interviews

We conducted 5 stakeholder interviews regarding mental health treatment and what factors lead to better health outcomes. Due to the limited scope of the project, we used convenience sampling to find the most relevant stakeholders to interview given our time/resource constraints.

We wanted to know:

- **What are current treatments for mental health?**
- **How are mental health disorders diagnosed?**
- **For those suffering with mental health problems, what factors lead to more successful health outcomes?**

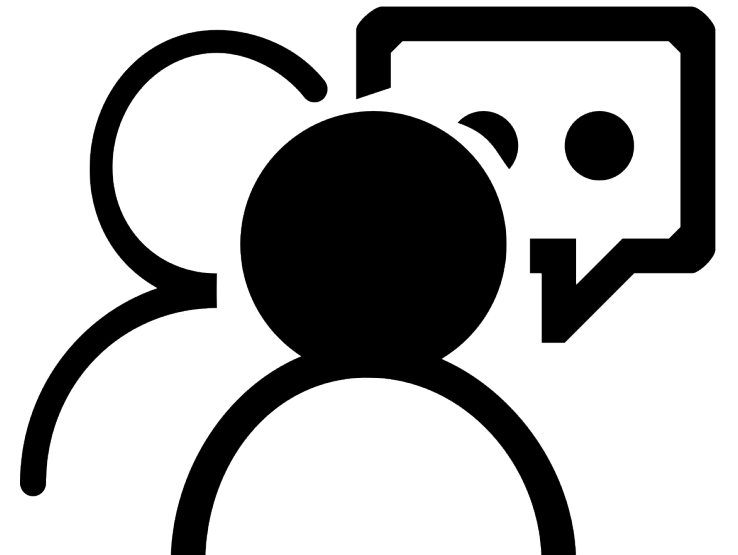
Interview Outcomes

The best mental health outcomes are self-motivated and incorporate Cognitive Behavioral Therapy.

Treating mental health is an ongoing process that necessitates constant recommitment and intentionality.

One of the most effective treatments for depression and anxiety is Cognitive Behavioral Therapy (CBT) that has patients overcome avoidance behaviors by getting them to do activities based on their values versus how they're feeling.

Patients with the best health outcomes are self-motivated, whereas external pressures can be a detriment to their treatment



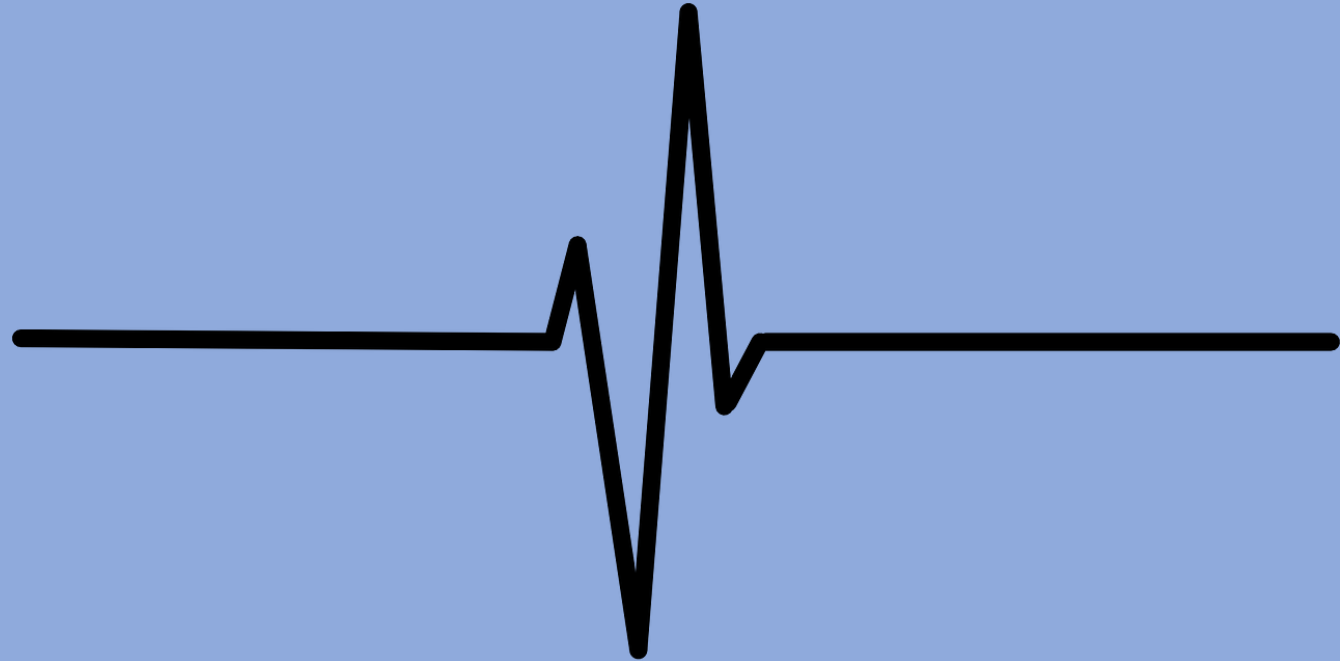
Interview Outcomes

Mental health disorders affect people's physiological processes.

Another salient takeaway from our interviews is that mental health can be tracked through biological markers like movement and heart rate.

Anxiety disorders can cause heart rate spikes, shortness of breath and increased blood pressure.

Symptoms associated with depression disorders include fatigue, low concentration and poor appetite.



Literature Review

Today's wearable devices are equipped with sophisticated sensors that collect informative, actionable health data.

Mobile applications in tandem with wearable devices have successfully altered human behavior to improve healthcare outcomes in other contexts (i.e., sleep patterns).

To understand the viability of using wearable devices as healthcare tools and what capabilities these devices are equipped with, we read through online journals, analyzed articles and attended relevant guest speaker events to uncover existing research on the role wearable devices have on healthcare outcomes.



Literature Review

100%

Wearables such as the Apple Watch are equipped with sophisticated sensors that can 100% accurately track baseline heart rate within 5bpm.¹

253 M

The total global shipments of health-focused wearables and fitness trackers is projected to 253 million units by 2025.²

90%

90% of US adults are willing to share wearable health device data with their physicians for healthcare purposes.³

1. Benjamin W Nelson and Nicholas B Allen. "Accuracy of Consumer Wearable Heart Rate Measurement During an Ecologically Valid 24-Hour Period: Intraindividual Validation Study." *JMIR mHealth and uHealth*, 7 no. 3 (March 2019). National Library of Medicine. doi:10.2196/10828

2. Lionel Sujay Vailshery, "Smartwatch shipments forecast worldwide from 2016 to 2025," Statista, Nov 3, 2021, <https://www.statista.com/statistics/878144/worldwide-smart-wristwear-shipments-forecast/>.

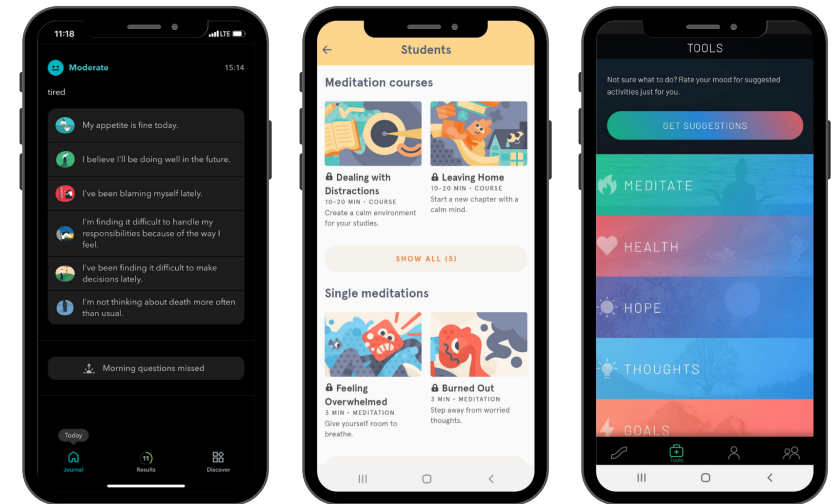
3. Conor Stewart, "Percentage of U.S. adults that were willing to share wearable health device data with select people as of 2018," Statista, March 27, 2019, <https://www.statista.com/statistics/829472/wearable-health-data-sharing-willingness-us-adults/>.

Comparative Analysis

Successful mental health-oriented mobile experiences give actionable directives for users to improve their mood.

Health adherence is promoted through apps with encouragement mechanisms such as notifications. We found that personalized experiences give users a sense of growth and personal development.

After getting a better understanding of the problem space, we wanted to find out if there were existing mobile tools that are used in mental health treatment. We identified and evaluated three tools in the mental health category: Moodpath, Headspace and Sanvello. However, we found that none of these apps were equipped to fully promote behavior changes or long-term mental health adherence.



Our solution

A wearable + phone app combination that can sense (through heart rate and movement) when the user is going through an episode of depression/anxiety and pushes personalized, actionable recommendations to the user through their wearable to improve their mental health.

Wireframes

We wanted to create an experience that capitalizes on user's personal motivation to promote long-term health adherence.

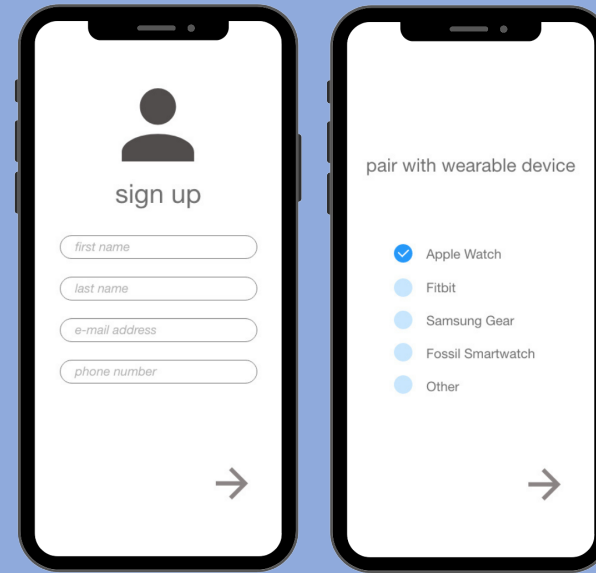
Design Requirements:

Leverages the user's health data to track physiological status and detect moments of mental health distress.

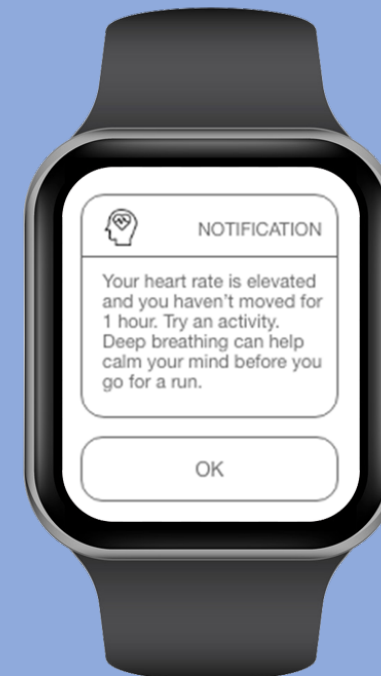
The system should reach out to the user when stress is identified.

Directives should be personalized to the user and provide them with actionable steps they can take to improve their mental health as needed.

Through an initial sign-up screen, users would be prompted to pair their wearable device with their phone app to launch the mental health adherence wearable + app combination.



The app would keep track of key physiological metrics that would allow the app to monitor the state of the user's mental health.



If unusual physiological measurements are detected, the wearable screen would display a notification prompting the user to do a personalized activity they selected to help pull themselves out of a mental health episode.

