

Leveraging the Fitbit API to Share Activity Levels with a Trusted Caregiver

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Introduction

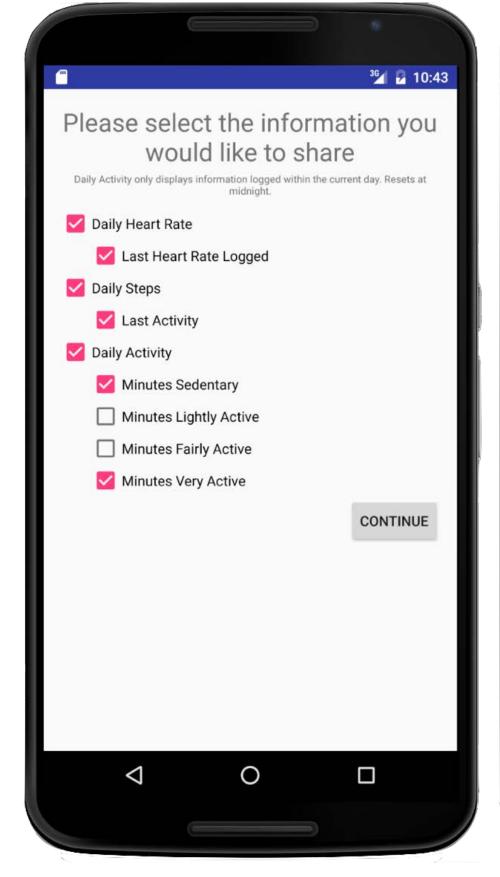
Wearable technologies may be beneficial in providing family caregivers valuable information on the safety, activity levels, or whereabouts of a patient. However, little is known regarding the perceived usefulness of such technologies for caregivers or the willingness of patients to share potentially sensitive health data in these interpersonal context.

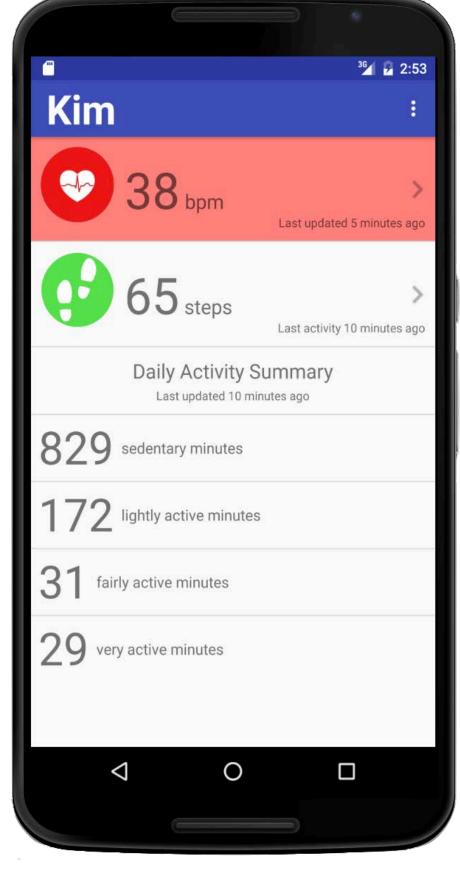
Therefore, we developed a mobile caregiving application, called **Carebit** that uses the Fitbit application protocol interface (API) to share pertinent health data from a patient with his or her caregiver.

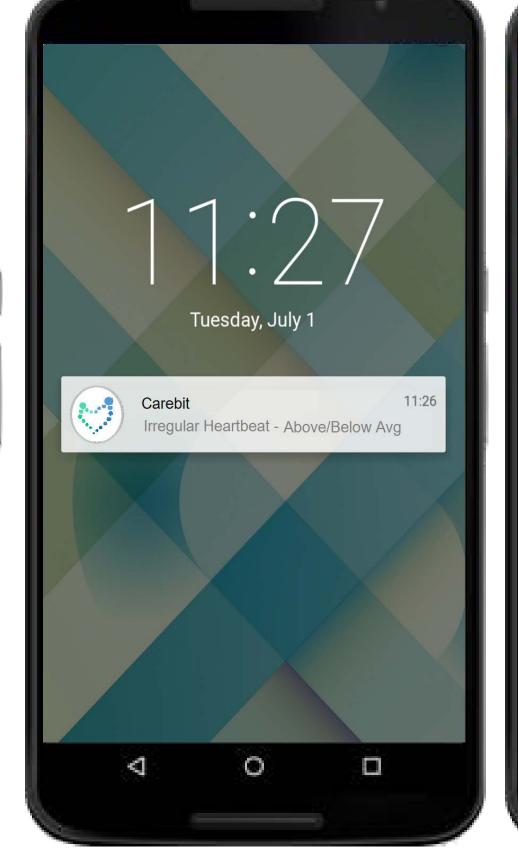
Background

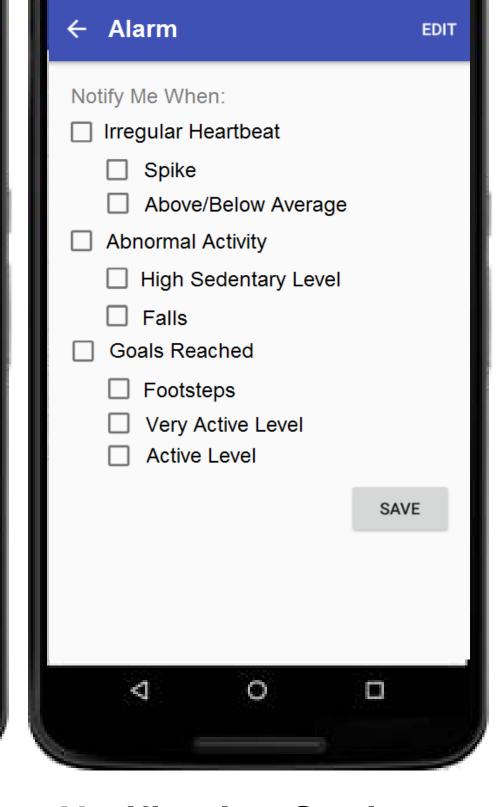
- A major concern of elderly patients is being unattended in the event of an accident [1].
- Technological monitoring can reduce readmission to hospitals and the cost of care which would increase efficiency with healthcare resources [1].
- More than half of patients do not mind sharing their data with peers and clinicians, but after a year patients' concerns about privacy and security increased [2] [3].
- The Fitbit was deemed reliable in measurement and it also contains an accelerometer that can estimate activity levels [3] [4].
- A solution to privacy is to place control and ownership of personal data in the hands of the patient by allowing the patient to restrict some access from their caregiver [5].

Carebit Interface Design









Initial Authentication

Caregiver Dashboard

Out-of-App Notification

Notification Settings

Initial Authentication

Allows Fitbit user (patient) to specify which information will be shared

Ensures that the patient is giving their consent to share their health data with a trusted caregiver

Caregiver Dashboard

Displays key vital statistics and activity levels over the last 24 hours

In-App Notifications are highlighted in RED

Out-of-App Notifications

When the caregiver is not logged into the app, a notification will be sent to the status bar

Emergency
notifications may be
implemented in the
case medical
attention is needed

Notification Settings

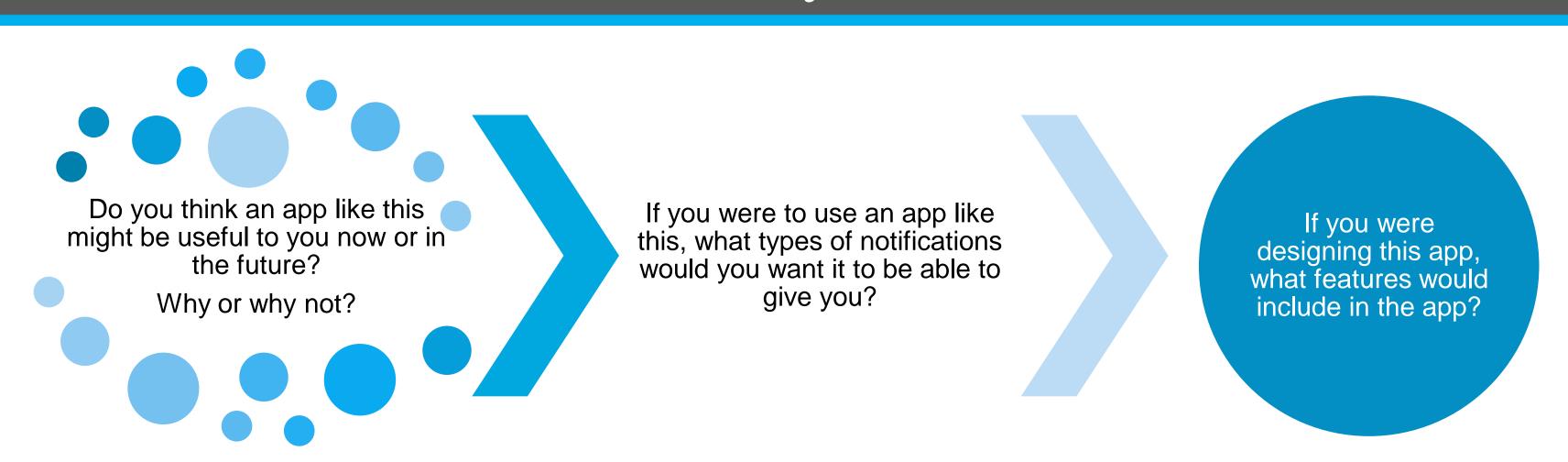
Based on user feedback, we are propose adding the notifications above to the app

However, these settings have not yet been implemented in the app

Methods

- Developed a mobile application using Android Studio and the Fitbit API
- Created a working prototype to authenticate to Fitbit and show a patient's data from the last 24 hours:
- 1) Last recorded activity, 2) Most recent heart rate reading, 3) Number of steps taken, and 4) Activity Levels
- Conducted a pilot study with 21 users to get feedback on the initial prototype. Participants were asked the questions shown to the right:

User Study Questions



Usefulness

Intelligent Notifications "Blue Sky" Exploration

Results

Perceived Usefulness

- 18 participants thought Carebit would be useful either now or in the future. Why?
 - Capability of patient to live independently
 - Monitoring loved ones from afar
 - Integration of technology & health to improve wellbeing
- 3 participants did not find Carebit useful. Why Not?
 - Emergency devices like LifeAlert already exist
 - Complexity of technology with elderly patients
 - No need if patient is severely prone to emergencies

Notifications Wanted

Irregular heartrate, Low activity levels, Goal achieved, and Falls

"Blue Sky" Features

Monitor blood sugar and/or sleep; Collect, save, and summarize previous data; Goal setting function; Alert medical response

Future Work

- Research the feasibility of the features suggested by participants (e.g., Fitbit's ability to detect a fall)
- Complete application development, including implementing notifications
- Run a full user study having family caregivers use
 Carebit to monitor a loved one

References

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