Pilly

SOEN 357 V

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Web Version:

https://jgavranovic.github.io/pilly/

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Introduction

Millions of people around the world are dealing with different kinds of chronic illnesses. Chronic illnesses are marked by health condition that lasts for an extended duration of time and requires ongoing medical attention. When living with a chronic illness, meetings with healthcare providers become common and necessary, in addition to an often time long list of pills and medications to each take according to their own unique scheduling and dosing recommendations. If not properly attended to, these conditions can worsen and make the lives of the patients more painful and more stressful. It is for these reasons that many people suffering from chronic illnesses could greatly benefit from a simple and powerful mobile application that could help them manage as well as schedule doctor appointments, in addition to managing and tracking the medication they need to take. If an app could deliver on these promises, it has the potential to greatly improve the lives and remove stress from a population demographic who have an increased burden in their lives. In order to make sure that such an app can accomplish what it sets out to do, especially as accessibility becomes non-negotiable when discussing an app targeting people suffering from chronic illnesses, a great deal of consideration and informed planning should go into the design of the app. And so with this in mind, this document will present many of the necessary stages in achieving the goal.

User Research

In order to properly understand the needs of users of the app, proper user research would be necessary. The goal of this research would be to try and recognize the goals, the difficulties, and the preferences of the population. The first type of research I would conduct would be to do semi-structured interviews with a diverse group of up to 20 potential users. These interviews would have

a basic script to make sure important topics are touched on, but would be more flexible and receptive than a structured interview, as the interviewer can adapt a bit and have a conversation with the interviewee to make sure they are properly heard. Some important topics to cover during these interview include: daily medication routine, appointment scheduling challenges, emotional stress points, current tools used, technological comfort level, and frustration with existing solutions.

Another type of user research that should be conducted are online surveys. This would collect information from a lot more people, such as 100 people, by asking them to fill out an online survey. While online surveys might not result in the in depth understanding of a specific user, they can provide valuable insights thanks to the much larger population from which the data is coming from. This survey could collect data on: the frequency of missed medications, number of medications taken daily, comfort level with mobile apps, interest in caregiver access features, and their most desired app features. It is especially important that the wording of the questions is free of potential bias, as it will have a large impact on how participants will respond to questions, and can therefore affect the accuracy of the data. Additionally, when asking users to quantify subjective feelings towards a questions, the Likert scale, such as asking levels of agreement with a statement and having an equal number of positive and negative options as well as a neutral option, could be useful to get the most accurate data possible.

Lastly, a batch of secondary research should be conducted in order to better understand trends in medical sector as well as app design from a more academic point of view. This step could comprise of reading academic research on medication adherence, modern accessibility guidelines, and existing health apps and user reviews for those apps. This secondary research could help identify important trends and issues, by using publicly available date, which can save valuable development resources.

The World Wide Web Consortium's (W3C) accessibility guidelines lay out important accessibility guidelines that should be considered during development of this app. These include that information should be easily perceivable, so it should not be too small and have adequate contrast. The application should be easily operable, thanks to intuitive navigation. Text should be easily understandable, thanks to simple wording. And the application should be robust, working across a wide range of devices. These guidelines have been written after lots of research by the important body, and will be useful to make Pilly accessible to many users. Some research in the medical field show that approximately 50% of adults do not take their medication as prescribed (NIH, 2011). This proves that many people struggle with medication adherence. An app like Pilly can improve this outcome, but must also understand that there are reasons other than regiment confusion or complexity that affect these numbers, made clear by the journal, that Pilly cannot address.

Personas

Personas are short profiles describing an imagined user which represent a larger segment of the user population. By promoting empathy with these fictional users, these personas help designers and developers keep in mind the specifics needs and feelings of users in order to better cater to them. Robert represent an older man who is dealing with hypertension and cardiac problems, and must therefore take medication regularly as well as schedule appointments with healthcare professionals. Kiara represents a different type of user; she is not using the app for herself, but using the app in order to help her mother who is suffering from Alzheimer's. By using the app on her phone as a

caretaker, she hopes to monitor her mother's medication schedule as well as hoping that the app reminds her mother to take her medication.

User Journeys

The user journeys serve as an easy way to walk through the personas using the app in various different ways. The journey breaks down different steps or use cases and what the user feels at each of these steps, as well as possible improvements that can be learned from their reactions. The following user journeys focus on Robert and Kiara's use cases for the app, managing multiple conditions as an older man and managing a parent's healthcare at the same time as having a busy professional career.

Robert Zhang

Core Profile

Name: Robert Zhang

Age and gender: 67 year old man

Conditions: Hypertension & Heart Disease

Occupation: Retired

Tech Comfort: Moderate to Low

Background

Short bio: A 67 year old retired mechanical engineer, Robert lives with his wife in a suburban neighborhood. After experiencing a minor cardiac event two years ago, he was diagnosed with hypertension and heart disease.

Lifestyle and values:

- Values independence and self-reliance
- Follows a structured daily routine
- Trusts medical professionals and wants accurate information

Motivations

- Maintain independence
- Avoid hospital visits
- Stay active for his grandchildren

Audience Insights

Goals:

- Keep track of multiple medications
- Remember doctor visits
- Share updates with cariologist
- Feel in control of his health

Pain Points:

- Complex medication schedules
- Small test and cluttered interfaces
- Confusion about which medication was taken
- Fear of making mistakes

How he uses the app:

- Relies heavily on reminders
- Uses daily check-list style medication tracker
- Reviews simple summaries before doctor visits
- May ask a family member for help setting it up

Behavior and Personality

Personality traits:

- Responsible
- Detail-oriented
- Cautious
- Practical
- Slightly anxious about health mistakes
- Resistant to change is learning curve is steep

Quote:

“I just want something simple that tells me what to take and when, without making me feel like I need a computer science degree.”

Design Insights

UX Implications:

- Large text and simple layout
- Clear confirmation after logging medication
- Visual pill identifiers (color/shape)
- Minimal steps per task

Kiara Patel

Core Profile

Name: Kiara Patel

Age and gender: 42 year old woman

Role: Caregiver for her 74 year old mother with Alzheimer's

Tech Comfort: High

Occupation: Project manager

Background

Short bio: 42 year old project manager who balances a demanding full-time career with caring for her 74 year old mother, who was diagnosed with Alzheimer's three years ago. After noticing missed medications and increasing confusion, Kiara stepped in to manager her mother's prescriptions and medical appointments.

Lifestyle and values:

- Values responsibility and family commitment
- Juggles work deadlines and caregiving duties
- Prefers efficiency and automation
- Deeply motivated by her mother's safety and well-being

Motivations

- Keep her mother safe
- Prevent emergency situations
- Balance caregiving with full-time work

Audience Insights

Goals:

- Ensure her mother takes medication correctly
- Coordinate appointments
- Communicate with doctors efficiently
- Reduce caregiving stress

Pain Points:

- Not knowing medication was taken
- Coordinate multiple specialists
- Managing everything through phone calls

How he uses the app:

- Sets medication reminders remotely
- Gets notifications if a dose is missed
- Shared health logs with doctors

Behavior and Personality

Personality traits:

- Proactive
- Organized
- Analytical
- Compassionate
- Stress-prone under uncertainty
- Solution-oriented

Quote:

“If I could just know that she took her medication and everything is on track, I could finally stop worrying all day”

Design Insights

UX Implications:

- Real-time alerts
- Caregiver permissions
- Shared health summaries

Robert Zhang

Bio

A 67 year old retired mechanical engineer, Robert lives with his wife in a suburban neighborhood. After experiencing a minor cardiac event two years ago, he was diagnosed with hypertension and heart disease.

Goals

- Keep track of multiple medications
- Remember doctor visits
- Share updates with cariologist
- Feel in control of his health

	Awareness & Setup	Daily Medication Routine	Preparing for Doctor Appointment	Missed Dose Scenario
Actions	• Doctor recommends using a medication management app • Robert downloads the app • Creates account • Inputs medications manually (name, dosage, time, with food)	• Receives reminder notification • Opens app • Confirms medication taken • Reviews daily checklist	• Reviews medication adherence • Checks blood pressure logs • Shares summary with cardiologist	• Misses a medication reminder • Receives follow-up notification • Opens app to check what to do
Pain Points	• Medical terminology confusion • Too many setup steps • Small text and cluttered layout	• Accidentally dismissing notifications • Forgetting if already logged it • Fear of double dosing	• Difficulty understanding the graphs • Too much data at once • Not knowing what's important	• Not knowing whether to take it late • Confusion about next steps
Feelings	1 Curious but slightly overwhelmed	2 Reassured when reminded but still unsure	3 Slight anxiety about results, relieved by consistent data	4 Feeling anxious and guilty about missing dose
Opportunities	• Simple onboarding with large text • "Scan prescription" feature • Step-by-step guided setup • Clear confimation after each medication entry	• Persistent reminders until confirmed • Clear visual confimation • Daily progress indicator • Simple, one-tap logging	• Simple summaries • Clear trend visualization • Printable or shareable doctor report	• Clear, doctor-approved guidance • Contact provider button • Messages written with reassuring tone

Kiara Patel

Bio

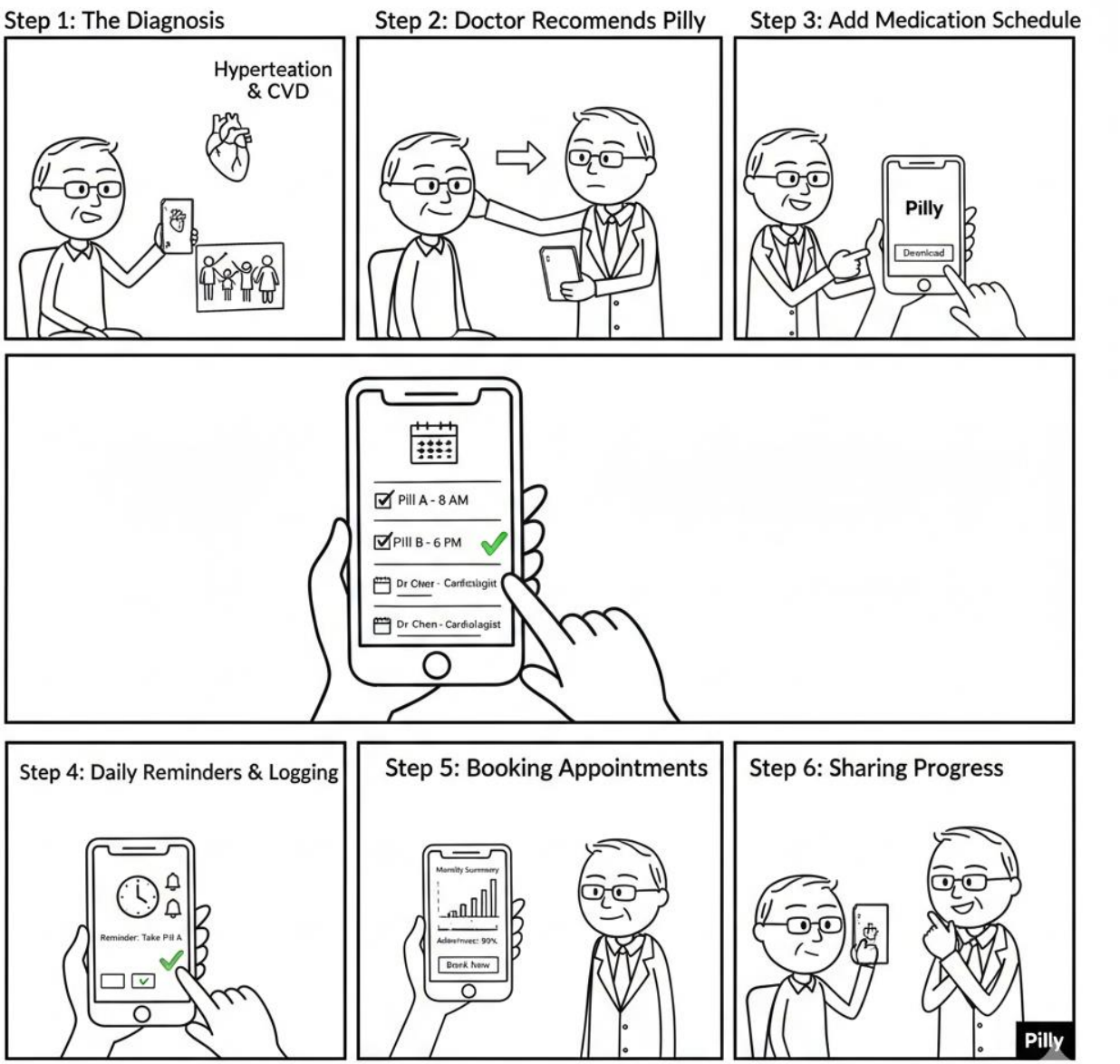
42 year old project manager who balances a demanding full-time career with caring for her 74 year old mother, who was diagnosed with Alzheimer's three years ago. After noticing missed medications and increasing confusion, Kiara stepped in to manager her mother's prescriptions and medical appointments.

Goals

- Ensure her mother takes medication correctly
- Coordinate appointments
- Communicate with doctors efficiently
- Reduce caregiving stress

	Account Setup & Adding Mother's Profile	Monitoring Daily Adherence	Coordinating Appointments	Emergency or Concern Event
Actions	• Creates account • Adds mother as a dependent profile • Inputs medication schedule • Enables notifications for missed doses	• Receives notification: "Medication cofirmed" or "Dose missed" • Checks adherence dashboard • Follows up with mother if needed	• Schedules doctor appointment • Syncs appointment to personal calendar • Prepares health summary before visit	• Noticies irregular pattern in medication adherence • Reviews logs • Contacts doctor through app
Pain Points	• Entering complex medication schedules • Not knowing what permissions are needed • Concerned about privacy/security	• False alarms • Delay in updates • Too many notifications	• Switching between apps • Manually copying information • Appresciates efficiency	• Uncertainy about severity • Slow communication • Lack of clear next steps
Feelings	1 Determined but slightly overwhelmed	2 Relief when dose confirmed, stressed when missed, wanting clear information	3 Slight anxiety about results, relieved by consistent data	4 Anxiety, urgency, need for reassurance
Opportunities	• Guided caregiver onboarding • Clear explanation of permissions • Pre-built medication templates • Secure but simple authentication	• Real-time status updates • Customizable notification frequency • Clear "Taken / Missed / Snoozed" indicators	• One-tap calendar integration • Appointment reminders for both caregiver and patient • Automatic health summary generation	• Highlighted "Irregular pattern detected" alerts • Quick-access contact button • Clear guidance for escalation

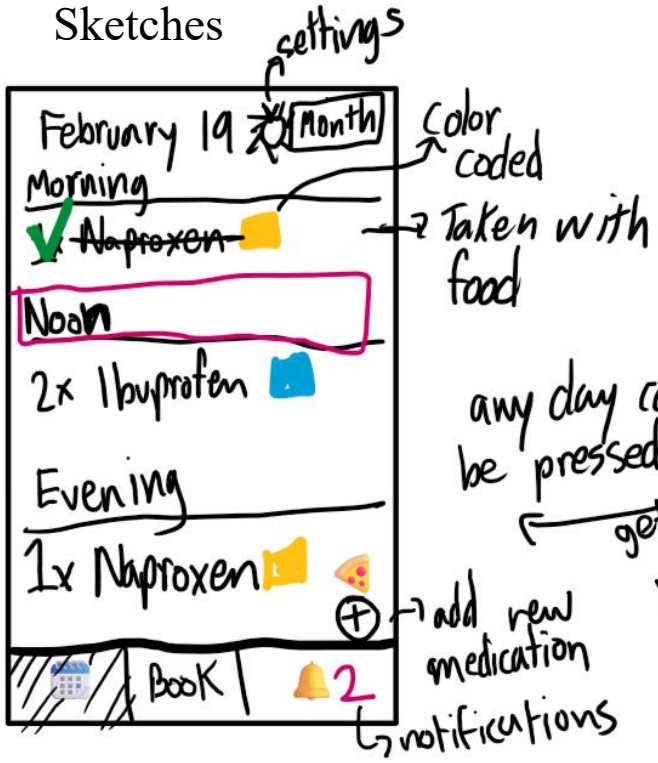
Storyboards



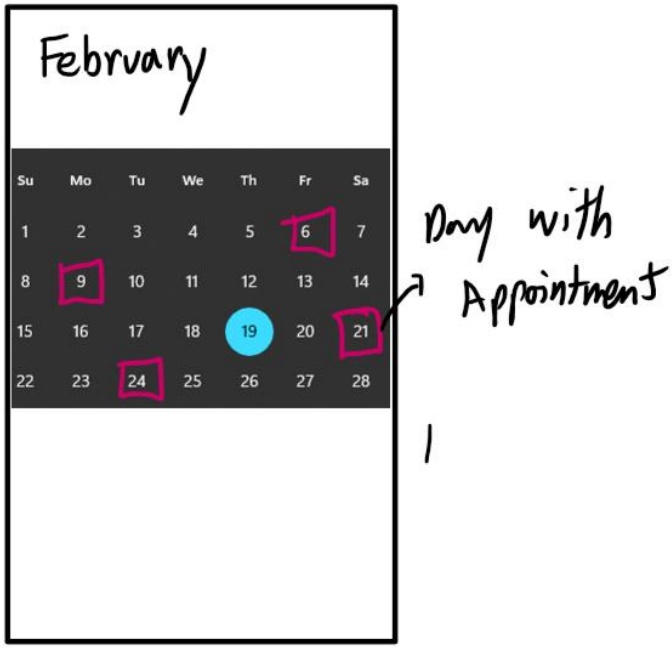

1
Kiara downloads Pilly for her and mom
2
Kiara sets herself as a caregiver on the app
Caregiver
Kiara Patil
Patient
Aslka Patel
Add Medications
For Mom
Pill A - 9 AM
Pill B - 7AM
Pill B - 7AM
4
Mom's Appointments
Book Appointments
All Good!
3
Pilly: URGENT! Mom missed 9 AM dose
6

Home Screen

Sketches

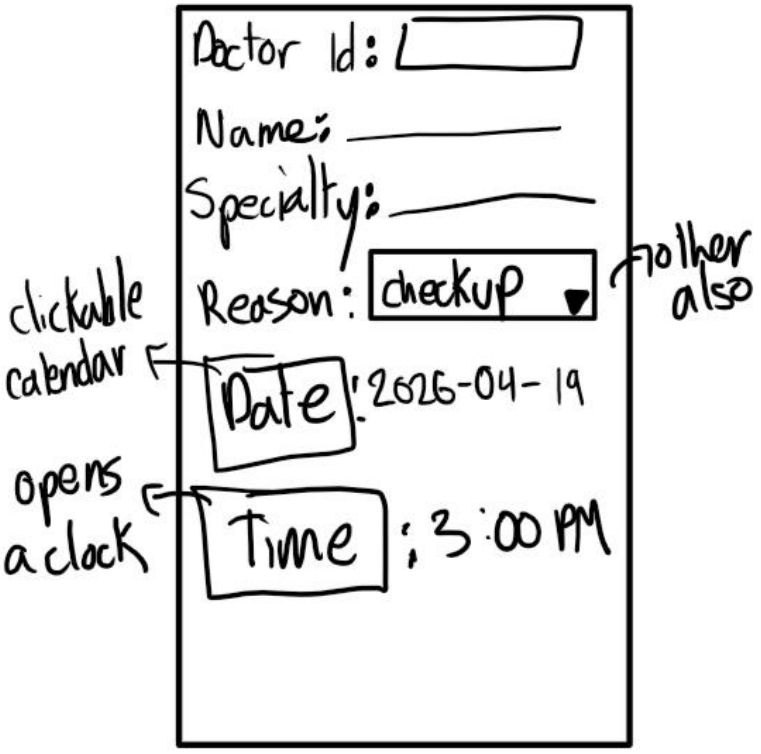


Month View

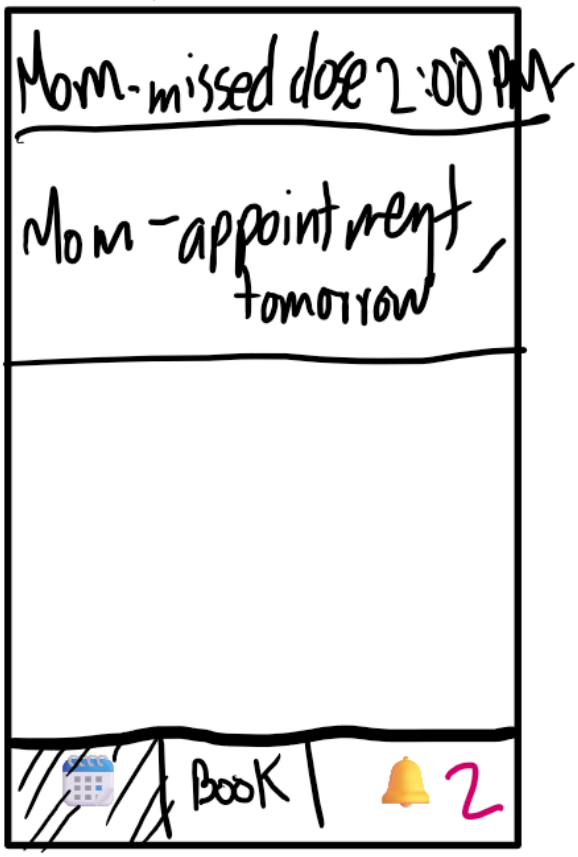


Add medication

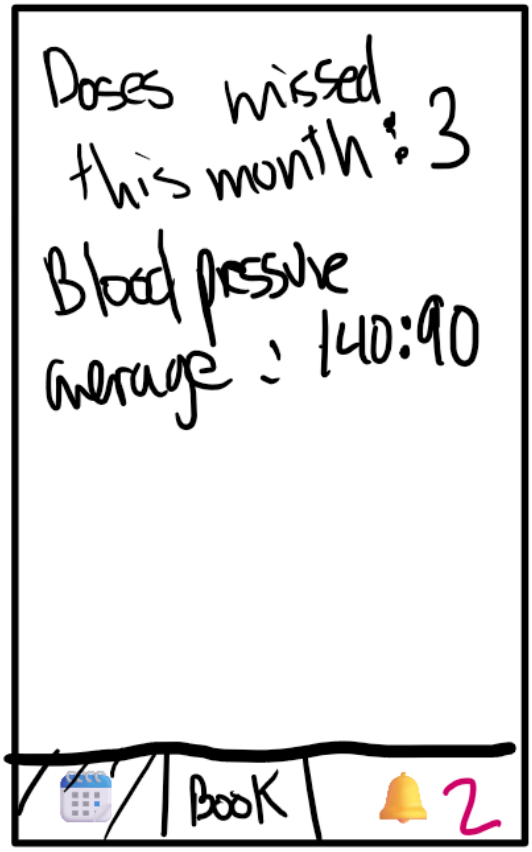
Book appointment



Notifications



Report



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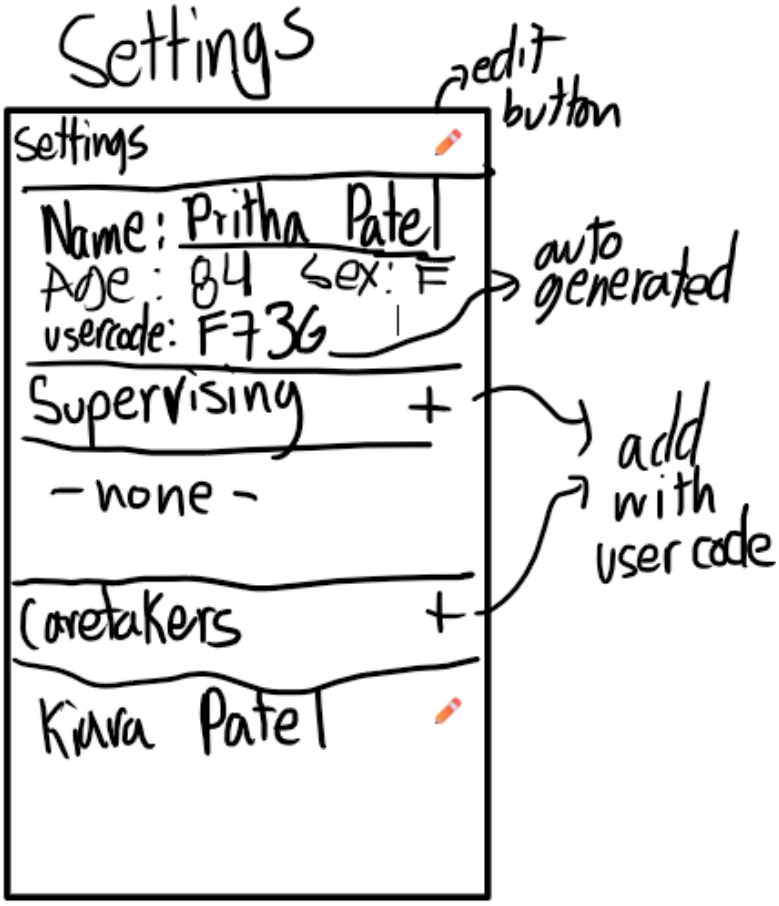
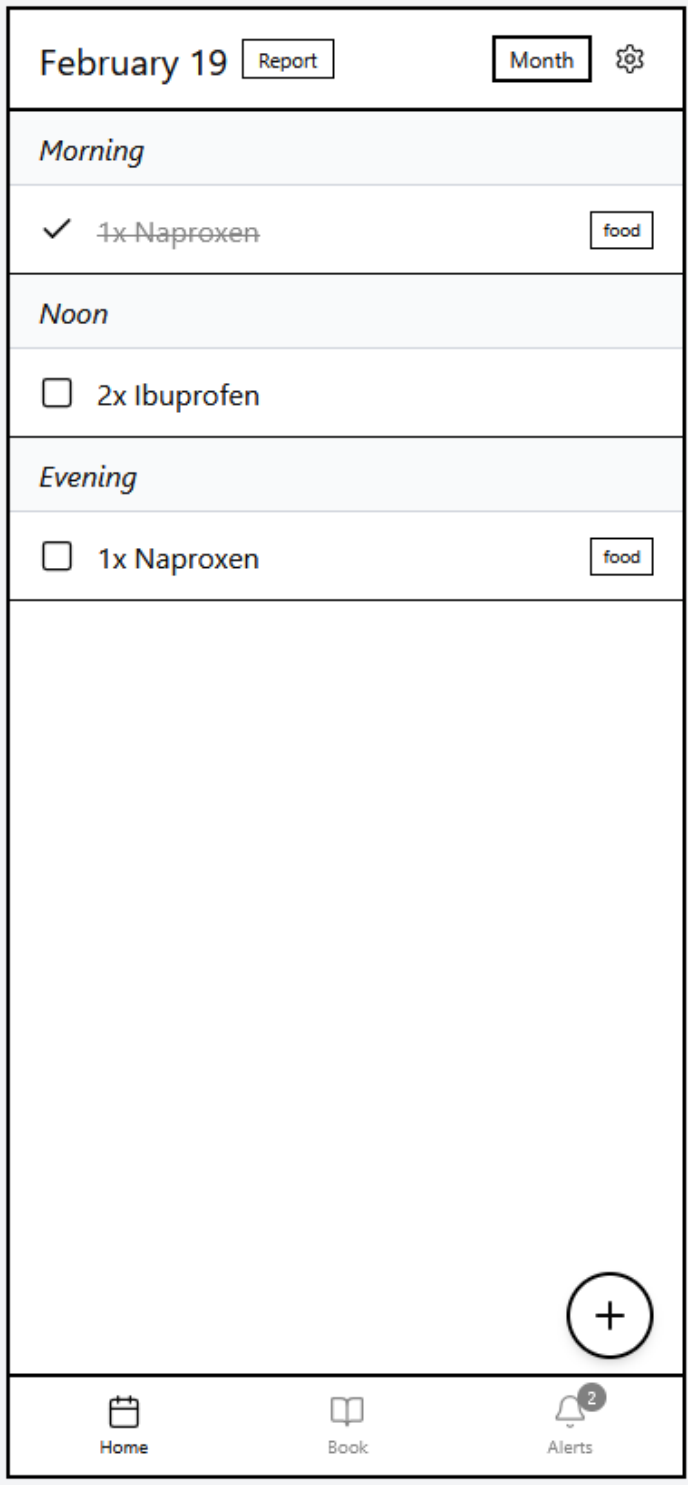
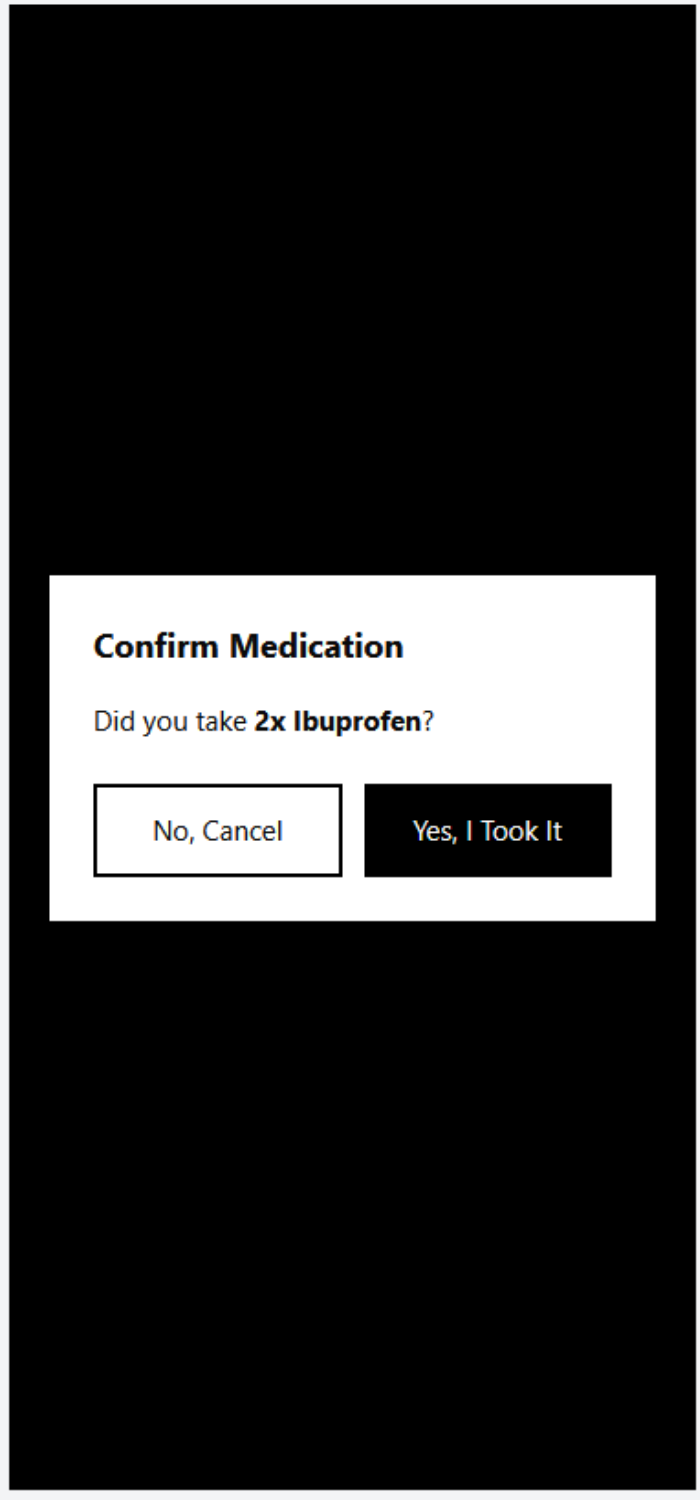
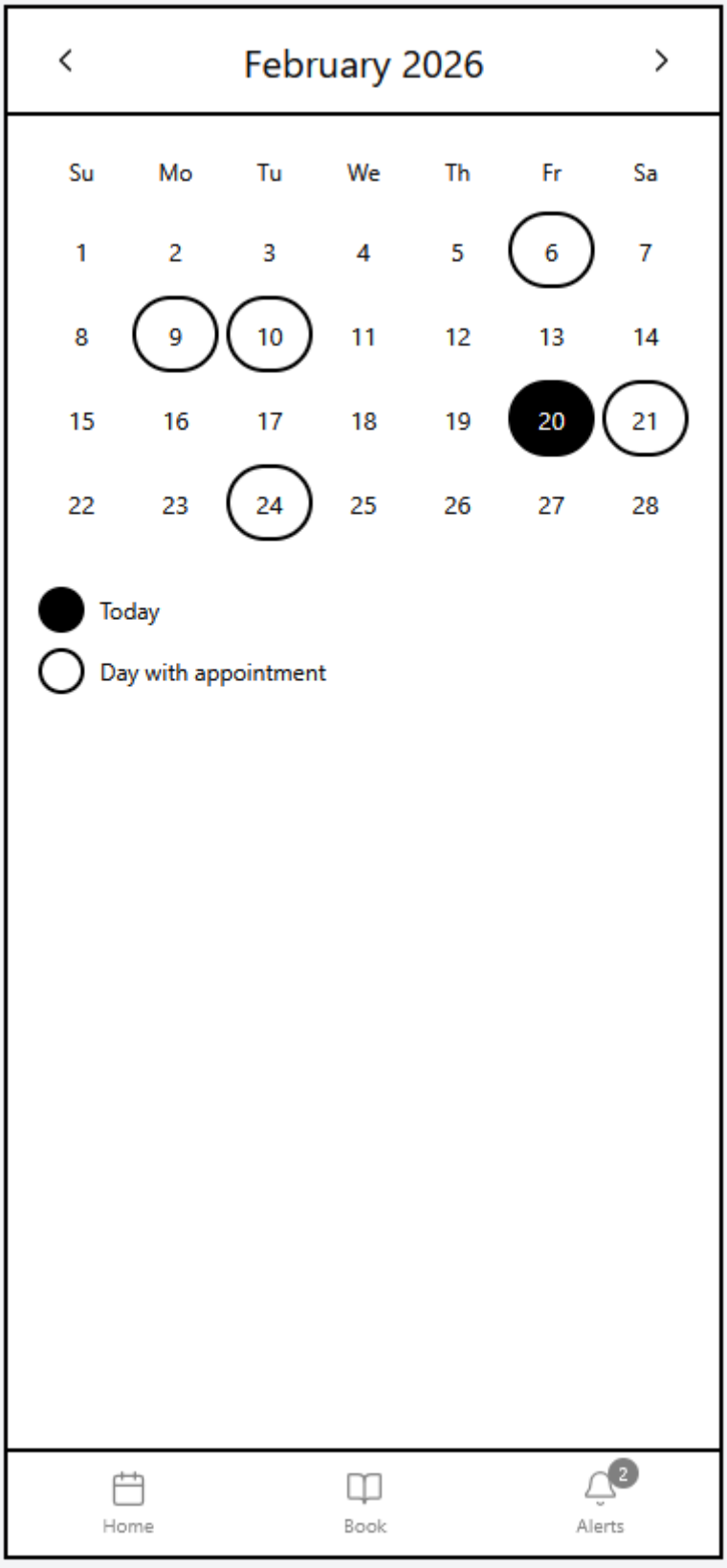
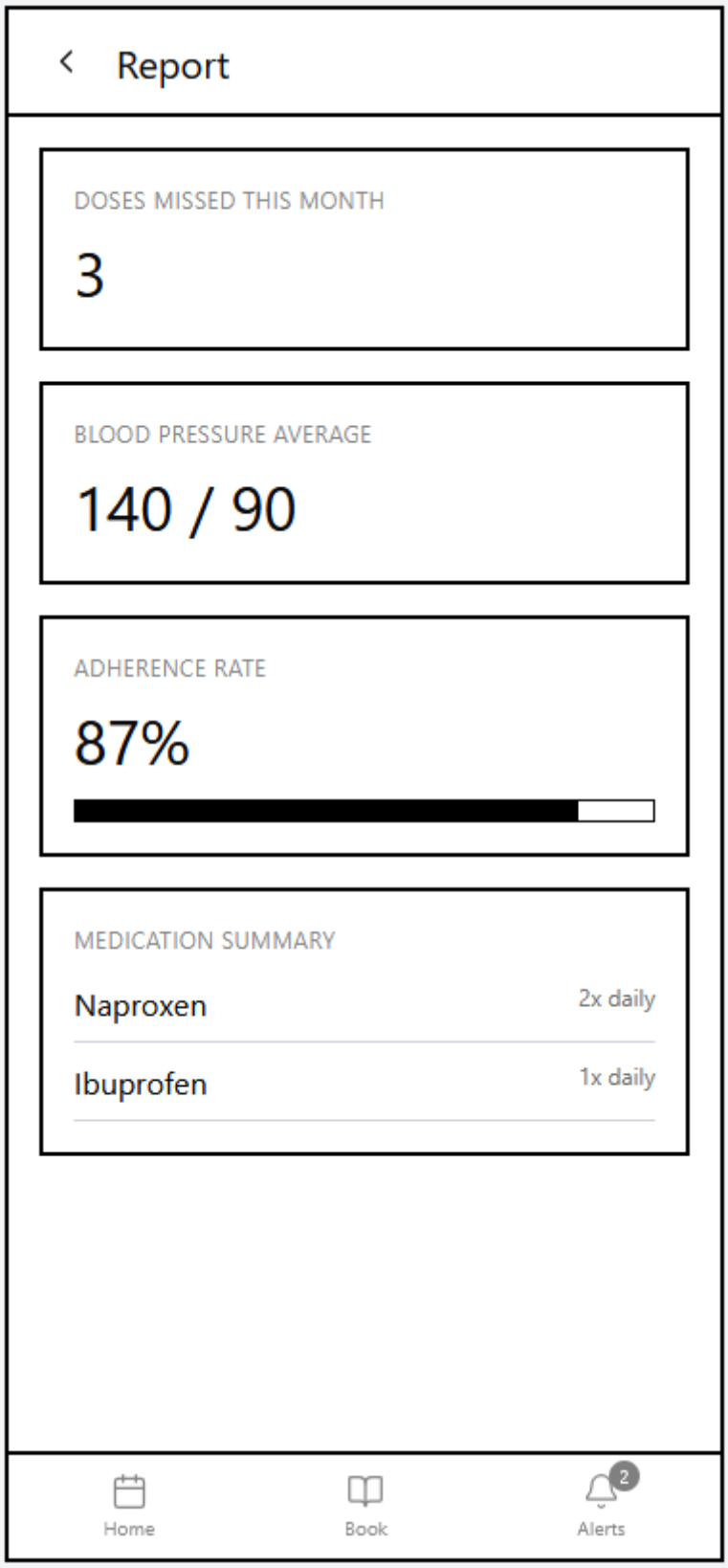


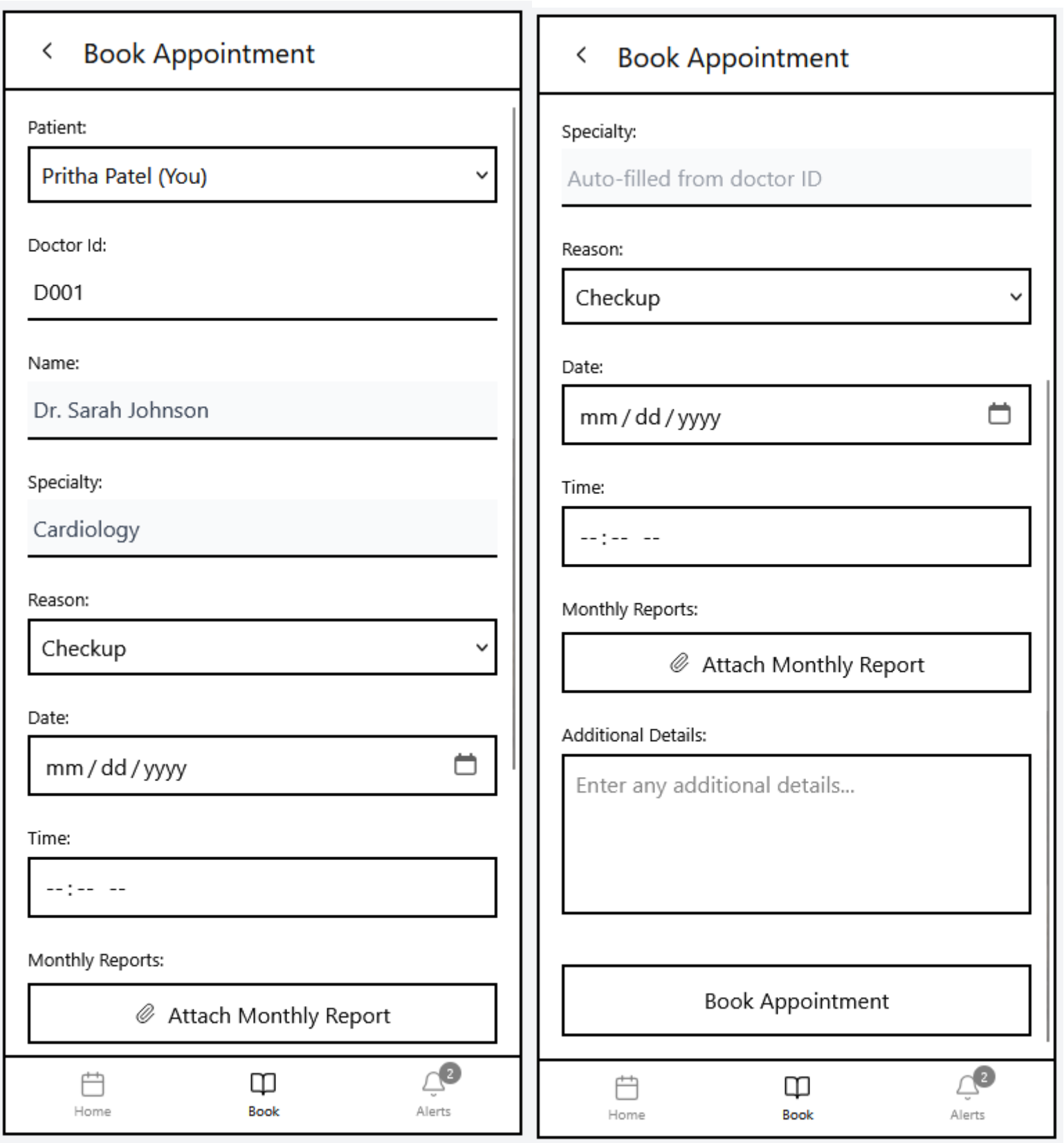
Wireframes

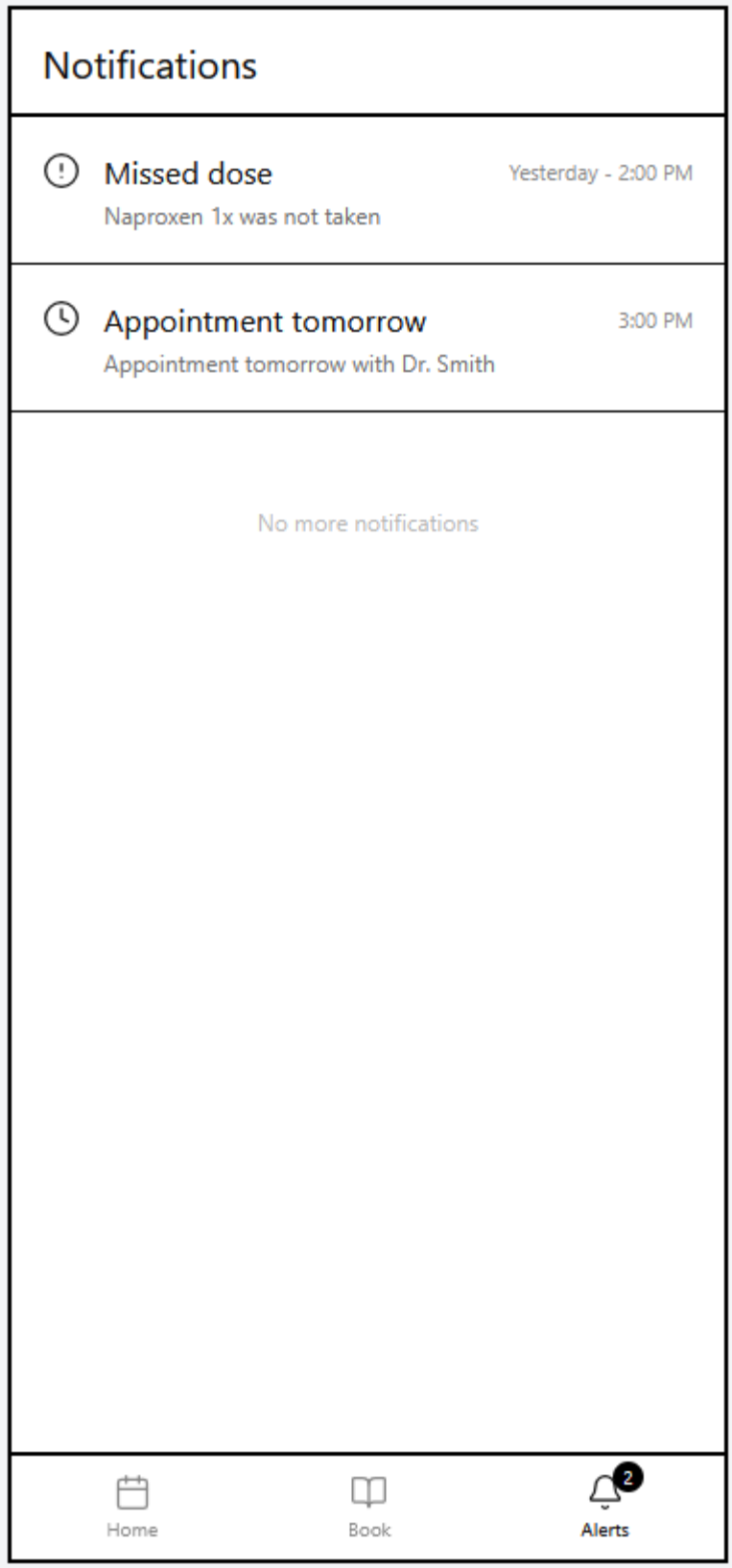

February 19
Report
Month
Morning
1x Naproxen
food
Noon
2x Ibuprofen
Evening
1x Naproxen
food
Home
Book
Alerts
2

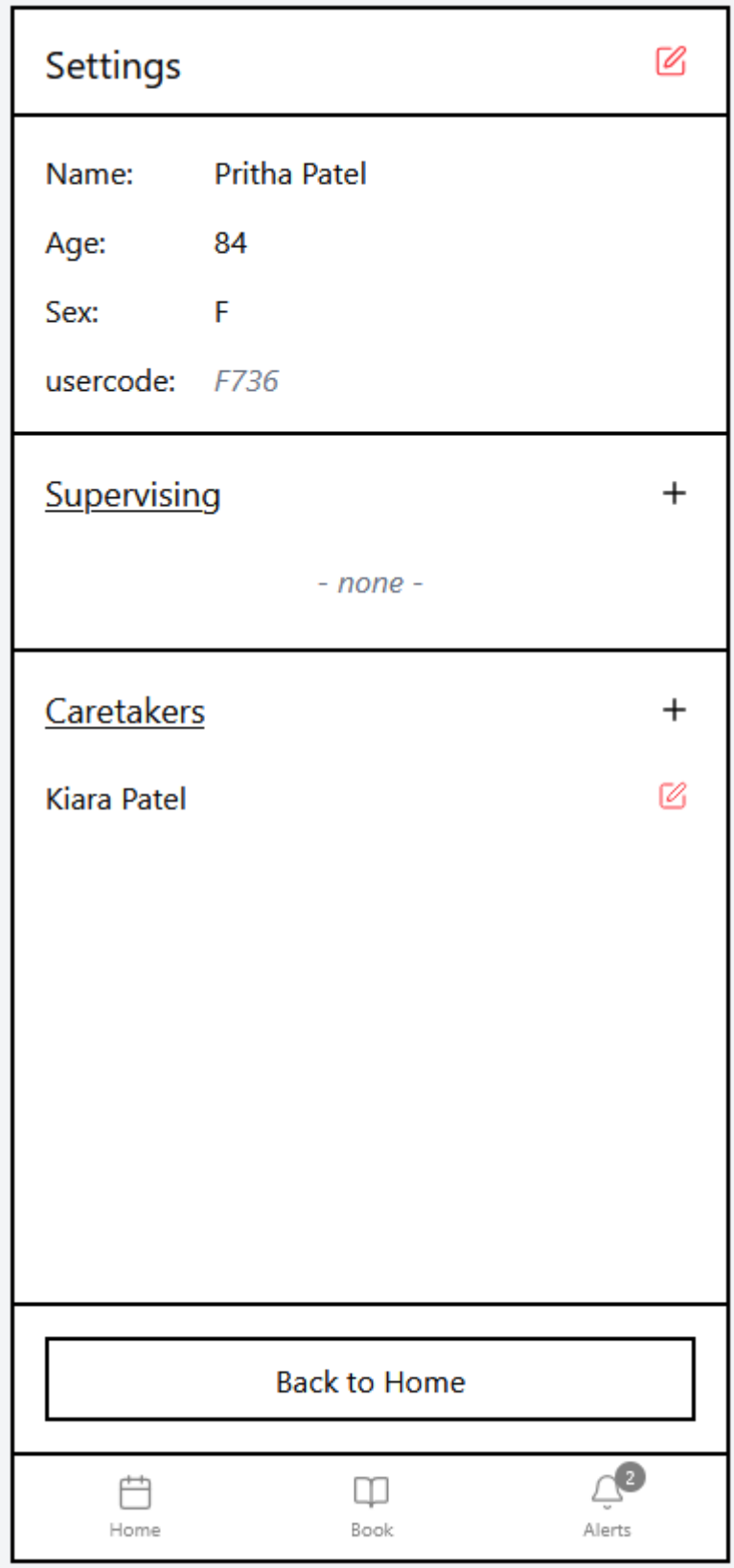

Confirm Medication
Did you take 2x Ibuprofen?
No, Cancel
Yes, I Took It


February 2026
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
Today
Day with appointment
Home
Book
Alerts
2


Report
DOSES MISSED THIS MONTH
3
BLOOD PRESSURE AVERAGE
140 / 90
ADHERENCE RATE
87%
MEDICATION SUMMARY
Naproxen
2x daily
Ibuprofen
1x daily
Home
Book
Alerts
2


Book Appointment
Patient:
Pritha Patel (You)
Doctor Id:
D001
Name:
Dr. Sarah Johnson
Specialty:
Cardiology
Reason:
Checkup
Date:
mm / dd / yyyy
Time:
--:-- --
Monthly Reports:
Attach Monthly Report
Home
Book
Alerts
2
Book Appointment
Specialty:
Auto-filled from doctor ID
Reason:
Checkup
Date:
mm / dd / yyyy
Time:
--:-- --
Monthly Reports:
Attach Monthly Report
Additional Details:
Enter any additional details...
Book Appointment
Home
Book
Alerts
2


Notifications
Missed dose
Yesterday - 2:00 PM
Naproxen 1x was not taken
Appointment tomorrow
3:00 PM
Appointment tomorrow with Dr. Smith
No more notifications
Home
Book
Alerts
2


Settings
Name: Pritha Patel
Age: 84
Sex: F
usercode: F736
Supervising
- none -
Caretakers
Kiara Patel
Back to Home
Home
Book
Alerts
2

Prototype

Included is a link to the Figma prototype. This prototype iterated on the wireframe, adding functionality, responsiveness, and improving readability and accessibility.

Usability Test

The goal of the usability testing plan is to evaluate whether users with chronic illnesses, and their caretakers, can efficiently use the app to manage their medication and appointments. The important things to assess are: how easily users can understand and navigate the calendar and daily medication views, whether they can correctly schedule, modify, and confirm medication whether alert and caretaker features are clear and trustworthy for users, and whether users feel confident sharing summaries with healthcare professionals. Along with these listed goals, it also important to identify any pain points for users while operating Pilly, since patients will chronic illnesses are often times already managing fatigue, stress, and other complications.

Participants would include individuals with chronic illnesses who regularly manage their medication schedule, and a small group of caretakers. During testing, users would be asked to complete realistic tasks using the prototype. These tasks could comprise of: adding a new medication as taken and confirming the action, editing or removing a scheduled medication, booking an appointment with a healthcare professional, adding/removing a caretaker profile, and viewing the monthly summary report. We would observe the completion time, error count, hesitations, clarification requests, as well as expressing their thought process out loud to better understand their instincts and emotions using the app. Semi-structured interviews at the end of the test could give participants a good opportunity to express their feelings, concerns, or compliment elements of the apps design. Designers could also learn about aspects of the user experience that the previous surveys didn't touch on.

In order to collect feedback from the testers, a mix of qualitative and quantitative methods would be appropriate. This could include observation notes, a short Likert scale question following each task, and a long post-test questionnaire asking about the clarity and stress level of using the app.

Once all the testing has concluded, the feedback would need to be analyzed. The issues brought up by participants should be categorized by severity (critical, moderate, minor), as well as by the frequency (how many users experienced the issue). Issues marked as critical, that prevent users from doing core actions in the app concerning medication schedule and appointment booking should be prioritized, as well as those which were experienced by many testers. Finally, a second round of similar tests could be performed to evaluate whether the changes made were enough to address the issues brought up in the first round of testing.

Reflection

The UX design process played a very important role in helping to better understand the real needs of a medication tracking app like Pilly. From a developers point of view, its natural to start thinking in terms of technical features and architecture, but with the help of user research and the creation of personas from that research, it helps developers think more empathetically about the end users who will be relying on the app to help them stay healthy. Robert's situation highlighted the important of simplicity, readability, and low cognitive load, while Kiara's role as a caretaker for her mother emphasized shared information access and notifications, which might not have been originally considered as necessary features for Pilly. User journeys also helped under stand the various emotional states and pain points of these personas while trying to accomplish their tasks.

One big challenge while designing the application was trying to find a balance between features/complexity and simplicity. The app needed to have a lot of functionality built into it with medication schedules, appointment booking, notifications, and summary reports, but displaying all this information at once could overwhelm the user, hindering their usage of the app. Lastly, useability testing would help evaluate the accessibility and user efforts made during the design process, and point out additional areas of possible improvement for an iterative design process.

Bibliography

Brown, M. T., & Bussell, J. K. (2011). Medication adherence: WHO cares?. *Mayo Clinic proceedings*, *86*(4), 304–314. https://doi.org/10.4065/mcp.2010.0575

W3C Accessibility Guidelines (WCAG) 3.0. W3C. (n.d.). https://www.w3.org/TR/wcag-3.0/