

Figure 2: User persona 'Sasha', a married medical professional career woman



Figure 3: User persona 'Abigail', a lonely divorced single mother

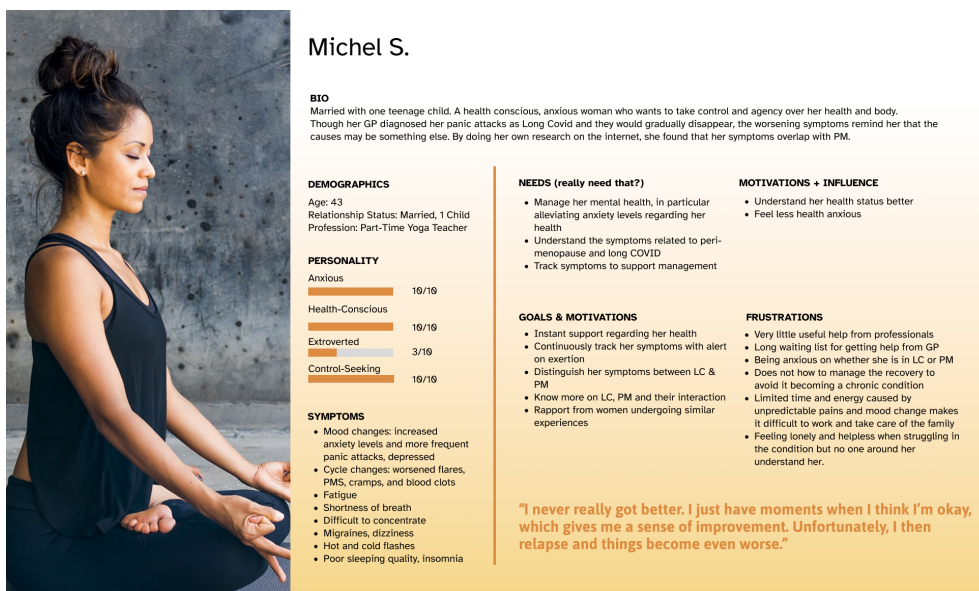


Figure 4: User persona 'Michel', a health anxious mother with a teenage child

THE “BUSY CAREER” USER

BACKGROUND + CONTEXT

Sasha is a busy neurosurgeon working at Great Ormond Street Hospital in the pediatric neurosurgery ward. She is extremely dedicated and data-driven. She is married but has no kids, and barely gets to spend time with her partner due to her busy schedule. Due to the extremely high-stress job condition, she has always had a very irregular menstrual cycle, headaches, and various other 'symptoms' that she always blamed on her stress. If she suspected anything else, she simply brushed it off saying that she doesn't have time to care for herself since patients were relying on her.

STORY

Sasha started using PAUSE just over three months ago, recognising that she needed to track her symptoms over an extended period of time for the resultant data to be informative for her and her GP. One morning when she has scheduled a day off work, she wakes up and finds that her period has started - her fourth since beginning use of the app. She decides that it is time to discuss her symptoms with her GP, and books in an appointment for the next day.

During the day, she experiences a resurgence in fatigue and brain fog, having not felt either symptoms significantly over the past two weeks. She also slept particularly poorly, waking up in the middle of the night. At the end of the day, PAUSE reminds her to log her symptoms. She opens up the app where she is automatically logged in. On the **Insights** tab, her perimenopause match displays 75%, a value she notices has been steadily increasing over the past few months. She navigates into the **Log Data** tab to indicate that her fatigue and brain fog has been Very Intense and Intense respectively, in addition to other symptoms such as her poor sleep. She follows this by pressing the **Log Period Start** button, also under the **Symptoms** button, indicating the spotting as intense. When returning to the **Insights** tab, she notices that her perimenopause match has increased to 77%.

The next day, she opens up the app again, and after toggling the Symptom Insights visualisation to the 'monthly' setting, selects the symptoms that she has found the most difficulty with over the past three months: brain fog, fatigue, vaginal dryness, and poor sleep. She then uses the **Export Data** function to generate a comprehensive PDF document with this graph, which she saves to her phone. Later that day at her GP appointment whilst discussing her situation, she is able to illustrate her point much more effectively by showing this visualisation. Her GP spots that many of her symptoms seem to coincide with the latter part of her luteal phase, indicating that they most likely stem from perimenopause. Whilst not entirely ruling out long COVID, the GP recommends her to a specialist, and prescribes initial pain medication typical for women going through menopause.

The clarity Sasha gets from this meeting makes her feel that a burden has been lifted off of her shoulders, and she feels optimistic that with the help of her GP and specialist, she can now start on the road back towards her normal life.



Figure 5: Background and user scenario for 'Sasha'

THE "ISOLATED" USER

BACKGROUND+ CONTEXT

Abigail is a 59-year-old single mother who divorced 5 years ago. She rarely communicates with her children and doesn't get along well with them. She is introverted, has a small social circle and likes to be alone. After her divorce, she has been suffering from intense mood swings and suffers from anxiety and depression, waking up 2-3 times during the night. She also notices other symptoms such as muscle aches and extreme fatigue, which she had thought were normal symptoms of menopause. However, she suspects that some symptoms were caused by Long Covid but is unsure and no one encourages her to search for more information about the causes of her symptoms.

STORY

Whilst searching up articles on menopause and long COVID, Abigail comes across mentions of the PAUSE app. Feeling particularly mentally and physical unwell, she decides to give it a go, downloading it onto her phone. Although initially apprehensive, she finds the onboarding experience quick and reassuring. She is particularly comforted by the comprehensive nature of the COVID and perimenopause data input, which lists many of the symptoms that she herself has been going through. She is pleasantly surprised by the app's **Integrate Menstrual Data with external app** function. After doing this, she begins to explore the app's main functions.

She is immediately drawn to the **Connect** tab. Under the **Discussion** tab, the first post happens to be titled 'Experiences with COVID and intense mood swings?', which instantly resonates with her. She clicks into the post, and spends a few minutes reading through the post and comments, liking those which she finds particularly helpful. Even within this first post, she feels a great sense of community, and realises that what she is going through may be shared by many women around the world. One user, called 'marageorge', has written a comment detailing her experiences as someone going through a divorce. She decides to click on her profile, and after adding her through the **Friends** tab, sends her a direct message introducing herself.

She next decides to enter the **Explore** tab, where suggested **Courses** are displayed. She decides to give the 'Tackling Insomnia' course a try, given its relevance to her own symptoms. Upon completing one of the lessons, she receives a pop-up notification congratulating her, including a gift of 100 points. She sees these points updated on her progress bar, and this feedback gives her a warm sense of achievement that she is taking steps to improve her own situation. Whilst going through the course, she receives a notification that 'marageorge' has replied to her direct message. Navigating back to the **Connect** tab, and then the **Friends** tab, she reads the reply, where the user enthusiastically says how great it is to find another woman of her age going through her situation. Abigail spends the next few minutes conversing with this woman, and even this brief conversation makes her feel significantly less alone.



Figure 6: Background and user scenario for 'Abigail'

THE “HEALTH-ANXIOUS” USER

BACKGROUND + CONTEXT

Michel is a married mother of one who is used to leading a highly health-conscious lifestyle. As a yoga practitioner, much of her physical and mental health is linked with having a keen understanding of her mind and body. After contracting COVID a year ago, she has been suffering from what her GP states are the typical symptoms of long COVID, such as mood changes. However, she has also noticed coinciding changes to her menstrual cycle and cramping. The uncertainty in her health only exacerbates the anxiety and panic attacks she goes through, and she desires to seek clarity in this aspect of her life.

STORY

Michel has been using PAUSE for just over a week, and has already been finding the comprehensive tracking functionality of the app very useful. At the start of every day, PAUSE is the first app that she opens. On the **Insights Page**, her **Symptom Score** provides an immediate reminder on managing her symptoms throughout the day; on this particular morning, a simple 'Take it easy today,' message is displayed. Users can choose to log their symptoms at any point in the day. For Michel, she prefers to do so in the morning. After logging the intensity of her usual symptoms, such as fatigue, shortness of breath, and migraines, she then uses the **Add Symptom** button, as she has just started experiencing hot flashes as of the day before.

Michel has also made taking courses in the **Explore > Learn** tab a part of her morning routine. In particular, she is determined to complete all the courses under the Perimenopause section, given that this was the primary reason she started using the app. After spending 15 minutes to complete the 'Nutrition and Supplements for Perimenopause' course, she receives a feedback notification that she has progressed to Level 5, which made her feel accomplished. The gamification of 'earning' badges encourages her to continue engaging in the educational resources and community features. She feels that hearing other people's stories and engaging with others going through this niche issue helps her learn more about symptoms that she had previously been confused and stressed out by.

The following morning after logging her symptoms again - including the recent intensity of hot flashes - she notices that her **Perimenopause match** has reached 75%. For her, this is enough impetus for her to book an appointment with her GP to investigate this matter. Whereas before she felt reluctant to take action, given her own anxiety regarding her uncertainty, the app has now given her the confidence to take the matter into her own hands.

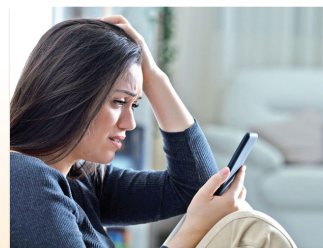


Figure 7: Background and user scenario for 'Michel'

User Requirements:

To formulate user requirements for PAUSE, we explored several health behaviour and digital intervention theories [4]. The Persuasive System Design model best matched the aims of our application, and it outlines how design and communication elements of software can be best structured to cultivate the adoption and maintenance of desired behaviours, including ones related to health [5]. The model emphasises four design features to illustrate how conceptual principles translate into software requirements:

- **Primary task support** (supporting an intervention's primary goals)
- **Dialogue support** (feedback through virtual support techniques)
- **Social support** (leveraging social and normative influences to facilitate observing/learning from others and permit cooperation in achieving behaviour change goals).
- **System credibility support** (providing credible information to users that demonstrates competence and expertise)

Ultimately, we developed a final set of user requirements that best meet the aims of PAUSE:

1. A detailed yet user-friendly symptom, activity, nutrition, and menstrual cycle tracking tool.
2. Clear data visualisation of the user's health progress that can be exported and shared.
3. Personalized and customisable notifications that encourage the user to regularly input health data.
4. A community feature that allows users to interact and connect with other women with similar lived experiences.
5. Educational resources retrieved from validated empirical sources that are provided in an interactive and accessible format.

Design Rationale:

The design process commenced with the development of low-fidelity wireframes through a Crazy 8s sprint (appendix B). Through dot voting, we narrowed our scope to the wireframes that we considered to best fit our user requirements, followed by the creation of mid-fidelity versions of our selected screens (appendix C). These were then iterated based on the system design features proposed by the Persuasive System Design model, adapted from [6].

PAUSE Features:

Primary Task Support:

Self-monitoring: Users can log, update, and monitor their activity, nutrition and symptoms related to PM and LC, and indicate the severity and add personal notes (figure 8, 9).

Personalisation:

- Users can customise which symptoms they want to track and view in their health progress report (figure 8).
- Users can customise when and what type of notifications they want to receive.
- Users have a personalised 'For You' explore page with custom educational content (figure 10).
- Users have a personalised profile page containing all their health data (figure 11).

Reduction: Detailed symptom tracking is made easy through reminders and simple data entry tools, providing visual and data-based feedback for users to download and share with their healthcare provider to assist in a more accurate diagnosis.

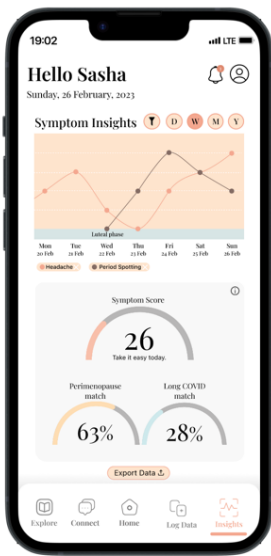


Figure 8: Symptom progress insights

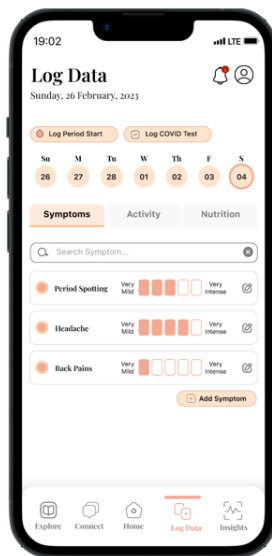


Figure 9: Data logging page.

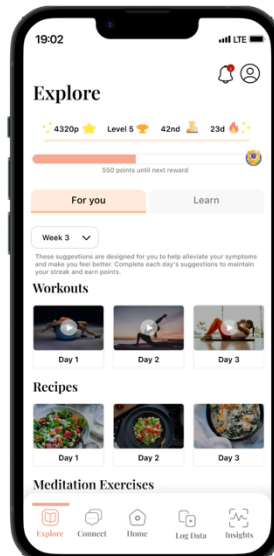


Figure 10: Personalized explore page

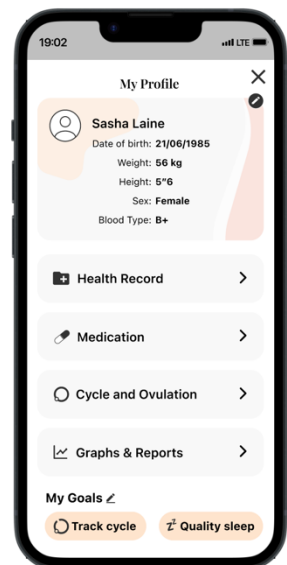


Figure 11: Personal health profile

Dialogue Support:

Rewards: Users can accumulate points and gain badges for logging their symptoms consistently, for completing courses and for engaging in community forums, and then use their points to grow their virtual garden (figure 13, 14).

Reminders: Users receive scheduled notifications to ensure they log all their symptoms and menstrual cycle changes consistently (figure 12).

Suggestion: The app provides suggestions for activities that could help alleviate symptoms (figure 10).

Liking: The application was designed to have an appealing and sleek colour scheme for women.

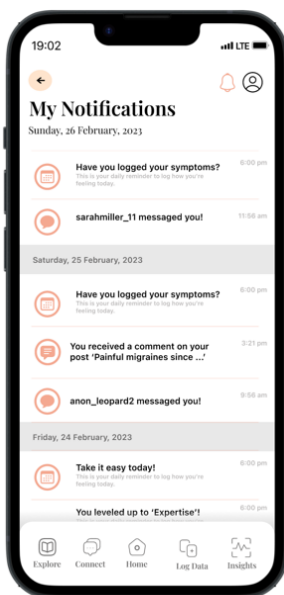


Figure 12: Notifications hub.

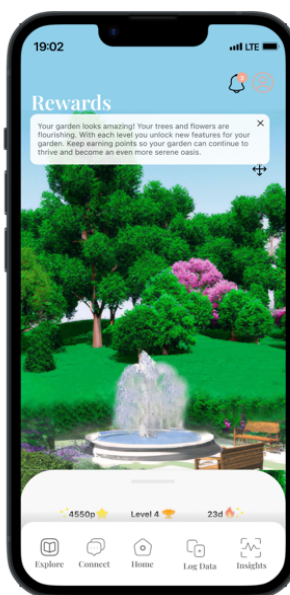


Figure 13: Virtual garden.

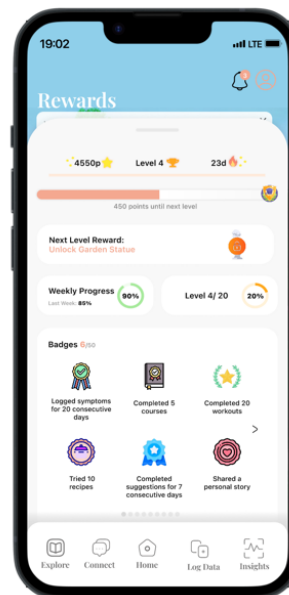


Figure 14: User progress and rewards dashboard

Social Support:

Social comparison: Users can compare their level of engagement to other users by seeing which badges they have won (figure 15).

Normative influence: The app provides a platform for women experiencing similar health conditions/symptoms of PM and LC, creating a community for sharing advice and personal stories.

Cooperation: The 'connect' feature provides a hub for cooperation where women can post questions, blogs or stories about their health experiences and enter discussions (figure 16, 17).

Recognition: Public recognition is implemented through the badge rewards system, where users can observe others' levels of engagement (figure 15).

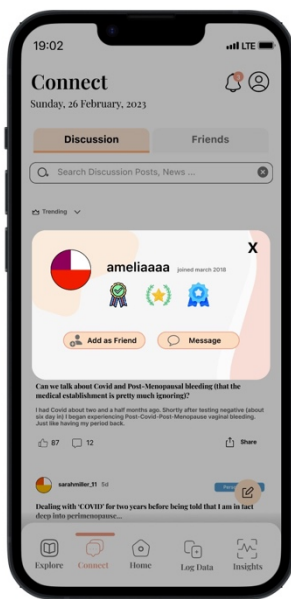


Figure 15: Badge awards.

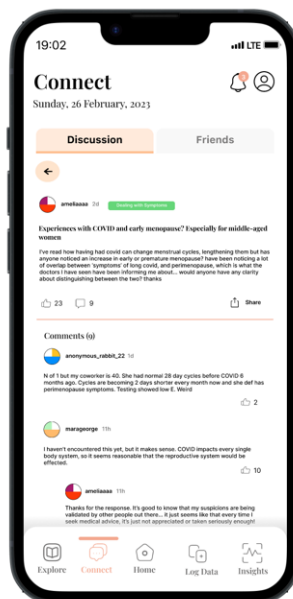


Figure 16: Community feature

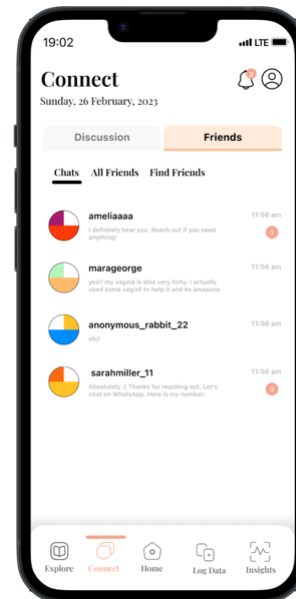


Figure 17: Direct messaging feature

System Credibility Support:

Trustworthiness: The app provides evidence-based information from peer-reviewed resources. Onboarding includes validated questionnaires for symptom status with long covid [9] and perimenopause [10] (figure 18-21).

Expertise: All information is sourced from relevant medical experts (figure 19).

Verifiability: Information is verifiable through external resources and referenced within the application for users to check.

Surface credibility: The app has a credible, professional look and feel.

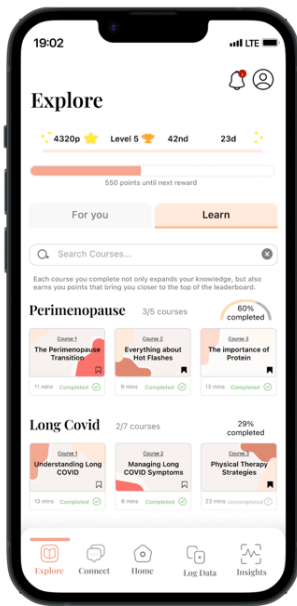


Figure 18: Educational courses.

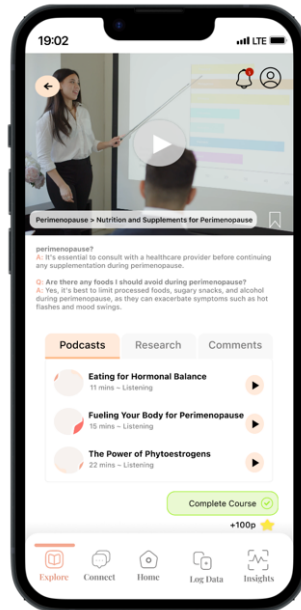


Figure 19: Educational content.

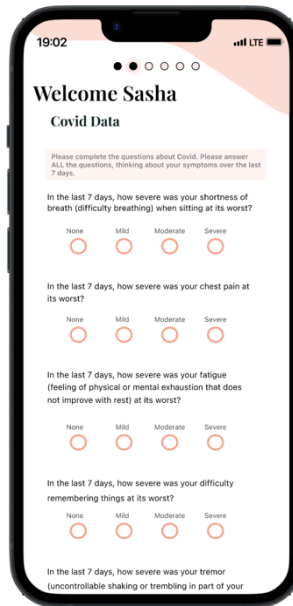


Figure 20: long COVID questionnaire.

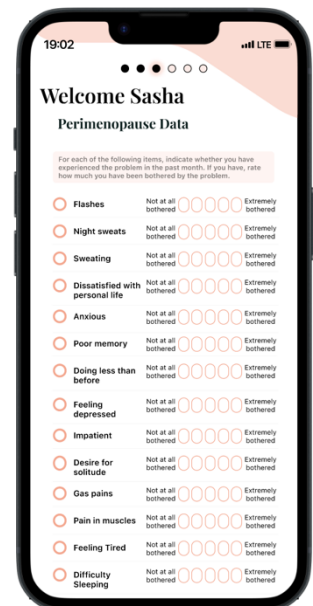


Figure 21: perimenopause questionnaire.

User Testing:

Aims

We employed a user-testing approach guided by the Persuasive System Design Model (PSDM), with a particular focus on ensuring high usability and user-friendliness of our product – PAUSE. As such, we aimed to obtain detailed feedback that guided refinements in the product, enabling more effective primary task, social, dialogue, and system credibility support.

Methods

We observed 8 female participants aged 22-50 and solicited feedback on onboarding, logging symptoms, community engagement, discovering resources, and evaluating insights (appendix D). Participants provided informed consent (appendix E, F). We evaluated the interactive elements and user experience with a high-fidelity prototype, and identified issues related to the app's heuristics [11], assigning a severity score of 1-5: 1 indicating mildly time-consuming issues, and 5 indicating issues preventing task completion (appendix G). Positive usability features were also noted.

Findings

Participants provided feedback that text and button sizes should be increased for easy navigation, and actions should be more intuitive. We updated our mockups to reflect these changes (more details in appendix H).

Primary Task Support - Log Symptoms

Logging symptoms should be easy and frictionless. Thus, we made deletion more intuitive and reduced the number of clicks in logging a new symptom.

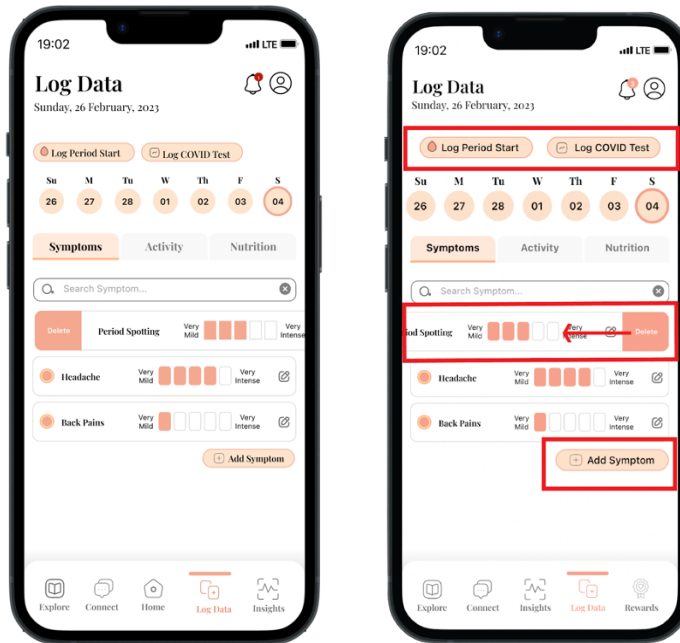


Figure 22.1: Initial (left) and redesigned (right) symptom tracking

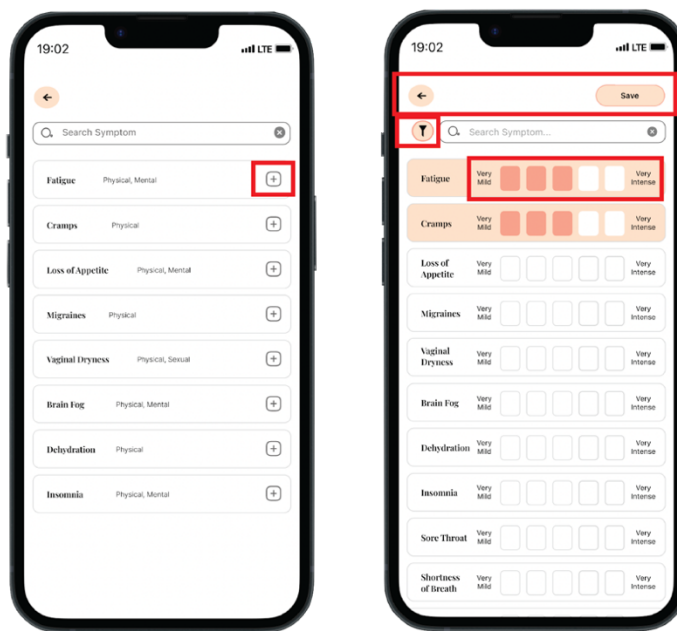


Figure 22.2: Initial (left) and redesigned (right) 'Add Symptom' screen

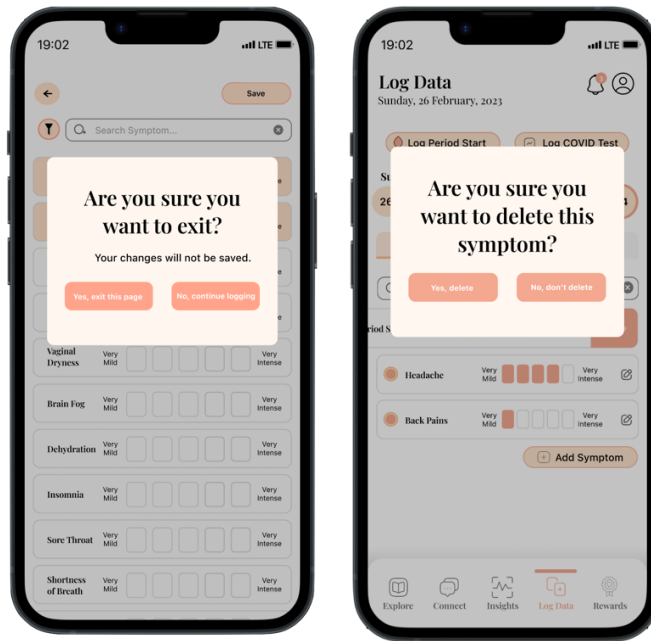


Figure 22.3: Added confirmation to prevent user error upon exit and deletion

Primary Task Support - Insights

'Log Symptoms' was added to the Insights page for users to easily update their symptom data.

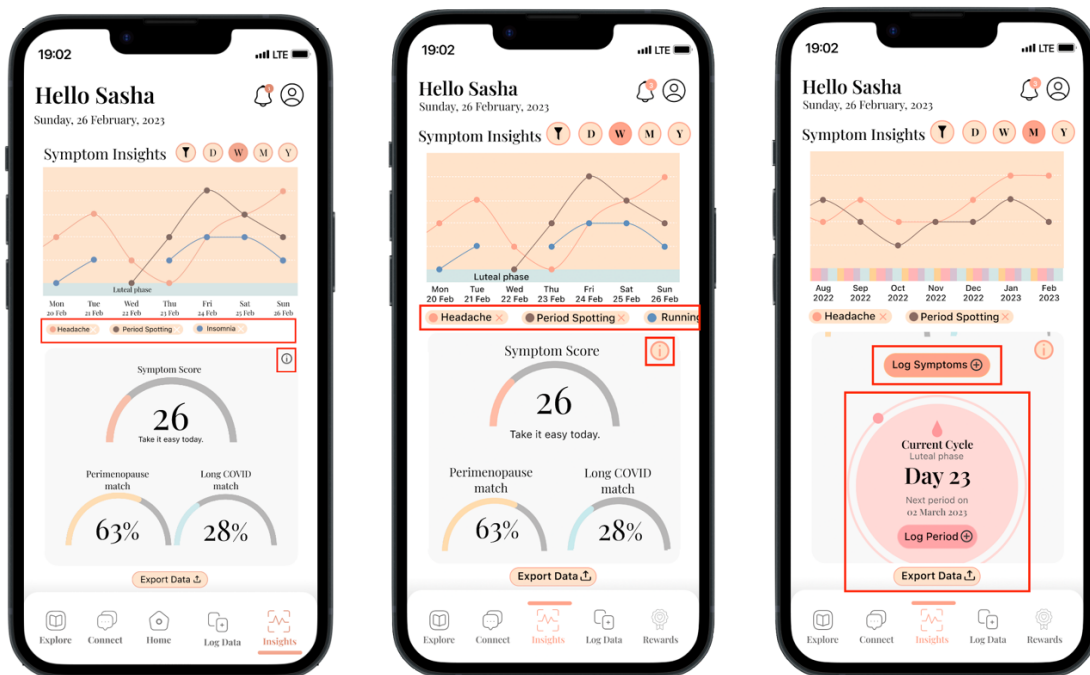


Figure 23.1: Initial (left) and redesigned (middle, right) insights screen.

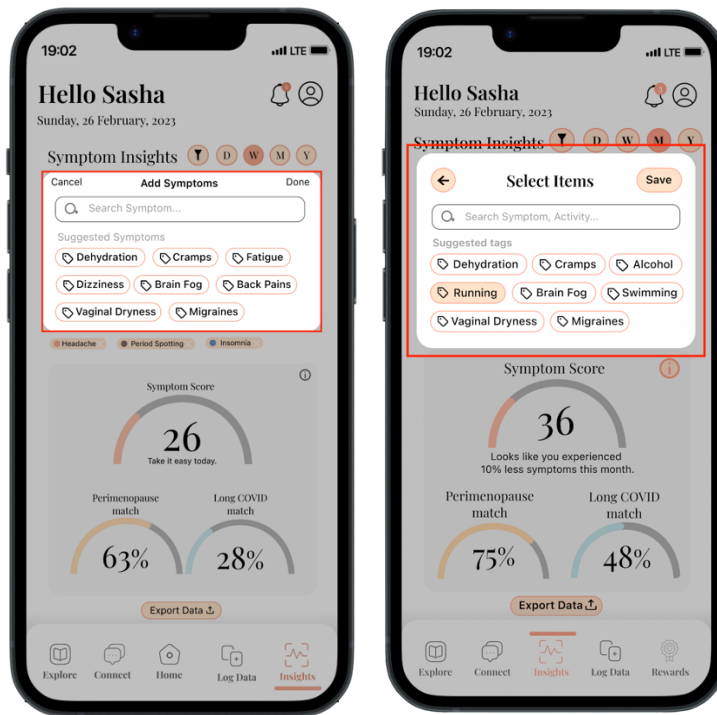


Figure 23.2: Initial (left) and redesigned (right) insights filter

Social Support

'Connect' allows users to engage with others through discussions and direct messaging. To promote a safe environment, participants suggested to anonymise all users, remove easy sharing, and have a privacy setting restricting chats from 'Friends'. Furthermore, 'Levels' were made visible so others can identify users' engagement and removed footer for single articles so users can read it better.

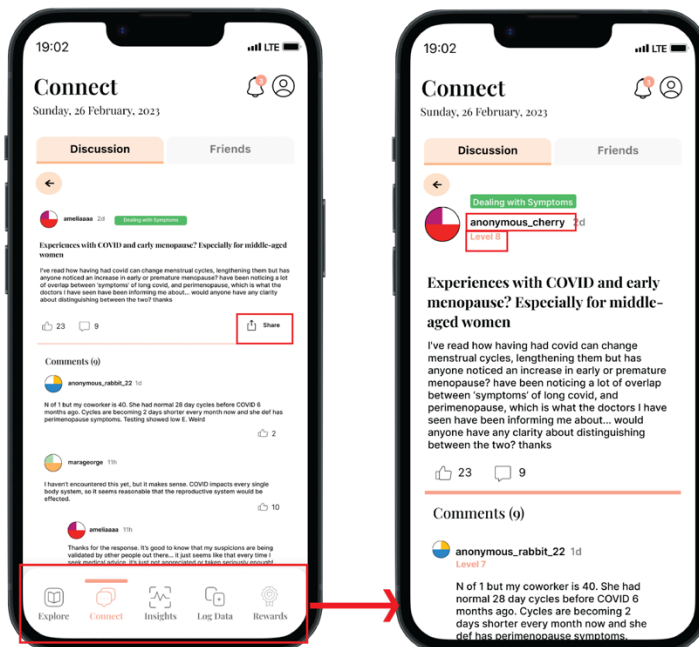


Figure 24.1: Initial (left) and redesigned (right) discussion page

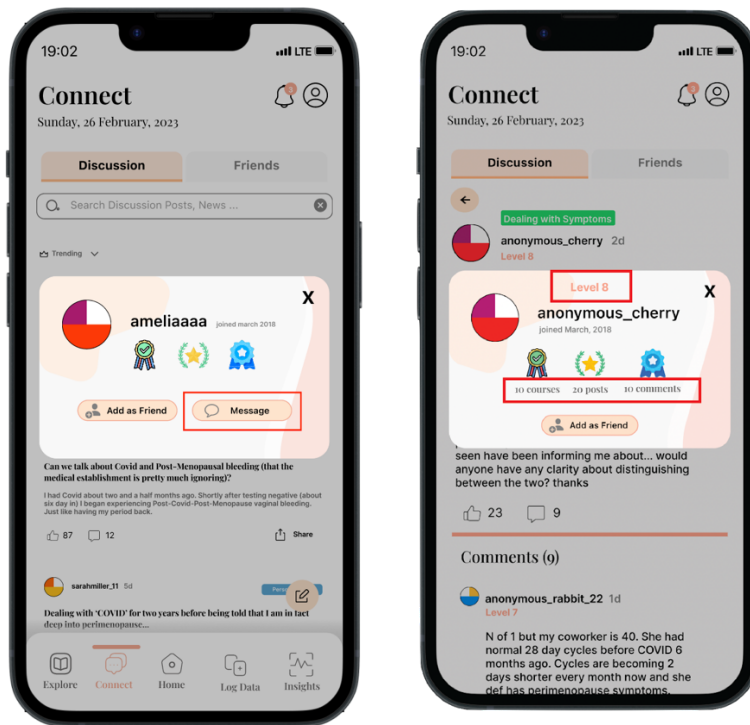


Figure 24.2: Initial (left) and redesigned (right) user profile window

Points and Rewards

A pop-up notification was added to inform users of task completion and the points earned. This is expected to encourage users to engage more actively.

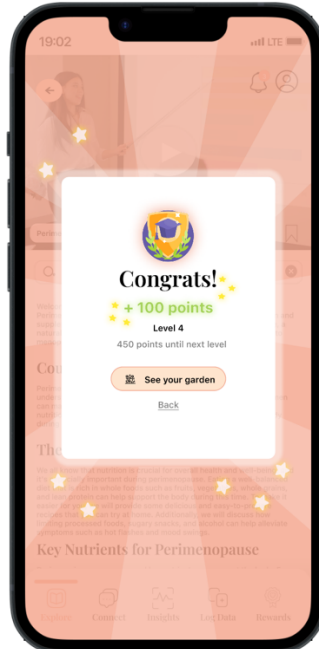


Figure 25.1: Task completion pop-up notification

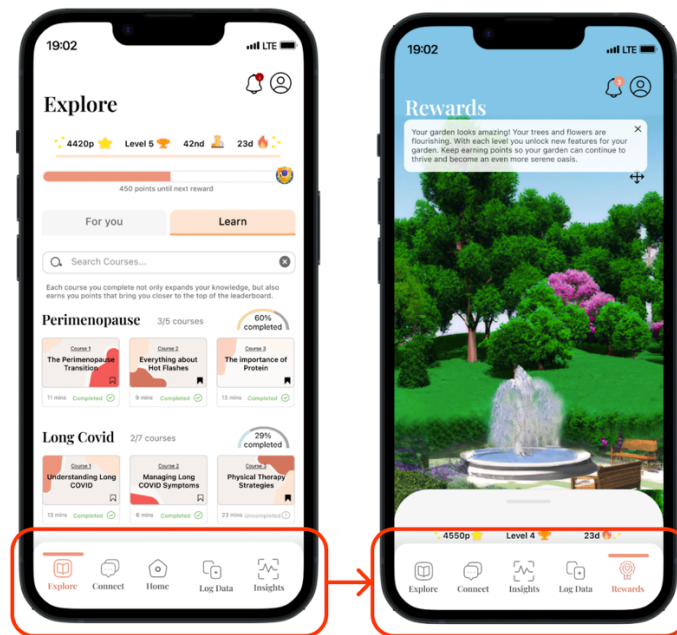


Figure 25.2: Included a new section in the footer for viewing rewards.

Dialogue Support

Participants liked the notifications feature deeming it helpful. Six participants found the Garden feature redundant and were sufficiently motivated by badges and levels.

System Credibility Support

Participants agreed that the 'Research Papers' on 'Explore' provided immediate credibility to the information provided. Two participants suggested that having clinical experts as 'verified' users would further increase their trust.

DISCUSSION

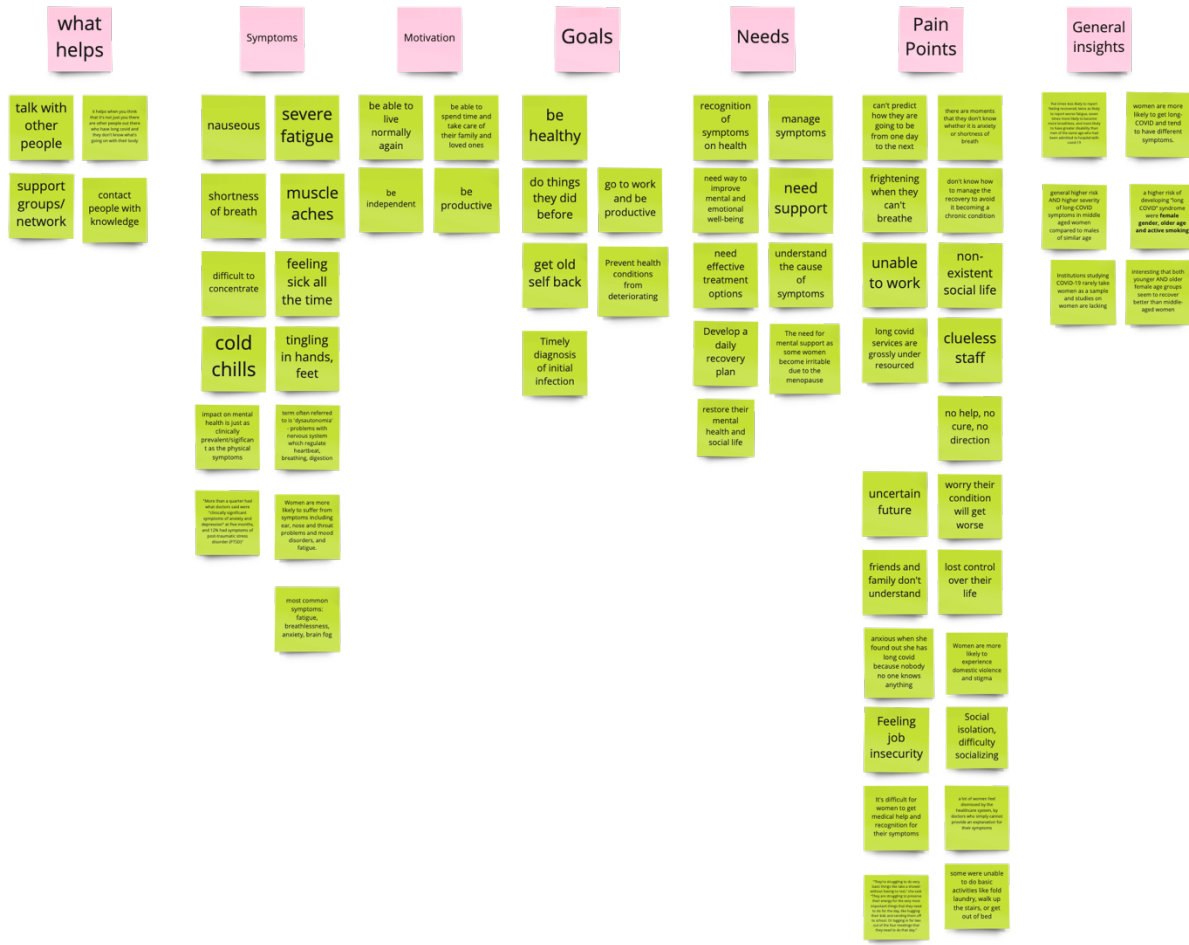
We could not recruit participants navigating long COVID and/or perimenopause due to time limitations. To obtain more representative user insights, a group of participants from our target population is necessary for further testing. To better understand user retention and long-term behavior change, future work should include a diary study. Additionally, an empirical study could determine the most effective gamification feature to encourage usage.

Our application values user privacy and data protection and will comply with GDPR regulations, provide two-factor authentication, and offer transparent information on how user data is being used and stored. Pause allows users to export and share data with their GP, but users retain control over what they share. Clinicians can integrate this information into the patient portal as an attachment for a comprehensive overview of their patient's health.

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Appendix A: Affinity Mapping for user persona development



Person 1 - Abigail

Age 33
Marriage Status: Divorced, three adult children, her children have moved out of the house already, remaining child is at university so she is usually by herself at home
Relationship: Divorced
Health status: She was going through menopause before she caught COVID. Thanks she just has menopause now.
Triggering Scenario: caught a flu virus in her office. She is very emotional and has been having chronic mood swings. She was always known to be the "happy" one but she hasn't been feeling herself. Needs support from others who are going through the same thing.
Her personal events have also led to a loss of her social activity and poor social connection on a daily basis.

Main Need: COMMUNITY SUPPORT

Person 2 - Sasha

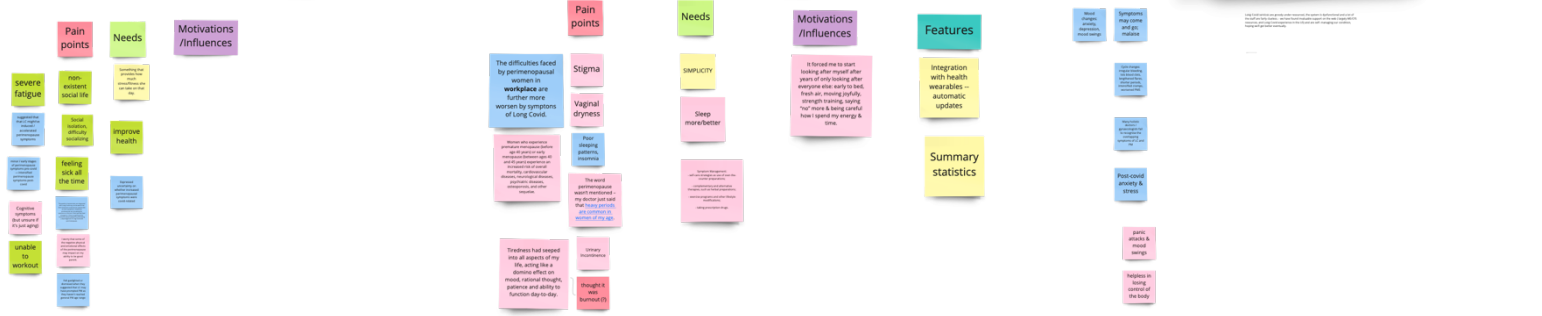
Age 37
Marriage Status: Married, no children
Profession: Surgeon
Health status: Perimenopausal, but others think she only has long COVID. She suspects maybe menopause too. Her OBGYN friend off-handedly mentioned that all her symptoms sound like perimenopause.
Triggering Scenario: Has perimenopause, had previously been infected by COVID, is told she is too young to be in perimenopause stage and it's probably just the stress of long COVID symptoms. She was told that just that's not true. She has no knowledge about perimenopause. However, she actually has premature onset perimenopause due to COVID. Super stressed and has irregular period.

Main Need: SIMPLICITY

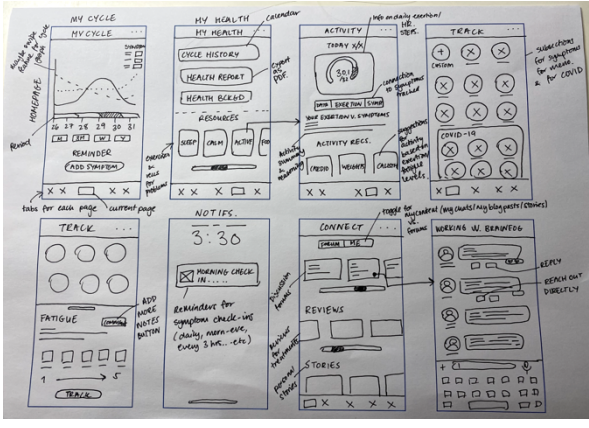
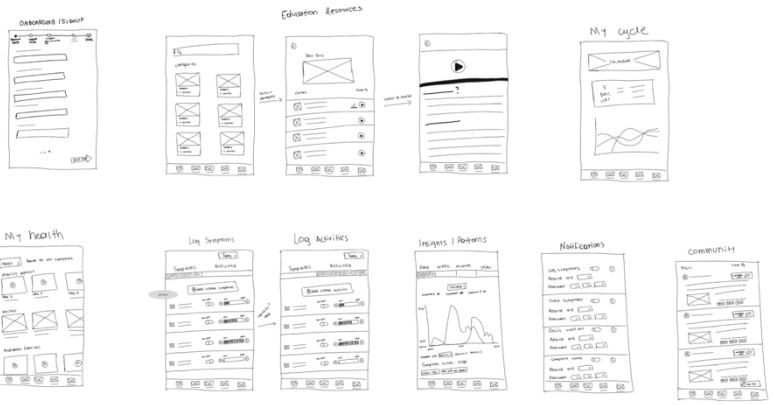
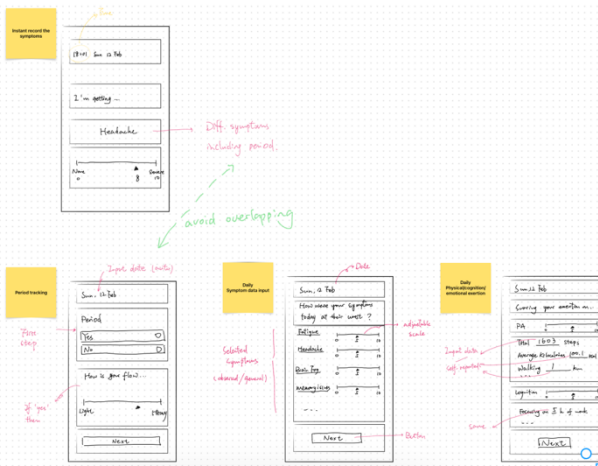
Person 3 - Michel

Age 43
Relationship Status: In a Relationship, 1 child
Profession: At home mother, part time yoga teacher
Health status: Both Perimenopause + Long COVID
A health conscious, anxious woman, wants more features available, likes details, likes to have control + agency over her own body (journal feature?), Has minor OCD and anxiety/panic attacks.
Triggering Scenario: She did a LOT of research about Long COVID and found this app first. She didn't realize that COVID can cause premature onset of menopause and became nervous that she also has both. She wants to be 100% sure about what's going on in her body.

Main Need: MENTAL HEALTH + PEACE OF MIND



Appendix B: Crazy 8s low-fidelity wireframes



Appendix D: User testing task script provided to all user testers

User testing tasks

Ask participants to do the following user testing tasks based off the following user requirements:

- Detailed, yet user friendly symptom and menstrual cycle tracking
- Personalised notifications and reminders to encourage users to input symptoms as well as manage physical and mental health
- Educational resources retrieved from validated scientific sources as well as first-hand personal stories
- Community feature allowing users to interact and connect with other women with similar lived experiences
- Gamification

Our aim for this user test is to evaluate how effective Pause is in providing the four pillars of support outlined in the persuasive system design model.

The tasks are delineated below in a step-by-step format. After each section, conduct a short semi-structured interview to gain insights on the participant's thoughts and feelings in regards to the task. We have outlined example questions to ask that directly relate to our aim.

Usability - Onboarding

- Fill out your information

Sample questions:

- How comfortable did you feel filling out the onboarding?
- Did you find it easy to fill out?

Scenario - Track Symptoms

- Access the application through notification on home screen
- Search for **Period Spotting** in search bar to search your currently logged symptoms left over from yesterday
- 'X' out of your search to return to the original list of three symptoms: **Period Spotting**, **Headache**, and **Back Pains**
- Delete the symptom **Period Spotting** because you realised that you may have your period rather than just spotting. This will be useful knowledge later.
- You have a major headache today. Worse than yesterday. Update your intensity level for **Headache to Level 5**.
- You are experiencing **Fatigue** and **Cramps**. Please **add these symptoms** to your log.
- Log intensity for **Fatigue to Level 2**.
- Log intensity for **Cramps to Level 1**.
- As we mentioned, you realise you weren't spotting but rather you started your period/menstruation a few days ago. Uh oh, irregular periods are a hallmark of perimenopause. To track your menstrual patterns, **please log the start of your cycle**.
- It began a few days ago so please click the date arrow back.
- Log your period flow to **Level 2**

Sample questions:

- Do you think this would be easy to do every day?
- Do you feel that the notification was helpful?
- Did you feel supported by the app in achieving this task?

Scenario - Educational Resources + Gamification

- Navigate to **"For You"** page in **Explore** tab
- Go to the **Learn Tab**
- Access **Perimenopause Course 4** on "Nutrition and supplements for perimenopause"
- Watch the educational video and skim through the resource information.
- Navigate to the **"Research"** resources
- Record that you have completed the course.
- Congrats! Navigate to **Your Garden**
- Explore your virtual garden and **Rewards** page

Sample questions:

- Did the garden provide motivation for you to engage with the application?
- How credible and trustworthy was the information provided by the app?
- Did you feel the Explore page was personalised to you?

Scenario - Community feature

- Go to your **Notifications**
- You have a message! Click on **ameliaaa's** message to you
- Chat with **ameliaaa**.
- Once she responds, go to the community **Discussion**.
- You want to learn more about others who have **Experience with early menopause, especially for middle-aged women**
- Read the thread regarding this topic and **submit a comment**
- View the author of the thread's profile
- Message the author of the thread directly
- Right! You just chatted with her :) Go back to the discussion forum
- Write your own post and submit**
- Go back to discussion, and filter to your posts to see your post

Sample questions:

- Did you feel that you trust this user's story? What would make it more or less credible?
- Did you enjoy being able to see the user's badges and levels in their profile? Would this motivate you?
- How safe and/or comfortable did you feel posting in the community page?
- How safe and/or comfortable did you feel directly messaging another user?
- How do you feel about having this sort of community interaction?

Scenario - Insights

- Navigate to **Insights** tab. Look at your **"weekly"** insights instead of "monthly".
- Look at your symptom insights for the symptoms **"Headaches"** **only** the past week.

- You can also look at more information on what your symptom score means by clicking the **information** icon
- Add the activity "running" into your insights graph.
- Export health data

Sample questions:

- Did the data visualisation help you understand your symptoms and what is going on in your body better?
- Did you find it useful?
- Do you know what you would do with this information?

Usability - My profile

- Navigate to "My Profile" icon
- Check your "Health record"

General Questions

Which screen(s) do you think are not intuitive to you, and why?

Name one thing you would like to change about the app (e.g., add or delete)?

Which feature of the app did you value the most? Why?

Any additional feedback

Appendix E: Information Sheet

UCL INTERACTION CENTRE
RESEARCH•CONSULTANCY•SEMINARS•COURSES



Information sheet

UCLIC Research Ethics Committee Approval ID Number:

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study: Designing an app for Human Factors for Digital Health

Department: UCLIC

Researcher(s): Monika Sikorska (ucju172@ucl.ac.uk) Arthur Chan (ucjuhc@ucl.ac.uk) Jade Lam (cheuk.lam.22@ucl.ac.uk) Ioanna Lazaridou (ucjulaz@ucl.ac.uk) Tianhui He (tianhui.he.22@ucl.ac.uk) Jennifer Higa (jennifer.higa.22@ucl.ac.uk)

Principal Researcher: Aneesha Singh (aneesha.singh@ucl.ac.uk)

This study has been approved by the UCLIC Research Ethics Committee: Project ID number:
UCLIC_2023_002_Teaching_HF4DH

1. Invitation Paragraph

You are being invited to take part in my user study. Before you decided it is important for you to understand why this study is being done and what participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

2. What is the project's purpose?

The aim of this project is to understand the user experience of an app designed to address a health condition. In this project specifically, we will be looking at perimenopause and long covid.

3. Why have I been chosen?

You have been invited to participate because you are:

- Aged 18 or over
- Able to communicate effectively in English, and do not consider yourself to be a vulnerable adult.
- Able to give informed consent.

4. Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. You can withdraw at any time without giving a reason. If you decide to withdraw you will be asked what you wish to happen to the data you have provided up that point. Note that it will not be possible to withdraw your data once the interview is completed as it will not be possible to identify the anonymised transcript.

5. What will happen to me if I take part?

You will be invited to participate in an interview, in which you will be invited to use a prototype app that has been designed to support an aspect of a health condition. In this case the app is for tracking perimenopause and long covid symptoms and providing health management advice to users experiencing symptoms related to these conditions. You will be asked questions during and after your use of the app. This study will take a maximum of 30 minutes. You will not be asked to download any app to your phone or create a user profile or register with your personal details.

6. Will I be recorded and how will the recorded media be used?

With your permission, the interview will be audio recorded. Transcriptions of the audio recording will be used for analysis. The audio recordings will be deleted once they have been transcribed and any identifying information will be removed during transcription. Anonymised transcripts will be shared with other members of my team so that we can improve the design of the app. Please note that despite the data being anonymous, we cannot guarantee that people cannot be recognized from quotes given the limited the size and type of participants (i.e., from the same module).

7. What are the possible disadvantages and risks of taking part?

No disadvantages or risks of taking part have been identified. In the unlikely event that participating causes you any distress, you are free to withdraw, and to discuss concerns with the researcher or the Principal Investigator.

8. What are the possible benefits of taking part?

While there are no immediate benefits to you from taking part, we hope that you will find the study interesting and that it will help you to reflect on how you find information.

9. What if something goes wrong?

If you have any concerns with the conduct of this study, please raise them in the first instance with Professor Aneesha Singh (aneesha.singh@ucl.ac.uk). If your concerns are not addressed to your satisfaction then you may contact the Chair of the UCL Research Ethics Committee – ethics@ucl.ac.uk

10. Will my taking part in this project be kept confidential?

All the information that we collect will be anonymised. You will not be identifiable in any ensuing report. However, please note that despite the data being anonymous, we cannot guarantee that people cannot be recognized from quotes given the limited the size and type of participants (i.e., from the same module).

11. What will happen to the results of the research project?

This study is for my Human Factors for Digital Health coursework, and the findings will be reported in my coursework report, and the reports of some of my fellow students.

16. Contact for further information

Contact details for me and my tutor are provided at the top of this sheet; feel free to contact either of us if you have queries or concerns.

Thank you for reading this information sheet and for considering taking part in this study.

Appendix F: Consent Form.

User testing tasks

Ask participants to do the following user testing tasks based off the following user requirements:

UCL INTERACTION CENTRE
RESEARCH•CONSULTANCY•SEMINARS•COURSES



CONSENT FORM FOR QUALITATIVE STUDY IN INTERACTION SCIENCE

Please complete this form after reading the Information Sheet or listening to an explanation of the study.

Title of Study: Designing an app for Human Factors for Digital Health

Department: UCLIC

Researcher(s): Monika Sikorska (ucju172@ucl.ac.uk) Arthur Chan (ucjuhc@ucl.ac.uk) Jade Lam (cheuk.lam.22@ucl.ac.uk) Ioanna Lazaridou (ucjulaz@ucl.ac.uk) Tianhui He (tianhui.he.22@ucl.ac.uk) Jennifer Higa (jennifer.higa.22@ucl.ac.uk)

Principal Researcher: Aneesha Singh (aneesha.singh@ucl.ac.uk)

This study has been approved by the UCLIC Research Ethics Committee: Project ID number:

UCLIC_2023_002_Teaching_HF4DH

Thank you for considering taking part in this study. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the student before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to.

I confirm that I understand that by ticking each box below I am consenting to this element of the study. I understand that unticked boxes means that I DO NOT consent to that part of the study. I understand that by not giving consent for certain elements, I may be deemed ineligible for the study.



		Tick
1.	I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me and to ask questions which have been answered to my satisfaction. I agree to take part in an evaluation of the study, consisting of I agree to take part in an evaluation of the study, consisting of a usability study, think aloud protocol and interview.	
2.	I understand that data will be anonymised.	
3.	I understand that all data gathered in this study will be stored anonymously and securely. It will not be possible to identify me in the transcription or any report.	
4.	I understand that my information may be subject to review by responsible individuals from the University for monitoring and audit purposes.	
5.	I understand the direct/indirect benefits of participating.	
6.	I understand that I will not benefit financially from this study or from any possible outcome it may result in in the future.	
7.	I consent to my interview being audio recorded and understand that the recording will be encrypted and stored securely, then destroyed following transcription.	
8.	I confirm that I understand the inclusion criteria as detailed in the Information Sheet and explained to me by the researcher and that I fall under the inclusion criteria.	
9.	I am aware of who I should contact if I wish to lodge a complaint.	

Please give verbal confirmation that you consent to participate.

Appendix G: Table of features mapped onto heuristics from the heuristic evaluation

Heuristic	Issues Identified	Severity	Redesign Solutions	Features Users Value
Visibility of system status	After a user finished a task, they were not notified through a pop-up regarding the completion of the task and the points earned. The text was not always legible and easy to read.	2	Implemented pop-up notifications to inform users of task completion and the corresponding points earned (Figure 25.1), while also increasing the font size for improved readability.	The progress bar incorporated into the onboarding process assists users in comprehending the total number of steps involved.
Match between system and real world	n/a	n/a	n/a	The commonly recognized icons and terminology are easily comprehensible.
User control and freedom	Issue with the log symptoms form, users were unable to exit the form without saving symptoms. The data were saved automatically, leaving them with no option to exit. Buttons' size was small and not always easy to click on.	4	A back button has been added to each screen for better navigation, and a "Done" button has been placed at the top right corner of forms to allow users to easily save their data after logging in (Figure 22.2). Additionally, the buttons' size has been increased to improve usability.	The option to post anonymously gives users more control over their interactions.
Consistency and standards	The cancel buttons lack consistency, with some placed on the left and others on the right. Certain pop-ups feature a cancel button, while others present a back button.	n/a	Ensure consistency in the placement of the 'Back' and 'Cancel' buttons throughout the screens.	Consistency in tabs, headings, colours and texts.
Error Prevention	User accidentally deleted a symptom. There was no friction when exiting screens without saving.	5	Implemented confirmation dialog (Figure 22.3).	n/a

Heuristic	Issues Identified	Severity	Redesign Solutions	Features Users Value
Recognition rather than recall	Users had difficulty locating their rewards and badges, which were located in their profile.	5	Added a rewards screen to the footer for convenient accessibility (Figure 25.2).	Clear and concise headings for screens and sections within the app, accompanied by easily recognizable icons for optimal usability.
Flexibility and efficiency of use	n/a	n/a	n/a	Flexibility to choose which symptoms/ activities to track, enabling customisation of the info displayed when monitoring symptoms. Search bar allows for quick location of the necessary information.
Aesthetic and minimalist design	n/a	n/a	n/a	Colour palette, design and visual cues help users easily complete tasks.
Help users recognize, diagnose, and recover from errors	n/a	n/a	n/a	n/a
Help and documentation	Users have expressed a need to be informed about the meaning of symptom score, perimenopause score, and long-covid score.	4	Made the information button more intuitive to find (Figure 23.1).	FAQ section, research papers/podcasts for courses to better support what and why PAUSE suggests to users. Users appreciated the app-walkthrough option on the onboarding process.

Appendix H: Table of the user testing findings and resulting redesign

Screen	Design Feature	Feedback / Issue detected	Redesign
Log Data	Deleting symptom	Swipe right to delete action was not intuitive to participants	Users can swipe left to delete symptom (<i>Figure 22.1</i>)
	Adding symptom	'+' button to add symptom was hard to click	Users can add symptom by clicking on the symptom bar (<i>Figure 22.2</i>)
	Exit 'log symptom' page without clicking save	No feedback was provided in regards to whether symptoms were logged or not	Pop-up informing users that no data will be logged if they choose to exit (<i>Figure 22.3</i>)
Explore	Rewards garden	Users found it redundant and gimmicky	Need future studies to evaluate a more effective rewards system
Insights	Filtering items under insights graph	Buttons were too small to click	Increased button sizes (<i>Figure 23.1</i>)
	Learning information about insight scores	Participants struggle to find related information on insight scores	Made information button more intuitive and visible (<i>Figure 23.1</i>)
	Log data through insights page	Lacks 'log symptom' button for users to easily navigate to 'log data screen'	Added 'Log Symptoms' button (<i>Figure 23.1</i>)
Connect	Username displayed on discussion forum	Participants desired full anonymity for all users	Anonymised username (<i>Figure 24.1</i>)
	Direct message	Some participants wanted to be reached out by 'friends' only on direct message (DM)	Added privacy settings where users can choose only 'friends' for DMs (<i>Figure 24.2</i>)
	Badges on user profile	Participants were unsure of the significance of each badge on other users' profiles.	Added text to explain badges and increase a11y (<i>Figure 24.2</i>)
All	N/A	Texts were too small to read	Increased font sizes for all screens
	Pop up windows	Inconsistent 'Back' and 'Save' buttons	Uniform 'Back' and 'Save' buttons