



Enhancing Health Literacy for Chronic Diseases

Design Project II : Final Report

Project By:

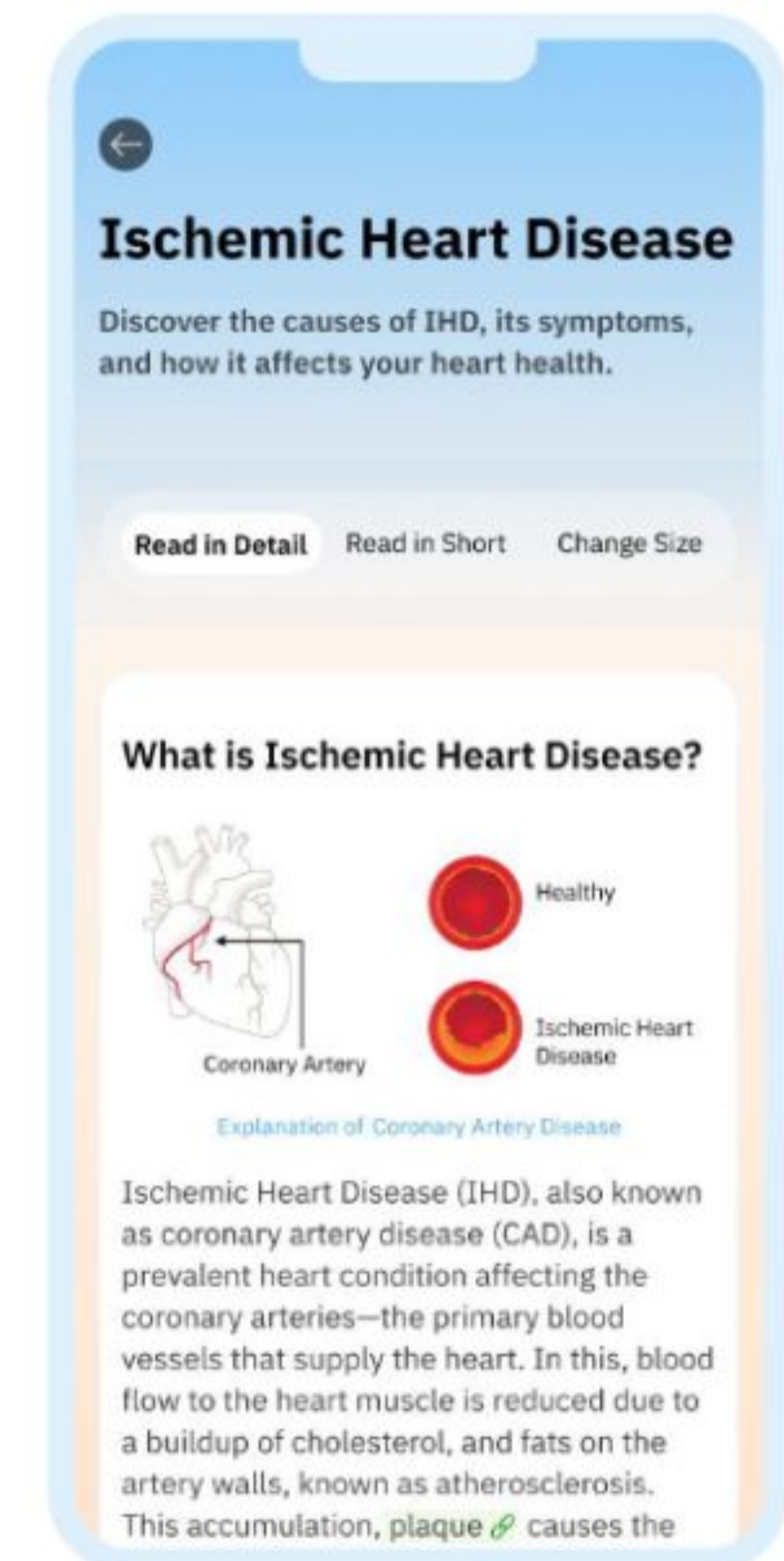
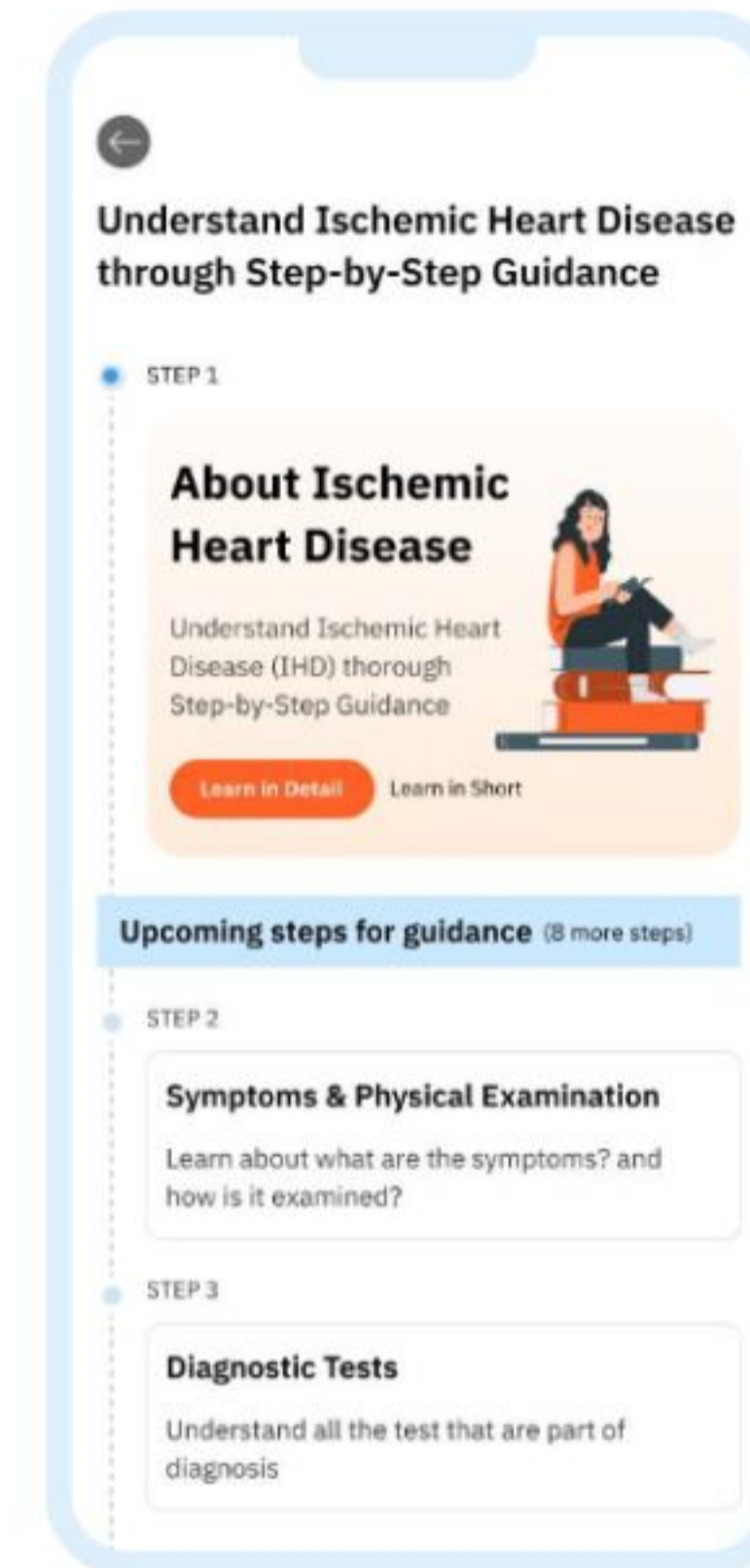
Ankita Thakur

23M2246, M.Des -IxD, 2023-25

Under the guidance of:

Prof. Swati Pal

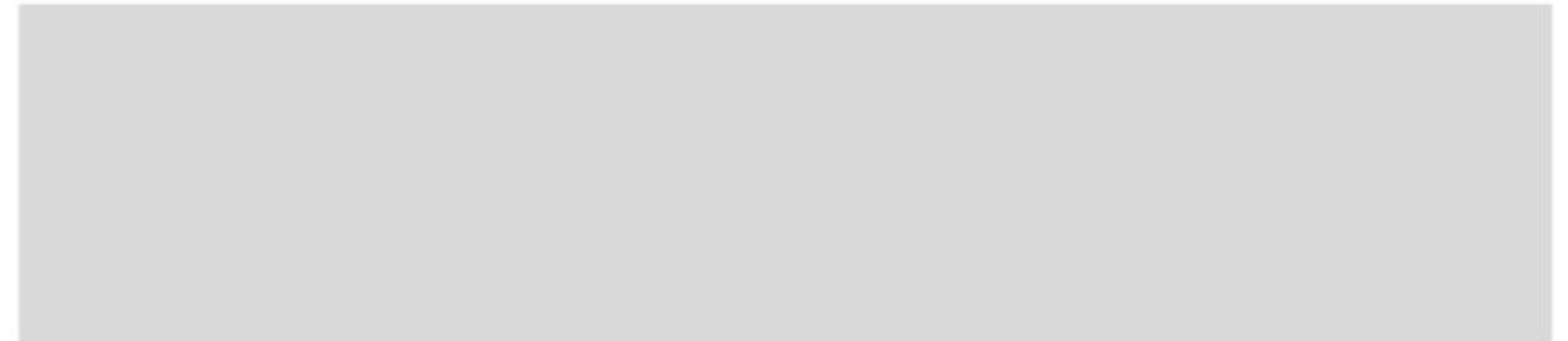
IDC, IITB



Declaration

This thesis titled 'Enhancing Health Literacy for Chronic Diseases: A Digital Platform to Empower Patients and Caregivers' has been carried out by the undersigned as part of the Masters' Programme in the Department of Design, Indian Institute of Technology, Bombay India, from July 2024 to Dec. 2024, under the supervision of Prof. Swati Pal. The undersigned hereby declares that this is her original work and has not been plagiarized, in part or in full form from any source. Furthermore, this work has not been submitted for any degree at this or any other University.

Name and Signature:



Ankita Thakur (23M2246)
M.Des 2023-25, IDC School of Design, IIT Bombay

Acknowledgement

Firstly, I extend my heartfelt gratitude to Prof. Swati Pal for her invaluable guidance and support throughout this project. Her expertise and encouragement were pivotal in shaping my research from start to end. Her feedback at every stage helped me shape the project focus and design better solutions.

I would like also to thank Prof. Girish Dalvi for his valuable inputs and feedback. Discussions with him were thought provoking and has helped me with my project.

I sincerely thank my parents unwavering support and facilitation for participant outreach, which led to meaningful discussions contributing significantly to my findings. Special thanks to my brother for his consistent help and encouragement.

I extend my heartfelt appreciation to the doctors and nurses whose insights greatly enriched this project. I am equally grateful to the patient families and older adults who shared their experiences, as well as the participants who provided valuable feedback during the evaluation stages.

Lastly, I am thankful to Deepanshu, Kritika, Anjali, Tamanna and my classmates for the indispensable contributions and feedback from time to time. Thank you all for your invaluable assistance.

Thankyou!

Content

	Page No.
1. Introduction -----	1
1.1 Initial Design Brief	3
1.2 Project Focus	3
2. Secondary Research -----	4
2.1 Related Works	4
2.2 Competitive Analysis of Existing Solutions	5
2.3 Identify Gap	6
3. Primary Research -----	8
3.1 Objectives of Primary Research	8
3.2 Technological Proficiencies	8
3.3 Finding Gaps in Research	9
4. Insights -----	9
4.1 Redefining the Objective	11
4.2 Journey Map Aged Adults and young Adults	12
5. Project Positioning -----	14
5.1 Insights from Existing solutions	15
5.2 Integration of Ai in existing solutions	16

Content

	Page No.
6. Initial Ideation	19
6.1 Concept 1	21
6.2 Concept 2	23
6.3 Concept 3	25
7. Final Design	27
7.1 Formative Evaluation	31
7.2 Design Changes	31
8. Design Evaluation	31
8.1 Pre- Test Survey	32
8.2 Task Based Usability testing	33
8.3 Information Retention	34
9. Results	35
10. Conclusion	36
11. References	37

Abstract

This project investigates the design and development of mediPal, a digital platform aimed at improving disease-related learning for individuals managing chronic conditions. The design solution addresses the communication gap between healthcare providers and patients by offering step-by-step guided health information tailored to user preferences in terms of depth and format. Previous research highlights the challenge of limited health literacy among patients with chronic diseases, leading to reduced adherence to treatment plans and poor health outcomes. Despite existing solutions, these attempts lack adaptability to individual learning styles and preferences, leaving critical gaps in patient understanding. This study introduces a design solution named 'mediPal', which offers personalized, accessible content through a combination of concise and detailed formats, including text, video, and visuals. The platform is designed to foster a cohesive, intuitive learning experience by breaking complex health information into manageable steps and providing on-demand assistance. Insights from patients, caregivers, and healthcare providers highlighted key features such as simple navigation, need for larger fonts, and scalable information based on user needs. Prototypes tested on smartphones received positive feedback, demonstrating the platform's effectiveness in enhancing health literacy, reducing anxiety, and supporting self-management of chronic conditions.

The findings suggest that mediPal has significant potential to improve patient understanding, empower users, and bridge the communication gap between healthcare systems and those with limited health literacy.

Keywords-

Digital Health Literacy, Interactive Digital Platforms, Digital Education, Healthcare User Experience (UX), Accessible Health Information, Health App Usability, Telehealth, Chronic Care, Patient Decision-Making

Introduction

Effective communication between healthcare providers and patients is essential for the successful management of chronic diseases, like cardiovascular diseases (CVDs), diabetes, cancer etc. Studies show that clear, empathetic, patient-centered communication can enhance health by improving patient understanding and self management skill (Sharkiya 2023). Shared Decision making and active listening empower patients to participate in their care. This approach aligns treatment plants with eh patient’s values and preferences. Patients can understand their conditions and treatment plans with techniques like “ask-tell-ask” where healthcare providers address patient’s specific concerns and confirm their understanding.

In India, limited health literacy is a significant barrier to effective healthcare. Approximately 90% of Indian adults are reported to have poor health literacy, contributing to mismanagement of diagnosis, not following treatment plans and poor health outcomes. Research highlights that health literacy deficiencies in India are linked to higher hospitalization rates, treatment errors, and anxiety among patients, especially for chronic diseases like diabetes and hypertension (Mohiuddin AK. (2023).

Despite advances in medical care, many patients struggle to fully comprehend their diagnosis, treatment plans, and prescribed medications due to limited health literacy. This lack of understanding can lead to anxiety, poor treatment adherence, and worsened health outcomes. Healthcare consultations, often brief, fail to provide patients

with the opportunity to ask all the necessary questions, leaving them without a comprehensive understanding of their condition and treatment options.

In such cases, patients often turn to secondary sources, such as family members, pharmacists, or online platforms, which can lead to inconsistent or inaccurate information, further complicating their healthcare journey. This communication gap is particularly problematic for individuals managing chronic conditions like CVDs, where long-term treatment adherence and self-management are crucial for maintaining health and preventing complications. To understand the what problems are faced at every step refer to Figure 01 and 2 (Page-6)



Figure 01: Illustration depicting patients confusion with report

Post Consultation

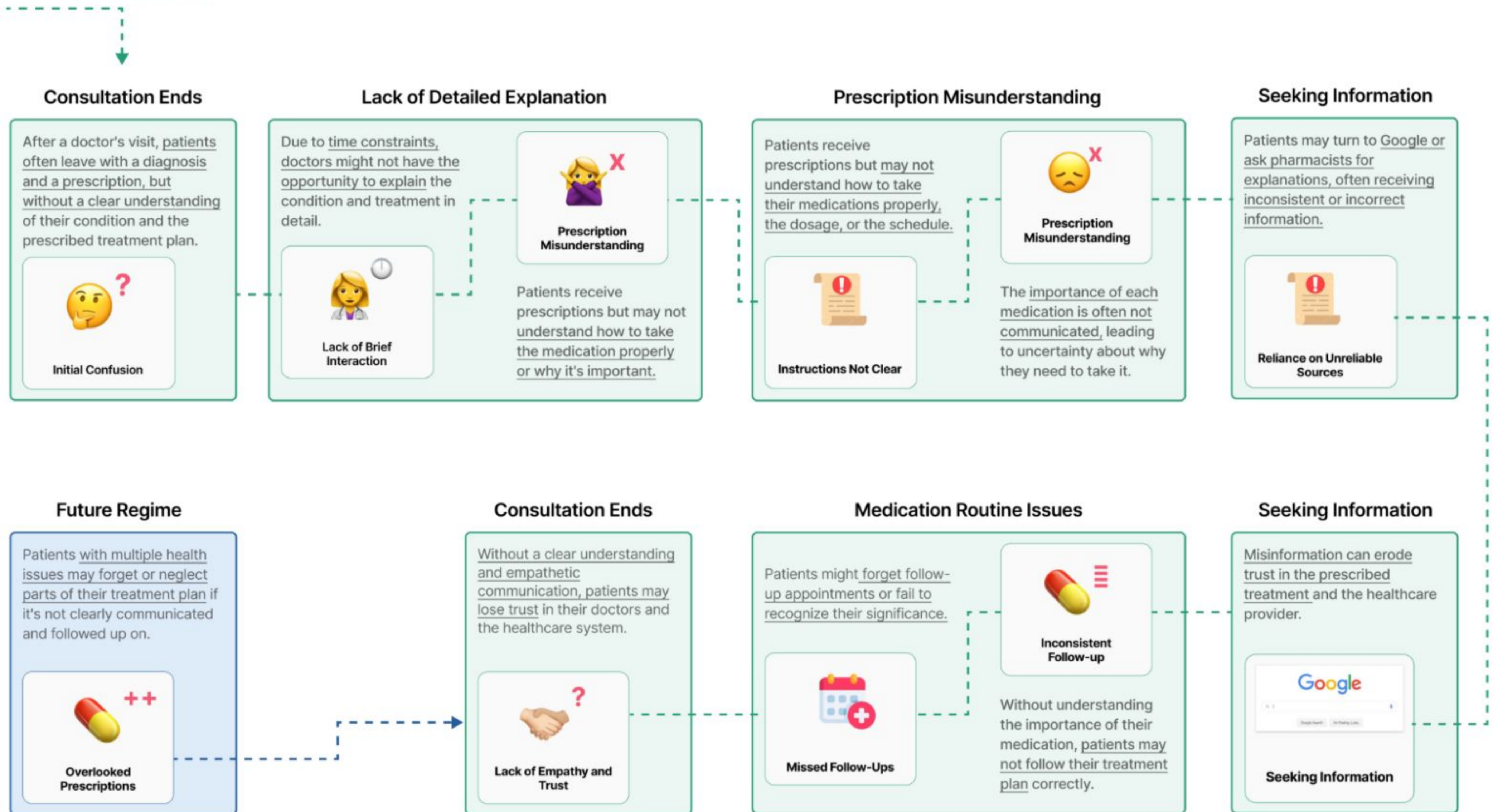


Figure 02- This flowchart helps one understand where does the problem start and how the problem continues from the start of the consultation to the end of it and how it propagates

How can we improve patient understanding and engagement in the management of chronic diseases, by providing clear, accessible, and actionable information tailored to individual health literacy levels and learning preferences?

Improving patient education in chronic disease management is essential for better health outcomes. A well-informed patient is more likely to adhere to prescribed treatments, make healthier lifestyle choices, and actively engage in their healthcare. This research aims to enhance patients' ability to understand and act on medical information, thereby promoting better disease management and treatment adherence. As chronic diseases become more prevalent, especially among aging populations, improving patient education becomes essential in managing these conditions.

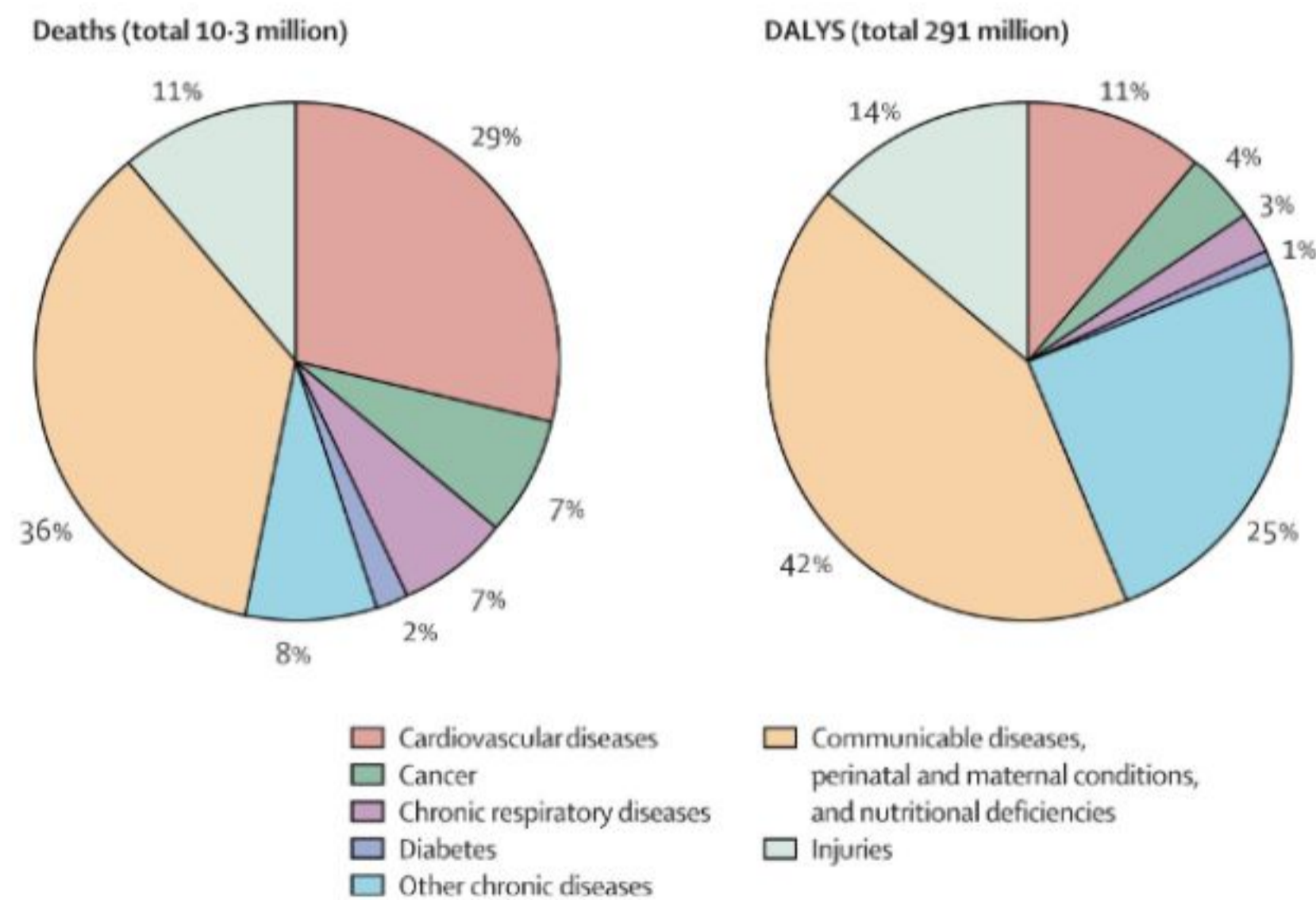


Figure 03- Chronic disease death Data, The Lancet, Volume 366, Issue 9498.

Effective disease management is not only about administering medication but also about empowering patients to take an active role in their care, which can lead to improved health outcomes and a reduced burden on healthcare systems. The significance of this study extends beyond cardiovascular diseases, as the principles and strategies developed could be adapted for managing other chronic conditions.

The primary scope involves understanding the challenges faced by patients in comprehending their diagnosis, treatment plans, and medications. The study will not delve into the clinical aspects of CVD treatment but will instead focus on how effective communication can improve patient education and self-management.

The findings are expected to be applicable to other chronic diseases, for now the prototype will initially target CVD patients only. Hence, the task is to design a solution that enhances patient's understanding and engagement with their treatment plans, this shall target outpatients managing chronic conditions such as cardiovascular diseases. The solution aims to bridge the communication gap between healthcare providers and patients by offering accessible, clear, and information about diagnoses, medications, and treatment options.

Initial Design Brief

To design a solution that enhances patient understanding and engagement with their treatment plans, specifically targeting outpatients managing chronic conditions such as cardiovascular diseases. The solution aims to bridge the communication gap between healthcare providers and patients by offering accessible, clear, and information about diagnoses, medications, and treatment options

Project Focus

- Designing content-driven, accessible interactions that enhance patient understanding of chronic disease management, specifically cardiovascular diseases (CVDs).
- Providing patients and caregivers with both quick, visual explanations and detailed, in-depth information on medical conditions, treatment plans, and medications.
- Designing for outpatients managing long-term conditions who need clear, actionable information to improve adherence to prescribed treatments and medication regimens

Secondary Research

Related Work

Effective communication between patients and doctors is essential for successful treatment outcomes, yet significant gaps in this area contribute to patient confusion and poor health management. On average, a consultation with a doctor in India lasts only 2.39 minutes, which is insufficient for providing a detailed understanding of a patient's condition. This is way below global standards, with countries like Sweden and the U.S. averaging over 20 minutes. As a result, 46% of patients leave the consultation without a clear idea of their treatment plan. Research highlights that shorter consultations correlate with overprescription of medications, including antibiotics, and a lack of preventive care advice, exacerbating health challenges in the country (British Journal of General Practice 2016).

This lack of clarity is even more critical when it comes to medication management, with 75.2% of patients globally unable to read or fully comprehend drug information in their prescriptions due to illegibility or complex medical terminology. Additionally, 50% of patients globally do not take their medications as prescribed, severely affecting their treatment outcomes. In India, studies indicate that illegibility contributes to numerous prescription errors, with nearly 17.6% of prescriptions at a rural tertiary care hospital in Maharashtra found to be unreadable. (Chaturvedi SK, 2018)

The issue of communication extends beyond doctor- patient interaction. A majority (86%) of patients report receiving most of their medicatio

-related information from pharmacists rather than doctors, with only 7.2% recognizing the prescribing doctor as their main source of information. (Vaidya et al, 2023)

This reliance on secondary sources, including friends and family, increases the likelihood of miscommunication and misunderstanding. In the context of chronic disease management, poor comprehension of medical instructions can lead to non-adherence rates as high as 30-50%, highlighting the urgent need for better educational interventions. (Baveja Lalit, 2021). In India, systemic barriers like language diversity, low health literacy, and limited doctor-patient communication makes the whole healthcare system difficult to comprehend by the patients.

Engaging patients through clearer explanations has proven to significantly improve their participation in decision- making processes. Educational interventions alone can reduce the use of unnecessary medications by 30%.

With patients often managing an average of 7.9 medications, there is a pressing need to minimize confusion surrounding their treatment plans. Personalized, localized health tips—delivered through systems like IVR—could bridge this gap, enhancing patients' understanding of their health conditions and prescribed treatments.

Compounding this issue is the rise in patients turning to the internet for additional health information, with 80% of patients seeking online resources after their medical consultations. While the internet can offer valuable insights, it can also expose patients to misinformation,

exacerbating their anxiety and confusion about their health. To understand how these connect together to lead to seeking information online refer to Figure 4 (page 05).

Competitive Analysis Of Existing Solutions

Existing solutions, such as the Treatment Advice by Mobile Alerts (TAMA) system for HIV/AIDS patients, provide automated reminders but assume that patients already understand their health status and treatment plans.

Similarly, mobile applications like MySugr and Glucose Buddy cater to patients with diabetes by offering medication tracking and lifestyle management features. However, they often fail to address the underlying gaps in patient knowledge, comprehension, and emotional well-being. Additionally, many of these solutions overlook the challenge of low digital literacy, especially in older adults, which presents a barrier to effective engagement. Despite offering tools for medication tracking, solutions such as CareZone and MyTherapy often assume a baseline understanding of health conditions, leaving patients who lack health literacy at a disadvantage. Many patients struggle with complex medical jargon, inadequate medication instructions, and unclear treatment goals, leading to medication mismanagement. These digital solutions do not adequately address the emotional and psychological challenges patients face, such as fear, anxiety, and resistance to technology. These barriers often lead to non-engagement, further limiting the potential benefits these mhealth apps can provide. Many of these apps fail to incorporate patient-centered approaches. They often lack personalized content, emotional support components, and accessible user

interfaces, making them less effective for individuals with diverse educational and cognitive abilities.

Current solutions focus primarily on physical health metrics like medication adherence or monitoring of vital signs, medication reminders and logistical support without integrating components for emotional and cognitive aspects of managing chronic diseases. While these tools are helpful for tracking physical health, studies suggest that patients with chronic conditions often need more comprehensive support that includes educational resources, cognitive behavioral strategies, and emotional encouragement. These gaps highlight the need for more personalized, emotionally supportive, and education-focused interventions that promote patient understanding, confidence, and adherence to treatment plans.

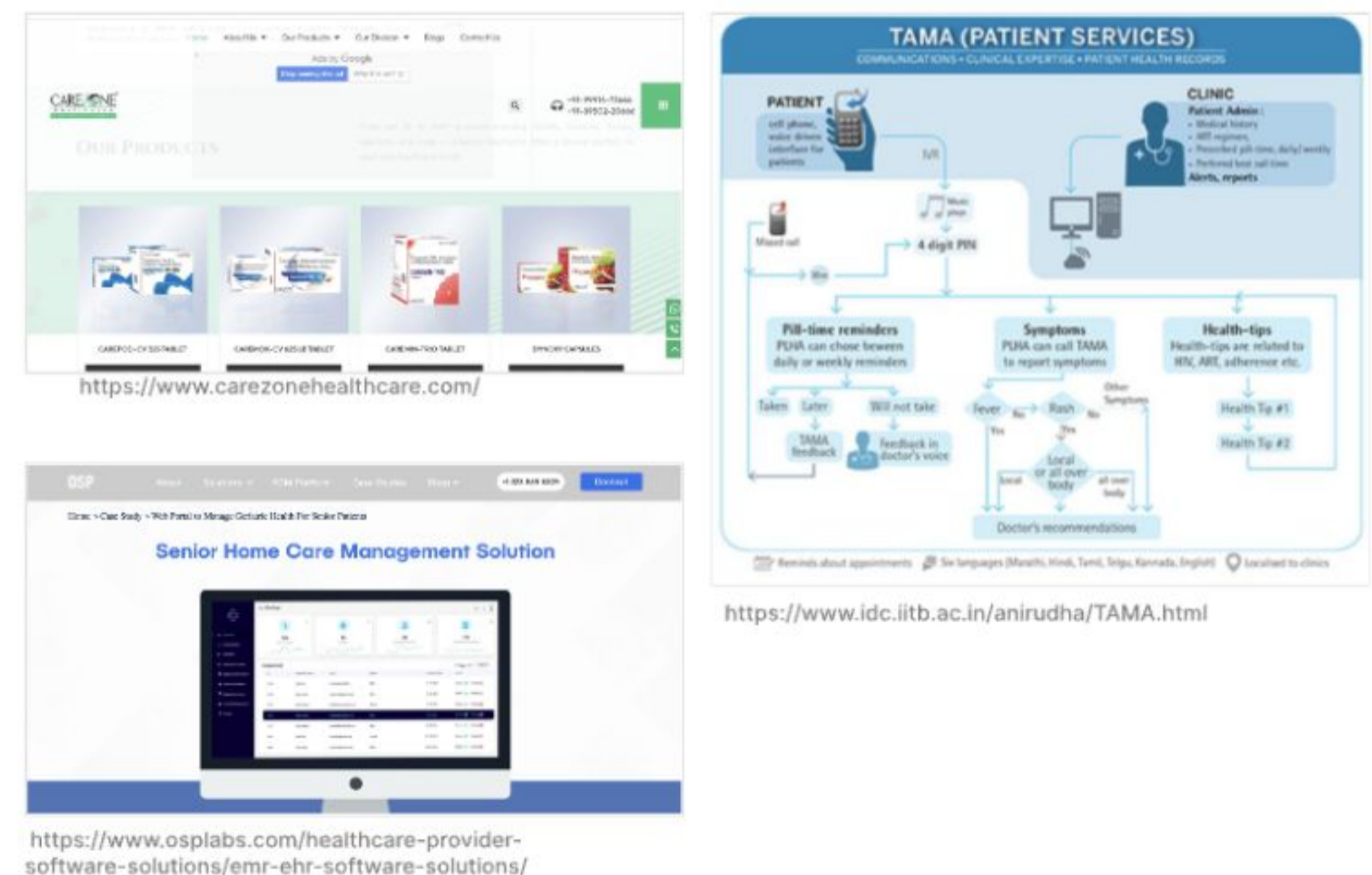


Figure 4

Insights From Secondary Research

The secondary research reveals several gaps in existing chronic disease management solutions:

Lack of Educational Content:

Many apps and interventions overlook the need for personalized educational content that could empower patients with a deeper understanding of their conditions and treatment regimens.

Emotional and Psychological Barriers:

Emotional and psychological factors, such as fear, doubt, and lack of confidence, often prevent patients from adhering to prescribed treatments. These barriers are not adequately addressed by most existing tools.

Health Literacy:

A significant portion of patients lacks the health literacy required to understand complex medical instructions. This gap leads to dependency on family members or friends to interpret medical information, further complicating treatment adherence.

This secondary research clearly highlights the need for a solution that provides not just logistical support but also addresses the emotional and educational gaps in chronic disease management.

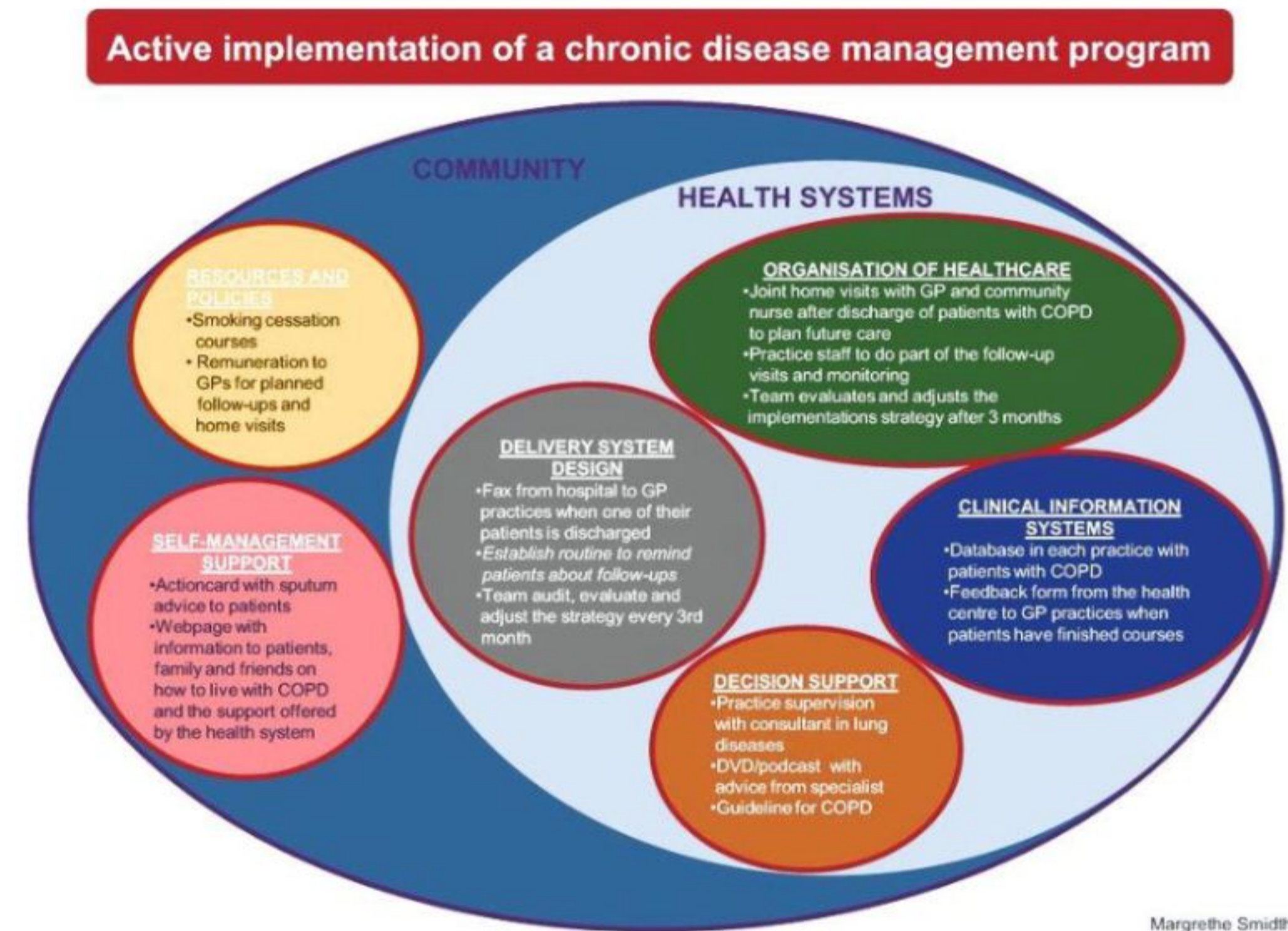


Figure 5: RWJF Chronic Disease Management Model

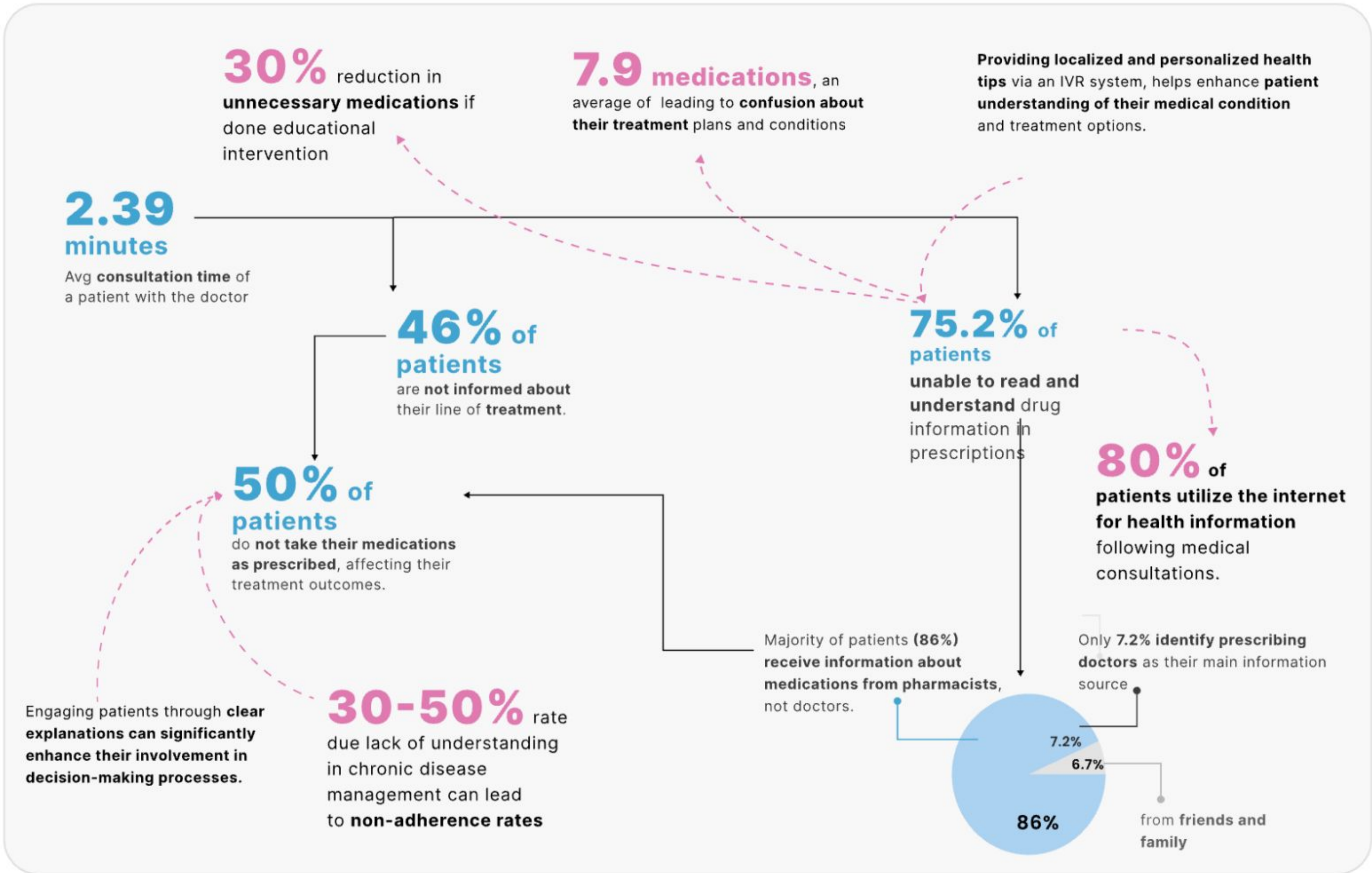


Figure 06: Chronic Disease mismanagement Data

Primary Research

Objective Of Research

Building on the insights from secondary research, the primary research aims to understand how patients with chronic diseases, particularly those with low health literacy, perceive and manage their medical conditions and medications. Building on secondary research, the study aims to access the challenges these patients face in understanding medical instructions and adhering to treatment plans. with The primary objectives explores the following:

- How doctors communicate medical conditions and treatment plans to patients.
- How patients perceive and process the information provided by healthcare providers.
- The role of understanding the treatment plan in shaping a patient's ability to adhere to prescribed treatments.
- Common misconceptions about diseases and medications.
- The emotional factors influencing patient adherence to treatment.
- The reliance on secondary sources like family and friends for instructions and understandings.

The primary research involved descriptive interviews with 10 chronic disease patients, both from urban and rural areas. These interviews were conducted in-person and online, ensuring diverse perspectives. Additionally, interviews with two healthcare professionals—one doctor and 2 nurses were conducted to gain insights into their experiences with patient education and medication management.

Technological Proficiencies

- 13 Participants
- 5 Elderly, 5 Young Adults 2 Nurses, 1 Doctor
- 4 Males, 6 Females
- 3 Rural area, 7 Urban area

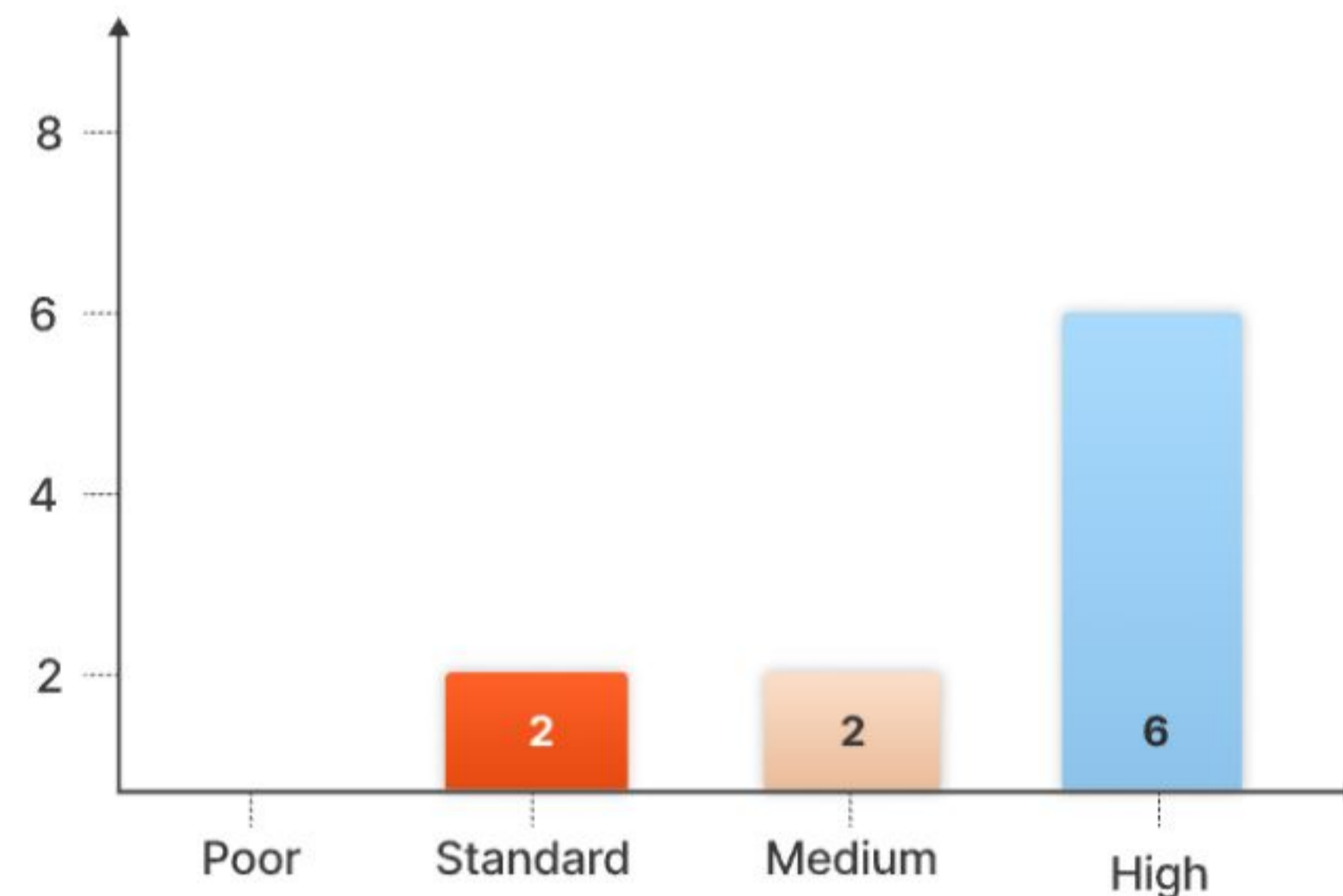


Figure 07: Technological Proficiencies

Finding Gaps In Research

The research is designed to address the gaps identified through secondary research, specifically focusing on how patients with chronic diseases, perceive and manage their conditions.

Secondary research revealed common challenges like misunderstanding medical diagnoses, confusion over treatment plans, and difficulties adhering to prescribed medications due to limited comprehension of medical information. These issues were further comprehended with confusion over treatment plans, and emotional barriers that creates adherence.

The primary study aims to investigate how factors such as clear communication, emotional support, and personalized education could help bridge these gaps. It sought to understand patients' struggles with comprehending complex medical terminology, the psychological impact of chronic disease management, and the role of caregivers or secondary sources in providing assistance.

This shall help healthcare providers to explore ways on enhancing their communication strategies to improve patient's overall health outcomes.

Insights From The Interviews

Confusion Over Diagnosis and Treatment Plans

Many patients expressed confusion over their diagnoses, particularly when medical tests returned normal results despite feeling unwell. This led to a lack of confidence in the treatment plan. One participant noted,

"I was told my tests are fine, but I did not understand why do I still had headache?"

Inadequate Explanation of Symptoms: Several patients mentioned that healthcare providers failed to adequately explain the symptoms or the underlying causes of their conditions. This lack of understanding contributed to anxiety, as patients were unsure how to manage their symptoms. One participant shared, "The doctor told me my sugar levels are high, but they didn't explain why or what I should do about it."

Difficulty in Medication Management: Patients, particularly older adults, often struggled to manage their medications due to poor handwriting, unclear instructions, and a lack of understanding about dosage and potential side effects. Many patients described relying on family members to help interpret prescription instructions, which led to inconsistencies in medication adherence.

Health Literacy Gaps: A significant barrier to effective disease management was low health literacy. Patients often did not understand medical jargon and were overwhelmed by complex treatment plans. This gap in understanding made it difficult for them to trust and follow prescribed treatments. One participant revealed, "I don't understand the terms on my prescription; I need someone to explain it in simpler words."

Fear and Emotional Barriers: Many patients expressed a sense of fear and frustration, especially when it came to managing chronic conditions like heart disease and diabetes. They often felt overwhelmed

by the ongoing nature of their illnesses, which led to inconsistent medication adherence. One participant shared, "I sometimes feel like giving up on my medication because it feels like it's never-ending."

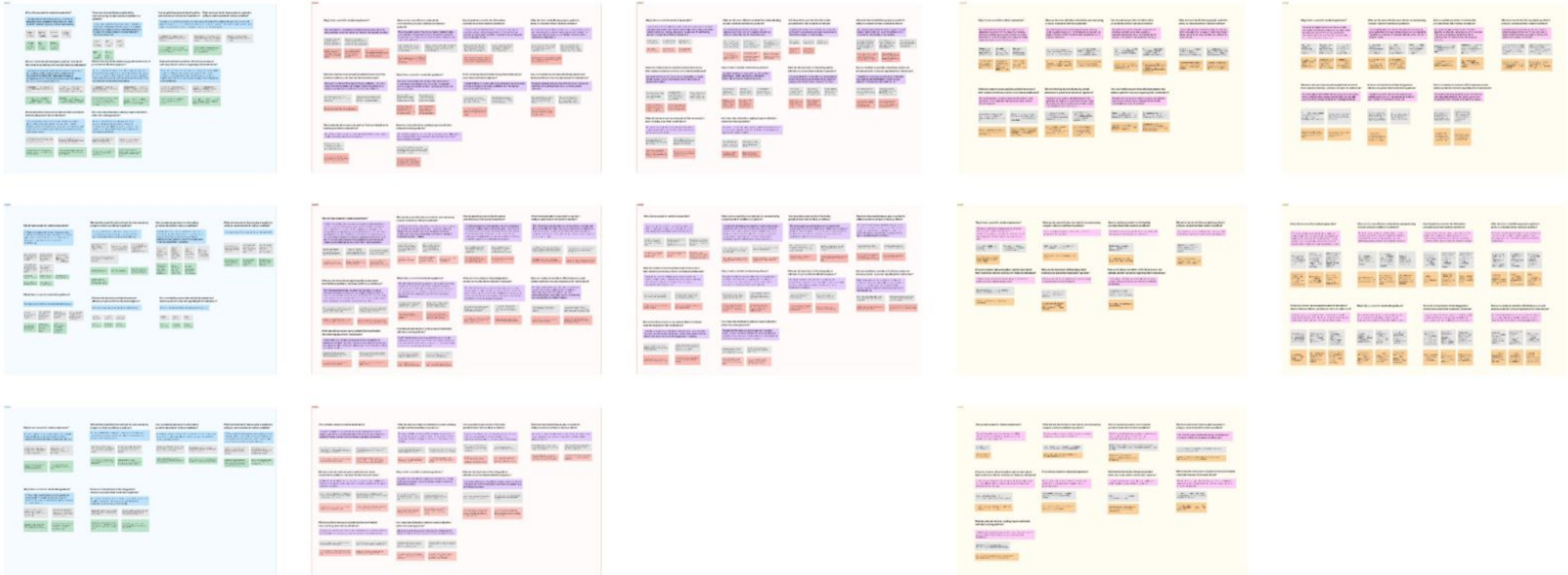
Insights From Healthcare Providers

Healthcare providers acknowledged that many patients struggle with understanding their diagnoses and treatment plans. The doctor emphasized that time constraints during consultations often prevent detailed explanations, while the pharmacist noted the importance of providing easy-to-understand medication leaflets and visual aids. Both professionals agreed that emotional support and clearer communication could significantly improve patient adherence and treatment outcomes.



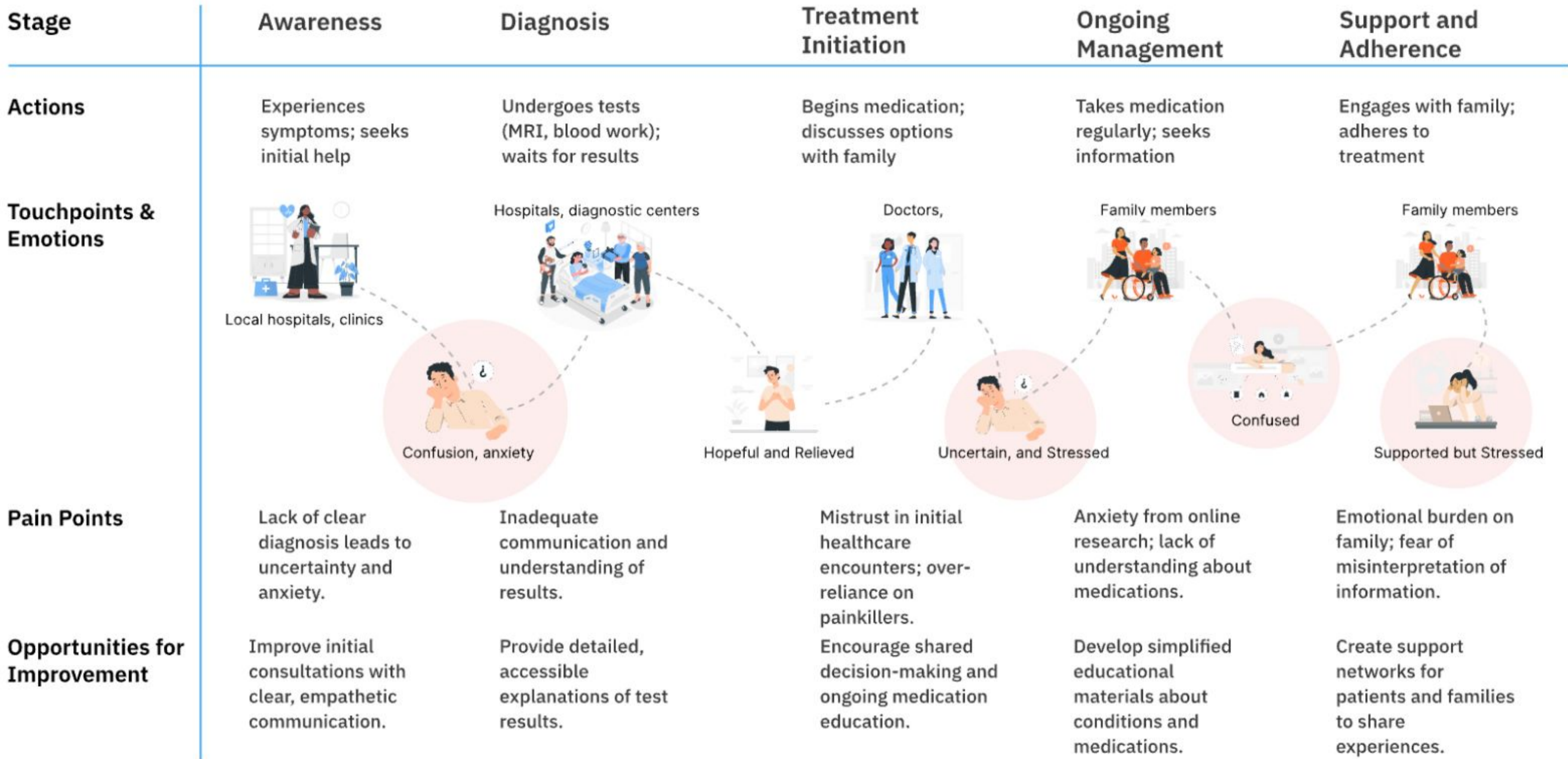
Figure 08: Challenges with patients

Interpretation Of Descriptive Interviews

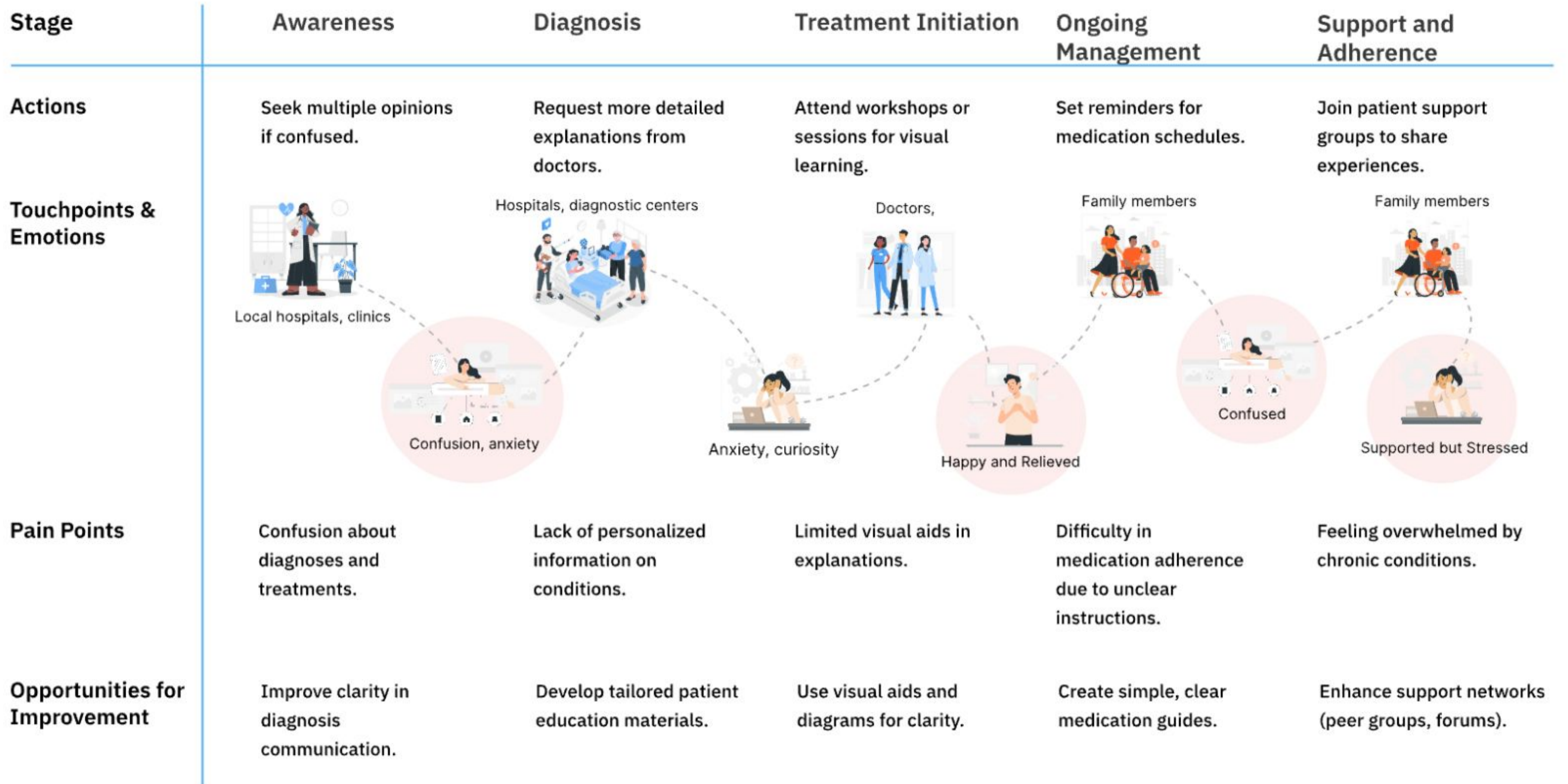


Please View the file as the Screen shot used wont give clarity → [Link To the File](#)

Journey Map for Elderly Patient



Journey Map for Young Adults



Project Positioning

Redefining the objective

To empower individuals with accessible, easy-to-understand information about medical conditions, supporting patients and their close ones in understanding.

Particularly for patients managing chronic conditions like cardiovascular diseases (CVD). With CVD being the leading cause of mortality in the country, accounting for 28% of total deaths annually, there is a pressing need for solutions that empower patients and their caregivers.

Identify area of intervention

Area of Intervention: Confusion about your health condition? This intervention focuses on addressing the common confusion patients face regarding their health diseases. It emphasizes the importance of clear communication during medical consultations, enabling patients to understand their diagnoses fully. By providing resources and support to facilitate discussions with healthcare providers, patients can become more informed about their conditions, reducing anxiety and fostering a proactive approach to their health.

Area of Intervention: Confusion about treatment and seeking solutions online. This intervention targets the confusion patients experience concerning their prescribed treatments and medications. Often, individuals turn to the internet for answers, which can lead to

misinformation and further anxiety. By offering reliable, easy-to-understand educational materials that explain treatment options and medication regimens, we can help patients feel more confident in their healthcare decisions. This intervention aims to ensure patients understand their treatment plans, leading to better adherence and ultimately improved health outcomes.



Figure 09: Patients seeking online help with google and youtube.

Existing Solution

Information about managing health is often scattered across various platforms, presented without visual aids, and heavily reliant on complex, jargon-filled text. While people are aware of their disease, trust in their treatment, and understand the importance of adhering to medication, accessing clear and concise guidance remains a challenge due to the overwhelming and inaccessible way information is delivered.

Chronic Disease Management Programs

Programs like the Diabetes Prevention Program (DPP) utilize mobile technology to deliver educational content and support.

mHealth Apps for Diabetes Management

Apps like MySugr and Glucose Buddy help diabetic patients track their blood sugar levels, medication intake, and dietary habits.

MyTherapy

This app assists users in managing their medications by providing reminders for pill intake and tracking adherence.

CareZone

CareZone is a comprehensive medication management app designed for chronic disease patients.

TAMA (Treatment Advice by Mobile Alerts)

TAMA is an Interactive Voice Response (IVR) system developed for people living with HIV/AIDS (PLHA). It provides pill-time reminders, symptom management recommendations, and health tips through voice calls.

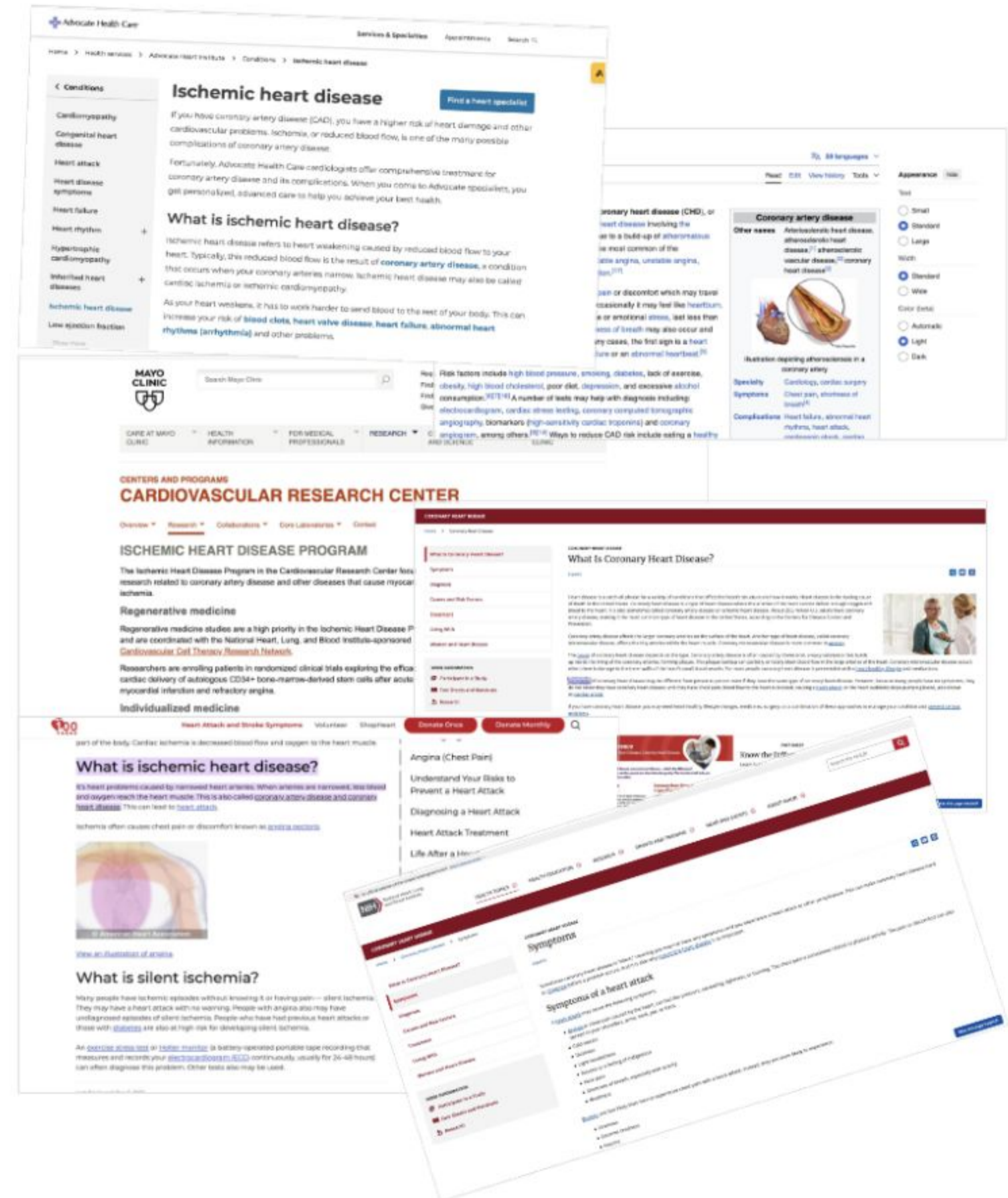


Figure 10: Existing medical help Apps and websites

Integration of AI in Existing Applications

Explored around the existing solutions for managing the chronic diseases using AI, and what feature do they provide and how they are trying to solve it and what are they areas there? We better intervene.

Ada Health: An AI-powered health assessment app that uses symptom-checking algorithms to help users understand their health. By analyzing symptoms, history, and lifestyle inputs, it provides personalized recommendations for chronic conditions like diabetes and cardiovascular diseases.

Livongo (Teladoc Health): A platform supporting chronic conditions like diabetes and hypertension. It connects to wearable devices, analyzes data on metrics like glucose levels and activity, and offers real-time insights, personalized coaching, and diet recommendations.

Glooko: A chronic condition management app integrating data from fitness trackers and health devices. Its AI analyzes the data to provide tailored recommendations on medication, diet, and physical activity.



Figure 11: Ada Health



Figure 12: Glooko

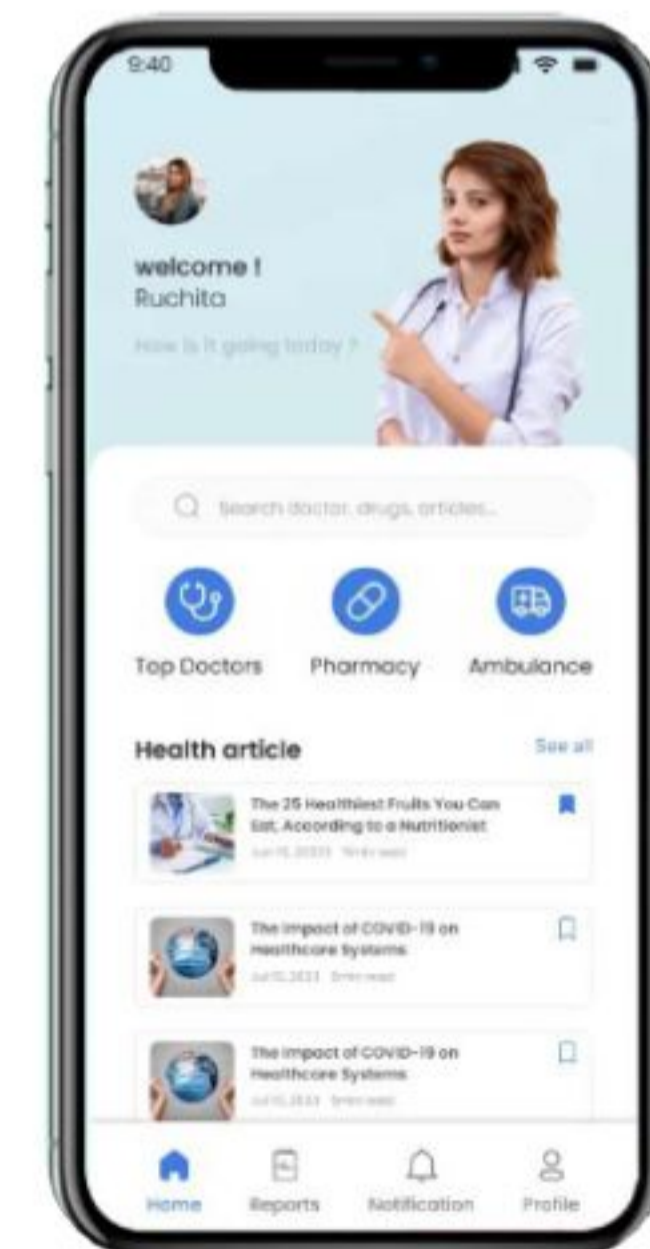


Figure 13: Livongo

Initial Ideation

Information Architecture

Based on the information and steps involved during the treatment of CVD an information architecture was created for now Ischemic heart disease has been solved full fledge

[Link to IA](#)

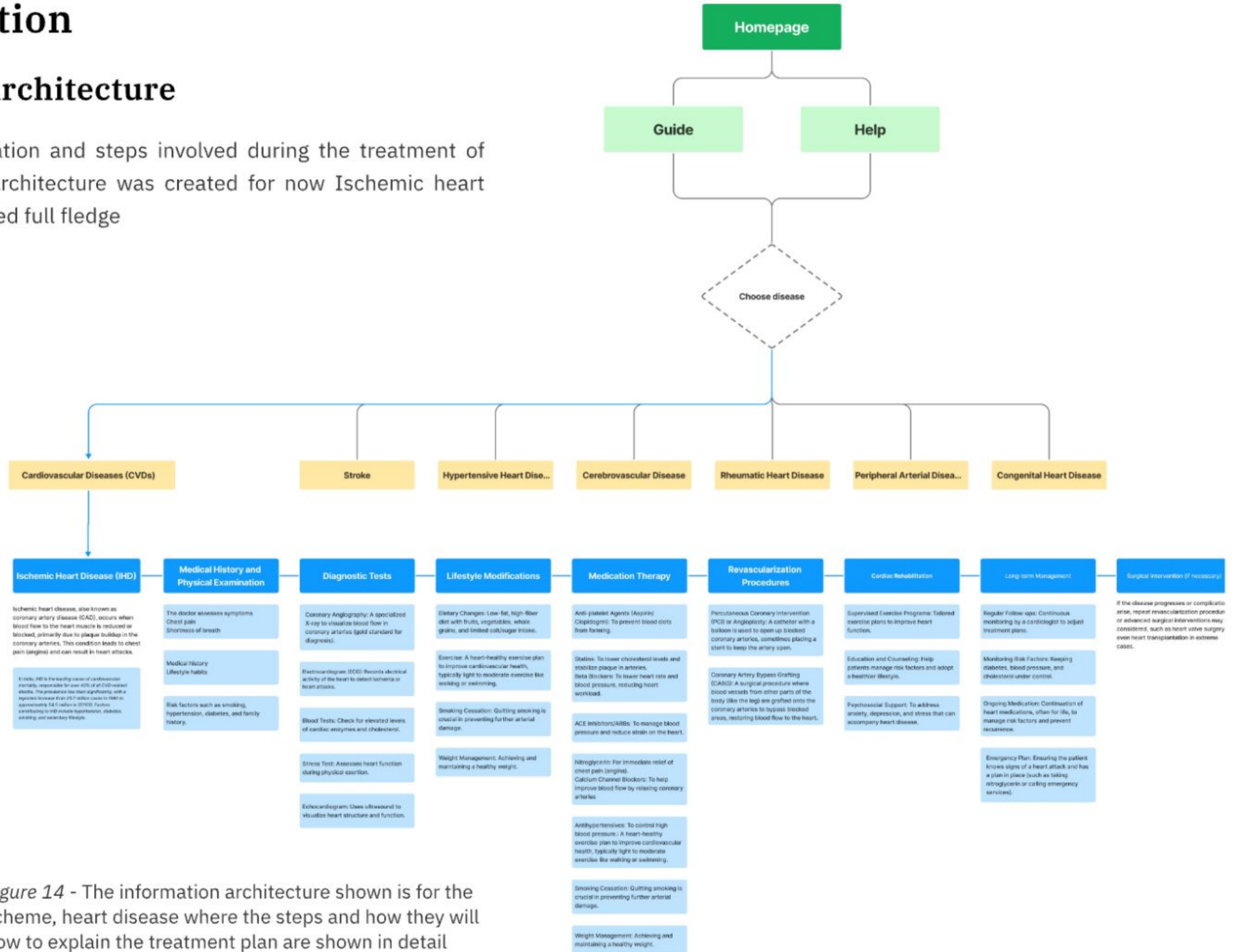
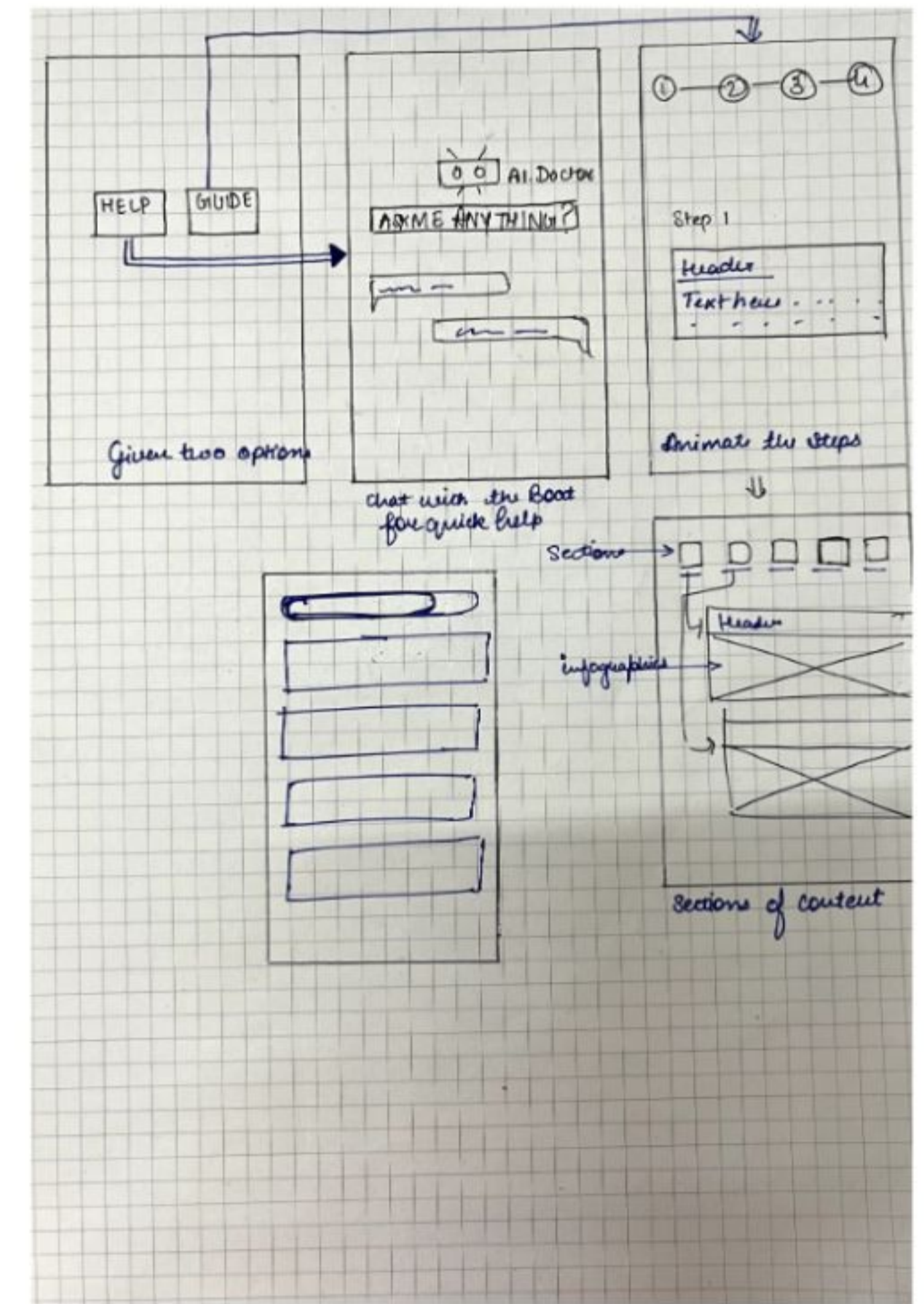
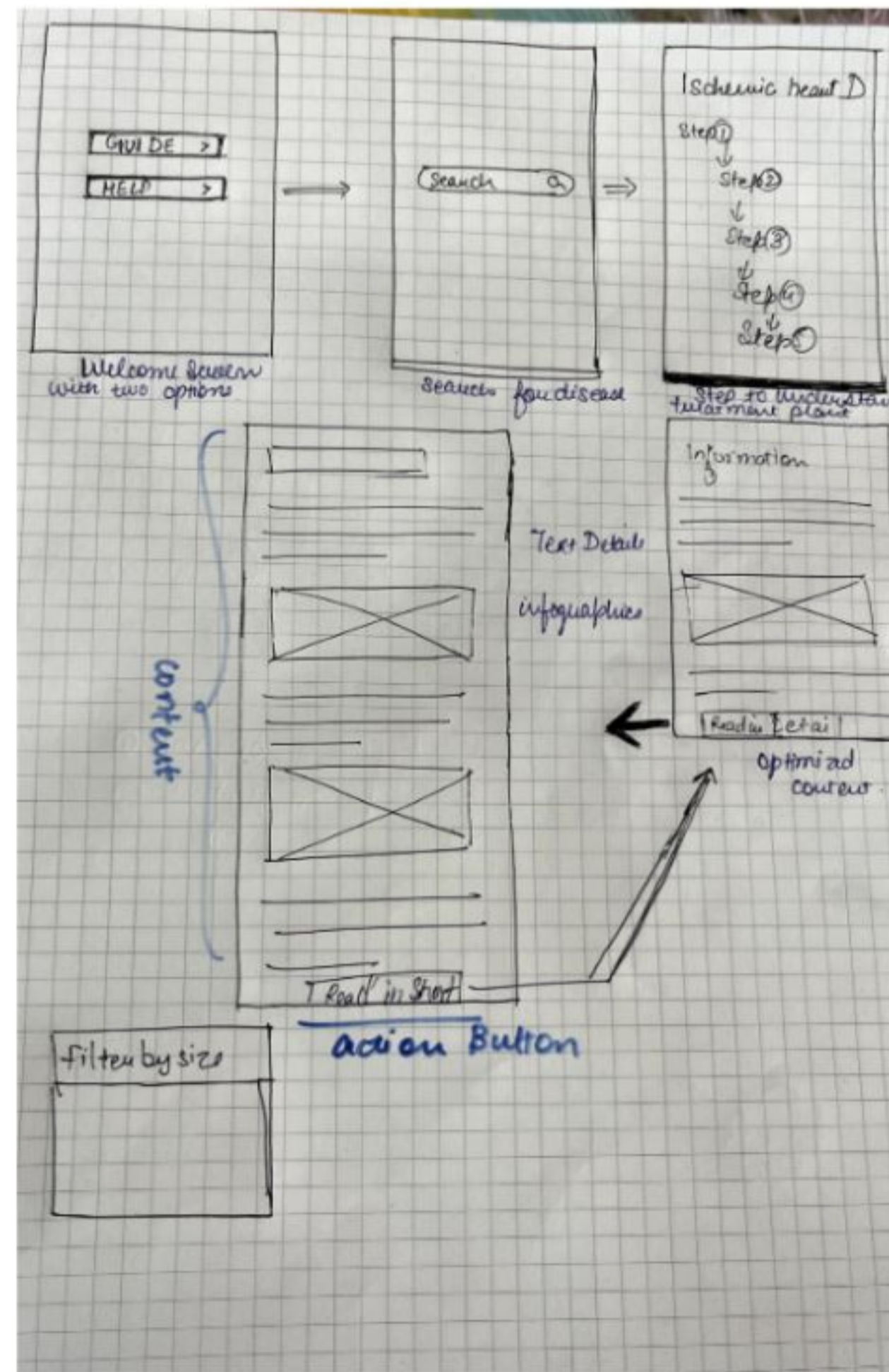
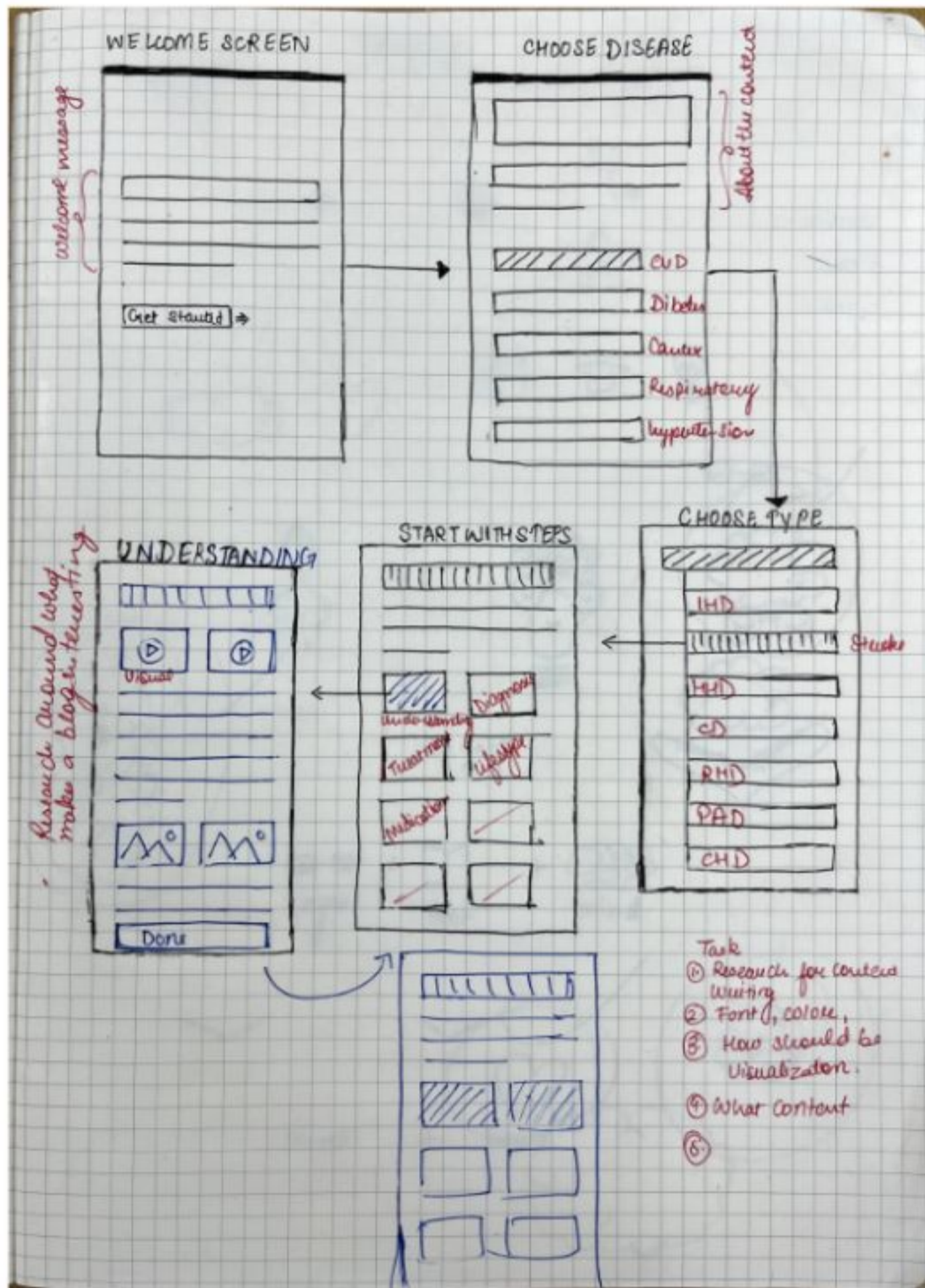


Figure 14 - The information architecture shown is for the scheme, heart disease where the steps and how they will flow to explain the treatment plan are shown in detail

Sketches

After understanding how the flow should be tried some sketches to get an idea how the information can be presented and how the flow should be. Brainstorming ideas and creating flows led to 3 concepts being created that were initially created based on content, age and time. These concepts were tested to know what ideas/flows work for people



Concept 1

9-Step Guidance: Sequential Guidance

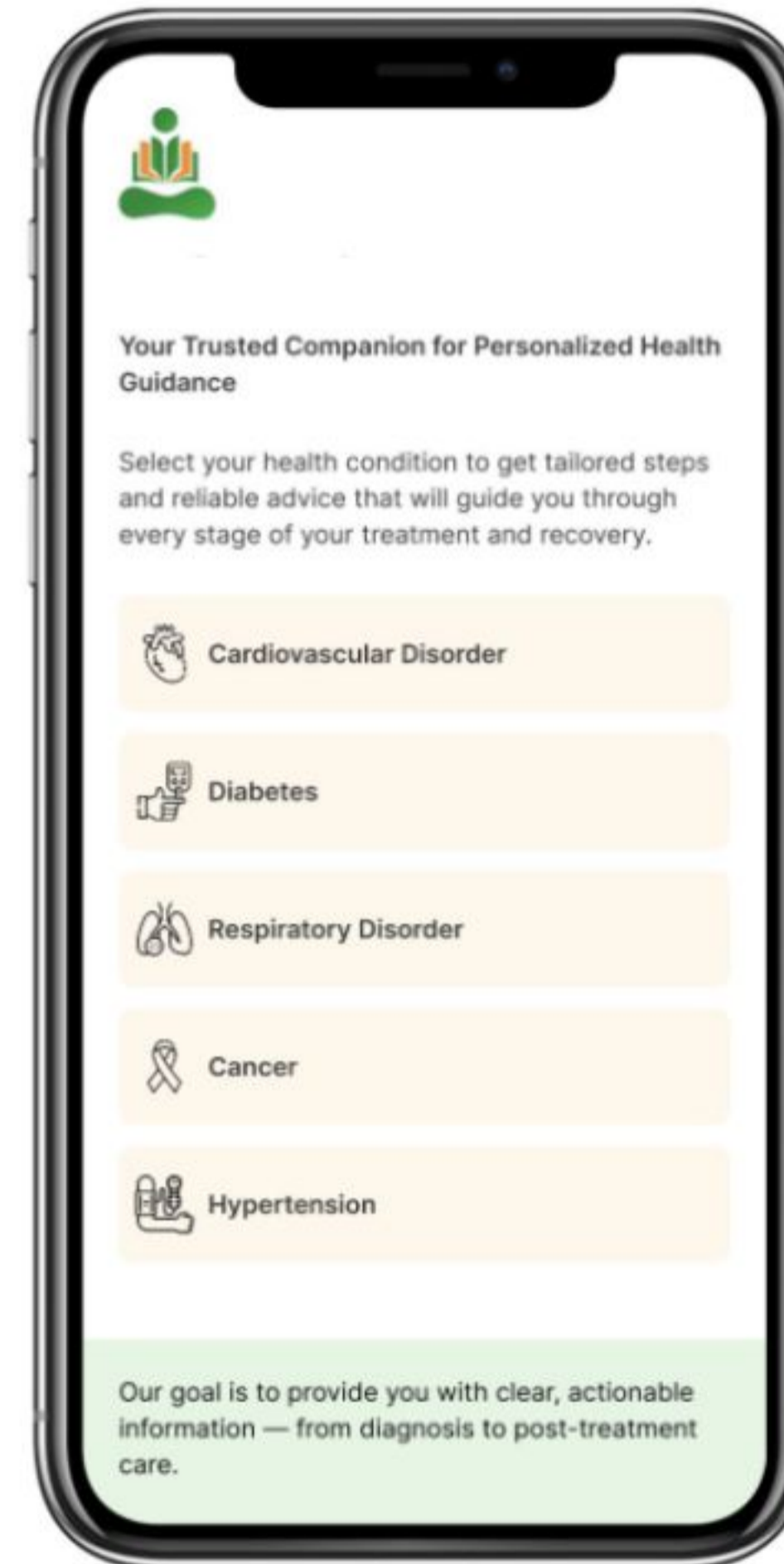
Description: Patients would be given a structured, step-by-step guide, starting from understanding the disease to long-term management. Each step (understanding, symptoms, diagnosis, lifestyle changes, etc.) is broken down into digestible sections, making the treatment journey clear and easy to follow.

Quick vs. Detailed Options: Users choose between a quick read or a detailed read based on their preference. The quick read includes visualizations and videos with minimal text, while the detailed option offers in-depth written content supported by visual aids.

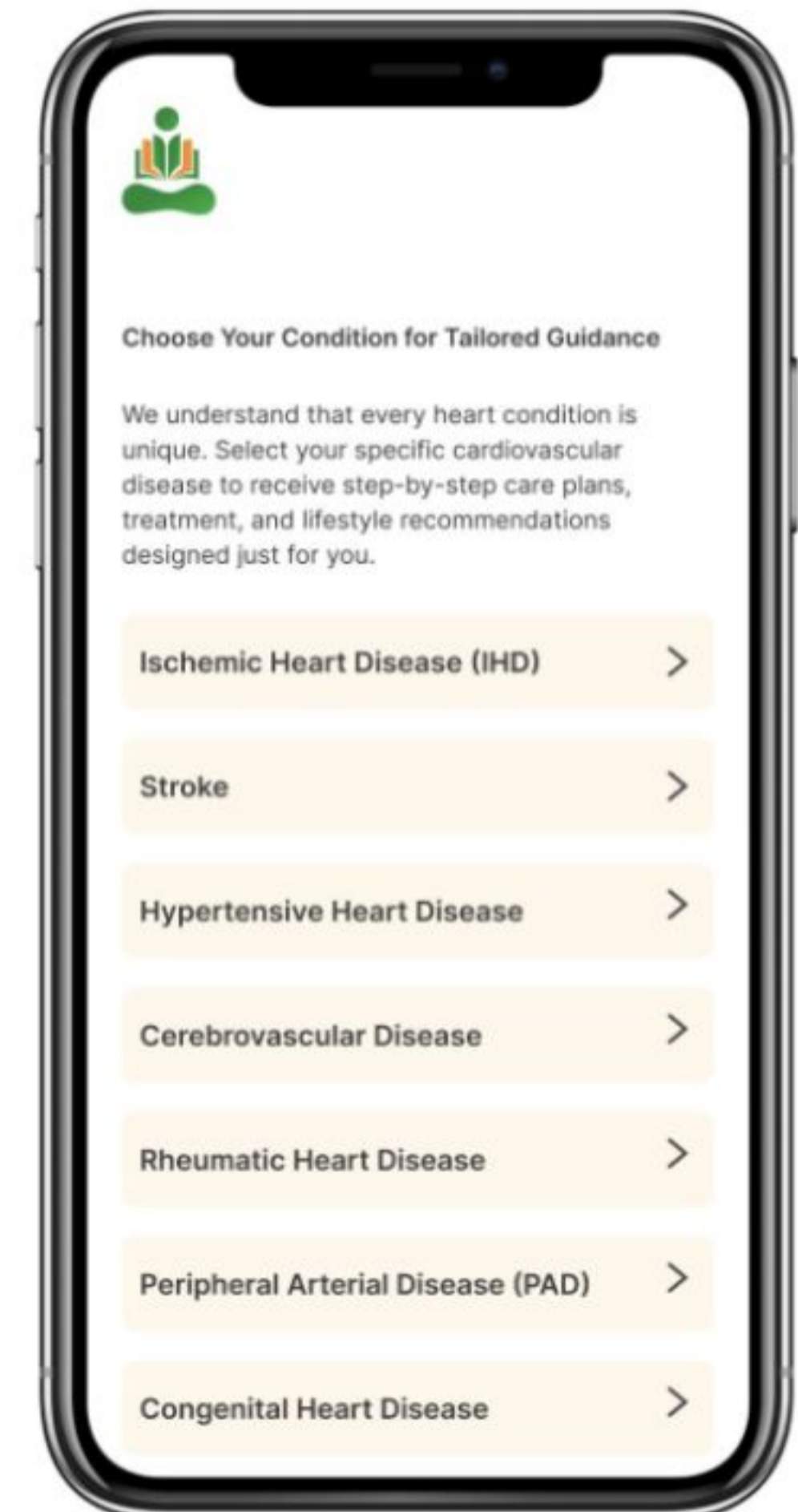
Detailed Coverage: Each step delivers the necessary details, from medical history to surgical intervention, ensuring users receive comprehensive guidance across all treatment phases.

Dual Experience: This approach allows users to either skim essential information or dive deeper when they need more comprehensive knowledge.

[Link to prototype](#)

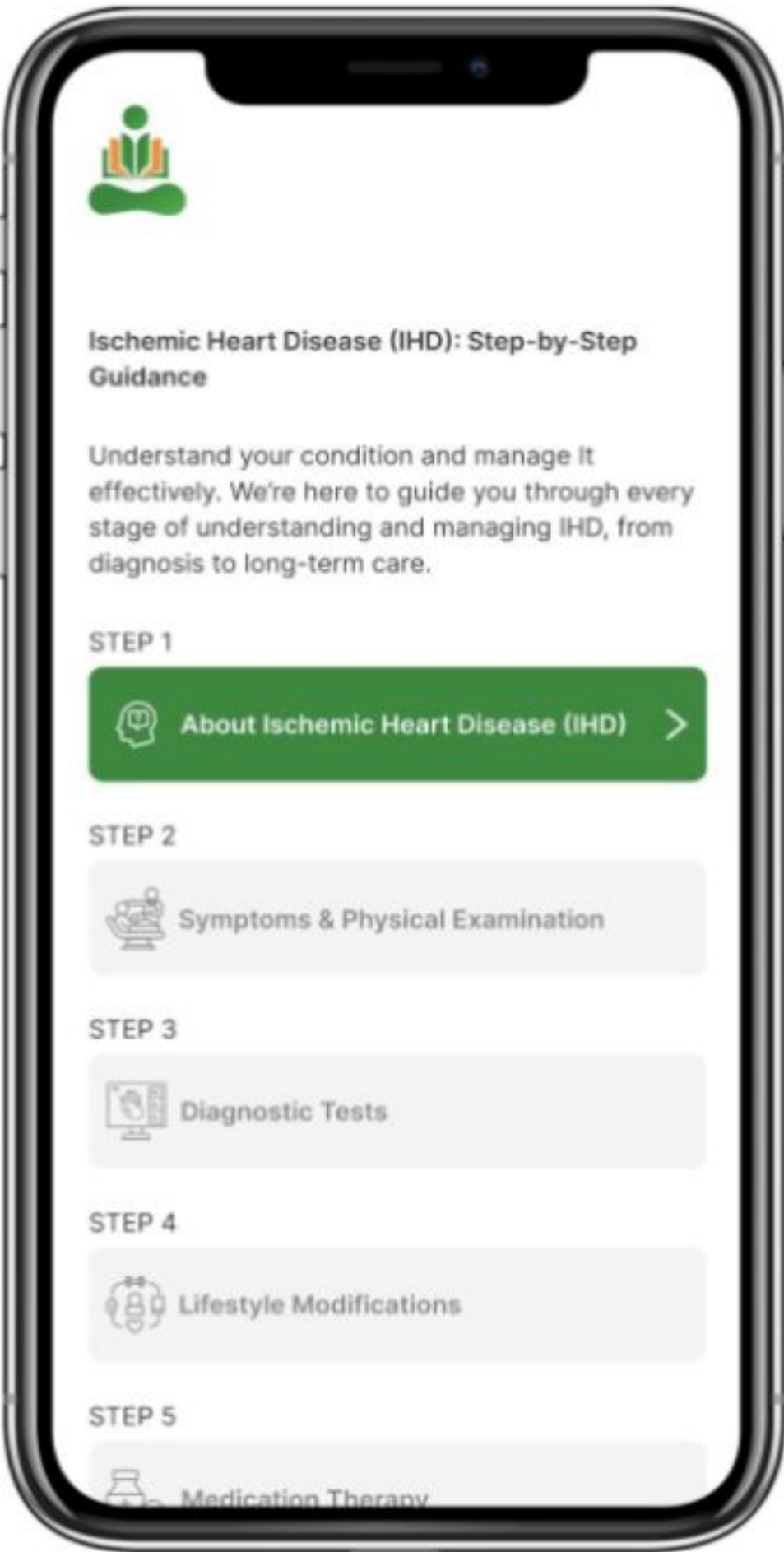


List of the top chronic diseases that are found in India

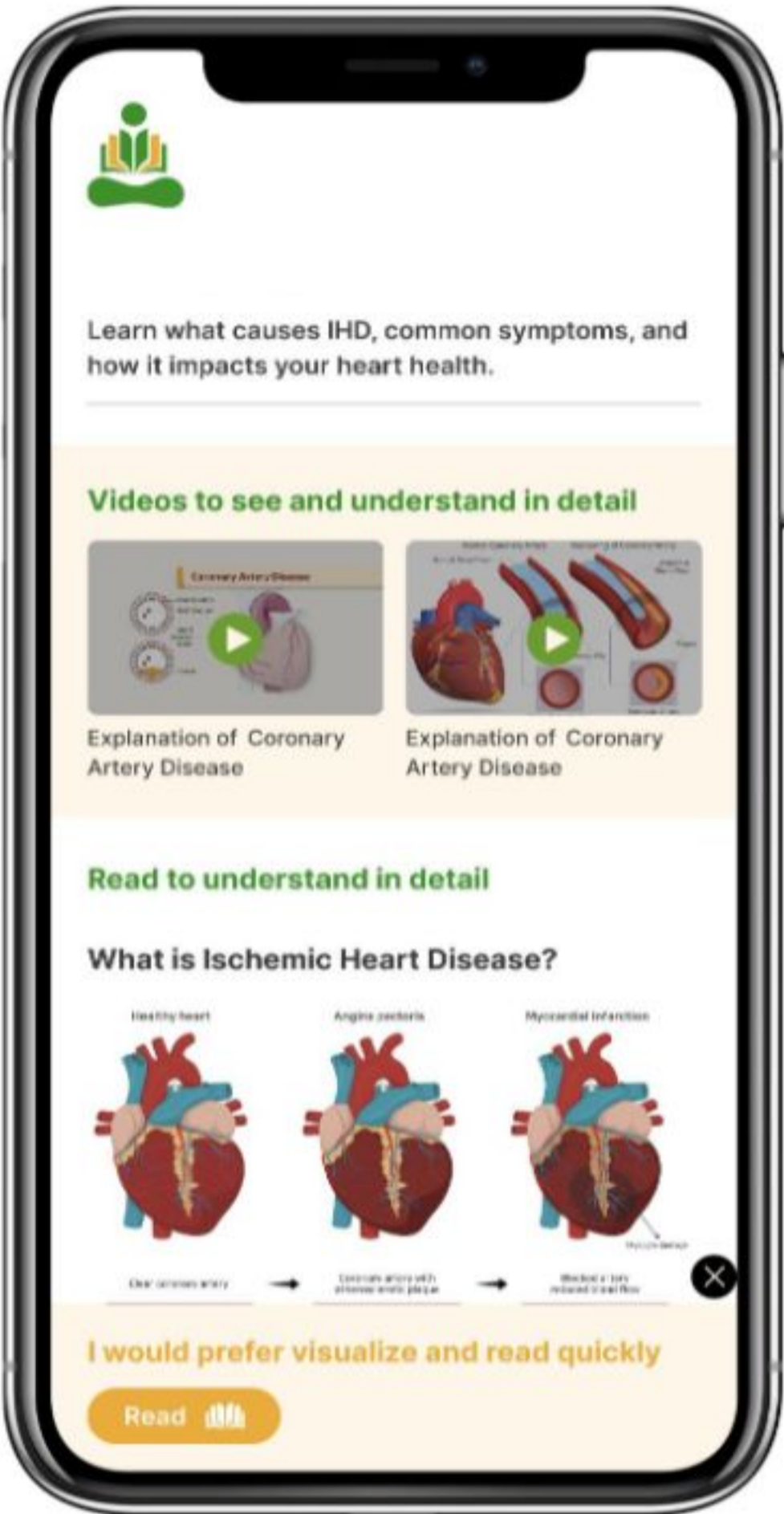


List of the cardiovascular diseases

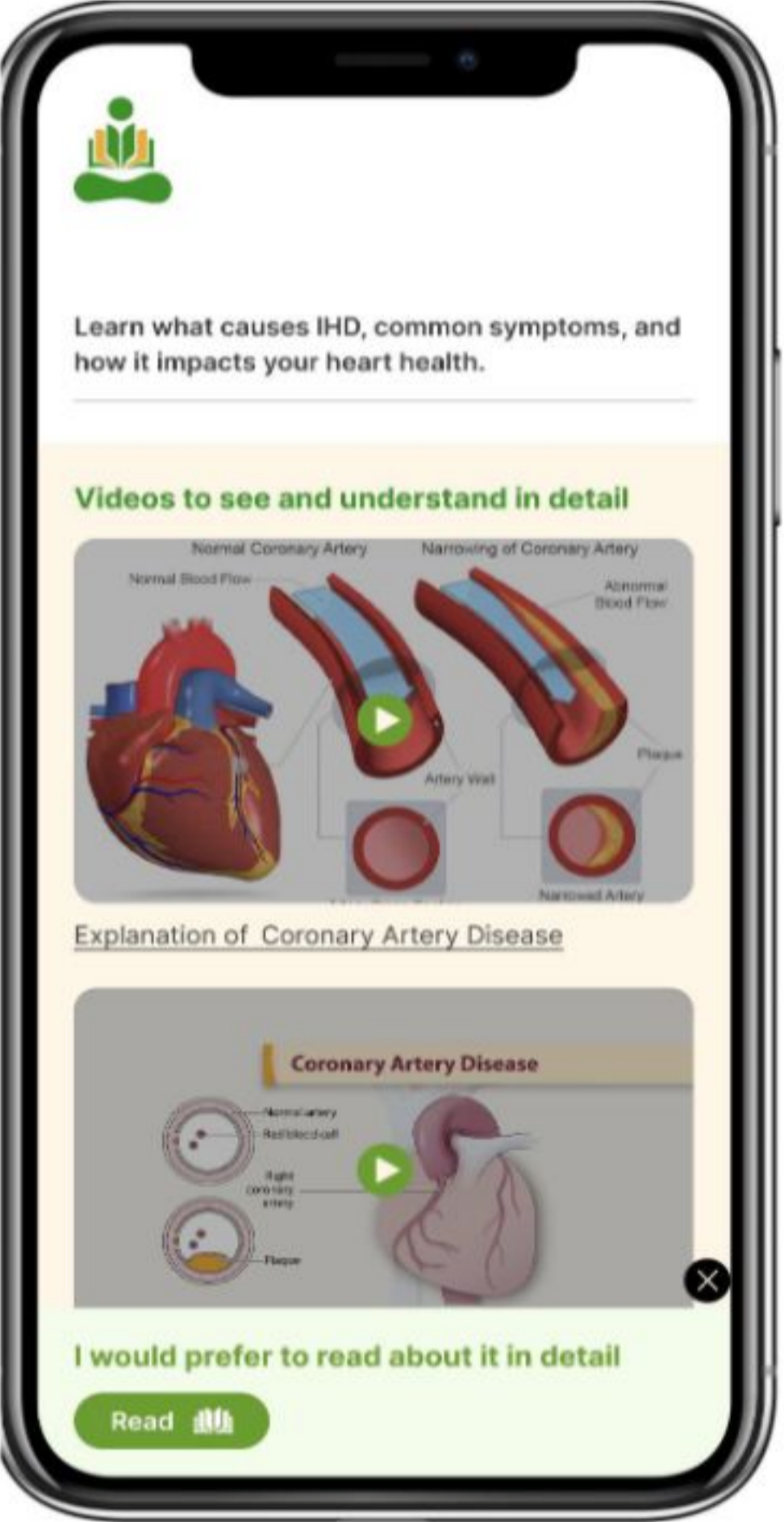
Reduces Cognitive Overload: Breaking down the treatment journey into digestible steps ensures that users can focus on one aspect at a time.



Improves Retention: Information presented sequentially is easier to understand and remember.



Users who are short on time can get essential information without feeling left out, while those seeking deeper understanding can access detailed insights.



Users have different preferences and cognitive styles. Offering quick and detailed reads ensures inclusivity.

Concept 2

Time-Based Learning Customization

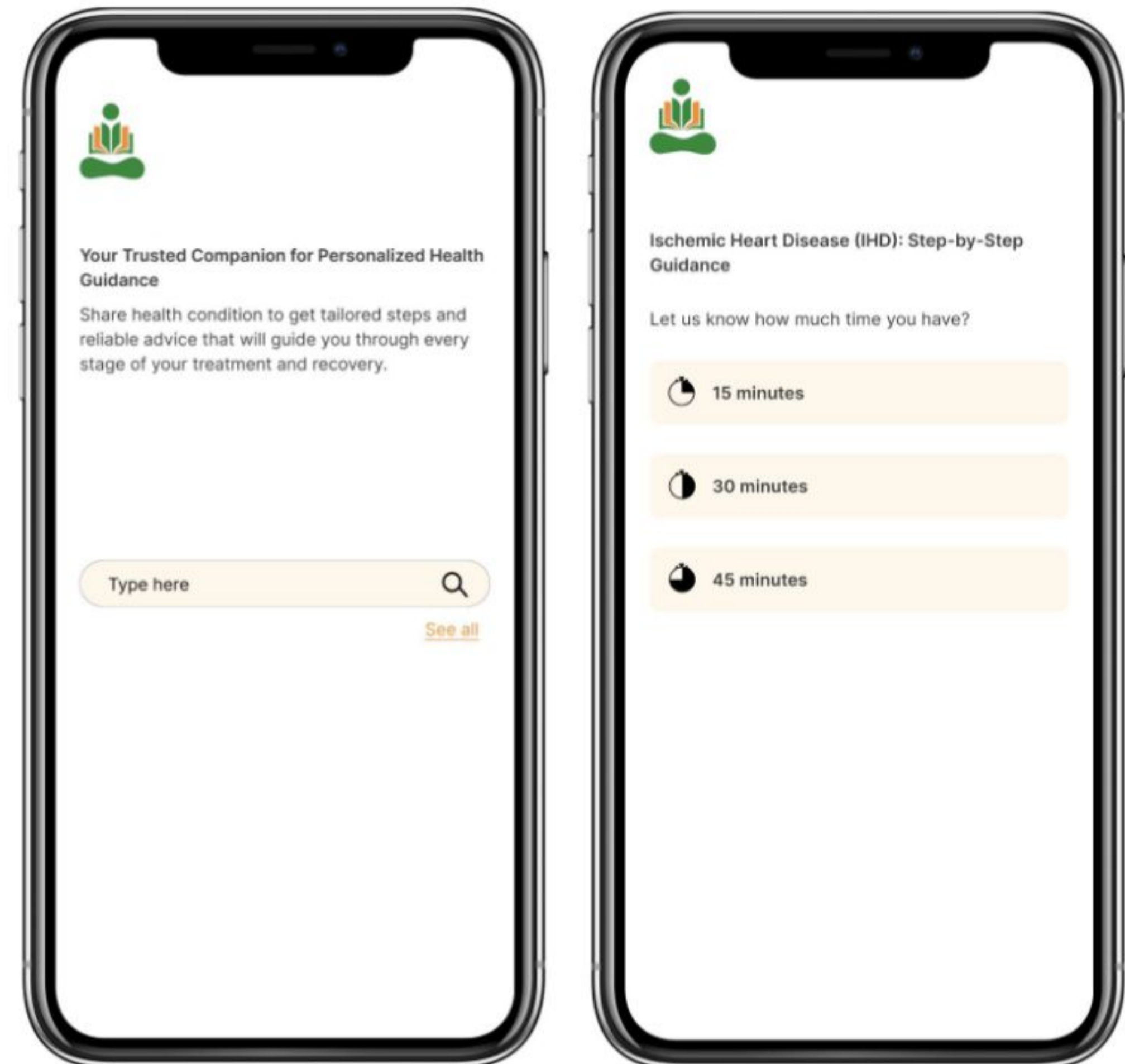
Time based guidance: The platform tailors content based on how much time the user has to understand the disease. During onboarding, users are asked how much time they can devote—15, 30, or 45 minutes.

Category based on minutes:

- For 15 minutes, users receive a highly visual, video-first experience with minimal written content.
- For 30 minutes, they get a balanced mix of videos, brief written content, and infographics.
- For 45 minutes, the platform offers detailed written explanations with supporting videos and visuals, catering to those who prefer an in-depth understanding.

Dual Experience: This approach allows users to either skim essential information or know more or dive deeper when they need more comprehensive knowledge of the health condition they are looking for.

[Link to prototype](#)

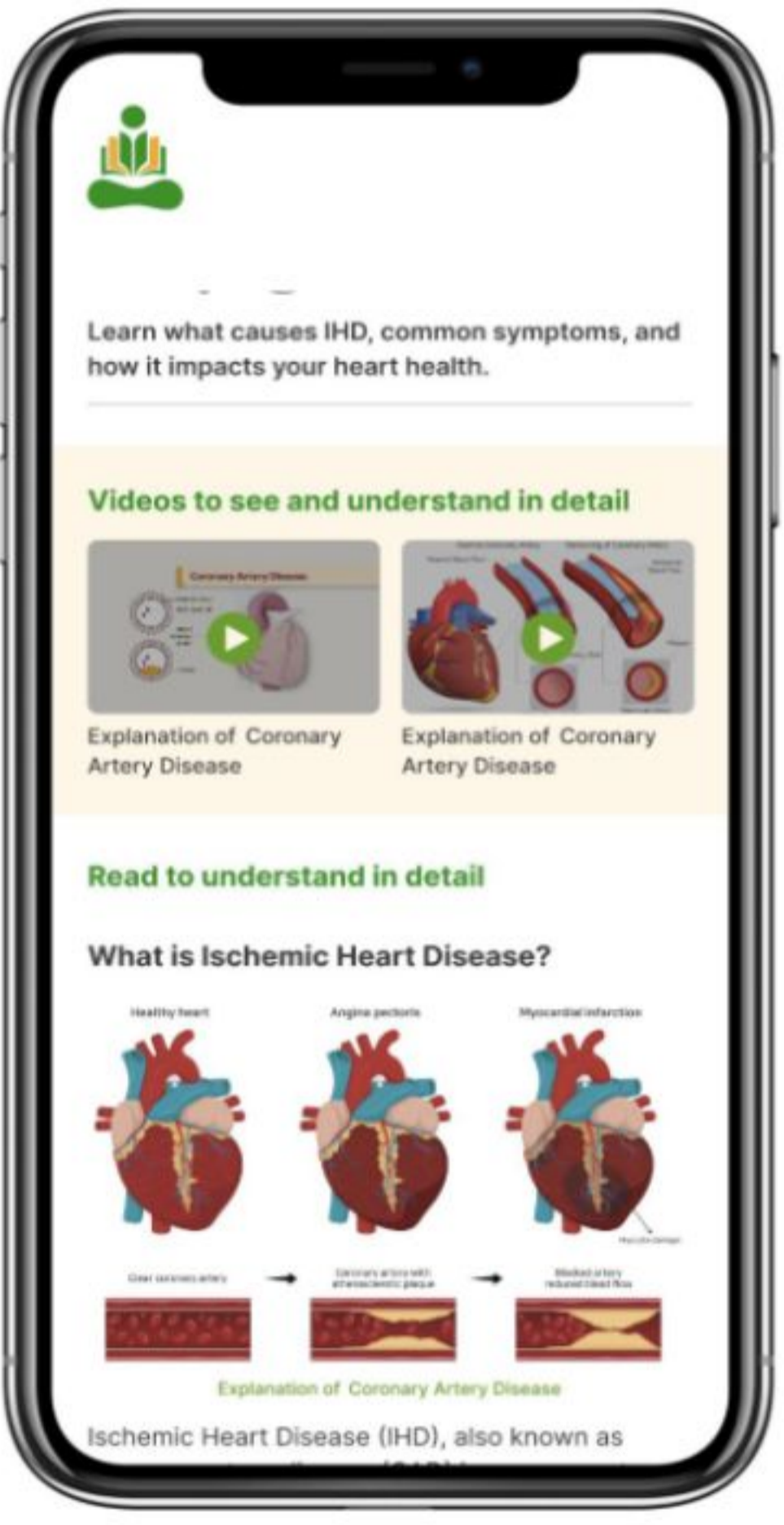
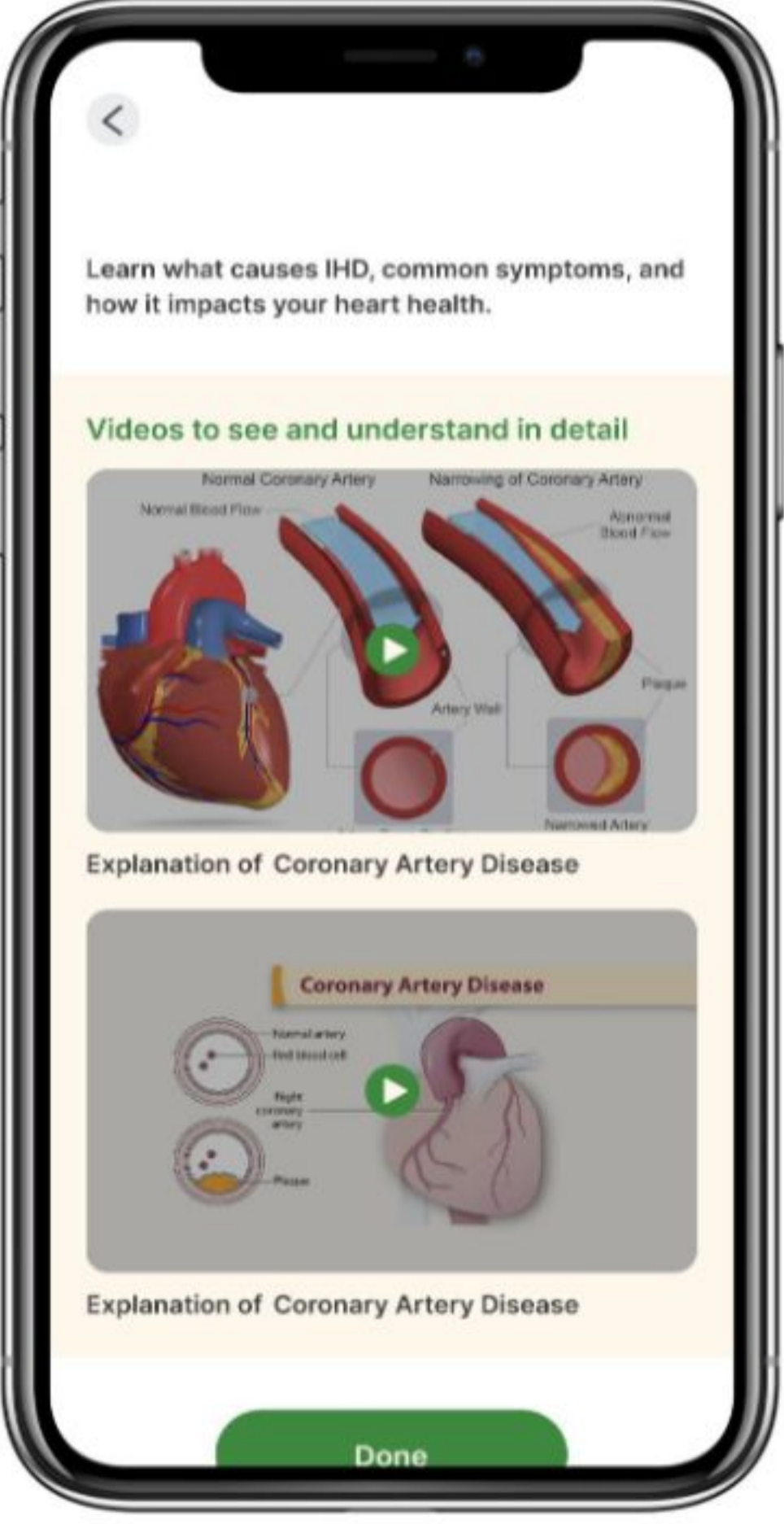
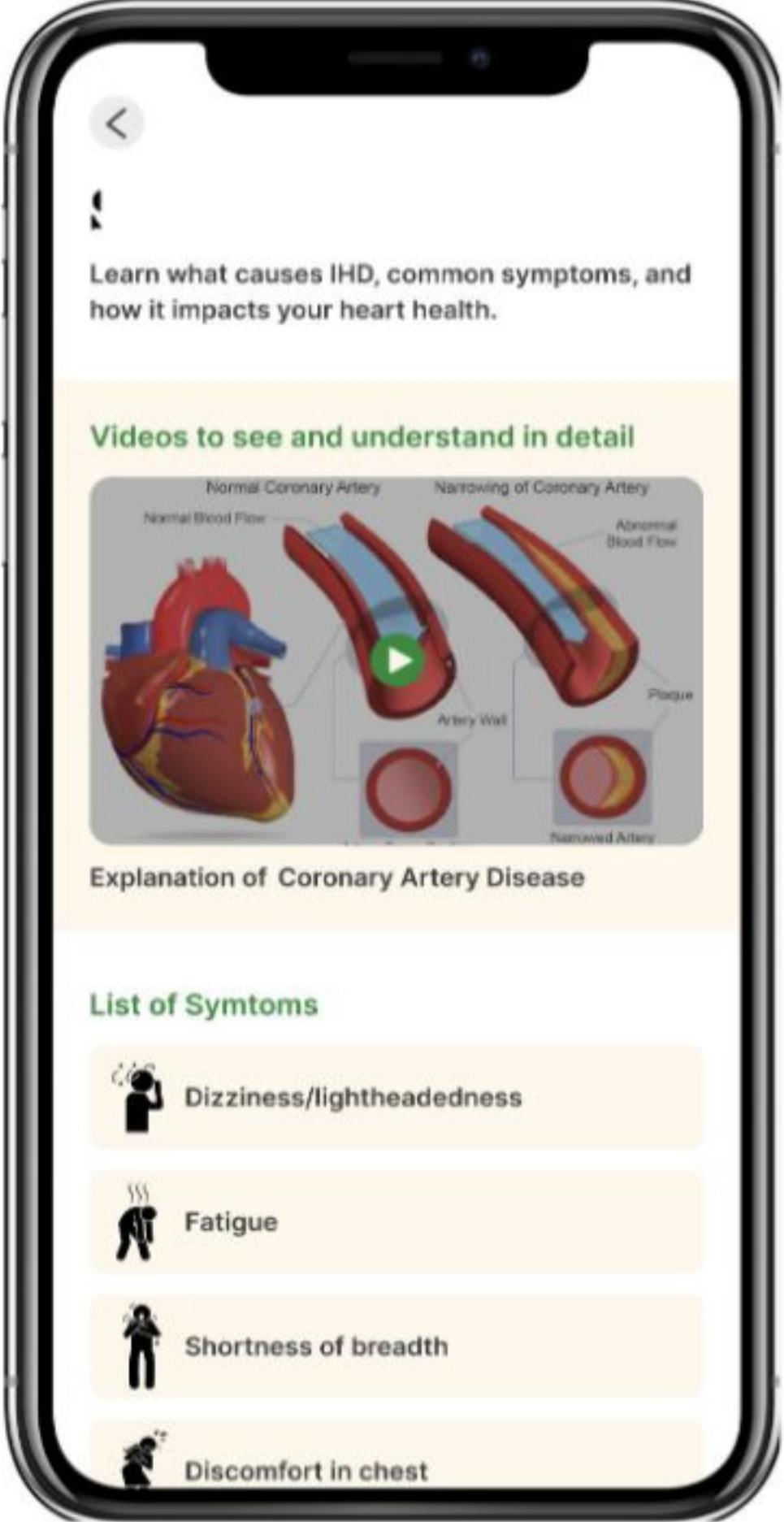
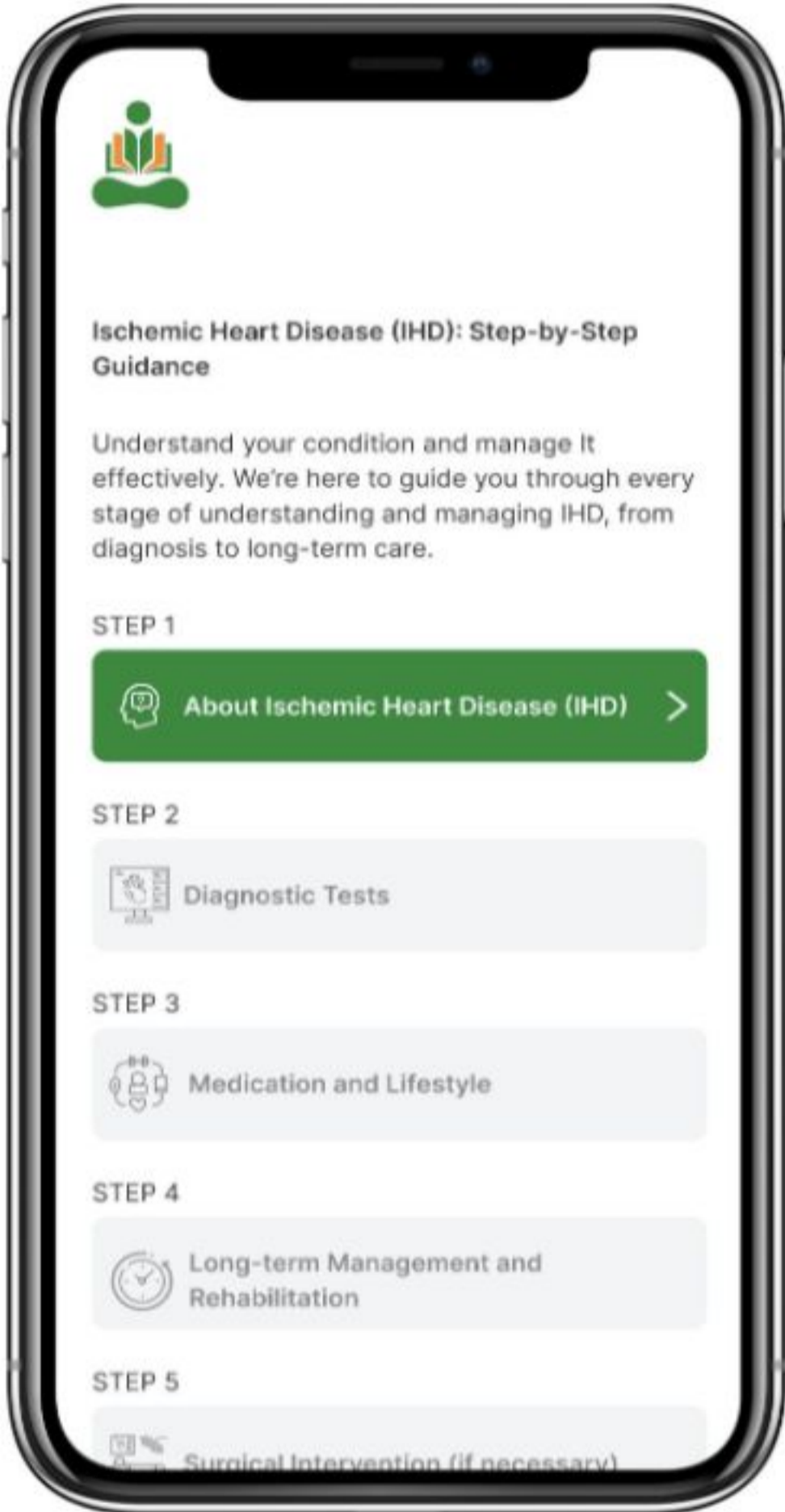


Give access to the user to type down the disease. They are looking for or view all the list of diseases clicking on see all.

Give list of time bound options to let the user choose based on time, the user wants to spend to study the disease

15 Minutes: Video-first, highly visual, minimal text.

45 Minutes: Detailed written explanations supported by visuals and videos.



30 Minutes: Balance of videos, infographics, and concise written text.

Concept 3

Age-Based Learning Experience

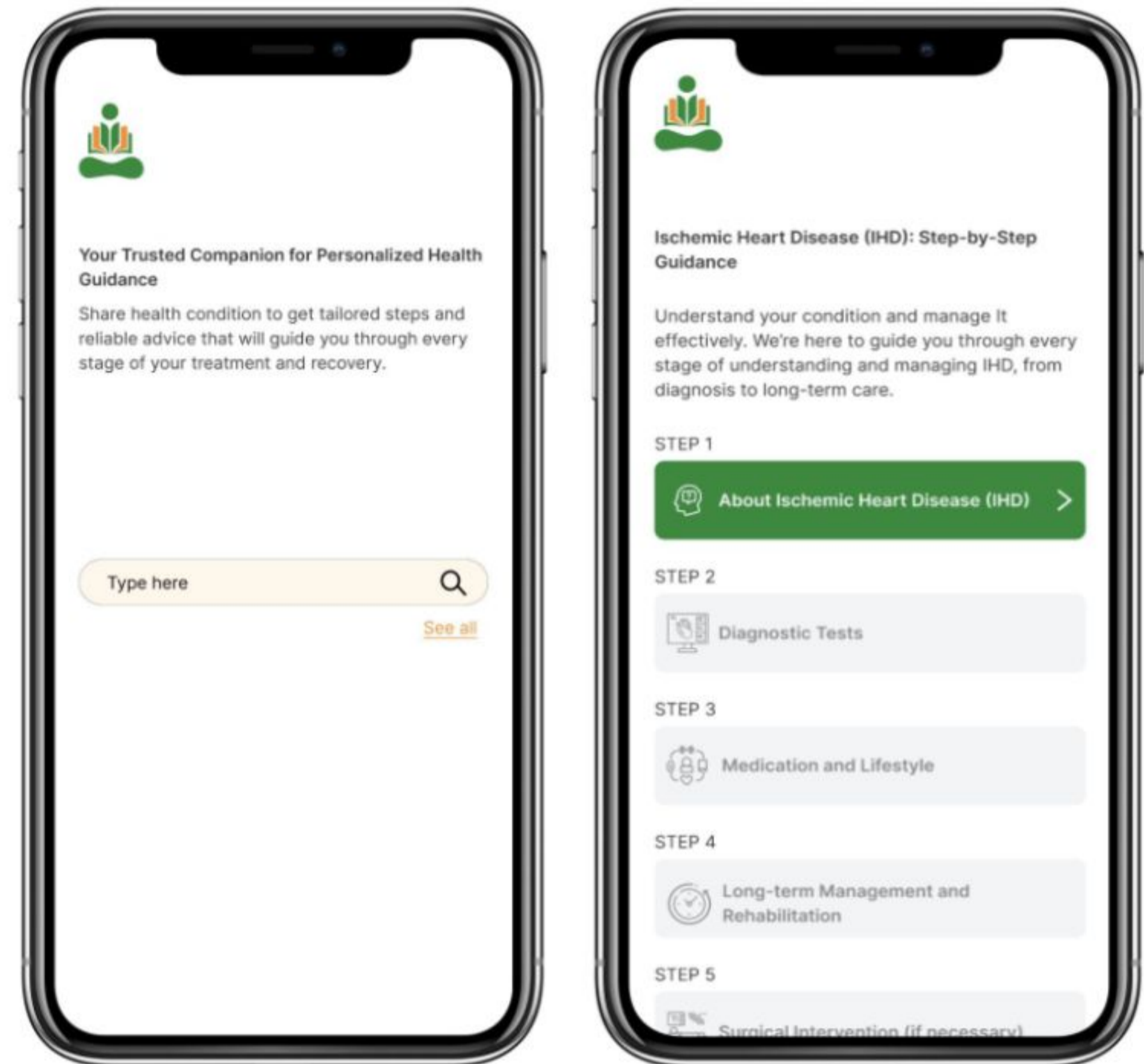
Sequential Guidance: This idea provides patients with a structured, step-by-step guide that covers the entire treatment journey, from understanding the disease to long-term management.

Tailored by Age Group: Seniors: The platform is designed to be user-friendly, focusing on larger fonts, simple language, and more visual content. Each step is simplified with minimal text and intuitive navigation, making it easy for elderly users.

Younger Users: The content is concise, modern, and interactive, catering to the fast-paced learning preferences of younger users. Information is delivered in short bursts with quizzes, polls, and gamified elements to keep them engaged.

Personalization for Age: Based on the user's age, the platform dynamically adjusts the content delivery to match their learning style, making it accessible for all age groups without compromising on the quality of information.

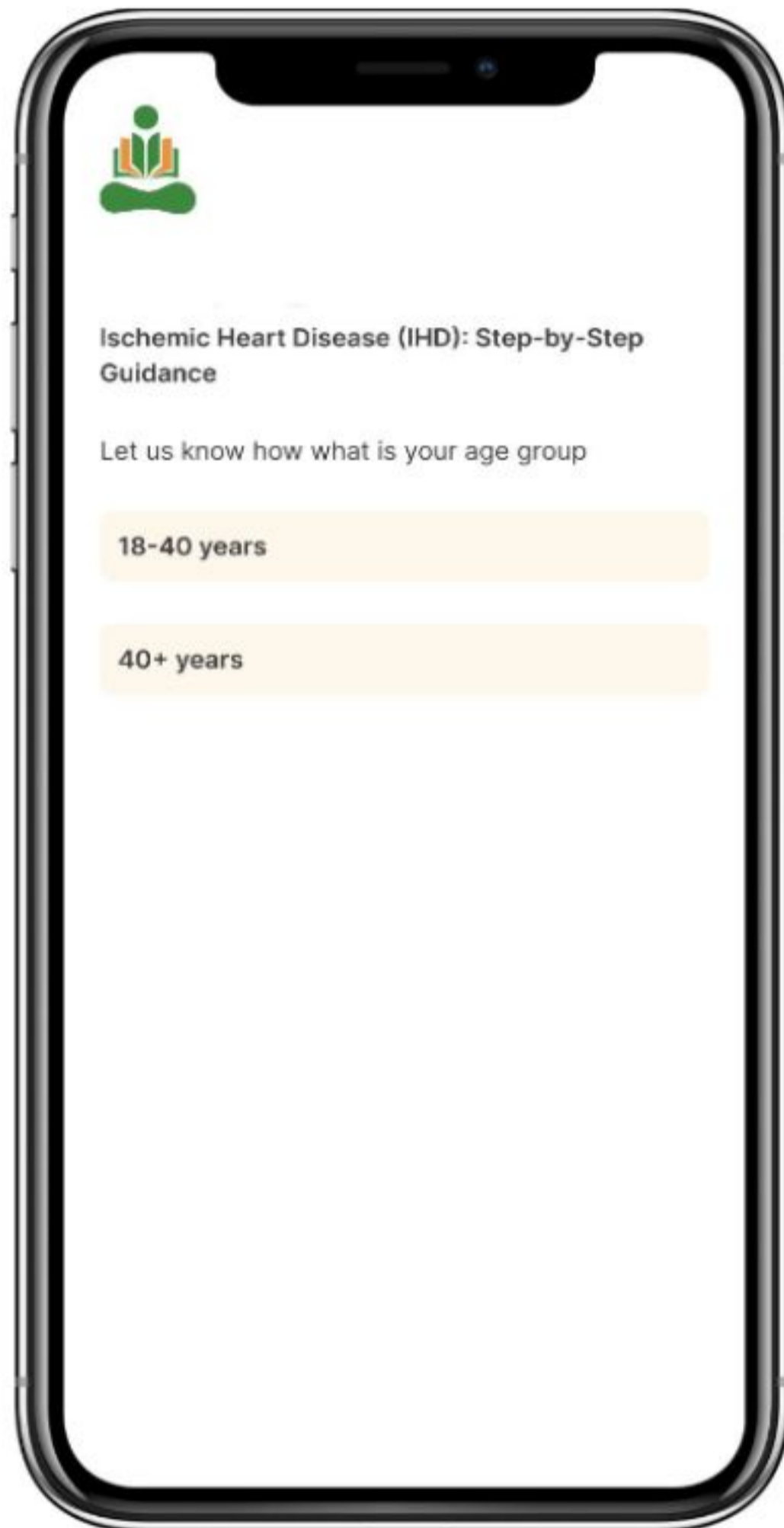
[Link to prototype](#)



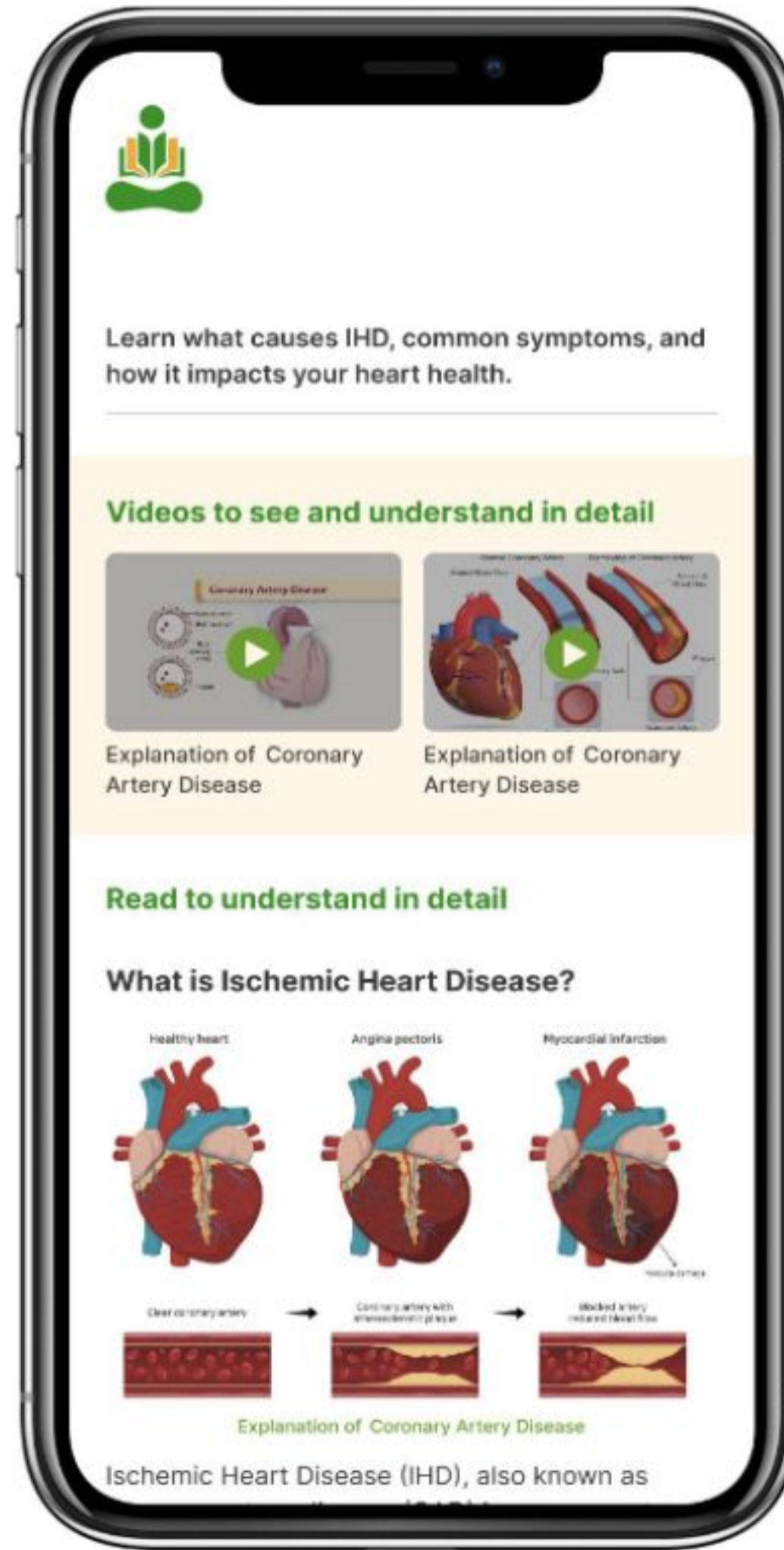
Give access to the user to type down the disease. They are looking for or view all the list of diseases clicking on see all.

Reduces Cognitive Overload: Breaking down the treatment journey into digestible steps ensures that users can focus on one aspect at a time.

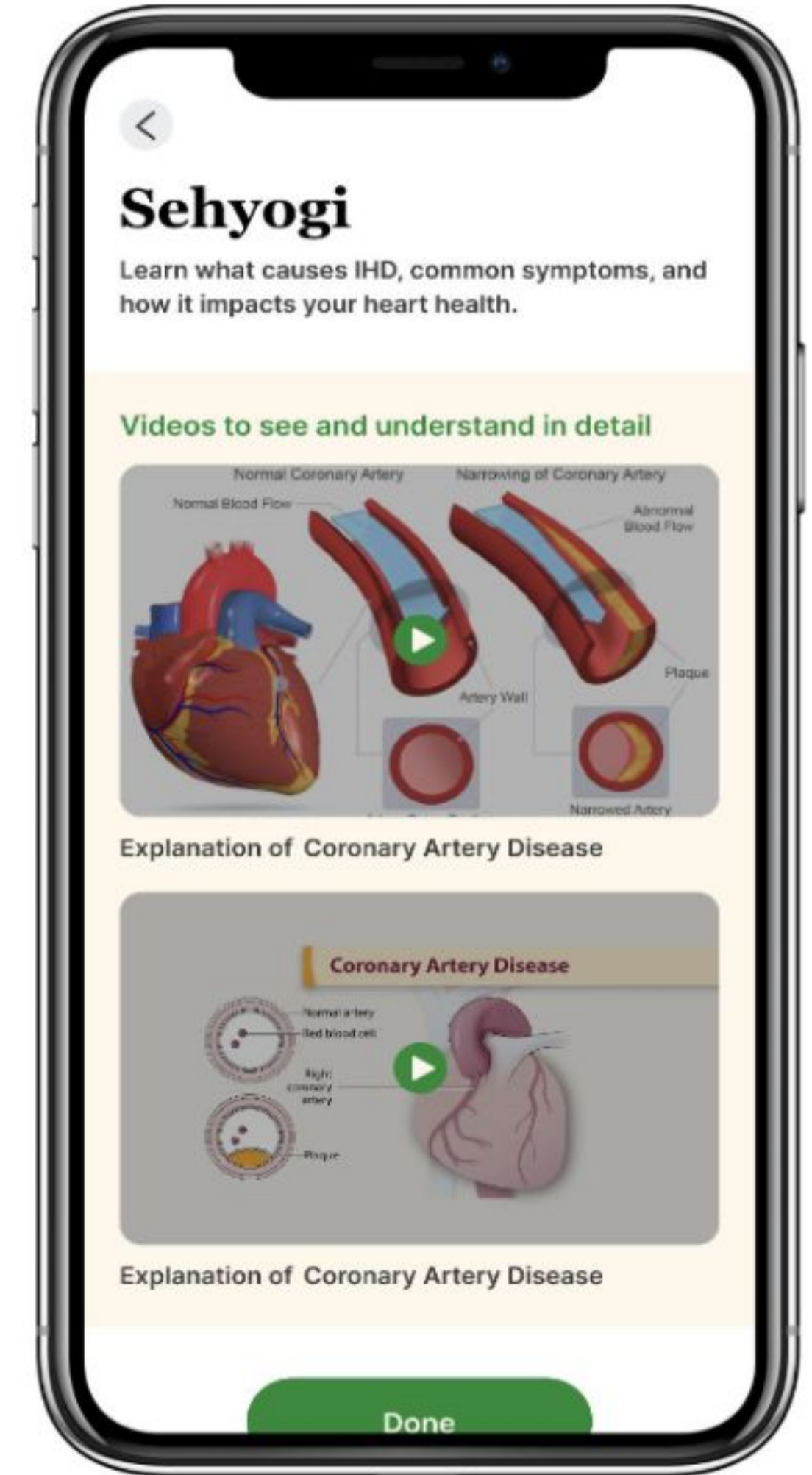
Tailoring content to age groups shows an understanding of their unique challenges (e.g., seniors with visual or cognitive impairments).



Older patients may struggle with complex interfaces and dense text. Simplifying content ensures usability.



Videos elements maintain interest and increase retention for users who prefer dynamic, fast-paced learning.



Formative Evaluation

Formative Evaluation played a critical role in refining the final design to meet diverse user needs by enabling step-by-step guidance and on-demand help with flexible, customizable content. This ensured that the design could adapt to varying user preferences for information depth, content accessibility, and time commitment, making it especially valuable for users managing chronic health conditions. Here's a breakdown of the initial design ideas assessed through formative evaluation and the resulting insights that shaped the final design:

Read More/Read Less Option

The evaluation showed that users valued the flexibility to either skim quickly or dive deeper when needed. This feedback led to the incorporation of a “read more/read less” toggle, offering a concise, step-by-step guide that could expand for further details, helping users feel in control of the information flow.

Age-Based Design Adaptation

Insights from the evaluation revealed that elderly users required larger fonts and simplified navigation, while younger users favored concise, interactive formats but it has nothing to do with what length of content they want.

Time-Based Learning Customization

Few users appreciated being able to choose content based on their time availability, indicating a preference for short, actionable modules but majorly they wanted the option to explore further.

This model informed the final design concept: a step-by-step guidance platform that adjusts content depth and timing to ensure critical health information is both manageable and meaningful for users of all literacy and tech skill levels.



Screenshot representing the ideations that I went through, while designing the final concept to view this, you can click on the link -> [Click Here](#)

Visual Identity

Name

mediPal

Logo



Typography

IBM Plex

Ag Header-01 · 24/140

Ag Header-01 · 24/140

Ag Subheader-01 · 20/140

Ag Body-01 · 16/140

Ag Body-02 · 16/140

Ag Body Small-01 · 14/20

Ag Body Small -02 · 14/Auto

Ag Caption · 12/Auto

Icons

MEDIPAL FILLED



Reflect clarity

Simplicity

Trust

Color System

Primary Colors



Secondary Colors



Tertiary Colors



Finalized Concept

We finalized our approach by combining concepts of step-by-step guidance and personalized assistance to design a digital platform. For users who may find medical information overwhelming, the app offers a simplified, step-based roadmap to learning about their condition, with an option for family support to aid in their journey. For users who prefer a more detailed exploration, the app caters to different learning preferences, providing options for in-depth reading, videos, or visual aids, along with adjustable content length and font sizes.

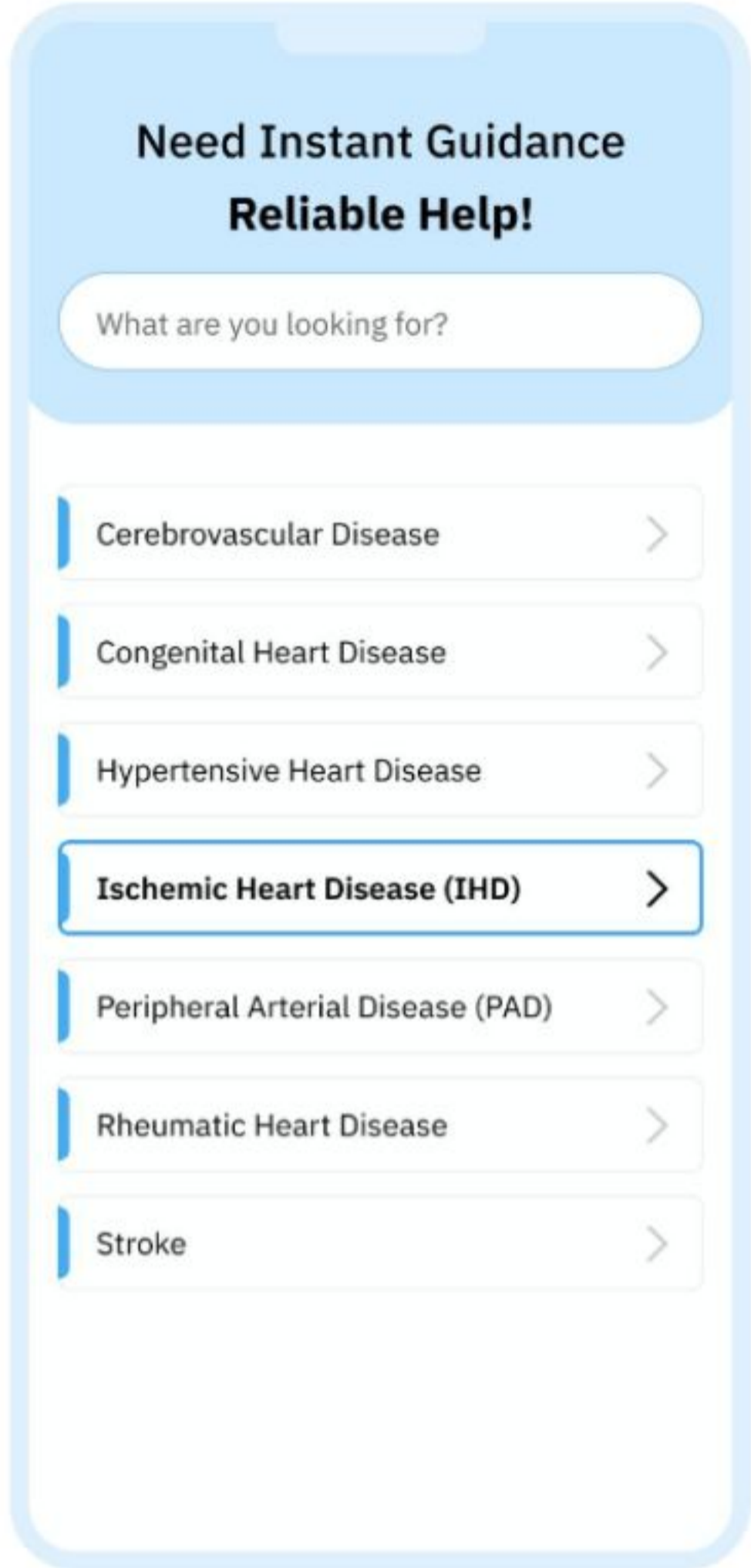
User Flow

Starting Screen: Users are welcomed by a clean, interactive screen listing common cardiovascular disorders, alongside a search bar for specific queries. This initial screen also offers a “Help/Ask” function for users seeking specific guidance or answers to questions.

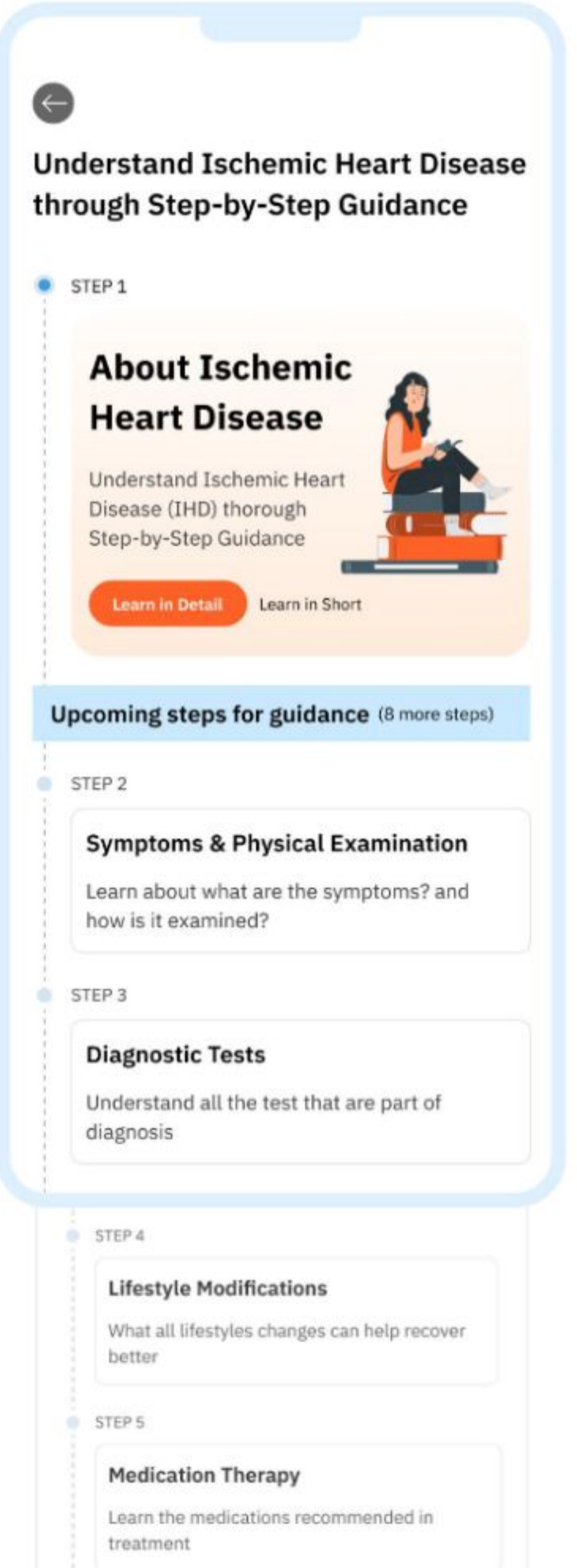
Navigating the Learning Pathway:

On selecting a condition, for instance, Ischemic Heart Disease, users are directed to a guided, multi-step roadmap to explore the condition in depth. This roadmap represents a comprehensive learning pathway divided into bite-sized steps, each building on the previous. al preferences.

Screen 01: List of cardiovascular disorder, as for now, the Prof focuses on the CVD’s ment



Screen 02: Set of steps that can best guide the patient to know the role map of the overall treat



Finalized Concept

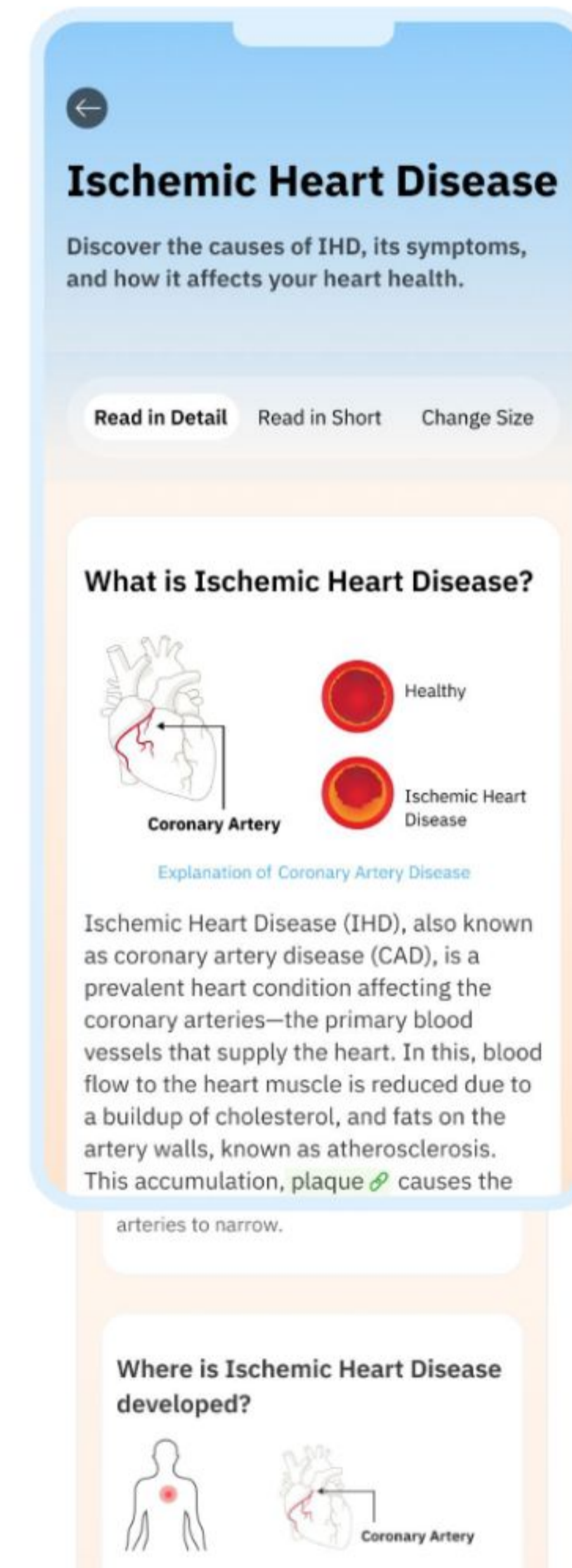
The roadmap steps for Ischemic Heart Disease include:

- About Ischemic Heart Disease
- Symptoms & Physical Examination
- Diagnostic Tests
- Lifestyle Changes
- Medication Therapy
- Revascularization Procedure
- Cardiac Rehabilitation
- Long-Term Management
- Surgical Intervention

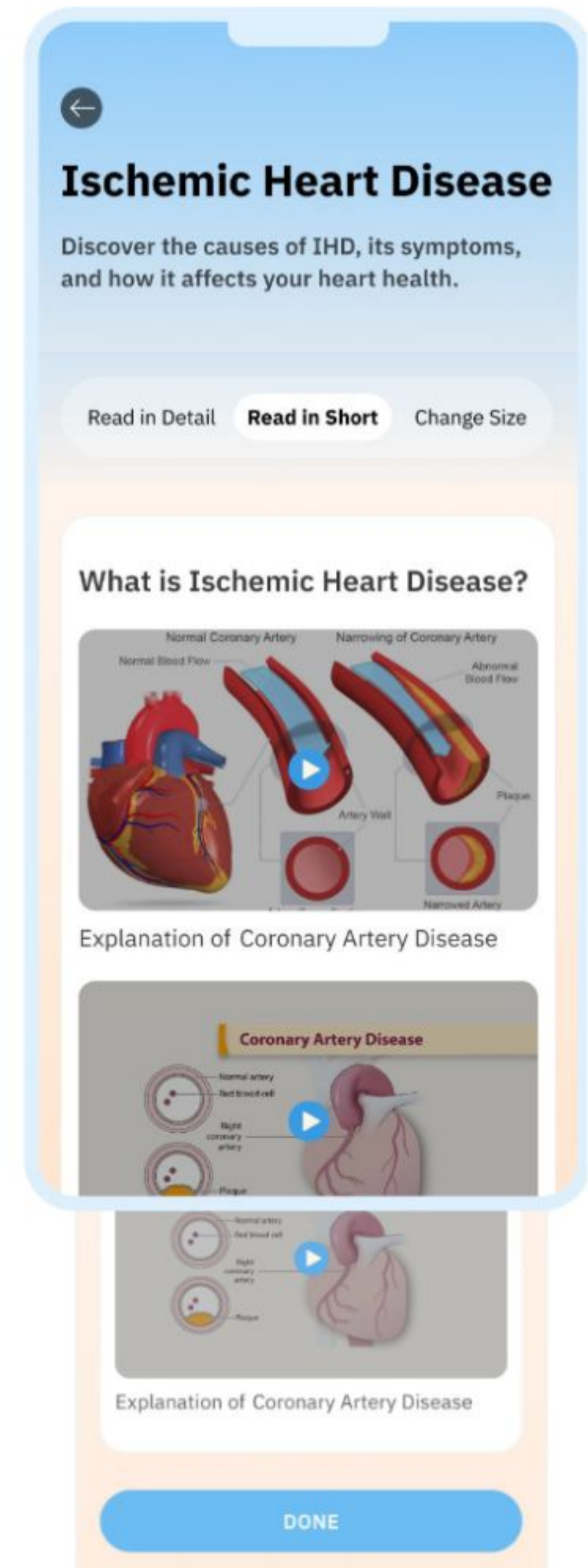
Step of Interaction:

- Each step activates sequentially, allowing the user to dive into specific aspects of the disease in a guided, logical order.
- Users can choose how much information they want to consume per step:
 - Content Length: Options are available to read in short or in detail for each topic, depending on the user's time and interest.
 - Size Customization: For reading ease, users can adjust font size (small, medium, or large) to meet individual

Screen 04: This screen shows the detailed explanation of a Ischemic, heart disease



Screen 05: This screen shows the in short explanation of a Ischemic, heart disease

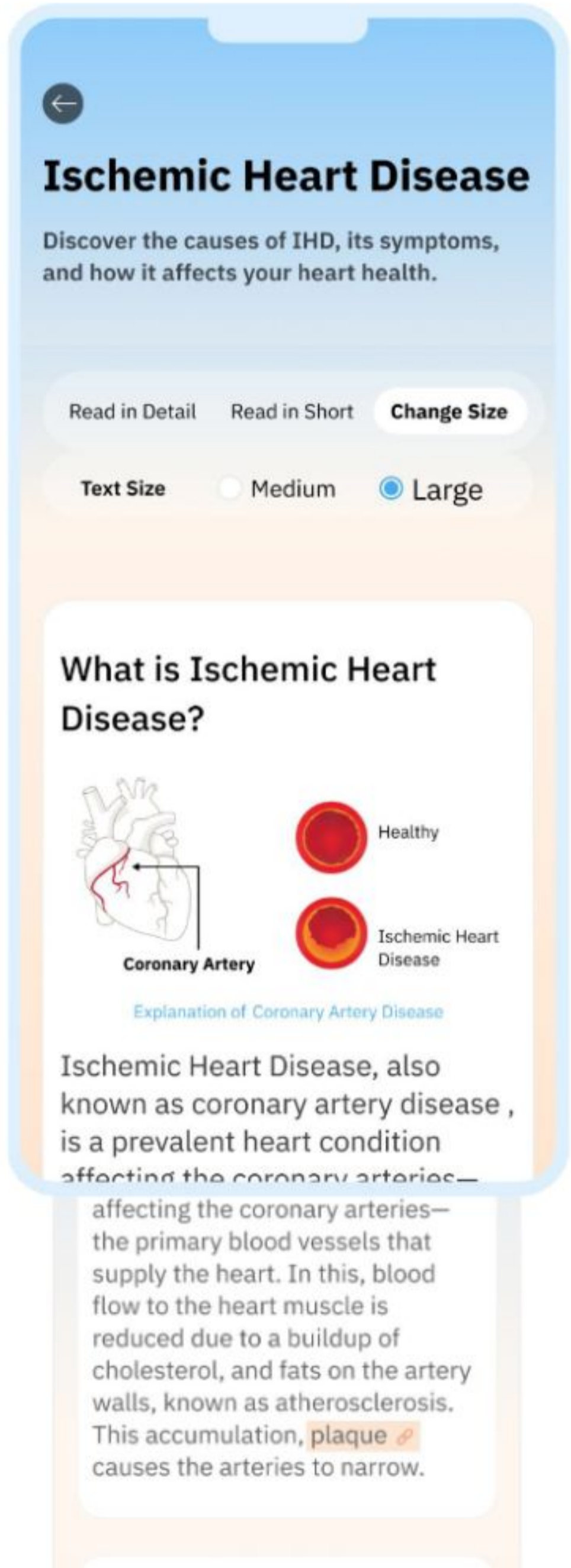


Progression and Completion:

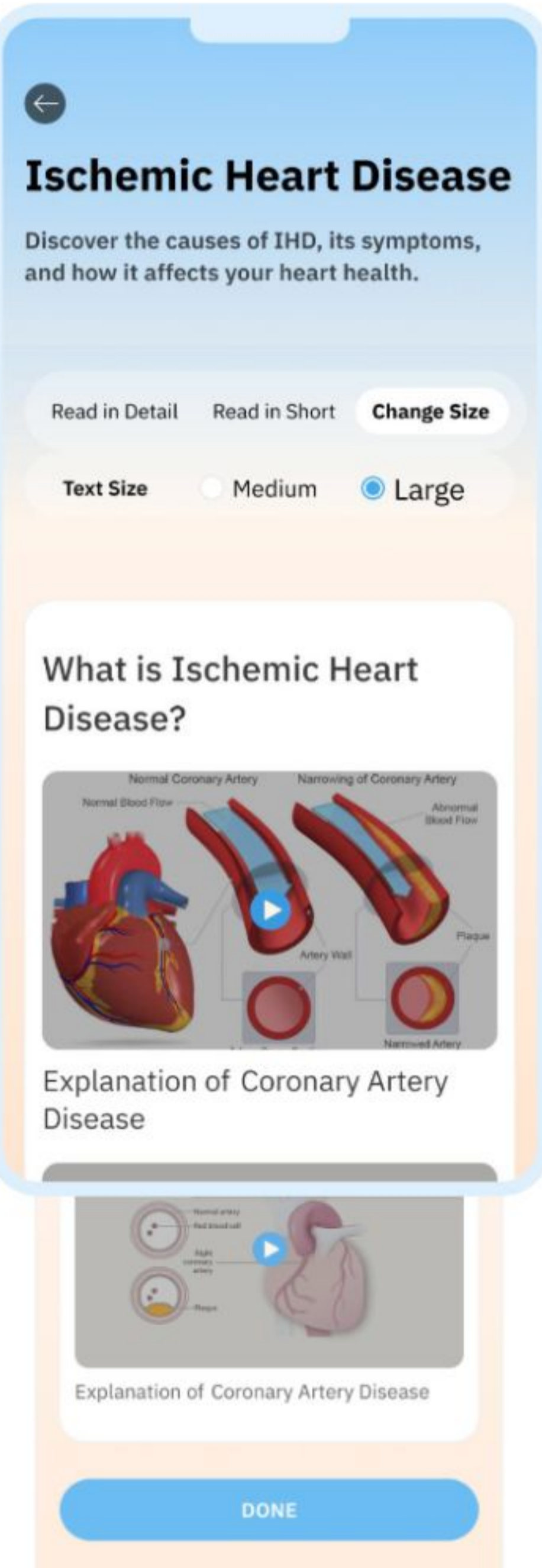
- Once users complete reading a step (or interacting with their chosen format), they can click “Done,” which marks the step as complete and activates the next step on the roadmap.
- This sequential activation keeps users focused on learning each section thoroughly before moving forward.

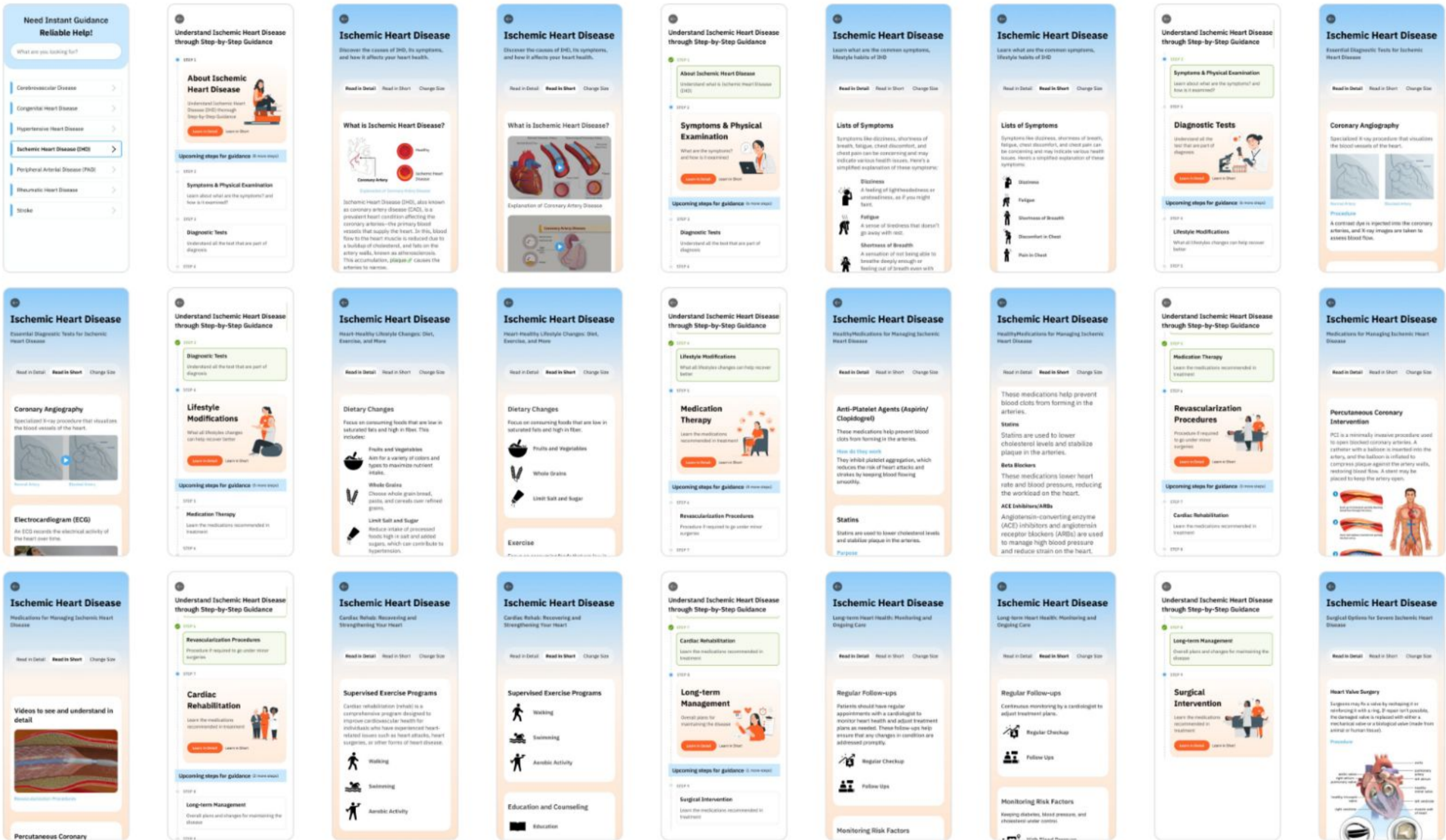
This solution helps users progressively build knowledge through guided steps, including an overview of the condition, diagnostic options, lifestyle changes, and treatment pathways.

Screen 05: Apply the change size filter for the text as large to view the content with the larger font size



Screen 06: Apply the change size filter for the text as large to view the content with the larger font size (Short Explanation)



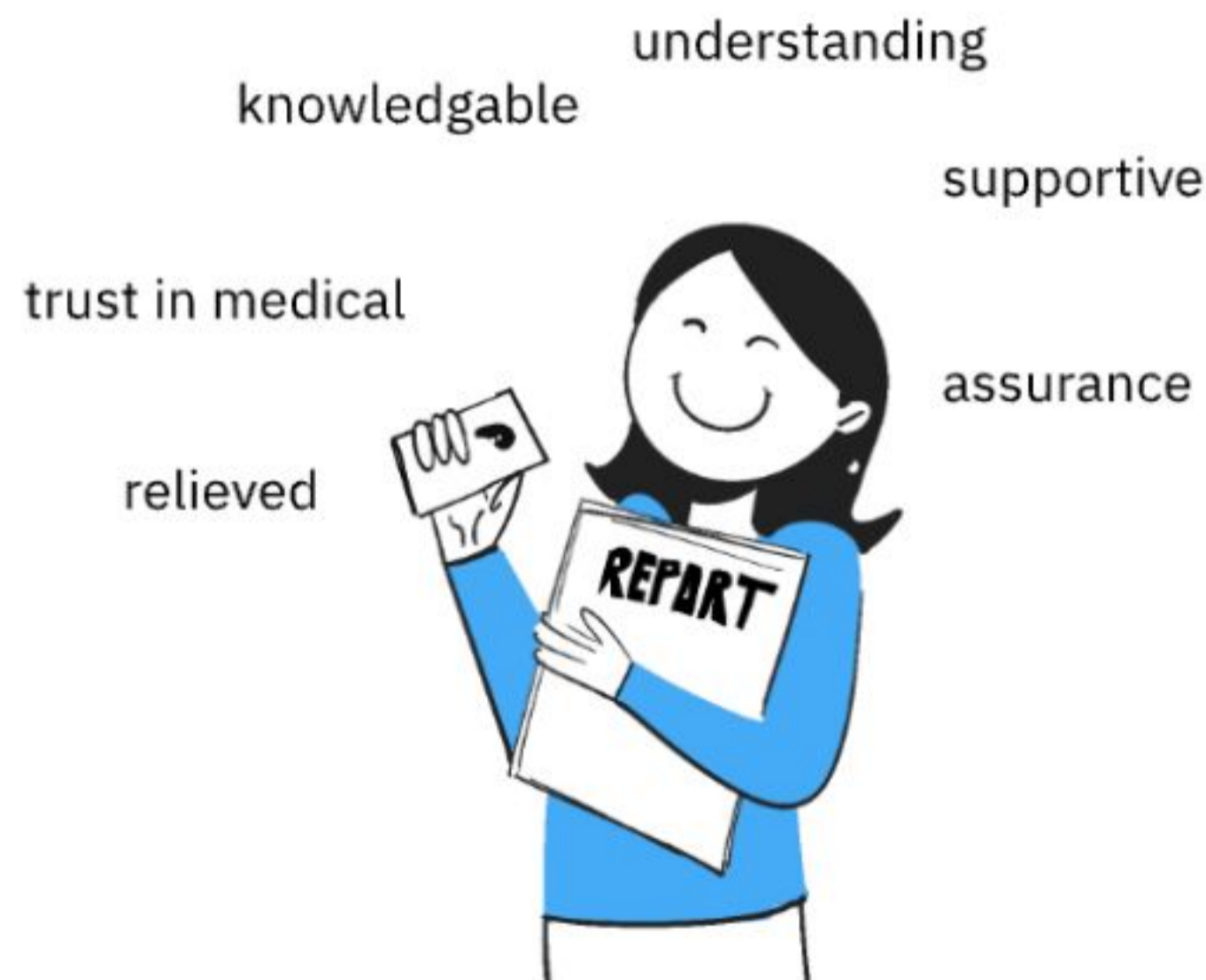


List of screens to complete all the steps: [Click here to View in detail](#)

Design Evaluation

Evaluation Goals

The primary goal of this evaluation is to assess the MediPal ability to support users in navigating healthcare information effectively, aligning with their learning, and enhancing their retention of key information. Specifically, we aimed to understand how well users could interact with its step-by-step guidance/roadmap, assess the clarity and usability of content in different formats (text, visuals, and videos), and measure how the content impacts information retention. Through this evaluation, we sought to identify areas where it meets user needs and where further refinements could enhance its effectiveness as a healthcare information platform tailored to diverse user learning styles.

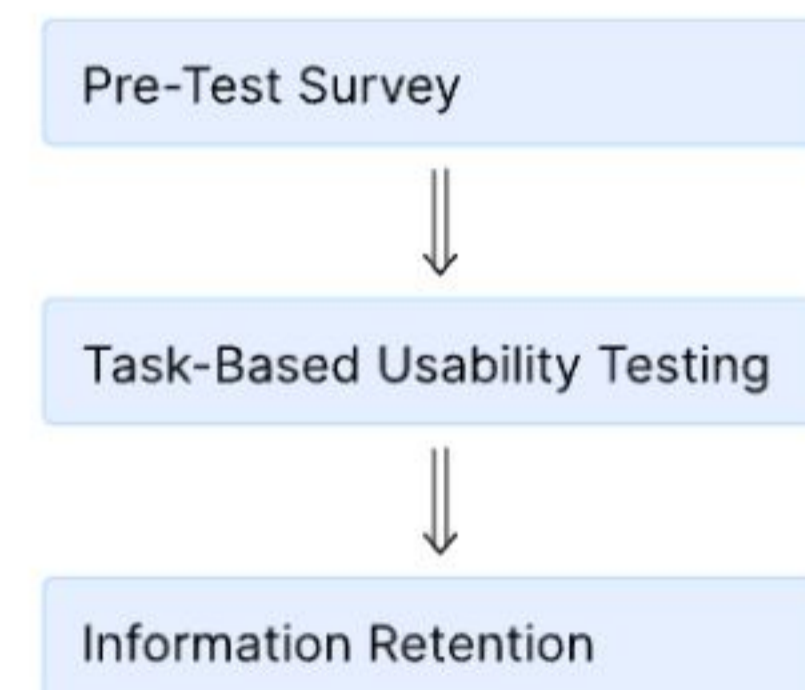


Testing Prototype

To ensure the evaluation reflected real user interactions, we conducted usability and information retention tests using a prototype that showed MediPal main features. By mimicking the step-by-step guidance system this prototype allowed us to observe how users interact with and navigate MediPal, providing valuable insights into their natural preferences and difficulties. This approach facilitated an understanding of MediPal usability without requiring a fully built platform and enabled a focused exploration of users' feedback on different content formats.

The Process

The evaluation involved recruiting a diverse group of users and gathering data across three phases: a Pre-Test Survey, Task-Based Usability Testing, and Information Retention assessment. In the Pre-Test Survey, users provided background information on their existing sources of healthcare information and preferred learning formats, forming the baseline for comparison.



The usability testing phase focused on how intuitively users could navigate MediPal step-by-step guidance to find relevant information.

Finally, the Information Retention assessment used a brief quiz to measure how well users retained the information delivered by MediPal. Each phase provided insights into different aspects of user engagement, interaction, and knowledge retention, helping shape a clearer understanding of MediPal strengths and areas for potential improvement.

Pre- Test Survey

Objective:

The primary objective of the Pre-Test Survey is to gather baseline insights into users' prior experiences with healthcare information sources and their preferred learning formats. This data will enable MediPal to better understand existing user habits and tailor its approach to meet the unique information needs of its users.

Key Metrics Collected:

Previous Information Sources: This metric identifies the users typically rely on for healthcare information, whether it be Google, direct consultation with doctors, pamphlets, or other sources. Understanding these sources offers MediPal insight into common user touch points and establishes a benchmark for comparison.

Learning Preferences: By examining whether users prefer videos, text, or visual formats for health information, MediPal can customize its content delivery. This will ensure that users are presented with content in the formats they find most engaging and accessible, supporting improved understanding and retention of information.

Pre-Tast Survey

The primary objective of the Pre-Test Survey is to gather baseline insights into users' prior experiences with healthcare information sources and their preferred learning formats. This data will enable us to better understand existing user habits and tailor its approach to meet the unique information needs of its users.

Your Name *

Short answer text

Which sources do you typically use to find health-related information? *

- Google or other search engines
- Consultations with doctors
- Health pamphlets or brochures
- Social media or health forums
- Other (please specify)

How confident do you feel about understanding the medical information you find through these sources? *

	1	2	3	4	5	
Very confident	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very unconfident

[Link to the form](#)

Task-Based Usability Testing

Objective:

The Task-Based Usability Testing aims to evaluate the functionality and efficiency of MediPal navigation and content delivery, with a focus on the platform's step-by-step guidance. This phase assesses whether users can effectively locate and interact with information and determines which formats (video, text, infographics) best align with their needs. Additionally, it captures users' confidence levels in understanding health information compared to their prior experiences.

Key Metrics Collected:

Ease of Navigation: This metric gauges the intuitiveness of MediPal step-by-step guidance. By tracking users' pathways, the testing identifies areas where users may encounter difficulty, allowing for optimization of navigation flows to ensure ease and clarity in finding health information.

Content Format Preference:

Understanding the preferred format (video, text, or infographics) for each type of health information enables MediPal to refine its content approach. Testing also highlights which formats are best suited for different types of information, guiding future content development strategies.

User Satisfaction:

This metric provides a direct comparison of user satisfaction between MediPal and previous sources of information. Feedback will

focus on clarity, depth, and whether MediPal successfully addresses information needs. High satisfaction rates would indicate MediPal success in enhancing user experience and trust in health information.

Post-Task Survey

The primary objective of this survey is to understand the accessibility and cohesiveness of the platform if that enables user to better understand the content.

Your name *

Short answer text

How confident do you feel in understanding the symptoms of Ischemic Heart Disease (IHD) after locating the information on **medipal**? *

1 2 3 4 5

Not Confident Very Confident

How confident do you feel in following the step-by-step guide for understanding surgery after reviewing it on **medipal**? *

1 2 3 4 5

Very Unconfident Very Confident

Which format did you find most helpful for understanding the symptoms? *

Videos

[Link to the form](#)

Post Task Survey

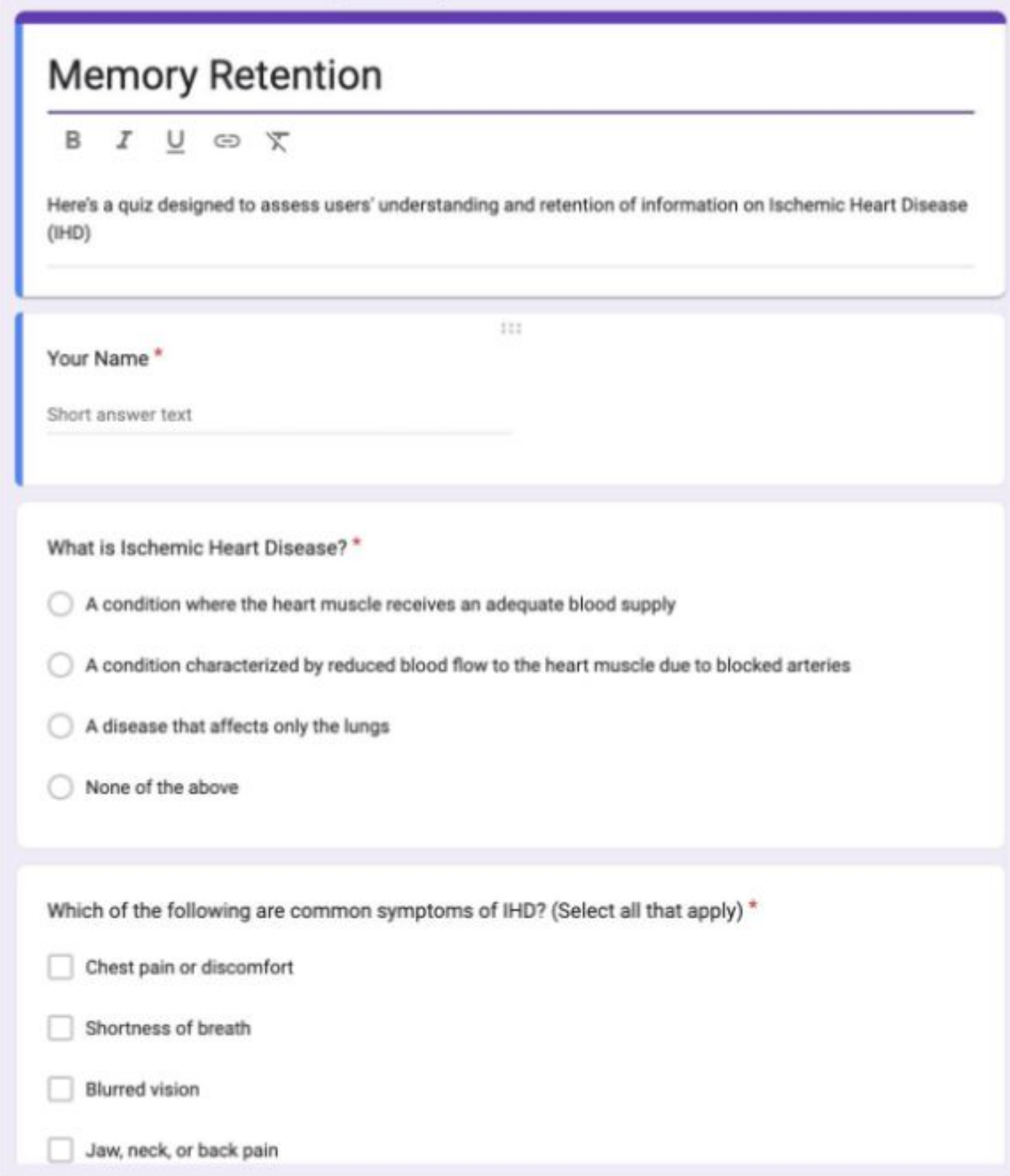
Objective:

The objective of the Information Retention evaluation is to determine the effectiveness of MediPal content in improving users' understanding and memory of medical information. This will help gauge the platform's role in reinforcing users' health knowledge and supporting informed decision-making.

Key Metrics Collected:

Quiz Scores:

After interacting with MediPal's content, users will be given a brief quiz designed to measure the level of comprehension and retention of the health information they reviewed. Quiz scores serve as a tangible metric of MediPal's ability to convey complex information in a way that is both understandable and memorable. Higher retention scores will validate the platform's impact on supporting sustained health literacy and informed health management.



The image shows a screenshot of a web-based quiz titled "Memory Retention". The form is contained within a light purple border. At the top, the title "Memory Retention" is displayed in a bold, black font. Below the title is a horizontal line, followed by a set of text formatting icons: bold (B), italic (I), underline (U), link (chain icon), and unlink (crossed chain icon). A short introductory paragraph reads: "Here's a quiz designed to assess users' understanding and retention of information on Ischemic Heart Disease (IHD)". Below this is a text input field. The next section is a form field labeled "Your Name" with a red asterisk, indicating it is required. Below the name field is a "Short answer text" label and a text input field. The following section is a multiple-choice question: "What is Ischemic Heart Disease?" with a red asterisk. It lists four options, each with a radio button: "A condition where the heart muscle receives an adequate blood supply", "A condition characterized by reduced blood flow to the heart muscle due to blocked arteries", "A disease that affects only the lungs", and "None of the above". The final section is a checkbox question: "Which of the following are common symptoms of IHD? (Select all that apply)" with a red asterisk. It lists four symptoms, each with a checkbox: "Chest pain or discomfort", "Shortness of breath", "Blurred vision", and "Jaw, neck, or back pain".

[Link to the form](#)

Results

Work in progress

References

1. Szilvay, András, Orsolya Somogyi, Attiláné Meskó, Romána Zelkó, and Balázs Hankó. "Qualitative and Quantitative Research of Medication Review and Drug-Related Problems in Hungarian Community Pharmacies: A Pilot Study." *BMC Health Services Research* 19 (May 3, 2019): 282. <https://doi.org/10.1186/s12913-019-4114-1>.
2. Garavalia, Linda, Brian Garavalia, John A. Spertus, and Carole Decker. "Medication Discussion Questions (MedDQ): Developing a Guide to Facilitate Patient-Clinician Communication about Heart Medications." *The Journal of Cardiovascular Nursing* 26, no. 4 (August 2011): E12. <https://doi.org/10.1097/JCN.0b013e3181efea94>.
3. Care (UK), National Collaborating Centre for Primary. "Key Clinical Questions and Searches." In *Medicines Adherence: Involving Patients in Decisions About Prescribed Medicines and Supporting Adherence* [Internet]. Royal College of General Practitioners (UK), 2009. <https://www.ncbi.nlm.nih.gov/books/NBK55436/>.
4. Hindustan Times. "Doctors in India See Patients for Just 2 Minutes: Study," November 9, 2017. <https://www.hindustantimes.com/india-news/doctors-in-india-see-patients-for-just-2-minutes-study/story-orj76kGppdffzyA5OcoWyN.html>.
5. "'eSanjeevani', Govt. of India's Free Telemedicine Service Completes 60 Lakh Consultations." Accessed November 19, 2024. <https://pib.gov.in/PressReleasePage.aspx?PRID=1725993>
6. Jimmy, Beena, and Jimmy Jose. "Patient Medication Adherence: Measures in Daily Practice." *Oman Medical Journal* 26, no. 3 (May 2011): 155. <https://doi.org/10.5001/omj.2011.38>.
7. Suppiah, Sumithra Devi, Yi Wen Tan, Sarah Siew Cheng Tay, Valerie Shu Ying Tan, Ngiap Chuan Tan, Wern-Ee Tang, Alexandre Chan, Gerald Choon-Huat Koh, and Rahul Malhotra. "Challenges Encountered by Pharmacy Staff in Using Prescription Medication Labels during Medication Counselling with Older Adults and Solutions Employed: A Mixed-Methods Study." *Exploratory Research in Clinical and Social Pharmacy* 9 (March 2023): 100226. <https://doi.org/10.1016/j.rcsop.2023.100226>.
8. "(PDF) Changing Doctor Patient Relationship in India: A Big Concern." Accessed November 21, 2024. https://www.researchgate.net/publication/334030613_Changing_doctor_patient_relationship_in_India_a_big_concern.
9. Brown, Marie T., and Jennifer K. Bussell. "Medication Adherence: WHO Cares?" *Mayo Clinic Proceedings* 86, no. 4 (April 2011): 304–14. <https://doi.org/10.4065/mcp.2010.0575>.
10. "(PDF) Patients Knowledge of Prescribed Medications and Factors Affecting It in a Tertiary Care, Public, Teaching Hospital in New Delhi, India." ResearchGate, October 22, 2024. https://doi.org/10.4103/mamcjms.mamcjms_45_20.

References

11. Sharkiya, Samer H. "Quality Communication Can Improve Patient-Centred Health Outcomes among Older Patients: A Rapid Review." *BMC Health Services Research* 23, no. 1 (December 2023): 1–14. <https://doi.org/10.1186/s12913-023-09869-8>.
12. Boxer, Harriet, and Susan Snyder. "Five Communication Strategies to Promote Self-Management of Chronic Illness." Accessed November 21, 2024. <https://www.aafp.org/pubs/fpm/issues/2009/0900/p12.html>.
13. "Low Health Literacy (LHL): A Devious Enemy of Patient Treatment Adherence." Accessed November 21, 2024. <https://www.mathewsopenaccess.com/full-text/low-health-literacy-lhl-a-devious-enemy-of-patient-treatment-adherence>.
14. Reddy, K. Srinath, Bela Shah, Cherian Varghese, and Anbumani Ramadoss. "Responding to the Threat of Chronic Diseases in India." *The Lancet* 366, no. 9498 (November 12, 2005): 1744–49. [https://doi.org/10.1016/S0140-6736\(05\)67343-6](https://doi.org/10.1016/S0140-6736(05)67343-6).
15. Elmore, Natasha, Jenni Burt, Gary Abel, Frances A. Maratos, Jane Montague, John Campbell, and Martin Roland. "Investigating the Relationship between Consultation Length and Patient Experience: A Cross-Sectional Study in Primary Care." *British Journal of General Practice* 66, no. 653 (December 1, 2016): e896–903. <https://doi.org/10.3399/bjgp16X687733>.