Yashoda - A comprehensive Pregnancy and Baby Care App

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1 Abstract

Pregnancy and childcare among mothers in India are confronted with issues of reduced awareness, access, and early intervention, particularly in rural settings. Yashoda is a culturally adapted, offline-capable mobile phone application that targets pregnancy and childcare. It fills significant lacunae in current mHealth by providing functions such as tracking immunizations, post-delivery care, local language support, and emotional nurturing, such as tools for miscarriage and abortion recovery. By aligning with Indian culture and government schemes, Yashoda empowers mothers with accurate, timely information to enhance health outcomes for both mother and child.

KEYWORDS: maternal health, baby care, immunization, postpartum support

2 Introduction

Government policies on women's health and child inoculation in India often struggle to reach grassroots levels due to gaps in awareness, accessibility, and implementation. Many rural communities lack proper healthcare infrastructure, and misinformation spreads easily, leading to vaccine hesitancy and poor maternal health outcomes. Parents can significantly benefit from inoculation services for their children, as vaccines protect against life-threatening diseases, reduce infant mortality, and promote overall well-being. However, due to misinformation, fear, and lack of accessibility, many parents remain hesitant or unaware of immunization programs. Technology can bridge these gaps by enabling mobile health (mHealth) apps to educate parents and ensure timely vaccinations. Strengthening digital healthcare solutions can support the system by improving outreach, tracking immunization progress, and ensuring that government policies translate into action at the grassroots level.

3 Literature Survey

A mixed-methods study was conducted by Sravanti L. and Mundkur N. [1] on a web-based parenting app to support child development during the first two years of life in India. This programme offers daily picture-based content, mainly sensorimotor stimulation, socioemotional needs, nutrition, and hygiene for parents. It was developed based on qualitative research in collaboration with traditional Indian child-rearing practices and evidence-based methods. More than 600 parents availed themselves of the program; most gave feedback that the application was user-friendly and effective. The app had daily activities, weekly quizzes, and developmental milestones alerts translated into three regional languages for accessibility. The study highlights the potential for the app to be a digital intervention in enhancing early childhood development based on attachment theory, neuroscience, and child development principles. The authors conclude that this program is a health-promotion and disease-preventive tool for parents. [1]

Bailey et al. [2] conducted a qualitative study on first-time mothers using the Baby Buddy app, a digital intervention designed to provide pregnancy and parenting support. The study found that mothers valued the app's reliable, easily accessible information, which increased their confidence in making informed decisions

and communicating with healthcare professionals. Features like daily updates, videos, and reminders were deemed helpful, but complex issues were best served face-to-face. Some moms suggested that pregnancy milestones and more information on postnatal care be added to the content in the future. Many said they used both apps, healthcare providers, and other social means to benefit from care. The study suggests the possibility of digital health tools in maternal care but also states that personal contact remains crucial. [2]

Katrin Langton's research [3] about the rising role of baby apps in modern parenting analyzes their social, cultural, and ethical implications. It reveals how these apps support parents in monitoring fertility, pregnancy, and infant care while also creating anxiety regarding data privacy, gendered expectations, and parental self-discipline. The datafication of early childhood refers to the process where personal information is collected and shared without full awareness by users. The study also criticizes the gendered design of these apps, which primarily focus on mothers and promote traditional caregiving roles. Even though baby apps empower some parents, others are coerced into idealized parenting norms. Langton calls for more research into balancing the convenience of technology with ethical concerns in digital parenting. [3]

Dwivedi et al. [4] designed an interactive mobile application to assist maternal and infant care among tribal birth attendants in Rajasthan, India. The main barriers identified in accessing healthcare included cultural beliefs, lack of transportation, and poor awareness among the tribal women. The MAI app has culturally relevant content regarding videos, audio, and pictorial quizzes in the local Marwari language, teaching TBAs about referral to government health services. Integrating traditional knowledge with modern health practices will likely enhance mother hygiene, proper infant care, and improved health outcomes for tribal populations residing in remote communities. The study shows the potential of digital health interventions in addressing healthcare disparities in underserved populations. [4]

Alsebayel et al. [5] conducted a qualitative study on user experiences with commercial pregnancy apps, analyzing over 4,000 online reviews. The study found that while these apps effectively provide pregnancy tracking and health information, they also shape users' emotional and social experiences. Users appreciated the features of memory preservation, self-tracking, and partner involvement but criticized the apps for being exclusive, failing to represent varied experiences of pregnancy, and violating privacy. Users found some pregnancy apps too medical, anxiety-provoking, or biased toward other cultures. Thus, much of the research calls for user-centred pregnancy apps that fit the diverse needs of women regarding pregnancy beyond medical results. [5]

Seeta Devi did a systematic review of Android pregnancy monitoring apps using the Mobile Application Rating Scale (MARS) to evaluate their accuracy, functionality, and usability [6]. Out of 1,176 apps reviewed, only 18 were included, with high ratings for functionality and engagement. Most apps had tracking features for pregnancy symptoms, minor disorders, and fetal development, but very few effectively covered high-risk pregnancies. Major drawbacks of the pregnancy apps included privacy concerns and limited real-time interaction with healthcare professionals. The study outlines gaps in existing pregnancy apps, highlighting the need for better, more comprehensive, user-friendly, and secure digital tools to monitor maternal health. [6]

Mazaheri Habibi et al. [7], in a systematic review of health apps used among pregnant women, evaluated usability and quality based on Nielsen's five principles of usability. According to the categorization of apps into entertainment, informational, and health-monitoring types, 10 apps are evaluated for their accuracy, efficiency, and satisfaction of users. The Amila app scored the highest in terms of usability at 98% satisfaction because it has features like pregnancy tracking, baby kick monitoring, and interaction with doctors. The study indicates a need for reliable, user-friendly pregnancy apps to support maternal health and reduce unnecessary travel; therefore, it recommends scientifically validated apps for pregnant women and healthcare providers. [7]

3.1 Research Gap

There is still much to be done to address the following research gaps despite the increased use of pregnancy and parenting apps. Most of the current apps are not personalized, presenting universal content without adjusting for users' medical history, pregnancy stage, or cultural background. Postpartum care and mental health services, especially for postpartum depression, are also underrepresented. The majority of apps are gender-biased, targeting mothers and ignoring the contribution of fathers or alternative caregivers. Real-time consultation with doctors is not present in most apps, and there are ongoing concerns about privately

handling data. There is little representation of multiple pregnancy experiences, particularly in marginalized groups, and minimal apps are scientifically tested for usability. Additionally, recent research infrequently evaluates the long-term health effects of app use, and numerous tools are deficient in a broad perspective, emphasizing narrowly tracking or information over the incorporation of emotional, medical, and community assistance. These limitations underscore the importance of inclusive, secure, evidence-based, and integrated digital solutions in maternal and child health.

3.2 Objectives

1. To enhance community-level healthcare engagement by ensuring vital health information reaches parents at the grassroots level. Focusing on local outreach, our mobile app empowers parents to make informed decisions regarding their children's vaccinations, regular doctor visits, and maternal health needs.

2. To expand access to underserved areas with limited healthcare awareness and facilities. Our approach aligns with Indian cultural values, where the well-being of pregnant women and new mothers is deeply significant. By reinforcing maternal and child health through timely notifications, our solution supports government healthcare initiatives and traditional family-centric care, ensuring no mother or child is left behind.

3. To incorporate reminders and information on post-miscarriage and post-abortion care, our app can help women prioritize their recovery, seek medical guidance, and access necessary emotional and healthcare support while attempting to remove the stigma associated with such issues in Indian culture.

4. To incorporate chat bot and community chat for ease of communication with the AI or other like minded people instead of repeated doctor appointments. Additionally, Mental Health and Wellness feature is to be incorporated which includes medication videos, healthy food habits etc.

5. Enhance gamification by adding a game to refresh the users minds with interactive user experience.

3.3 Contributions

1. **Holistic Health Support**: The app offers information on physical care and mental health support through soothing sounds, meditation videos, and healthcare and skincare advices - a key feature often missing in other apps.

2. **Integration with Government Schemes and Verified Medical Info**: Connects users to government health schemes, lists verified physician information, and provides emergency contacts, filling the gap of real-time institutional support.

3. **Interactive and Personalized Experience**: Includes milestone reminders, games for refreshing minds and activity updates tailored to the user's journey, which enhances engagement and customization, unlike many generic apps.

4. **Inclusivity in Design and Accessibility**: Designed to be user-friendly for urban and rural mothers, including first-time mothers.

5. **Comprehensive Baby Care Postpartum**: Many apps focus heavily on pregnancy but lack in-depth postnatal care. Yashoda addresses both the pre-and post-delivery stages equally.

6. **ChatBot and Community Chat**: The Yashoda AI in the user dashboard helps the users to get their queries resolved immediately. The Community Chat helps users with specific roles communicate with people like them and get to know more about their concerns.

4 Methodology

1. **System Design and Planning:**
   Define the app's core functionalities, including a notification system for vaccinations, doctor visits, and maternal health tracking. Design a user-friendly interface to ensure accessibility, particularly for users in underserved communities. Plan the backend architecture, database structure, and integration of step-tracking features for health monitoring.

2. **Frontend Development:**
   Develop a mobile-friendly UI with straightforward navigation and accessibility features. Implement forms and dashboards for parents to track vaccination schedules and maternal health progress. Design notification interfaces for timely health reminders.

3. **Backend and Database Development:**
   Create a backend system to manage user authentication, scheduling, and notifications. Build a secure database to store vaccination records, maternal health information, and activity tracking data. Ensure data privacy and security, particularly for sensitive health-related information. Implementation of Notification System Develop an automated notification system to remind parents about upcoming vaccinations and doctor visits. Integrate reminders for maternal health, including supplement intake and post-miscarriage care. Optimize notification delivery to be non-intrusive yet effective. Integration of Step Tracking Explore the feasibility of integrating a step tracker to assess women's physical activity levels during pregnancy and postpartum. Test the potential benefits of activity tracking in promoting maternal health and recovery.

4.1 Low Level Design Diagram

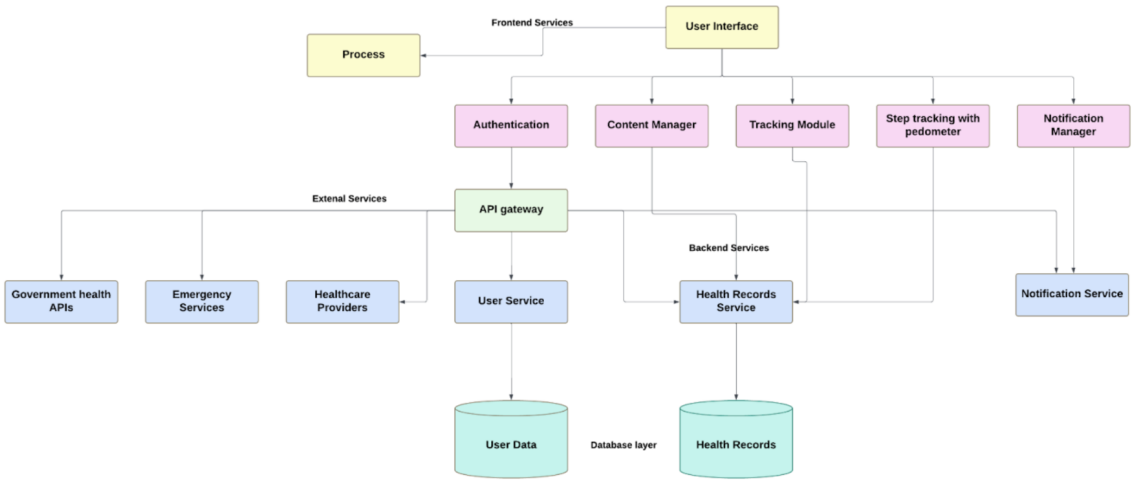


Figure 1: A Low-Level Diagram of the Mobile Application

App Flow Diagram presents a systematic outline of how the users interact with the Yashoda app. It starts with a new user signing up and choosing their role as a pregnant woman or a mother with a baby. Depending on the choice, the app offers customized content. For pregnant women, the path involves week-by-week pregnancy tracking, health tips, diet plans, and reminders about hospital appointments. On the contrary, for baby moms, the app targets postnatal care by providing milestone tracking, vaccination reminders, and nutritional guidance to the baby. This sequence offers a personalized and friendly experience geared towards the user's level of being a mom.

4.2 High-Level Design Diagram

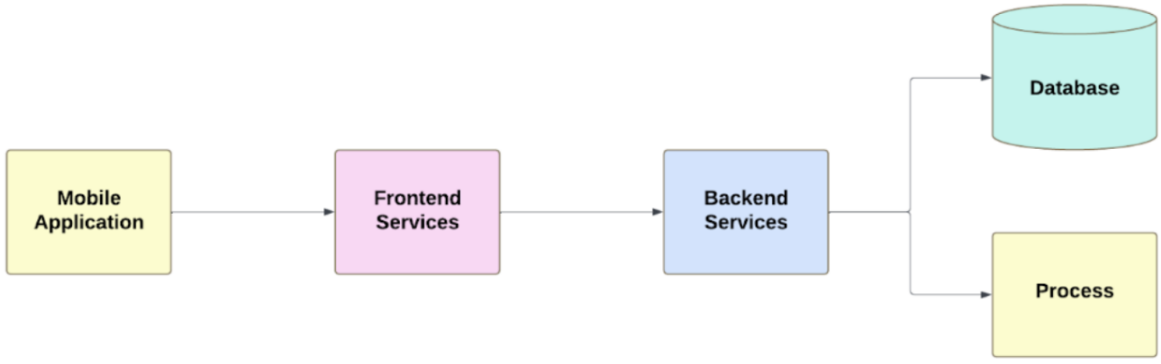


Figure 2: A High-Level Diagram of the Mobile Application

The High-Level Design diagram describes the technical architecture of the Yashoda app. It illustrates a three-tier model consisting of the frontend, backend (API layer), and the database. The front end is the mobile application interface accessible on Android and iOS platforms. The API layer is the intermediary between the front and backend services, receiving requests and sending responses. The backend is coupled with a safe database to handle user profiles, medical history, and appointment information. The architecture can also integrate with external systems like health data APIs and push notification services for timely reminders. This architecture provides scalability, data integrity, and smooth user performance in various app functionalities.

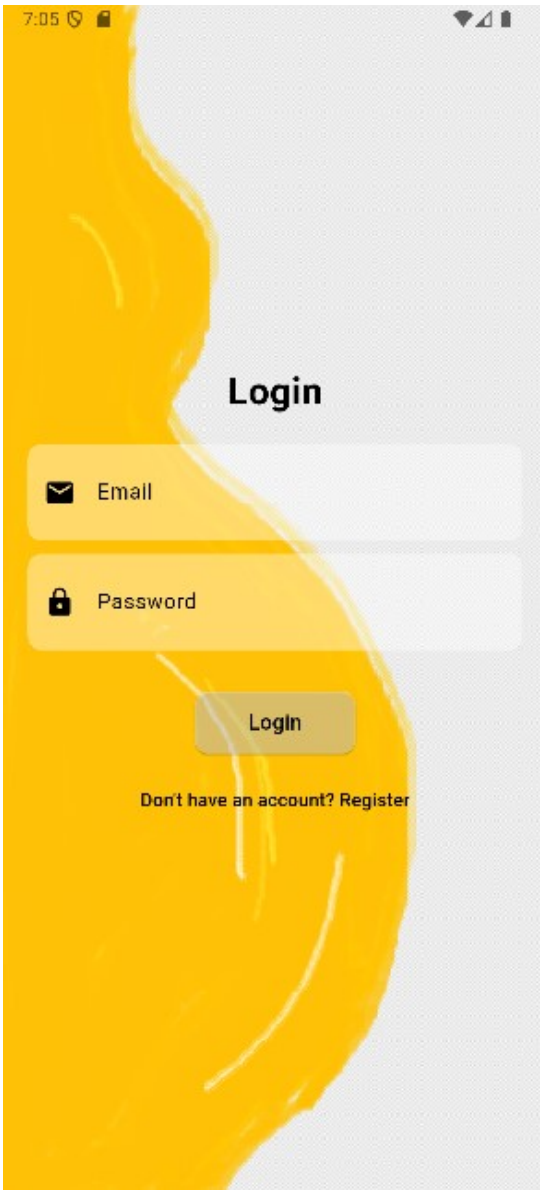
5 Results

Despite the growing number of mobile applications focused on maternal and child healthcare, existing solutions exhibit critical gaps in their approach to accessibility, inclusivity, and proactive health monitoring. Through an in-depth analysis of current platforms and user experiences, we identified that most applications fail to address the comprehensive and evolving needs of pregnant women, new mothers, and individuals who have experienced pregnancy loss. These shortcomings include complex user interfaces, lack of personalized support, limited community engagement, and insufficient mechanisms to track and encourage physical well-being.In response to these challenges, we have designed and developed a holistic mobile application that aims to bridge these gaps by prioritizing simplicity, empathy, and functionality. Central to the app's design is an intuitive, notification-based reminder system that ensures users receive timely alerts for essential healthcare activities, including vaccinations, regular doctor visits, prenatal check-ups, and supplement intake. This feature enhances adherence to recommended healthcare schedules and reduces the likelihood of missed appointments or treatments.

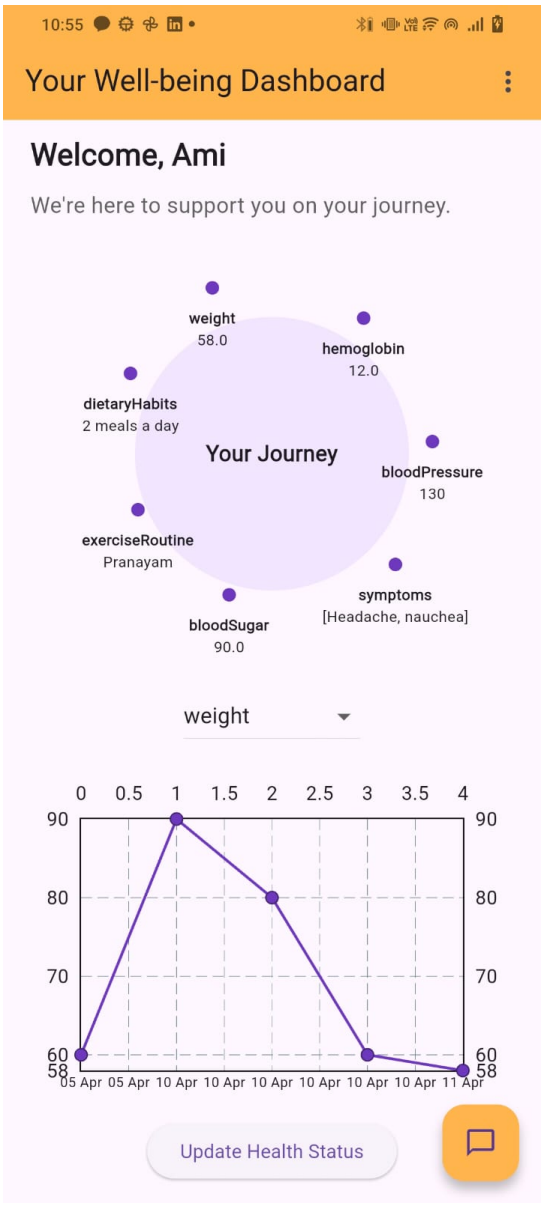
A chatbot assistant has been embedded within the app to promote real-time interaction and instant query resolution. This chatbot offers round-the-clock responses to common health concerns, medication schedules, diet tips, and general inquiries, reducing anxiety and dependence on external consultations for minor issues.In addition, the app introduces a Community Support feature, creating a safe and inclusive space where users - pregnant women, new mothers, and those who have experienced pregnancy loss - can connect, share experiences, ask questions, and offer peer support. This community-driven approach cultivates a sense of belonging, reduces isolation, and empowers users with shared knowledge.Adding a unique layer of engagement, the app incorporates gamification elements as a health-themed game. This feature encourages regular app usage and creates a more interactive, positive user experience, turning daily health tasks into

enjoyable challenges. This element not only increases user retention but also makes wellness routines feel less burdensome and more rewarding.

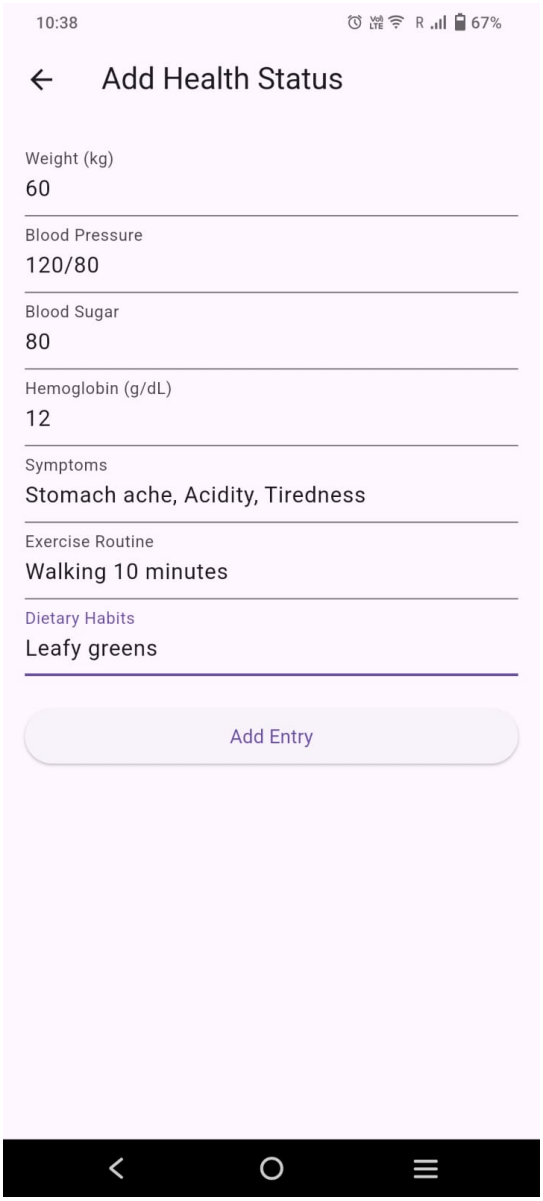
Together, these innovations validate the app's potential to significantly transform maternal and child healthcare experiences. They also provide a clear roadmap for future enhancements, including integration with wearables, deeper AI-based personalization, and multilingual support for wider accessibility. By focusing on the real needs of diverse users, our app lays a strong foundation for improving healthcare outcomes and emotional support in the maternal journey.



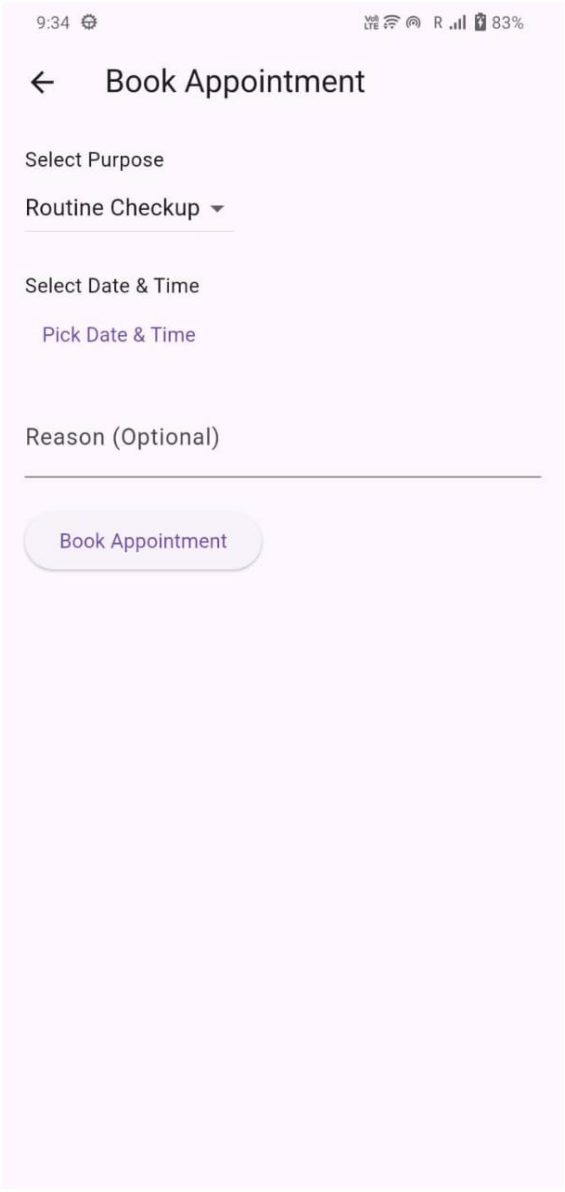
Login Screen



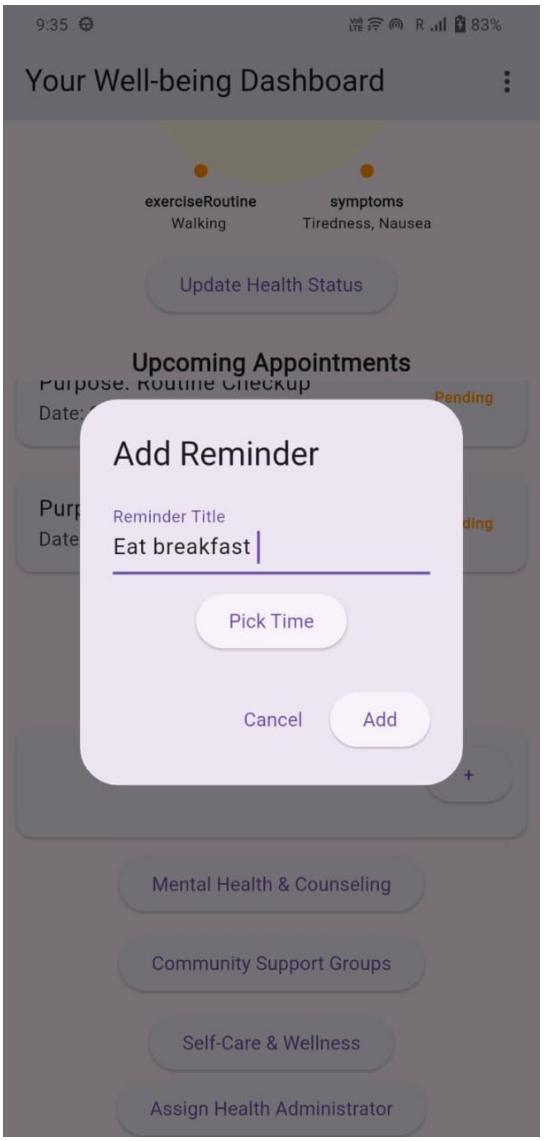
Dashboard Screen



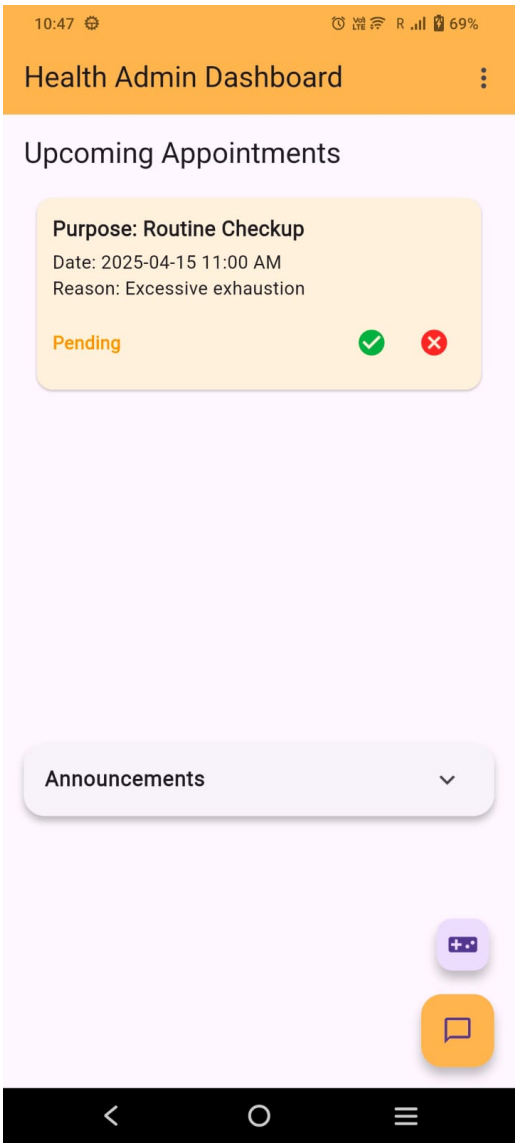
Health Status Update



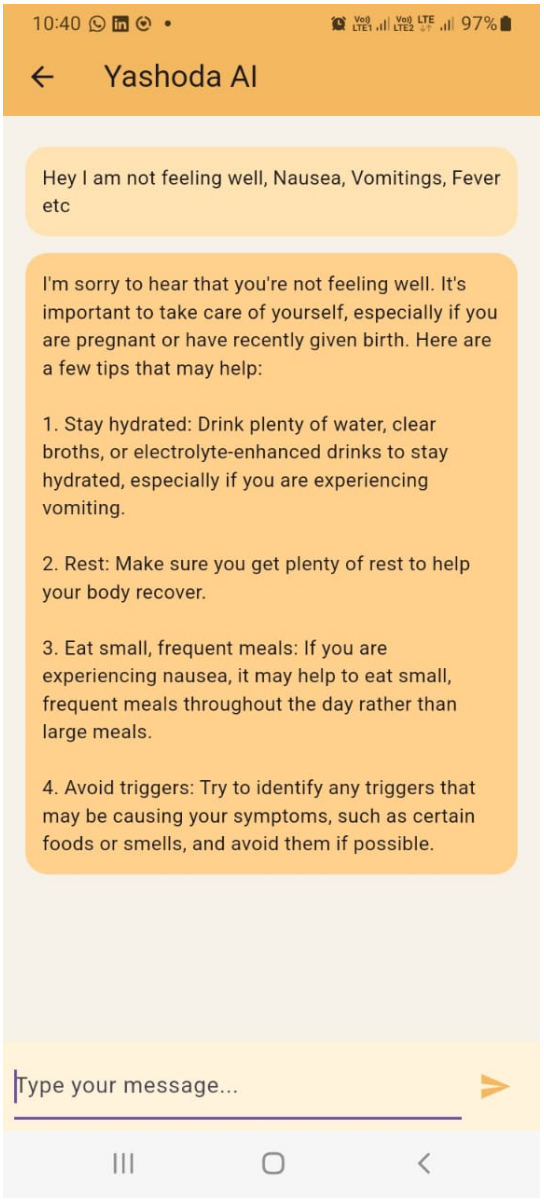
Book Appointment



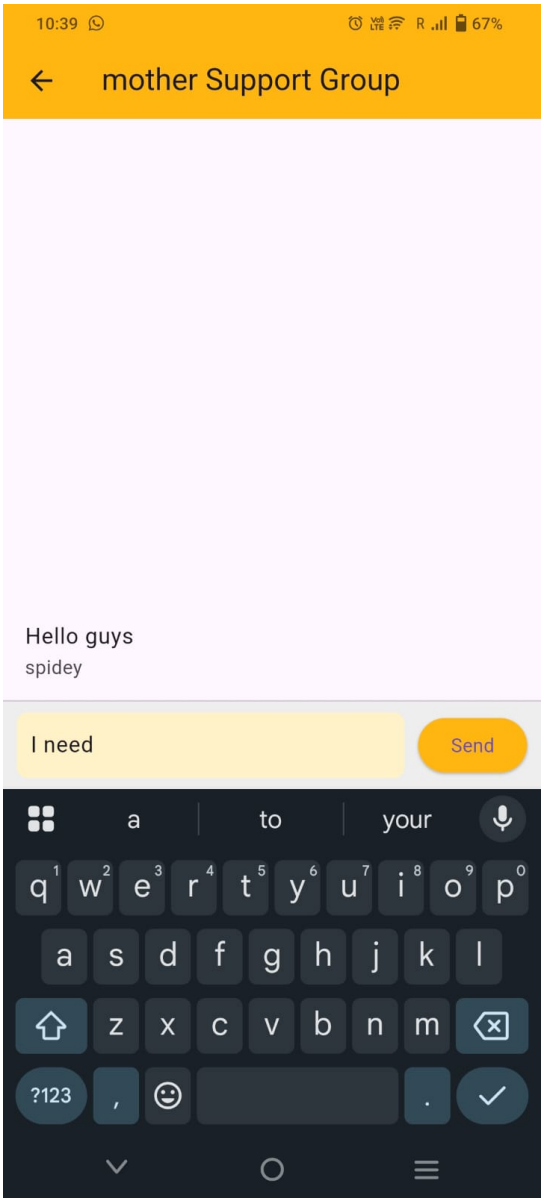
Add Reminder



Health Admin Dashboard

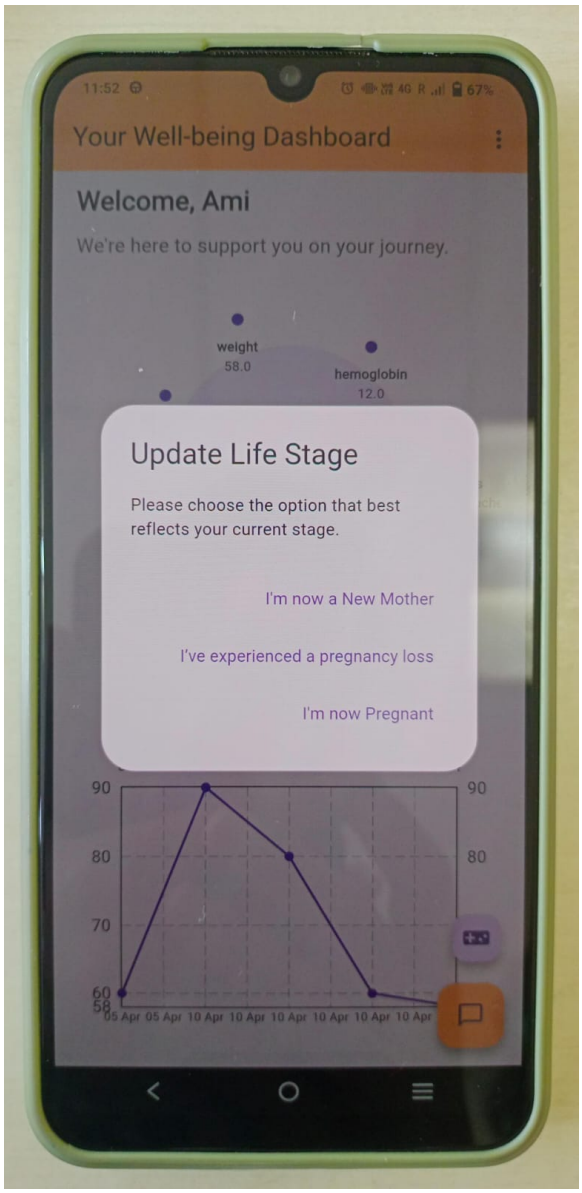


Community Chat

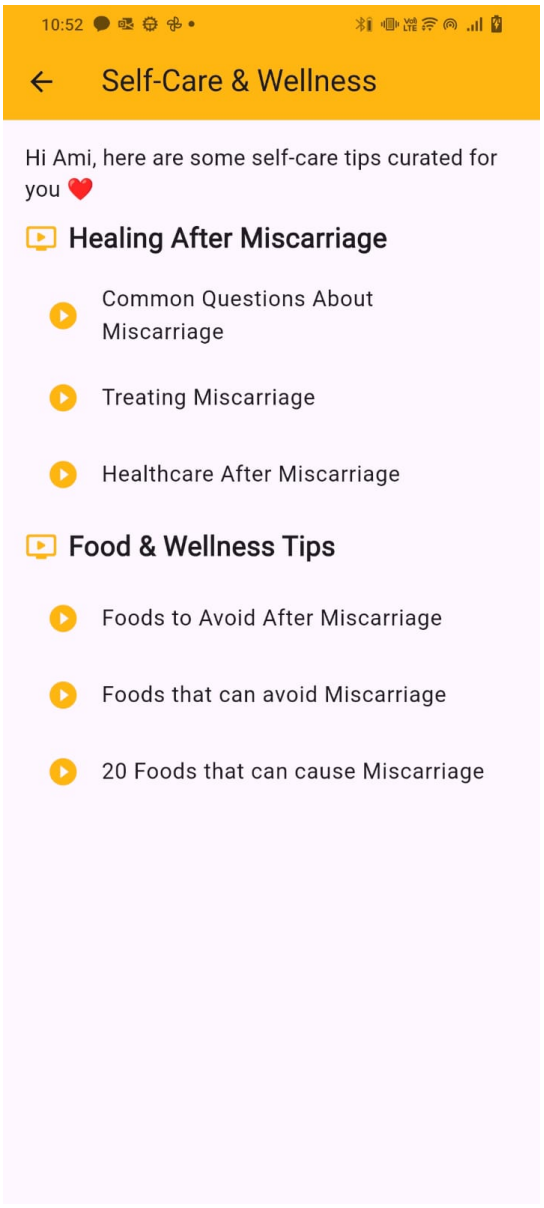


Chat Bot

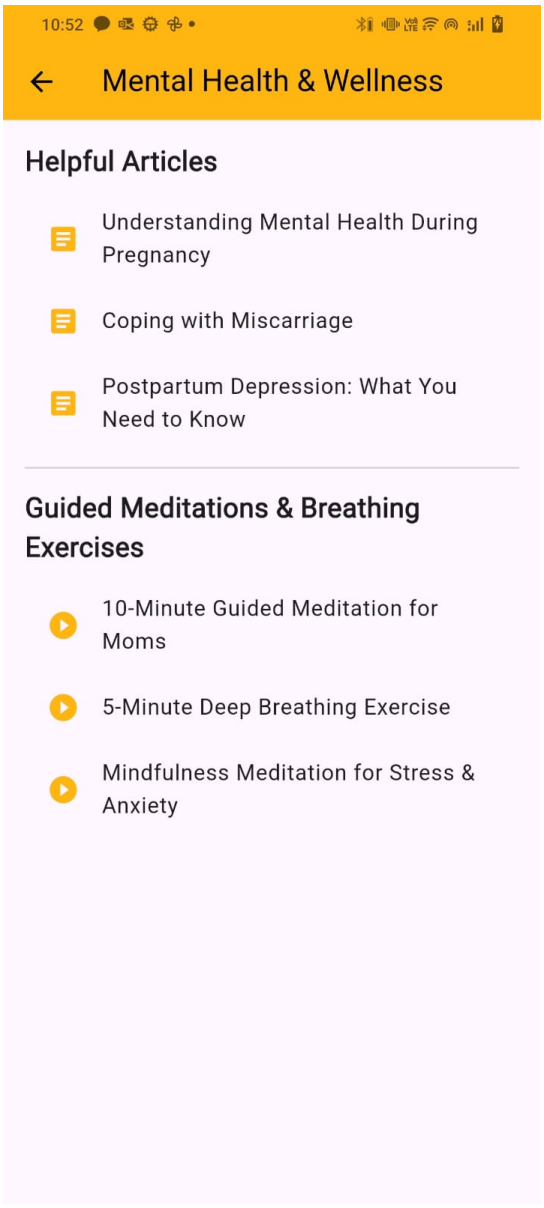
Constellation Game



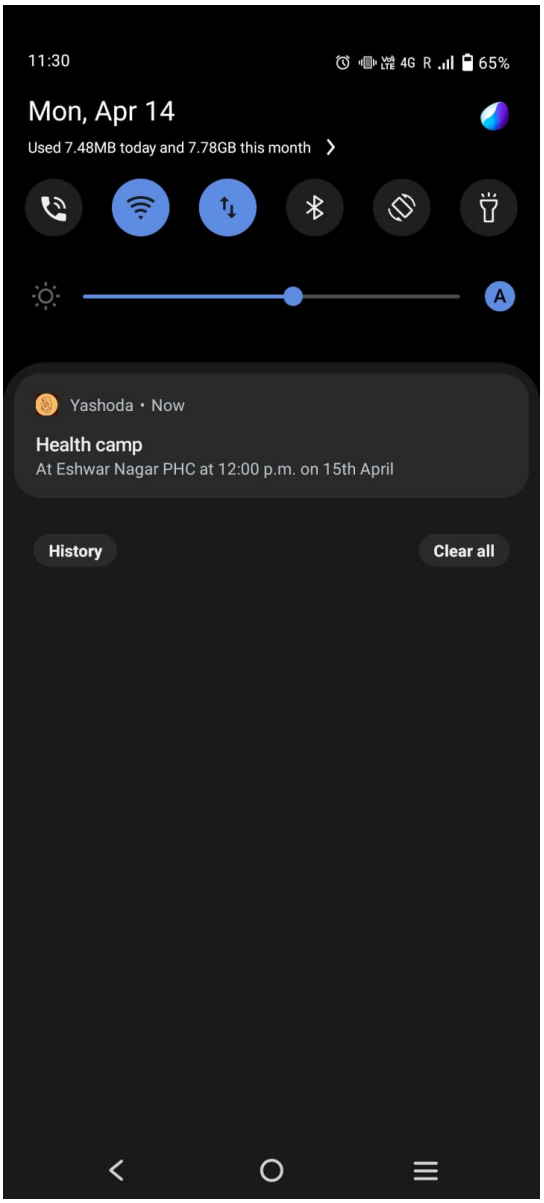
Update Life Stage



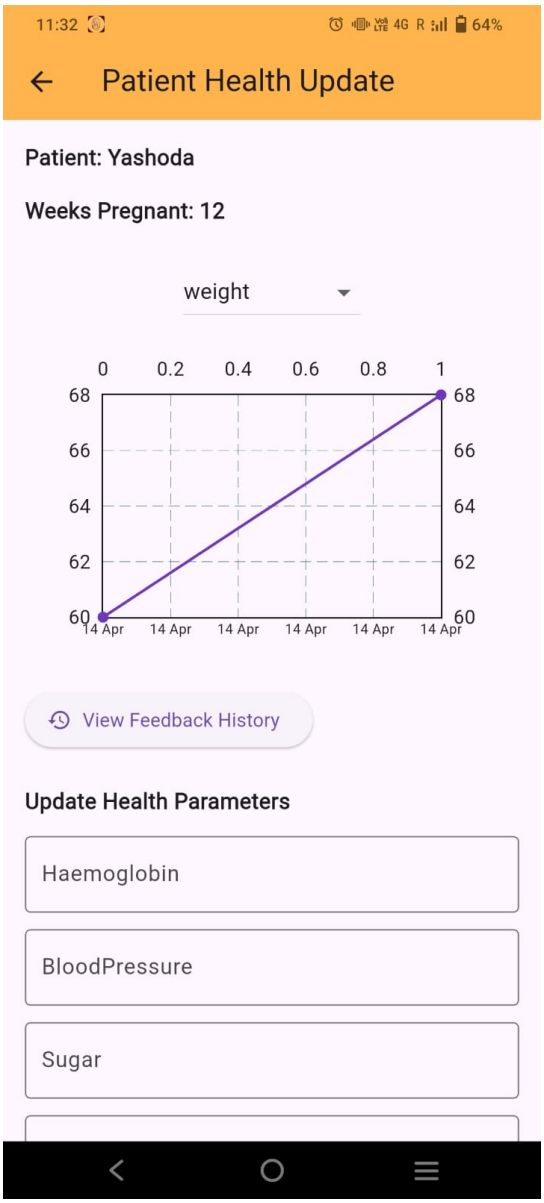
Self Care and Wellness



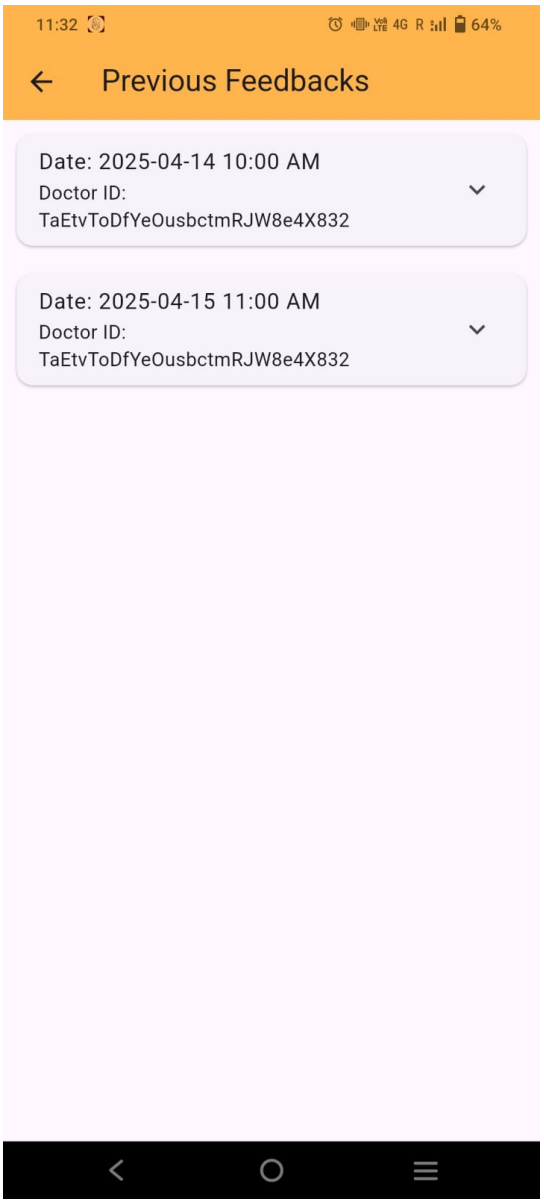
Mental Health



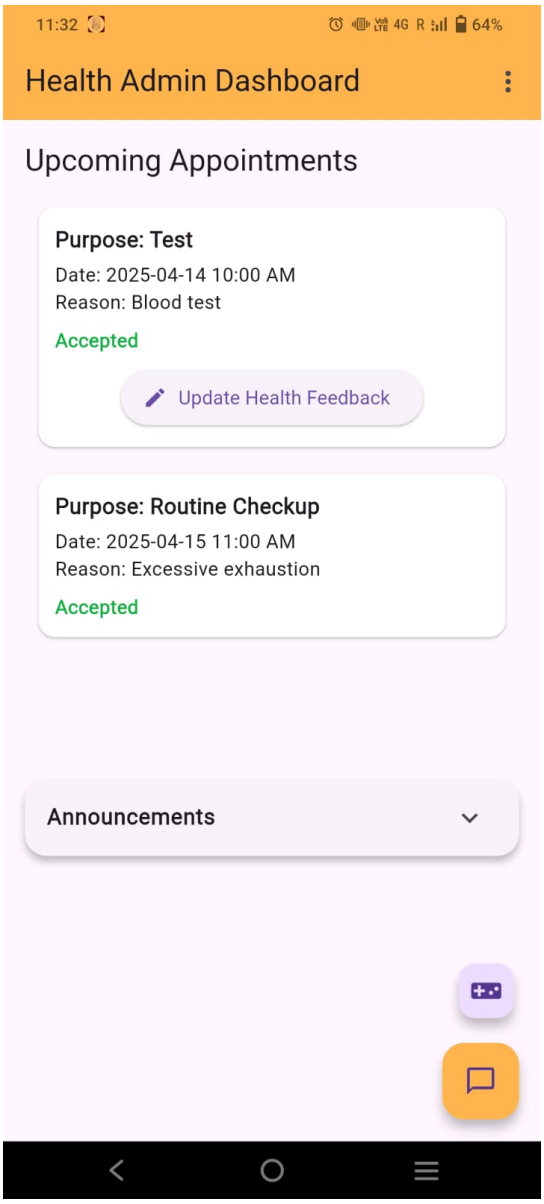
Broadcast Notification



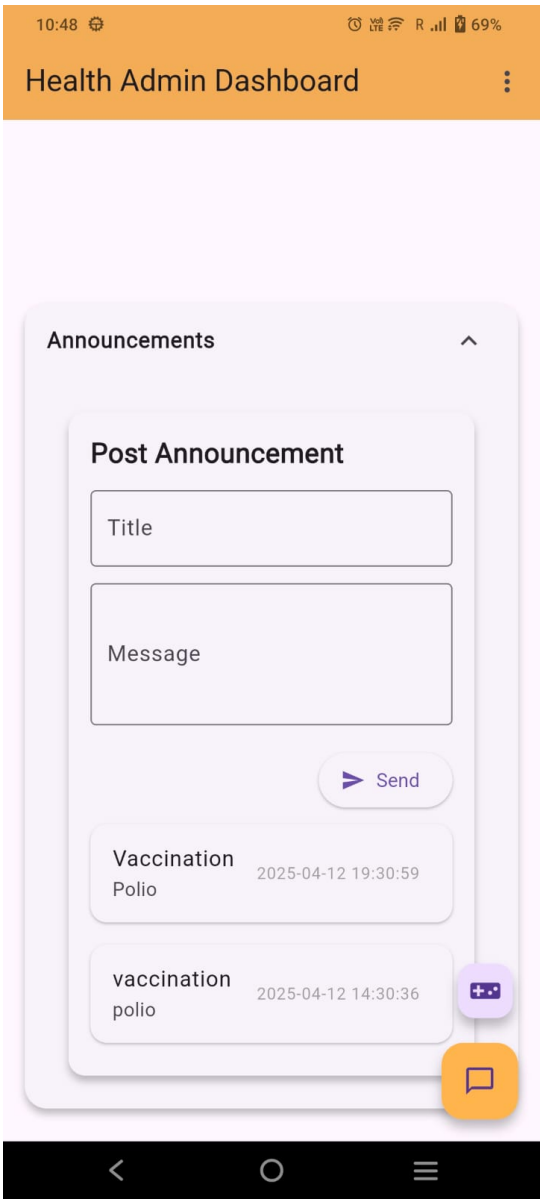
Patient Health Update



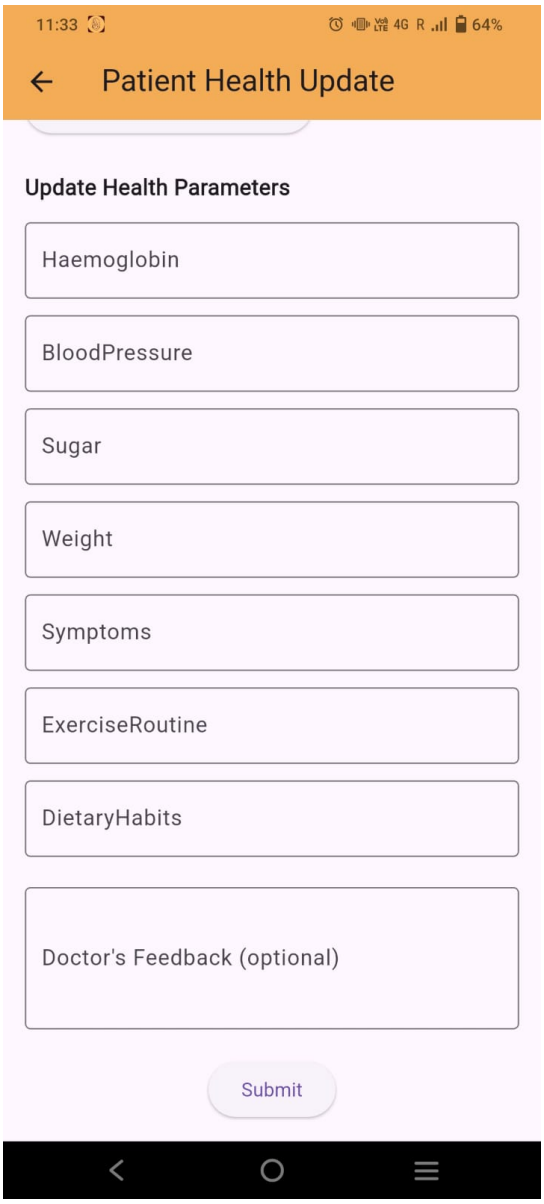
Previous Appointment Feedbacks



Upcoming Appointments



Announcements from Health Admin to Patients



Patient Health Update

6 Conclusion

This project seeks to fill the long-standing maternal and child healthcare gaps through a well-thought-out mobile application that provides timely health, emotional support, and activity tracking reminders. In contrast to most platforms that concentrate on pregnancy or infant care, our app is holistic in its approach—covering the needs of pregnant women, new mothers, and even those dealing with miscarriages or abortions. Integrating features like a notification system, step tracking, and user-friendly design, the app aims to make the service more accessible, particularly in underserved populations. The research and development to date highlight the value of such an offering and its ability to produce tangible results for public health. As we approach full implementation, the project will deliver a streamlined yet robust instrument for families and healthcare providers to promote improved maternal and child well-being.

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