

Understanding User Engagement Assessment and Modernization in a Chronic Disease Management App on A–B–C Platform

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Abstract.

The study examines user engagement and satisfaction with a chronic disease management app on the A–B–C platform. It explores demographic details and factors influencing engagement, including usability, features, personalization, social support, and accessibility. Specific app elements such as goal–setting, education resources, communication, reminders, and wearables integration are scrutinized, alongside user barriers like technological challenges, awareness gaps, time constraints, and privacy issues. Using a purposive sample of 200 participants, including patients, caregivers, healthcare professionals, and app users, data analysis employs descriptive statistics to inform app modernization efforts. The study demonstrates how usability and robust social support features influence positive user engagement. It also identifies areas for improvement in notifications, educational content, and accessibility. Key app features contributing to satisfaction include personalized goal–setting, comprehensive educational resources, and communication support, while challenges encompass technological barriers, a lack of awareness, time constraints, and privacy concerns. Recommendations include tailored marketing, feature enhancements, and addressing barriers, with proposed plans focusing on user education, data privacy, and app performance. Timely execution of these plans is crucial, with a focus on integrating data privacy measures and security software to ensure a trustworthy user experience.

Keywords: A–B–C platform, Chronic disease management, Engagement assessment, Modernization

1.Introduction

Mobile health apps have transformed chronic disease management, offering personalized tools and resources for self-monitoring and education, but sustaining user engagement remains challenging. Research indicates that higher engagement levels lead to improved self-management and health outcomes. Incorporating gamification elements like challenges and rewards can increase motivation and engagement. Studies on diabetes and cardiovascular disease management apps confirm this correlation. Modernizing features to enhance engagement is crucial for optimizing effectiveness. Understanding user engagement within A-B-C platforms and integrating AI, big data analytics, and cloud computing is essential. AI-based personalized recommendations have shown significant improvements in engagement and adherence. App design plays a pivotal role; visually appealing interfaces and clear navigation boost engagement and adherence. User feedback is crucial for identifying usability issues and improving engagement, emphasizing the importance of user-centric evaluation.

The integration of social support features in chronic disease management apps has been shown to significantly enhance engagement, self-efficacy, and health outcomes. Understanding user engagement in these apps, particularly those hosted on A-B-C platforms utilizing AI, big data analytics, and cloud computing, is crucial for optimizing effectiveness. Research indicates that personalized recommendations driven by AI algorithms can boost engagement and adherence, while visually appealing interfaces and clear navigation further enhance engagement. However, sustaining user engagement remains challenging, requiring a comprehensive understanding of factors like usability, design, and content relevance. This study aims to contribute insights into strategies for assessing and enhancing user engagement in chronic disease management apps on A-B-C platforms, offering actionable recommendations for developers, healthcare providers, and policymakers to improve health outcomes. The study objectives include analyzing the link between user engagement and health outcomes, exploring modernization methods like gamification and AI-based recommendations, evaluating user feedback and social support impacts, and understanding how A-B-C platforms can enhance engagement through AI, big data, and cloud technologies.

2.Methodology

This study employs a descriptive research methodology to investigate user engagement and satisfaction factors within a chronic disease management application on an A-B-C platform. Descriptive research aims to comprehensively understand the characteristics, behaviors, and experiences of a specific population or phenomenon. Through this approach, the study provides a detailed overview of user engagement, factors influencing engagement, and the current state of the application. Data collection includes demographic variables like age, gender, education, and socioeconomic status to understand user composition and its impact on engagement. Additionally, the research explores various factors affecting engagement, such as usability, features, personalization, and social support. The study also examines specific features contributing to user engagement, including personalized goal setting and integration with wearable devices. Furthermore, the research identifies and addresses barriers like technological limitations and privacy concerns that hinder user engagement, aiming to enhance the overall user experience with the application.

2.1. *Local of the Study*

The selection of Beijing, China, as the study location is justified by several compelling factors. These include the high incidence of chronic diseases in the region, continuous technological advancements, a dedicated focus on healthcare innovation, and the diverse composition of the population.

2.2. *Sampling Procedure*

The study used purposive sampling to select 200 respondents, including patients with chronic diseases, caregivers, family members, healthcare professionals, and app users. Purposive sampling allowed intentional selection based on population characteristics and research objectives. Additionally, quota sampling determined the sample size, ensuring a balanced representation across demographic categories. This method enabled focused analysis of engagement patterns within specific user groups, enhancing understanding of user engagement in chronic disease management apps on the A-B-C platform.

2.3. Respondents

RESPONDENTS	NO. OF SAMPLES
Patients with Chronic Diseases	50
Caregivers and Family Members	50
Healthcare Professionals	50
App Users	50
TOTAL	200

2.4. Data Gathering Procedure

Before distributing the self-created survey questionnaire to eligible participants, the study underwent an evaluation process. Once permission was obtained, the researcher explained the study's purpose and utilized the questionnaire to collect information on user engagement assessment and modernization of a chronic illness management app. Confidentiality of the gathered data was ensured. Data analysis involved the use of the Statistical Package for Social Sciences (SPSS) to compile, tally, organize, and process the data. Statistical tools such as mean and percentage frequency were employed to examine the profiles and perspectives of the respondents. Responses to the questionnaire, indicating agreement or disagreement with the statements, were interpreted using a 4-point Likert scale.

3. Results and Discussion

3.1 Demographic Profile of the Respondents

The data illustrates a diverse distribution in terms of age, with individuals aged 28–33 years old forming the largest group at 28.4%, followed by those aged 34–39 years old at 24.4%. Conversely, the smallest age group consists of individuals between 55–60 years old, comprising only 4% of the respondents. Regarding gender, the sample slightly skews towards males, with 56% being male and 44% female. Educational attainment is well-represented, with 72% holding a Master's degree, 17.2% having a Doctoral degree, and 10.8% having a college degree. This demographic breakdown is essential for understanding the composition of the surveyed population, offering valuable insights into age distribution, gender balance, and educational background for various research or marketing purposes.

3.2 Factors influencing user engagement with a chronic disease management app on a A-B-C platform

3.2.1 App usability

The app's overall influence on user engagement as well as its usability in terms of navigation, aesthetic appeal, responsiveness, clarity of instructions, and responsive design. Consumers overwhelmingly concurred (WM = 2.93) that the application was simple to use and navigate. Users were in agreement on this. Users overwhelmingly agreed that the app was useful, and they gave it high marks for organization and visual attractiveness (WM = 3.71). User involvement was further enhanced by users' perceptions of the software's responsiveness and clarity of instructions (WM = 3.14 and 3.16, respectively). Users strongly agreed (WM = 3.63) that the app was effective, and this resulted in a strong overall feeling of agreement (grand mean of 3.31) about usability. This suggests that the app's design had a positive overall impact on user engagement. These outcomes demonstrate the benefits of the software and its ability to deliver a positive user experience. Furthermore, previous research supports the significance of user experience in app design, with studies demonstrating a noteworthy influence on happiness and engagement in a range of app settings.

3.2.2 App features and functionalities

The features of an app for managing chronic diseases, with an emphasis on tools that are readily available, include goal-setting, reminders, and personalized health tracking. Weighted mean [WM] = 3.34 indicates that users were pleased with the app's extensive capabilities and customizable features (WM = 3.08 for goal-setting and 3.40 for health tracking). They valued the instructional material offered (WM = 2.43), although they found space for improvement in the reminders (WM = 2.64). While most users (grand mean = 2.98) expressed significant agreement with the app's functionality, they also emphasized the need for improved reminders. These findings are consistent with previous research, emphasizing the value of all-inclusive tools and customized features in apps for managing chronic illnesses. A recurring

problem in healthcare apps is the need for better reminders, which highlights the significance of user-centric design in sustaining user engagement.

3.2.3 Personalization

Users overwhelmingly agreed on the app's simplicity and ease of navigation (WM = 2.93), as well as its usefulness, organization, and visual appeal (WM = 3.71). They found the app's responsiveness and clarity of instructions (WM = 3.14 and 3.16, respectively) further enhanced their involvement. Users strongly agreed on the app's effectiveness (WM = 3.63), resulting in an overall positive sentiment (grand mean of 3.31) regarding usability. These findings suggest a positive impact of the app's design on user engagement. This underscores the software's ability to deliver a positive user experience, consistent with prior research highlighting the significance of user experience in app design across various settings.

3.2.4 Social Support

The app's social support features, including connecting users with others sharing the same chronic disease, offering a community or forum, facilitating communication with healthcare professionals, and promoting peer interaction. Users highly appreciate these features, especially connecting with others (WM = 3.71) and community forums (WM = 3.14). They value communication with professionals (WM = 3.16) and peer interaction (WM = 3.63), believing they enhance engagement and motivation (WM = 3.34). The strong overall agreement (grand mean = 3.40) underscores the importance of these features in chronic disease management apps, supported by existing literature emphasizing their role in fostering community, providing support, and boosting engagement.

3.2.5 App Accessibility

The app's accessibility, covering availability across platforms, device compatibility, language options, and features for users with disabilities. Users perceive it as generally accessible but suggest improvements. They appreciate its platform availability and device compatibility (WM=3.08 and WM=3.40), yet note the need for more language options (WM=2.64) and enhanced accessibility features (WM=2.43). Despite concerns, users believe accessibility contributes positively to their experience (WM=2.95), with an overall agreement (grand

mean of 2.90). These findings stress the importance of accessibility in widening the user base and improving the experience, echoing existing literature on digital application accessibility's significance.

3.3 Features and Functionalities contribute to user engagement and satisfaction in a chronic disease management app A–B–C platform

3.3.1 Personalized goal setting

The app offers personalized goal–setting features tailored to users' chronic disease management needs, allowing them to set, track, adjust, and receive suggestions for health goals. Users generally perceived these features positively, finding them beneficial for staying motivated and engaged. They appreciated the flexibility in setting personalized goals (WM = 2.59) and tracking progress (WM = 2.76), as well as the app's suggestions for realistic goals (WM = 2.70) and the option to adjust goals (WM = 2.96). Overall, the personalized goal–setting feature positively contributed to user motivation and engagement (WM = 2.93), emphasizing its importance in healthcare apps and aligning with existing literature on its effectiveness in promoting behavior change and empowering users in chronic disease management.

3.3.2 Communication and Support

The app's personalized goal–setting features, including setting, tracking, adjusting, and receiving tailored health goal suggestions for chronic disease management. Users perceived these features positively, finding them beneficial for motivation and engagement. They appreciated the flexibility to set goals (WM = 2.59), track progress (WM = 2.76), receive realistic suggestions (WM = 2.70), and adjust goals (WM = 2.96). Overall, personalized goal–setting positively contributed to user motivation and engagement (WM = 2.93), aligning with existing literature on its effectiveness in empowering users in chronic disease management.

3.3.3 Reminders and Notification

The app's reminder and notification features, including tasks, appointments, and medications, and their impact on engagement and adherence to disease management, are discussed. Users highly appreciated medication reminders

(WM = 3.08) and appointment notifications (WM = 3.40), indicating their practicality. Customizable options received a slightly lower score (WM = 2.64). Overall, users strongly agreed (grand mean = 2.90) that these features helped them stay on track with disease management routines (WM = 2.43) and boosted overall engagement and adherence (WM = 2.95). These findings underscore the importance of timely reminders in healthcare apps, consistent with prior research highlighting their usefulness in improving medication adherence and appointment attendance.

3.3.5 Integration with Wearables and Devices

The result highlighted the app's impact on motivation, engagement, and satisfaction, along with its integration with wearable technology and other health apps. Users appreciated wearables integration and smooth connectivity (WM = 2.59) and data syncing from other sources (WM = 2.76), providing a comprehensive health perspective (WM = 2.70). This integration significantly increased overall engagement and satisfaction (WM = 3.71) by promoting healthy behaviors and managing chronic conditions effectively (WM = 2.93). The grand mean of 2.94 indicated overall user agreement. Integration improved the user experience by offering convenience, inspiration, and increased engagement. Existing literature supports users' recognition of the convenience and motivation that integration brings, highlighting its role in enhancing satisfaction and engagement.

3.3.6 Technological Barriers

The assessment focused on challenges users faced while using the app, including navigation, device compatibility, technical requirements, and performance issues. Users generally agreed with these challenges, citing difficulties in understanding the interface and accessing the app on various devices (WM=3.14 and WM=3.16, respectively). Technical requirements and performance issues were also reported, with users acknowledging hindrances to engagement (WM=3.63 for technical requirements, WM=3.34 for performance). The overall sentiment was agreement (grand mean=3.27) regarding technological barriers. Addressing these challenges is crucial for improving user satisfaction and engagement. Existing literature supports users' acknowledgment of these common challenges in mobile apps, emphasizing the

importance of meeting user expectations and collecting feedback for enhancing the user experience.

3.3.7 Time Constraints

The study found that users face challenges in allocating time for regular app engagement, including busy schedules, perceived app features' time requirements, and consistency issues. These factors impact their engagement, leading to trade-offs. The study emphasizes the importance of understanding users' daily routines for optimizing app timing and frequency, emphasizing user-centered design principles to accommodate time constraints effectively.

3.3.7 Privacy and Security

Users expressed concerns about the security and privacy of their health information when using an app. They expressed concerns about data collection and sharing without consent, uncertainty about privacy policies, and lack of clarity about security measures. These concerns impact trust and engagement with the app. Addressing these concerns through robust security measures, transparent privacy policies, and clear communication could enhance user trust and engagement, contributing to its effectiveness in chronic disease management. Strong data protection measures and informed consent practices are essential for users' trust in healthcare apps.

3.3.8 Enhance Plans

The project aims to improve the app's user experience by enhancing onboarding, addressing data privacy and security concerns, and optimizing app performance. The team will develop an enhanced onboarding process within three months, enhancing user understanding of the app's capabilities and benefits. A thorough security audit will be conducted, followed by robust data encryption measures. The security audit will be initiated and completed within six months, with ongoing monitoring and updates. The performance audit will be conducted, followed by code optimization, aiming to overcome challenges related to usability, device compatibility, technical requirements, and performance, resulting in improved app performance and increased user satisfaction.

4. Conclusions

In conclusion, our study has delved into various dimensions of user engagement with the chronic disease management app, encompassing user demographics, influencing factors, notable features, and encountered obstacles. The proposed enhancement

plans, devised to tackle identified issues, are geared towards enhancing user understanding, fortifying data privacy and security, and optimizing app performance and compatibility. Emphasizing tailored marketing strategies, prioritized enhancements, and the continual integration of personalized features emerge as crucial conclusions from our findings. Recommendations stem from the imperative to address technological barriers, bolster user education initiatives, and promptly implement proposed enhancement plans to elevate the user experience in chronic disease management. Furthermore, we advocate for the inclusion of specific measures, such as the implementation of targeted security software, to fortify the app's infrastructure and instill greater user confidence in its reliability and security.

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