Moodicare: A Disruptive Mobile App for Medication Adherence and Emotional Tracking

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Abstract. The increasing prevalence of mental disorders and their implications for public health have driven the development of technological solutions aimed at therapeutic support. In this context, this study presents the prototyping of a mobile application as a strategy to support medication adherence and the monitoring of emotional aspects during treatment. Based on principles of usability, accessibility, and user-centered design, the prototype simulates functionalities such as recording prescribed medications, automated reminder notifications, dose administration indication, and mood tracking. The information is organized into charts, allowing users to monitor their medication intake regularity and identify mood variations. These records can be exported in a format compatible with clinical use, without diagnostic purpose, functioning as a complementary resource to professional follow-up. Although developed with a focus on mental health, the model shows potential for application in other contexts involving continuous medication use.

Keywords: Mental Health; Medication Adherence; Mood Tracking; Mobile Health Applications; Prototyping.

1 Introduction

Mental health has gained prominence on global public health agendas due to its increasing prevalence and direct impact on quality of life [1]. The World Health Organization (WHO) estimates that around 970 million people are affected by some form of mental disorder, accounting for approximately 13% of the global population [2]. However, access to adequate, continuous, and humanized care remains limited, mainly due to the shortage of specialized professionals, social stigma, and systemic barriers in healthcare delivery [3, 4]. Among the key challenges in mental health treatment is low adherence, which compromises clinical outcomes and impedes the monitoring of patient progress when inconsistent [5]. Additionally, the difficulty in tracking daily emotional fluctuations restricts the collection of meaningful data for more accurate and contextualized clinical evaluations [2].

In this context, digital technologies have proven to be important allies in healthcare, especially in mental health [2]. Mobile applications, in particular, have

shown potential to encourage self-care, enable continuous monitoring of emotional symptoms, and support adherence to drug treatment in an accessible way that integrates into users' routines [6, 7]. These tools also foster increased autonomy, enable interventions more centered on individual experience, and can complement traditional clinical practices [8, 9].

This article presents *Moodicare*, a high-fidelity mobile application prototype developed to support adherence to pharmacological treatment and the monitoring of emotional aspects during the therapeutic process, focusing on mental health promotion. It simulates functionalities such as medication logging according to professional guidance and automated reminders at scheduled times. For each dose, users can log whether they took, delayed, or missed the medication, allowing for a more accurate follow-up. The app also features mood tracking through self-assessment scales and open-ended notes, encouraging subjective monitoring of the user's emotional state. The recorded data is displayed through interactive graphical representations, showing trends in medication usage and mood variations over time. Instead of data export, the information is directly accessible through the user's dashboard, enhancing daily engagement. The prototype was designed based on usability, accessibility, and user-centered design principles, aiming to deliver an intuitive and functional digital experience tailored to the target audience's routine [10, 11, 12]. The solution promotes user engagement, strengthens treatment adherence, and fosters greater autonomy in health management.

Although the primary focus is on mental health, the application can be extended to other therapeutic contexts involving continuous medication use. Mental health was prioritized due to the direct association between psychotropic drug use and mood fluctuations [2, 13], making this area particularly suited to integrated solutions for medication adherence and emotional monitoring. It is important to note that the system does not aim to provide clinical diagnoses, but rather to complement pharmacological treatment while respecting ethical and professional boundaries.

2   Methodology

This study adopted an applied and qualitative approach, aimed at developing a digital solution based on the identification of a real problem in the field of mental health. The need to promote greater medication adherence and support emotional monitoring—recognized challenges in long-term treatments [2, 5]—was the starting point for the chosen methodology. The proposal was grounded in principles of Software Engineering [14, 15, 16, 17] and in User-Centered Design (UCD) guidelines [10, 11, 12], with an emphasis on creating a meaningful, safe, and accessible digital experience.

The methodology involved a literature review using databases such as Google Scholar, SciELO, and PubMed to establish theoretical foundations on digital technologies in mental health, user-centered design, interface prototyping, and software engineering best practices. In parallel, mobile apps and academic works with similar goals were analyzed to identify functional patterns, technical constraints, and opportunities for innovation, which helped define the project scope and feature set. Based on these findings, the scope was aligned with the most recurring user needs and

the objectives of the proposal. Interaction flows were then mapped and represented through a use case diagram [16, 17], supporting the definition of functional and non-functional requirements [14, 15]. With flows and features established, the project followed consolidated user interface and experience design guidelines [10, 11, 12] to build a visual identity and design system, including color palette, typography, iconography, and reusable components. A high-fidelity prototype was created in Figma [18], with documentation of interface states, interaction patterns, and navigation flows to ensure implementation fidelity and consistency with the intended user experience [19, 20, 21].

Finally, a validation survey was conducted with target users, using closed-ended questions and evaluative scales to assess the perceived usefulness, adequacy of the features, and potential acceptance of the app as a mental health support tool. This stage provided preliminary insights into strengths, limitations, and areas for improvement during the prototyping phase.

3   Comparative Analysis: Literature and Market Solutions

This section presents a comparative analysis between available market applications and scientific works that explore functionalities similar to those of the proposed system, aimed at medication control and emotional monitoring. The objective is to contextualize the developed proposal based on concrete references from practice and theory, highlighting recurring functional criteria, observed gaps, and the distinguishing features of the proposal.

To begin the analysis, nine mobile applications focused on medication adherence, emotional tracking, or a combination of both were analyzed. The selection considered publicly accessible tools with good user acceptance and practical relevance. Figure 1 presents the evaluated applications and the presence of key functionalities such as medication control, reminders, emotional monitoring, visual reports, and clinical data export.

Application Name	Medication Tracking	Medication Reminders	Mood Tracking	Visual Reports	Clinical Data Export
MyTherapy	✓	✓	✓	✓	✓
Medisafe	✓	✓		✓	✓
Dr. Cuco	✓	✓			
Pill Reminder	✓	✓		✓	✓
Bearable	✓	✓	✓	✓	✓
Breeze			✓	✓	
Me+			✓	✓	
DailyBean			✓	✓	
Daylio			✓	✓	✓

Fig. 1. Functional comparison among selected applications.

The analysis of existing applications revealed varied approaches to medication adherence and emotional monitoring. While some integrate multiple functionalities, most address only one aspect of care, requiring users to combine different tools. Applications focused on medication management, such as *Medisafe* and *MyTherapy*, stand out for their technical precision and robust features. In contrast, mood tracking apps like *Breeze*, *Me+*, and *DailyBean* offer well-crafted interfaces, high customization, and strong user engagement mechanisms. Functional limitations were also noted in many free versions, including entry caps, restricted medication registrations, and limited access to key features. Data export capabilities vary widely—some tools generate structured, clinically useful reports, while others offer only basic, minimally customizable records.

The following stage involved reviewing eight academic studies addressing digital interventions for medication adherence, emotional tracking, or their integration. Selection prioritized studies aligned with this proposal's objectives, with relevant contributions in terms of functional scope, usability, and clinical applicability. Figure 2 summarizes the functionalities explored in each study, highlighting patterns and identifying gaps compared to the integrated approach proposed here.

Study Title	Main Objective	Related Features	Methodology	Relevance to the Project
Development and validation of a smartphone application to optimize therapeutic adherence in hypertensive patients (2023) [22]	To develop and validate an application to optimize therapeutic adherence in hypertensive patients	Medication reminders, dose confirmation, and report generation	Development of a functional prototype and usability evaluation	Directly addresses medication adherence, with a focus on notifications
Efficacy of a Smartphone App in Enhancing Medication Adherence and Accuracy in Individuals With Schizophrenia During the COVID-19 Pandemic (2023)[23]	To evaluate the effectiveness of an app with facial recognition for medication adherence in patients with schizophrenia	Facial recognition, dose intake confirmation, automatic reports	Randomized clinical trial measuring adherence and psychiatric symptoms	Scientific validation in a psychiatric population, aligned with the project's focus
Development and usability testing of the BMT4me© mHealth app for medication adherence in pediatric stem cell transplant patients (2024) [24]	To develop and test a medication adherence app for pediatric post-transplant patients	Personalized reminders, visual diary, symptom tracking	User-centered approach involving multiple stakeholders for app development	Provides insights into user-centered design and adaptable features
A Mobile App–Based Intervention for Depression: End-User and Expert Usability Testing Study (2023) [25]	To evaluate user experience and usability of an app for depression intervention	Reminders, personalized goals, motivational reinforcements	Usability study with end users and experts, using standardized scales	Provides evidence on usability and engagement, relevant to the project's development
Development and evaluation of an app for monitoring the mental health of university students (2021) [26]	To develop and evaluate an app for screening and tracking emotional symptoms in students	Emotional scales, reflective journaling, educational content	Applied study with validation through testing with the target audience	Emotional monitoring structure applicable to the project's context
Aconchego: development and validation of an application to support mental health (2023) [27]	To design and validate an app focused on emotional support and care	Mood self-assessment, supportive messages, emotional journaling	App development and validation by mental health and technology experts	Integrates subjective aspects of emotional care, aligned with the project scope
In the Mood: Engaging Teenagers in Psychotherapy Using Mobile Phones (2011) [28]	To engage adolescents in psychotherapy through emotional tracking via mobile application	Mood tracking, reports, integration with therapy	Development of a symptom tracking tool used in clinical settings with adolescents	Demonstrates practical use of emotional tracking in therapeutic contexts
Engagement in mobile phone app for self-monitoring of emotional wellbeing predicts changes in mental health: MoodPrism (2017) [29]	To investigate the impact of engagement with a self-monitoring app on mental health	Daily tracking, visual feedback, gamification	Longitudinal study analyzing the relationship between app usage and changes in psychiatric symptoms	Provides quantitative basis on the emotional impact of mood-tracking apps

Fig. 2. Functional comparison among selected articles.

The analysis showed that the evaluated solutions tend to focus either on supporting medication adherence or on emotional monitoring, without proposing an integration between these two fronts. This separation reveals an underexplored gap in the analyzed studies, especially considering that mood and adherence are often interconnected in long-term treatments. Although some works mention aspects related to usability, this is not a consistent pattern among the reviewed studies, and few clearly follow consolidated user-centered design guidelines.

In this regard, the proposal developed here aims to differentiate itself by offering an integrated approach that treats mood tracking and medication management as complementary parts of the same care process. Although some studies present prototypes or initial tests, the results are still limited to specific contexts and narrow scopes. This reinforces the importance of developing more integrated solutions that are applicable to the everyday reality of those dealing with mental health treatments.

4   Proposed Architeture

The proposed system architecture encompasses the organization of interactions between user and application, based on use case modeling and interface prototyping. The use case diagram developed for the project describes the main actions that the user can perform within the application and made it possible to define the essential functionalities from the early stages of development, ensuring alignment between the defined requirements and the intended user experience flows [16, 17]. The interfaces were developed in Figma as high-fidelity prototypes, with special attention to visual clarity, screen consistency, and accurate simulation of the final user experience. Prototyping enabled the validation of the defined flows and the anticipation of usability adjustments [18]. A specific visual identity was created for the project, along with a design system, to ensure consistency and cohesion across screens [10, 11, 12].

4.1   Use Case Diagram

The use case diagram, developed using the Lucidspark tool [30], structurally represents the main interactions between the user and the system, based on the previously defined functional requirements. It highlights system behavior in response to user actions, facilitating the understanding of the functional scope, enhancing communication among stakeholders in the project, and supporting validation with end users [11, 15].

In the proposed model, the main actor is the user, who interacts with the system through a set of functionalities organized into use cases. Access to the application is granted through authentication, with the option of account creation for new users. The system's core actions involve mood and medication management, both structured around CRUD operations. Within the medication module, users can suspend or resume treatments and log extra doses, allowing flexibility in situations that deviate from the prescribed dosage. The medication schedule defines the timing of each dose based on the registered prescription and is linked to use cases such as confirming, delaying, or skipping a dose through inclusion relationships. This structure enables integrated support for decision-making related to each administration. Additionally, based on the recorded dosage, the system sends automated reminders at the

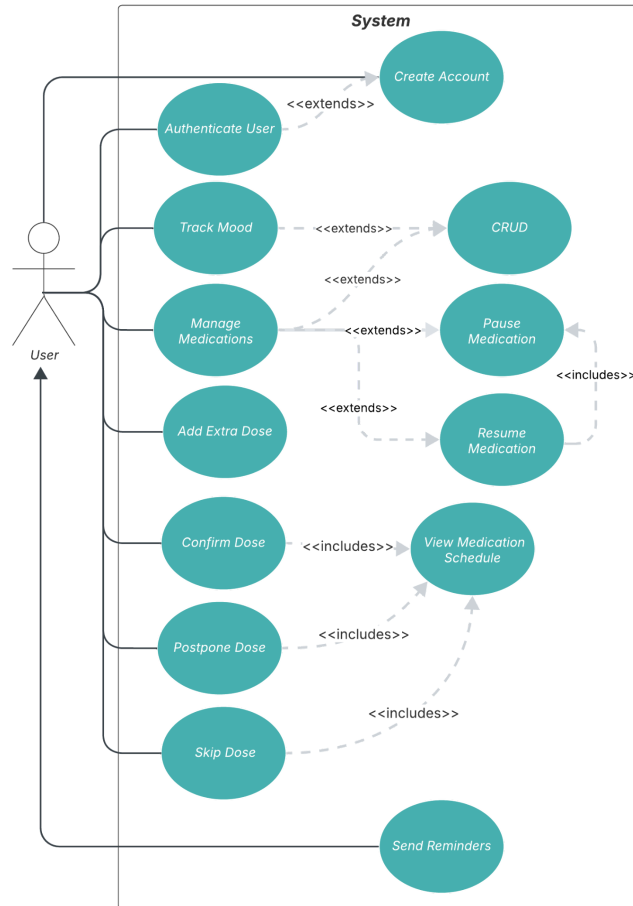appropriate times to promote adherence and reduce failures caused by forgetfulness or disorganized routines.

Fig. 3. Use case diagram.

4.2   System Interfaces

The application's interfaces were organized to follow the user's journey in a clear and accessible manner, with a focus on simplicity and consistency. The entire navigation flow was mapped in Figma with specific annotations to guide the future implementation of the proposal. The design followed a previously defined visual identity and used reusable components, ensuring consistency across screens and facilitating maintenance. Educational messages were also integrated throughout the navigation, reinforcing the responsible use of medications and the importance of following professional prescriptions.

Figure 4 presents a set of representative screens from the project, highlighting the system's functional structure and the principles adopted in organizing the navigation. At various points in the interface, a floating action button allows users to add new mood records, register medications, or log extra doses of a medication. On the home screen, the user is encouraged to record their emotional state and can view the day's medication schedule in an interface that balances informational clarity and educational guidance. In the calendar, entries are organized according to the selected date: in the medication tab, users can check scheduled doses and record whether they were taken, postponed, or skipped; in the mood tab, users can access emotional records from that day, including associated feelings and notes. The medication screen displays the registered items, distinguishing between active and suspended treatments. When accessing a medication's details, the user can review the prescription, edit information, temporarily suspend its use, or delete the item, maintaining continuous control over their therapeutic routine.
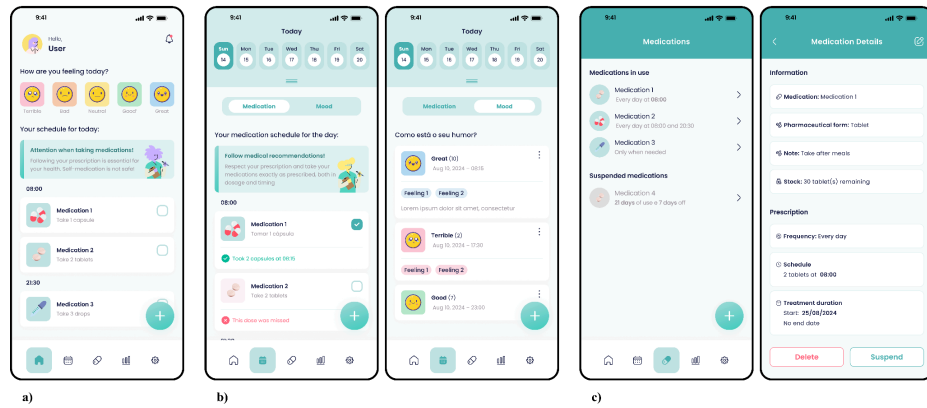

Fig. 4. Application interfaces: (a) home screen; (b) calendar with tabs for viewing medications and mood records; (c) medication screen, with a list of treatments and access to details.

5   Results and Discussion

In order to evaluate the target audience's receptiveness to the developed proposal, an online survey was applied to a group of 65 participants, composed of healthcare professionals and Information Systems students from the Federal Institute of Santa Catarina – Camboriú Campus. The questionnaire was structured into three sections: sociodemographic and health profile, well-being routine and interest in the application. The analysis of the responses made it possible to understand relevant aspects of the application's potential audience, their therapeutic needs, and the level of interest in digital solutions aimed at mental healthcare.

Figure 5 presents the characterization of the participants' profiles, revealing that most of them belong to the age groups of 25 to 34 years (47.7%) and 18 to 24 years (30.3%), which may be associated with greater familiarity with mobile devices. The gender distribution was balanced, with a slight male predominance (50.8%), contributing to the diversity of the sample. Regarding occupation, 46.2% reported

having formal employment, and 41.5% work autonomously or informally, suggesting potentially intense routines and reinforcing the usefulness of digital solutions for therapeutic organization. Previous experience with mental health care was also significant: 30.8% are currently undergoing psychological or psychiatric treatment, and another 40% have received such care in the past. These data indicate that many participants have already experienced mental health care practices, which may facilitate engagement with digital solutions that enhance therapeutic follow-up. Additionally, 29.2% of participants use mental health-related medication on a continuous basis, and 23.1% have used such medication in the past, reinforcing the relevance of features aimed at medication adherence. Finally, the fact that 83.1% reported having family members diagnosed with mental disorders increases the social relevance of the proposal, highlighting that the issue affects not only individuals directly but also their social circles.
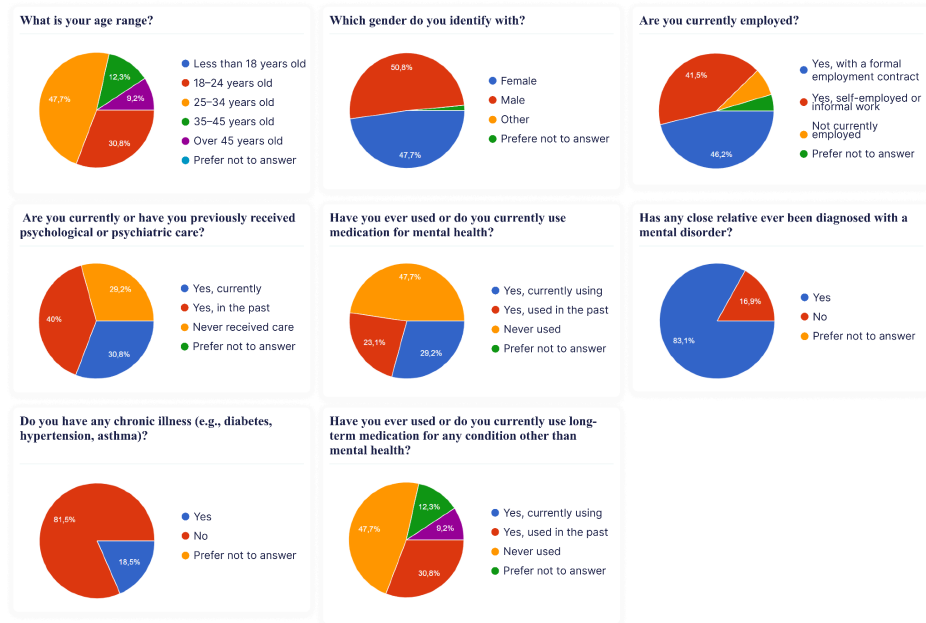

Fig. 5. Participant profile: age, gender, occupation, mental health history, and medication use.

The results related to well-being routines, presented in Figure 6, highlight significant weaknesses in the respondents' self-care habits. When asked about how often they forget to take their medication, most indicated intermediate scores on the scale (2 and 3), totaling 56.9% of responses. This suggests a considerable recurrence of forgetfulness and reinforces the importance of features such as automated reminders to support treatment adherence. Regarding emotional well-being, 38.5% reported experiencing frequent mood swings, which highlights the need for tools that enable continuous monitoring of emotional states. The stress level was also high: 72.4% assigned scores between 3 and 5 to their current condition in recent days, with an emphasis on the higher end of the scale. Despite this emotional overload, self-care

practices appeared at a moderate level, with 67.7% of participants reporting that they have been engaging in activities that help them relax or feel good, such as talking to someone, resting, or having personal time. These findings indicate an openness to technologies that can encourage and structure such practices more consistently.
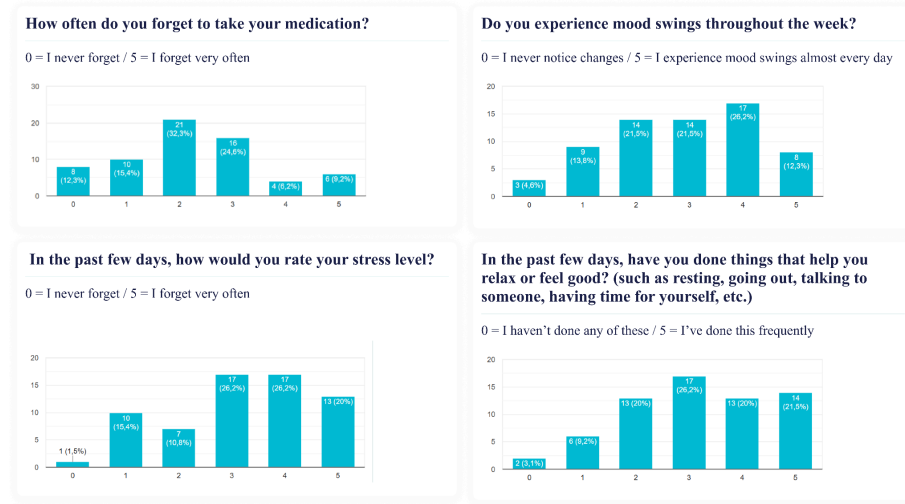

Fig. 6. Well-being routine indicators: frequency of medication forgetfulness, mood variations, stress levels, and recent self-care practices.

The third and final part of the questionnaire, presented in Figure 7, offers important insights into users' experiences and openness toward digital solutions for mental health support and medication adherence. Although 73.8% of participants reported never having used an app for emotional well-being or medication reminders, the majority expressed strong interest in such tools. When asked about using an app to help remember medication times, 80% gave scores between 4 and 5 on a 5-point scale, with 55.4% selecting the highest score. Similarly, 67.7% showed high willingness to use an app to track their emotional states throughout the days, with 40% choosing the maximum score. These results suggest a high level of receptiveness to mental health technologies, especially when supported by features that meet users' expectations. Among the most valued functionalities were the ability to receive reminders and generate reports based on recorded data, each selected by 86.2% of respondents. Additional features such as maintaining a complete therapeutic record, monitoring mood changes, and checking treatment adherence were also highlighted as useful by over 60% of participants. The open-ended responses further enriched these findings by emphasizing the importance of personalization through artificial intelligence, integration with clinical monitoring, and gamification elements to enhance engagement. Collectively, these results not only validate the relevance and feasibility of the proposed solution but also reinforce its alignment with the practical needs and preferences of its target audience, offering a solid foundation for both implementation and future refinement.
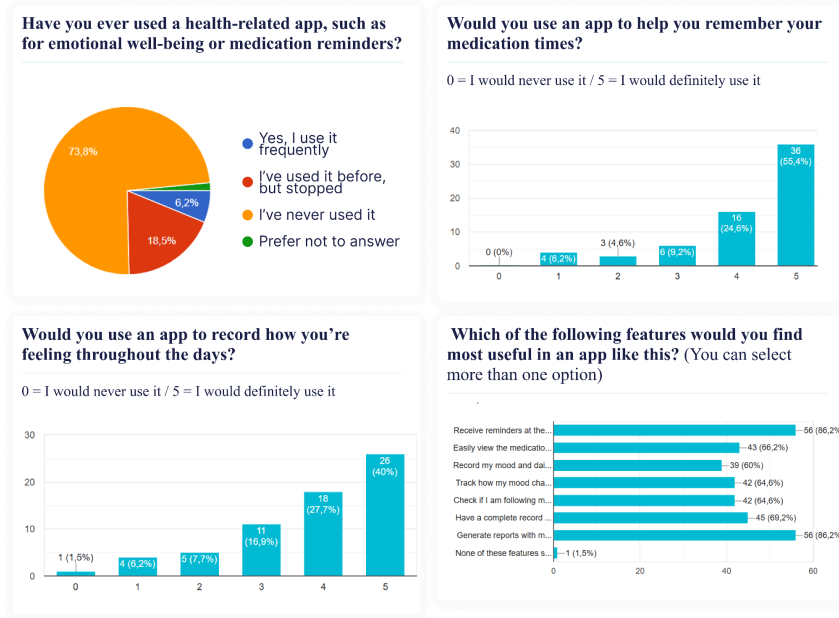
Have you ever used a health-related app, such as for emotional well-being or medication reminders?

- Yes, I use it frequently
- I've used it before, but stopped
- I've never used it
- Prefer not to answer

73,8%
6,2%
18,5%

Would you use an app to help you remember your medication times?

0 = I would never use it / 5 = I would definitely use it

0 (0%)   4 (6,2%)   3 (4,6%)   6 (9,2%)   16 (24,6%)   36 (55,4%)

Would you use an app to record how you're feeling throughout the days?

0 = I would never use it / 5 = I would definitely use it

1 (1,5%)   4 (6,2%)   5 (7,7%)   11 (16,9%)   18 (27,7%)   26 (40%)

Which of the following features would you find most useful in an app like this? (You can select more than one option)

Receive reminders at the... — 56 (86,2%)
Easily view the medicatio... — 43 (66,2%)
Record my mood and dai... — 39 (60%)
Track how my mood cha... — 42 (64,6%)
Check if I am following m... — 42 (64,6%)
Have a complete record ... — 45 (69,2%)
Generate reports with m... — 56 (86,2%)
None of these features s... — 1 (1,5%)

Fig. 7. Use and interest in digital technologies: app usage history, intent to use for reminders and mood tracking, and most valued features.

6   Conclusion

This study led to the development of *Moodicare*, a mobile app prototype designed to support medication adherence and emotional monitoring in mental health treatment. Based on user-centered design and usability principles [10, 11, 12], it features mood and medication logging, visual tracking, reminders, and data export. Its scope was defined through personas and modeled via use case diagrams and Figma prototypes [10, 18], with a design system focused on clarity, softness, and consistency [11, 12].

The results revealed a positive reception of the proposal among participants, mainly reflected in the high intention to use the app's core features and in the perception of its applicability within therapeutic contexts. Features such as medication reminders, therapeutic plan organization, daily mood and feeling logging, and report generation were perceived as compatible with the routines and challenges faced by individuals in mental health treatment, supporting both organization and emotional awareness. The questionnaire responses reinforce that the developed functional scope aligns with the needs of the target audience, validating its relevance and practical value.

As a future development, the integration of Artificial Intelligence is suggested to detect patterns between mood and medication usage. Based on these patterns, the app could offer adaptive support through reminders, motivational messages, and simple guidance to promote treatment consistency and emotional insight. Therefore, this

work presents a viable foundation for digital solutions that integrate pharmacological and emotional monitoring in mental healthcare, encouraging future initiatives that ethically connect technology and clinical care.

7   References

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