Designing Mobile UI/UX for a Healthy Diet Tracking App to Enhance User Awareness and Engagement

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Abstract:*In modern life, many individuals struggle to maintain a healthy diet due to social pressures, poor habits, and a lack of nutritional awareness. This study designed a mobile application for healthy diet tracking to enhance nutritional awareness and user engagement. The application adopts the Human-Centered Design (HCD) approach and offers features such as calorie tracking, macro- and micronutrient monitoring, and nutrition education. Data were collected through questionnaires, interviews, and observations targeting users aged 18–40 in Indonesia. The results show that most users face difficulties in managing their eating patterns and need a simple, user-friendly interface. This application is expected to help users plan daily meals, understand nutritional content, and stay motivated to live a healthy lifestyle. Appealing visual design, personalization features, and a built-in community also enhance the user experience. This study contributes to designing user-based digital solutions with a positive impact on public health. The findings conclude that an application focused on user needs and experience can improve nutritional understanding and support healthier living. It also serves as an accessible medium for digital nutrition education.*

Keywords: *Application, Health, Lifestyle, Macronutrients, Nutrition*

INTRODUCTION

In recent years, dietary patterns among the global population have changed significantly, driven by increasingly fast-paced lifestyles, frequent consumption of foods high in sugar and fat, and limited awareness of balanced

nutrition. These trends have contributed to a growing prevalence of non-communicable diseases such as obesity and diabetes, particularly in developing countries.Obesity is recognized as a major public health challenge globally, as it increases the risk of various chronic illnesses. One of the most influential risk factors linked to obesity is the place of residence, where urban and rural environments present different lifestyle influences. According to Riskesdas (Basic Health Research) 2018 Indonesia's national health survey the prevalence of obesity continues to rise in both urban and rural settings, although with varying contributing factors. Supporting this trend, a study at Universitas Malikussaleh revealed that although most students had a good understanding of the health risks associated with Western fast food, this knowledge did not necessarily lead to healthier eating behavior. Instead, frequent consumption of fast food was significantly associated with varied nutritional statuses (Safrida et al., 2022). This highlights the importance of addressing behavior change in addition to simply providing information. In today's digital era, diet-related mobile applications have become a popular solution for managing nutritional issues (Shalika Syifarani,2022) notes that diet apps are widely used for their personalized and accessible services, especially for weight management. However, there remains a significant gap between nutritional knowledge and actual behavior, which has not been widely tackled using engaging and educational visual approaches.Therefore, this research aims to develop a mobile application-based solution designed to help users understand and improve their eating habits using Human-Centered Design and User Experience (UX) principles. By focusing on the needs and behaviors of users, this intervention is expected to contribute to better awareness, improved decision-making, and ultimately, healthier lifestyle choices. Indonesia is facing serious nutritional challenges, largely due to limited public understanding of healthy eating. Data from the Ministry of Health shows rising rates of overnutrition and obesity: 10.78% of adult males and 15.13% of females are overnourished,

while obesity affects 12.94% of males and 34.05% of females (BMI >27). These issues are driven by diets high in sugar, salt, and fat, increasing the risk of chronic diseases. In urban areas, fast-paced lifestyles lead many especially students and young professionals—to depend on fast food or processed meals, which are high in calories and low in nutrients. Limited time, lack of accessible nutrition education, and misinformation from social media contribute to poor dietary habits. Time constraints and the lack of culturally relevant tools worsen the problem. Data from Badan Pusat Statistik (2020) shows an increase in online food purchases, reflecting the need for convenience but also highlighting reduced time for meal preparation. Food tracking apps can help users monitor their calorie intake, set diet goals, and receive tailored food recommendations. Diah (2023) noted that features like water reminders and expert consultations enhance healthy habits. Research by Koeryaman et al. (2023) showed that web-based apps improved dietary diversity and nutrient intake in pregnant women. Fanani et al. (2023) emphasized that intuitive user experience design boosts user engagement. However, existing apps like *Lifesum* often limit access through paid subscriptions and rely heavily on numeric data, which may not appeal to local users. Agustina et al. (2022) highlighted the need for simple, culturally adapted interfaces that offer practical nutritionnal advice.

RESEARCH METHOD

This study employed a mixed-method approach integrating both quantitative and qualitative data collection and analysis techniques. The design process was guided by the principles of Human-Centered Design (HCD) to ensure the final solution aligned with users' real needs and behaviors.

Research Focus and Respondents

The research focused on individuals aged 18 to 40 living in urban areas of Indonesia, particularly university students and young professionals. These groups were selected due to their high smartphone usage, exposure to fast-paced lifestyles, and limited access to practical nutrition guidance.

Sampling and Participants

A purposive sampling method was used to select participants who matched the target user profile. Quantitative data were collected through an online questionnaire distributed to 100 respondents. The survey included questions on eating habits, current use of health apps, visual design preferences, and desired features. For the qualitative part, in-depth interviews were conducted with three target users and one UI/UX design expert. These interviews provided deeper insights into personal motivations, challenges in food tracking, and expectations toward app design.

Data Collection and Analysis

Quantitative data were analyzed using descriptive statistics, summarizing key trends and user preferences. And used to construct user personas, empathy maps, and define design requirements.

Design and Validation Process

The design process followed the standard HCD stages and Low-fidelity and high-fidelity prototypes were developed and refined through usability testing involving selected respondents.To ensure the validity and reliability of findings, data triangulation was applied by comparing insights from surveys,

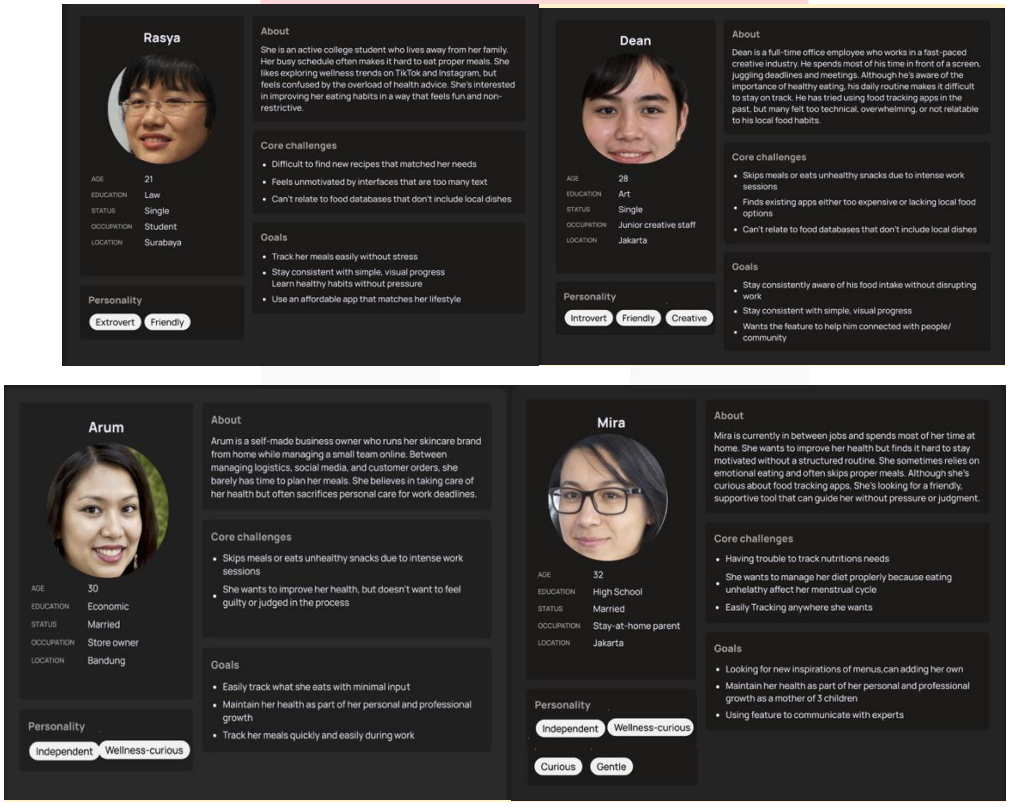
interviews, and usability observations. This approach allows for replicability and ensures that the resulting prototype is grounded in actual user behavior and expectations.

Table 1 The user-testing

	Q1	**Q2**	**Q3**	**Q4**	**Q5**
User 1 Homemaker, 39	As elder lady i (39 y.o) like it,i can see clearly with my eyes **Rate: 2**	I like it,even tho at first i though it was something else **Rate: 2**	It is matched and the combination itself **Rate: 1**	Yes, i do,I can understand ,actually no complaint about it **Rate: 1**	The text or font is quite good maybe make it a bit bigger cause sometime im not wearing glasses **Rate: 3**
User 2 Student,18	It's great **Rate: 2**	As a gym person i do love it **Rate: 2**	never seen this before and it looks good **Rate: 3**	It is good for me **Rate: 1**	Yes ofcours e i do and i don't have other comments **Rate: 2**
User 3 Retail Worker,23	The homepage was easy to understand. and it's clean **Rate: 2**	The meal prep feature itself is good **Rate: 2**	Love the color,Rarely seen this type of app,it'all fine **Rate: 2**	Ok,Good,im okay with that,but making small improvemen t **Rate: 2**	Yes it's all fine for me I think i'm going to say 8/10 **Rate: 1**
User 4 Unemployed ,30	The first screen felt intuitive. I didn't need any instructions to move	I like that **Rate: 2**	No complains at all **Rate: 3**	Iam very familiar with this kind of app,i hope this is going to be good if it's having	Yes i like it,and not so confusing appreciate your work!

	around. It reminded me of fitness apps I've used before. **Rate: 1**			the summary of it **Rate: 3**	**Rate: 1**

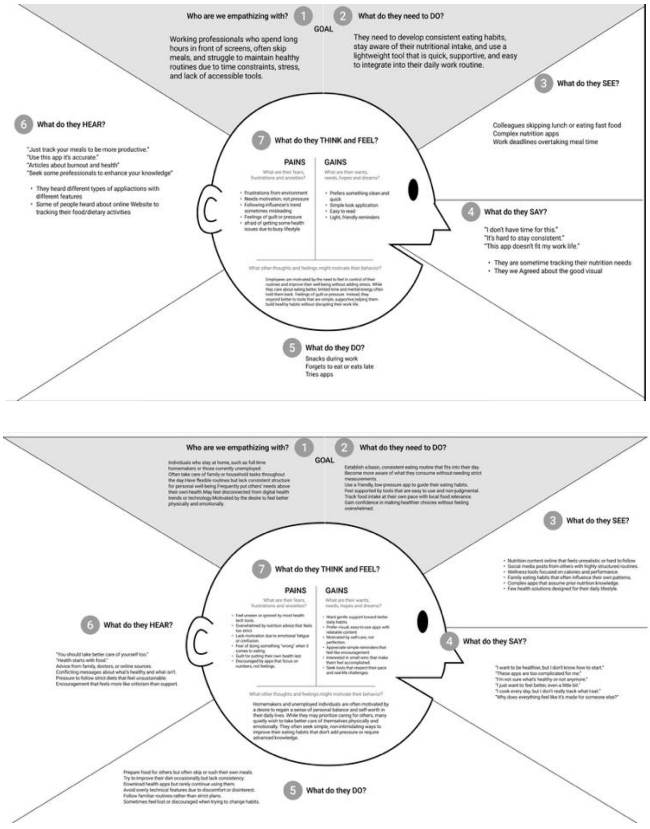
Table 1 User testing and Task
Source: Personal Data



Picture 1 User-Personas
Source: Personal Data

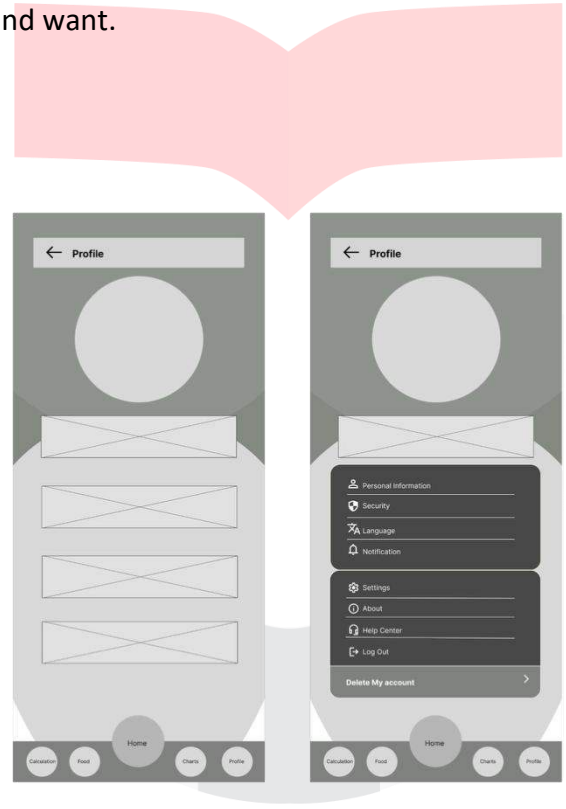
Rasya is a 21-year-old law student from Surabaya who lives away from her family. As an active college student, her busy class schedule often leads to

inconsistent eating habits. Dean represents working professionals in creative industries who face high workloads and irregular daily routines. His profile highlights the need for nutritional tools that can be integrated seamlessly into a fast-paced schedule without requiring complex input or disrupting productivity. Arum represents the modern female entrepreneur who balances business ownership with personal well-being. Her persona reflects the challenges of managing a growing brand while lacking the time or mental space to plan healthy meals. This user segment tends to seek tools that are flexible, supportive, and non-judgmental. Mira embodies stay-at-home parents or homemakers who operate within fluid daily routines and often carry the emotional and physical load of caregiving. Her profile emphasizes users with high intent to improve their health but who lack structure and confidence in nutrition tracking.



Picture 2 Empathy Map
Source: Personal Data

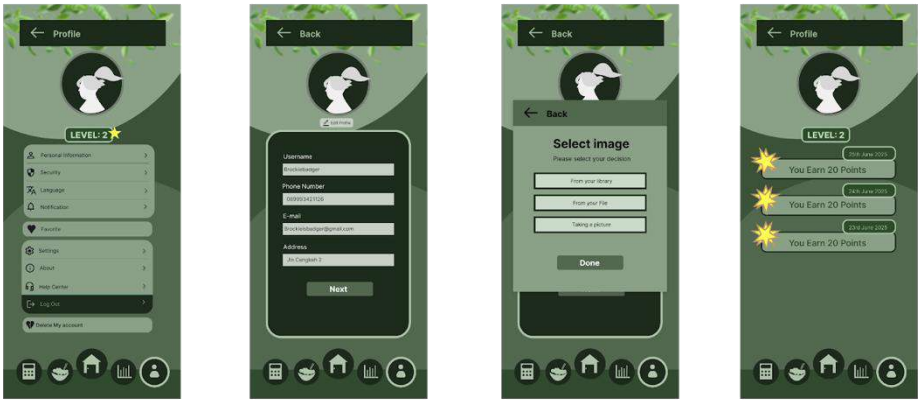
An empathy map is a simple visual tool used in human-centered design to help teams understand users better. It organizes what we know about users into four parts what they say, think, do, and feel. This helps us see the user as a whole person, not just as data or statistics. By using empathy maps, we can discover what users really need and want.



Picture 3 Low-Fidelity
Source: Personal Data

The process of designing application,A low-fidelity prototype is a simple, rough representation of a design that focuses on the basic structure, layout, and user flow rather than visual details or aesthetics. In this lo-fi login page, only the essential elements are shown, such as input fields for username and password, a

login button, and basic options like "Forgot Password" or "Register New Account." There are no detailed icons, colors, or images just boxes, labels, and placeholders to illustrate the main components.



Picture 4 High-Fidelity
Source: Personal Data

The Profile section serves as the user's personal space within the NutriYumm app. Here, users can view and manage their identity and health-related information. The layout presents the user's name and avatar prominently, giving a personalized touch to the application. Users can access a form to update personal data

RESULT AND DISCUSSION

Several prior studies have explored the use of digital health applications, particularly in supporting healthcare workers operating in resource-limited settings. Olaniyi et al. (2022) emphasized how behavioral logs from these apps can be transformed into time series data, allowing for continuous monitoring of user activity. While this data-oriented approach is valuable in clinical contexts,

engagement among everyday users especially young adults is more often shaped by personal motivation, usability, and how relevant the app content is to their daily routines.

In the area of dietary health, earlier research has highlighted the importance of education in preventing hypertension and cardiovascular diseases. Hakim et al. (2024) pointed out that early dietary interventions are essential, especially for younger populations, and that education plays a central role in raising awareness about healthy eating. However, user adoption of health apps still hinges on how easy they are to use. Zhao et al. (2018) noted that perceived ease of use significantly affects whether individuals engage with health-related applications.

The present study supports and expands on these findings by emphasizing how user behavior influences app interaction. Han et al. (2019) and Bentley et al. (2016) previously demonstrated that mobile apps can facilitate behavior change when they align with users' needs and motivations. In contrast to earlier platforms that rely heavily on numeric tracking, this study introduces NutriYumm, a visually focused and adapted app designed specifically for young Indonesian users. Visual feedback, personalized goals, and localized content play an essential role in motivating users to engage with the app consistently. Furthermore, this study reinforces the claims of Zorbas et al. (2018), who found that food choices among young adults are often affected by time constraints and convenience.

The current research adds to this by showing that users are more inclined to adopt healthier habits when information is delivered in a visually engaging and easy-to-digest manner. This supports the arguments by (Fanzo,2019) and (Larson et al.,2019), who emphasized the growing importance of healthy, sustainable eating and the influence of locally sourced ingredients in shaping food decisions. While most existing studies have addressed broad dietary choices, this study

focuses more specifically on meal selection behavior. The role of meal frequency as a determinant of diet quality, as highlighted by (Murakami and Livingstone,2015), is explored further here by showing how app design elements such as visual meal logs and reminder features can influence daily food decisions. These findings underscore the potential of well-designed digital interfaces to act as behavioral drivers in mobile nutrition interventions.

CONCLUSION

This research demonstrates the potential of Human-Centered Design (HCD) in developing mobile nutrition applications that are intuitive, engaging, and culturally relevant. By focusing on real user behaviors and challenges, *NutriYumm* was designed to assist Indonesian users aged 18–40 in improving their eating habits through practical features such as meal tracking, personalized goals, and visual nutrition guidance. The findings suggest that poor time management, limited access to credible nutrition information, and low motivation are key barriers to healthy eating. The application's clean interface, use of visual communication, and localized content helped address these challenges and improve user engagement. Usability testing further confirmed that clarity, ease of navigation, and visual appeal are crucial to sustaining user interest and promoting daily use.

This study contributes to the growing intersection of visual design, user experience, and public health. It shows how thoughtful design can bridge the gap between knowledge and action in health-related behavior. However, limitations such as a small sample size and short testing period may affect the generalizability of the results. Future studies are needed to evaluate the long-term effects of app use, and whether these design strategies continue to support behavior change over time. Expanding the research across different user segments such as older

adults, rural populations, or individuals with specific health conditions may also offer deeper insights into the broader applicability of the approach.

In conclusion, *NutriYumm* presents a promising example of how mobile technology, when grounded in user-centered principles and adapted to local cultural contexts, can play an active role in promoting healthier lifestyles. The integration of visual design and interactive features not only enhances usability, but also transforms nutrition tracking into a more meaningful and motivating experience. As digital health tools continue to evolve, this research underscores the importance of aligning design with human behavior to create solutions that are not only functional, but also emotionally resonant and socially relevant.

SUGGESTION

Future research should explore long-term behavioral impact, involve more diverse user groups, and consider integrating the app with wearable devices or health data platforms for broader impact. Expanding Food Database include more local and international dishes with accurate nutritional data to improve user relevance and trust.Add Multilingual Support Adding More translations for people Integrate with Wearables Enable synchronization with smartwatches or fitness bands to offer real-time health monitoring. Enhance Personalization Use AI to tailor food recommendations based on user preferences, allergies, health goals, or existing medical conditions. Include Educational Content Consider adding articles, infographics, or short videos related to nutrition and healthy living to enhance the app’s role not just as a tracker.

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