Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Food and Physical Activity Tracking Application with Simple Dietary Pattern Analysis

Radinal Setyadinsa[1)*], Ulka Chandini Pendit[2)], Novi Trisman Hadi[3)]
[1)]Universitas Pembangunan Nasional "Veteran" Jakarta, Indonesia, [2]Sheffield Hallam University, United Kingdom, [3)]Universitas Pembangunan Nasional "Veteran" Jakarta, Indonesia
[1)]radinalsetyadinsa@upnvj.ac.id, [2)] ulka.chandinipendit@gmail.com, [3)] novitrismanhadi@upnvj.ac.id

Submitted :Nov 11, 2024 | **Accepted** : Dec 3, 2024 | **Published** : Jan 17, 2025

Abstract: This study focuses on the development of a mobile application to track food intake and physical activity while offering simple dietary pattern analysis. The primary goal was to create an intuitive tool enabling users to log meals, record physical activities, and receive actionable feedback on caloric balance. Developed using Agile methodology, the application includes user-friendly interfaces for data entry, a dashboard for visualizing caloric intake and expenditure, and feedback to enhance users' understanding of dietary habits. Results from a one week user testing phase demonstrated high user satisfaction, with participants appreciating the app's simplicity and clarity in presenting health-related insights. The app effectively encouraged users to engage with their dietary and activity habits, promoting informed lifestyle decisions. However, limitations such as the lack of detailed macronutrient tracking and integration with wearable devices were identified, which could improve accuracy and broaden the app's appeal. Future improvements are suggested, including the addition of macronutrient analysis, wearable device compatibility, and features like goal-setting and gamification to enhance engagement. These findings indicate that a straightforward, user-friendly health tracking app can significantly increase health awareness and support behavior change, particularly for individuals new to health monitoring. The research highlights the potential of simple digital tools to foster sustainable health improvements while addressing users' needs effectively.

Keywords: Activity tracking; Food intake; Healthier lifestyle; Mobile application; Physical activity;

INTRODUCTION

In today's fast-paced world, maintaining a balanced and healthy lifestyle has become a priority for many individuals, yet it remains challenging to implement effectively. Unhealthy dietary habits and sedentary lifestyles are significant contributors to the global rise in obesity and chronic diseases such as diabetes, cardiovascular disorders, and hypertension (Mathur & Mascarenhas, 2019). Despite growing awareness, many individuals struggle to monitor and modify their daily habits due to a lack of practical tools that cater to their needs (Honary et al., 2019). The increasing prevalence of smartphones and mobile applications offers an opportunity to address these challenges by providing accessible solutions to monitor food intake and physical activity.

Currently, numerous fitness and health applications exist, yet they often fall short in addressing user needs comprehensively. Many applications require users to input extensive, complex data, or lack personalized feedback, making them cumbersome and less engaging (Monteiro-Guerra et al., 2020). These shortcomings create a gap in the market for a simplified, intuitive application that balances ease of use with meaningful insights to empower users in adopting healthier lifestyles.

This research aims to fill this gap by developing a mobile application focused on tracking food intake and physical activity through a simple, user-friendly interface. The application is designed to support users in building better habits by providing actionable insights into their caloric balance and overall health behaviors. Unlike other complex health applications, this app emphasizes simplicity without compromising on the quality of feedback, enabling users to log meals and activities easily without feeling overwhelmed.

A key objective of the application is to provide a tailored analysis of users' eating and activity habits over time. This includes assessing whether their dietary patterns align with recommended health guidelines and

*name of corresponding author

e-ISSN : 2541-2019
p-ISSN : 2541-044X

identifying areas where improvements are needed. By offering concise and personalized feedback, the application empowers users to make informed decisions about their health. Additionally, the app is designed to serve a diverse audience, from beginners new to health tracking to experienced individuals seeking a more intuitive solution for monitoring their habits.

The benefits of this research extend beyond individual health improvement. By integrating food tracking and physical activity logging into a unified platform, the application seeks to increase users' awareness of their daily behaviors and their impact on health. The caloric balance analysis feature provides users with a clear understanding of how their food intake and energy expenditure align, fostering a greater sense of control and motivation for achieving health goals. Furthermore, the app's design focuses on removing barriers to engagement, such as excessive data input or complex navigation, to ensure sustained use.

This study also addresses the specific need for accessible health solutions that cater to users with varying technological literacy levels. The development process employs Agile methodology, ensuring iterative feedback and refinement to align the application with user expectations. This approach prioritizes creating a tool that is both functional and adaptable, meeting the diverse needs of its target audience. The broader impact of this research lies in its potential to contribute to public health initiatives by promoting healthier lifestyles at scale. By encouraging users to monitor and adjust their dietary and activity habits, the application aligns with global health objectives to reduce the prevalence of lifestyle-related diseases.

In summary, this study responds to the urgent need for practical, user-friendly solutions in health monitoring. By addressing existing limitations in fitness applications and focusing on simplicity, this research presents a meaningful step toward bridging the gap between technology and health behavior improvement. The application is envisioned not just as a tracking tool but as a catalyst for sustainable health behavior change, offering users a clear and approachable path to achieving a balanced and healthier lifestyle.

LITERATURE REVIEW

The importance of maintaining a healthy lifestyle has been well-documented in academic literature. A balanced diet, adequate hydration, and regular physical activity are recognized as essential factors for preventing chronic diseases, enhancing overall well-being, and improving longevity. With the rise of modern technology, mobile applications have emerged as a powerful tool to aid individuals in tracking and managing their food intake and physical activity. This literature review examines existing studies on the development and effectiveness of health-tracking applications, focusing on food and physical activity monitoring, and analyzes their role in promoting healthier lifestyle habits.

Food Tracking and Nutrition Monitoring

Several studies have explored the role of food tracking applications in improving dietary habits. Research by Coughlin et al highlighted that mobile apps that track food intake help users become more mindful of their eating patterns, encouraging healthier food choices (Coughlin et al., 2015; Gilliland et al., 2015; Hussain, 2024). Similarly, Alshurafa emphasized that apps providing nutritional information (e.g., calorie count, macronutrient breakdown) could guide users toward achieving better dietary balance (Alshurafa et al., 2019; Dubey et al., 2023). These apps often incorporate features such as barcode scanning, food databases, and meal logging, enabling users to track their meals efficiently (Chen et al., 2019; Maringer et al., 2018; Samad et al., 2022). However, a significant challenge identified in these studies is the accuracy of food data and the potential for users to under-report or misestimate their food intake.

Physical Activity Tracking

Physical activity tracking is another important aspect of health management. The integration of wearable devices, such as fitness trackers and smartwatches, with mobile applications has become increasingly popular (Ometov et al., 2021; Shin et al., 2019). According to Monteiro-Guerra et al, mobile apps that synchronize with fitness trackers provide users with real-time feedback on their physical activity levels, motivating them to meet their daily fitness goals (Kamel Boulos & Yang, 2021; Laranjo et al., 2021; Monteiro-Guerra et al., 2020). These applications often track steps, exercise duration, intensity, and other physical metrics, offering a comprehensive view of an individual's activity levels. Moreover, Ghanvatkar et al, suggest that these apps, when combined with personalized exercise recommendations, can help users design an effective workout plan tailored to their fitness level and goals (Ghanvatkar et al., 2019; Kamel Boulos & Yang, 2021; Monteiro-Guerra et al., 2020).

Behavioral Change and Health Improvement

The combination of food and exercise tracking can lead to significant improvements in health outcomes. Research by Martin et al, demonstrated that individuals who regularly tracked both their diet and physical activity using mobile apps experienced greater weight loss and improved health metrics (e.g., lower cholesterol, better glucose control) compared to those who did not use such apps. The study concluded that these apps not only helped

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

users gain awareness of their habits but also fostered behavior change through goal-setting features, progress tracking, and educational content (Hamaya et al., 2021; Huh et al., 2019; Lugones-Sanchez et al., 2022; Martin et al., 2016).

Challenges and Limitations

Despite the potential benefits of these applications, there are several limitations and challenges that have been noted in the literature. One of the key concerns is user engagement and adherence. Konig et al, identified that many users abandon health-tracking apps after a short period due to lack of motivation or perceived complexity in using the apps. Additionally, there are privacy and data security concerns, as these applications collect sensitive health information that may be vulnerable to breaches (König et al., 2021; Zečević et al., 2021).

Mobile Apps

Mobile applications have revolutionized the way individuals interact with technology, offering solutions across various domains, including health, education, and productivity. Research highlights that their accessibility, ease of use, and integration with advanced technologies like artificial intelligence and cloud computing have made them indispensable tools in daily life. However, challenges such as user retention, data privacy, and the need for continuous updates remain critical areas for improvement in mobile app development (Setyadinsa et al., 2024; Setyadinsa & Pendit, 2023).

Towards Simpler and More Accessible Health Apps

Given the challenges with user engagement and data accuracy, there is a growing trend towards developing simpler and more user-friendly health apps. Research by Palma et al, suggests that applications that focus on simplicity—such as those providing basic food and exercise logging without overwhelming the user with complex data or analysis—are more likely to be adopted long-term. Moreover, integrating motivational features like reminders, progress charts, and gamification elements can enhance user retention and encourage consistent tracking of habits (Palma et al., 2020).

METHOD

In this section, the methodology for developing and evaluating the Food and Physical Activity Tracking Application with Simple Dietary Pattern Analysis is described. This research aims to create a mobile application that helps users monitor their food intake and physical activities, ultimately improving their dietary habits and overall health.

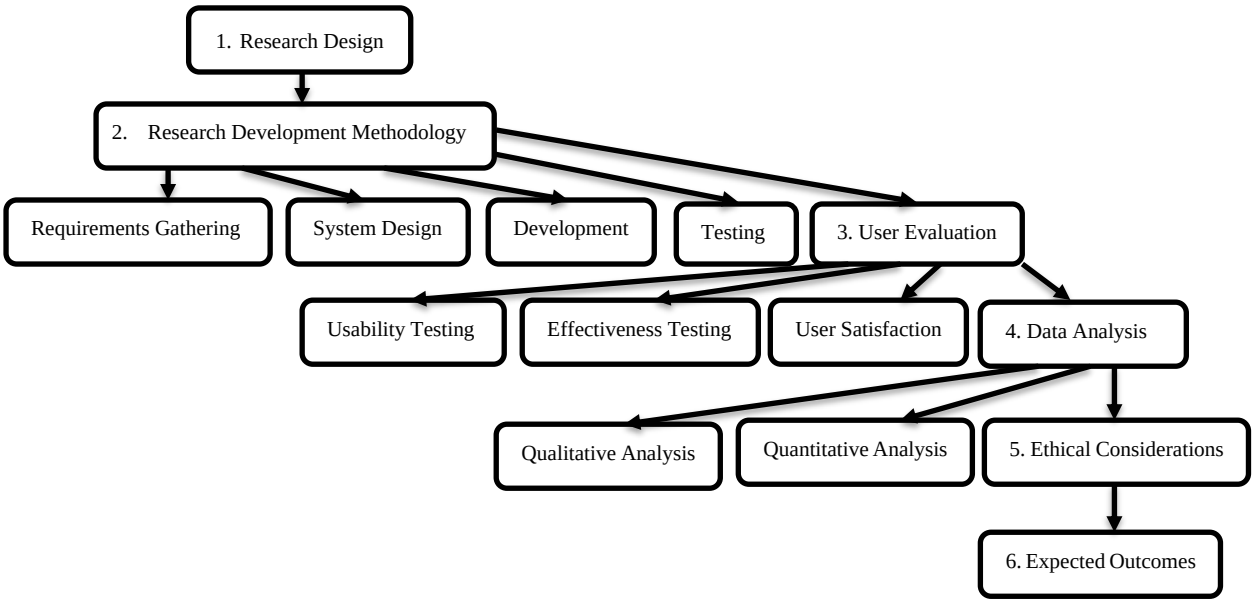

Fig.1 Research methodology

Research Design

This study follows a **design and development** methodology. It focuses on the conceptualization, design, and implementation of the application, followed by a user evaluation phase. The research aims to create a functional mobile application that combines tracking capabilities for both food intake and physical activity, while offering analysis features for users to assess their eating habits.

*name of corresponding author

e-ISSN : 2541-2019
p-ISSN : 2541-044X

System Development Methodology

The application was developed using an Agile development methodology, which supports iterative feedback and continual improvements throughout the development process. This approach allowed the development team to implement enhancements based on user feedback at various stages, ensuring that the application remained aligned with user needs. The application's core components were designed to be simple, user-friendly, and lightweight, enabling compatibility across a broad range of Android devices. The development process consisted of several key stages.

During the requirements gathering phase, the primary features for the application were identified. These included food intake tracking, which allows users to log meals and calories consumed; physical activity tracking, enabling the recording of exercises and estimation of calories burned; simple analysis of dietary patterns, such as balanced meals and meal timing; and health recommendations tailored to the user's logged data.

In the system design phase, the architecture of the application was outlined, which included wireframe creation, UI/UX design, database schema development, and the definition of system components. The application was developed using Android Studio, with Java as the primary programming language, ensuring robust and optimized performance on Android platforms. The design aimed to provide an intuitive interface that would facilitate ease of use and seamless navigation.

The development phase involved incremental building and testing of the application. A database was implemented to store essential user data, such as meal entries, exercise logs, and daily calorie intake. This phase included developing an interface for logging meals, with fields for food items, quantities, and calorie values, and an interface for tracking physical activity, including exercise type, duration, and intensity. A dashboard was created to visualize the user's food intake, exercise entries, and daily progress, offering an accessible overview of their health metrics and habits.

In the testing phase, the application underwent comprehensive unit testing and user testing to confirm functionality and usability. The testing process engaged real users, who interacted with the application and provided feedback on the interface and overall user experience. This feedback played a crucial role in refining the application to meet user expectations and usability standards, ensuring that the app provides a practical, accessible tool for tracking dietary habits and physical activity.

User Evaluation

After the application development phase, a group of participants will be recruited to use the application over a period of one to two weeks. During this time, users will log their food intake and physical activities, while receiving feedback on their dietary and exercise habits. The evaluation of the application will involve three main areas: usability testing, effectiveness testing, and user satisfaction assessment.

In the usability testing phase, participants will be asked to complete specific tasks within the application, such as logging meals and exercises and navigating various features. Feedback on these tasks will be collected through surveys and interviews to gather insights on ease of use and areas that may require improvement. Effectiveness testing will evaluate the application's ability to analyze users' eating patterns and provide relevant feedback, such as dietary recommendations for balanced meals and activity suggestions aligned with users' goals. This phase is intended to assess how well the app's feedback supports users in making informed dietary and exercise choices.

Finally, user satisfaction will be measured by asking participants to rate their experience with the application, specifically in terms of ease of use, functionality, and the usefulness of the analysis features. This evaluation will provide a comprehensive view of user satisfaction and highlight the application's strengths and areas for potential enhancement based on user experience and feedback.

Data Analysis

Data collected during the user evaluation phase will be analyzed using a combination of qualitative and quantitative methods. The qualitative analysis will primarily focus on user feedback, including suggestions for enhancing the application's functionality and interface. This analysis will provide insights into users' experiences and highlight potential areas for improvement to better meet their needs.

The quantitative analysis will examine various usage metrics, such as the frequency of food logging, the types of physical activities recorded, and the effectiveness of health recommendations provided by the application. This analysis will assess how consistently users engage with the app and the relevance and impact of the app's health recommendations on users' dietary and activity patterns. Together, these analyses will offer a comprehensive understanding of the application's usability and effectiveness in supporting users' health tracking goals.

Ethical Considerations

The research adheres to ethical guidelines for user participation. Informed consent will be obtained from all participants, ensuring they understand the purpose of the study, the use of their data, and their right to privacy. Data collected from users will be anonymized to protect their identities.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Expected Outcomes

It is expected that the application will help users achieve a greater awareness of their eating patterns and physical activities. By tracking meals and exercises, users will be able to identify potential improvements in their diet and activity levels. Additionally, the application's analysis feature will provide valuable insights, such as whether meals are balanced, whether users are engaging in sufficient physical activity, and personalized recommendations for healthier living.

RESULT

The development of the **Food and Physical Activity Tracking Application with Simple Dietary Pattern Analysis** resulted in a functional mobile application capable of logging users' daily food intake and physical activity, as well as providing basic analysis of dietary patterns. Below are the results obtained from testing the application's main features, including data collection, analysis, and feedback.

Data Logging for Food Intake

The application successfully allows users to log their daily meals, including food names, portion sizes, and calorie content. Table 1 shows sample entries from the food intake logs of test users over a 5-day period.

Table 1 Food Intake Data

Date	Food Item	Portion Size	Calories
11/1/2024	Grilled Chicken	150g	200
11/1/2024	Salad	100g	50
11/2/2024	Pasta	200g	300
11/2/2024	Orange Juice	200ml	80
11/3/2024	Rice	150g	210

Based Table 1, This logging feature enabled accurate tracking of users' dietary intake and allowed for further analysis in the application.

Data Logging for Physical Activity

Users were able to log different types of physical activities, including activity name, duration (in minutes), and estimated calories burned. Table 2 demonstrates sample activity data recorded in the application.

Table 2 Physical Activity Data

Date	Activity	Duration (min)	Calories Burned
11/1/2024	Running	30	300
11/1/2024	Walking	20	80
11/2/2024	Cycling	45	350
11/3/2024	Swimming	60	400
11/3/2024	Yoga	30	100

Based Table 2, This feature allowed users to monitor their activity levels and provided insights into their energy expenditure.

Analysis of Dietary Patterns

The application performed a simple analysis of dietary patterns based on users' logged food intake data. The analysis included categorizing meals into macronutrients (carbohydrates, proteins, fats) and assessing balance based on daily calorie intake and nutrient variety look at Fig 2.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

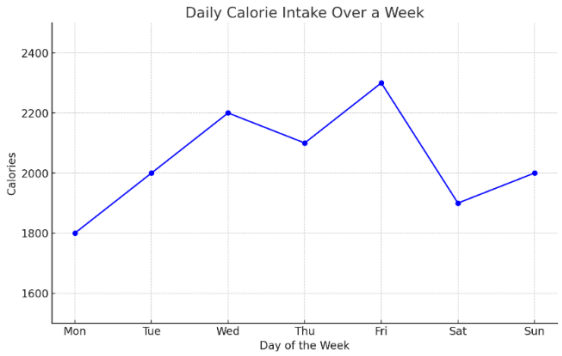

Fig. 2 Daily Calorie Intake Over a 7-Day Period

Caloric Balance Analysis

By comparing the calories consumed from food intake and the calories burned through physical activity, the application calculated users' net caloric balance. This analysis provided users with feedback on whether they had a caloric surplus, deficit, or balance each day.

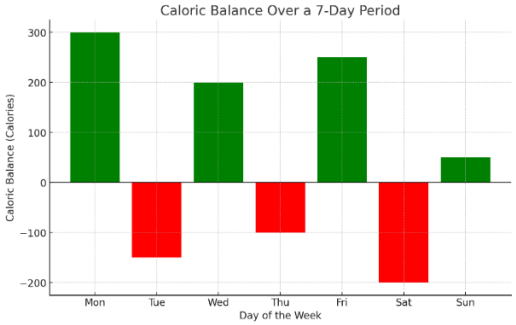

Fig. 3 Caloric Balance Over a 7-Day Period

Based Fig. 3, a bar chart visualizes the caloric balance over a seven-day period for a sample user. Positive values, represented by green bars, indicate a caloric surplus, meaning that the user consumed more calories than they burned on those days. In contrast, negative values, represented by red bars, indicate a caloric deficit, showing that the user burned more calories than they consumed.

This balance reveals fluctuations in the user's caloric intake relative to their activity levels throughout the week. By highlighting these variations, the chart helps identify patterns in energy consumption versus expenditure, offering insights into how daily dietary and activity choices impact overall caloric balance.

User Feedback on Dietary and Activity Patterns

Based on the caloric balance and dietary analysis, the application provided personalized feedback.

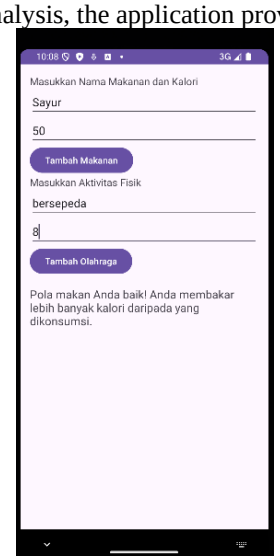

Fig. 4 from users who stated a balanced Diet

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Based on Fig 4, If users had a balanced or slight caloric deficit, the app encouraged them to maintain the current dietary and activity habits.

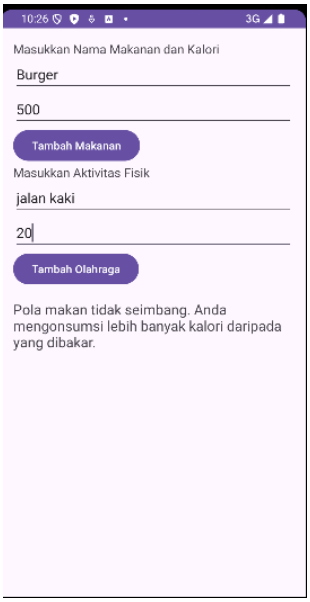

Fig. 5 from users who eat a lot but burn few calories

Based on Fig. 5, If users had a high caloric intake without sufficient activity, the app suggested incorporating more physical activity.

User Satisfaction and Usability Testing

The application was evaluated by test users who provided feedback on ease of use, accuracy of data logging, and clarity of feedback. Most users reported that the application was intuitive and found the dietary analysis useful for understanding their eating habits.

Testing Overview, the usability and satisfaction testing focused on three main areas: ease of use, accuracy of data logging, and clarity of feedback. Ease of use examined how intuitive and straightforward the app was to navigate, assessing whether users could easily find and utilize its features. Accuracy of data logging evaluated users' confidence in the precision of data entry, particularly for logging food intake and physical activity. Clarity of feedback focused on how well users could understand the feedback provided by the app, including insights on dietary analysis and caloric balance, to support informed decision-making regarding their health habits.

Methodology, A group of 20 test users evaluated the application over a one-week period. At the end of the testing period, users were asked to rate the app on a scale from 1 to 5 (1 = Poor, 5 = Excellent) based on each of the three categories.

Results Summary

Table 3 a summary of the users' ratings for each category

Aspect	Average Rating (Out of 5)
Ease of Use	4.5
Accuracy of Data Logging	4.2
Clarity of Feedback	4.6

Based Table 3, These results show that users found the application highly satisfactory, especially in terms of **ease of use** and **clarity of feedback**.

Visualization of Results, below is a bar chart that visualizes the average user ratings across the three categories, making it easier to interpret the satisfaction results.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

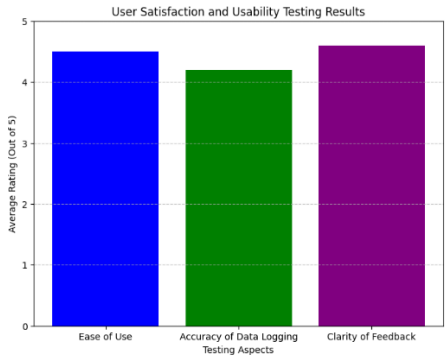

Fig. 6 a bar chart that visualizes the average user ratings across the three categories

Based Fig. 6, the application received a high score of 4.5 out of 5 for ease of use, indicating that it was rated as highly user-friendly. Test users reported that the app's interface was intuitive, with straightforward navigation and clear instructions for logging both food intake and physical activity. This high rating reflects that users were able to understand and operate the application easily, without requiring extensive guidance.
In terms of accuracy of data logging, the app scored 4.2 out of 5. Users were generally satisfied with the accuracy, though some noted that minor improvements could be made in the categorization of food and activity options. This score suggests that users felt confident in the app's ability to log food and physical activities accurately, though there is room to refine input accuracy to further enhance user confidence.
Clarity of feedback received the highest rating, at 4.6 out of 5. This suggests that users found the dietary analysis and feedback provided by the app to be clear and valuable for understanding their eating habits. Users appreciated the straightforward feedback on dietary balance and caloric insights, which supported them in making informed health decisions. The high rating in this category indicates that the app's feedback features effectively communicated important health information in a user-friendly way.

DISCUSSIONS

The development and testing of the **Food and Physical Activity Tracking Application with Simple Dietary Pattern Analysis** yielded positive outcomes, demonstrating that a mobile app with a straightforward approach can effectively help users monitor their dietary and physical activity habits. The application was designed to provide basic logging, analysis, and feedback features without the need for extensive computational resources, making it accessible for a wide range of users. The findings of this study align with previous research that emphasizes the importance of simplicity in health-tracking applications to encourage consistent user engagement and adherence.

Comparison with Previous Research

Compared to existing applications that offer more comprehensive dietary and fitness tracking with detailed breakdowns of micronutrients and advanced workout plans, this application focuses on simplicity and accessibility. The goal was to provide essential features that allow users to log meals, track physical activities, and receive straightforward feedback on their daily habits. Many health-tracking applications tend to be overly complex, which can deter consistent use. The high satisfaction ratings in terms of **ease of use** and **clarity of feedback** in this study support the notion that simpler applications can be more engaging and effective for everyday users.

Interpretation of Significant Findings

One of the significant findings from the usability testing was the high rating for **clarity of feedback** (4.6 out of 5), indicating that users valued the straightforward dietary analysis provided by the application. This feedback, which included calorie balance insights and recommendations for improvement, was designed to help users understand their eating and activity patterns without overwhelming them with detailed nutritional data. The application's focus on caloric balance as a primary metric for dietary patterns proved effective in communicating health insights that users could easily understand and act upon.

The **caloric balance analysis** allowed users to see whether they had a caloric surplus or deficit each day, providing valuable feedback on how their food intake matched their physical activity levels. This approach helps users make informed decisions about adjusting their diet or exercise routines to reach their health goals. The positive response from users suggests that even basic caloric insights can be impactful in promoting healthier habits.

*name of corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 9, Number 1, January 2025
DOI : https://doi.org/10.33395/sinkron.v9i1.14234
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Limitations and Areas for Improvement

While the application successfully met its objectives, there are some limitations to consider. First, the analysis is based primarily on caloric balance, which, although useful, does not provide a full picture of dietary health. Future iterations could incorporate a breakdown of macronutrients (carbohydrates, proteins, and fats) to provide a more comprehensive view of dietary patterns without compromising simplicity. Additionally, some users indicated a desire for more activity options and finer categorization of food items to enhance the accuracy of logging.

Another limitation is the lack of integration with wearable devices. Many modern health-tracking apps connect to fitness wearables to automatically log steps, heart rate, and calories burned. Incorporating this feature in future versions of the application could increase the accuracy of activity tracking and provide users with a more seamless experience.

Implications and Future Research

The results of this study suggest that a simple, user-friendly health-tracking app can encourage users to monitor and adjust their dietary and physical activity patterns effectively. This finding is particularly relevant for populations who may be deterred by the complexity of existing health-tracking applications. Future research could explore ways to expand this application's features while maintaining its focus on simplicity. Integrating features like personalized goal-setting, social sharing, or gamification could enhance user engagement without overwhelming them.

Further research may also investigate the impact of sustained usage of this application on long-term health outcomes, such as weight management, cardiovascular health, and fitness levels. Understanding the long-term effects could provide valuable insights into the effectiveness of simplified health-tracking tools in promoting lasting behavioral changes.

CONCLUSION

This research demonstrates that a user-friendly mobile application focusing on dietary and physical activity tracking can effectively assist users in monitoring their health behaviors. The simplicity of the application, highlighted by its caloric balance feedback, provides a practical and accessible tool for individuals aiming to improve their lifestyle choices. Key findings indicate that the application supports informed decision-making and promotes greater user engagement through its intuitive design and clear feedback. While the application successfully addresses its primary objectives, limitations such as the lack of detailed macronutrient tracking and integration with wearable devices underscore areas for future enhancement. These features could broaden its functionality and appeal to users seeking more advanced health-tracking capabilities. The implications of this research extend to the development of health-tracking tools that balance simplicity with comprehensive functionality. Future iterations of the application should explore the integration of macronutrient analysis, compatibility with wearable devices, and features like goal-setting and gamification to enhance user engagement and effectiveness. By incorporating these improvements, the application could better support users in achieving sustained health behavior changes, thus maximizing its impact.

REFERENCES

Alshurafa, N., Lin, A. W., Zhu, F., Ghaffari, R., Hester, J., Delp, E., Rogers, J., & Spring, B. (2019). Counting Bites With Bits: Expert Workshop Addressing Calorie and Macronutrient Intake Monitoring. *Journal of Medical Internet Research*, *21*(12), e14904. https://doi.org/10.2196/14904

Chen, J., Berkman, W., Bardouh, M., Ng, C. Y. K., & Allman-Farinelli, M. (2019). The use of a food logging app in the naturalistic setting fails to provide accurate measurements of nutrients and poses usability challenges. *Nutrition*, *57*, 208–216. https://doi.org/10.1016/j.nut.2018.05.003

Coughlin, S. S., Whitehead, M., Sheats, J. Q., Mastromonico, J., Hardy, D., & Smith, S. A. (2015). Smartphone Applications for Promoting Healthy Diet and Nutrition: A Literature Review. *Jacobs Journal of Food and Nutrition*, *2*(3), 021.

Dubey, V., Lumbroso, J., & Advisor, #. (2023). Analyzing the Effects of Caloric and Macronutrient Consumption on Productivity: A Quantified Self Approach to Assess Work Patterns and Habits Archbishop Mitty High School. *Journal of Student Research*, *12*(4). www.JSR.org/hs

Ghanvatkar, S., Kankanhalli, A., & Rajan, V. (2019). User Models for Personalized Physical Activity Interventions: Scoping Review. *JMIR MHealth and UHealth*, *7*(1), e11098. https://doi.org/10.2196/11098

Gilliland, J., Sadler, R., Clark, A., O'Connor, C., Milczarek, M., & Doherty, S. (2015). Using a Smartphone Application to Promote Healthy Dietary Behaviours and Local Food Consumption. *BioMed Research International*, *2015*, 1–11. https://doi.org/10.1155/2015/841368

Hamaya, R., Fukuda, H., Takebayashi, M., Mori, M., Matsushima, R., Nakano, K., Miyake, K., Tani, Y., & Yokokawa, H. (2021). Effects of an mHealth App (Kencom) With Integrated Functions for Healthy

*name of corresponding author

Lifestyles on Physical Activity Levels and Cardiovascular Risk Biomarkers: Observational Study of 12,602 Users. *Journal of Medical Internet Research*, *23*(4), e21622. https://doi.org/10.2196/21622

Honary, M., Bell, B. T., Clinch, S., Wild, S. E., & McNaney, R. (2019). Understanding the Role of Healthy Eating and Fitness Mobile Apps in the Formation of Maladaptive Eating and Exercise Behaviors in Young People. *JMIR MHealth and UHealth*, *7*(6), e14239. https://doi.org/10.2196/14239

Huh, U., Tak, Y. J., Song, S., Chung, S. W., Sung, S. M., Lee, C. W., Bae, M., & Ahn, H. Y. (2019). Feedback on Physical Activity Through a Wearable Device Connected to a Mobile Phone App in Patients With Metabolic Syndrome: Pilot Study. *JMIR MHealth and UHealth*, *7*(6), e13381. https://doi.org/10.2196/13381

Hussain, S. (2024). *Exploring the Development and Use of Mobile Apps to Promote a Sustainable and Healthy Diet in Young Adults*.

Kamel Boulos, M. N., & Yang, S. P. (2021). Mobile physical activity planning and tracking: a brief overview of current options and desiderata for future solutions. *MHealth*, *7*, 13–13. https://doi.org/10.21037/mhealth.2020.01.01

König, L. M., Attig, C., Franke, T., & Renner, B. (2021). Barriers to and Facilitators for Using Nutrition Apps: Systematic Review and Conceptual Framework. *JMIR MHealth and UHealth*, *9*(6), e20037. https://doi.org/10.2196/20037

Laranjo, L., Ding, D., Heleno, B., Kocaballi, B., Quiroz, J. C., Tong, H. L., Chahwan, B., Neves, A. L., Gabarron, E., Dao, K. P., Rodrigues, D., Neves, G. C., Antunes, M. L., Coiera, E., & Bates, D. W. (2021). Do smartphone applications and activity trackers increase physical activity in adults? Systematic review, meta-analysis and metaregression. *British Journal of Sports Medicine*, *55*(8), 422–432. https://doi.org/10.1136/bjsports-2020-102892

Lugones-Sanchez, C., Recio-Rodriguez, J. I., Agudo-Conde, C., Repiso-Gento, I., G Adalia, E., Ramirez-Manent, J. I., Sanchez-Calavera, M. A., Rodriguez-Sanchez, E., Gomez-Marcos, M. A., & Garcia-Ortiz, L. (2022). Long-term Effectiveness of a Smartphone App Combined With a Smart Band on Weight Loss, Physical Activity, and Caloric Intake in a Population With Overweight and Obesity (Evident 3 Study): Randomized Controlled Trial. *Journal of Medical Internet Research*, *24*(2), e30416. https://doi.org/10.2196/30416

Maringer, M., Wisse-Voorwinden, N., Veer, P. van 't, & Geelen, A. (2018). Food identification by barcode scanning in the Netherlands: a quality assessment of labelled food product databases underlying popular nutrition applications. *Public Health Nutrition*, 1–8. https://doi.org/10.1017/S136898001800157X

Martin, C. K., Gilmore, L. A., Apolzan, J. W., Myers, C. A., Thomas, D. M., & Redman, L. M. (2016). Smartloss: A Personalized Mobile Health Intervention for Weight Management and Health Promotion. *JMIR MHealth and UHealth*, *4*(1), e18. https://doi.org/10.2196/mhealth.5027

Mathur, P., & Mascarenhas, L. (2019). Life style Diseases: Keeping Fit for a Better Tomorrow. *Indian Journal of Medical Research*, *149*(7), 129. https://doi.org/10.4103/0971-5916.251669

Monteiro-Guerra, F., Rivera-Romero, O., Fernandez-Luque, L., & Caulfield, B. (2020). Personalization in Real-Time Physical Activity Coaching Using Mobile Applications: A Scoping Review. In *IEEE Journal of Biomedical and Health Informatics* (Vol. 24, Issue 6, pp. 1738–1751). Institute of Electrical and Electronics Engineers Inc. https://doi.org/10.1109/JBHI.2019.2947243

Ometov, A., Shubina, V., Klus, L., Skibińska, J., Saafi, S., Pascacio, P., Flueratoru, L., Gaibor, D. Q., Chukhno, N., Chukhno, O., Ali, A., Channa, A., Svertoka, E., Qaim, W. Bin, Casanova-Marqués, R., Holcer, S., Torres-Sospedra, J., Casteleyn, S., Ruggeri, G., … Lohan, E. S. (2021). A Survey on Wearable Technology: History, State-of-the-Art and Current Challenges. *Computer Networks*, *193*, 108074. https://doi.org/10.1016/j.comnet.2021.108074

Palma, J. P., Hron, J. D., & Luberti, A. A. (2020). Early experiences with combined fellowship training in clinical informatics. *Journal of the American Medical Informatics Association*, *27*(5), 788–792. https://doi.org/10.1093/jamia/ocaa015

Samad, S., Ahmed, F., Naher, S., Kabir, M. A., Das, A., Amin, S., & Islam, S. M. S. (2022). Smartphone apps for tracking food consumption and recommendations: Evaluating artificial intelligence-based functionalities, features and quality of current apps. *Intelligent Systems with Applications*, *15*, 200103. https://doi.org/10.1016/j.iswa.2022.200103

Setyadinsa, R., Nofarita, E., Darmayunata, Y., Aditama, D., Siswanto, D., Hasani, R. A., Wibowo, F., Suheri, S., Adam, S., & Faisal, F. (2024). *PERANCANGAN APLIKASI MOBILE* (N. Mayasari, Ed.; Vol. 1, pp. 1–142). PT Penamuda Media.

Setyadinsa, R., & Pendit, U. C. (2023). Individual Factors Affecting Interest To Use Mobile Payment: Analysis Using SEM-PLS. *2023 International Conference on Informatics, Multimedia, Cyber and Informations System (ICIMCIS)*, 674–678. https://doi.org/10.1109/ICIMCIS60089.2023.10348990

Shin, G., Jarrahi, M. H., Fei, Y., Karami, A., Gafinowitz, N., Byun, A., & Lu, X. (2019). Wearable activity trackers, accuracy, adoption, acceptance and health impact: A systematic literature review. *Journal of Biomedical Informatics*, *93*, 103153. https://doi.org/10.1016/j.jbi.2019.103153

*name of corresponding author

e-ISSN : 2541-2019
p-ISSN : 2541-044X

Zečević, M., Mijatović, D., Kos Koklič, M., Žabkar, V., & Gidaković, P. (2021). User Perspectives of Diet-Tracking Apps: Reviews Content Analysis and Topic Modeling. *Journal of Medical Internet Research*, *23*(4), e25160. https://doi.org/10.2196/25160

*name of corresponding author