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DEVELOPMENT OF MOBILE HEALTH APPLICATION AS A SUPPORTING SYSTEM FOR HEALTH-PROMOTING LIFESTYLE IN THE UNIVERSITIES

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Abstract

The urgency of research to be conducted through a health promotion-based approach can increase the university's contribution to improving health and providing meaningful values to the population by protecting health and enhancing the well-being of students, staff, and the broader community through university policies. Despite clear evidence showing the benefits of being physically active, many people need to be made aware of it; this could change with the development and implementation of innovative interventions. Mobile health (mHealth) technology has been suggested to offer innovative health behavior change interventions to the community, especially in universities. This study describes the systematic, theory-based, and user-testing process of developing a smartphone-based physical activity application. The planned research outputs are published in an international Scopus-indexed journal and an intelligent mobile technology-based application.

Keywords: Application, Health, Healthy lifestyle, M-mobile, University.

1. Introduction

Physical activity is one of the important subjects, shown by much research relating to this subject (Table 1). Short-term physical activity interventions already exist, such as high-intensity interval training [1]. However, snacktivity differs in terms of purpose, duration, and intensity.

Table 1. Previous studies in physical activity.

No.	Title	Ref
1	Effect of weight exercise on the development of some components of special muscle strength and perform some artistic gymnastics skills	[2]
2	Effect of demonstration method on primary school pupils' academic achievement in physical and health education	[3]
3	Rehabilitation program for surgical shoulder joint protrusion among team games players injured	[4]
4	Effect of physical exercise on weight reduction of students	[5]
5	Yoga and chronic conditions	[6]
6	Effectiveness of cooperative learning using multimedia in some physical abilities and basic skills for junior players in basketball	[7]
7	Health-related factors and teaching performance of physical education teachers amidst COVID-19 pandemic	[8]
8	Teachers 21st century skills special program in sports curriculum	[9]
9	Achievement motivation and socio-economic status of engineering sports persons	[10]
10	Play-based learning as a tool in enhancing physical skill development of children	[11]

One of the aspects that must be considered in university life is the policy regarding the health of the entire community in the campus environment. Health issues have long been a concern among higher education institutions, including Health promotion among the campus community. This health promotion-based approach has the potential to increase the university's contribution to improving the health of its population. Health Promoting Universities is a project supported by WHO that is reviewed based on the concept, field experience, and framework for action. In 2000, all settings of life and social activities of people in cities, schools, workplaces, and home environments must provide greater opportunities to promote health. However, in natural conditions, especially in Indonesia, concern and participation in promoting health is still very low.

This is indicated by the high rate of sedentary behaviour and the low participation rate in sports/physical activity. This condition results in a high risk of various hypokinetic diseases (53% heart and stroke); Indonesia is even ranked 9th in the world for diabetes in 2010 and is predicted to rise to 6th in 2030. The same condition occurs in the university environment; several health disorders arise not only in physical health but also in mental health. Some students experience weight gain to the point of obesity, and around 24.9% of students experience anxiety. An unhealthy lifestyle and diet cause negative emotions and are risk factors for eating disorders and excessive weight gain. The relationship between mental health and obesity is very complex. The results of a 2010 systematic review found that people with depression have a 58% increased risk of becoming obese. Effective

interventions with a broad reach are needed to improve the involvement of physical activity levels in the university population. Given that mobile health (mHealth) interventions can reach ubiquitous users are relatively inexpensive to deliver and can be offered at a convenient time and place [4, 5]. Therefore, these tools can promote physical activity interventions such as Snacktivity in university populations [6, 7]. Furthermore, mHealth interventions can integrate key health behaviour change strategies, including self-monitoring, goal setting, prompts or motivation, and feedback on behaviour that effectively increases physical activity participation. There is a large body of systematic evidence supporting the use of mHealth as an intervention to promote health behaviour change [8, 9], although trials with long-term follow-up (e.g.,>6 months) are required [10, 11]. This study aims to describe in a systematic, theory-based manner the process (using I.M.) undertaken to develop a smartphone-based physical activity application linked to an individual physical activity tracking system that can ultimately increase individual physical activity participation and levels.

2. Method

This study used a systematic approach to developing the application based on previous research results. The development of this application is part of a more extensive study to test the effectiveness of the application in increasing physical activity throughout the day in adults. This application works by conducting self-monitoring, providing feedback on the activity completed, offering users a method for setting goals, and creating an action plan to complete their physical activity each day. The framework for developing this application consists of 6 stages of work plans; these stages are a way of working that is often applied to guide the development of interventions to change Health behaviour. The first four stages of the application development process include (1) Needs of Assessments specifying intervention outcomes and objectives, (3) designing the intervention and applying theory, and (4) refining intervention development. Meanwhile, the last 2 steps for Application Development (adoption, implementation, and evaluation plan) (Fig. 1).

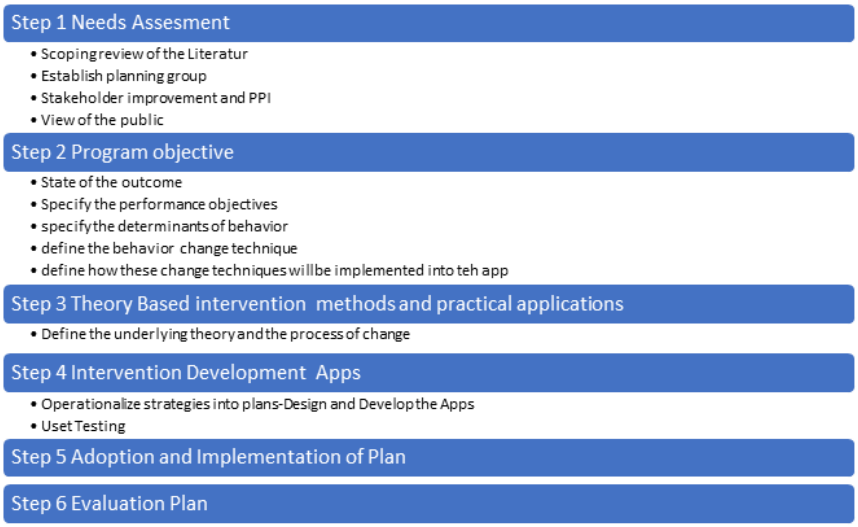

Fig. 1. Flow diagram.

3. Results and Discussion

Figure 2 shows the login page. The login page is the initial page displayed when accessing the website link. The login page enters user and admin accounts to start the learning process. This page is used to change the password when the user forgets it. Changing the password is done through the verification stage of the user's email and username. Figure 3 shows the account registration page. This page is used to register a new account. Several data must be filled in to register an account, namely full name, affiliation, telephone number/WhatsApp, date of birth, age, gender, email, username, password, and password confirmation. Figure 4 shows the developer page. The developer page contains information about the Health Edu Forge application developer.

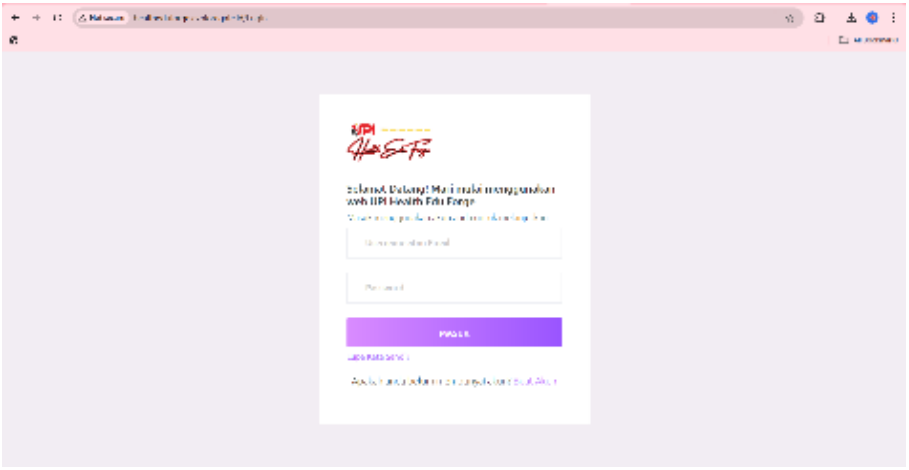

Fig. 2. Login page.

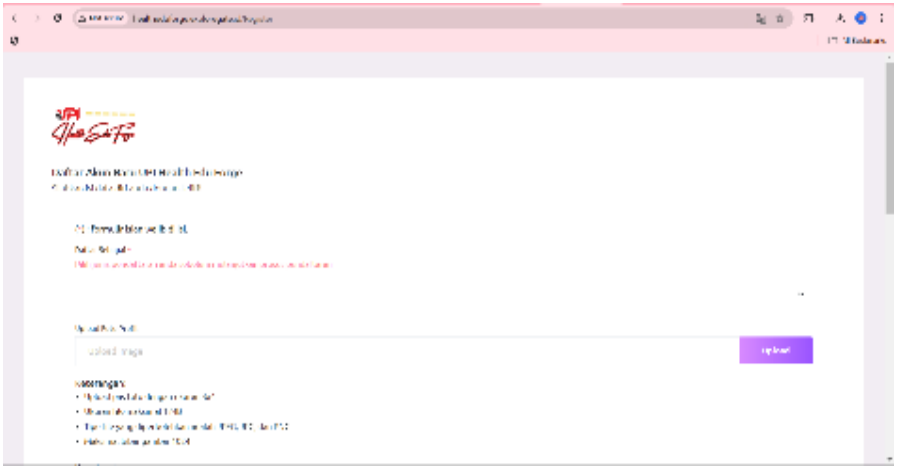

Fig. 3. The account registration page.

Fig. 4. Developer page.

Figure 5 shows the user's home page. The user home page is accessed after students successfully log into the Health Edu Forge system. We have four main features: health hub, health metric, health overview, and health facilities. Figure 6 shows the health hub page. Health Hub is one of the features we provide to provide information about various physical exercises tailored to your body condition. In this web there is a menu of Health Metrics Page. This page consists of two main menus, that is Health History Screening and Health Data. Health History Screening records user health data from height, weight, and other medical history. Health data is a page used to view and access the health history data editing menu. The Health Overview page, one of the features we provide to provide information on recommendations and results of your health screening. The last main feature, which is Health Facilities. Health facilities are one of the features we provide to provide information on facilities and infrastructure that can be used when carrying out physical training or other sports.

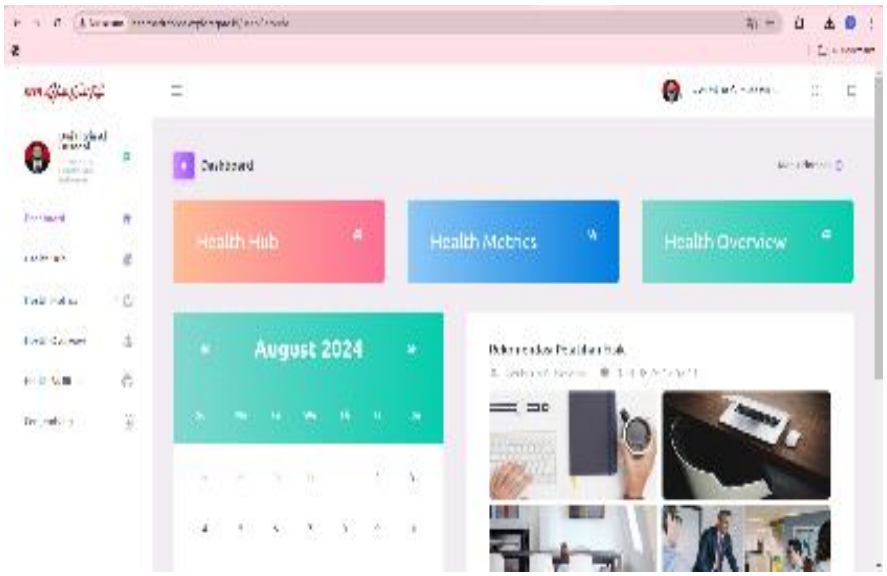

Fig. 5. User home page.

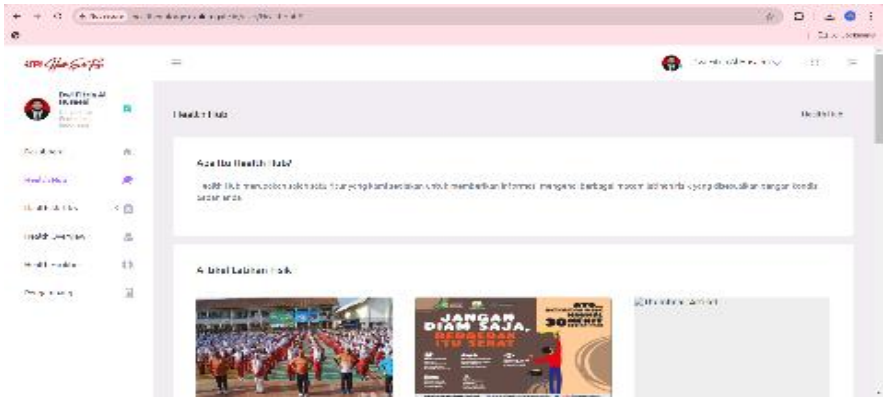

Fig. 6. Health hub page.

Figure 7 shows the admin home page. This page is the initial page that will appear when you log in as an admin on the HealthEduForge web page. This page explains what healtheduforge is and several menu shortcuts to user management, health hub management, facility data, BMI data, and developer data. On the admin page, users can export data to Excel based on the data displayed in the table. Figure 8 shows the user management page. The user management page is used to manipulate data by adding, deleting, and editing user data, which is divided into 5 categories: all users, general, lecturers, students, and educators. Figure 8 shows the Health Hub Management Page. The health hub management page is used to manipulate data by adding, deleting, and editing article data, which is divided into 2 categories, namely Text Articles (News) and Video Articles (YouTube). Figure 9 shows the Facility management page. This page manipulates data by adding, deleting, and editing data on sports facilities. For the last Fig 10 shows User Body Mass Index (BMI) Data. The User Body Mass Index (BMI) Data page is used to export and view the BMI data of users undergoing health history screening.

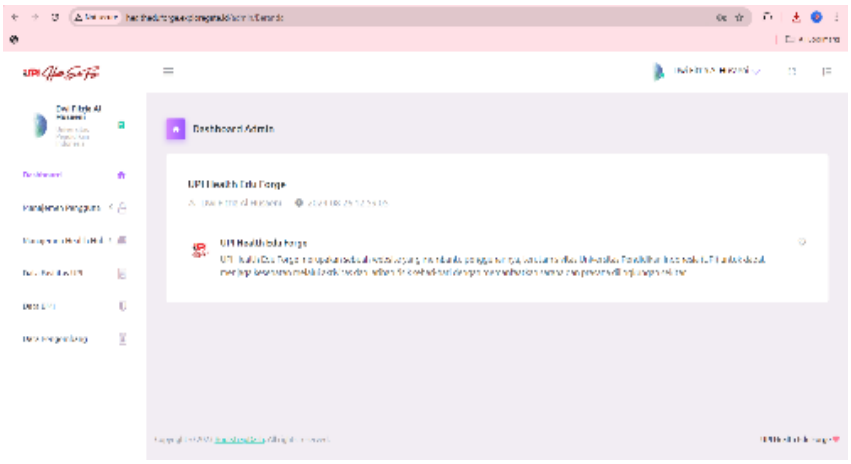

Fig. 7. Admin home page.

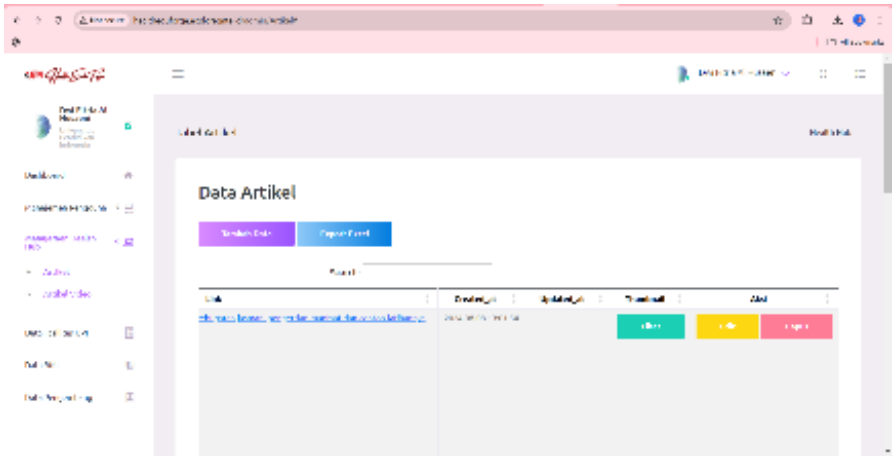

Fig. 8. Health hub management page.

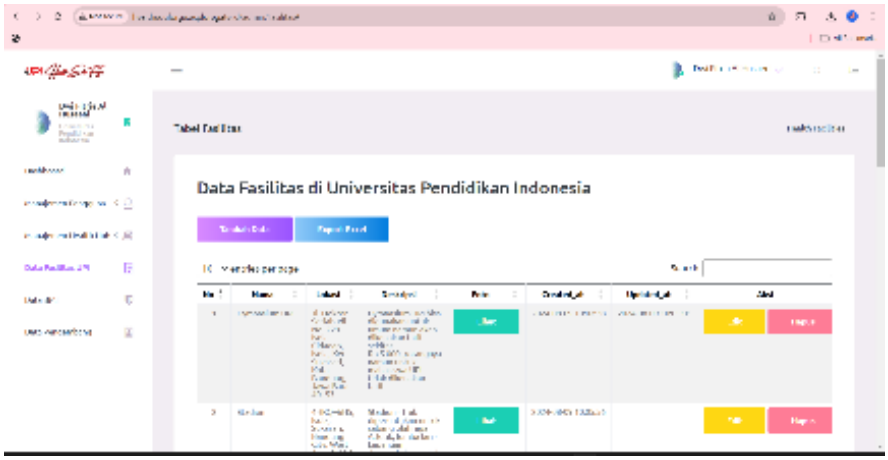

Fig. 9. Facility data.

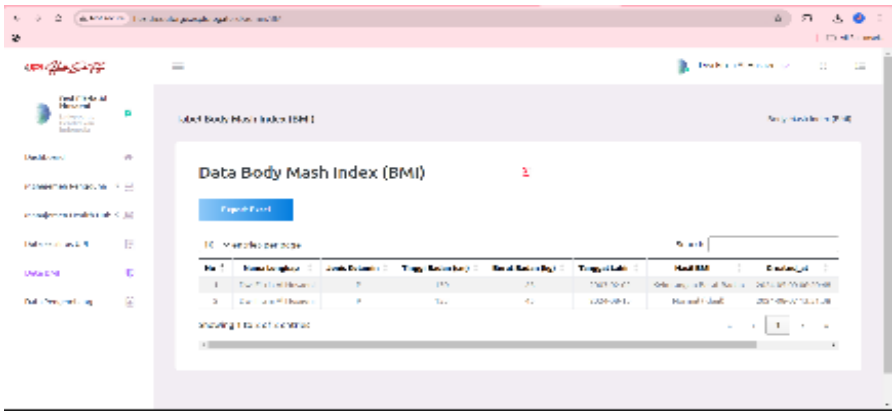

Fig. 10. User body mass index (BMI) data.

4. Conclusion

This research concludes that a health promotion-based approach has the potential to increase the university's contribution to improving health and providing meaningful values to the population by protecting health and improving the well-being of students, staff, and the broader community through university policies. Despite clear evidence showing the benefits of being physically active, many people are not aware of it, this could change with the development and implementation of innovative interventions. Mobile health (mHealth) technology has been suggested to offer innovative health behaviour change interventions to the community, especially in universities.

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