

Assistance in the Application of Android-Based Exercise Control in DM Patients

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ABSTRACT

Diabetes is a serious chronic disease that occurs when the pancreas does not produce enough insulin (a hormone that regulates blood sugar) or when the body cannot effectively use the insulin that is produced. Physical activity is one of the four pillars of diabetes management, along with education, nutritional therapy, and pharmacotherapy. The goal of this activity is to disseminate information about the implementation of an Android-based Exercise Control application for patients with diabetes mellitus (DM). This activity was conducted on May 17, 2024, involving 32 individuals with DM in the Kopri Health Center working area, Sungai Raya Village, Kubu Raya Regency. The methodology included target group surveys, preparation of facilities and infrastructure, implementation of activities, and evaluation. The results were categorized as good (46.88%), satisfactory (37.50%), and unsatisfactory (15.62%). This indicates that the Android-based Exercise Control Application for DM patients is user-friendly and has the potential to increase the motivation of patients with DM to engage in daily physical activities, thereby helping to maintain stable blood sugar levels and reduce the risk of serious complications such as diabetic foot ulcers.

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INTRODUCTION

Diabetic foot ulcers are a complication of diabetes mellitus that involves small blood vessels (microangiopathy), medium blood vessels, and large blood vessels, leading to macroangiopathy. The resulting metabolic damage can cause axon loss and increase the risk of peripheral neuropathy, which can result in foot ulcers (Embuai, 2022). By 2045, IDF projections show that 1 in 8 adults, approximately 783 million people, will be living with diabetes, representing a 46% increase (IDF, 2021).

Peripheral neuropathy is a common consequence of both Type 1 and Type 2 diabetes mellitus, and chronic hyperglycemia involving vascular pathways or metabolic disorders. The presence of peripheral neuropathy leads to a loss or decrease in pain sensation in the feet, resulting in unnoticed trauma that leads to foot ulcers. Research conducted by Prayuka using the literature study method supports the idea that diabetic foot exercises can increase foot sensitivity in people with DM (Prayuka, 2021). According to Perkeni (2021), the management and prevention of Type 2 DM can be achieved through education, nutritional therapy, physical exercise, and pharmacological therapy (Soelistijo, 2021). This aligns with research by Kurniawan, who reported that physical activity helps maintain stable blood sugar levels (Kurniawan & Wuryaningsih, 2016). Properly recorded physical activity can also increase the motivation of DM patients (Lestari & Mundriyastutik, 2023). Besides diabetic foot exercises, other activities such as walking, running, and cycling are also suitable options to meet the exercise needs of people with DM. Physical activity can reduce blood sugar levels (Istiqomah & Yuliyani, 2022).

A physical activity logging app can further boost motivation in DM patients (Pelletier et al., 2021). Map May Run is an Android-based application designed to support exercise activities by documenting details such as duration, distance traveled, speed, and calories burned. For people with DM, exercise is recommended for at least 150 minutes per week (Soelistijo, 2021). With measurable documentation, it is hoped that people with DM will be more motivated to exercise regularly, thus helping to prevent DM complications such as diabetic foot ulcers.

METHODS

Community service activities were carried out on May 17, 2024 at the Korpri Health Center, Sungai Raya Village, Kubu Raya Regency, West Kalimantan, targeting 32 people with DM. The methodological approach of this activity includes: Target Group Survey, The first stage was carried out by collecting information about the location and targets who had never received the same activity. This stage was carried out by the author, assisted by local health cadres, to understand the situation and conditions of the target group. Preparation of Facilities and Infrastructure, this stage is carried out by preparing facilities and infrastructure that will support activities. Preparations made include the place and location that will be used for activities. Other facilities are prepared in stages by considering the level of need. Implementation of service activities, aims to provide assistance in "Applying Android-Based Exercise Control to DM Patients". The author, assisted by students and the team, delivered some material related to the importance of physical activity to help maintain the stability of blood sugar levels in addition to taking the right drugs and diet. After the material was delivered, the android application was introduced which can help control physical activity activities. The application can record the distance traveled during activities such as cycling or running and can document the speed traveled, so that every time the activity is carried out all this information can be targeted, where the minimum recommendation for physical activity for DM patients is at least 150 minutes per week. After being introduced to the application, participants were asked to download the application and try the application. The service activity evaluates how the participants' ability to use the application in order to meet the minimum target of physical activity for DM patients and increase motivation.

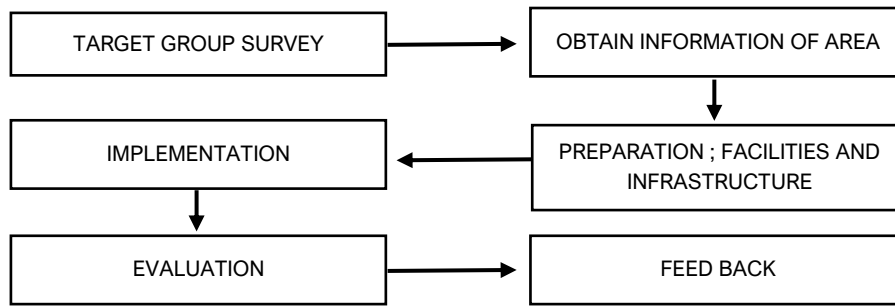


FIGURE 1. Methodology Chart

RESULTS AND DISCUSSION

The activity lasted approximately 100 minutes, with high enthusiasm from the community PKM activities running smoothly. After the team completed the material, they continued by asking the participants to demonstrate directly with the Smartphone owned by each participant from the download stage to creating an account in the MapMyRun application as an exercise control. Interpretation results were obtained which showed that the majority of participants were able to demonstrate the use of the MapMyRun application correctly.

Physical activity is an important component in improving foot circulation in patients with DM (Embuai, 2022) . Physical activity that can be done can be done by walking, cycling according to the ability of DM patients, or by doing activities such as diabetic foot exercises (Nuraeni, 2016). One of the diabetic foot exercise methods that can be used is using the Burger Allen Exercise method which has been shown to be able to prevent peripheral neuropathy (Amrullah et al., 2022). Peripheral neuropathy is a complication that commonly occurs in people with chronic DM (Simanjuntak & Simamora, 2020). Neuropathy that occurs has the potential to become a diabetic foot ulcer (Herlina et al., 2019). Doing routine physical activity can reduce blood sugar levels in patients with type 2 DM (Nurhayani, 2022). If blood sugar levels are controlled, the risk of diabetic foot ulcer can be reduced (Eltrikanawati, 2021). The motivation of people with type two DM to carry out regular activities is the key to maintaining stable blood sugar levels (Adamfati, 2022). Based on research conducted by research has been conducted that there is a significant effect of using activity trackers in increasing the motivation of patients with type two DM to carry out physical activity, where the existence of a tool to record physical activity carried out makes patients with type two DM have a target to achieve (Pelletier et al., 2021).

Tabel 1. Performance in Using the Application

Grade	Score		Total (n=30)	
	Poin	%	n	%
Good	15-20	> 75	15	46,87
Satisfy	10-40	50-70	10	37,50
Less Satisfactory	< 9	< 45	5	15,62

CONCLUSION AND RECOMMENDATIONS

Physical activity is the most important part of DM management. because physical activity is often forgotten by DM patients, because they feel it is only enough to consume drugs and diet. Therefore, to the health center, cadres, to always encourage DM patients to routinely carry out physical activity as a way to maintain the stability of blood glucose levels, so as to avoid complications such as diabetic foot ulcers.

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