The Effectiveness of Dokterkit Application-Based Coronary Heart Risk Monitoring and Education

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ABSTRACT

***Background**: In 2019, primary diagnoses in coronary heart disease outpatients increased by 1.4% and secondary diagnoses by 6% of patients. **Aims**: To determine the effectiveness of Edmon (Education & Monitoring) based on the medical kit application on coronary heart disease risk control at Soewandhi Hospital Surabaya. **Method**: This study is a quantitative study with quasi-experimental non-equivalent group design. This study involved 30 people consisting of 2 groups (the treatment group that received CHD health education through a dokterkit application and through leaflets). This research was conducted at Soewandi Hospital in Surabaya in August-November 2022. Univariate data analysis techniques were performed on each variable from the research results, then an independent test was carried out to find out the differences between the two groups. **Results**: The results showed that android-based education and monitoring were effective because they contributed to a 26.7% reduction in the number of patients with severe CHD risk and a 40% increase in the number of patients with normal uric acid levels in the treatment group. **Conclusion**: Dokterkit-based education & monitoring is effective in controlling the risk of coronary heart disease and uric acid levels in Soewandhie Hospital Surabaya, but not effective in reducing cholesterol levels, systolic blood pressure, blood sugar levels and not effective in changing smoking behavior.*

***Keyword**: Coronary Heart Disease, Doctorkit Application, Education, Effectiveness, Monitoring.*

INTRODUCTION

One of the global and national concerns is non-communicable diseases. This is because PTM has an increasing tendency to cause morbidity and mortality. According to information from the World Health Organization (WHO), non-communicable diseases are the main cause of death worldwide. By the age of 70, more than 40% of people die prematurely. Deaths caused by non-communicable diseases will increase from 38 million in 2012 to 52 million by the end of 2030 (World Health Organization, 2014). The socio-cultural epidemiological shift is a significant factor contributing to the rise of NCDs. The way people live and eat has drastically changed as a result of economic development. These modifications have an effect on rising obesity and diabetes rates, which eventually result in non-communicable diseases (Low, Lee and Samy, 2015). CHD events reported by the CDC in 2010 were grouped by age, education, and gender, and were aged 18-44 years (1.2%). The incidence of CHD by level of education is known, and the incidence of CHD is lower in those with higher education (4.6%) compared to those with low education or no schooling (9.2%).

The increase in NCDs in Indonesia compared to infectious diseases is influenced by, among others, environmental imbalances, people's lifestyles, smoking habits, exercise, fast food consumption, stress, and sleep deprivation (Wartiningsih, 2019). Non-communicable disease incidence is rising, and this burden is being felt by the government as well as the general public. This is a result of rising healthcare costs and the sophisticated technology needed for surgery to treat non-communicable diseases. As many as 10.801,787 persons, or 5.7% of NHS users, got care for catastrophic diseases. Services for disorders like heart disease account for

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21.8% of the cost of health services, or roughly IDR 14.6 trillion, or IDR 7.4 trillion (P2ptm.kemenkes, 2019).

All parties must be involved in ongoing efforts to prevent and control non-communicable diseases, and everyone must work together to reduce risk factors that are major contributors to morbidity. It is very challenging to teach individuals as equals from a young age in Indonesia, where economic status, academic level and social level all vary. As a result, a comprehensive education system that covers all levels of society from an early age is needed so that people can detect and adopt a healthy lifestyle, thereby reducing the risk of non-communicable diseases.

According to the 2013 Indonesian Research and Health Centers data it was 0.5%, while around 1.5% was found based on the diagnosis (Badan Penelitian dan Pengembangan Kesehatan RI, 2013). The nine non-communicable disease targets are included in WHO regulations as a global policy, one of which is cardiovascular disease control. These goals include drug technology and accessibility, preventive medicine, reducing diabetes and obesity rates, limiting alcohol consumption, reducing mortality, increasing physical activity, limiting smoking, and lowering blood pressure. Six international initiatives to combat non-communicable diseases are anticipated to help achieve the nine non-communicable disease targets by 2025. The six steps include prioritizing disease prevention and control, enhancing national capabilities, reducing risk category, powering health systems, implementing for high-quality health programmes, research, and keeping an eye on disease trends (World Health Organization, 2013).

According to the catastrophic data of the KCU Surabaya heart clinic, in 2019 there was an increase in primary diagnoses compared to 2018, an increase in primary diagnoses of 1.4% from 1,396 to 3,387, while secondary diagnoses were 6% from 52,543 to 55,896 CHD patients undergoing outpatient care. Meanwhile, CHD who were admitted to advanced hospitalization at the hospital in 2019 experienced a decrease of 19.46%, primary diagnoses 695 compared to 2018 of 863, while secondary diagnoses experienced an increase of 0.2% from 1,229 to 1,490 sufferers (BPJS Kesehatan, 2020).

However, during the Covid-19 pandemic, health services were disrupted. In addition, patient access to cardiac rehabilitation is decreasing. So that technology-based low- and middle-income countries for health system services are needed (Taylor, Dalal and McDonagh, 2022).

One of the technology-based health services is the dokterkit application. This application provides health education features. CHD health education is very significant to increase the knowledge and awareness of CHD patients so that they can take preventive measures independently and early on (Mohamad et al., 2018). In addition, the dokterkit application also functions to store the results of the dokterkit's examination of the patient and the prescriptions given. So that through this application one can find complete patient information and data.

Based on the explanation above regarding the high incidence of CHD, especially in Surabaya, the researchers made this problem the basis for research on the Effectiveness of Edmon (Education & Monitoring) medical-based applications on controlling the risk of coronary heart disease at Soewandhi Hospital, Surabaya.

METHODS

This study is quantitative, employs an ex-ante control group study methodology, and utilizes a quasi-experimental design. This study aims to reveal the effectiveness of Edmon (Education & Monitoring) based on the kit-based application on coronary heart disease risk control at Soewandhi Hospital, Surabaya. The group selection used was the non-equivalent group design which consisted of the experimental and control groups. This is because the determination of the results of the hypothesis is based on the results of observations in the two groups. The determination of the experimental and control groups is not random because the experimental group has to understands how android works and while the control group wants to be directly educated through posters. These two groups will later be tested using the same instrument and analyze which treatment is more optimal; whether the experiment is better or the control.

In this study, CHD risk was determined using the Framingham risk

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score for the control and experimental groups, which consisted of two groups, namely: the treatment group which received CHD health education through a dokterkit application and through leaflets. This research was from August 2022 to November 2022. The population for this study were patients at Soewandhie Hospital Surabaya in August-November 2022. The process of selecting a representative population used a simple random representative sample by means of probability types and levels of research significance $\alpha = 0.05$. The sample size of each group was 30 people, so that there was a total of 60 patients as research subjects.

In this study, the summary criteria for research subjects were patients aged 25-55 years old, having the ability to operate an android-based mobile phone, being able to fill out Google Forms questionnaires, having the ability to read and write well, at risk of CHD with presence or absence of a history of hypertension, at risk of CHD. with or without a history of diabetes, and with or without a history of smoking. While the exclusion criteria were patients in a state of impaired consciousness and CHD patients who were being treated for complications. After calculating the sample size, a sample of 30 patients was obtained based on the number of groups studied.

The data collected in this study were demographic data on age, gender, BMI (Body Mass Index), occupation) and manual CHD monitoring through the Framingham risk score. The initial data collection process was carried out in front of the heart polyclinic at Soewandhi Hospital, Surabaya. During this phase, participants have fresh capillary blood samples taken to check HDL, cholesterol, and blood pressure values. This initial data were grouped according to the distribution of participants in the treatment and control groups.

Participants in the control group, measured by the Framingham Risk Score, were placed in the mild, moderate or severe risk category, then were given CHD health education. Meanwhile, participants in the treatment group were taught how to use the dokterkit application to download, as well as an introduction to its functions. Participants were then asked to measure the risk of CHD independently, and also had access to health education included in the functionality of the dokterkit application. Within two weeks, participants could do another examination.

After two weeks, the participants in the control and treatment groups were collected again and examined, as well as measuring blood pressure, then CHD risk was measured using the Framingham risk score. Researchers monitored the decrease or increase in the risk of CHD, uric acid, cholesterol values, systolic blood pressure, smoking behavior, and blood sugar levels.

Univariate data analysis techniques were carried out on each variable from the research results. Then the processed data were analyzed for statistical test values before and after treatment with the independent t test to determine the differences between the two unpaired groups, namely the control group and the treatment group.

This research has passed the ethical test at the Health Research Ethics Commission, Faculty of Medicine, Universitas Ciputra Surabaya with an ethical number no. 004/EC/KEPK-FKUC/VII/2022.

RESULTS AND DISCUSSION

Patient Characteristics

The following is the distribution of the characteristics of the respondents.

Table 1. Frequency Distribution of Patient Characteristics

Characteristics	Control		Treatment		Total
	N	%	n	%	
Gender					
Men	2	13.3	4	26.7	6
Women	13	86.7	11	73.3	24
Total	15	100	15	100	30
Age					
30-35 years old	0	0.0	1	6.7	1
36-40 years old	1	6.7	0	0.0	1
41-45 years old	4	26.7	1	6.7	5
46-50 years old	4	26.7	6	40.0	10
>50 years old	6	40.0	7	46.7	13
Total	15	100	15	100	30

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According to Table 1, the majority of CHD patients in both the control and treatment groups were women, with 13 patients (86.7%) in the control group and 11 patients (73.3%) in the latter. Table 1 above also shows that in terms of age, the distribution of patients in both groups was dominated by patients over 50 years of age. The similarity of the control and treatment groups is that they have coronary heart disease and go to a doctor at Soewandhie Hospital.

Effectiveness of Edmon Dokterkit on Reducing CHD Risk

CHD is the main cause of death in the world. The risk factors for this disease are lifestyle, environmental factors and genetic factors (Malakar et al., 2019). The following presents the distribution of CHD risk in each control and treatment group.

Table 2. CHD Risk Frequency Distribution.

CHD Risk	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
Light	9	60.00	8	53.3	5	33.3	7	46.733.320.00
Medium	4	26.7	7	46.7	3	20.0	5	
Severe	2	13.3	0	0.0	7	46.7	3	
Total	15	1000	15	100	15	100	15	1000

Based on Table 2, it can be seen that in the control group, there was a decrease in the number of patients with mild and severe CHD risk categories. The risk of mild CHD decreased by 6.7%, while the reduction in the risk of severe CHD was shown by the percentage from 13.3% to zero percent or decreased by 13.3%. This shows that education using leaflets in the control group relatively contributes to reducing the risk of mild and severe CHD. In the treatment group there was a decrease in the number of patients at risk for severe CHD, by 26.7%. This shows that android-based education and monitoring in the treatment group contributes to a reduction in the number of patients at risk of severe CHD. Based on the results of previous studies, CHD patients who were provided with health education had better knowledge or awareness and better medical care outcomes than CHD patients who were not provided with health education (Melamed et al., 2014).

Overall, CHD patients in both the control and treatment groups were dominated by female patients, namely 13 people (86.7%) in the control group, and 11 people (73.3%) in the treatment group. Based on previous research, women are more at risk of suffering from coronary heart disease (Ghani, Susilawati and Novriani, 2020).

Meanwhile, in terms of age, the distribution of patients in both groups was dominated by patients over 50 years old, namely six people (40%) in the control group, and seven people (46.7%) in the treatment group. This is in line with previous studies, that those over 45 years of age have a greater risk of suffering from coronary heart disease (Johanis, Hinga and Sir, 2020). Meanwhile, the next highest number were patients aged 41-45 years and 46-50 years.

Table 3. Results of CHD Risk Analysis (Pre-post Test) for Edmon Dokterkit in the Control and Treatment Groups.

	Mean ± SD of CHD Risk		P-value
	Pre-test	Post-test	
Control	8.54 ± 7.06	8.75 ± 4.42	0.442
Treatment	15.48 ± 8.46	10.95 ± 7.97	0.042
P-value	0.021	0.358	

Based on the pre-post test it can be seen that in the control group the mean post-test value is greater when compared to the pre-test mean. The p-value generated in the control group was 0.442 which was greater than 0.05, meaning that there was no significant difference in CHD risk between the pre-test and post-test. This shows that education through leaflets is not effective in reducing CHD risk.

In the treatment group, the mean post-test was smaller than the mean pre-test. The p-value generated in the treatment group is 0.042, which is less than 0.05, meaning that there is a significant difference in CHD risk between the pre-test and post-test. This shows that android-based education and monitoring dokterkit effectively contributes to reducing the risk of CHD.

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Based on previous research, health education through online health applications is more in demand by the public. In addition, health applications can complement existing health services (Kusumadewi et al., 2021).

In the independent test between the control and treatment groups, a p-value of 0.021 was obtained for the pre-test data and 0.358 for the post-test data. These results indicate that the risk of CHD from patients before the test is done tends to be different, with a mean risk of 8.54 for the control group and 15.48 for the treatment group. Meanwhile, after the test was carried out, the risk of CHD between the control and treatment groups was not significantly different.

Effectiveness of Dokterkit's Edmon on Reducing Uric Acid Levels

The following below is the frequency distribution of uric acid levels in each control and treatment group.

Table 4. Frequency Distribution of Category of Uric Acid Levels.

Category of uric acid levels	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
Normal	10	66.7	6	40.0	5	33.3	11	73.3
More than normal	5	33.3	9	60.0	10	66.7	4	26.7
Total	15	100	15	100	15	100	15	100

Based on Table 4, in the control group there was a decrease in the number of patients with normal uric acid category by 26.7% after the test was carried out. This shows that education using leaflets in the control group does not contribute to an increase in the number of patients with normal uric acid levels. Meanwhile in the treatment group there was an increase in the number of patients with normal uric acid levels, by 40%. This shows that android-based education and monitoring in the treatment group contributed to an increase in the number of patients with normal uric acid levels.

Table 5. Results of Analysis of Uric Acid Levels (Pre-post Test) on Edmon Dokterkit in the Control and Treatment Groups.

	Mean ± SD uric acid levels		P-value
	Pre-test	Post-test	
Control	5.,66 ± 1.77	6.61 ± 2.02	0.069
Treatment	7.28 ± 1.83	5.62 ± 1.58	0.007
P-value	0.010	0.144	

Based on Table 5, the p-value produced in the control group was 0.069 or greater than 0.05, meaning that there was no significant difference in the uric acid levels of the patients before and after the test was carried out. This shows that education through leaflets is not effective in reducing uric acid levels from patients. Meanwhile in the treatment group the mean post-test was smaller when compared to the mean pre-test.

The p-value produced in the treatment group was 0.007, or less than 0.05, meaning that there was a significant difference in uric acid levels between the pre-test and post-test. This shows that android-based education and monitoring of dokterkit is effective in reducing uric acid levels in patients.

The results of this study are in line with previous research that health education has an effect on reducing uric acid levels (Wetik et al., 2022). However, this also needs to be supported by patient compliance in adopting a healthy lifestyle to reduce uric acid levels.

In the independent test between the control and treatment groups, a p-value of 0.010 was obtained for the pre-test data and 0.144 for the post-test data. These results indicate that the uric acid levels of the patients before the test tended to be different, with a mean of 5.66 mg/dl for the control group and 7.28 mg/dl for the treatment group. Meanwhile, after the test was carried out, the uric acid levels between the control and treatment groups did not differ significantly.

Effectiveness of Edmon Dokterkit on Reducing Total Cholesterol Levels

The following shows the frequency distribution of total cholesterol levels in the control and treatment groups.

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Table 6. Frequency Distribution of Total Cholesterol Levels.

Total Cholesterol Levels	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
<189	2	13.3	0	0.0	7	46.7	6	40.0
190-227	5	33.3	8	53.3	2	13.3	6	40.0
228-265	4	26.7	5	33.3	5	33.3	2	13.3
266-303	3	20.0	2	13.3	1	6.7	1	6.7
≥304	1	6.7	0	0.0	0	0.0	0	0.0
Total	15	100	15	100	15	100	15	100

Cholesterol has important functions for the body, namely building and maintaining membranes, regulating membrane fluidity over physiological temperature ranges and intracellular transport, cell signaling and nerve conduction (Bare and Smeltzer, 2015). In Table 6, the majority of patients have cholesterol levels of more than 200 mg/dl. This cholesterol level can increase if the patient consumes foods high in cholesterol then causes hyperlipidemia so that the body cannot metabolize this cholesterol properly (Sharma and Gulati, 2013). Based on Table 6, in the control group the biggest change in the control group between the pre-test and post-test was in the increase in the number of patients with total cholesterol levels of 190-227 mg/dl, which increased by 20% after the test was carried out. Meanwhile, changes in the number of patients in the other classes of total cholesterol were only around 6.6% to 13.3%. This shows that education using leaflets in the control group is sufficient to contribute to an increase in the number of patients who have total cholesterol levels of 190-227mg/dl.

A similar situation also occurred in the treatment group, where the biggest change between the pre-test and post-test was in the increase in the number of patients with total cholesterol levels of 190-227 mg/dl, which increased by 26.7% after the test was carried out. This shows that android-based education and monitoring in the treatment group contributed to an increase in the number of patients who had total cholesterol levels of 190-227 mg/dl. In general, it can be said that android-based education is better at increasing the number of patients who have total cholesterol levels of 190-227 mg/dl when compared to education through leaflets.

Table 7. Results of Analysis of Cholesterol Levels (Pre-post Test) on Edmon Dokterkit in the Control and Treatment Groups.

	Mean ± SD of Cholesterol Levels		P-value
	Pre-test	Post-test	
Control	238.00 ± 54.08	230.33 ± 25.95	0.512
Treatment	194.53 ± 57.19	203.87± 39.26	0.599
P-value	0.041	0.038	

Based on Table 7, the p-value produced in the control group was 0.512 or greater than 0.05, meaning that there was no significant difference in the total cholesterol levels of the patients before and after the test was carried out. This shows that education through leaflets is not effective in reducing the total cholesterol level of patients.

The p-value generated in the treatment group was 0.599. which was greater than 0.05, meaning that there was no significant difference in total cholesterol levels between pre-test and post-test. This shows that education and monitoring based on android dokterkit is not effective in reducing total cholesterol levels from patients.

The unpaired test between the control and treatment groups showed that the total cholesterol levels of the patients before the test tended to be different, with a mean of 238 mg/dl for the control group and 194.53 mg/dl for the treatment group. After the test was carried out, the total cholesterol levels between the control and treatment groups differed significantly, with an average of 230.33 mg/dl for the control group and 203.87 mg/dl for the treatment group.

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Effectiveness of Edmon Dokterkit on Reducing Systolic Blood Pressure

Table 8. Frequency Distribution of Systolic Blood Pressure Categories.

Systolic Blood Pressure	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
<120	2	13.3	0	0.0	0	0.0	0	0.0
120-129	4	26.7	2	13.3	2	13.3	4	26.,7
130-139	2	13.3	3	20.0	0	0.0	3	20.0
140-149	4	26.7	3	20.0	9	60.0	4	26.7
150-159	1	6.7	4	26.7	4	26.7	2	13.3
≥160	2	13.3	3	20.0	0	0.0	2	13.3
Total	15	100	15	100	15	100	15	100

Based on Table 8, in the control group there were more than 10% of patients who had systolic blood pressure ≥ 150 mmHg. Based on previous research, hypertension is a risk factor for several diseases such as stroke, chronic kidney disease, retinopathy and coronary heart disease (Falase, Stewart and Sliwa, 2012).

In addition, it can be seen that the biggest change in the control group between the pre-test and post-test was in the increase in the number of patients with systolic blood pressure of 150-159 mmHg, which increased by 20% after the test was carried out. The treatment group showed better results, where after medical education there was a decrease in the number of patients with systolic blood pressure of 140-149 mmHg and 150-159 mmHg, with a decrease of 33.3% and 13.4%, respectively. In general, it can be said that android-based education is better at reducing the number of patients who have abnormal systolic blood pressure when compared to education through leaflets.

Table 9. Results of Systolic Blood Pressure Analysis (Pre-post Test) for Edmon Dokterkit in the Control and Treatment Groups.

	Mean ± SD of Systolic Blood Pressure Analysis		P-value
	Pre-test	Post-test	
Control	138.47 ± 26.61	156.00 ± 24.43	0.034
Treatment	149.13 ± 14.54	148.60± 25.46	0.936
P-value	0.184	0.424	

The p-value generated in the control group was 0.034, or less than 0.05, meaning that there was a significant difference in the systolic blood pressure of the patient before and after the test was carried out. This shows that the existence of education through leaflets actually has an impact on a significant increase in the systolic blood pressure of patients. In the treatment group it is known that, even though the mean post-test is smaller when compared to the mean pre-test, the resulting p-value is 0.936, or greater than 0.05, meaning that there is no significant difference in systolic blood pressure from patients before and after dokterkit education is carried out.

In the unpaired test between the control and treatment groups, a p-value of 0.184 was obtained for the pre-test data and 0.424 for the post-test data. These results indicated that the systolic blood pressure of the patients before the test tended to be the same, with a mean of 138.37 mmHg for the control group and 149.13 mmHg for the treatment group. Likewise, after the test was carried out, the systolic blood pressure between the control and treatment groups did not differ significantly, with an average of 156 mmHg for the control group and 148.6 mmHg for the treatment group.

Effectiveness of Edmon Dokterkit on Smoking Behavior

Smoking behavior is a habit that can cause health problems. Below is the distribution of the frequency of smoking behavior in the control and treatment groups.

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Table 10. Frequency Distribution of Smoking Behavior.

Smoking Behavior	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
No	15	100.0	15	100.0	14	93.3	14	93.3
Yes	0	0.0	0	0.0	1	6.7	1	6.7
Total	15	100	15	100	15	100	15	100

Based on Table 10, it shows that in both the control and treatment groups the number of patients smoking between before the test and after the test did not change. While in the treatment group there were 14 people (93.3%) who did not smoke and one person (6.7%) who smoked. In general, this shows that the educational method, either by using leaflets or android-based education on dokterkit, does not contribute to changes in smoking behavior of patients. Based on previous research, smoking behavior will increase the risk of coronary heart disease in a person (Lehmann et al., 2014). In addition, previous research also stated that smoking behavior causes many adverse changes in the body so that quitting smoking can reduce the reduction in morbidity and mortality of coronary heart disease (Keto et al., 2016).

Based on Table 11, the control group could not be tested regarding the relationship between smoking behavior between the pre-test and post-test. This is because the patients tested were all non-smokers. The test results in the treatment group showed a p-value greater than 0.05. This shows that there is no relationship between smoking behavior before and after the test is carried out. Below are the results of the analysis of smoking behavior on Edmon dokterkit.

Table 11. Results of the Analysis of Smoking Behavior on Edmon Dokterkit.

Smoking Behavior	P-Value Uji Exact Fisher
Control	-
Treatment	0.067

Effectiveness of Edmon Dokterkit on Reducing Blood Sugar Levels

High blood sugar levels accompanied by disturbances in the metabolism of carbohydrates, proteins and lipids in the body are symptoms of diabetes mellitus (P2PTM Kemenkes RI, 2016). Microvascular and macrovascular complications can occur in someone with diabetes accompanied by poor metabolism (Saldanha et al., 2013). Below is the frequency distribution of blood sugar levels.

Table 12. Frequency Distribution of Blood Sugar Level Categories.

Blood Sugar Level	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
Normal	13	86.7	14	93.3	13	86.7	15	100.0
More than Normal	2	13.3	1	6.7	2	13.3	0	0.0
Total	15	100	15	100	15	100	15	100

Based on Table 12, blood sugar levels above normal still occur in one to two respondents. Based on previous research, the main determinant of the possibility of the emergence of disease in patients with diabetes mellitus is coronary heart disease (Aronson and Edelman, 2015).

In the control group there was an increase in the number of patients with normal blood sugar levels after the test was carried out. This shows that education using leaflets in the control group has contributed to increasing the number of patients with normal blood sugar levels. Meanwhile in the treatment group there was an increase in the number of patients

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with normal blood sugar levels. This shows that android-based education and monitoring in the treatment group contributed to an increase in the number of patients with normal blood sugar levels.

Table 13. Results of Analysis of Blood Sugar Levels (Pre-Post Test) for Edmon Dokterkit in the Control and Treatment Groups.

	Mean ± SD of Blood Sugar Levels		P-value
	Pre-test	Post-test	
Control	136.33 ± 95.45	133.07 ± 109.04	1.000
Treatment	141.27 ± 92.05	99.80± 28.66	0.065
P-value	0.683	0.305	

According to Table 13, the control group's p-value was higher than 0.05, indicating that there was no significant difference between the patients' blood sugar levels before and after the test. This demonstrates that patient blood sugar levels cannot be changed by education provided through leaflets. The treatment group's p-value was higher than 0.05 and there was no discernible variation in blood sugar levels between the pre- and post-test. This demonstrates that android dokterkit -based education and monitoring are ineffective for lowering blood sugar levels.

In the independent test between the control and treatment groups, a p-value of 0.683 was obtained for the pre-test data and 0.305 for the post-test data. These results indicate that the blood sugar levels of the patients before the test tended to be the same, with a mean of 136.33 mg/dl for the control group and 141.27 mg/dl for the treatment group. The same thing also happened in the comparison of post-test blood sugar levels, where there was no significant difference between blood sugar levels before and after the test was carried out, with a mean of 133.07 mg/dl for the control group and 99.80 mm/dl for the treatment group.

The concept of using applications in health promotion is to increase public access to health information and promote healthy living behaviors. The use of the application accelerates the achievement of educational and monitoring objectives quickly and on target thereby saving time, effort and costs in health promotion efforts (Levac et al., 2023). On the other hand, patient decision-making in healthcare services is also influenced by the information that the patient previously had (Supriyanto et al., 2023).

Concept and the effectiveness of monitoring and education using the dokterkit application is to reduce the risk of coronary heart disease using the Framingham risk score assessment. Dokterkit provides health education features, patient barcodes, records, medical history and Swayanaka with the SOCS program. The purpose of this application is to create a community that has the same vision and mission, lives a healthy life with a positive impact on oneself, has identity data and previous health checks that are neatly arranged, provides nutrition guidelines and plays a role in providing nutrition education. The scope of the program is the data entry feature. This feature serves as a place to store the results of the doctor's examination of the patient and the prescriptions given by the doctor to the patient, to be entered into the patient's history. This feature serves to find out in full about patient information and data. The limitation of this application program is that this application uses a database, so that the program arrangement system requires a database storage engine or called storage media / Database Storage.

CONCLUSION

Education and monitoring based on medical applications is effective in controlling the risk of coronary heart disease and uric acid levels in Soewandhi Hospital Surabaya, but not effective in reducing cholesterol levels, systolic blood pressure, blood sugar levels and not effective in changing smoking behavior.

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