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COMMUNITY EMPOWERMENT FOR NON-COMMUNICABLE DISEASE SCREENING USING THE SI-TELUR PETIS APP ON HEALTH CADRES IN SIDOREJO VILLAGE, CENTRAL JAVA

PEMBERDAYAAN MASYARAKAT UNTUK SKRINING PENYAKIT TIADA MENULAR MENGGUNAKAN APLIKASI SI-TELUR PETIS PADA KADER KESEHATAN DI DESA SIDOREJO, JAWA TENGAH

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ABSTRACT

NCD is the cause of death nearly 70% in the world including Indonesia with the highest cases of hypertension and Diabetes Mellitus. Preliminary studies conducted Sidorejo village has the most common health problems are hypertension and Diabetes Mellitus not only at the age of the elderly but the age of adolescence as well. This Sidorejo village have a good potential to be developed with motivation source high human resources, namely health cadres who are always actively involved in health services. This health cadre needs to be equipped with improvement of knowledge and skills. Look at the phenomenon above that's what this community service program is done to implementing the Si-Telur Petis app. The purpose of this community service activity is to enhance the knowledge and skills of health cadres in utilising the SI-TELUR PETIS application as a medium for screening, health education, and monitoring the prevention behaviour of hypertension and diabetes mellitus in the community. The method used is focus group discussion/socialization, screening. education. empowerment, and evaluation and monitoring. The result of the activity there were 68 respondents consisting of most age range of 19 - 44 years 63.2%, female gender 88.2%, high school education 41.2%, and has income < 1,500,000 82.4%. The community empowerment programs increased the self-capacity of health cadres in Sidorejo, Purworejo, Central Java, in screening non-communicable diseases, as evidenced by increased knowledge, implementation of home visits, and cadre commitment in assisting the community to use the Si-Telur Petis application. This activity provides a role in the management of non-communicable diseases in terms of opportunities for education and preventive behavior modification (p-value= 0.000).

Keywords: *Community Empowerment; Health Cadres; Non-Communicable Disease; Screening; SI-TELUR PETIS App.*

ABSTRAK

Penyakit Tidak Menular (PTM) menjadi penyebab hampir 70% kematian di dunia, termasuk di Indonesia, dengan kasus tertinggi berupa hipertensi dan Diabetes Melitus. Studi pendahuluan yang dilakukan di Desa Sidorejo menunjukkan bahwa masalah kesehatan yang paling umum adalah hipertensi dan Diabetes Melitus, yang tidak hanya ditemukan pada lansia tetapi juga pada usia remaja. Desa Sidorejo memiliki potensi yang baik untuk dikembangkan dengan adanya sumber daya manusia yang bermotivasi tinggi, yaitu kader kesehatan yang selalu aktif terlibat dalam pelayanan kesehatan. Kader kesehatan ini perlu dibekali dengan peningkatan pengetahuan dan keterampilan. Melihat fenomena di atas, program pengabdian kepada masyarakat ini dilakukan untuk mengimplementasikan aplikasi Si-Telur Petis. Tujuan dari kegiatan pengabdian masyarakat ini adalah untuk meningkatkan pengetahuan dan keterampilan kader kesehatan dalam memanfaatkan aplikasi SI-TELUR PETIS sebagai media skrining, edukasi kesehatan, serta pemantauan perilaku pencegahan hipertensi dan diabetes melitus di masyarakat. Metode yang digunakan adalah focus group discussion (FGD)/sosialisasi, skrining, edukasi, pemberdayaan, serta evaluasi dan pemantauan. Hasil kegiatan menunjukkan terdapat 68 responden yang sebagian besar berada pada rentang usia 19–44 tahun (63,2%), berjenis kelamin perempuan (88,2%), berpendidikan SMA (41,2%), dan memiliki penghasilan < Rp1.500.000 (82,4%). Program pemberdayaan

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masyarakat ini meningkatkan kapasitas diri kader kesehatan di Sidorejo, Purworejo, Jawa Tengah dalam melakukan skrining penyakit tidak menular, yang dibuktikan dengan meningkatnya pengetahuan, pelaksanaan kunjungan rumah, serta komitmen kader dalam mendampingi masyarakat menggunakan aplikasi Si-Telur Petis. Kegiatan ini berperan dalam pengelolaan penyakit tidak menular dalam hal peluang untuk edukasi dan modifikasi perilaku pencegahan (p-value = 0,000).

Kata Kunci: Kader Kesehatan; Pemberdayaan Masyarakat; Penyakit Tidak Menular; Skrining; Aplikasi SI-TELUR PETIS.

INTRODUCTION

Non-communicable diseases (NCDs), particularly hypertension and diabetes mellitus, continue to be a significant public health issue both globally and nationally. The productive age group (15–59 years) is vulnerable to experiencing non-communicable disease (NCD) risk factors due to unhealthy behaviours, such as smoking, alcohol consumption, unhealthy eating patterns, lack of physical activity, obesity, stress, hypertension, hyperglycemia, and hypercholesterolaemia. Hypertension and diabetes mellitus are two non-communicable diseases that significantly contribute to morbidity and mortality rates both globally and in Indonesia (Direktorat Jenderal Pelayanan Kesehatan, 2022; DIY Health Department, 2019).

In Central Java Province, NCDs remain a top priority in the disease control program. The Central Java Province Health Profile for 2023 shows that the estimated number of hypertension sufferers among the population aged over 15 years reaches 8,554,672 people or 38.2% of the total population aged over 15 years. Hypertension is also the non-communicable disease (NCD) with the largest reported proportion, at 72.0%, while diabetes mellitus ranks third at 9.59%. The high prevalence of hypertension and diabetes mellitus indicates the need for continuous promotive and preventive efforts through innovative and community-based approaches (Dinas Kesehatan Provinsi Jawa Tengah, 2023).

In previous studies, researchers have successfully developed an Android-based telenursing application named System Telenursing Prevention of Hypertension and Diabetes Mellitus (Si-Telur Petis app). This app is an innovation effort of nonpharmacological nursing as a preventive behavior modification of NCD. This app has three main menus: questionnaires containing related questions about the prevention of hypertension and diabetes mellitus; education-related prevention of non-communicable behaviors, including diet and physical activity; and diary notes containing preventive behavior monitoring against DM disease and hypertension. The results showed that the Si-Telur Petis app has had a significant influence on behavioral change prevention for DM and hypertension.

This is supported by expert validation of the quality of the device software by 96%; the information and features in the application are easy to understand, accompanied by an explanation of the flow of application use (Sinaga, Indrayanti, et al., 2022). The effectiveness of the use of applications is influenced by internal and external factors. The most dominant internal factors affecting the effectiveness of use of the application are the enabling factors, which include the availability of the physical environment, supporting facilities such as internet quotas, memory capacity of mobile devices, the guidebook, and the completeness of application features. While the most dominant external factor is the quality of the system, it also includes ease of access, easy-to-understand information, availability of information, reliability, and satisfaction with information services.

Currently, several themes or global issues related to health, development, and humanity are also covered by YAKKUM, such as inclusion services. YAKKUM needs to ensure that the implementation of these issues brings benefits not only for the community, patients, and students served but also for the development of staff and institutions. Through this program, the team will develop the use of the Si-Telur Petis app in one of the areas managed by YAKKUM, namely Sidorejo village, which is assisted by UPKM RS Panti Waluyo Purworejo. Preliminary studies conducted in Sidorejo village found that the most common health problems are hypertension and diabetes mellitus, not only at the age of the elderly but also in adolescence. This Sidorejo village has a good potential to be developed with motivation and high human resources, namely health cadres who are always actively involved in health services. This health cadre needs to be equipped with improved knowledge and skills. Look at the phenomenon above; that's what this community service program is doing to implement the Si-Telur

Petis app for health cadres, which is the driving force of health services in the community as screening efforts for non-communicable diseases, especially Diabetes Mellitus and hypertension.

Various efforts to prevent hypertension and diabetes mellitus have been made through health education and posbindu activities involving health cadres. However, these activities generally still focus on face-to-face education and have not yet been supported by the use of digital technology that enables continuous monitoring of health behaviours. However, the use of application-based health technology has the potential to improve access to health information, facilitate the screening process, and support communication between the community and healthcare professionals (Ginny Brunton et al., 2017; Haldane et al., 2019; Sinaga, 2021; Susilawati et al., 2024).

The preliminary study results in Sidorejo Village, which is an area supported by UPKM RS Panti Waluyo Purworejo, show that hypertension and diabetes mellitus are health issues frequently found in the community. This village has great potential in developing community-based health programs because it is supported by health cadres who are active in various health service activities. Nevertheless, health cadres still require capacity building in the utilisation of digital technology to support promotive and preventive activities in the community. Therefore, this community service activity is carried out through the socialisation and implementation of the SI-TELUR PETIS application as a medium for screening, education, monitoring health behaviours, and community assistance in efforts to prevent hypertension and diabetes mellitus. The purpose of this community service activity is to enhance the knowledge and skills of health cadres in utilising the SI-TELUR PETIS application as a medium for screening, health education, and monitoring the prevention behaviour of hypertension and diabetes mellitus in the community.

METHOD

Community service activities are carried out using a community empowerment approach consisting of six stages, namely focus group discussion (FGD)/socialization, screening, education, empowerment, evaluation and monitoring, and sustainability program. This approach refers to the principles of community empowerment that emphasise active community participation in efforts to improve health and control non-communicable diseases (G Brunton et al., 2017; Haldane et al., 2019).

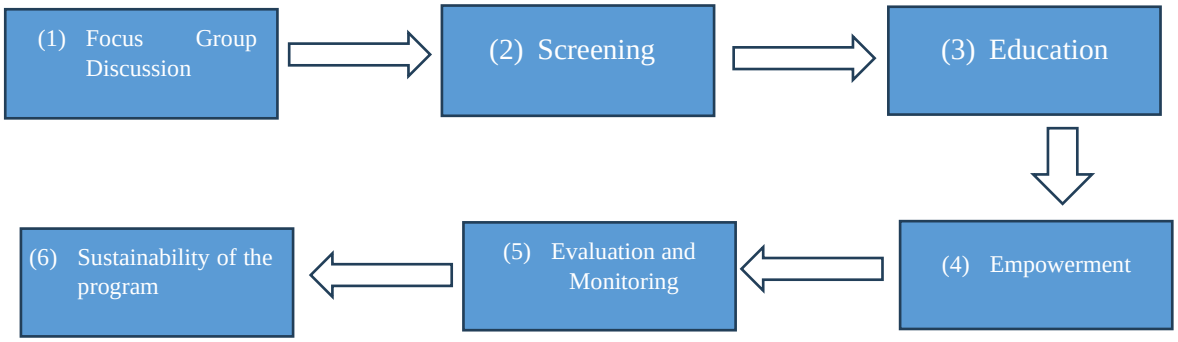


Figure 1. The flow chart of program implementation method

(1) Focus Group Discussion / socialization

The initial stage was conducted through Focus Group Discussions (FGD) and socialisation with village officials, health cadres, health center staff, and program partners. This activity aims to identify community needs, obtain stakeholder support, and agree on the program implementation mechanism. FGD is a participatory method widely used in public health programs to explore the needs, perceptions, and readiness of the community before the implementation of health programs (Mcalpin et al., 2022).

(2) Screening

The screening stage is conducted to identify risk factors for hypertension and diabetes mellitus in the community using the SI-TELUR PETIS application. Screening is an important part of the early detection efforts for non-communicable diseases so that at-risk individuals can promptly receive appropriate education and intervention. The World Health Organization (WHO) recommends early

detection of non-communicable disease risk factors as one of the main strategies for controlling NCDs in the community (Allen et al., 2023; Fitriahadi et al., 2024).

(3) Education

The health education phase is carried out through the delivery of materials on hypertension, diabetes mellitus, non-communicable disease risk factors, healthy lifestyles, and the use of the SI-TELUR PETIS application. Health education aims to increase public knowledge and awareness so that they can make better decisions regarding their own health. Health education is one of the main strategies of health promotion to improve the knowledge, attitudes, and health behaviours of the community (Martin et al., 2021).

(4) Empowerment

At the empowerment stage, health cadres are provided with training and assistance regarding the use of the SI-TELUR PETIS application as well as early detection of hypertension and diabetes mellitus. Cadres are expected to assist the community in using the application, conducting risk factor screenings, and providing basic health education. Community empowerment is the process of enhancing the capacity of individuals and groups to identify health problems, make decisions, and actively participate in solving health issues in their environment (G Brunton et al., 2017). Involvement of health cadres has also proven effective in increasing the reach and sustainability of community-based health programs (Haldane et al., 2019; Intening et al., 2024; Pujiastuti et al., 2023; Sinaga, Istianti, et al., 2022).

(5) Evaluation / monitoring evaluation

Monitoring and evaluation were conducted two weeks after the program implementation to assess changes in knowledge, attitudes, and behaviours of cadres in assisting the community using the SI-TELUR PETIS application. The evaluation was carried out through pre-test and post-test measurements, monitoring the use of the diary note feature on the application, documentation of home visits by cadres, and discussions via WhatsApp groups. The level of knowledge of the cadres was measured using a questionnaire on hypertension, diabetes mellitus, and the use of the SI-TELUR PETIS application, which consisted of 15 multiple-choice questions. Each correct answer is scored 1 point and each incorrect answer is scored 0 points. The total score is calculated as a percentage and is used to compare the level of knowledge before (pre-test) and after (post-test) the training. The evaluation stage is an important part of the health program cycle to assess the achievement of program objectives and identify aspects that need improvement (Andriyani et al., 2025; Kidder, 2024). Regular monitoring is also necessary to ensure the sustainability of digital health innovation usage in the community.

(6) Sustainability of the program

The sustainability phase of the program is carried out through collaboration with the Puskesmas and local health cadres. Cadres are encouraged to continue using the SI-TELUR PETIS application in community screening and assistance activities, while the health center plays a role in supervision and technical support. Sustainability is an important component in public health programs because it determines the program's ability to continue operating and providing benefits after the service activities have been completed (Muho et al., 2025).

RESULTS AND DISCUSSION

(1) FGD/Socialization

This activity marks the beginning of a community service team meeting with village administrators, cadres, and target community groups. In this activity, we also carried out the delivery of objectives and programs that do anything, as well as time contracts. So that it can help inform other communities to be able to take advantage of these opportunities well. The event is shown in Figure 2.



Figure 2. Socialization programme

(2) Screening

The community service team conducted one of the complementary therapies together as one of the promotional measures of disease prevention that is not infectious, namely hypnotherapy and health checks such as blood pressure and blood sugar. Screening is done as a behavior modification prevention measure for non-communicable diseases, namely hypertension and diabetes mellitus. The total number of participants was 68. The event is shown in Fig. 3. The description of the examination is shown in Table 1.



Figure 3. Mentoring use Si-Telur Petis app for screening

Table 1. Description of the screening

Characteristic	Frequency	Percentage
Age (years)		
<19	2	2.9
19-44	43	63.2
45-59	19	27.9
>60	4	5.9
Gender		
Male	8	11.8
Female	60	88.2
Education level		
No school	3	4.4
Elementary school	4	5.9
Junior High School	22	32.4
Senior High School	28	41.2
College	11	16.2
Income (IDR)		
<1.500.000	56	82.4
>1.500.000	12	17.6

Table 1 shows that the majority of respondents are in the age range of 19–44 years, with 43 respondents (63.2%), and respondents are at least at the age of < 19 years, with a total of 2 respondents (2.9%). Results: This study is in line with research conducted (Astuti, 2017) that found that many patients with Diabetes Mellitus were between the ages of 31 and 60, which is as many as 73 respondents (88%). The aging process that occurs in a person of any age (45 years and older) results in changes in the anatomical, physiological, and biochemical composition of the body, one of the effects of which is increased insulin resistance. Product Age has a less active lifestyle and an unbalanced diet due to more focus at work or busyness, which will trigger the occurrence of insulin resistance. These results are in accordance with the results of (Riskesdas, 2018) which showed an increase in the prevalence of the disease hypertension with age. It is associated with changes in the structure of blood vessels, and with increasing age, a person will experience changes in blood pressure.

Based on the most genders, there were a total of 60 respondents (88.2%), and the least respondents were those who had a male gender, with 8 respondents (11.8%). The results are in line with research conducted by (Susanti, 2019) with the title overview of risk factors for Diabetes Mellitus in patients with Type 2 diabetes mellitus. The majority of female respondents (76.4%) were female, compared with 21 men. The same results were obtained also in research conducted by (Pahlawati et al., 2019) with the title relationship type gender and economic level with the incidence of Diabetes Mellitus in the working area of the Samarinda city Palaran Health Center in 2019, which shows the results of the chi-square test with the value of p-value = 0.299 > 0.05, meaning there is no relationship between gender and diabetes mellitus. Diabetes Mellitus can occur in anyone, including female or male sex. This can happen because it is caused by several factors, such as genetics, heredity, a diet that is not healthy, stress, and obesity. The results of this study are supported by prior research that states that the prevalence of hypertension in women is 36.9% compared to 31.3% in men (Riskesdas, 2018). Differences the prevalence of hypertension by sex is due to hormonal factors can also be caused by sex chromosomes different between males and females.

Based on the most education, it was high school education, with a total of 28 respondents (41.2%). These results are supported by the opinion of researchers that the higher the level of education, the more related it is to the ability to receive information in making decisions about preventive behavior (Silalahi, 2019). Based on the most income is who has income < 1,500,000 with 56 respondents (82.4%).

(3) Education

The community service team, along with assistants, provides health education-related prevention of NCD, including both physical activity and diet for Diabetes Mellitus and hypertension, emergencies in diabetes mellitus, and management of home visits by health cadres. The event is shown in Figure 4.



Figure 4. Education about non-communicable diseases

(4) Result of Empowerment

Paired sample t-test is used to see the difference between pre and post-test on Diabetes Mellitus and hypertension show as Table 2

Table 2. Result pre and post test

Variable		Mean	SD	p-value
Diabetes	Pre	45.57	4.866	0.000
Mellitus	Post	49.13	4.850	
Hypertension	Pre	50.85	5.506	0.000
	Post	54.47	6.074	

Table 2 shows that The paired sample t-test analysis showed a significant difference between pre-test and post-test scores ($p < 0.001$), indicating an improvement in cadres' knowledge after participating in the program. This shows that there is a significant difference in the prevention of DM behavior in the intervention group, which means there is an influence of Android-based telenursing applications on behavior modification prevention of DM. The results of this study are supported by research (Higano et al., 2015) which shows that the effectiveness of telenursing in patients with type 2 Diabetes Mellitus in DM self-management treatments such as exercise regularity and consuming the right foods such as fruit, vegetables, and carbohydrates. This is in line with research (Rahmawati et al., 2018), which shows that telenursing affects the increase in the value of supporting families with type 2 diabetes in carrying out therapy in the region of Indralaya Health Center. Souza explained that telenursing in nursing can be used as a service for health and has proven to be a tool with technology to overcome geographical barriers and provide health information to the community, especially during the COVID-19 pandemic, which can minimize direct contact in providing services for health in DM prevention behavior (Souza-Junior et al., 2016). In line with research, telenursing applications become an opportunity to provide health education and a sense of security to clients who can overcome the shortage of health workers, distance, and time to provide health services. Telenursing is a tool that is useful for health education and behavioral intervention in patients with Diabetes Mellitus (Boro & Hariyati, 2020) In addition, telenursing that is android-based can help patients and their families participate in caring for clients who have chronic diseases and reduce the duration of treatment (Misbah et al., 2023).

The telenursing app plays a role in diabetes management; this is supported by research that explains that telenursing may be associated significantly with lowering HbA1c in patients with Diabetes Mellitus and, as a useful tool, provide education for patients as a helpful behavior to improve glycemic control (Borhani et al., 2013). In addition, this telenursing application has also been tested. A feasibility analysis of the Si-Telur Petis app shows that 96% overall, this application can be understood for its purpose and usefulness, coupled with the explanation of the application flow. This is supported by the results of the research, which show that it is necessary to evaluate the quality, which refers to the ISO/IEC 9126-4 standardization, by looking at the four characteristics of effectiveness, productivity, safety, and satisfaction (Kumar & Snooks, 2013; Sinaga, Indrayanti, et al., 2022; Siren et al., 2019).

Behavior change prevention for DM and HT can be seen from the results of filling out a diary note, which include physical activity and diet. It is indicated with DM moderate risk behavior changes from 80% to 50% in the intervention group, while changes in risky behavior medium HT from 90% to 73% This opinion is supported by research (Ghoulami-Shilsari & Bandboni, 2019) showing that telenursing has the benefit of providing health education and changing public health behaviors, which has been shown to improve community health programs and reduce complications from chronic diseases. Telenursing is effective in improving lifestyles and preventing chronic diseases (Sinaga, Indrayanti, et al., 2022).

When it comes to addressing the issue of non-communicable diseases, collaboration across sectors is essential (Tarmizi, 2023a, 2023b). To play an optimal role and be aware of the dangers of non-communicable illnesses, the community must be encouraged to take the initiative to implement risk management strategies (Permina, Yullya; Intening, Vivi Retno; Sudarta, 2024). It has been demonstrated that empowerment using the si-Telur Petis application improves health cadres' ability to conduct home visits for mentorship and non-communicable disease screening (Iswarawanti, 2010). After completing training, health cadres undertake home visits to promote NCDs and record home visit forms for monitoring and evaluation. 100% of health cadres conduct home visits to the community on a regular basis following the implementation of this community empowerment program, recording the outcomes on the home visit form (Intening et al., 2024) (Sinaga et al., 2024.).

CONCLUSION

Community service activities through the implementation of the SI-TELUR PETIS application successfully increased the capacity of health cadres in conducting screening, education, and community support related to the prevention of hypertension and diabetes mellitus. Evaluation results showed a significant increase in the knowledge of cadres after participating in the training. The SI-TELUR PETIS application can be used as a media to support health promotion and early detection of non-communicable diseases based on the community. The involvement of health cadres in the use of digital technology has the potential to strengthen efforts in the prevention and control of hypertension and diabetes mellitus in the community.

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