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Research Article

Behavior Prevention Modification of Non-Communicable Diseases During the COVID-19 Pandemic Using Android-Based Telenursing Application "SI-TELUR PETIS"

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Abstract

Aims: Pandemic Covid-19 pandemic became a global health threat that impacts the health sector, including non-communicable diseases. Innovation efforts of nursing non-pharmacological is behavior modification using android-based telenursing application. This study aimed to determine the effect of android-based telenursing application "SI-TELUR PETIS" as behavior prevention modification of non-communicable diseases during the COVID-19 pandemic.
Design: This study is a quantitative study using the quasi-experimental study with pre and post-test with control group design.
Methods: The sample of this study amounted to 60 respondents with 30 respondents in the intervention group and 30 respondents in the control group were selected using purposive sampling. Data were collected from May to August 2021. The application has been validated by adopting the ISO 9126 about the quality of the software that has the six aspects of assessment. Mann Whitney U and Wilcoxon tests were used for data analyses.
Results: Android-based telenursing application "SI-TELUR PETIS" has a significant effect on the change in the behavior prevention modification of non-communicable diseases (DM and Hypertension) ($p<.05$).
Conclusions: Overall the application is easy to understand the purpose and usefulness coupled with the explanation of the groove of the use of the application. Android-based telenursing application "SI-TELUR PETIS" has a significant effect on behavior prevention modification of non-communicable diseases (DM and Hypertension) through the features of the daily note, namely diet, and physical activity.

Keywords
Behavior modification; non-communicable disease; diabetes mellitus; hypertension; telenursing

INTRODUCTION

COVID-19 pandemic becomes a global health threat that impacts the health sector, including non-communicable diseases (1). The spread of the virus COVID-19 according to the WHO in October 2020 by 42.966.344 people and death occurs 1.152.604 and in Indonesia the data confirmed by the Covid-19 virus were 392.934 people and death 13.411 people (2,3). In Indonesia confirmed 392.934 people and death 13.411 people The double burden faced by Indonesia causes serious problems due to the increased

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prevalence of infectious diseases and non-communicable diseases at once. Non-communicable diseases is the cause of death of nearly 70% in the world including Indonesia with the case of the highest Hypertension and Diabetes Mellitus (4,5). Data from the Department of Health of the City of Yogyakarta, DIY on the fourth-order as a province with cases of Hypertension which is high followed by Diabetes Mellitus (6). The increasing prevalence of non-communicable diseases is related to the behavior of poor lifestyle such as lack of physical activity, consumption of fruits and vegetables, the risk factors of work due to sitting too long, worked too long in front of a laptop, plus the pressure of work. This can be evidenced by the proportion of the population affected by non-communicable diseases this is a population with a level of college education and work as PNS/TNI/Polri/BUMD (5).

Increasing non-communicable diseases impact on state losses due to the cost of treatment against a disease that many and long recovery time. This condition will also affect productivity and disrupt the economy of the family. Castillo reveals the need to include strengthening primary care services in terms of building the capacity of health workers trained and do care collaborative for the management of patients with non-communicable diseases in a holistic manner (7). Efforts have been made towards the control of non-communicable diseases is not optimal because the people in Indonesia still use traditional medicine, there is still high confidence sociocultural to use alternative treatment, almost half of that amount undiagnosed feel healthy and do not feel any symptoms, the presence of a perception that is not good to the health care system related administrative procedures are complex, as well as a bad experience obtained while using health insurance (8).

One of the innovations of non-pharmacological nursing is using telenursing application based on android as behavior modification of non-communicable disease prevention. Telenursing in nursing to health services and orientation has proven to be an efficient tool to help the country overcome geographical barriers and provide health information to the public (9). The results of the literature review show that the use of the application telenursing may help increase access to a more comprehensive and improving the quality of health services, facilitate monitoring to evaluate the health status, not limited to distance so that the intervention can still be given (10). This condition will have an impact on the cost of health care is cheap, and the increase in coverage of health care for a long distance because it can be accessed through an android smartphone (10). In addition, the use of the application telenursing can also overcome the shortage of health workers, reducing the distance and travel time, provide opportunities for health education, as well as improve the taste of safe care and client (11).

Making this application is a basic research with the aim of designing several menus/features to determine the effectiveness of Android-based telenursing application as a behavior modification of diabetes mellitus and hypertension prevention. This application is easy to use proven from the results of the expert validity test of the content of application use. One of the menus in this application is education about diabetes mellitus and

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hypertension prevention behavior, by accessing education every day independently by respondents, respondents will perform preventive behavior including physical activity and diit, then documented in a diary note for 21 days. After the 21st day will be done post-test, and obtained the results of an increase in preventive behavior.

This application can be accessed independently by the user, anytime and anywhere so that action can be done early or referral if found more serious health problems. This study aimed to determine the effect of android-based telenursing application "SI-TELUR PETIS" as behavior prevention modification of non-communicable diseases during the COVID-19 pandemic.

METHODS

This study is a quantitative study using the quasi-experimental study with pre and post-test with control group design. Research carried out in the territory of the Yogyakarta City. The sample of this study amounted to 60 respondents with 30 respondents in the intervention group and 30 respondents in the control group. The sampling technique in this research is purposive sampling with inclusion criteria, namely the age of 15 to 59 years in the city of Yogyakarta, has an android phone, and can read and write, while exclusion criteria are of childbearing age who use a mobile phone-based IOS and refused to participate in the study.

This application is validated by adopting ISO 9126 about the quality of the software that has the six aspects of the assessment (12,13). This application has three main menus. First, screening related prevention behavior of diabetes mellitus and hypertension. Second, education about disease prevention of diabetes mellitus and hypertension. Third, diary note as documentation recording behavior prevention of diabetes mellitus and hypertension conducted. The first day respondents completed the stuffing of questions related to prevention behavior for initial screening. Furthemore, the first week of the first day is given education related to the prevention of diabetes mellitus and hypertension that can be accessed every day by respondents independently, then fill out a diary note until the 21st day. Then after the 21st day of post-test, fill back questions related to diabetes mellitus and hypertension prevention behavior. Research was done with a home visit using the protocol in health due to the rising cases of COVID-19 in the region of the study site, while the daily monitoring was done online using communication media WhatsApp Group. Researchers gave informed consent to the respondents as evidence of consent to participate in the study. Researchers propose ethical clearance in KEPK STIKES Bethesda Yakkum Yogyakarta with the number 064/KEPK.02.01/IV/2021.

This study is a quantitative research with quasi experiment design with pre and post-test with control group approach. The data collected is non-parametric data. Data analysis used Mann Whitney U-Test because the data is not normally distributed (14). The test using IBM SPSS statistics version 26 software.

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RESULTS

Table 1.
The Behavior of the Prevention of DM in the Intervention and Control Groups, Before and After the Intervention in Yogyakarta City (n=60)

Variable	Pre-test (Mean±SD)	Post-test (Mean±SD)	Mean difference	p-value
Behavior prevention of DM				
Intervention group	1,8±0,407	1,5 ±0,509	0,3	0,003*
Control group	1,87±0,346	1,90±0,403	-0,17	0,655*
p-value		0,001**		

*Wilcoxon-test | **Mann Whitney U-test

Table 1 shows that the behavior of the prevention of diabetes mellitus (DM) before and after the intervention android-based telenursing application "SI-TELUR PETIS" has a significant effect from 1.8 (SD=0,407) to 1.5 (SD=0,509) with a p-value of 0.003. Whereas the control group was not significant with a p-value of 0,655.

Table 2.
The Behavior of the Prevention of HT in the Intervention and Control Groups, Before and After the Intervention in Yogyakarta City (n=60)

Variable	Pre-test (Mean±SD)	Post-test (Mean±SD)	Mean difference	p-value
Behavior prevention of HT				
Intervention group	1,9±0,305	1,73 ±0,450	0,17	0,025*
Control group	2±0,263	1,93±0,254	0,07	0,157*
p-value		<0,001**		

*Wilcoxon-test | **Mann Whitney U-test

Table 2 shows that the behavior of the prevention of hypertension (HT) before and after the intervention android-based telenursing application "SI-TELUR PETIS" has a significant effect from 1.9 (SD=0,305) be of 1.73 (SD=0,450) with a p-value of 0.025. Whereas the control group was not significant with a p-value of 0,157.

DISCUSSION

This study aimed to determine the effect of android based telenursing application "SI-TELUR PETIS" as behavior prevention modification of non-communicable diseases during the COVID-19 pandemic. The results showed that the android-based telenursing application "SI-TELUR PETIS" has a significant effect on the change of the behavior of the prevention of DM and Hypertension (Table 2 and 3). The results of the research are in line with previous research which shows that there is the effectiveness of telenursing in patients with Diabetes Mellitus Type 2 in the treatment of self-management of DM such as the regularity of exercise, intake of the right food such as fruit, vegetables, and carbohydrates (15). It is also supported by the opinion that telenursing affects

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the increase in the value of family support patients with Type 2 DM in running therapy treatment (16). Telenursing in nursing can be used as a health service and has been proved as a tool with technology to overcome geographical barriers and provide health information to the community, especially in the pandemic COVID-19 can minimize direct contact in providing health services in the behavior of the prevention of DM (9,17). In addition, the application telenursing is an opportunity to provide health education and a sense of security on the client which can overcome the shortage of health personnel, the distance and time in providing health services, can help patients and families to participate in caring for clients who have chronic diseases and reduce the time to treatment (18). Telenursing is a useful tool for health education and behavioral intervention in patients with Diabetes Mellitus (10).

The behavior of the prevention of DM in the group of an adult is very useful in the pandemic COVID-19 so that it can help health workers to prevent the increase of DM cases and prevent further complication. The handling of the DM can be carried out optimally to maintain nutritional status, prevent obesity, setting a pattern of healthy eating, balanced nutrition, do routine activities with exercise (19). Telenursing has effectiveness in the prevention of DM evidenced by the use of android technology can facilitate the improvement of nurse communication with patients (20). This has created opportunities for improving the management of DM and prevention of diseases of DM media through smartphones, can facilitate as a tool reminders to consume a healthy diet, exercise, and access to health services as well as an innovative model for improving nursing services in the community.

Based on Table 2 shows that there is a significant change in the behavior of the prevention of hypertension after a given android-based telenursing application "SI-TELUR PETIS". The results of this study are in line with research by Kazem who explains that telenursing is more effective in lowering hypertension compared to methods of self-monitoring, the method is simple and low-cost as controlling disease hypertension is effective (19). This opinion is also supported by Souza that telenursing is an efficient tool in helping to provide information about health care to the community (20). The Law Of The Republic Of Indonesia No. 38 the Year 2014 Article 29 about duty and authority of the nurse explains that the nurse as a provider of nursing care, educator, and counselor for the patient as the manager of nursing services. As a counselor, the implementation of this task can be developed by the method of telenursing (21).

Ghoulami argues that telenursing benefits in providing health education to change the behavior of the health of the community as evidenced by the increased public health programs, and complications of chronic diseases decreased (22). In addition, changes in behavior can also be seen from the individual who can control the body mass index, blood pressure systole, and diastole in the normal limit (23). This opinion is also supported by research using the media WhatsApp on the care of clients with chronic diseases (24,25). In addition, counseling by nurses over the phone can improve health behaviors, reduce systolic blood

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pressure, and improve the behavior of self-care in patients with hypertension (26). This study concluded that the application of telenursing android-based useful as one of the media that is used as a behavior modification prevention of hypertension in facilitating nurses to provide services to the client in obtaining a healthy lifestyle. Making this application is a basic research with the aim of designing several menus/features to determine the effectiveness of Android-based telenursing application as a behavior modification of diabetes mellitus and hypertension prevention. This application is easy to use proven from the results of the expert validity test of the content of application use. One of the menus in this application is education about diabetes mellitus and hypertension prevention behavior, by accessing education every day independently by respondents, respondents will perform preventive behavior including physical activity and diit, then documented in a diary note for 21 days. After the 21st day will be done post-test, and obtained the results of an increase in preventive behavior.

Application telenursing gives it a role in the management of diabetes mellitus. This is supported by the results of a study that explains that telenursing can relate significantly to lowering HbA1c in patients with diabetes mellitus, and as a useful tool to provide education for the patient as a behavior that helps patients to improve glycemic control (18,27). In addition, the application telenursing has also been made an analysis of the feasibility of the development of an "SI-TELUR PETIS" which showed that 96% of the overall this application can be understood the purpose and usefulness coupled with the explanation of the application flow. This is supported by the results of the research shows that it is necessary to evaluate the quality of which refers to the standardization of ISO/IEC 9126 about the quality of the software that has the six aspects of the assessment (13).

DM and Hypertension disease are comorbid and become the focus of attention on the conditions of the pandemic COVID-19 at this time so that the application telenursing gives benefits to prevent the spread of and provide comfort and security. This opinion is supported also by the results of previous research that the tool telemedicine is very useful for the management of high-risk patients, namely with the disease comorbid in the pandemic COVID-19 (28,29). Change in the behavior of the prevention of DM and HT can be seen from the charging diary note include physical activity and diet were monitored in 21 days. This is indicated by the change in risky behavior are DM from 80% to 50% in the intervention group, while the change in behavior that is at risk of being HT from 90% to 73%. This opinion is in line with the results of research that digital platforms provide an opportunity with a low cost, highly relevant for the user at a young age, and an important component as an effective intervention to describe health behavior change a young age is a pattern of eating habits and physical activity (30,31).

CONCLUSION

Overall the application "SI-TELUR PETIS" is easy to understand the purpose and usefulness coupled with the explanation of the groove of the use

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of the application. The android-based telenursing application "SI-TELUR PETIS" has a significant effect as a behavior modification prevention of DM and Hypertension through the features of the daily note, namely diet, and physical activity.

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