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ELECTRONIC-TINDAK LANJUT TENSIKU (E-TITENKU) INTERVENTION MODEL DEVELOPMENT FOR THE PREVENTION OF CORONARY HEART DISEASE

PENGEMBANGAN MODEL INTERVENSI ELECTRONIC-TINDAK LANJUT TENSIKU (E-TITENKU) UNTUK PENCEGAHAN PENYAKIT JANTUNG KORONER

Sidik Awaludin[1]✉, Galih Noor Alivian[2], Aprilia Kartikasari[3], Dwi Novitasari[4]

[1, 2, 3]School of Nursing, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto, Indonesia, 53123
[4]School of Nursing, Faculty of Health, Harapan Bangsa University, Purwokerto, Indonesia, 53182
Correspodence Email: abifayza@yahoo.co.id

ABSTRACT

Coronary Heart Disease is still the leading cause of death globally. Therefore, primary prevention efforts are needed to reduce morbidity and mortality from Coronary Heart Disease. The era of the industrial revolution demands the use of digital information technology in solving every problem, including in the field of nursing. Electronic Tindak Lanjut Tensiku (e-TITENKU) is a nursing intervention application designed to increase knowledge of coronary heart disease prevention through controlling blood pressure and direct nursing interventions if the user has hypertension according to their level. The purpose of this study was to develop an e-TITENKU intervention model for the prevention of coronary heart disease. The design of this research is research and model development, where researchers develop models and applications based on web and smartphones based on theoretical studies, for smartphone application operations. application using Analysis, Design, Development, Implementation, and Evaluation (ADDIE) approach. The results of the research on the e-TITENKU model have been compiled and the results of 2 expert tests obtained Kappa test results of 0.85. This model can be used easily to categorize the level of hypertension, providing nursing interventions to reduce hypertension according to the level.

Keywords: coronary heart disease; hypertension; nursing intervention model; smartphone

ABSTRAK

Penyakit jantung koroner masih menjadi penyakit penyebab kematian tertinggi di tingkat global. sehingga diperlukan upaya pencegahan primer untuk mengurangi kesakitan dan kematian akibat penyakit jantung koroner. Era revolusi industri menuntut penggunaan teknologi informasi digital dalam menyelesaikan setiap permasalahan termasuk dibidang keperawatan. Electronic Tindak Lanjut Tensiku (e-TITENKU) merupakan aplikasi intervensi keperawatan yang disusun untuk meningkatkan pengetahuan pencegahan penyakit jantung koroner melalui pengontrolan tekanan darah dan intervensi keperawatan secara langsung apabila pengguna mengalami hipertensi sesuai levelnya. Tujuan penelitian ini untuk mengembangkan model intervensi e-TITENKU untuk pencegahan penyakit jantung koroner. Desain penelitian ini yaitu research and model development yaitu peneliti melakukan pengembangan model dan aplikasi berbasis web dan smartphone berdasarkan kajian teori, untuk operasional aplikasi smartphone. aplikasi dengan menggunakan pendekatan Analysis, Design, Development, Implementation, dan Evaluation (ADDIE). Hasil penelitian model e-TITENKU telah disusun dan hasil uji 2 oarang pakar diperoleh hasil uji Kappa 0.85. Model ini dapat digunakan secara mudah untuk mengkategorikan level hipertensi, pemberian intervensi keperawatan untuk menurunkan hipertensi sesuai levelnya.

Kata kunci: hipertensi; jantung coroner; model intervensi keperawatan; smartphone

INTRODUCTION

Cardiovascular disease is still a major world health problem. Hypertension is the most risk factor for heart disease and increases the risk of death in cardiovascular disease (Ministry of Health, 2018; Shrout, Rudy, and Piascik, 2017; Utami and Azam, 2019). Hypertension is a cardiovascular disorder characterized by a systolic blood pressure of more than 140 mmHg and diastolic blood pressure of more than 90 mmHg (Shrout, et al, 2017). Hypertensive sufferers often do not experience any perceived symptoms, they will feel symptoms when they have complications in other organ systems, for example to the heart, and cause coronary heart disease, which can be life-threatening. The majority of hypertension sufferers find that they have hypertension accidentally, namely when they experience severe complaints and complications and a blood pressure check is carried out it turns out that their blood pressure is very high, this incident raises more complex management (Awaludin et al, 2020).

Seeing this phenomenon, high blood pressure experienced by sufferers needs to be carried out in primary and secondary prevention by increasing patient awareness in identifying risk factors and carrying out preventive management of coronary heart disease events (Indrawati, 2014). Efforts made can be in the form of following up on blood pressure that is known. The first effort is through increased knowledge and efforts to make immediate efforts to follow up on high blood pressure experienced in accordance with guidelines for the management of high blood pressure, such as quitting smoking, low a salt diet, exercising regularly, reducing psychological stress, regularly taking anti-hypertensive medication given, and monitor blood pressure regularly (Mullie dan Clarys, 2011; Nuraini et al, 2016). Increased follow-up can be pursued through a medium that is easily accessible today, namely Mobile Health (m-Health). Using m-Health, you can use an application on your smartphone (Hamilton, 2018; Neubeck, 2015). Currently, almost every family already has a smartphone device.

Electronic Tindak Lanjut Tensiku (e-TITENKU) is a web-based and smartphone-based application designed to perform coronary heart disease prevention management in hypertensive patients. This application contains an interpretation of the results of independent blood pressure checks and guidelines for interventions that should be carried out by people with hypertension after knowing their blood pressure. The guide in the smartphone application can provide information related to efforts to prevent heart disease through controlling blood pressure that will be carried out by people with hypertension. Intervention models e-TITENKU designed in this study using software available on smartphones that can be downloaded and installed on smartphone users, namely nurses and patients. Instructions are made in a simple model and easily understood by patients. Every intervention given by the nurse and actions taken by the patient will be documented.

e-TITENKU Model consists of a program to scan blood pressure test results with a digital sphygmomanometer, then the blood pressure results will be interpreted in the application to categorize the level of mild to severe hypertension or even hypertensive crisis. After being categorized, recommendations will appear for patients to carry out the management of high blood pressure to prevent coronary heart disease. This research was conducted to develop an intervention. This research was conducted to develop an intervention model e-TITENKU for the prevention of coronary heart disease.

METHOD

The research design used in stage I was research and model development, namely researchers developing web and smartphone-based models and applications based on theoretical studies, for smartphone application operations carried out in consultation with 2 experts, namely information technology experts and cardiovascular nursing experts.

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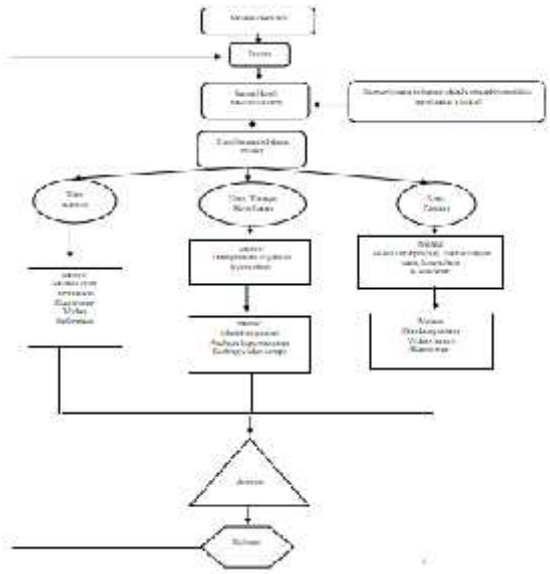
Scheme 1. Flowchart Design



After the expert consultation, the validity and reliability tests of the contents of the model were continued to assess the rater agreement of the two experts on the model that had been developed. This research has passed the ethical clearance from the Ethics Committee Faculty of Health Sciences Universitas Jenderal Soedirman No: 771/EC/KEPK/IV/2022.

RESULT

This research resulted in an application model intervention program e-TITENKU for the prevention of coronary heart disease.

DISCUSSION

The model development stage is carried out in the following steps:

Study of literature

Researchers have studied various literature in the form of textbooks, scientific articles, as well as the results of previous studies conducted by researchers regarding problems that occur in hypertensive patients.

Designing Applications

Researchers made an application in collaboration with IT technicians from Wijaya Kusuma University, Purwokerto. Making applications using the approach Analysis, Design, Development, Implementation, dan Evaluation (ADDIE) (Dick, Carey and Carey, 2005; Wibawa, 2017).

The analysis was carried out by analyzing user needs, problems and characteristics of respondents, it was found that hypertension sufferers only know blood pressure, and do not know the category of blood pressure and the initial actions that can be taken to reduce blood pressure. Requirements analysis includes user requirements, content requirements, software and hardware requirements. e-TITENKU application model requires the need for software, among others; Operating System: Windows 7 Ultimate, programming language: PHP Native (Php,Css, Javascript, Jquery,bootstrap), application development: Texpad, Android Studio, server operating system: Linux, database: MYQSL, web server: Apache Web Server, database manager: PhpMyAdmin and APK Extractor. While the hardware needed is a smartphone.

In the Design Stage, the researcher compiles a flowchart that functions as an illustration of the sequence and structure of the application media. This stage also produces storyboards and interfaces. Storyboards are made based on flowcharts that have been prepared before. The storyboard itself includes the content, menu layout and buttons from the application that are implemented in a real way into the interface. The initial design was formed from the flowchart described in schematic 1. After compiling the flowchart, it continued to develop the interface, the results of which are shown in Figures 1, 2 and 3.

Figure 1. The first view of the application model

Figure 1. describes the login process for a user who has a username and password.

Figure 2. Process of inputting blood pressure data by voice

Figure 2 shows the user using voice to enter systolic and diastolic blood pressure results of self recording using a digital sphygmomanometer.

Figure 3. Classification of blood pressure and recommendations

Figure 3. explains the results of the interpretation of the blood pressure categorization and recommendations for nursing therapy that have been determined according to the program and level of the blood pressure category.

The development stage is the stage of product development and testing based on predetermined analysis and design until it becomes the desired product. This stage is also carried out by consulting experts according to their fields. The contents of the consultation include the simplicity of the model, the ease of operation of the model, the suitability of the subject of the model user, the ease of language, the clarity of the video sound, and the material content of the model. After the consultation process, the researchers improved the application model according to expert advice.

Table 1. Interrater Reliability Test Results for the e-Titenku Model

No	Rater 1	Rater 2	Kappa Value
1	5	5	0,85
2	5	5	
3	5	5	
4	5	5	
5	4	4	
6	4	4	
7	4	4	
8	5	4	
9	4	4	
10	4	4	
11	4	4	
12	4	4	
13	4	4	

Table 1 describes the results of the reliability test between raters, the result of

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which is 0.85, which means the application is reliable.

The application model that has been improved by the researcher is then assessed by an expert agreement index (Rater Agreement) to see the content validity of the model.

In the Implementation phase, the validity and reliability of the contents of the model were tested, so the researcher then applied the model to a small group of respondents whose results were valid and reliable, so that the model could be used in larger samples. The evaluation stage is carried out by researchers at each stage to see the quality of the application. Suggestions and input obtained from each stage are followed up to improve the application.

Prevention of coronary heart disease through health education using appropriate media and information technology-based nursing with smartphones through applications is an innovation to facilitate and optimize one's knowledge and understanding. Smartphone health (m-Health) as a medical and public health practice supported by mobile devices and other wireless devices has presented new opportunities to improve patient care. Differing from telemonitoring stations and personal computer-based systems, the m-Health application is inexpensive, ubiquitous, intuitive and flexible for a variety of lifestyles. Currently a large number of m-Health applications have been developed, but evidence of their effectiveness is still limited, for m-Health applications with communication and service interventions. Available from the Apple App Store and Google Play (Arikunto, 2010). Apps fall into different categories, such as logbooks and diaries (Mufidah, Kurniawati & Widyawati, 2021).

CONCLUSION

The e-TITENKU model can be used easily to categorize hypertension levels, provide nursing interventions to reduce hypertension according to its level so as to prevent coronary heart disease in the community.

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