ORIGINAL ARTICLE

Effectiveness of Self Care Education on Knowledge and Behavior Among Android-based Hypertension Patients at Yogyakarta Health Center

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ABSTRACT

Introduction: Hypertension is a cardiovascular disease that evolves worldwide. Hypertension prevalence increased by 7.61% over five years, from 26,5% in 2013 to 34,11% in 2018 in Indonesia. Then in Yogyakarta, the prevalence of hypertension is 8.8% higher than the national average. It has become the leading cause of non-communicable diseases. The problem has focused on the issue of hypertension management and has not been effective. According to various sources, hypertension self-care education via smartphone applications is one of the interventions used to improve self-care behaviour in hypertensive patients. Thus, it is important to study the effectiveness of these interventions on hypertensive patients. The study aimed to determine the effectiveness of android-based hypertension self-care education on knowledge and behavior among hypertensive patients. **Methods:** A quantitative descriptive-analytic study was conducted. One hundred and eight hypertensive patients were selected in Yogyakarta randomly. The patients followed an android-based hypertension self-care education programme for three months. **Results:** Statistical analysis with paired and independent t-tests showed a significant difference in self-care knowledge and behavior before and after intervention in the intervention group ($p=0.000 <0.05$; $p=0.000<0.05$, respectively). There was a significant difference in self-care knowledge and behavior between the intervention group and the control group ($p=0.000<0.05$; $p=0.003<0.05$, respectively). **Conclusion:** A minimal, three-month android-based hypertension self-care education programme enhanced self-care knowledge and behavior among hypertensive patients. It was suggested that the nurses educate hypertensive patients about hypertensionself-care more intensively.
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Keywords: Hypertension; Android-Based Hypertension Self-Care Education; Self-Care Knowledge; Self-Care Behavior

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INTRODUCTION

Hypertension is a cardiovascular disease that is a problem worldwide. It is known as the silent killer because there are no symptoms (1). The prevalence of hypertension increases every year. According to WHO (2) data, the prevalence of hypertension in adults increased by 13.27% in the last five years in 2019. Moreover, hypertension was a significant cause of early death worldwide, with 8.6 million deaths in 2015 (2, 3). Then the prevalence increased from 26.5% in 2013 to 34.11% in 2018 in Indonesia (4). Furthermore, the average hypertension prevalence in Yogyakarta was 8.8% higher than the national average in 2018 (5).

One of the most serious issues in hypertensive patients is a lack of self-care. Self-care in hypertension is an individual's ability to manage his illness, which requires knowledge and skills for self-care (6). Meanwhile, hypertension self-care components include a medication regimen, low-salt diet intake, smoking habits, alcohol consumption, blood pressure monitoring, and physical exercise (7). Several factors that can influence it include their knowledge, which in turn causes a lack of hypertension self-care behavior.

Hypertensive patients' knowledge and behaviour are essential components of self-care. According to previous research (8), lack of knowledge and lack of a positive attitude are the main factors causing the inability of hypertensive patients to do self-care. Despite various government efforts to overcome hypertension, hypertension management was not optimal. The previous research (9) stated that out of 45 hypertension patients studied, 42.2% had sufficient knowledge, others had less education, and 60% had a negative attitude toward hypertension treatment. This phenomenon results in non-optimal hypertension self-care behavior, and the government's lack of knowledge and ability to practise self-care in hypertensive patients is a concern (4). As a result, hypertensive patients require interventions to improve hypertension self-care knowledge and behaviour that are easily accessible, affordable, and time-sensitive.

Self-care education on hypertension is one of the nursing interventions that has implications for knowledge and behaviour in self-care among hypertensive patients. Previous research has found that an educational intervention for hypertension self-care management improves knowledge and ability to care for oneself significantly (10). Smartphone applications, including Android applications, are one of the new methods in self-care education for hypertensive patients. Android-based self-care education for hypertension self-care is a viable option for increasing hypertension patients' knowledge and self-care behaviour that is simple to use, accessible, and usable in daily practise at any time. Previous studies state the mobile app has proven to improve self-management compliance with hypertension treatment (11). Using smartphone applications improves hypertensive patients' ability to self-care for hypertension, which includes understanding and actions in treating hypertension (12). This phenomenon is a new issue to be studied at the Public Health Center Ngemplak I Yogyakarta. As a result, the effectiveness of the intervention in hypertensive patients must be determined. Therefore, the study aimed to determine the effectiveness of android-based hypertension self-care education to enhance knowledge and behavior among hypertensive patients.

MATERIALS AND METHODS

A quantitative descriptive-analytic study with a randomised control group pretest-posttest design was conducted. One hundred and eight hypertensive patients were randomly selected at Public Health Center Ngemplak I Yogyakarta as the intervention and control groups. Inclusion criteria included new patients with a medical diagnosis of primary hypertension, were age ≥ 18 years, had an android phone (their own or family), and lived in the Ngemplak I Public Health area. Patients who were hospitalized during the process or those who experienced complications (cardiovascular, cerebrovascular, kidney damage) and other complications were excluded from this study. The patients followed the hypertension self-care education using an Android-based programme for three months. The research instruments used were the Hypertension Knowledge-Level Scale (HK-LS) (13, 14) and the Hypertension Self-Care Behavior Questionnaire (15). Researchers distributed questionnaires to each participant by visiting each other's homes. Then they filled it out and returned it to the researcher on the same day until all data was collected. Furthermore, the data were analyzed statistically with with paired and independent t-tests.

Ethical Clearance

This article has received ethical clearance from the Health Research Ethics Committee, Universitas Sari Mutiara Medan, Indonesia, with Ethical Approval No. 625/F/KEP/USM/I/2021 dated January 22, 2021.

RESULTS

According to the description of the respondents' characteristics, the majority of the respondents, 87 people (80.5%), were female. It was assumed that women have a greater tendency to develop hypertension. It is also known that 60 people (55.6%) were between the ages of 41 and 50. It revealed a shift in the hypertension phenomenon from the elderly to young people who are still productive. In addition, the majority of respondents, 92 (85.2%), had hypertension for 0–5 years. It was assumed that hypertensive patients still needed literacy about hypertension.

Based on Table I, there was a statistically significant difference in self-care knowledge with a mean difference of 3.09 (95% CI 2.41–3.77; $p = 0.000 < 0.05$) and self-care behavior with a mean difference of 9.52 (11.42) (95% CI 2.41–3.77; $p = 0.000 < 0.05$) before and after the android-based hypertension self care education intervention. It was discovered that a three-month android-based hypertension self-care education intervention effectively improved hypertension self-care knowledge and behavior.

According to Table II, after three months of an android-based hypertension self-care education intervention, there was a statistically significant difference in self-care knowledge in the intervention group, with a mean difference of 3.59 (95% CI 2.54 to 4.63; $p=0.000 <0.05$). A significant difference in self-care behaviour was also observed, with

Table I : Mean Differences of both groups

Variable	Intervention Group n = 54		Control Group n = 54		P - Value	Mean Difference (CI95%)
	Mean	SD	Mean	SD		
Self-Care Knowledge	32.44	2.47	28.85	2.98	0.000	3.59 (2.54 – 4.63)
Self-Care Behaviour	75.69	9.36	69.63	10.91	0.003	6.06 (2.18 – 9.93)

Table II : Mean Differences of Interventions

Variable	Before Intervention n = 54		After Intervention n = 54		P - Value	Mean Difference (CI95%)
	Mean	SD	Mean	SD		
Self-Care Knowledge	29.28	3.18	32.37	2.28	0.000	3.09 (2.41 – 3.77)
Self-Care Behaviour	66.17	11.56	75.69	9.36	0.000	9.52 (6.40 – 12.63)

a mean difference of 6.06 (95% CI 2.18 – 9.93; p-value = 0.003 <0.05).

DISCUSSION

Statistical analysis revealed a significant difference in self-care knowledge and self-care behavior before and after the intervention (p= 0.000<0.05). It is assumed that android-based hypertension self-care education has a role in enhancing self-care knowledge. This study revealed a significant difference in the self-care knowledge of the intervention group compared to the control group, with p=0.00 <0.05. It suggests that educational interventions enhance the self-care knowledge of hypertensive patients effectively. Knowledge is the main component that plays a role in self-care behavior. It has a significant impact on hypertensive patients' ability to self-care (16). A similar study also states that knowledge affects the self-care process in hypertensive patients (17). In this study, self-care knowledge is understanding the theory of hypertension, and self-care demand, including dimensions of definition, medical treatment, drug compliance, lifestyle, diet, and complications (13, 18). The previous research stated that an educational intervention in hypertensive patients based on a smartphone application increased the hypertension patients' knowledge effectively (19).

Statistically, there was a significant difference in self-care behavior before and after the intervention, with a p-value = 0.000 <0.005. This study also revealed a significant difference in self-care behavior between the intervention and control groups, with p=0.003 <0.05. It showed that self-care education improved the self-care behavior of hypertensive patients effectively. The study's finding followed previous studies that found a relationship between hypertension education and the self-care behavior of hypertensive patients (20). The research conducted by Fadilah stated that mobile-based health interventions were effective in blood pressure control and medication adherence in hypertensive patients (21). The results of other studies suggested that mobile applications had a positive potential to improve the self-care behavior of hypertensive patients and significantly lower blood pressure (22). This study measures self-care behavior, including medication components, weight management, a salt, low-fat diet, physical activity, alcohol consumption, smoking, stress management, and blood pressure measurement. These components are according to recommendations of the Joint National Committee on the prevention, detection, evaluation, and treatment of high blood pressure.

Hypertension self-care education is a necessary component of hypertension management. The android-based hypertension self-care education intervention is one method that is statistically effective in increasing self-care knowledge and behaviour in hypertensive patients. The advantage of this intervention is that education using this Android

mobile application makes it possible for everyone to access and learn it repeatedly at any time. This application has a chat forum where everyone can ask questions about hypertension. There is also an activity video menu for hypertension that everyone can play anytime. These resources can help hypertensive patients improve their self-care knowledge and behaviour after three months of education. The previous study stated that education using smartphone applications could facilitate delivering information, reminding, providing feedback, monitoring, and communication (23). Self-care behaviour is a necessary indicator for controlling hypertension. However, this self-care behaviour is also the primary issue in hypertensive patients, necessitating the assistance of a nursing agency to improve hypertension self-care behavior. One of the appropriate interventions in this condition is hypertension education, following the community's needs as a supportive educational system.

The android-based hypertension self-care management education implementation acts as a nursing agency: a supportive educational system to improve self-care knowledge (24). Another study also found that progressive muscle relaxation combined with other therapies have good effect on hypertension. (25) The Supportive Educative System is part of the Basic Nursing System as a nursing agency to help individuals fulfil self-care demands so that patients can perform self-care optimally. The educational-developmental system is the most appropriate to help hypertensive patients improve self-care behavior. Self-care education includes educational activities, support for lifestyle modification, and support to help individuals develop the skills that are needed by the patient for the effective management of chronic diseases (26). Health education supports a nursing system and a self-care agency and influences self-care behavior (27).

CONCLUSION

Following hypertension self-care education using an Android application for three months enhanced the hypertensive patients' self-care knowledge and behaviour effectively. According to the findings of the study, nurses should educate hypertensive patients about self-care. Android-based hypertension self-care education can be a nursing intervention to improve hypertensive patients' self-care knowledge and behavior.

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