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Health Volunteers and E-Booklet Impact on Knowledge and Treatment Adherence in Hypertension Patient

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ABSTRACT

Hypertension is a disease with a global prevalence of 1.3 billion cases in 2019, which is the leading cause of cardiovascular morbidity and mortality. The prevalence of hypertension in Indonesia is 34.1% among the adult population, with a mortality rate of 427,218. The failure of hypertension patient management is mostly due to a lack of awareness of the importance of adherence to hypertension treatment and a lack of knowledge. This study aims to determine the effect of health education by health volunteers using e-booklet on the knowledge and adherence to treatment of hypertensive patients at Batujajar Health Center area. This study used a quasi-experimental design with intervention and control groups. The sample in this study consisted of 32 respondents, who were selected using the purposive sampling technique. The results showed that health education by health volunteers using e-booklet significantly increased the mean knowledge of hypertensive patients, with the mean value of knowledge rising from 75.6 to 86.8 after the intervention. Patients' adherence to treatment also increased, with the mean value rising from 4.4 to 6. The results showed a significant positive effect on both variables, with a p-value of 0.016 for knowledge and 0.001 for treatment adherence, respectively. Based on the findings, health education conducted by health volunteers using e-booklets significantly impacts the knowledge and medication adherence of hypertension patients in the Batujajar Health Center area. It is recommended that health volunteer training be conducted periodically by healthcare professional and that the e-booklet be utilized as an educational tool at the health center and as a credible reference source for the community.

***Keywords**: Adherence; E-Booklet; Health Volunteers; Health Education; Hypertension; Knowledge*

ABSTRAK
Hipertensi menjadi penyakit dengan prevalensi global 1,3 miliar kasus pada 2019 yang merupakan penyebab utama morbiditas dan mortalitas kardiovaskular. Di Indonesia, prevalensi hipertensi sebesar 34,1% diantara populasi dewasa dengan angka kematian mencapai 427.218. Kegagalan manajemen pasien hipertensi mayoritas dikarenakan kurangnya kesadaran pentingnya patuh terhadap pengobatan hipertensi dan kurangnya pengetahuan. Penelitian ini bertujuan untuk mengetahui pengaruh pendidikan kesehatan oleh kader menggunakan e-booklet terhadap pengetahuan dan kepatuhan pengobatan pasien hipertensi di wilayah Puskesmas Batujajar. Penelitian ini menggunakan desain quasi eksperimental dengan kelompok intervensi dan kontrol. Sampel dalam penelitian ini sebanyak 32 responden yang dipilih melalui teknik purposive sampling. Hasil penelitian ini menunjukan pendidikan kesehatan oleh kader menggunakan e-booklet secara signifikan meningkatkan rerata pengetahuan pasien hipertensi, dengan nilai rerata pengetahuan naik dari 75,6 menjadi 86,8. Kepatuhan pengobatan pasien juga meningkat, dengan nilai rerata naik dari 4,4 menjadi 6. Hasil penelitian menunjukkan pengaruh positif signifikan pada kedua variabel, dengan masing-masing p-value 0,016 untuk pengetahuan dan 0,001 untuk kepatuhan pengobatan. Sehingga dapat disimpulkan bahwa pendidikan kesehatan oleh kader dengan media e-booklet memberikan pengaruh signifikan terhadap pengetahuan dan kepatuhan pengobatan pasien hipertensi di wilayah Puskesmas Batujajar. Disarankan agar pelatihan kader dapat dilakukan secara berkala oleh petugas puskesmas dan memanfaatkan e-booklet ini sebagai alat pendidikan di puskesmas serta sumber referensi yang kredibel bagi masyarakat.
Kata Kunci: *E-Booklet*; Hipertensi; Kader; Kepatuhan; Pendidikan Kesehatan; Pengetahuan

INTRODUCTION

Hypertension is a highly significant global health problem, with a prevalence exceeding one billion cases worldwide (Mills et al., 2020). From 1990 to 2019, the number of people with hypertension doubled, reaching 1.3 billion people, representing 31% of the global adult population (WHO, 2023). In Indonesia, in 2018 there were approximately 63,309,620 people with hypertension, represent for 34.1% of the adult population, with hypertension mortality reaching 427,218 people (Riskesdas, 2018). In the West Java region, the annual mean of hypertension patients accessing health services reached 3,627,479.75 people, while West Bandung Regency reported 80,543 cases in the last two years (Open Data Jabar, 2023). At Puskesmas Batujajar, hypertension is the non-communicable disease with the highest prevalence, increasing from 1,244 cases in 2022 to 1,717 cases in 2023 (Puskesmas Batujajar Profile, 2023).

The incidence of hypertension is influenced by various factors, both genetic and environmental. Factors such as heredity, gender, stress, cigarette consumption, coffee, and daily activity patterns have an important role in the development of hypertension (Ayu et al., 2022; Irawan et al., 2020). Modifiable environmental factors, such as obesity, salt intake, physical activity, and alcohol consumption, contribute significantly to the risk of

hypertension (Mills et al., 2020). Uncontrolled hypertension can lead to a range of serious cardiovascular complications, including heart failure, stroke, and coronary heart disease, and accounts for 10.4 million global deaths (Kotruchin et al., 2021; Lukitaningtyas & Cahyono, 2023; Rodrigues et al., 2023). In Indonesia, hypertension causes 1.5% of coronary heart disease cases and 12.1% of stroke cases (Susanti et al., 2021).

In an effort to reduce the incidence of non-communicable diseases such as hypertension, Posbindu Non-Communicable Diseases has been developed, which is an integral part of the health care system and includes various promotive and preventive efforts. The development of a community-based non-communicable disease control model through Posbindu is a form of community participation in efforts to control risk factors independently and continuously (Ministry of Health Indonesia, 2018). However, the utilization of Posbindu by the community is still not optimal, which is caused by several factors including knowledge (Nurhayati, 2020).

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Knowledge about hypertension is essential in preventing and managing this disease. Patients who have good knowledge about hypertension are more likely to adhere to treatment and take preventive measures to avoid complications (Anshari, 2019). Conversely, a lack of understanding can result in treatment non-adherence, with less knowledgeable patients having a 1.503 times greater risk of not adhering to antihypertensive treatment (Fauziah & Mulyani, 2022). In addition, many hypertensive patients are unaware of the early symptoms of hypertension and often consider them trivial, which reduces their motivation to follow the recommended therapy (Lewis in Syukkur et al., 2022).

Health centers have a key role in hypertension prevention through health education, which involves health volunteerto improve community knowledge and adherence to hypertension treatment. Health cadres, who are part of the community have a role in health counseling and motivating the community to lead a healthy lifestyle (Kemenkes RI, 2019; Putri & Suhartiningsih, 2020). However, many health volunteerdo not have a history of health education, which can hinder the effectiveness of counseling (Hidayati, 2021). Therefore, it is important to improve cadres' knowledge through effective health education. The use of e-booklets as a health education medium can significantly enhance the knowledge and adherence of hypertensive patients (Muwakhidah et al., 2021; Okiningrum & Handayani, 2023).

This study aims to evaluate the effect of health education by health volunteerusing e-booklets on the level of knowledge and treatment adherence of hypertensive patients at the Batujajar Health Center. Referring to Imogene King's theory of interaction as an open system, this study seeks to show how e-booklets can improve the knowledge and adherence of hypertension patients. The training of health volunteerand the provision of e-booklet, it is expected to enhance the quality of life and life expectancy of hypertensive patients, as well as reduce the risk of complications and mortality due to hypertension (Rofii et al., 2021; Syukkur et al., 2022).

METHOD

The design in this study used a quasi-experimental design with an intervention group and a control group. Respondents in the intervention group were given health education treatment by health volunteer with e-booklet media while respondents in control group were not given special treatment. The number of samples in this study 32 respondents, with each group totaling 16 respondents. The sample selection technique in this study used purposive sampling and cluster random sampling to choose representative respondent from each area (*RW*). The inclusion criteria in this study were hypertensive patients who took antihypertensive drugs, understood and able to read Indonesian, had a cell phone with specifications capable of opening PDF files and an internet connection, and willing to voluntarily participate in a series of study activities by signing an informed-consent sheet. The exclusion criteria are hypertensive patients with an age of more than 60 years and pregnant women. This study was conducted from May to June 2024 in the Galanggang Village area of the Batujajar Health Center. In the initial phase, the researchers selected health volunteer to be trained in health education based on specific criteria and clusters. The clustering process identified six health volunteer, who were then trained to conduct health education over one day. The training was delivered by a certified expert with a *TPK* certificate. To ensure consistent perceptions between the trainer and the researchers, an inter-rater reliability test was conducted. Once the health volunteer met the competency standards, they proceeded to conduct health education to the intervention group using an e-booklet. At the start of the health education session, a pre-test was conducted to assess knowledge and adherence. Following the pre-test, the health volunteer conducted the health education session using the e-booklet for 15 minutes. After the session, respondents were given access to the e-booklet on their mobile phones for any time and anywhere access as

needed. A post-test on knowledge was conducted 3 days after the intervention, while a follow-up post-test for adherence was conducted 14 days after the intervention.

The standardized instruments that have been tested for validity and reliability used were the HKLS questionnaire to measure knowledge (r n is greater than r table 0.181 and 0.537 and Cronbach alpha = 0.758) and MMAS to measure medication adherence (all question are valid, Spearman Rank Order -0.199; p: 0.218 and Cronbach alpha=0.759). In addition to these two instruments, this study also used e-booklets (the average test score from all experts is 91.4% or strongly valid), e-booklet validation forms, health volunteer training modules, health education *SAP*, and health education SOP outside the Puskesmas building. Data analysis used univariate and bivariate analysis with the help of the SPSS.29 application. Univariate was used to determine the characteristics of respondents and bivariate was used to compare between two variables. The bivariate tests used were t-test, Wilcoxon, and Mann-Whitney.

RESULT

Table 1

Frequency Distribution of Respondent Demographic Data

Characteristics	Frequency			
	Intervention		Control	
	N	%	N	%
Age				
Early Adulthood (15-40)	1	6.25	2	12.5
Late Adulthood (41-60)	15	93.75	14	87.5
Educational Background				
Low (*SD-SMP*)	10	62.5	11	68.75
Middle (*SMA*-Academy)	6	37.5	5	31.25
Gender				
Female	16	100	16	100

1. Demographic Data

Table 1 shows the frequency distribution of respondent data based on age, education level, and gender. The majority of respondents were in the age range of 41-60 years (93.73%) in the intervention group and (87.5%) in the control group. The majority of respondents' educational background was in the low category (62.5%) in the intervention group and (68.75%) in the control group, and all respondents were female.

2. The Effect of Health Education on the Mean Knowledge of the Intervention Group

Based on Table 2, the mean value of knowledge before the intervention was 75.69, while the mean value of knowledge after the intervention was 86.81 with a p-value=0.016<α=0.05, then Ho was rejected. Therefore, it is concluded that there is a difference in the mean value of knowledge of hypertensive patients before and after health volunteer conducted health education using e-booklet media.

Table 2

Wilcoxon Statistical Test Results Mean Knowledge of Intervention Group Respondents

Intervention Group	*Mean*	Min-Max	*p-value*	*Z*	*n*
Pre-Test	75.69	27-91	0.016	-2.420	16
Post-Test	86.81	68-95			

Table 3

Paired T-Test Statistical Test Results Mean Adherence of Intervention Group Respondents

Intervention Group	*Mean*	*Std. Error of Mean*	*Std. Deviation*	*p-value*	n
Pre-Test	4.43	0.393	1.573	0.001	16
Post-Test	6.05	0.288	1.154		

3. The Effect of Health Education on the Mean Adherence of the Intervention Group

Based on Table 3, the mean value of adherence before the intervention was 4.67 (Standard Deviation 1.573), while after the intervention the mean value of adherence was 6.05 (Standard Deviation 1.154) with a p-value = 0.001 <α = 0.05, then Ho is rejected. Therefore, it is concluded that there is a difference in the mean treatment adherence of hypertensive patients before and after health education conducted by health volunteert hrough e-booklet media.

4. Mean Knowledge of Control Group

Based on Table 4, the results of the measurement before the mean value of the level of knowledge was 72.87 (Standard Deviation 14.380), while the measurement after the mean value of the level of knowledge was 73.75, (Standard Deviation 13.513) with a p-value = 0.245> α = 0.05, then Ho is accepted. Therefore, before and after showed no difference in the mean knowledge of patients regarding hypertension in the control group.

5. Mean Adherence to Treatment of Control Group Respondents

Based on Table 5, the results of the measurement before the mean value of treatment adherence was 5.11 (Standard Deviation 1.820), while the measurement after the mean value of treatment adherence was 5.28 (Standard Deviation 1.975) with a

p-value = 0.258> α = 0.05, then Ho is accepted. Therefore, before and after showed no difference in mean adherence in the control group.

Table 4

Results of Paired T-Test Statistical Test of Mean Knowledge of Control Group Respondents

Control Group	*Mean*	*Std. Error of Mean*	*Std. Deviation*	*p-value*	n
Pre-Test	72.87	3.595	14.380	0.245	16
Post-Test	73.75	3.378	13.513		

Table 5

Paired T-Test Statistical Test Results Mean Adherence of Control Group Respondents

Control Group	*Mean*	*Std. Error of Mean*	*Std. Deviation*	*p-value*	*n*
Pre-Test	5.11	0.455	1.820	0.258	16
Post-Test	5.28	0.494	1.975		

Table 6

Results of Mann-Whitney Statistical Test and Unpaired T-Test of Mean Knowledge and Compliance Between Intervention and Control Group Respondents

Variable	Group	*Mean*	*p-value*
Knowledge	*Post* Intervention	21.16	0.004
	Post Control	11.84	
Adherence	*Post* Intervention	6.05	0.004
	Post Control	5.28	

6. Mean Difference in Knowledge and Adherence Between Intervention and Control Groups

Based on Table 6, the results of measuring knowledge variables with the Mann-Whitney test on intervention group respondents obtained a mean value of 21.16, and control group respondents obtained a mean value of 11.84. The results of measuring adherence variables with the Unpaired T-Test test on intervention group respondents obtained an mean value of 6.05 and control group respondents obtained an mean value of 5.28. The results of the non-parametric test of 2 unpaired groups on the variables of knowledge and adherence both obtained a p-value = 0.004 <α = 0.05, so Ho is rejected. Therefore, it can be concluded that between the intervention and control groups, there are differences in knowledge and adherence to the treatment of hypertensive patients after health volunteer conduct health education through e-booklet media.

DISCUSSION

The majority of respondents were in the age range of 41-60 years (93.73%) in the intervention group and (87.5%) in the control group. Handayani (2022), blood pressure continues to increase with age. the average person will begin to experience an increase in blood pressure at the age of 40 years or even earlier. The results of the field found that the average patient with hypertension is in the age range of adulthood to late adulthood.

The study showed that health education intervention using e-booklet significantly improved the knowledge of hypertensive patients in the intervention group. The mean value of knowledge increased from 75.69 before the intervention to 86.81 after the intervention. In contrast, the control group did not experience any significant change in their knowledge, with the mean value remaining at around 72.87 before and 73.75 after measurement.

These findings are consistent with previous studies showing that interactive and structured educational methods, such as the use of e-booklets, can significantly improve patients' health knowledge (Anggraini et al., 2023; Sari & Werdiharini, 2020). E-booklets conduct easy access to well-organized information, allowing patients to learn and understand information in a more in-depth and sustainable manner (Chuang et al., 2022).

The study further found that medication adherence of patients in the intervention group increased significantly from a mean value of 4.43 before the intervention to 6.05 after the intervention. On the other hand, the control group showed almost unchanged mean values of 5.11 before and 5.28 after the intervention, indicating no significant increase in adherence.

The low adherence in the control group could be attributed to the lack of knowledge and accurate information regarding hypertension treatment (Kartikasari et al., 2022; Mahardika & Ayu Made Adyani, 2023). Limited knowledge often leads patients to feel that there is no need to continue treatment if they do not feel obvious symptoms. In addition, they are also concerned about the side effects of long-term drug use. Previous studies have shown that clear and continuous education can improve medication adherence by providing the necessary information to understand the importance of long-term treatment (Langston et al., 2019; Lukitasari et al., 2021).

Statistical analysis revealed a significant difference in both knowledge and adherence to treatment between the intervention group and the control group, with p-values of

0.016 and 0.001, respectively. These results indicate that the intervention using the e-booklet had a more significant impact compared to no intervention. Correlation tests (Pearson and Spearman) demonstrated that other confounding factors, such as age and education level, did not significantly affect patients' knowledge and adherence. This reinforces the finding that educational interventions by health volunteer using the e-booklet are a key factor in improving health outcomes for hypertensive patients.

Health volunteer, as part of the community, can build closer relationships with patients, improving communication and adherence (Iseghem et al., 2023; Jumaroh & Nafi'ah, 2023). Trained health volunteer can conduct more relevant and contextualized information for patients, and support them in overcoming challenges in hypertension management. Overall, the health education intervention by health volunteer with e-booklet media showed significant improvement in knowledge and medication adherence of hypertensive patients. The e-booklet provided organized and easily accessible information, which contributed to increased patient understanding and engagement in their care. Health education by health volunteer was also shown to be effective in improving medication adherence, thanks to their ability to build close social relationships with patients. These findings emphasize the importance of interactive educational approaches and support from health health volunteer in hypertension management and can be used as a basis for the development of more comprehensive and effective health education methods in the community.

CONCLUSION

The mean knowledge of patients about hypertension before health education by health volunteer with e-booklet media tends to be sufficient and the mean knowledge of patients about hypertension after health education by health volunteer with e-booklet media tends to have a significant increase with a good category.

The mean patient medication adherence before health education by health volunteer with e-booklet media tends to be low and the mean patient medication adherence after health education by health volunteerwith e-booklet media tends to have a significant increase with the category of adherence and moderate adherence.

There is an effect of health education by health volunteer with e-booklet media on the mean knowledge and treatment adherence of hypertension patients in the Batujajar Health Center area, West Bandung Regency in the form of a significant increase in the mean value of knowledge and treatment compliance.

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