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EFFECTIVENESS OF A HEALTH BEHAVIOR MODULE BASED ON TRANSCULTURAL NURSING IN EFFORTS TO PREVENT CARDIOVASCULAR COMPLICATIONS ON HYPERTENSION PATIENTS IN THE COMMUNITY

Israfil[1], Ah Yusuf[2]*, Ferry Efendi[2]
[1]Faculty of Health, Institut Teknologi dan Kesehatan Bali, South Denpasar, Denpasar, Bali 80227, Indonesia
[2]Faculty of Nursing, Universitas Airlangga, Mulyorejo, Surabaya, East Java 60115, Indonesia
*ah-yusuf@fkp.unair.ac.id

ABSTRACT
Hypertension is a chronic non-communicable disease which, if not treated properly, will cause cardiovascular complications which are the cause of disability and death in communities throughout the world. Patient behavior that does not follow hypertension management guidelines is a major factor in the risk of cardiovascular complications in hypertensive patients in the community. The aim of this research is to determine the effectiveness of a health behavior module based on transcultural nursing in efforts to prevent cardiovascular complications on hypertensive patients in the community. The research design was a quasi experiment with a pre-post-test control group design. The sample size used the two-proportion difference hypothesis test formula and obtained 50 treatment samples and 50 control samples. The research sample was taken using a purposive sampling technique based on predetermined inclusion criteria. The research data were analyzed descriptively, homogeneity test using Levene Statistics, Wilcoxon pre-post difference test for each group, and simultaneous pre-post difference test for both groups with Mann-Whitney. Results of the test for equality of respondent characteristics p-value = > 0.05, Wilcoxon test in the treatment group p-value = 0.000, control group p-value = > 0.05, Mann Whitney test pre test p-value > 0.05 and post test < 0.05. Conclusion: Behavioral module interventions to prevent cardiovascular complications based on transcultural nursing have proven to be effective in increasing efforts to prevent cardiovascular complications in hypertensive patients, namely by carrying out routine health checks, taking antihypertensive medication, adopting a healthy lifestyle, and being independent in self-care.

Keywords: health behavior module; hypertension; transcultural nursing

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INTRODUCTION

Hypertension is a chronic non-communicable disease which, if not treated properly, will cause cardiovascular complications such as coronary heart disease, stroke, heart failure and other heart diseases (Baumann et al. 2019) . Cardiovascular disease is a complication of hypertension which has become the main cause of morbidity and mortality in communities throughout the world (Baumann et al. 2019) . The main risk factor for cardiovascular complications in hypertensive patients is behavioral factors (Indonesian Ministry of Health 2019) . The behavior of hypertensive patients who do not implement hypertension disease management guidelines is a major factor in the risk of cardiovascular complications and target organ damage in hypertensive patients (Abegaz, et al, 2017) . The behavior of hypertensive patients in society can be influenced by the culture in society which provides different traditional and professional health care knowledge and practices to individuals and groups (Leininger and McFarland 2002) .

The World Health Organization *(WHO*) estimates that 1.13 billion people worldwide suffer from hypertension (WHO 2020) . It is estimated that 17.9 million people die from cardiovascular disease and as many as 85% of these deaths are caused by heart attacks and strokes (WHO 2021) . The results of the RI Ministry of Health's Riskesdas 2018 found that the prevalence of hypertension in Indonesia increased from 25.8% in 2013 to 34.1% in 2018. The prevalence of stroke as a type of hypertension complication increased from 7% to 10.9%, and the prevalence of heart disease reaches 1.5% (RI Ministry of Health 2018) . Prevention of complications can be done by increasing knowledge and disease control behavior in hypertensive patients. The behavioral module for preventing cardiovascular complications in hypertensive patients based on transcultural nursing is the result of model development, literature studies, focus group discussions, and expert consultations that have been carried out in previous research (Israfil, Yusuf, and Efendi 2024) .

The resulting module was consulted with experts, namely medical doctor in heart and blood vessel specialists and nurse practitioners in the field of community nursing. The module contains seven material chapters, namely 1) the concept of hypertension and the dangers of cardiovascular complications, 2) daily habits that are at risk of cardiovascular complications in hypertensive patients, 3) health checks, drug consumption, and healthy lifestyles for hypertensive patients in preventing cardiovascular complications, 4) plants family medicine and culture that are useful in preventing cardiovascular complications in hypertensive patients, 5) the role of the family in preventing cardiovascular complications in hypertensive patients, 6) community health center programs in preventing cardiovascular complications in hypertensive patients, and 7) views and advice of religious leaders to hypertensive patients in prevention of cardiovascular complications (Israfil, Yusuf, and Efendi 2024) . This study aims to determine the effectiveness of a health behavior module based on *transcultural nursing* in efforts to prevent cardiovascular complications on hypertensive patients in the community.

METHOD

The research design is *a quasi experiment* with a *pre-post-test control group design* . *Quasi-experiment* . The sample size was determined using the two-proportion difference hypothesis test formula according to Lemeshow and obtained 50 treatment samples and 50 control samples. Samples were taken using *purposive sampling technique* based on the inclusion criteria, namely that the patient has been diagnosed with hypertension for the first time > 6 months, is aged ≥ 45 – ≤ 65 years, can read and write, is not compliant with health control, is not compliant with taking antihypertensive medication, and is not compliant with a hypertension diet. Patients who have experienced cardiovascular complications such as CAD, Angina Pectoris, MI, Non-Hemorrhagic Stroke, have cognitive disorders such as dementia, have psychosocial disorders such as anxiety and paranoia, and are not willing to be respondents have been excluded from this study.

Data collection was carried out by forming two groups of hypertension patients, namely the treatment group and the control group. Both groups of respondents underwent *a pre-test* to determine the efforts they had taken to prevent cardiovascular complications before the intervention was given. Hypertensive patients in the treatment group were then given a *transcultural nursing*- based health behavior module that had been developed, while hypertensive patients in the control group were given health services according to standards at the local health center by receiving leaflets. The intervention in the treatment group was carried out using an approach that we named IBILKREM and BaTalSakiT. IBILKREM (Ingatkan Baca, Ingatkan Lakukan, Kunjungan Rumah, Evaluasi dan Monitoring) is carried out by health workers, which is an abbreviation for "Remind to Read, Remind to Do, Home

Visits, Evaluation and Monitoring". BaTaLSaKiT (Baca, Tanya, Lakukan, Sampaikan, Kunjungi, Ikuti Terapi) is carried out by the patient, namely "Read, Ask, Do, Tell, Visit, Follow Therapy". The intervention was carried out for 12 weeks and then a post-test was carried out to determine the efforts to prevent cardiovascular complications that had been carried out by hypertensive patients. This research was carried out in the work area of the Community Health Center in Kupang City in September-November 2023.

The research data were analyzed descriptively to describe each variable. Equality test analysis uses Levene Statistics to ensure that the characteristics of respondents are similar between the treatment group and the control group with the test results stating that the data is equal or homogeneous if the significance value is $p \geq 0.05$. *Wilcoxon test* to assess differences in efforts to prevent cardiovascular complications in each group before and after intervention. *Mann-whitne* y test to see the treatment effect in the intervention group and control group simultaneously. The research has been registered and passed ethics at the Research Ethics Commission of the Faculty of Nursing, Airlangga University with Ethical Approval No : 2640-KEPK.

RESULTS

Table 1.
Distribution of characteristics and equality of patients in the treatment group and control group (n=100)

No	Characteristics	Group		Equality Test
		Treatment (n=50) f (%)	Control (n=50) f (%)	
1	Gender			
	Man	18 (36 .0 %)	17 (34 .0 %)	p=0.679
	Woman	32 (64 .0 %)	33 (66 .0 %)	
2	Age			
	35-44 years old	3 (6 .0 %)	5 (10 .0 %)	p=0.378
	45-54 years old	17 (34 .0 %)	20 (40 .0 %)	
	55-65 years old	30 (60 .0 %)	25 (50 .0 %)	
3	Level of education			
	elementary school	8 (16 .0 %)	9 (18 .0 %)	
	Middle/Junior High School	10 (20 .0 %)	9 (18 .0 %)	p=0.527
	high school/high school	23 (46 .0 %)	20 (40 .0 %)	
	College	9 (18 .0 %)	12 (24 .0 %)	
4	Work			
	Civil servants/ASN	6 (12 .0 %)	11 (22 .0 %)	p=0.266
	Private	17 (34 .0 %)	2 (4 .0 %)	
	Doesn't work	27 (54 .0 %)	37 (74 .0 %)	
5	Religion			
	Islam	6 (12 .0 %)	7 (14 .0 %)	p=0.318
	Catholic	7 (14.0%	14 (28 .0 %)	
	Protestant	36 (72 .0 %)	29 (58 .0 %)	
	Hindu	1 (2 .0 %)	0 (0 .0 %)	
6	Suffering from hypertension for a long time			
	< 5 years	43 (86 .0 %)	41 (82 .0 %)	p=0.280
	6 – 10 years	7 (14 .0 %)	9 (18 .0 %)	
7	PBJS Ownership			
	Yes	50 (100%)	50 (100%)	.
	No	0 (0%)	0 (0%)	

Table 1 shows that the majority of hypertensive patients in the treatment group and control group were female, 64.0% and 66.0%, 60.0 and 50.0% were aged between 55-65 years, 46.0% and 40.0%. % have high school education, 54.0% and 74.0% do not work, 72.0% and

58.0% are Protestant Christians, 86.0% and 82.0% suffer from hypertension < 5 years, and 100% and 100% have BPJS Health insurance. The results of the equality test show that all respondents' characteristics have a p value > 0.05 , which indicates that the characteristics of respondents in the treatment group and control group are homogeneous or equal.

Table 2.
Frequency distribution of efforts to prevent cardiovascular complications in hypertensive patients before and after intervention (n=100)

No	Efforts to prevent cardiovascular complications	PRE		POST	
		Treatment Group (n=50) f (%)	Control Group (n=50) f (%)	Treatment Group (n=50) f (%)	Control Group (n=50) f (%)
1	Medical examination				
	Good	0 (0%)	0 (0%)	8 (16 .0 %)	0 (0%)
	Enough	5 (10 .0 %)	6 (12 .0 %)	42 (84 .0 %)	8 (16 .0 %)
	Not enough	45 (90 .0 %)	44 (88 .0 %)	0 (0%)	42 (84.0%
2	Treatment				
	Good	0 (0%)	0 (0%)	41 (82 .0 %)	1 (2 .0 %)
	Enough	11 (22 .0 %)	10 (20 .0 %)	9 (18 .0 %)	10 (20 .0 %)
	Not enough	39 (78 .0 %)	40 (80 .0 %)	0 (0%)	39 (78 .0 %)
3	Healthy lifestyle				
	Good	0 (0%)	0 (0%)	29 (58 .0 %)	0 (0%)
	Enough	14 (28 .0 %)	15 (30 .0 %)	21 (42 .0 %)	17(34 .0 %)
	Not enough	36 (72 .0 %)	35 (70 .0 %)	0 (0%)	33 (66 .0 %)
4	Independent in self-care				
	Good	0 (0%)	0 (0%)	35 (70 .0 %)	0 (0 .0 %)
	Enough	26 (52 .0 %)	19 (38 .0 %)	15 (30 .0 %)	19 (38 .0 %)
	Not enough	24 (48.0%)	31 (62 .0 %)	0 (0%)	31 (62 .0 %)

Table 2 shows that the majority of efforts to prevent cardiovascular complications before providing intervention in the treatment group and control group were 90.0% and 88.0% poor in health examination efforts, 78.0% and 80.0% poor in hypertension treatment efforts , 72.0% and 70.0% were not good at healthy lifestyle efforts, and 48.0% and 62.0% were not good at independence. After intervention in the treatment group were 84.0% good enough for health checks, 82.0% good for treatment or consumption of anti-hertensive drugs, 58.0% good for a healthy lifestyle, and 70 .0% good at independence. Meanwhile, in the control group there were no significant changes, namely 84.0% were poor in health checks, 78.0% were poor in taking antihypertensive medication, 66.0% were poor in healthy lifestyle, and 62.0% were poor in independence.

Table 3 shows that all indicators of efforts to prevent cardiovascular complications in hypertension patients in the treatment group have a p-value of 0.000, while in the control group they have varying p-values, all of which are more than 0.05 . The results of this statistical analysis show that the behavioral module for preventing cardiovascular complications based on *transcultural nursing* in the treatment group was effective or had a significant influence on efforts to prevent cardiovascular complications in hypertensive patients, while services by providing leaflets in the control group were found to be less effective or did not have a significant influence on efforts. prevention of cardiovascular complications in hypertensive patients.

Table 3.
Effectiveness of transcultural nursing-based cardiovascular complication prevention behavioral modules and standard interventions using leaflets on efforts to prevent cardiovascular complications in groups of hypertensive patients (n=100)

Efforts to prevent cardiovascular complications	*Wilcoxon Signed Ranks Test*	Group			
		Treatment (n=50)		Control (n=50)	
		Pre	Post	Pre	Post
Medical examination	Mean	1.10	2.16	1.12	1.16
	elementary school	0.30	0.37	0.32	0.37
	Minimum	1	2	1	1
	Maximum	2	3	2	2
	Z	-6,887		-1,414	
	p-value	0,000		0.157	
Treatment	Mean	1.22	2.82	1.20	1.24
	elementary school	0.41	0.38	0.40	0.47
	Minimum	1	2	1	1
	Maximum	2	3	2	3
	Z	-6,374		-0.632	
	p-value	0,000		0.527	
Healthy lifestyle	Mean	1.28	2.58	1.30	1.34
	elementary school	0.45	0.49	0.46	0.47
	Minimum	1	2	1	1
	Maximum	2	3	2	2
	Z	-6,450		-1,414	
	p-value	0,000		0.157	
Independent in self-care	Mean	1.52	2.70	1.38	1.38
	elementary school	0.50	0.46	0.49	0.49
	Minimum	1	2	1	1
	Maximum	2	3	2	2
	Z	-6,617		0,000	
	p-value	0,000		1,000	

Table 4.
Pre and post intervention differences in the two groups of hypertensive patients simultaneously (n=100)

Efforts to prevent cardiovascular complications	Test	Group	Mean	Sig.	Information
Medical examination	*Pre test*	Intervention	50.00		No
		Control	51.00	0,750	Significant
	Post test	Intervention	72.14		
		Control	28.86	0,000	Significant
Treatment	*Pre test*	Intervention	51.00		No
		Control	50.00	0.807	Significant
	Post test	Intervention	74.01		
		Control	2 8.86	0,000	Significant
Healthy lifestyle	*Pre test*	Intervention	50.00		No
		Control	51.00	0.82 6	Significant
	Post test	Intervention	71.93		
		Control	2 9.07	0,000	Significant
Independent in self-care	*Pre test*	Intervention	54.00		No
		Control	47.00	0.162	Significant
	Post test	Intervention	72.65		
		Control	28.35	0,000	Significant

Table 4 of the Mann Whitney statistical test shows that all indicators of efforts to prevent cardiovascular complications in hypertensive patients in the treatment group and control

group in the pre test had a p-value > 0.05, and the post test had a value < 0.05. The results of this analysis show that there is no significant difference in the *pre-test scores* in the two groups before giving the intervention, and there is a significant difference in the *post-test scores* in the two groups after giving the intervention. These results indicate that the behavioral module intervention to prevent cardiovascular complications based on *transcultural nursing* has proven to be effective in increasing efforts to prevent cardiovascular complications in hypertensive patients.

DISCUSSION

The results of the study showed that the behavioral module intervention to prevent cardiovascular complications in hypertensive patients based on *transcultural nursing* was proven to be effective in influencing increased efforts to prevent cardiovascular complications in hypertensive patients, namely health checks, consumption of antihypertensive drugs, healthy lifestyles, and independent in self-care. The effectiveness of the module is influenced by several factors, the material or content of the module, independent practice, and the way the module is implemented are thought to be factors that cause the effectiveness of the module intervention. The behavior module for preventing cardiovascular complications in hypertensive patients based on *transcultural nursing* has seven material topics derived from the results of the model development in this research, namely 1) the concept of hypertension and the dangers of cardiovascular complications, 2) daily habits that pose a risk of cardiovascular complications in hypertensive patients, 3) health checks, drug consumption, and healthy lifestyles for hypertensive patients in preventing cardiovascular complications, 4) family and cultural medicinal plants that are useful in preventing cardiovascular complications in hypertensive patients, 5) the role of the family in preventing cardiovascular complications in hypertensive patients, 6) community health center programs in preventing cardiovascular complications in hypertensive patients, and 7) views and advice from religious figures to hypertensive patients in preventing cardiovascular complications. The danger of cardiovascular complications is important information that must be improved in providing health education to hypertensive patients along with information on the treatment and care they must undergo. Complete knowledge about cardiovascular disease as a complication of hypertension is very important to influence patient attitudes and behavior for the better and must be considered in developing health interventions (Liu et al. 2020)

Patients who are treated by providing information and healthy lifestyle interventions such as lipid reduction diet, blood glucose control, physical activity, stress reduction and measures to avoid tobacco exposure provide optimal results in preventing cardiovascular damage (Prado and Napierkowski 2020) . Information on family medicinal plants supports patients in utilizing family medicinal plants according to their culture in an effort to prevent cardiovascular complications. Family medicine plants are an ancient, culture-bound health care practice that existed before science was used in health matters and have been used for centuries. Various types of medicinal plants are used to treat hypertension and prevent cardiovascular disease. Family medicinal plants have several active substances with pharmacological and prophylactic properties that can be used in the treatment of hypertension (Kamyab et al. 2021) . Family roles are important information that cannot be separated in an effort to prevent cardiovascular complications in hypertensive patients. Hypertensive patients generally have less than optimal levels of blood pressure control and need family support in increasing compliance with various treatment programs. Family-based interventions have a significant health impact on hypertensive patients and achieve better levels of blood pressure control at the population level (Chacko and Jeemon 2020) . Not all patients know that the Community Health Center has various programs to control hypertension and prevent

cardiovascular complications in the community. Puskesmas organizes health promotion activities, disease prevention, and early diagnosis and basic treatment of cardiovascular diseases, including hypertension, diabetes, coronary heart disease (CHD), and stroke (Arsyad et al. 2022) . The views and advice of religious figures are the final material in the module. The religious figures involved were the majority religious figures at the research location, namely Protestant Christian religious figures, Catholic religious figures and Islamic religious figures. The involvement of religious figures in education for hypertensive patients can be a spiritual reinforcement and motivation in supporting changes in the behavior of hypertensive patients for the better. Patients who have religious beliefs are significantly more likely to have and adhere to better health habits and fewer cardiovascular risk factors (Kobayashi et al. 2015) . Culture and religiosity are highly valued in many societies and can shape health beliefs and behavior. Internal religiosity, organizational involvement and religious leadership are associated with increased motivation of hypertension patients in participating in treatment and health care programs (Wahab et al. 2021)

The independent training in the module gives hypertensive patients the opportunity to try taking steps to prevent cardiovascular complications directly. Independent training is given to patients at the end of each chapter of the material in the module. Independent exercise or exercise programs can directly increase the knowledge and practical skills of hypertensive patients regarding lifestyle, medication practices and hypertension care in preventing cardiovascular complications (Oyewole et al. 2020) . Independent training was provided because the level of self-care practice among hypertensive patients in the community was found to be still low. The prevalence of good self-care practices in hypertensive patients is still low. Good self-care practices are significantly related to age, formal education, comorbidities, knowledge about hypertension, patient condition and social support (Hussen et al. 2020) . The self-directed exercise provided can be a specifically targeted intervention for hypertensive patients that is needed to improve self-care practices to prevent the risk of cardiovascular complications (Melaku et al. 2022)

The way to implement the module for preventing cardiovascular complications in hypertensive patients based on *transcultural nursing* is carried out using the abbreviations IBILKREM and BaTaLSaKiT. IBILKREM is carried out by health workers, namely "Remind to Read, Remind to Do, Home Visit, Evaluation and Monitoring", BaTaLSaKiT is carried out by patients, namely "Read, Ask, Do, Tell, Visit, Follow Therapy". Technically, the implementation of the module is carried out by forming patients who receive the module into a WhatsApp electronic communication group with health workers. Health workers remind patients to read the module every day according to the instructions for use via WhatsApp text message. Patients who want to ask questions and discuss must visit the Community Health Center to meet health workers and discuss directly. Direct consultations and discussions are carried out only at the Community Health Center with the aim of teaching patients to utilize health service facilities and obtain direct health examination services. Patients who do not go to the Community Health Center will be visited at home or home visits to find out about the problems they are experiencing and motivate them to go to the health facility for examination and receive treatment. Health workers also remind patients to complete each independent exercise task at the end of the chapter in the module which contains practices for preventing cardiovascular complications. Next, health workers monitor and evaluate the actions of hypertensive patients in preventing cardiovascular complications as explained in the module. Hypertension nursing care case management in primary health care by means of direct consultation, telephone contact as a reminder, home visits, health education, and referral processes, is effective in improving blood pressure control and medication compliance in

patients with hypertension (Mattei da Silva et al. 2020) . The care provided in forming a group as a medium for interaction and follow-up via text messages on average increases the lifestyle behavior of hypertensive patients, namely weight loss, lowering blood pressure, adherence to taking medication, low salt diet, and the ability to reduce stress levels. (Spies, Nanyonga, and Nakaggwa 2019) . Intervention in the form of BEST *(Bundled Education and Support with Text)* by nurses can improve biometric results and better lifestyle modifications, the ability to control diet, and the ability to take medication as prescribed (Spies, Nanyonga, and Nakaggwa 2019) . Direct counseling is effective in controlling cardiovascular risk and improving the quality of life of patients with hypertension, overweight, and dyslipidemia (Vílchez Barboza et al. 2016) . Periodic short education using digital communication information technology can be considered an effective method in increasing awareness and knowledge about behavior change and maintaining healthy lifestyle behavior in addition to direct face-to-face health education (Jahan et al. 2020)

CONCLUSION

Implementation of the behavioral module for preventing cardiovascular complications in hypertensive patients based on transcutural nursing using the IBILKREM and BaTaLSaKiT approaches is effective in increasing efforts to prevent cardiovascular complications in hypertensive patients in the community, namely routine health checks, taking antihypertensive medication, adopting a healthy lifestyle, and independent in self-care. A health behavior module based on transcultural nursing to prevent cardiovascular complications in hypertensive patients can be an effective health promotion media choice in changing the behavior and health status of hypertensive patients in the community..

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