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Community-Based Health Education on Healthy Foods to Reduce Blood Pressure among Hypertensive Patients in the Community

Israfil[1*], I Gede Putu Darma Suyasa[1], Ni Luh Putu Inca Buntari Agustini[1], Ni Luh Dwi Indrayani[1], I Ketut Swarjana[1], Ni Kadek Sriasih[1], Ganyanee Nooiad[2], I Gusti Agung Yogi RS[3], I Nyoman Tripayana[1], I Gusti Agung Tresna Wicaksana[1]

[1] Department of Nursing, Faculty of Health, Institute of Technology and Health Bali, Denpasar, Indonesia
[2] Department of Nursing, Faculty of Nursing, Saint Louis College, Bangkok, Thailand
[3] Department of Food Technology, Faculty of Technology, Institute of Technology and Health Bali, Denpasar, Indonesia
* E-mail: ahmadisrafil6@gmail.com

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Abstract

Hypertension is one of the non-communicable diseases whose prevalence continues to increase and remains a major risk factor for cardiovascular disease. The management of hypertension does not rely solely on pharmacological therapy but also requires non-pharmacological interventions, such as adopting a healthy diet rich in fruits and vegetables and low in salt. However, public knowledge regarding types of foods that effectively help lower blood pressure remains limited, particularly in rural areas. This community service program (PKM) aimed to provide education on healthy foods that can reduce blood pressure as a form of non-pharmacological therapy for patients with hypertension in the community. The activity employed the Preparation, Action, Reflection, and Evaluation (PARE) approach and was conducted in Melinggih Village, Gianyar Regency, Bali Province, involving 29 participants with hypertension. The program began with a pre-test, followed by health education sessions supported by visual educational media, consultations, discussions, and question-and-answer sessions, and concluded with a post-test evaluation. The results showed that the proportion of participants with good knowledge increased from 34.5% before the intervention to 100% after the implementation of the program. The Wilcoxon test results indicated Z = -4.300; p = 0.001, demonstrating a statistically significant difference in participants' knowledge levels before and after the activity. The success of the program was supported by lecture methods, consultations, and interactive discussions conducted bilingually (Indonesian and Balinese), as well as the use of colorful leaflets illustrating vegetables and fruits beneficial in lowering blood pressure. Thus, this community-based educational intervention proved effective in improving community knowledge and awareness regarding healthy food choices for hypertension management.

Keywords: Hypertension, Health Education, Non-Pharmacological Therapy, Healthy Food, Community Empowerment.

Abstrak

Hipertensi merupakan salah satu penyakit tidak menular yang prevalensinya terus meningkat dan menjadi faktor risiko utama penyakit kardiovaskular. Pengendalian hipertensi tidak hanya bergantung pada terapi farmakologis, tetapi juga memerlukan intervensi nonfarmakologis seperti pengaturan pola makan sehat yang kaya buah dan sayur serta rendah garam. Namun, pengetahuan masyarakat mengenai jenis makanan yang efektif membantu menurunkan tekanan darah masih terbatas, khususnya di wilayah pedesaan. Program pengabdian kepada masyarakat (PKM) ini bertujuan untuk memberikan edukasi tentang makanan sehat yang dapat menurunkan tekanan darah sebagai bentuk terapi nonfarmakologis pada pasien hipertensi di masyarakat. Kegiatan ini menggunakan pendekatan Persiapan, Tindakan, Refleksi, dan Evaluasi (PARE) dan dilaksanakan di Desa Melinggih, Kabupaten Gianyar, Provinsi Bali, dengan melibatkan 29 peserta penderita hipertensi. Pelaksanaan kegiatan diawali dengan pre-test, dilanjutkan dengan sesi pendidikan kesehatan yang didukung media edukasi visual, konsultasi, diskusi dan tanya jawab, serta diakhiri dengan evaluasi melalui post-test. Hasil menunjukkan bahwa tingkat pengetahuan baik peserta meningkat dari 34,5% sebelum

intervensi menjadi 100% setelah pelaksanaan PKM. Hasil uji Wilcoxon menunjukkan nilai Z = -4,300; p = 0,001, yang mengindikasikan adanya perbedaan signifikan tingkat pengetahuan peserta sebelum dan setelah kegiatan. Keberhasilan program ini didukung oleh metode ceramah, konsultasi, dan diskusi interaktif yang dilakukan secara bilingual (Bahasa Indonesia dan Bahasa Bali), serta penggunaan leaflet berwarna yang menampilkan jenis sayur dan buah yang bermanfaat dalam membantu menurunkan tekanan darah. Dengan demikian, intervensi edukasi berbasis komunitas ini terbukti efektif dalam meningkatkan pengetahuan dan kesadaran masyarakat mengenai pemilihan makanan sehat untuk manajemen hipertensi.

Kata Kunci: Hipertensi, Edukasi Kesehatan, Terapi Nonfarmakologis, Makanan Sehat, Pemberdayaan Masyarakat.

A. INTRODUCTION

Hypertension is a chronic non-communicable disease that has become a major cause of mortality worldwide, including in Indonesia (Maharani, 2022; Rukmini et al., 2022; Sudikno, et al., 2023; WHO, 2023; Kalsum, et al., 2024; Wahidin, et al., 2025). Hypertension, or high blood pressure, is a leading risk factor for several life-threatening conditions such as stroke, heart attack, kidney failure, and retinopathy (Israfil & Making, 2020; Kementerian Kesehatan Republik Indonesia, 2019). Hypertension control can be achieved through both pharmacological and non-pharmacological approaches, aiming to prevent illness, complications, and premature death (Dhungana, Pedisic, & De Courten, 2022; Maniero et al., 2023; Timsina et al., 2023). The pharmacological approach involves the use of medication to control blood pressure effectively, while non-pharmacological management emphasizes lifestyle modifications towards healthier habits (Kementerian Kesehatan Republik Indonesia, 2018). Unfortunately, the practice of pharmacological and non-pharmacological approaches to hypertension patients continues to be a challenge.

The World Health Organization (WHO) estimates that 1.28 billion people aged 30-79 years worldwide suffer from hypertension, 46% are unaware that they have hypertension, 42% have been diagnosed and treated, and only about 1 in 5 people or 21% of hypertensive patients can control hypertension (WHO, 2023). The results of the 2018 Indonesian Ministry of Health Riskesdas showed that the prevalence of hypertension in the population > 18 years in Indonesia reached 34.11%. This condition has increased from 25.8% in the 2013 Indonesian Ministry of Health Riskesdas. Hypertension sufferers who routinely take medication are 54.4%, and those who do not routinely take medication and do not take medication at all are 32.27% and 13.33% respectively (Kementerian Kesehatan Republik Indonesia, 2019). The main factors causing hypertension include unhealthy diet, sedentary lifestyle, high salt consumption, and low public awareness of the importance of controlling blood pressure through behavioral changes including healthy food patterns and types (Kementerian Kesehatan Republik Indonesia, 2018). One non-pharmacological approach that has been proven effective in lowering blood pressure is healthy food interventions such as cucumber, papaya, chayote and celery (Apriyani et al., 2020; Budiman & Erisandi, 2021; Kasumayanti, 2017; Tukan, 2018)

The results of discussions with the community showed that not all people know that various types of vegetables and fruits in the community have good benefits in lowering blood pressure. Some people said they had heard about it and had read it on social media but had never tried it directly because they still did not believe its truth and did not know how to process it properly. On the other hand, health education about vegetable and fruit foods has never been obtained directly from health workers. Health promotion activities carried out by health workers are often pharmacological therapy about the importance of consuming antihypertensive drugs according to recommendations, and general healthy food education such as reducing foods high in salt, fat and oil, and have not targeted specific types of vegetables and fruits that can help reduce blood pressure. This condition is the basis for the right decision to provide community-based health education that focuses on introducing healthy vegetables and fruits to lower blood pressure in hypertension sufferers. This activity will provide benefits not only for sufferers, but also for families and the wider community as a preventive effort in controlling blood pressure and preventing the risk of complications due to hypertension in the community.

The purpose of this community service activity (PKM) is to educate about types of vegetables and fruits that can lower blood pressure in hypertension patients in the community. The targets of the PKM activity are hypertension patients, their families, and all levels of society who will attend. The activity will be held at the Melinggih village hall, Payangan District, Gianyar Regency, Bali Province.l Through the PKM activity "Healthy Food Education to Lower Blood Pressure in Hypertension Patients in the Community", the team is committed to providing scientific- healthy food education that are easy to apply every day. With a participatory approach and based on community needs, this activity is expected to increase community awareness, and knowledge in managing hypertension independently and sustainably.

B. METHODS AND IMPLEMENTATION

The program was open to all participants, including hypertension patients and their families. However, education and evaluation were only provided to participants with hypertension, with blood pressure criteria exceeding 140/90 mmHg. Core activities included blood pressure checks, patient knowledge assessments prior to the health education session, counseling and consultation, and post-test evaluations. Consultation and discussion materials covered hypertension and its potential complications, as well as healthy foods available in the community that can help lower blood pressure. The stages of this community service activity were generally conducted using the PARE (Preparation, Action, Reflection, and Evaluation) approach (Doubeni et al., 2022). This community service activity was conducted in Melinggih Village, Payangan District, Gianyar Regency, Bali Province, on Friday, May 23, 2025,

The Preparation stage involved coordinating with community leaders, identifying participants from among individuals with hypertension or members of the general public, and preparing the necessary tools and materials. Health promotion materials and educational media were developed, while pre-test and post-test instruments were designed to measure participants' knowledge. Logistical arrangements, including the preparation of the venue, were also completed to ensure the smooth implementation of the program.

The Action stage began with an opening session, followed by an explanation of the objectives and procedures of the activity. Participants completed a pre-test to assess their baseline knowledge. Educational sessions were then delivered on the risks of hypertension and the types of healthy foods that can help lower blood pressure. These sessions were complemented by interactive discussions and question-and-answer activities to enhance engagement and understanding. The activity concluded with a post-test and the distribution of educational leaflets.

During the Reflection stage, participants were encouraged to share their experiences before and after the activity, reflecting on the benefits they had gained. Facilitators provided positive reinforcement for active participation, welcomed feedback and suggestions for improvement, and motivated participants to continue managing their health independently at home.

Finally, the Evaluation stage was conducted through the analysis of post-test results and the collection of participant feedback to assess the effectiveness of the program. Recommendations for follow-up activities were formulated to sustain community engagement, and the event concluded with a formal closing session.

C. RESULTS AND DISCUSSION

Table 1. Participant characteristics (n = 29).

Characteristics	**f**	**%**
Gender		
Male	5	17.2
Female	24	82.8
Age		
<59	6	20.7
60-69	11	37.9
66-70	4	13.8
>70	8	27.6

Education		
No formal education	14	48.3
Elementary school	7	24.1
Junior high school	2	6.9
Senior high school	4	13.8
Higher education	2	6.9
Occupation		
Civil servant	0	0
Entrepreneu	16	55.2
Housewife	3	10.3
Unemployed	10	34.5

Table 1 shows that the participants of the Community Service Program (PKM) were predominantly female (82.8%), while male participants accounted for 17.2%. The majority were in the 60–69 age group (37.9%) and above 70 years old (27.6%), indicating that most participants belonged to the elderly population. Nearly half of the participants had no formal education (48.3%), while most of the remaining had completed primary school (24.1%). The largest occupational group was self-employed individuals (55.2%), followed by those without permanent employment (34.5%). Overall, the PKM participants were mainly elderly women with basic educational backgrounds and occupations in the informal sector.

Table 2. Categories of participants' knowledge levels before and after the activity (n = 29).

Category	**Pre**		**Post**	
	f	**%**	**f**	**%**
Good	10	34.5	29	100
Moderate	6	20.7	0	0
Poor	13	44.8	0	0

Table 2 shows that before the activity, most participants were in the low knowledge category (44.8%), and only 34.5% had good knowledge. After the activity, all participants (100%) demonstrated an improvement in knowledge, reaching the good category.

Table 3. Frequency distribution of respondents' knowledge about hypertension (n = 29).

No	**Statement**	**Pre-Test**		**Post-Test**	
		Correct f (%)	**Incorrect / Do not know f (%)**	**Correct f (%)**	**Incorrect / Do not know f (%)**
1	Hypertension is a chronic or lifelong disease	8 (27.6)	21 (72.4)	29 (100)	0
2	Hypertension is a disease caused by high blood pressure.	14 (48.3)	15 (51.7)	29 (100)	0
3	High blood pressure is defined as blood pressure greater than 140/90 mmHg	13 (44.8)	16 (55.2)	29 (100)	0
4	High blood pressure can cause complications such as stroke, heart attack, cerebral hemorrhage, kidney failure, and blindness.	13 (44.8)	16 (55.2)	29 (100)	0
5	Hypertension can be prevented by having adequate night sleep (7–8 hours)	9 (31.0)	20 (69.0)	29 (100)	0

6	Hypertension can be prevented by reducing the consumption of salty, fried, and fatty foods.	18 (62.1)	11 (37.9)	29 (100)	0
7	Hypertensive patients should take antihypertensive medication daily for life.	17 (58.6)	12 (41.4)	29 (100)	0
8	Chayote (Sechium edule) vegetables can help lower blood pressure	13 (44.8)	16 (55.2)	29 (100)	0
9	Cucumber (Cucumis sativus) fruit can help lower blood pressure	19 (65.5)	10 (34.5)	29 (100)	0
10	Celery leaves (Apium graveolens) can help lower blood pressure.	16 (55.2)	13 (44.8)	29 (100)	0

Table 3 indicates that most participants initially lacked accurate knowledge regarding various aspects of hypertension. For instance, only 27.6% understood that hypertension is a lifelong chronic disease, and 48.3% recognized that it is caused by high blood pressure. Furthermore, only about 44.8% of participants were aware that high blood pressure can lead to serious complications such as stroke, kidney failure, and blindness. After the community service (PKM) activity, there was a significant increase in knowledge across all statements, with 100% of participants providing correct answers to all question items.

Table 4. Wilcoxon test on differences in respondents' knowledge pre and post.

Knowledge	**Wilcoxon**						
	n	**Mean**	**SD**	**Min**	**Max**	**Z**	***p-value***
Pre-test	29	4,69	3,935	0	10	-(4,300)	0,001
Post-test	29	10,00	0	10	10		

Table 4 shows that the Wilcoxon test results yielded a Z value of -4.300 with a p-value of 0.001 ($p < 0.05$), indicating a significant difference between the knowledge scores before and after the intervention. The average pre-test score was 4.69 (SD = 3.935), while the average post-test score increased to 10.00 (SD = 0). These results indicate that the educational intervention provided was effective in increasing participants' knowledge about hypertension and healthy foods that can lower blood pressure.

Figure 2. Documentation of the community service activity in Melinggih Village.

This Community Service Program (PKM) was primarily attended by participants from the elderly age group with basic educational backgrounds. Prior to the implementation, participants' knowledge regarding hypertension was relatively low; however, following the educational activities, all participants demonstrated a marked improvement, achieving a good level of understanding. Statistical analysis revealed a significant difference between pre- and post-intervention knowledge levels, indicating that the PKM activity was effective in substantially increasing participants' knowledge about hypertension and foods that can help lower blood pressure.

Despite the predominance of elderly participants with low educational attainment, the success of this program was attributed to the use of a friendly and inclusive educational approach that combined lectures, consultations, and interactive discussions conducted bilingually in Indonesian and Balinese the local language. This bilingual approach proved effective because it utilized participants' everyday language, thereby enhancing engagement and comprehension throughout the activity. Bilingualism plays a vital role in improving understanding by employing familiar and accessible language. The use of two languages, such as Indonesian and a local vernacular, helps bridge literacy gaps and reinforces memory and conceptual understanding (Vaghela, 2024)

In addition, the PKM activity provided educational media in the form of colorful leaflets featuring images of vegetables and fruits known to help lower blood pressure, such as papaya, chayote, garlic, and celery. The use of visual media was particularly beneficial for participants with lower educational backgrounds, as it made information more concrete and engaging. Visual interventions serve as effective tools for clarifying information and reinforcing memory, especially among participants with varying levels of literacy. Research has shown that visual formats, such as videos or colored images, significantly enhance comprehension compared to conventional methods (Galmarini et al., 2024)

In the context of health education, combining visual presentation with oral discussion represents a more optimal strategy than relying solely on one method. This approach not only captures participants' attention but also strengthens understanding through contextual explanations. Studies indicate that visual-based media significantly improve comprehension levels compared to conventional methods alone (Nagamma et al., 2020).

The combination of lectures, discussions, consultations, and visual media delivered in easily understood language proved effective in enhancing participants' knowledge about hypertension management and the consumption of healthy foods to control blood pressure. This approach aligns with the principles of community health education, emphasizing contextual, communicative, and participant-centered information delivery. Previous studies have also demonstrated that the use of visual media, such as leaflets, significantly influences improvements in public knowledge and attitudes regarding hypertension (Jayadi et al., 2021).

Ultimately, this PKM activity demonstrated that the educational interventions successfully enhanced participants' understanding of the definition, causes, complications, prevention, and management of hypertension, including the benefits of natural ingredients such as chayote, cucumber, and celery leaves in helping reduce blood pressure. The PKM program successfully achieved its objective of improving public knowledge about hypertension through educational methods tailored to participants' characteristics. This increased knowledge is expected to foster behavioral changes in the prevention and management of hypertension at both individual and family levels, thereby contributing to the sustainable improvement of community health. It is recommended that community nurses integrate culturally sensitive, bilingual, and visually supported educational strategies into routine health promotion activities, especially when working with older populations and individuals with limited educational backgrounds.

CONCLUSION

This Community Service Program (PKM) proved effective in enhancing participants' knowledge regarding hypertension and foods that can help lower blood pressure. Although most participants were elderly with basic educational backgrounds, statistical analysis demonstrated a significant improvement in knowledge following the intervention. This success was supported by the

use of lectures, consultations, and interactive discussions delivered through a bilingual approach (Indonesian and Balinese), as well as the application of visual media such as colorful leaflets depicting vegetables and fruits beneficial for reducing blood pressure. Regular health education activities are recommended to sustain behavioral changes following improved knowledge. The bilingual approach and visual media should be retained and refined, especially for communities with lower education levels.

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