Knowledge About Hypertension and Its Treatment Among Patients and Lay Health Workers in the Posyandu Lansia

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Abstract. The size of the elderly population continues to increase. In Indonesia, hypertension often occurs in the elderly. Knowledge about hypertension plays a vital role in hypertension control. Posyandu lansia (Integrated Health Service Post for the Elderly) is a community program involving the active participation of lay health workers. This study assessed patients' and lay health workers' knowledge about hypertension and its treatment in a rural village in Yogyakarta province. The associations between patients' knowledge and their sociodemographic and clinical characteristics were also studied. A cross-sectional survey of 154 patients and 12 lay health workers was conducted between February and April 2020. The questionnaire gathered information about the patients' sociodemographic data (age, sex, education level, occupation), clinical condition, and participation in posyandu lansia. Eighteen items of the Hypertension Knowledge Level Scale questionnaire were used to examine patients' knowledge. Ninety of 154 (58.4%) patients had good hypertension knowledge. The mean hypertension knowledge score was 12.97 $\pm$ 4.08 out of 18 points. Similarly, 58.3% of lay health workers were categorized as having good knowledge. The percentage with good knowledge did not differ significantly between patients who were members of posyandu lansia (59.1%) and those who were not members (58%) ($p = 0.787$). A higher education level was associated with excellent patient knowledge ($p = 0.035$). This study shows that a considerable percentage of patients who are members and nonmembers of posyandu lansia have poor hypertension knowledge. A low education level was strongly associated with poor hypertension knowledge.

Keywords: Knowledge · Hypertension · Lay Health Workers · Posyandu Lansia

1 Introduction

The elderly are highly vulnerable to health problems because of the presence of predisposing factors [1]. Susceptibility to noncommunicable diseases (NCDs) is one type of clinical problem associated with older age. Hypertension, "the silent killer" [3], is the most prevalent NCD among the elderly in Indonesia [2]. This disease occurs mainly

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in people aged 45 years and older, and about half of the older people in Indonesia have hypertension [4]. Of all provinces, Yogyakarta province has the second-highest prevalence of hypertension in Indonesia [2].

The Faculty of Medicine Universitas Islam Indonesia in Yogyakarta has delivered several community-based programs dedicated to addressing the challenges in hypertension management. One of these community programs is provided in Pandak, a rural village in south Yogyakarta. Like most villages in Indonesia, Pandak village has the Integrated Health Service Post for the Elderly (posyandu lansia) that serves people aged 45 years or older in the village. Blood pressure measurement is a routine service provided in posyandu lansia meetings. Based on the register book, about 30% of posyandu members in Pandak have hypertension.

Management of chronic diseases, such as hypertension, involves active patient participation. Patients' knowledge is essential to improving their participation in managing, monitoring, maintaining, and preventing hypertension complications. Lack of knowledge contributes to failure in hypertension management [9]. A previous study reported that knowledge about hypertension and its treatment among patients and lay health workers remains low, and only about 54% of people with hypertension are aware that they have it [5]. Another study showed that patients lack knowledge about hypertension [6] and its treatment [7]. A study of lay health workers found that only 6.6% had good hypertension knowledge [8].

We reasoned that elderly people learn more about hypertension if they attend the posyandu. Lay health workers are vital to the delivery of the posyandu lansia program and must have good knowledge to provide the best services to the elderly. It is important to evaluate the roles of patients and lay health workers in optimizing hypertension management. This study assessed patients' and lay health workers' knowledge about hypertension and its treatment in Pandak village. The associations between patients' knowledge and their sociodemographic and clinical characteristics were also studied.

2 Method

2.1 Study Participants

A cross-sectional survey of 154 patients and 12 lay health workers was conducted between February and April 2020 in Pandak village, Yogyakarta. This study used a total sampling technique based on the following inclusion and exclusion criteria.

The inclusion criteria for patients were being a Pandak village resident, age ≥45 years, having hypertension based on the Healthy Indonesia Program with A Family Approach (PIS-PK) data, and willing to participate in the study. Patients with memory impairment were excluded.

The inclusion criteria for lay health workers were being an active lay health worker in the posyandu lansia and willing to participate (Fig. 1).

2.2 Instrument

The survey instrument collected information about the patients' sociodemographic data (age, gender, education level, occupation), clinical condition, and participation in the

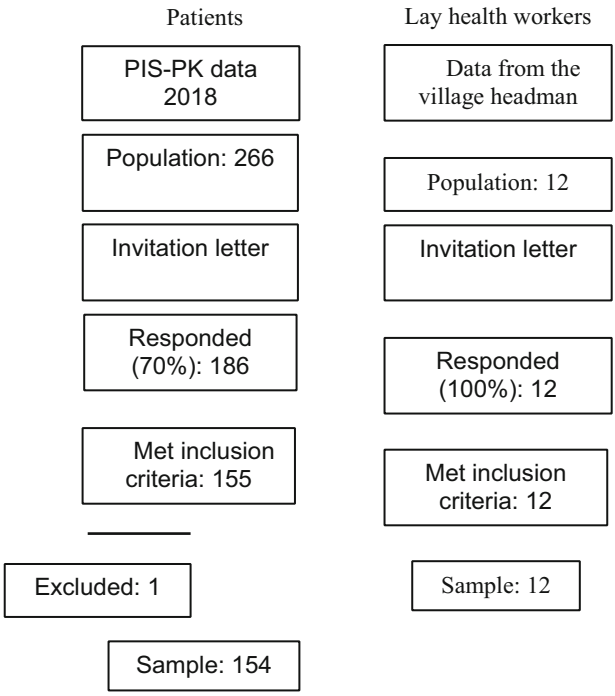

Fig. 1. *A flow diagram of study selection*

posyandu lansia. The 18 items on the Hypertension Knowledge Level Scale questionnaire were used to examine patients' knowledge. This questionnaire included six domains relating to hypertension: definition, treatment, adherence, lifestyle, diet, and complications [10].

2.3 Data Collection

The PIS-PK data were obtained from Pandak 1 Primary Health Center. The Pandak village headman then checked these data to eliminate patients who had moved or died. Data mapping of patients aged ≥45 years, determining the place and time of research, and asking lay health workers to help distribute invitation letters were also performed.

On the research day, patients and lay health workers who met the inclusion criteria met in a room with a 1 m distance between them. They were instructed about completing the questionnaire within 15 min. Respondents were monitored so that they did not copy from each other. Any patients who could not read or write were assisted in completing the questionnaire.

A correct answer was given a score of 1 and an incorrect answer was given a score of 0. Respondents were categorized into two groups according to their score: those with poor knowledge (score 0–12) and those with good knowledge (score 13–18).

2.4 Data Analysis

The data were analyzed using IBM SPSS Statistics (version 24). The chi-square and Mann–Whitney U tests were applied.

2.5 Ethics

This study was approved by the Ethics Committee of the Faculty of Medicine Universitas Islam Indonesia with approval number 32/Ka.Kom.Et/70/KE/V/2019.

Table 1. Characteristics of patients

Characteristic	Mean ± SD	n (%)	
Patients (N = 154)			
Sociodemographic			
Age group (years)	62.4 ± 9.6		
45–59		65	(42.2)
≥ 60		89	(57.8)
Gender			
Male		65	(42.2)
Female		89	(57.8)
Job			
Laborer		52	(33.8)
Entrepreneur		21	(13.6)
Farmer		20	(13.0)
Retired		12	(7.8)
Civil servant		3	(1.9)
Other		18	(11.7)
Unemployed		28	(18.2)
Education level			
No formal education		29	(18.8)
Elementary school		73	(47.4)
Junior high school		23	(14.9)
High school		25	(16.2)
College/university		4	(2.6)
Posyandu lansia			
Members		66	(42.9)
Nonmembers		88	(57.1)
Clinical condition			
Duration of hypertension	4.3 ± 5.0		
<5 years		118	(76.5)
≥ 5 years		36	(23.4)

3 Result and Discussion

3.1 Patients' Characteristics

Table 1 shows that the patients' mean age was 62.4 ± 9.6 years (range 45–90 years). Most respondents were aged ≥60 years (57.8%), female (57.8%), working (81.8%), not a member of posyandu (57.1%), had hypertension <5 years (76.5%), and had low education level (junior high school and below) (125 patients, 81.2%). The shortest duration of hypertension was 2 years, and the longest was 29 years.

The lay health workers' age ranged from 27 to 57 years. Table 2 shows that all lay health workers were female, married, and had formal education. Seven of the 12 lay

Table 2. Characteristics of lay health workers

Characteristic	Mean ± SD	n (%)	
Lay health workers (N = 12)			
Age group (years)	43.6 ± 9.6		
<45		7	(58.3)
≥ 45		5	(41.7)
Gender			
Male		0	(0.0)
Female		12	(100.0)
Job			
Housewife		5	(41.7)
Entrepreneur		1	(8.3)
Village apparatus		1	(8.3)
Unemployed		5	(41.7)
Education level			
Elementary school		3	(25.0)
Junior high school		2	(16.7)
High school		7	(58.3)
Marital status			
Married		12	(100.0)
Not married		0	(0.0)
Duration of lay health worker service	6.9 ± 4.7		
<5 years		6	(50.0)
≥ 5 years		6	(50.0)
Lay health worker training			
Yes		4	(33.3)
No		8	(66.7)

Table 3. Patients' and lay health workers' knowledge level

Knowledge level (score range 0–18)		Mean ± SD	n (%)	
Patients				
Good	(13–18)	15.8 ± 1.7	90	(58.4)
Poor	(0–12)	9.0 ± 2.8	64	(41.6)
Lay health workers				
Good	(13–18)	14.9 ± 2.0	7	(58.3)
Poor	(0–12)	10.0 ± 2.8	5	(41.7)

health workers (58.3%) had regular jobs. Their shortest service in posyandu lansia was 2 years, and the longest was 12 years. Many health workers (66.7%) were untrained before they started working as a health worker.

3.2 Knowledge Level

Table 3 shows that 90 of 154 (58.4%) patients and seven (58.3%) of lay health workers had good knowledge about hypertension. The mean hypertension knowledge scores were 12.97 ± 4.08 of 18 in patients and 12.83 ± 3.35 in lay health workers. The lowest scores were 0 in the patients and 6 in the lay health workers.

The category of poor knowledge was defined as <70% of the correct answers [11]. Table 4 shows that the patients and lay health workers had poor knowledge about the definition and diet domains. Table 5 shows that they did not know that systolic and diastolic blood pressure are associated with hypertension or about the types of meat that can be consumed by people with hypertension. Table 5 also shows that patients and lay health workers had good knowledge about lifestyle factors for people with hypertension, such as avoiding alcohol and smoking, eating fruits and vegetables, and cooking without frying.

The participants knew that stroke is a complication of hypertension but not that kidney failure is also a complication (complication domain). They knew that antihypertensive drugs must be consumed every day (treatment domain) and that blood pressure increases with age and must be treated (adherence domain).

Table 4. Knowledge level for each domain

Domain	Correct answer	n (%)			
		Patients (N = 154)		Lay health workers (N = 12)	
1. Definition	Range 0–2				
Poor	0–1	98	(63.6)	8	(66.7)
Good	2	56	(36.4)	4	(33.3)
2. Treatment	Range 0–3				
Poor	0–1	43	(27.9)	2	(16.7)
Good	2–3	111	(72.1)	10	(83.3)
3. Adherence	Range 0–3				
Poor	0–1	33	(21.4)	1	(8.3)
Good	2–3	121	(78.6)	11	(91.7)
4. Lifestyle	Range 0–4				
Poor	0–2	18	(11.7)	3	(25.0)
Good	3–4	136	(88.3)	9	(75.0)
5. Diet	Range 0–2				
Poor	0–1	71	(46.1)	8	(66.7)
Good	2	83	(53.9)	4	(33.3)
6. Complications	Range 0–4				
Poor	0–2	43	(27.9)	3	(25.0)
Good	3–4	111	(72.1)	9	(75.0)

Patients' Characteristics and Knowledge Level

Table 6 shows significant associations between patients' education level and their knowledge about hypertension and its treatment ($p = 0.04$). Patients with a high education level were 2.6 times more likely to have greater knowledge than those with a low education level. This result has been reported in other studies [6, 12, 13]. As one of the basic needs for self-development, education is closely related to knowledge. Those with a higher education level can more easily receive and understand information. A low education level can interfere with the understanding or acceptance of information [14].

The patients' age and knowledge level about hypertension and its treatment were not significantly related ($p = 0.18$). This has also been reported in two other studies [15, 16], but another study found the elderly tend to have lower knowledge than the younger ones [13]. Age-related changes in the brain affect memory, learning, and other cognitive

Table 5. Distribution of patients' and lay health workers' answers for each item in the questionnaire

Domain	Patients (N = 154)				Lay health workers (N = 12)			
	Correct		Incorrect		Correct		Incorrect	
Definition								
1. Increased diastolic blood pressure also indicates increased blood pressure.	64	(41.6)	90	(58.4)	6	(50)	6	(50)
2. High diastolic or systolic blood pressure indicates increased blood pressure.	61	(39.6)	93	(60.4)	7	(58.3)	5	(41.7)
Treatment								
3. Drugs for increased blood pressure must be taken every day.	121	(78.6)	33	(21.4)	11	(91.7)	1	(8.3)
4. Individuals with increased blood pressure must take their medication only when they feel ill.	93	(60.4)	61	(39.6)	9	(75)	3	(25)
5. Individuals with increased blood pressure must take their medication in a manner that makes them feel good.	118	(76.6)	36	(23.4)	11	(91.7)	1	(8.3)
Adherence								
6. If the medication for increased blood pressure can control blood pressure, there is no need to change lifestyle.	106	(68.8)	48	(31.2)	8	(66.7)	4	(33.3)

(*continued*)

Table 5. (*continued*)

Domain	Patients (N = 154)				Lay health workers (N = 12)			
	Correct		Incorrect		Correct		Incorrect	
7. Increased blood pressure is the result of aging, so treatment is unnecessary.	121	(78.6)	33	(21.4)	11	(91.7)	1	(8.3)
8. Individuals with increased blood pressure can eat salty foods as long as they take their drugs regularly.	122	(79.2)	32	(20.8)	9	(75)	3	(25)
Lifestyle								
9. Individuals with increased blood pressure can drink alcoholic beverages.	130	(84.4)	24	(15.6)	10	(83.3)	2	(16.7)
10. Individuals with increased blood pressure must not smoke.	129	(83.8)	25	(16.2)	9	(75)	3	(25)
11. Individuals with increased blood pressure must eat fruits and vegetables frequently.	147	(95.5)	7	(4.5)	11	(91.7)	1	(8.3)
12. For individuals with increased blood pressure, the best cooking method is frying.	129	(83.8)	25	(16.2)	9	(75)	3	(25)
Diet								
13. The best type of meat for individuals with increased blood pressure is white meat.	89	(57.8)	65	(42.2)	4	(33.3)	8	(66.7)

(*continued*)

Table 5. (*continued*)

Domain	Patients (N = 154)				Lay health workers (N = 12)			
	Correct		Incorrect		Correct		Incorrect	
14. The best type of meat for individuals with increased blood pressure is red meat.	103	(66.9)	51	(33.1)	6	(50)	6	(50)
Complications								
15. Increased blood pressure can cause heart diseases, such as heart attack, if left untreated.	117	(76)	37	(24)	8	(66.7)	4	(33.3)
16. Increased blood pressure can cause stroke if left untreated.	136	(88.3)	18	(11.7)	12	(100)	0	(0)
17. Increased blood pressure can cause kidney failure if left untreated.	95	(61.7)	59	(38.3)	4	(33.3)	8	(66.7)
18. Increased blood pressure can cause visual disturbance if left untreated.	117	(76)	37	(24)	9	(75)	3	(25)

Values are presented as number (%)

functions. Brain function reaches its peak around age 20–30 years and, after a stable period, starts to decrease with age [17]. This may explain the poorer knowledge in older people. Patient's knowledge about hypertension may be based on previous knowledge, the patient's experience, and information they have received [18].

We also found that knowledge did not differ significantly between men and women ($p = 0.32$). This finding has been observed before [15, 16], but other studies reported females have greater knowledge because they have more time to read and discuss with others and may also be more likely to access electronic media to seek information [19]. However, males in some cultures have also been reported to have greater hypertension knowledge because they communicate more easily with health workers to inquire about the disease [13].

Table 6. Patients' characteristics and knowledge level (N = 154)

Characteristics	Knowledge level				OR (95% CI)	p
	Good		Poor			
	n (%)		n (%)			
Age group (years)[a]						
45–59	42	(64.6)	23	(35.4)	0.6 (0.3–1.2)	0.18
≥ 60	48	(53.9)	41	(46.1)		
Gender[a]						
Female	55	(61.8)	34	(38.2)	1,4 (0.7–2.7)	0.32
Male	35	(53.8)	30	(46.2)		
Education level[a]						
High	22	(75.9)	7	(24.1)	2.6 (1.1–6.6)	0.04[c]
Low	68	(54.4)	57	(45.6)		
Job[a]						
Yes	77	(61.1)	49	(38.9)	1.8 (0.8–4.1)	0.15
No	13	(46.4)	15	(53.6)		
Duration of hypertension[a]						
<5 years	68	(57.6)	50	(42.4)	1.2 (0.5–2.5)	0.71
≥5 years	22	(61.1)	14	(38.9)		
Posyandu lansia[b]						
Member	39	(59.1)	27	(40.9)	-	0.79
Nonmember	51	(58.0)	37	(42.0)		

[a] Chi-square | [b] Mann–Whitney *U* | [c] $p < 0.05$

Patients with a regular job had greater knowledge although the result was not significant ($p = 0.15$). This has been reported in two other studies [6, 15] but not in another study [16]. The work environment can provide opportunities to gain experience and knowledge. Work that requires interactions with others may increase knowledge by creating opportunities for discussion, learning new information, and further developing one's abilities [20].

We found no difference in knowledge between patients according to the duration of hypertension (<5 years vs. ≥ 5 years; $p = 0.71$). This has been reported in one study [15] but not another [13]. A longer duration of disease may provide more opportunities to learn more about that disease [21]. However, patients with a shorter duration of disease may still have good knowledge if they make the effort to gather more information to improve their health and well-being [22].

3.3 Participation in the Posyandu Lansia and Knowledge Level

Table 6 shows that there was no difference in the percentages of patients with good knowledge between members and nonmembers of posyandu lansia (59.1% vs. 58%, respectively; $p = 0.79$) (59.1%). The mean knowledge scores were 76.4 for members and 78.3 for nonmembers. Although the difference in knowledge was not significant, member patients had more correct answers on each questionnaire item.

4 Discussion

About 42% of patients and lay health workers had poor knowledge of hypertension and its treatment. The patients and lay health workers had poor knowledge mainly about the definition and diet domains. These are two important factors for controlling blood pressure. Knowing the definition of hypertension is important to understanding the disease and the importance of starting treatment immediately. Understanding the role of diet encourages behavioral changes needed for controlling blood pressure and can reduce the risk of hypertension complications [23].

Good knowledge may lead to a better attitude [14], especially about hypertension management. We found that knowledge was related to education level. Efforts to increase hypertension knowledge should be prioritized in people with a low education level. The lack of education is a challenge because of the low literacy level in people with a low education level.

Lay health workers can help to extend the reach of primary health care by conveying information about hypertension to local patients. This is geographically convenient by increasing sociocultural understanding and using a dialect that is easier for patients to understand [24]. However, we found that lay health workers' knowledge was not greater than that of the patients. This suggests the need for follow-up to improve the competencies of lay health-care workers through training, mentoring, and supervision.

A considerable percentage of both members and nonmembers in posyandu lansia had poor hypertension knowledge. This is surprising because an active participant would be expected to have learned more than a nonparticipant. In our study, 66 of 154 respondents were posyandu lansia members. We expect that the 88 nonmembers who participated in this study will continue their active involvement in posyandu lansia activities such as blood pressure checks, exercise, education, and treatment. Posyandu lansia has strategic potential in hypertension management [24] under the guidance and supervision of primary health care.

Since 2017, Pandak village had become a target area of the Faculty of Medicine Universitas Islam Indonesia through various empowerment and mentoring programs. The results of this study indicate that patients' and lay health workers' knowledge about hypertension and its treatment need improvement. Education is an important way to increase knowledge [23]. Such education is needed for successful hypertension management in Pandak village.

As the spearhead of services at posyandu lansia, lay health workers' capacity should be improved in Pandak village, for example, through further training in measuring blood pressure, interpreting blood pressure readings, and following up on hypertension screening. Strengthening and increasing the coverage of posyandu lansia should also include

materials for counseling about hypertension and primary health care under the posyandu lansia program.

The advantages of this study are that the data were collected directly in a community setting and that the participants were both members and nonmembers of posyandu lansia. These two factors provided a better view of the patients' knowledge level in Pandak village. However, because the study was conducted in only one village, generalizations should be made carefully, and the study should be repeated in other populations.

One limitation of this study is that external factors, such as marital status, income, culture, and information interests and source, which can influence hypertension knowledge, were not examined. These factors may have also been associated with patients' hypertension knowledge in Pandak village. Another limitation is the data were collected using a questionnaire, which assumes that the respondents answered truthfully and accurately; thus, there is a possibility of recall bias.

5 Conclusion

Good knowledge about hypertension and its treatment was found in 58.4% of patients and 58.3% of lay health workers. The knowledge level did not differ between posyandu lansia members and nonmembers. However, knowledge about hypertension was strongly associated with the level of education.

Further studies are needed to identify the best ways to increase patients' and lay health workers' knowledge in Pandak village. Areas needing improvements include the definition of hypertension and the importance of diet for people with hypertension. To increase public participation in hypertension management, the competence of lay health workers should be strengthened through training. Primary health care is expected to provide regular posyandu lansia counseling and supervision to increase community participation.

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