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The Relationship Between the Level of Knowledge and Community Behavior Towards the Incident of Hypertension in Sumberngepoh Village, Lawang District, Malang Regency

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Abstract

Lifestyle is one of the primary factors contributing to hypertension. The World Health Organization (WHO) estimates that approximately 1.28 billion adults aged 30–79 years worldwide are affected by this condition, with the majority residing in developing countries. A preliminary survey conducted in Sumberngepoh Village, Lawang District, Malang Regency revealed that 17 out of 24 respondents were unaware of their hypertension status and had never had their blood pressure measured. Additionally, 5 respondents were identified as having uncontrolled hypertension, attributed to irregular blood pressure monitoring and non-compliance with antihypertensive medication. Given these findings, this study aimed to examine the relationship between knowledge level and community behavior toward hypertension incidence in Sumberngepoh Village, with the goal of raising public awareness about the serious complications associated with this disease. The study employed a cross-sectional design, conducted from October 26 to 31, 2025. Knowledge was assessed using the Hypertension Knowledge-Level Scale (HK-LS), while a structured questionnaire was used to evaluate community behavior regarding hypertension prevention. Statistical analysis using the Chi-square test revealed no significant relationship between knowledge level and hypertension incidence, with a p-value of 0.271 ($p > 0.05$). However, a significant relationship was found between behavioral level and hypertension incidence, with a p-value of 0.024 ($p < 0.05$). Furthermore, Spearman correlation analysis indicated no significant association between knowledge level and hypertension prevention behavior, yielding a p-value of 0.392 ($p > 0.05$). These findings suggest that behavior plays a more influential role than knowledge alone in determining hypertension outcomes within this community.

Keywords: knowledge; behavior; hypertension

INTRODUCTION

Hypertension, or high blood pressure, is one of the non-communicable diseases that constitutes a major global health problem. According to the World Health Organization (WHO), approximately 1.28 billion adults aged 30–79 years worldwide suffer from hypertension, with most living in developing countries (WHO, 2025). Hypertension is often referred to as the silent killer because it does not cause obvious symptoms but can lead to serious complications, such as stroke, coronary heart disease, kidney failure, and premature death. One of the factors contributing to hypertension is lifestyle and level of knowledge. In health, lifestyle refers to a way of living that takes into account factors influencing health, including diet and exercise (Asiri et al., 2020; Devi et al., 2017; Ojangba et al., 2023). Lifestyle modification can improve quality of life and prevent degenerative diseases by regulating dietary patterns and nutrient intake through a healthy diet that reduces salt intake, limits alcohol consumption, promotes weight loss, encourages smoking cessation, supports regular physical activity, and reduces stress.

Sumberngepoh Village, Lawang District, is a rural area with a relatively low level of community education. This condition affects the community's level of knowledge about hypertension, including its risk factors, symptoms, the importance of regular medication, and the role of a healthy lifestyle. Furthermore, health education provided in this village is still

limited, resulting in low public awareness of monitoring blood pressure, taking medication as prescribed, and adopting a healthy lifestyle. During a preliminary survey on hypertension knowledge conducted in Sumberngepoh Village, Lawang District, Malang Regency, researchers found that 17 out of 24 respondents were unaware that they had hypertension and had never previously checked their blood pressure. Five respondents also had uncontrolled hypertension, either because they did not regularly monitor their blood pressure or were nonadherent to antihypertensive medication (Bilal et al., 2015; Gikunda & Gitonga, 2019; Worku & Gessese, 2024). Furthermore, the results showed that 17 respondents had an education level equivalent to elementary school (Cui et al., 2021; Laksono et al., 2021).

Based on the initial survey conducted in Sumberngepoh Village, Lawang District, Malang Regency, the researchers sought to investigate the relationship between community behavior and the incidence of hypertension, as well as the relationship between the level of knowledge about hypertension and community behavior in preventing hypertension (Anam, 2023; Eshah & Al-Daken, 2016; Gong et al., 2020; Legido-Quigley et al., 2015; Ozoemena et al., 2019).

A number of studies have examined the relationship between knowledge, behavior, and the incidence of hypertension. Research by Asep Sukohar and Suharmanto (2021), using the Health Belief Model (HBM) approach, showed that the perceived benefits of a healthy lifestyle, such as reducing salt intake and quitting smoking, significantly affect adherence to hypertension prevention behaviors. Meanwhile, research by Fatmawati, Suprayitna, and Istianah (2024) found that self-efficacy is the strongest factor influencing hypertension patients' efforts to control blood pressure. Other studies by Setiyaningsih, Tamtomo, and Suryani (2022), as well as Hulu et al. (2023), also confirmed that healthy behaviors, such as limiting salt intake, engaging in regular exercise, and routinely checking blood pressure, are associated with a reduced risk of hypertension. However, most of these studies were conducted in urban areas or advanced healthcare facilities, and only a few specifically targeted rural communities with low levels of education, such as Sumberngepoh Village (Liu et al., 2018; Park et al., 2022).

Based on the literature review, the research gap in this study is that most previous studies have focused on the direct relationship between knowledge and the incidence of hypertension without examining the role of behavior as an intervening variable. In addition, studies simultaneously examining the relationship between knowledge and hypertension incidence, behavior and hypertension incidence, and knowledge and hypertension prevention behavior within a single model remain limited, especially in rural areas (Dégano et al., 2017; Kalam et al., 2025; Ragavan et al., 2021). Furthermore, studies comprehensively applying the Health Belief Model to rural communities in East Java are still scarce. The novelty of this research lies in its focus on Sumberngepoh Village, which represents a rural area with limited healthcare access and low educational attainment; the simultaneous testing of three relationships using the validated Hypertension Knowledge-Level Scale (HK-LS) instrument; and the integration of findings with the Health Belief Model and Lawrence Green's theory to explain the knowledge–behavior gap that has rarely been explored previously. Based on this background, this study was conducted to address these gaps (Alordiah, 2023; Nyanchoka et al., 2019).

This research aims to analyze the relationship between the level of public knowledge about hypertension and the incidence of hypertension in Sumberngepoh Village; analyze the

relationship between community hypertension prevention behavior and the incidence of hypertension in Sumberngepoh Village; and analyze the relationship between the level of knowledge and community prevention behavior in Sumberngepoh Village. The theoretical benefit of this research is to enrich the literature on the Health Belief Model and health behavior theory in the context of rural communities, particularly in explaining the gap between knowledge and behavior, and to serve as a reference for future researchers. Practically, these findings can provide input for the Malang Regency Health Office and local health centers in designing more effective educational and behavioral intervention programs, focusing not only on knowledge transfer but also on strengthening self-efficacy, providing cues to action, and optimizing the use of existing posyandu and poskesdes. In addition, this research is expected to increase public awareness in Sumberngepoh Village regarding the importance of routine blood pressure monitoring, adherence to medication, and the implementation of a healthy lifestyle to prevent hypertension-related complications.

METHOD

This research was an observational analytical study with a cross-sectional approach. The research population consisted of the entire community of Sumberngepoh Village, Lawang District, Malang Regency in October 2025. The minimum sample size for this study was calculated using the formula for comparing two proportions for each variable, resulting in a minimum of 31 samples for each variable. Since there were two observed variables, the minimum required sample size was 62 participants.

Data collection was carried out on Wednesday, October 29, 2025, by collecting primary data through structured interviews based on the attached questionnaire, which were conducted directly by the research team. The research team collected data from 66 participants. To measure the level of public knowledge, the Hypertension Knowledge-Level Scale (HK-LS) was used, while community behavior regarding hypertension prevention efforts was assessed using a questionnaire that had been tested for validity and reliability by the research team.

The data were analyzed quantitatively using SPSS. The analysis began with a univariate test to examine the frequency distribution of each variable, followed by a bivariate analysis to examine the relationship between the level of knowledge about hypertension and hypertension preventive behavior with the incidence of hypertension in the community.

RESULT AND DISCUSSION

Sumberngepoh village, Lawang district, Malang Regency. Sumberngepoh village has an area of 708.6 hectares. Sumberngepoh village consists of three hamlets, namely Krajan Hamlet, Barek Hamlet, and Gapuk Hamlet which consist of 7 Community Units (RW). Sumberngepoh village has the following boundaries: to the north it borders Sentul village, Purwodadi district; to the south with Sidodadi village, Lawang district; to the west with Mulyoarjo village, Lawang district; and to the east with Cowek village, Purwodadi district. Sumberngepoh village has several health service facilities, namely the Village Health Post (Poskesdes) managed by a village midwife, Posyandu which is in each RW totaling 7 Posyandu, and 1 Posyandu park. Sumberngepoh village has a total population 5,111 residents, some of the population live as farmers and private sector.

Table 1. Distribution of Respondent Characteristics by Gender, Education and Occupation

Variable	Characteristic Sample	Frequency	Percent
Gender	Male	18	27,3%
	Female	48	72,7%
Education	Not Education	4	6,1 %
	Elementary school	37	56,1 %
	Junior high school	14	21,2 %
	Senior High School	10	15,2 %
	Bachelor	1	1,5 %
Occupations	Farmer	13	19,7 %
	Housewife	29	43,9 %
	Private sector	17	25,8 %
	Government Employees	0	0 %
	Other Jobs	7	10,6 %
Hypertension	Yes	47	71,2 %
	Not	19	28,8%

Source: Primary research data, processed by the researcher, 2025

Table 3.2 Level of Knowledge and Level of behavior about Hypertension among population of Sumberngepoh village, Lawang district, Malang regency

Variable	Category	Frequency	Precent
Knowledge Level	High	11	16,7%
	Moderat	20	30,3%
	Lack of knowledge	35	53,0%
Behavior Level	High	6	9.1%
	Moderat	14	21.2%
	Lack of behavior	46	69.7%

Source: Primary research data, processed by the researcher, 2025

In this study, a reliability test of the questionnaire regarding hypertension-related behaviors was conducted using the IBM SPSS Statistics application, obtaining a Cronbach's Alpha value greater than 0.7. Thus, the data obtained could be considered reliable and suitable for further analysis.

The questionnaire used in this study regarding behaviors related to hypertension incidence was also tested for normality using the IBM SPSS Statistics application. The researchers used the Kolmogorov–Smirnov test because the sample size in this study was greater than 50, with a total of 66 respondents. The results of the normality test showed a value of $p < 0.05$ (0.013), indicating that the data were not normally distributed.

This research study was analyzed using the chi-square test to determine the significance of the relationship between behavioral variables and the incidence of hypertension, resulting in a p-value of 0.024. A second chi-square test was conducted to examine the relationship between the level of knowledge and the incidence of hypertension, resulting in a p-value of 0.271 (> 0.05), indicating a nonsignificant relationship.

The results of the statistical tests using the Spearman correlation test showed no significant relationship between the level of knowledge and the level of hypertension prevention behavior, with a p-value of 0.392 ($p > 0.05$). The contingency coefficient (CC) value of −0.107 indicated a weak negative relationship. Thus, it could be concluded that the level of

knowledge about hypertension did not have a significant relationship with hypertension prevention behavior.

The results of this study provide a critical perspective on the knowledge–behavior gap in rural hypertension management. While the Health Belief Model (HBM) and Lawrence Green's PRECEDE–PROCEED framework suggest that knowledge is a predisposing factor for behavioral change, the statistical analysis revealed a more complex reality in Sumberngepoh Village. A striking finding of this study was that although 71.2% of the respondents had hypertension, there was no significant correlation between the level of knowledge and preventive behavior ($p = 0.392$), nor between knowledge and the incidence of hypertension ($p = 0.271$). This finding suggests that merely possessing knowledge about hypertension does not necessarily translate into preventive action. This knowledge–behavior gap implies that traditional health education in this community may have reached a plateau in effectiveness. In the context of the HBM, although respondents may possess adequate information, they likely lacked perceived susceptibility or cues to action necessary to trigger lifestyle changes. In contrast to the nonsignificant relationship involving knowledge, preventive behavior showed a significant relationship with the incidence of hypertension ($p = 0.024$). This confirms that actual behavioral interventions—such as salt restriction, physical activity, and regular medical checkups—are the primary drivers of blood pressure control in this population. However, with 69.7% of respondents exhibiting inadequate preventive behavior, the community remained at high risk. This finding is consistent with the study by Asep Sukohar and Suharmanto (2021), who argued that high perceived barriers, such as the workload of the 19.7% of respondents working as farmers or the domestic responsibilities of the 43.9% who were housewives, often outweighed the perceived benefits of healthy living.

The Health Belief Model explains that health behavior is influenced by predisposing, enabling, and reinforcing factors that shape a person's preventive health actions. HBM is a psychological framework that explains how an individual's beliefs influence health-related behaviors. It is often used to help patients feel more confident in undergoing treatment and recovery processes. According to HBM theory, individual behavior toward hypertension prevention can be explained through six main components: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Individuals with high perceived susceptibility tend to engage in greater preventive behaviors, such as maintaining a healthy diet, exercising regularly, and routinely checking blood pressure. Conversely, individuals who do not perceive themselves to be at high risk of disease tend to ignore prevention efforts.

Perceived susceptibility refers to an individual's assessment of the likelihood of contracting a disease or experiencing an undesirable health outcome, such as susceptibility to hypertension. Perceived severity refers to understanding the seriousness of a disease, condition, or adverse outcome, as well as the potential consequences if no additional action is taken beyond the current treatment. Individuals may hold varying perceptions regarding the severity of a disease. Perceived benefits refer to how effective an individual believes certain actions are in reducing disease risk. Perceived barriers refer to obstacles that may prevent individuals from taking preventive health measures, including limited healthcare services, social implications, or discomfort associated with the disease. Cues to action in the HBM are triggers or prompts that motivate individuals to take health-related actions. Patients often act when they experience

symptoms of disease or receive information and explanations from healthcare professionals regarding their condition. Self-efficacy refers to an individual's belief in their ability to effectively perform a specific behavior or task. It is also associated with the likelihood of engaging in the desired behavior. Self-efficacy was originally incorporated into the construct of perceived barriers; for example, a patient with a chronic illness who adheres to a prescribed medication regimen demonstrates self-efficacy.

Research by Asep Sukohar and Suharmanto (2021), which used the HBM as an approach for hypertension prevention, showed that high perceived benefits of a healthy lifestyle, such as reducing salt intake and quitting smoking, significantly influenced adherence to hypertension prevention behaviors. Meanwhile, perceived barriers, such as limited time, financial constraints, or lack of social support, could hinder behavioral change even when individuals possessed adequate knowledge. Therefore, public health interventions need to focus on strengthening self-efficacy and providing cues to action, for example through counseling, medication reminders, and community support. This finding is consistent with the study by Fatmawati, Suprayitna, and Istianah (2024), which applied the HBM to hypertension patients at a community health center. The study found that self-efficacy was the strongest factor influencing patients' efforts to control hypertension. Individuals who felt capable of consistently implementing healthy behaviors showed a significant reduction in blood pressure after three months of intervention. This indicates that the HBM is effective in explaining and improving hypertension preventive behaviors. People who engage in healthy behaviors, such as limiting salt intake, exercising regularly, and routinely checking blood pressure, have a lower risk of developing hypertension. Therefore, the results of this study emphasize the need for intervention programs that focus not only on knowledge transfer but also on mentoring and supporting behavioral change in hypertension risk management (Setiyaningsih et al., 2022; Hulu et al., 2023; Hijrah et al., 2024; Roring et al., 2024).

The demographic profile—dominated by females (72.7%) and individuals with primary education—suggests that hypertension interventions must be culturally and educationally tailored. According to Lawrence Green's theory, the seven posyandu and the Village Health Post (poskesdes) in Sumberngepoh Village are vital enabling factors. However, the persistently high prevalence of hypertension (71.2%) suggests that these facilities may be underutilized for preventive purposes and may instead primarily serve treatment needs after the disease has progressed.

This research possessed several notable strengths. First, it utilized a theoretical triangulation approach by effectively combining the HBM with Lawrence Green's framework to provide a comprehensive perspective on both internal and external behavioral drivers. Second, the study used validated and reliable instruments, specifically the Hypertension Knowledge-Level Scale (HK-LS) and a behavioral questionnaire that achieved a Cronbach's Alpha value greater than 0.7, thereby ensuring the integrity of the collected data. Furthermore, the high prevalence rate identified (71.2%) provided substantial clinical urgency, making these findings highly relevant for local health policy interventions in rural East Java.

Despite its strengths, several limitations should be acknowledged. The study employed a cross-sectional approach, which captured data at a single point in time and therefore prevented the establishment of long-term causal relationships between knowledge and behavioral change. Additionally, the data showed a non-normal distribution (Kolmogorov–Smirnov $p = 0.013$),

which limited the analysis to nonparametric statistical tests. There was also potential gender bias in the sample, as 72.7% of respondents were female, which may not fully represent the behavioral patterns of the male population in the village. Finally, the reliance on self-reported questionnaires for behavioral measures may have introduced social desirability bias.

CONCLUSION

This study highlights a significant knowledge–behavior gap within the Sumberngepoh Village community, where the high prevalence of hypertension (71.2%) persisted despite varying levels of health knowledge. The statistical analysis showed that knowledge alone was insufficient to influence behavioral change ($p = 0.392$), whereas preventive behavior had a significant relationship with the incidence of hypertension ($p = 0.024$). Individuals who practiced healthy behaviors, such as limiting salt intake, engaging in regular physical activity, and routinely monitoring blood pressure, demonstrated a lower risk of developing hypertension. Therefore, public health interventions should shift from traditional information-based education toward empowerment-oriented strategies that emphasize strengthening self-efficacy, behavioral mentoring, and the provision of cues to action. Existing village health infrastructure, such as the seven posyandu units, should be optimized to support practical programs, including salt-reduction workshops and routine blood pressure monitoring, particularly targeting housewives as key health decision-makers within the household to encourage sustainable lifestyle changes throughout the community. Future research is recommended to employ longitudinal or experimental study designs to better examine causal relationships between knowledge, behavior, and hypertension outcomes, as well as to evaluate the long-term effectiveness of community-based behavioral intervention programs in rural populations.

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