

Health Belief Model and Hypertension-Related Actions Among Posyandu Community Health Workers in Langgudu District, Bima Regency, West Nusa Tenggara, Indonesia

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ABSTRACT

Background: Hypertension is one of the most prevalent non-communicable diseases and remains a major public health concern worldwide. Effective hypertension control requires not only formal healthcare services but also active community participation through community health workers who play a crucial role in health promotion and disease prevention. Community health workers' actions in hypertension control may be influenced by psychological factors described in the Health Belief Model (HBM). This study aimed to analyze the association between HBM constructs and hypertension-related actions among Posyandu community health workers.

Subjects and Method: A cross-sectional study was conducted among 86 integrated community health (*posyandu*) workers. Sample was selected using purposive sampling. The dependent variable was hypertension-related actions. The independent variables were perceived susceptibility, perceived severity, perceived benefit, perceived barrier, and cues to action. Data were collected using a structured questionnaire and analyzed using a multiple logistic regression.

Results: Integrated community health workers with high perceived severity were 3.69 times more likely to perform good hypertension-related actions than those with low perceived severity (OR= 3.69, 95% CI= 1.11 to 12.27, p= 0.033). Community health workers with high perceived barrier were 4.80 times more likely to demonstrate good hypertension-related actions (OR= 4.80, 95% CI= 1.37 to 16.83, p = 0.014). Perceived susceptibility (OR = 1.49, 95% CI= 0.44 to 5.13, p = 0.522), perceived benefits (OR= 0.42, 95% CI= 0.10 to 1.91, p = 0.263), and cues to action (OR= 4.18, 95% CI = 0.97 to 18.02, p = 0.055) were not significantly associated with hypertension-related actions.

Conclusion: The study concludes that perceived severity and perceived barriers are the most influential HBM constructs affecting hypertension-related actions among community health workers.

Keywords: health belief model, hypertension, integrated community health service, health workers

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BACKGROUND

Hypertension is one of the leading non-communicable diseases (NCDs) and a major contributor to global morbidity and mortality. The World Health Organization (WHO) reported that approximately 1.28 billion adults aged 30–79 years are living with hypertension, with the majority residing in low- and middle-income countries (WHO, 2023). Hypertension is often referred to as a silent killer because it frequently develops without noticeable symptoms while substantially increasing the risk of stroke, coronary heart disease, kidney failure, and premature death (Pradono et al., 2020; WHO, 2023). In Indonesia, hypertension remains a significant public health challenge due to its increasing prevalence and its role as one of the primary risk factors for cardiovascular diseases (Pradono et al., 2020; Basic Health Research, 2018).

Data from the Indonesian Health Survey indicate that hypertension continues to impose a substantial health burden on the population (Ministry of Health of the Republic of Indonesia, 2023a). This condition is exacerbated by low public awareness regarding routine blood pressure screening, delayed diagnosis, poor adherence to treatment, and inadequate adoption of healthy lifestyle behaviors. Therefore, comprehensive hypertension control strategies involving promotive, preventive, curative, and rehabilitative approaches are required, with active participation from multiple sectors, including communities.

Efforts to control hypertension should not rely solely on formal healthcare services but also require community engagement through empowerment-based approaches. One of the key components of community-

based healthcare services in Indonesia is the community health worker, who serves as the frontline health worker at the village and community levels (Ministry of Health of the Republic of Indonesia, 2022). Integrated community health service (*Posyandu*) workers contribute to blood pressure screening, health education, monitoring of NCD risk factors, assistance for high-risk individuals, and referrals to healthcare facilities (Ministry of Health of the Republic of Indonesia, 2022). The effectiveness of these roles is highly dependent on community health workers' health-related behaviors and actions.

Health behavior is shaped by the interaction of predisposing, enabling, and reinforcing factors that influence individuals' health-related decision-making processes (Green & Kreuter, 2005; Notoatmodjo, 2018). One of the most widely used theoretical frameworks for explaining health behavior is the Health Belief Model (HBM). This model proposes that health-related actions are influenced by individuals' perceptions of disease susceptibility (perceived susceptibility), disease severity (perceived severity), benefits of preventive actions (perceived benefits), barriers to taking action (perceived barriers), and stimuli that motivate action (cues to action) (Glanz et al., 2015; Rosenstock, 1974). The HBM has been extensively applied to explain preventive behaviors and disease management practices related to hypertension, diabetes mellitus, and other cardiovascular conditions (Glanz et al., 2015; Jones et al., 2015).

Previous studies have demonstrated that HBM constructs are associated with preventive health behaviors and adherence to recommended health actions. Indivi-

duals with a high perception of disease severity are generally more motivated to engage in preventive measures and early detection because they believe that the disease may have serious consequences for health and quality of life (Jones et al., 2015; Rosenstock et al., 1988). Similarly, positive perceptions regarding the benefits of preventive actions have been shown to increase the likelihood of adopting healthy behaviors (Carpenter, 2010). External support from healthcare professionals, access to health information, and other motivating factors may also function as cues to action that encourage healthier behaviors (Glanz et al., 2015). Nevertheless, evidence regarding the influence of individual HBM constructs remains inconsistent across different populations and research contexts, indicating the need for further investigation.

Research examining the application of the Health Belief Model among *Posyandu* community health workers as community health workers remains limited, particularly in Bima Regency, West Nusa Tenggara, Indonesia. Considering their strategic role in supporting community-based hypertension control programs through Posbindu PTM and Integrated Primary Healthcare Services (*Integrasi Layanan Primer*), understanding factors that influence their actions is essential (Ministry of Health of the Republic of Indonesia, 2022).

Langgudu District is one of the areas in Bima Regency with a relatively high burden of hypertension based on reports from the local health authority. This situation highlights the importance of active and empowered *Posyandu* community health workers in strengthening community-based hypertension prevention and control efforts. Therefore, this study aimed to analyze the association between Health Belief Model constructs and hypertension-

related actions among *Posyandu* community health workers in Langgudu District, Bima Regency.

Although numerous studies have applied the Health Belief Model to explain preventive and disease-management behaviors, most have focused on patients, high-risk populations, or the general public (Carpenter, 2010; Islam et al., 2025). Research specifically examining HBM constructs among community health workers who actively participate in health promotion and disease prevention remains limited. Furthermore, previous studies have reported inconsistent findings regarding which HBM constructs exert the strongest influence on health-related behaviors, particularly in the context of hypertension prevention and control (Islam et al., 2025; Mohammadkhah et al., 2023). These gaps highlight the need for further investigation into the psychosocial factors that influence the actions of community health workers in supporting community-based hypertension control programs.

This study contributes to the existing literature by applying the Health Belief Model to *Posyandu* workers, a unique group of community health workers who serve as an essential link between healthcare services and local communities. Unlike previous studies that primarily focused on patients or individuals at risk of hypertension, this research investigates the factors influencing *Posyandu* workers' actions in supporting hypertension prevention and control efforts at the community level. The findings are expected to extend the application of the Health Belief Model within community empowerment settings and provide evidence-based insights for designing training programs and capacity-building interventions aimed at strengthening the role of *Posyandu* community health

workers in primary healthcare and non-communicable disease prevention.

SUBJECTS AND METHOD

1. Study Design

This was a cross-sectional study conducted at Langgudu and East Langgudu integrated community health centers (*Posyandu*) in Langgudu District, Bima Regency, West Nusa Tenggara, Indonesia, from February to March 2026.

2. Population and Sample

The target population consisted of all *Posyandu* community health workers involved in community-based hypertension services in Langgudu District, Bima Regency. The source population comprised 350 active *Posyandu* community health workers registered within the working areas of Langgudu and East Langgudu community health centers. The minimum sample size was calculated using the Slovin formula, resulting in 78 participants. To anticipate non-response, an additional 10% was added, yielding a final sample size of 86 respondents. Participants were selected using purposive sampling based on the following inclusion criteria: residing in Langgudu District; aged 16–55 years; having served as a *Posyandu* cadre for more than one year; and willing to participate in the study by signing informed consent. The exclusion criteria were hospitalization during data collection and those with severe illness.

3. Study Variables

The dependent variable was hypertension-related actions among *Posyandu* health workers. The independent variables were Health Belief Model constructs, consisting of: perceived susceptibility; perceived severity; perceived benefit; perceived barrier; and cues to action.

4. Operational Definition of Variables

Community health workers Actions

referred to community health workers' actual practices in providing hypertension-related services, including blood pressure measurement, recording results, delivering health education, and referring suspected cases to community health centers.

Perceived Susceptibility referred to community health workers' beliefs regarding the risk of hypertension within the community.

Perceived Severity referred to community health workers' perceptions concerning the seriousness and consequences of hypertension if preventive measures were not undertaken.

Perceived Benefits referred to community health workers' perceptions regarding the advantages of early detection and hypertension prevention activities.

Perceived Barriers referred to obstacles perceived by community health workers in conducting hypertension prevention and screening activities.

Cues to Action referred to internal and external factors encouraging community health workers to engage in hypertension prevention efforts.

5. Study Instruments

Data were collected using a structured self-administered questionnaire. Health Belief Model constructs were measured using a 15-item questionnaire covering perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. Responses were assessed using a four-point Likert scale ranging from strongly disagree to strongly agree. Hypertension-related actions were measured using a Guttman-scale questionnaire assessing community health workers' actual practices related to hypertension services in the community. Items measuring perceived barriers were negatively worded and

reverse scored prior to analysis. Therefore, higher scores indicated more favorable perceptions regarding barriers to hypertension prevention activities, reflecting fewer perceived obstacles to performing hypertension-related actions. Instrument testing was conducted among 30 *Posyandu* health workers from Ngali and Lambu Community Health Centers.

6. Data analysis

Univariate analysis was performed to describe respondents' characteristics and the distribution of study variables. Bivariate analysis was conducted using the Chi-square test to assess associations between each HBM construct and hypertension-related actions. Variables meeting the statistical criteria were subsequently included in a multiple logistic regression model. The strength of association was expressed as Odds Ratios (ORs) with 95% Confidence Intervals (CI). A p-value less than 0.05 was considered statistically significant.

7. Research Ethics

Research ethical issues, including informed consent, anonymity, confidentiality, and voluntary participation, were carefully addressed throughout the study. Prior to data collection, all participants received an

explanation regarding the objectives, procedures, benefits, and risks of the study. Written informed consent was obtained from all respondents before participation. This study received ethical approval from the Research Ethics Committee of Universitas Sebelas Maret, Indonesia (Approval No. 33/UN27.06.11/KEP/EC/2026) on February 20, 2026.

RESULTS

1. Sample Characteristics

A total of 86 *Posyandu* community health workers participated in this study. Most respondents were aged 36–45 years (62.8%), had completed senior high school or vocational high school education (75.6%), and were housewives (91.9%). Among the five Health Belief Model constructs, cues to action showed the highest proportion of high scores (79.1%), followed by perceived barriers (76.7%) and perceived benefits (65.1%). This finding suggests that most cadres had strong motivational triggers and external support to engage in hypertension prevention activities. Overall, 73.3% of respondents showed good hypertension-related actions.

Table 1. Sample characteristics and Distribution of Study Variables (n=86)

Characteristics	Category	n	Percentage (%)
Age	16–25 years old	1	1.2
	26–35 years old	8	9.3
	36–45 years old	54	62.8
	46–55 years old	23	26.7
Education	Junior high school	14	16.3
	Senior high school	65	75.6
	Bachelor	7	8.1
Occupation	Housewife	79	91.9
	Farmer	2	2.3
	Private employee	3	3.5
	Others	2	2.3
Perceived Susceptibility	Low (< 60.5)	34	39.5
	High (≥ 60.5)	52	60.5
Perceived Severity	Low (< 61.6)	35	40.7
	High (≥ 61.6)	51	59.3

Characteristics	Category	n	Percentage (%)
Perceived Benefits	Low (< 66.3)	30	34.9
	High ($\geq$ 66.3)	56	65.1
Perceived Barriers	Low (< 84.5)	20	23.3
	High ($\geq$ 84.5)	66	76.7
Cues to Action	Low (< 86.0)	18	20.9
	High ($\geq$ 86.0)	68	79.1
Hypertension-related Actions	Poor (< 91.1)	23	26.7
	Good ($\geq$ 91.1)	63	73.3

2. Bivariate Analysis

Table 2 showed that high perceived severity (OR= 5.29; 95% CI= 1.87 to 14.95; $p < 0.001$), high perceived barrier (OR= 7.50; 95% CI= 2.49 to 22.63; $p < 0.001$), strong cues to action (OR= 5.29; 95% CI= 1.75 to 16.03; $p = 0.002$), and perceived suscep-

tibility (OR= 2.60; 95% CI= 0.98 to 6.91; $p = 0.052$) increased hypertension-related actions in *Posyandu* health workers. High perceived benefit increased hypertension-related actions in *Posyandu* health workers, but it was statistically not significant (OR= 2.12; 95% CI= 0.80 to 5.65; $p = 0.128$).

Table 2. Bivariate Analysis of Health Belief Model Constructs and Hypertension-Related Actions

Variable	Hypertension-related Actions				OR	95% CI		p
	Poor		Good			Lower Limit	Upper Limit	
	N	%	N	%				
Perceived Susceptibility								
Low	13	38.2	21	61.8	2.60	0.98	6.90	0.052
High	10	19.2	42	80.8				
Perceived Severity								
Low	16	45.7	19	54.3	5.29	1.87	14.95	<0.001
High	7	13.7	44	86.3				
Perceived Benefit								
Low	11	36.7	19	63.3	2.12	0.80	5.65	0.128
High	12	21.4	44	78.6				
Perceived Barrier								
Low	12	60	8	40	7.50	2.49	22.63	<0.001
High	11	16.7	55	83.3				
Cues to Action								
Low	10	55.6	8	44.4	5.29	1.74	16.03	0.002
High	13	19.1	55	80.9				

3. Multivariate analysis

Table 3 showed that high perceived severity (OR= 3.69; 95% CI= 1.11 to 12.27; $p = 0.033$), high perceived barrier (OR= 4.80; 95% CI= 1.37 to 16.83; $p = 0.014$), and high perceived benefit (OR= 3.69; 95% CI= 0.11 to 12.27; $p = 0.033$) significantly increased hypertension-related actions in *Posyandu*

health workers. High perceived susceptibility (OR= 1.49; 95% CI= 0.44 to 5.13; $p = 0.052$) and strong cues to action (OR = 4.18; 95% CI = 0.97 to 18.02; $p = 0.055$) increased hypertension-related actions in *Posyandu* health workers and they were marginally significant.

Table 3. The result of multiple logistic regression analysis

Independent Variables	OR	95% CI		p
		Lower limit	Upper limit	
Perceived Susceptibility	1.49	0.44	5.13	0.522
Perceived Severity	3.69	1.11	12.27	0.033
Perceived Benefits	0.42	0.10	1.91	0.263
Perceived Barriers	4.80	1.37	16.83	0.014
Cues to Action	4.18	0.97	18.02	0.055
N observation= 86				
-2 log likelihood= 76.47				
Nagelkerke R ² = 34.7%				

DISCUSSION

This study demonstrated that perceived severity and perceived barriers were significant determinants of hypertension-related actions, whereas perceived susceptibility, perceived benefits, and cues to action were not statistically significant after adjustment for other HBM constructs. These findings indicate that community health workers' actions in hypertension prevention and control are influenced more strongly by their perception of the seriousness of hypertension and the extent to which barrier can be overcome than by risk perception alone.

Association of Perceived Susceptibility with Hypertension-Related Action

Perceived susceptibility was not significantly associated with hypertension-related actions after adjustment for other HBM constructs. Although respondents with high perceived susceptibility had 1.49 times greater odds of performing good hypertension-related actions than those with low perceived susceptibility, this association was not statistically significant. This finding suggests that awareness of susceptibility alone may be insufficient to motivate preventive behavior among *Posyandu* community health workers. According to the Health Belief Model, perceived susceptibility functions as an individual's belief regarding the likelihood of experiencing a

disease and serves as an initial cognitive appraisal of health risk. However, behavioral change generally occurs when risk perception is accompanied by stronger perceptions of disease severity, expected benefits of action, and manageable barriers (Rosenstock, 1974; Rosenstock et al., 1988). This finding is consistent with previous studies showing that risk perception does not necessarily translate into health behavior when other motivational factors are absent (Carpenter, 2010; Wirawan et al., 2020). Likewise, (Jones et al. (2015) reported that perceived susceptibility had weaker predictive power than other HBM constructs in explaining hypertension prevention behaviors. Therefore, interventions targeting *Posyandu* community health workers should not only increase awareness of hypertension risk but also strengthen perceptions of disease severity, reduce perceived barrier, and reinforce the benefit of preventive actions to encourage sustainable hypertension-related behaviors.

Association of Perceived Severity with Hypertension-Related Actions

Perceived severity was significantly associated with hypertension-related actions. *Posyandu* community health workers with high perceived severity were more likely to perform appropriate hypertension-related actions than those with lower perceived severity, indicating that stronger perceptions regarding the seriousness of

hypertension substantially increased the likelihood of engaging in preventive action. This finding supports the central proposition of the Health Belief Model that individuals are more likely to adopt preventive behaviors when they believe a disease may result in serious consequences (Glanz et al., 2015; Rosenstock et al., 1988). Hypertension remains one of the leading risk factors for cardiovascular disease, stroke, chronic kidney disease, and premature mortality worldwide (WHO, 2023). In Indonesia, hypertension continues to contribute substantially to morbidity and mortality, emphasizing the importance of community-based prevention efforts (Ministry of Health of the Republic of Indonesia, 2023b; Basic Health Research, 2018).

One possible explanation is that community health workers who recognize these serious consequences are more motivated to encourage blood pressure screening, promote healthy lifestyles, and facilitate referral services within their communities. This finding is in line with previous studies conducted by (Gatewood, 2008; Jones et al., 2015; Mohammadkhah et al., 2023), which identified perceived severity as a significant predictor of preventive health behavior. These findings suggest that educational interventions for Posyandu community health workers should emphasize the serious health consequences of uncontrolled hypertension, as strengthening perceptions of disease severity may improve cadres' motivation to participate actively in hypertension prevention and early detection programs.

Association of Perceived Benefits with Hypertension-Related Actions

Perceived benefits were not significantly associated with hypertension-related actions after adjustment for other HBM constructs. Community health workers with high perceived benefits were not signifi-

cantly more likely to perform good hypertension-related actions than those with lower perceived benefits. Within the Health Belief Model, perceived benefits refer to an individual's belief that adopting a recommended health behavior will reduce disease risk or improve health outcomes (Glanz et al., 2015; Rosenstock et al., 1988).

Contrary to expectations, although most respondents recognized the advantages of hypertension prevention and early detection, this perception alone was insufficient to predict actual behavior. One possible explanation is that awareness of these benefits was already high and relatively homogeneous among respondents, thereby reducing the variability of this construct. Furthermore, the performance of Posyandu community health workers is influenced not only by personal beliefs but also by organizational support, supervision, availability of resources, and community participation.

This finding differs from studies by Carpenter (2010) and Suharmanto (2021), which reported perceived benefits as an important determinant of preventive behavior. However, similar inconsistencies have been reported in HBM-based studies, suggesting that the influence of perceived benefits may vary according to population characteristics and contextual factors (Champion & Skinner, 2008). These findings indicate that educational interventions should be complemented by adequate organizational support and enabling resources so that awareness of the benefits of hypertension prevention can be translated into sustained hypertension-related actions among *Posyandu* health workers.

Association of Perceived Barriers with Hypertension-Related Actions

Perceived barriers emerged as the strongest predictor of hypertension-related actions. It should be noted that the perceived barriers

scale was reverse scored; therefore, higher scores reflected fewer perceived barriers. This finding indicates that community health workers who perceived fewer obstacles were substantially more likely to engage in hypertension prevention and control activities. The result is highly consistent with HBM theory, which identifies perceived barriers as one of the most influential determinants of health behavior because individuals tend to evaluate practical obstacles before deciding whether to take action (Champion & Skinner, 2008; Glanz et al., 2015).

In the context of Posyandu health services, barriers may include limited blood pressure monitoring equipment, insufficient operational funding, competing household responsibilities, inadequate training opportunities, and low community participation. When these barriers are perceived as manageable, community health workers are more likely to perform blood pressure screening, provide health education, and support hypertension monitoring activities. Similar findings have been reported by (Mirhoseini et al., 2019; Nahum-Shani et al., 2018), who reported that reducing perceived barriers significantly improves participation in preventive health programs. Therefore, strengthening Posyandu infrastructure, ensuring adequate equipment, providing continuous training, and improving supervisory and financial support may substantially enhance hypertension prevention activities among community health workers.

Association of Cues to Action with Hypertension-Related Actions

Cues to action demonstrated a relatively strong magnitude of association but did not achieve statistical significance. Community health workers with high cues to action were approximately 4.2 times more likely to perform good hypertension-related actions

than those with lower cues to action; however, this association did not reach the conventional threshold for statistical significance. According to the Health Belief Model, cues to action include both internal and external stimuli that trigger health-related behaviors, such as exposure to health information, training activities, supervision from health professionals, personal experiences with disease, and government health campaigns (Glanz et al., 2015).

Although the association was not statistically significant, the relatively large odds ratio suggests that cues to action may still have practical relevance. The wide confidence interval indicates considerable uncertainty in the estimated effect, possibly reflecting the limited statistical power associated with the relatively small sample size. Similar findings have been reported by (Suharmanto, 2021), who suggested that cues to action often function as facilitating factors that strengthen the influence of other HBM constructs rather than directly determining health behavior. Likewise, (Mbuthia et al., 2022) highlighted that continuous supervision, health education, and community health workers-led interventions act as important external cues that improve hypertension management in low- and middle-income countries.

Furthermore, Suseela et al. (2022) stated that community-based education and peer support effectively encouraged sustained hypertension prevention behavior by providing continuous motivational cues. These findings imply that strengthening external cues through continuous training, supportive supervision, health promotion campaigns, and regular reminders may enhance hypertension-related actions among *Posyandu* community health workers and should be explored further in larger studies.

The Nagelkerke R^2 value of 0.35 indicates that approximately 35% of the variation in hypertension-related actions was explained by the HBM constructs included in this study. This finding suggests that a substantial proportion of behavioral variation remains unexplained. Health behavior is inherently multidimensional and influenced by individual, interpersonal, organizational, and environmental factors (Glanz et al., 2015). Among *Posyandu* community health workers, factors such as educational level, health literacy, length of service, self-efficacy, motivation, social support, training experience, supervision from healthcare professionals, and organizational capacity may contribute to behavioral outcomes. Previous studies have similarly emphasized that community health workers performance is shaped by a combination of psychological and contextual determinants (Nahum-Shani et al., 2018).

The findings of this study reinforce the applicability of the Health Belief Model in understanding health-related behaviors among community health workers. However, the results also suggest that cognitive perceptions alone are insufficient to explain community health workers' actions. Effective hypertension prevention program should therefore combine behavioral approaches with organizational and structural support mechanisms. Strengthening community health workers' understanding of hypertension complications may increase perceived severity, whereas improving access to equipment, training, supervision, and operational resources may reduce perceived barriers and facilitate better performance.

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference between HBM constructs and hypertension-related

actions. Second, the use of self-reported questionnaires may have introduced recall bias and social desirability bias. Third, the study was conducted in a single district of Bima Regency, limiting the generalizability of the findings to other populations. Future studies should employ longitudinal designs, larger sample sizes, and additional behavioral variables such as self-efficacy, social support, and organizational commitment to provide a more comprehensive understanding of factors influencing cadre performance.

Perceived severity and perceived barriers were significant determinants of hypertension-related actions among *Posyandu* health workers, with perceived barriers emerging as the strongest predictor. These findings indicate that community health workers are more likely to engage in hypertension prevention and control activities when they recognize the serious consequences of hypertension and perceive fewer obstacles to action. Policy efforts should therefore prioritize continuous cadre training on hypertension complications, provision of adequate screening equipment, strengthening of supervisory support from primary healthcare facilities, and reduction of operational barriers that may hinder community-based hypertension prevention programs.

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CONFLICT OF INTEREST

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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