



ANALYSIS OF TERTIARY PREVENTION EFFORTS FOR HYPERTENSION IN BOYOLALI REGENCY BASED ON THE THEORY OF PLANNED BEHAVIOR: PATH ANALYSIS

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ABSTRACT

Hypertension remains a major public health problem and a leading risk factor for cardiovascular morbidity and mortality. Effective tertiary prevention is needed to prevent complications and improve blood pressure control. The Theory of Planned Behavior (TPB) provides a framework for understanding preventive behaviors among patients with hypertension. A cross-sectional study involving 200 working-age patients with hypertension was conducted in Boyolali Regency, Central Java, Indonesia, from April to May 2026. Participants were selected through stratified multistage random sampling. Instrument validity was assessed using corrected item-total correlation ($r \geq 0.30$), and reliability using Cronbach's alpha ($\alpha \geq 0.70$). Blood pressure control was measured using a calibrated sphygmomanometer. Data were analyzed using Generalized Structural Equation Modeling (GSEM). Attitude ($OR=3.43$; $p=0.003$), subjective norms ($OR=3.97$; $p=0.001$), and perceived behavioral control ($OR=5.42$; $p=0.001$) significantly influenced intention. Intention ($OR=13.28$; $p<0.001$) and perceived behavioral control ($OR=21.43$; $p<0.001$) significantly influenced tertiary prevention efforts. Good tertiary prevention efforts were associated with controlled blood pressure ($OR=20.94$; $p<0.001$). Perceived behavioral control showed the strongest direct and indirect effects through intention. TPB effectively explains tertiary prevention efforts among working-age patients with hypertension. Strengthening perceived behavioral control and intention may improve self-management and blood pressure control.

Keywords: blood pressure control; hypertension; tertiary prevention; theory of planned behavior

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INTRODUCTION

An estimated 1.4 billion people worldwide will have hypertension by 2024. Hypertension affects about 1 in 3 adults aged 30–79. As many as 600 million adults (44%) of the world's population are unaware that they have hypertension, while only 630 million (44%) adults have been diagnosed with hypertension and are receiving treatment. Hypertension remains a major concern, as it is still the leading cause of premature death worldwide (WHO, 2025). The prevalence of hypertension increases with age and is influenced by lifestyle changes, including an unhealthy diet and lack of physical activity. The number of people with hypertension is increasing significantly in low- and middle-income countries, where the majority of the population has low to middle incomes. The number of people with hypertension is projected to rise to 1.5 billion by 2025 (Mills et al., 2020; Y A Mashuri et al., 2022).

In Southeast Asia, epidemiological data are shifting in tandem with rapid modernization and lifestyle changes in developing countries. This has made noncommunicable diseases, such as hypertension, a top priority in disease control. Recent research reports a 33.8% prevalence of hypertension in urban populations (Nawi et al., 2021). In Indonesia, the number of people with hypertension ranks fifth globally. The prevalence of hypertension among those aged 18 to 24 years is 10.7 percent, while among those aged 25 to 34 years, it reaches 17.4 percent. In total, approximately 29.0 percent of Indonesia's population suffers from hypertension, with the majority of current patients falling within the working age group. The prevalence of hypertension increases with age (SKI, 2023).

In Central Java Province, hypertension still accounts for the largest proportion of all reported noncommunicable diseases (NCDs). The prevalence of hypertension in Central Java is estimated at 32.9% of the total population. Of this estimated number, only 54.6% have received education and regular treatment. The prevalence of hypertension ranks first among noncommunicable diseases (NCDs) in Central Java, followed by obesity and diabetes mellitus, which are the top priorities for NCD control in the province. (Dinkes Prov. Jateng, 2024). In Boyolali Regency, the number of hypertension cases has risen over the past five years. As of 2024, 332,837 people nearly one-third of the population aged 18 and older in Boyolali suffer from hypertension. The areas served by the Ngemplak, Cepogo, and Mojosoongo Community Health Centers had the highest number of hypertension cases. Approximately 89.1% of people with hypertension in Boyolali Regency received care in accordance with standards (Dinkes Kab. Boyolali, 2024).

Global public awareness of the dangers of hypertension remains relatively low. Only 42% of all people with hypertension have been diagnosed, and only 320 million people with hypertension worldwide (23%) have successfully controlled their blood pressure (WHO, 2025). In Indonesia, hypertension remains a serious public health issue. The prevalence of hypertension patients in Indonesia who undergo regular follow-up visits with a doctor is only 43.1%. Among the total number of hypertension patients in Indonesia, only 18.9% have their blood pressure under control. The rate of adherence to regular medication among hypertension patients in Central Java is 39.8%. About 70.0% of patients do not take their medication regularly because they feel healthy (SKI, 2023).

The rise in body mass index means that hypertension is no longer limited to the elderly but is increasingly affecting people of working age (Ministry of Health, 2024). Based on current epidemiological trends, hypertension is no longer merely an individual clinical issue. The growing number of people with hypertension in the working-age population will increase the burden on a country's healthcare budget. According to the World Economic Forum, the budget spent on managing hypertension has reached US\$4.4 trillion, equivalent to Rp. 58.542 trillion, including the costs of all treatments resulting from hypertension complications (Balgis et al., 2022).

The risk of complications from hypertension increases as blood pressure rises in patients (Zhang et al., 2019). Elevated blood pressure in patients with hypertension causes almost no symptoms in the early stages, but has the potential to lead to serious complications if it is not detected or managed properly. Lifestyle interventions and management of cardiovascular risk factors can help control blood pressure in patients with hypertension (H. Muscab, 2023). This presents a significant challenge for the field of preventive medicine at the primary care level.

Uncontrolled hypertension is a major preventable risk factor for cardiovascular disease, the leading cause of death worldwide. Cardiovascular diseases, including coronary heart disease, heart failure, stroke, and aortic aneurysm, are common conditions caused by uncontrolled hypertension. Hypertension also leads to chronic kidney disease, retinopathy, cognitive impairment, and vascular dementia (Williams et al., 2018). The number of people with hypertension and blood pressure

exceeding 140 mmHg accounts for 3.6 million (40.1%) deaths due to ischemic heart disease, 1.1 million (38.1%) due to ischemic stroke, and 1.4 million (42.5%) due to hemorrhagic stroke (Mills et al., 2020).

Efforts to prevent complications of hypertension are divided into three stages: primary, secondary, and tertiary prevention (Caren, 2024). Primary prevention focuses on broad-based population interventions through the promotion of a healthy lifestyle, raising awareness, and identifying modifiable risk factors for hypertension. Secondary prevention involves the early detection and management of hypertension to prevent its progression and reduce the risk of cardiovascular disease. Tertiary prevention aims to minimize the impact of hypertension-related complications and improve quality of life through optimal disease management, risk factor control, and patient education. Among these three stages of prevention, tertiary prevention is the most critical to implement.

Tertiary prevention of chronic diseases is of critical importance because it aims to reduce morbidity, mortality, and disability resulting from disease complications. Tertiary prevention efforts aim to prevent the onset of early organ damage so that it does not lead to morbidity and mortality associated with the progression of the chronic disease (Abdulraheem, 2023). Tertiary prevention efforts for hypertension are crucial because at this stage, patients are expected to be aware of their condition and make a sincere effort to prevent complications. At this stage, accurate diagnosis and blood pressure control are effective interventions in managing hypertension (Parati, 2021). Uncontrolled blood pressure and the absence of tertiary prevention efforts among hypertensive patients need to be analyzed based on behavioral theory as the foundation for interventions in hypertensive patients.

Factors influencing tertiary prevention efforts are the focus of this study, which examines them through a theoretical approach in preventive medicine. The application of the Theory of Planned Behavior (TPB) in this study is highly relevant for analyzing the factors that influence tertiary prevention efforts and their relationship to blood pressure control. This approach does not merely view behavior as the result of intention alone but also considers attitudes, subjective norms, and perceived behavioral control as interacting factors. Based on this description, this study aims to examine the influence of attitude, subjective norms, and perceived behavioral control on tertiary prevention efforts and blood pressure control among hypertensive patients in Boyolali Regency using path analysis. The results of this study are expected to serve as a basis for developing theory-based health promotion interventions that are more contextually appropriate, in line with the cultural and geographical characteristics of the community in Boyolali Regency.

METHOD

This study used an observational analytic design with a cross-sectional approach and was conducted in Boyolali Regency, Central Java Province, Indonesia, from April to May 2026. The study population consisted of working-age adults (18–59 years), and a total of 200 participants were selected using stratified multistage random sampling. The dependent variables were tertiary prevention behavior for hypertension and blood pressure control, while the independent variables included attitude toward behavior, subjective norm, perceived behavioral control, and behavioral intention. Data on psychosocial variables were collected using structured questionnaires, whereas blood pressure control was assessed using a sphygmomanometer. The questionnaire was tested for validity and reliability before data collection. Item validity was assessed using corrected item-total correlation, with items considered valid if $r \geq 0.30$. Internal consistency reliability was evaluated using Cronbach's alpha coefficient, with values ≥ 0.70 indicating acceptable reliability.

Univariate analysis was performed to describe the distribution of study variables, while logistic regression and path analysis using the Structural Equation Model (SEM) were applied to assess

direct and indirect relationships among variables. Generalized SEM was chosen for the path analysis because this method is suitable for analyzing dichotomous variables. Ethical principles, including informed consent, anonymity, and confidentiality, were maintained throughout the study. Ethical approval was obtained from the Research Ethics Committee of Kusuma Husada University of Surakarta (No. 3418/UKH.L02/EC/IV/2026).

RESULT

Table 1.
Respondent characteristics

Characteristics	Mean	f	%	Min	Max
Age (years)	49.78			18	59
< 45 years		43	21.5		
≥ 45 years		157	78.5		
Sex					
Male		60	30.0		
Female		140	70.0		
Educational Attainment					
Elementary School		53	26.5		
Junior High School		56	28.0		
Senior High School		72	36.0		
Bachelor's Degree		17	8.5		
Diploma		1	0.5		
Master's Degree		1	0.5		
Occupation					
Housewife		77	38.5		
Private Employee		42	21.0		
Student		2	1.0		
Civil Servant		11	5.5		
Self-employed		68	34.0		
Body Mass Index (BMI)	26.41			15.06	39.90
Underweight (<18.5 kg/m ²)		6	3.0		
Normal (18.5–24.9 kg/m ²)		85	42.5		
Overweight (25.1–27.0 kg/m ²)		33	16.5		
Obese (≥27.0 kg/m ²)		76	38.0		
Blood Pressure (mmHg)	153/92			108/65	230/180
Controlled		105	52.5		
Uncontrolled		95	47.5		

Based on Table 1, the mean age of the respondents was 49.78 years. The majority of respondents were female, accounting for 140 individuals (70.00%). Regarding educational attainment, most respondents had completed senior high school education, with 72 individuals (36.00%). The largest proportion of respondents were housewives, comprising 77 individuals (38.50%). In terms of body mass index (BMI), the majority had a normal BMI, totaling 85 individuals (42.50%). Blood pressure control was predominantly categorized as controlled, with 105 respondents (52.50%) having a systolic blood pressure of less than 150 mmHg.

Tabel 2
Research variable score distribution

Variable	Mean	Standard Deviation	Minimum	Maximum
Attitude	19.95	2.528	13	25
Subjective Norm	15.905	2.095	11	20
Perceived Behavioral Control	19.555	2.767	13	25
Intention	16.315	2.170	12	20
Tertiary Prevention Efforts	27.105	4.331	14	35

Based on table 2, the mean scores were 19.95 for attitude, 15.91 for subjective norm, 19.56 for perceived behavioral control, 16.32 for intention, and 27.11 for tertiary prevention efforts. The variables were converted into dichotomous categories using STATA, with cut-off points based on the mean for normally distributed data and the median for non-normally distributed data, as

determined by the Shapiro Wilk test ($p > 0.05$). Attitude was classified as positive (≥ 20) or negative (< 20), subjective norm as strong (≥ 16) or weak (< 16), perceived behavioral control as strong (≥ 20) or weak (< 20), intention as strong (≥ 16) or weak (< 16), and tertiary prevention efforts as good (≥ 27) or poor (< 27).

Table 3.
Logistic SEM Analysis of Factors Influencing Intention

Variable	OR	95% CI	p-value
Intention ← Attitude	3.43	1.51–7.80	0.003
Intention ← Subjective Norm	3.97	1.70–9.25	0.001
Intention ← Perceived Behavioral Control	5.42	2.01–14.60	0.001

Based on table 3, logistic Structural Equation Modeling (SEM) analysis showed that attitude, subjective norms, and perceived behavioral control were significantly associated with intention. Respondents with a positive attitude were 3.43 times more likely to have a strong intention (OR = 3.43; 95% CI = 1.51–7.80; $p = 0.003$). Similarly, strong subjective norms increased the likelihood of strong intention by 3.97 times (OR = 3.97; 95% CI = 1.70–9.25; $p = 0.001$), while perceived behavioral control had the strongest effect, increasing the likelihood by 5.42 times (OR = 5.42; 95% CI = 2.01–14.60; $p = 0.001$). These findings indicate that all three variables are significant predictors of intention, with perceived behavioral control showing the greatest influence.

Table 4.
Logistic SEM variables that influence tertiary prevention efforts

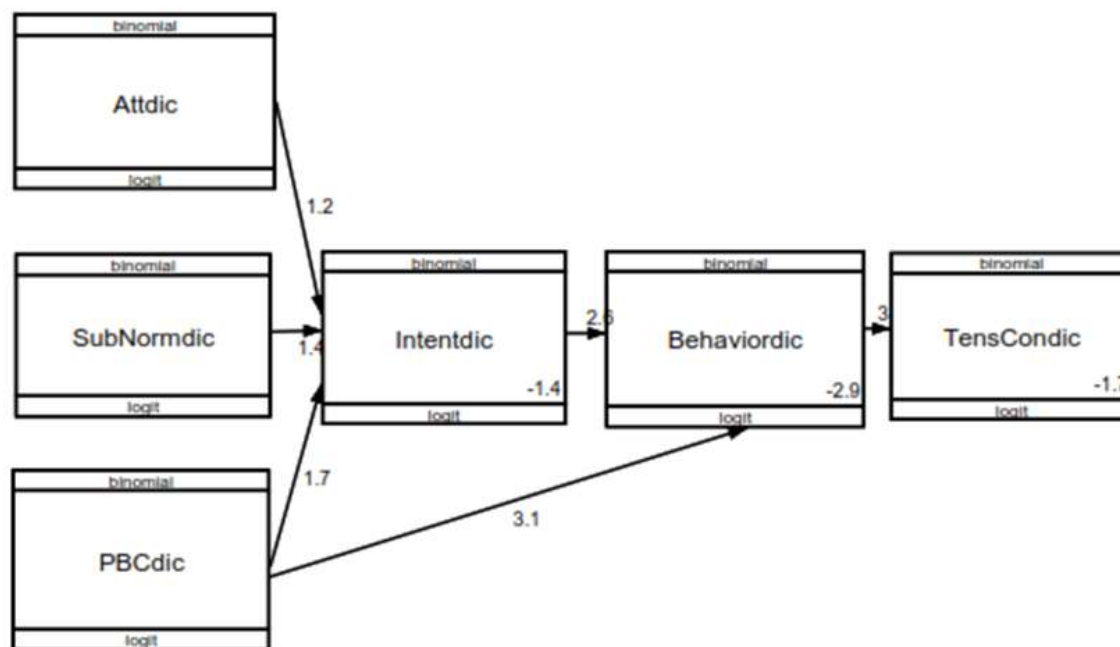
Variable	OR	95% CI	p-value
Tertiary Prevention Efforts for Hypertension ← Intention	13.28	4.67–37.80	<0.001
Tertiary Prevention Efforts for Hypertension ← Perceived Behavioral Control	21.43	8.65–53.06	<0.001

Based on Table 4, logistic Structural Equation Modeling (SEM) analysis revealed that intention and perceived behavioral control were significantly associated with tertiary prevention efforts for hypertension. Respondents with a strong intention were 13.28 times more likely to engage in tertiary prevention efforts than those with a weak intention (OR = 13.28; 95% CI = 4.67–37.80; $p < 0.001$). Perceived behavioral control demonstrated an even stronger effect, with respondents who had high perceived behavioral control being 21.43 times more likely to undertake tertiary prevention efforts compared to those with low perceived behavioral control (OR = 21.43; 95% CI = 8.65–53.06; $p < 0.001$). These findings indicate that both intention and perceived behavioral control are significant predictors of tertiary prevention efforts, with perceived behavioral control showing the strongest influence.

Tabel 5
Logistic SEM tertiary prevention efforts towards blood pressure control.

Variable	OR	95% CI	p-value
Blood Pressure Control ← Tertiary Prevention Efforts for Hypertension	20.94	9.96–43.99	<0.001

Based on Table 5, logistic Structural Equation Modeling (SEM) analysis showed a significant association between tertiary prevention efforts for hypertension and blood pressure control. Respondents who demonstrated good tertiary prevention efforts were 20.94 times more likely to achieve controlled blood pressure compared to those with poor tertiary prevention efforts (OR = 20.94; 95% CI = 9.96–43.99; $p < 0.001$). These findings indicate that effective tertiary prevention efforts are a strong predictor of blood pressure control among patients with hypertension.



N Observation = 200	AIC = 499,06
Log likelihood = -240,53022	BIC = 528,74

Figure 1 Path Analysis

Figure 4.2 presents the path analysis results of the Theory of Planned Behavior on tertiary prevention efforts for hypertension. Tertiary prevention efforts had a positive and significant effect on blood pressure control ($b = 3.0$; $p < 0.001$). These efforts were directly influenced by intention ($b = 2.6$; $p < 0.001$) and perceived behavioral control ($b = 3.1$; $p < 0.001$). Intention was positively and significantly influenced by attitude ($b = 1.2$; $p = 0.003$), subjective norms ($b = 1.4$; $p = 0.001$), and perceived behavioral control ($b = 1.7$; $p = 0.001$). Overall, the findings support the Theory of Planned Behavior, demonstrating that attitude, subjective norms, and perceived behavioral control influence intention, which subsequently promotes tertiary prevention efforts and contributes to better blood pressure control.

Table 6.
Direct Effects Analysis

Variable	b	95% CI	p-value
Intention ← Attitude	1.2	0.4–2.1	0.003
Intention ← Subjective Norm	1.4	0.5–2.2	0.001
Intention ← Perceived Behavioral Control	1.7	0.7–2.7	0.001
Tertiary Prevention Efforts for Hypertension ← Intention	2.6	1.5–3.6	<0.001
Tertiary Prevention Efforts for Hypertension ← Perceived Behavioral Control	3.1	2.2–4.0	<0.001
Blood Pressure Control ← Tertiary Prevention Efforts for Hypertension	3.0	2.3–3.8	<0.001

Based on table 6, perceived behavioral control (PBC) was the strongest predictor of tertiary prevention efforts for hypertension, demonstrating both direct and indirect effects. PBC significantly influenced intention ($b = 1.7$; $p = 0.001$) and had a stronger direct effect on tertiary

prevention efforts ($b = 3.1$; $p < 0.001$). These findings indicate that intention partially mediated the relationship between PBC and tertiary prevention efforts, suggesting that patients with higher perceived control are more likely to engage in preventive behaviors both by strengthening their intention and through a direct influence on behavior. Mediation analysis was conducted using Generalized Structural Equation Modeling (GSEM) with a logit link function. Indirect effects were estimated using the nlcom post-estimation procedure and the delta method in Stata, which are appropriate approaches for testing mediation in non-linear models with binary outcomes.

Table 7.

Indirect Effects Analysis

Variable	b	95% CI	p-value
Blood Pressure Control $\leftarrow$ Intention	7.9	4.2–11.6	<0.001
Blood Pressure Control $\leftarrow$ Perceived Behavioral Control	9.3	5.7–12.9	<0.001
Tertiary Prevention Efforts for Hypertension $\leftarrow$ Attitude	3.2	0.7–5.7	0.012
Tertiary Prevention Efforts for Hypertension $\leftarrow$ Subjective Norm	3.6	0.9–6.2	0.008
Tertiary Prevention Efforts for Hypertension $\leftarrow$ Perceived Behavioral Control	4.4	1.3–7.5	0.006

The indirect effect analysis (Table 7) using the nlcom post-estimation procedure in GSEM demonstrated significant mediation effects ($p < 0.05$). Intention and perceived behavioral control had significant indirect effects on blood pressure control through tertiary prevention efforts ($b = 7.9$, $p < 0.001$; $b = 9.3$, $p < 0.001$, respectively). In addition, attitude ($b = 3.2$, $p = 0.012$), subjective norms ($b = 3.6$, $p = 0.008$), and perceived behavioral control ($b = 4.4$, $p = 0.006$) had significant indirect effects on tertiary prevention efforts through intention. The indirect effect of perceived behavioral control on tertiary prevention efforts remained significant ($b = 4.4$, $p = 0.006$), indicating partial mediation by intention. The total effect of perceived behavioral control was 7.5 (4.4 indirect effect + 3.1 direct effect; $p < 0.05$), suggesting that stronger perceived behavioral control substantially increased tertiary prevention efforts. Overall, all tested pathways were positive and statistically significant, supporting the proposed model and confirming that individual perceptions, intentions, and preventive behaviors are linearly interconnected.

DISCUSSION

The significant influence of attitude on intention in this study should not be interpreted merely as a statistical relationship—that is, the more positive the attitude, the stronger the intention. This finding needs to be analyzed through the lens of behavioral beliefs in the Theory of Planned Behavior, specifically an individual's beliefs regarding the benefits or consequences of a behavior, which subsequently shape positive or negative evaluations of health behaviors (Ajzen, 2002). In the working age group (18–59 years), the formation of behavioral beliefs is influenced by distinctive psychological and social characteristics. Individuals in this phase are generally in the active working years, have career goals, bear family economic responsibilities, and face high social demands; consequently, health is viewed as the primary asset for maintaining their productivity and the continuity of their social functions (Bani Hani et al., 2024).

In the context of hypertension, the condition becomes more complex because hypertension is often asymptomatic or what is known as a “silent killer.” Many patients continue to feel healthy, are able to work normally, and experience no complaints even though their blood pressure is uncontrolled. This asymptomatic condition leads some individuals to form erroneous behavioral beliefs, such as the belief that hypertension is not a serious disease or that treatment is only necessary when symptoms appear. This indicates that the intention to comply arises through a process of cognitive evaluation of the benefits and risks of health behaviors. (Eslamimehr et al., 2024).

Patients of working age who maintain a positive attitude demonstrate more rational and future-oriented behavioral beliefs. They understand that even though they may feel healthy now, hypertension can gradually damage blood vessels and increase the risk of stroke, kidney failure, or heart attack in the future. This awareness fosters the belief that adherence to antihypertensive medication, sodium restriction, physical activity, and blood pressure monitoring constitute a long-

term health investment to maintain quality of life and work productivity (Peters and Templin, 2010). During working age, the threat of hypertension complications carries broader psychological implications beyond mere physical health issues. The risk of stroke or heart attack is perceived as a threat to one's ability to work, family economic stability, and the continuity of one's social role as a breadwinner. Therefore, patients with a positive attitude view adherence not only as a medical obligation but also as a strategy to protect their future career and family (Bani Hani et al., 2024).

The results of the study indicate that subjective norms have a positive and significant influence on the intention of hypertensive patients of working age to engage in tertiary prevention efforts. These findings suggest that an individual's decision to adhere to hypertension management behaviors is influenced not only by personal motivation but also significantly by social pressure, environmental support, and the expectations of people considered important in their daily lives. From the perspective of the Theory of Planned Behavior, this relates to the concept of normative beliefs—that is, an individual's belief that significant others expect them to engage in certain behaviors, and the individual's tendency to conform to those expectations (Ajzen, 2002).

The strong influence of subjective norms in this study may reflect the sociocultural characteristics of the community in Boyolali Regency, which still maintains patterns of collective social relationships, strong family ties, and a strong sense of community in daily life. In such a collectivist culture, health-related decisions are often not entirely individual in nature but are influenced by social interactions, emotional support, and social judgments from the immediate environment. Among the working-age population, subjective norms do not originate solely from spouses or immediate family but also from coworkers, peers, community leaders, and healthcare providers who influence the daily behaviors of individuals with hypertension. Positive social support—such as a spouse helping to prepare low-sodium meals, family members reminding the patient to take medication regularly, coworkers refraining from encouraging high-sodium food consumption during gatherings, and healthcare providers consistently offering education and motivation—has been shown to strengthen patients' commitment to staying on the path of tertiary prevention.

A social environment that is permissive of unhealthy lifestyles can undermine patients' motivation and adherence to managing hypertension (Gallant, 2003). Research in Indonesia also indicates that family support and social support are strongly correlated with adherence to a hypertension diet and medication adherence among patients with hypertension (Sari et al., 2021). Therefore, the success of hypertension control among the working-age population in Boyolali Regency cannot focus solely on individual change but must involve family-based, workplace, and community approaches to create collective support capable of sustaining tertiary prevention behaviors over the long term.

The results of the study indicate that perceived behavioral control (PBC) has a positive and significant effect on intention and exerts a much stronger direct influence on tertiary prevention efforts among hypertensive patients of working age. From the perspective of the Theory of Planned Behavior, this indicates that patients' health behaviors are not solely shaped by the strength of their intentions but are significantly influenced by actual behavioral control—that is, the extent to which individuals actually have control over the resources, opportunities, time, and ability to engage in such behaviors. When the direct path of PBC to tertiary prevention efforts has a larger coefficient compared to its path to intention, this indicates that practical factors in daily life are the primary determinants of whether patients are able to consistently implement tertiary prevention or not. This finding is highly relevant to the characteristics of hypertensive patients of working age in Boyolali Regency, the majority of whom are still actively employed and face various real-world barriers in managing their hypertension.

The greatest barriers faced by the working-age population are not merely a lack of knowledge or negative attitudes toward hypertension, but rather limited control over their time, access to

healthcare services, work conditions, and the ability to maintain a healthy lifestyle amid the demands of daily life. In the context of control beliefs, various conditions in workers' lives can be major barriers to the implementation of tertiary prevention, such as long working hours, high work pressure, physical fatigue after work, difficulty finding time to undergo routine check-ups at community health centers during morning service hours, and limited options for healthy, low-sodium foods in the workplace (Ajzen, 2002). Among informal workers and daily laborers, time lost from work for health checkups is often viewed as a loss of income, leading to low adherence to blood pressure monitoring. Additionally, a culture of consuming high-sodium foods while working, smoking habits in the workplace, and limited opportunities for physical activity further exacerbate behavioral barriers to hypertension management. These conditions indicate that while patients may have good intentions to maintain their health, tertiary prevention efforts will not be optimal if individuals feel they lack sufficient control over their life circumstances.

When patients feel they have a high degree of control—such as easily obtaining permission from their workplace to undergo health checkups, having access to nearby and easily accessible healthcare facilities, receiving family support, having the financial means to purchase medication regularly and choose healthy foods, and having the flexibility to exercise and rest—their chances of actively implementing tertiary prevention measures increase significantly, even exponentially. Therefore, the results of this study indicate that interventions for hypertension control among the working-age population in Boyolali Regency should not merely focus on enhancing individual education and motivation but must be directed toward strengthening actual behavioral control through the provision of more flexible access to healthcare services, workplace policies that support health, the development of workplace-based hypertension control programs, and improved access to affordable healthy food and physical activity. Thus, strengthening the perception of behavioral control not only increases patients' intentions but can directly drive the formation of sustainable tertiary prevention efforts that impact the success of blood pressure control.

The results of the study indicate that intention has a positive and significant effect on tertiary prevention efforts among hypertensive patients of working age in Boyolali Regency. These findings indicate that the stronger a patient's intention to maintain their health, the greater the likelihood that this intention will translate into concrete actions in daily hypertension management, such as medication adherence, routine blood pressure monitoring, salt intake restriction, regular physical activity, and adherence to healthcare professionals' recommendations. From the perspective of the Theory of Planned Behavior, intention is the most important proximal predictor of behavior formation because it reflects an individual's psychological readiness to undertake a health-related effort. The significant relationship between intention and behavior in this study indicates that the majority of working-age hypertensive patients already possess sufficient internal motivation and self-regulation to implement tertiary prevention efforts. This condition may reflect patients' awareness of the risks of hypertensive complications, such as stroke, kidney failure, and heart disease, thereby generating an internal drive to maintain their health and work productivity.

The research findings need to be analyzed through the concept of the intention-behavior gap, which refers to a situation where strong intentions do not always translate into consistent actual behavior (Sheeran and Webb, 2016). For patients with chronic conditions such as hypertension, this gap between intention and behavior often arises because disease management requires long-term commitment, high discipline, and sustained lifestyle changes. In the context of working-age patients in Boyolali Regency, an individual may have good intentions to regularly monitor blood pressure and maintain a healthy diet, but these intentions may weaken when faced with work demands, physical fatigue, economic pressures, work-related stress, time constraints, and the weariness of undergoing lifelong chronic therapy. This situation indicates that the strength of intention alone is insufficient to ensure the formation of stable tertiary prevention behaviors if not supported by a sense of behavioral control (PBC) and an adequate environment.

When individuals feel they do not have enough time to seek medical treatment, have difficulty accessing healthcare facilities, or are unable to maintain a healthy lifestyle in their work and social environments, their initially strong intentions may gradually wane. Research on hypertension self-management indicates that patients who have environmental support, good access to healthcare services, and high self-control tend to be better able to consistently maintain healthy behaviors compared to patients who have only the intention but lack adequate external support (Warren-Findlow et al., 2012). Therefore, the results of this study confirm that successfully managing hypertension in the working age group requires more than just building patients' motivation and intent. Tertiary prevention efforts for hypertension in Boyolali Regency also require strengthening the supportive environment, providing flexible access to healthcare services, securing family and workplace support, and implementing sustainable mentoring strategies to ensure that established intentions do not wane during the lifelong management of this chronic condition.

The results of the study indicate that tertiary prevention efforts have a significant impact on the success of blood pressure control among hypertensive patients of working age in Boyolali Regency. These findings demonstrate a strong link between health behavior aspects in health promotion and clinical outcomes in epidemiology and clinical medicine. Theoretically, good tertiary prevention behaviors not only serve as a form of behavioral compliance but also have a direct physiological impact on cardiovascular system stability. Compliance with regular antihypertensive medication, limiting sodium intake, engaging in regular physical activity, managing stress, quitting smoking, and undergoing periodic blood pressure monitoring have been shown to reduce peripheral resistance, decrease sympathetic nervous system activation, suppress renin-angiotensin-aldosterone system activity, and maintain vascular elasticity, thereby keeping blood pressure within more stable and safe limits (Whelton et al., 2018). From a pathophysiological perspective, excessive sodium intake can increase intravascular fluid retention and elevate pressure on arterial walls, while chronic stress can trigger increased levels of catecholamines and cortisol, which contribute to vasoconstriction and persistent elevation of blood pressure. Therefore, consistent adherence to tertiary prevention measures directly contributes to the control of the biological mechanisms underlying chronic hypertension.

Medication adherence also plays a crucial role in maintaining stable blood pressure, as antihypertensive medications work through various mechanisms, such as vasodilation of blood vessels, reduction of cardiac output, inhibition of sodium and fluid retention, and inhibition of renin-angiotensin system activity. Non-adherence to medication causes blood pressure to fluctuate and increases the risk of damage to target organs, including the brain, kidneys, heart, and retina. In the context of patients of working age, successfully maintaining blood pressure within controlled limits is particularly important because this group is still actively working and has a high risk of experiencing early cardiovascular complications due to work-related stress, unhealthy eating habits, and a sedentary lifestyle. The results of this study indicate that respondents with good tertiary prevention efforts have a significantly higher likelihood of achieving controlled blood pressure compared to those with poorer behavioral habits. These findings demonstrate that changes in health behavior not only result in psychological changes but also produce tangible clinical effects on the physiological condition of patients with hypertension.

The study findings are consistent with the latest clinical recommendations from the American Heart Association and the Ministry of Health of the Republic of Indonesia, which emphasize that hypertension management should be achieved through a combination of pharmacological therapy and sustained lifestyle modifications. The American Heart Association guidelines state that reducing sodium intake, increasing physical activity, weight control, limiting alcohol, smoking cessation, and adherence to antihypertensive therapy are key strategies for reducing the risk of cardiovascular disease due to hypertension (Whelton et al., 2018). Meanwhile, guidelines from the Ministry of Health of the Republic of Indonesia also emphasize that successful hypertension control

can prevent severe complications such as stroke, coronary heart disease, heart failure, and chronic kidney disease—which are the leading causes of death and disability in Indonesia (Ministry of Health of the Republic of Indonesia, 2023). Thus, successful blood pressure control among the working-age population in Boyolali Regency not only provides individual benefits in the form of improved quality of life for patients but also has long-term epidemiological implications for reducing the incidence of early-onset stroke, kidney failure, and coronary heart attacks in the community. If tertiary prevention efforts can be widely maintained among the working-age population, the financial burden of healthcare costs resulting from complications of hypertension can be reduced, productivity can be sustained, and the risk of losing working-age years due to premature death or permanent disability can be minimized.

CONCLUSION

This study confirms the applicability of the Theory of Planned Behavior in explaining tertiary prevention efforts among working-age patients with hypertension. Attitude, subjective norms, and perceived behavioral control significantly influenced intention, while perceived behavioral control emerged as the strongest predictor of tertiary prevention behavior. Furthermore, tertiary prevention efforts significantly improved blood pressure control. These findings highlight the importance of strengthening patients' perceived behavioral control, intentions, and self-management capabilities to enhance hypertension prevention efforts and achieve better blood pressure outcomes.

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