

Application of Social Cognitive Theory in Promoting Tertiary Prevention Behavior among Hypertensive Patients in Tulungagung, East Java, Indonesia

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ABSTRACT

Background: Hypertension is a non-communicable disease that can affect individuals across all age groups, including the productive age population, largely due to changes in lifestyle. The implementation of tertiary prevention behaviors is essential to prevent disease complications such as coronary heart disease, stroke, kidney failure, and liver disease. This study aimed to analyze the application of Social Cognitive Theory in relation to tertiary prevention behaviors among patients with hypertension.

Subjects and Method: This analytic observational study employed a cross-sectional design. The study subjects were patients with hypertension of productive age (15–64 years) in Tulungagung Regency, selected using a non-proportional random sampling technique, with a total sample of 220 participants. Data were collected using a research questionnaire that had been tested for validity and reliability. Multivariate data analysis was conducted using path analysis to examine both direct and indirect effects among variables.

Results: There were direct and statistically significant effects of observational learning ($b = 0.13$; 95% CI = 0.01 to 0.24; $p = 0.028$), self-efficacy ($b = 0.20$; 95% CI = 0.05 to 0.35; $p = 0.008$), and attitude ($b = 0.31$; 95% CI = 0.17 to 0.45; $p < 0.001$) on tertiary prevention behaviors. Education was not significantly associated with tertiary prevention behaviors. Age ($b = 0.17$; 95% CI = 0.05 to 0.29; $p = 0.005$) and tertiary prevention behaviors ($b = -0.38$; 95% CI = -0.49 to -0.27; $p < 0.001$) showed direct and significant effects on blood pressure. Sex was not significantly associated with blood pressure. Social support, outcome expectations, and age had indirect effects on tertiary prevention behaviors through self-efficacy.

Conclusion: There are direct effects of observational learning, attitude, and self-efficacy on tertiary prevention behaviors, as well as indirect effects of social support, outcome expectations, age, and education on tertiary prevention behaviors. In addition, age, sex, and tertiary prevention behaviors have direct effects on blood pressure.

Keywords: hypertension, tertiary prevention behavior, Social Cognitive Theory

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BACKGROUND

Hypertension is defined as a condition characterized by systolic blood pressure of 140 mmHg or higher and or diastolic blood pressure of 90 mmHg or higher, as measured in hospitals or clinical settings (Mancia et al., 2023). Globally, hypertension is recognized as a major health problem and is often referred to as a silent condition because it can lead to sudden death without prior noticeable symptoms (Arini et al., 2021). The global burden of hypertension is expected to continue increasing, with an estimated 1.5 billion people affected worldwide by 2025 (WHO, 2023).

The prevalence of hypertension is particularly high in the Southeast Asia region, accounting for approximately 25 percent of global cases, with Indonesia contributing a substantial proportion. In 2019, the global prevalence of hypertension across age groups was reported at 33 percent, while the prevalence in Southeast Asia reached 32.4 percent. Indonesia recorded a higher prevalence rate of 34.1 percent, indicating that hypertension remains a significant public health concern in the country (Ministry of Health of the Republic of Indonesia, 2024).

Data from the 2023 Indonesian Health Survey indicate that East Java Province ranks fourth in the highest prevalence of hypertension at 34.3 percent, following Central Kalimantan, South Kalimantan, and West Java. The estimated number of individuals aged over 15 years living with hypertension in East Java reached 11,702,478 people (East Java Provincial Health Office, 2024). Hypertension is the disease with the highest prevalence in Tulungagung Regency, yet not all affected individuals have received adequate health services. Tulungagung Regency ranks sixth with an estimated 319,056 people living

with hypertension. The coverage of hypertension services in Tulungagung Regency was 87.6 percent, which has not yet met the target set by the East Java Provincial Government of 90.8 percent (Tulungagung Regency Health Office, 2024).

Hypertension arises from a combination of modifiable and non-modifiable risk factors. Non-modifiable risk factors include age, sex, and family history of hypertension. In contrast, modifiable risk factors include high salt and monosodium glutamate consumption, smoking habits, high fat intake, alcohol consumption, physical inactivity, obesity, and stress (Sulistiyono et al., 2022). To date, hypertension control has largely focused on pharmacological management. However, non-pharmacological approaches should also be emphasized. One important strategy in hypertension control is the implementation of tertiary prevention through lifestyle modification among patients with hypertension. Tertiary prevention aims to improve the quality of life of patients and to prevent the occurrence of complications associated with hypertension. Through this approach, patients are expected to better understand and adopt tertiary preventive behaviors to reduce the risk of comorbid conditions (Apriyus et al., 2024).

This study applies Social Cognitive Theory to understand tertiary preventive behaviors among patients with hypertension in maintaining long-term health behaviors and preventing disease complications. Social Cognitive Theory emphasizes three core determinants of healthy lifestyle behavior, namely individual factors, environmental factors, and behavioral factors, which interact dynamically and reciprocally with one another (Sulaeman, 2025). This study aims to analyze the influence of the application of Social Cognitive Theory on tertiary prevention

behavior among patients with hypertension in Tulungagung Regency.

SUBJECTS AND METHOD

1. Study Design

This study employed an analytical observational design with a cross-sectional approach. The research was conducted from July to August 2025 at five primary health centers in Tulungagung Regency, Indonesia.

2. Population and Sample

The target population consisted of patients diagnosed with hypertension in Tulungagung Regency. A total of 220 respondents were recruited from five primary health centers, namely Tulungagung, Sembung, Campurdarat, Sumbergempol, and Ngunut Primary Health Centers. The sampling technique used was non-proportional random sampling for participant selection, while stratified random sampling was applied for the selection of health centers.

3. Study Variables

The dependent variables were tertiary prevention behavior and blood pressure. The independent variables were observational learning, self-efficacy, outcome expectations, attitudes, social support, education level, age, and sex.

4. Operational Definition of Variables

Observational learning refers to the learning process in which respondents acquire knowledge or skills by observing the behaviors and experiences of others in their surrounding environment.

Self-efficacy is an individual's internal belief and confidence in their ability to manage and control hypertension effectively.

Outcome expectations are the anticipated results perceived by patients with hypertension regarding the behaviors they choose to adopt in implementing a healthy lifestyle.

Attitude is the response exhibited by respondents through behaviors, emotions, and

beliefs toward a particular object or situation.

Social support refers to the assistance received by respondents from family members, peers, or healthcare providers, encompassing emotional, instrumental, informational, and appraisal support.

Age is the length of time a respondent has lived, calculated from the date of birth to the time of data collection.

Sex is the biological identity of the respondent as socially recognized.

Education is the highest level of formal education completed by the respondent.

Tertiary prevention behavior refers to actions undertaken by respondents to maintain and improve behaviors aimed at preventing disease progression and complications.

Blood pressure is the force exerted by circulating blood against the walls of the arteries during cardiac contraction and relaxation, measured using a sphygmomanometer.

5. Study Instruments

The research instrument used in this study was a structured questionnaire consisting of 40 items, including 5 items assessing observational learning, 5 items measuring self-efficacy, 8 items evaluating outcome expectations, 8 items assessing attitudes, 5 items measuring social support, and 9 items assessing tertiary prevention behavior. Blood pressure was measured using a sphygmomanometer and a digital blood pressure monitor.

6. Data analysis

Univariate analysis was conducted to describe the distribution and characteristics of each study variable. Bivariate analysis using simple linear regression was performed to examine the relationships between independent variables and dependent variables. Multivariate analysis was carried out using path analysis to deter-

mine the magnitude of direct and indirect effects among variables. All statistical analyses were performed using STATA 13.

7. Research Ethics

Ethical issues, including informed consent, anonymity, and confidentiality, were carefully addressed throughout the research process. Ethical approval was obtained from the Health Research Ethics Committee of Dr. Moewardi Regional General Hospital, Surakarta, Indonesia (No. 1.200/VI/HREC/2025), issued on 04 June 2025.

RESULTS

1. Sample Characteristics

Table 1 presents the characteristics of the 220 respondents. The distribution of categorical variables is as follows: the majority were female (75.91%), had lower education (<senior high school) (56.82%), were married (98.18%), were housewives (50.45%), had a normal body mass index (BMI) (89 respondents; 40.45%), and reported a family history of hypertension (55.00%).

Table 1. Characteristics Sample of Application of Social Cognitive Theory in Promoting Tertiary Prevention Behavior among Hypertensive Patients in Tulungagung, East Java, Indonesia

Characteristics	Category	n	%
Sex	Male	53	24.09%
	Female	167	75.91%
Education	< Senior high school	125	56.82%
	>= Senior high school	95	43.18%
Marital status	Unmarried	4	1.82%
	Married	216	98.18%
Employment status	Housewives	111	50.45%
	Entrepreneur	70	31.82%
	Private sector employee	18	8.18%
	Daily laborer	10	4.55%
	Civil servant	11	5.00%
Body mass index (BMI)	Underweight (<18.5 kg/m ²)	6	2.73%
	Normal weight (18.5 - 24.9 kg/m ²)	89	40.45%
	Overweight (25.0 - 26.9 kg/m ²)	41	18.64%
	Obese (>27.0 kg/m ²)	84	38.18%
History of hypertension	None	99	45.00%
	Yes	121	55.00%

Table 2 shows the descriptive statistics for continuous variables among hypertension patients. The mean age of respondents was 53.53 years (SD = 6.95). The mean scores for the study variables were as follows: observational learning 20.15 (SD = 2.65),

self-efficacy 21.03 (SD = 1.35), outcome expectations 32.02 (SD = 3.29), attitudes 29.84 (SD = 3.84), social support 19.21 (SD = 2.97), tertiary prevention behavior 26.33 (SD = 4.76), and blood pressure 158.62 mmHg (SD = 15.54).

Table 2. Univariable Analysis of Continuous Data

Variabel	Mean	SD	Min.	Max.
1. Age (years old)	53.53	6.95	30	64
2. Observational learning	20.15	2.65	10	25
3. Self-efficacy	21.03	1.35	20	25
4. Outome expectation	32.02	3.29	25	40
5. Attitude	29.84	3.84	22	40

Variabel	Mean	SD	Min.	Max.
6. Social support	19.21	2.97	10	25
7. Tertiary preventive behavior	26.33	4.76	13	35
8. Blood pressure (mmHg)	158.62	15.54	139	220

2. Bivariate analysis

Table 3 presents the results of the simple linear regression analysis examining the relationships between study variables, tertiary prevention behavior, and blood pressure among hypertension patients in Tulungagung Regency. Observational learning showed a positive and significant association with tertiary prevention behavior (b= 0.37; 95% CI= 0.14 to 0.61; p = 0.002).

Self-efficacy was positively and significantly associated with tertiary prevention behavior (b = 1.51; 95% CI = 1.09 to 1.93; p < 0.001).

Outcome expectations were positively and significantly associated with tertiary prevention behavior (b= 0.27; 95% CI = 0.08 to 0.46; p= 0.005).

Social support demonstrated a positive and significant association with tertiary prevention behavior (b= 0.29; 95% CI= 0.81 to 0.50; p= 0.007).

Attitude showed a positive and significant association with tertiary prevention

behavior (b = 0.55; 95% CI = 0.41 to 0.70; p < 0.001).

Education level was not significantly associated with tertiary prevention behavior (b = 0.64; 95% CI = -0.62 to 1.92; p = 0.318). Patients with senior high school education or higher tended to have higher tertiary prevention behavior scores than those with lower education.

Age was not significantly associated with tertiary prevention behavior (b= -0.01; 95% CI = -0.11 to 0.07; p = 0.684).

Age was positively and significantly associated with blood pressure (b = 0.43; 95% CI = 0.14 to 0.72; p = 0.004).

There was no significant difference in blood pressure between males and females (b= 3.57; 95% CI = -1.23 to 8.39; p = 0.145).

Tertiary prevention behavior was negatively and significantly associated with blood pressure (b= -1.27; 95% CI = -1.67 to -0.87; p <0.001).

Table 3. Results of Simple Linear Regression Analysis of Variables Affecting Tertiary Prevention Behavior and Blood Pressure in Hypertension Patients in Tulungagung Regency

Independent variables	b	95% CI		p
		Lower limit	Upper limit	
Tertiary preventive behavior				
Observational learning	0.37	0.14	0.61	0.002
Self-efficacy	1.51	1.09	1.93	<0.001
Outcome expectation	0.27	0.08	0.46	0.005
Attitude	0.55	0.41	0.70	<0.001
Social support	0.29	0.08	0.50	0.007
Education	0.64	-0.62	1.92	0.318
Age	-0.01	-0.11	0.07	0.684
Blood pressure				
Age	0.43	0.14	0.72	0.004
Sex	3.57	-1.23	8.39	0.145
Tertiary preventive behavior	-1.27	-1.67	-0.87	<0.001

3. Multivariate analysis

The analysis was conducted to explain the influence of the Social Cognitive Theory constructs attitude, self-efficacy, observational learning, social support, outcome expectations, education, age, and gender on tertiary prevention behavior and blood pressure. This analysis was performed using path analysis to evaluate both direct and indirect relationships among the study variables.

The model specification is illustrated in Figure 1, which presents the relationships among the study variables. The model shows that tertiary prevention behavior is directly influenced by self-efficacy, attitude, and observational learning. Self-efficacy is further influenced by social support, outcome expectations, education, and age. Meanwhile, blood pressure is directly affected by age, gender, and tertiary prevention behavior.

In terms of model identification, the study includes 10 measured variables consisting of 7 exogenous variables and 3 endogenous variables, with a total of 15 parameters estimated in the model. The calculated degree of freedom (df) is 30, indicating that the proposed research model is appropriate and identifiable for path analysis.

Regarding model fit, the results of the multivariate analysis presented in Table 4 indicate that the tested model demonstrates excellent goodness-of-fit indices. The values obtained include Chi-square $p=0.3398$, RMSEA=0.023, CFI= 0.995, TLI=0.989, SRMR=0.025, and CD= 0.587, suggesting that the model fits the observed data very well.

The parameter estimation results reveal several significant relationships among the variables. Attitude has a positive and statistically significant effect on tertiary prevention behavior. An

increase of one unit in the attitude score is associated with an increase of 0.31 units in tertiary prevention behavior ($b=0.31$; 95% CI= 0.17 to 0.45; $p<0.001$). Similarly, self-efficacy shows a positive and statistically significant relationship with tertiary prevention behavior, where a one-unit increase in self-efficacy corresponds to a 0.20-unit increase in tertiary prevention behavior ($b=0.20$; 95% CI=0.05 to 0.35; $p=0.008$). Observational learning also has a positive and statistically significant influence on tertiary prevention behavior, with a one-unit increase in observational learning score associated with a 0.13-unit increase in tertiary prevention behavior ($b=0.13$; 95% CI=0.01–0.24; $p=0.028$).

The analysis further indicates that gender does not have a significant relationship with blood pressure ($b=0.06$; 95% CI=-0.06 to 0.18; $p=0.323$). However, age shows a positive and statistically significant association with blood pressure, where a one-unit increase in age leads to a 0.17-unit increase in blood pressure ($b=0.17$; 95% CI=0.05 to 0.29; $p=0.005$). In contrast, tertiary prevention behavior has a negative and statistically significant effect on blood pressure, indicating that a one-unit increase in tertiary prevention behavior score results in a 0.38-unit decrease in blood pressure ($b=-0.38$; 95% CI=-0.49--0.27; $p<0.001$).

In addition, attitude is positively and significantly associated with self-efficacy. A one-unit increase in attitude score increases self-efficacy by 0.45 units ($b=0.45$; 95% CI=0.35–0.55; $p<0.001$). Social support also shows a positive and statistically significant relationship with self-efficacy, where a one-unit increase in social support score corresponds to a 0.26-unit increase in self-efficacy ($b=0.26$; 95% CI=0.17–0.35; $p<0.001$). Outcome expectations si-

imilarly have a positive and significant effect on self-efficacy, with a one-unit increase in outcome expectations score increasing self-efficacy by 0.18 units ($b=0.18$; 95% CI=0.07–0.29; $p=0.001$). Observational learning also contributes positively and significantly to self-efficacy, where a one-unit increase in observational learning score increases self-efficacy by 0.14 units ($b=0.14$; 95% CI=0.05–0.24; $p=0.002$).

Furthermore, education level does not show a statistically significant relationship with self-efficacy. Hypertensive patients

with senior high school education or above tend to have slightly higher self-efficacy compared to those with lower education levels, although the association is not statistically significant ($b=0.08$; 95% CI=-0.08–0.17; $p=0.076$). Finally, age demonstrates a positive and statistically significant relationship with self-efficacy, where a one-unit increase in age is associated with a 0.10-unit increase in self-efficacy score ($b=0.10$; 95% CI=0.01–0.19; $p=0.023$).

Table 4. Path analysis results of the application of Social Cognitive Theory on tertiary prevention behavior and blood pressure among hypertension patients.

Dependent variable	independent variables	b	95% CI		P
			Lower limit	Upper limit	
Direct effect					
Perilaku pencegahan tersier	→ Attitude	0.31	0.17	0.45	<0.001
	→ Self-efficacy	0.20	0.05	0.35	0.008
	→ Observational learning	0.13	0.01	0.24	0.028
Tekanan darah	→ Age	0.17	0.05	0.29	0.005
	→ Sex	0.06	-0.06	0.18	0.323
	→ Tertiary preventive behavior	-0.38	-0.49	-0.27	<0.001
Indirect effect					
Self-efficacy	→ Attitude	0.45	0.35	0.55	<0.001
	→ Social support	0.26	0.17	0.35	<0.001
	→ Outcome expectation	0.18	0.07	0.29	0.001
	→ Observational learning	0.14	0.05	0.24	0.002
	→ Age	0.10	0.01	0.19	0.023
	→ Education	0.08	-0.0	0.17	0.076
N observation= 220 Log likelihood= -5023.57 Chi square p= 0.340 RSMEA= 0.02, CFI= 0.99 TLI= 0.99, SRMR= 0.03. CD= 0.59					

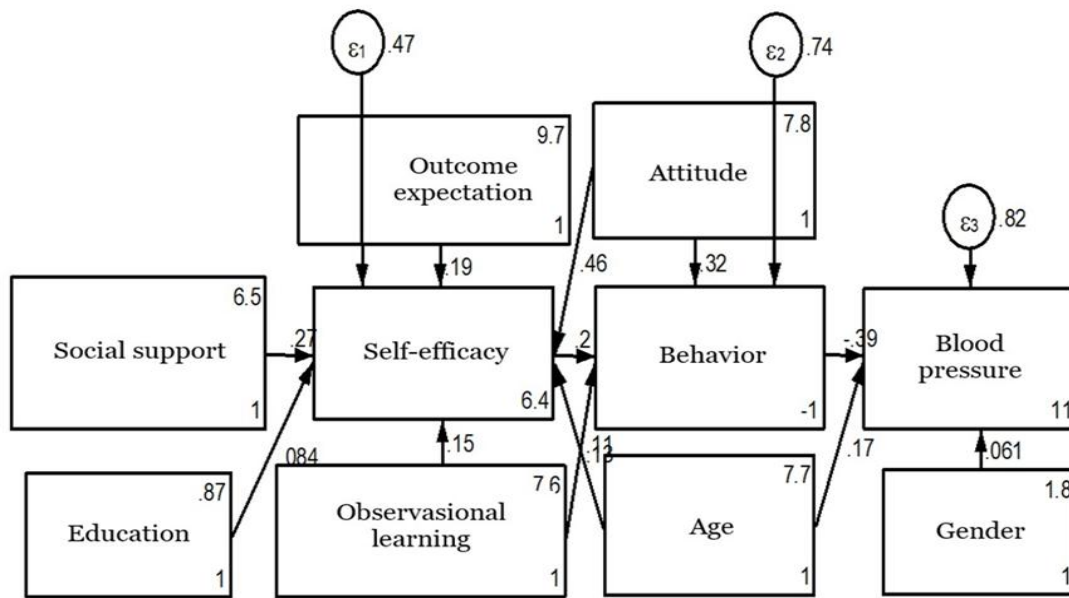


Figure 1. Path diagram of the Social Cognitive Theory (SCT) constructs illustrating the relationships between observational learning, self-efficacy, outcome expectations, attitude, social support, and tertiary prevention behavior, as well as their effect on blood pressure among hypertension patients

DISCUSSION

1. Relationship between attitude and tertiary prevention behavior

Path analysis results indicate that attitude has a direct and positive effect on tertiary prevention behavior, with the relationship being statistically significant. Individuals with a positive attitude are more likely to engage in tertiary prevention behaviors compared to those with a negative attitude. This finding is consistent with a study by Eslamimehr et al. (2024) in Iran, which reported a direct and significant effect of attitude on tertiary prevention behavior (b= 2.13; p<0.001). The study suggests that patients with a more positive attitude toward tertiary prevention are more actively involved in lifestyle management, including low-salt consumption, weight control, and regular blood pressure monitoring.

Similarly, Liu et al. (2025) in China found that attitude directly and strongly influences exercise practices among hypertensive patients, with a significant path

coefficient (b=0.841; p<0.001). This demonstrates that attitude is a dominant factor shaping individual behaviors in preventive efforts such as physical activity. Furthermore, attitude can indirectly affect tertiary prevention behavior through self-efficacy, with the relationship being statistically significant. Patients with a positive attitude tend to have higher self-efficacy, which in turn motivates them to consistently implement tertiary prevention behaviors (Villarino et al., 2021).

2. Relationship between observational learning and tertiary prevention behavior

The results of the path analysis indicate that observational learning has a direct and positive effect on tertiary prevention behaviors, and this relationship is statistically significant. Individuals with higher levels of observational learning are more likely to engage in tertiary prevention behaviors compared with those who exhibit lower levels of observational learning. This

finding is consistent with the study by Sanusi et al. (2025), which reported that individuals who observe the behaviors of others tend to adopt similar practices more quickly in their daily lives, such as taking medication regularly, reducing salt intake, engaging in physical activity, and routinely checking blood pressure at health care facilities.

Patients with hypertension often pay close attention to their surrounding environment, including family members and peers, when shaping their daily health behaviors. When family members or peers with hypertension successfully manage their condition through treatment and lifestyle modification, patients are more likely to imitate these behaviors (Wirandini et al., 2025). In addition to its direct effect, observational learning also exerts an indirect effect on tertiary prevention behaviors through self-efficacy, and this relationship is statistically significant. This finding is supported by a study conducted by Aje et al. (2024), which involved 357 patients with hypertension who participated in a peer-led observational learning intervention that exposed patients to role models demonstrating healthy behaviors for blood pressure control. The intervention group showed higher levels of self-efficacy, indicating that observational learning is effective in strengthening patients' confidence in their ability to manage their condition.

3. Relationship between self-efficacy and tertiary prevention behavior

The results of the path analysis indicate that self-efficacy has a direct and positive effect on tertiary prevention behaviors, and this relationship is statistically significant. Individuals with higher levels of self-efficacy are more likely to engage in tertiary prevention behaviors than those with lower self-efficacy. This finding is consistent with

the study by Karimi et al. (2024), which demonstrated that self-efficacy has a significant direct effect on self-care behaviors ($b = 0.425$; $p < 0.001$), as patients with hypertension are able to understand the perceived risks of their condition and adopt appropriate tertiary prevention behaviors.

Other studies have also reported a positive and significant association between self-efficacy and tertiary prevention behaviors among patients with hypertension. Patients with high self-efficacy tend to have strong intrinsic motivation to adhere to self-care practices (Hani et al., 2024). Moreover, self-efficacy is closely linked to the lifestyle of patients with hypertension. Behavioral changes are more likely to be sustained when patients have strong confidence in their ability to manage their condition, as self-efficacy provides guidance for decision-making and supports the achievement of successful health outcomes (Tan et al., 2021).

4. Relationship between age and blood pressure

The results of the path analysis indicate that age has a direct and positive effect on blood pressure, and this relationship is statistically significant. Older individuals are more likely to develop hypertension compared with younger individuals. This finding is consistent with a study by Das (2024) conducted in the Bangladeshi population, which reported that the prevalence of hypertension increases with advancing age. The study further identified that the risk of developing hypertension becomes higher after the age of 30 years.

Age is recognized as an important contributing factor to hypertension. As individuals grow older, structural changes occur in the arterial blood vessels, including increased stiffness and thickening of the arterial walls due to the accumulation of collagen. These changes lead to narrowing

of the blood vessels, which disrupts normal blood circulation and consequently results in elevated blood pressure (Nuraeni, 2019). Additionally, a study by Osunkwo et al. (2020) conducted among the Nigerian population found a high prevalence of hypertension even among individuals in the productive age group, suggesting that poor lifestyle management may contribute to the early onset of hypertension.

5. Relationship between tertiary prevention behavior and blood pressure

The results of the path analysis indicate that tertiary prevention behaviors have a direct and significant effect on blood pressure. Individuals who demonstrate higher levels of tertiary prevention behaviors are more likely to experience a reduction in systolic blood pressure compared with those who exhibit lower levels of such behaviors. This finding is consistent with a study by Duus et al. (2024) conducted in Denmark, which reported that one form of tertiary prevention behavior, namely adherence to a low-salt diet, is effective in lowering blood pressure among patients with hypertension and in reducing the risk of cardiovascular complications.

Similarly, research by Wang et al. (2019) in China demonstrated that tertiary prevention behaviors represent an effective strategy for patients with hypertension to maintain their quality of life, particularly through the adoption of a low-sodium diet. Such preventive measures play an important role in minimizing the risk of serious complications, including stroke and coronary heart disease (Chumaidah et al., 2024).

6. Sex difference on blood pressure

A path analysis model indicates that there is no significant difference in blood pressure between males and females. This finding is consistent with the study by Liweleya

(2024), in which multivariate analysis showed no significant association between sex and blood pressure (AOR = 1.48; $p = 0.67$). This lack of association may be explained by the influence of other factors that more strongly affect blood pressure. Age, in particular, may play a more dominant role, thereby attenuating the observable effect of sex on blood pressure.

However, evidence from a study conducted by Choi et al. (2017) suggests that sex differences in hypertension prevalence among adults in Korea become more apparent in later life, with women being more likely than men to develop hypertension after entering older age. This difference has been attributed to hormonal factors. Estrogen levels are generally higher in women than in men and are thought to play a protective role in maintaining vascular health. Changes in estrogen levels with aging may therefore contribute to increased hypertension risk among older women (Khasanah, 2022).

7. Relationship between social support and tertiary prevention behavior

The results of the path analysis indicate that social support has an indirect and positive effect on tertiary prevention behaviors through self-efficacy, and this relationship is statistically significant. Individuals who receive higher levels of social support tend to have stronger confidence in their ability to engage in tertiary prevention behaviors compared with those who receive lower levels of social support. A study conducted by Guo et al. (2023) in Shanghai, China, involving 1,697 patients with hypertension, reported that social support has a direct and statistically significant effect on treatment adherence ($b = 0.165$; $p < 0.001$).

Similarly, research by Azmiardi et al. (2025) found that family support has an indirect effect on self-care behaviors among

patients with hypertension through self-efficacy. Support provided by family members helps strengthen patients' confidence in adhering to treatment recommendations. Consistent findings have also been reported in China, where social support was shown to have a positive association with self-care behaviors among patients with hypertension through its influence on self-efficacy (Li et al., 2024).

8. Relationship between outcome expectation and tertiary prevention behavior

The results of the path analysis indicate that outcome expectations have an indirect and positive effect on tertiary prevention behaviors through self-efficacy, and this relationship is statistically significant. Individuals with higher outcome expectations tend to have stronger confidence in their ability to engage in tertiary prevention behaviors compared with those with lower outcome expectations. This finding is consistent with a study conducted in Nigeria, which reported that outcome expectations do not have a direct effect on medication adherence but exert a strong and statistically significant influence on patients' self-efficacy ($b = 0.451$; $p < 0.001$). Higher desired outcomes are associated with greater self-efficacy in managing treatment. This relationship is reciprocal, such that stronger self-confidence further reinforces higher outcome expectations (Okuboyejo et al., 2018).

Similarly, a study by Turki et al. (2024) reported an indirect association between outcome expectations and self-care behaviors among patients with hypertension. Patients with higher self-confidence are more likely to modify unhealthy habits into healthier behaviors by adhering to prescribed treatment, regularly monitoring blood pressure, avoiding smoking, and

engaging in sufficient physical activity (Sanusi et al., 2025).

9. Relationship between education and tertiary prevention behavior

Path analysis results indicate that there is no significant relationship between education and tertiary prevention behavior through self-efficacy. Hypertensive patients with senior high school education or higher tend to have higher self-efficacy compared to those with lower education levels. Kuzzairi et al. (2023) reported that hypertensive patients with higher education levels are more likely to possess strong self-efficacy, enabling them to effectively perform tertiary prevention behaviors and control blood pressure. However, differences in educational attainment alone cannot be considered a definitive predictor of a patient's ability to engage in preventive behaviors. The study sample shows that patients with education below senior high school are more numerous than those with higher education. This may be influenced by other factors such as income, social status, and family support, where family can act as a motivator for patients to adhere to preventive measures (Chumaidah et al., 2024). Similarly, Veghari (2012) found that individuals who are illiterate tend to have higher hypertension prevalence compared to those with education beyond high school ($OR=3.093$). Formal education may indicate a person's capacity to understand health information and implement effective tertiary prevention behaviors.

10. Relationship between age and tertiary prevention behavior

Path analysis results indicate that age has a positive and indirect effect on tertiary prevention behavior through self-efficacy, and this relationship is statistically significant. Younger individuals tend to have higher self-efficacy in performing tertiary prevention behaviors compared to older indivi-

duals. A study by Tebelu et al. (2023) reported that individuals of productive age are 3.77 times more likely to possess self-care abilities than older adults (AOR=3.77; 95% CI=1.60 to 8.89; $p<0.05$). Good self-efficacy increases the ability to perform self-care among productive-age individuals by 3.33 times (AOR=3.33; 95% CI=1.12 to 9.87; $p<0.05$). Younger patients are more capable of performing effective self-care due to strong confidence in tertiary prevention and adherence to healthcare recommendations, driven by high motivation to recover from hypertension.

Another study conducted by Turki et al. (2024) in Saudi Arabia among 342 hypertensive patients found a significant negative relationship between age and self-efficacy. Higher age is associated with lower self-efficacy, while younger patients tend to have higher confidence in controlling tertiary prevention behaviors. Older adults may struggle to develop self-efficacy due to fatigue or reduced motivation. According to Septianingtyas et al. (2022), motivation and self-efficacy can be enhanced through social support from family, neighbors, peers, healthcare providers, and fellow hypertensive patients, such as reminders to avoid consuming high-salt foods.

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CONFLICT OF INTEREST

None.

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