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Adherence to a Healthy Lifestyle Among Hypertensive Patients Based on Social Cognitive Theory in a Private Hospital in Bogor

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Abstract:
Introduction: Hypertension management relies heavily on lifestyle modification, yet many patients remain non-adherent to healthy behaviours. This study aimed to assess the influence of sociodemographic, personal, and environmental factors on healthy lifestyle adherence among hypertensive patients, using the Social Cognitive Theory (SCT) framework. Methods: A cross-sectional study was conducted in July 2024 at a private hospital in Bogor, involving 239 hypertensive outpatients. Validated questionnaires assessed self-efficacy, self-regulation, social support, and adherence behaviours. Data were analyzed using Chi-square and Fisher's Exact tests ($p < 0.05$). Results: Significant associations were found between age, BMI, number of children, and family history of hypertension with motivation, self-efficacy, self-regulation, social support, and lifestyle adherence. Age was significantly linked to motivation ($p = 0.001$), self-efficacy ($p = 0.001$), and self-regulation ($p = 0.005$). BMI correlated with illness perception ($p = 0.002$), self-regulation ($p = 0.025$), and adherence ($p = 0.004$). Number of children and family history of hypertension were also significantly related to multiple behavioural factors. Gender, education, and occupation showed no significant effects. Conclusion: Adherence to a healthy lifestyle among hypertensive patients is significantly influenced by age, BMI, number of children, and family history. SCT-based interventions should target personal and familial factors to improve lifestyle adherence and hypertension outcomes.

Keywords: Hypertension, Lifestyle Adherence, Social Cognitive Theory, Self-Efficacy, Family History, BMI

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INTRODUCTION

Hypertension, or high blood pressure, remains a leading global health challenge due to its high prevalence and potential to cause life-threatening complications. According to the World Health Organization (WHO), the number of adults living with hypertension nearly doubled from 594 million in 1975 to 1.13 billion in 2015, with the highest burden observed in low- and middle-income countries (World Health Organization, 2023). This rapid rise is primarily attributed to lifestyle changes and increasing risk factors such as obesity, stress, poor diet, and lack of physical activity (Andini & Siregar, 2024; Flack & Adekola, 2020).

Despite being a manageable condition, hypertension continues to be a "silent killer" due to its often-asymptomatic nature and poor treatment adherence. Globally, 41% of women and 51% of men with hypertension remain undiagnosed, and less than half of those diagnosed achieve adequate blood pressure control (anonymous, 2022). In Indonesia, hypertension is the most common cardiovascular risk factor in Indonesia, with a measured prevalence of 34.11%, far exceeding the 8.36–8.84% reported by diagnosis or medication use, indicating widespread underdiagnosis—especially in rural and low-

wealth groups. About 32.27% of patients do not take medication regularly, with 13.33% not taking any, mainly due to lack of symptoms (59.8%), irregular checkups (31.1%), use of traditional medicine (14.5%), and forgetfulness (11.5%) (Harmadha et al., 2023). Other data shows that hypertension is more prevalent in women (36.9%) and the elderly population (69.5%), particularly those with lower education and income levels (Kementrian Kesehatan, 2018).

Non-adherence to treatment regimens—including lifestyle modifications—is a critical barrier to effective hypertension control, with many patients citing reasons such as feeling healthy, not visiting healthcare facilities regularly, or relying on traditional remedies (Kementrian Kesehatan, 2018). This preference reflects broader sociocultural beliefs wherein traditional medicine is seen as a natural and accessible first-line approach, often embedded in communal and familial knowledge systems (Jonathan et al., 2023).

Lifestyle modification is a cornerstone in the management of hypertension and includes dietary adjustments, regular physical activity, stress management, and avoiding tobacco use. Non-pharmacological interventions can significantly reduce blood pressure and prevent complications (Larkin & Cavanagh, 2016). However, a study showed that 72% of hypertensive patients did not adhere to healthy lifestyle behaviours, which include maintaining a balanced diet, exercising, and quitting smoking (Huang et al., 2023). In Indonesia, a study shows smoking prevalence was relatively low at 8.7%; however, only 25.5% of smokers intended to quit after their hypertension diagnosis, indicating a gap in smoking cessation efforts (Ari Mashuri et al., 2024). This lack of adherence is influenced by various personal and environmental factors, including motivation, self-efficacy, family support, and access to health services.

The Social Cognitive Theory (SCT), developed by Albert Bandura, provides a robust framework to understand the interaction between personal factors, behaviour, and environmental influences in health-related decision-making (Zhang & Qian, 2024). Key constructs such as self-efficacy—the belief in one's ability to perform behaviours that lead to desired outcomes—and self-regulation—the ability to monitor and control one's actions—are central to this theory and have been shown to predict health behaviours including medication adherence and lifestyle compliance (Huang et al., 2023; Tadayon Nabavi & Bijandi, 2012). Social Cognitive Theory (SCT) improves patient and caregiver outcomes by targeting key constructs such as self-efficacy, outcome expectations, observational learning, and behavioural capability. Enhancing self-efficacy helps individuals feel more confident in managing stress and caregiving tasks (Wan Ghazali et al., 2025). A cross-sectional study of 420 T2DM patients in Ghana used a Social Cognitive Theory (SCT)-based model to identify factors influencing diabetes self-management (DSM). Path analysis showed that family support had a significant direct effect on DSM, mediated by self-efficacy. Conditional indirect effects of diabetes knowledge and support were also significant at higher levels of belief in treatment effectiveness (Obirikorang et al., 2022).

Given the increasing burden of hypertension and the critical role of behavioural factors in its management, this study aims to analyze the relationship between sociodemographic characteristics, personal and environmental factors, and adherence to a healthy lifestyle among hypertensive patients using the Social Cognitive Theory (SCT) framework. Despite growing recognition of the behavioural dimensions of hypertension control, there remains a limited number of studies—particularly in low- and middle-income countries—that comprehensively integrate the SCT framework to understand lifestyle adherence in hypertensive populations. Furthermore, many existing publications focus on

isolated factors without exploring the complex interaction between personal beliefs, social influences, and environmental support. This study is therefore important as it not only addresses this gap but also provides a structured, theory-driven approach to understanding health behaviours. The novelty of this research lies in its application of SCT to a holistic model of lifestyle adherence in hypertension, offering actionable insights that can inform tailored interventions and public health strategies.

RESEARCH METHODS

This research was a quantitative, non-experimental, cross-sectional study employing a survey method. The study aimed to explore the relationship between personal and environmental factors and adherence to a healthy lifestyle among hypertensive patients, using the Social Cognitive Theory as a conceptual framework. The study was conducted at a private hospital in Bogor, Indonesia, in July 2024. The target population consisted of hypertensive outpatients aged 18 years and older, with a confirmed diagnosis of hypertension (systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg). A total of 239 participants were selected through simple random sampling based on the hospital's outpatient hypertension registry based on :

1. Inclusion
    a. Patients aged >18 years.
    b. Diagnosed with hypertension.
    c. Outpatients attending the hospital during the data collection period.
    d. Minimum education level: elementary school.
2. Exclusion
    a. Inpatients.
    b. Patients with cognitive impairment.

All instruments were tested for validity and reliability. Validity was assessed using Pearson correlation ($r > 0.126$ considered valid), and reliability was tested using Cronbach's Alpha ($\alpha > 0.6$ accepted). Data were collected through structured interviews using questionnaires. The collected data were analyzed using SPSS version 26. Chi-square tests and Fisher's Exact Test were applied to assess associations between variables, with a significance level set at $p < 0.05$. Homogeneity tests were performed using Levene's test.

RESULTS AND DISCUSSION

Table 1. Validity Analysis

No	Construct	Question	r table	r count	Description
1	Self-Motivation	1	0.126	.722**	Valid
2	Self-Motivation	2	0.126	.694**	Valid
3	Self-Motivation	3	0.126	.694**	Valid
4	Self-Motivation	4	0.126	.492**	Valid
5	Self-Motivation	5	0.126	.617**	Valid
6	Self-Motivation	6	0.126	.762**	Valid
7	Self-Motivation	7	0.126	.604**	Valid
8	Self-Motivation	8	0.126	.732**	Valid
9	Self-Motivation	9	0.126	.717**	Valid
10	Self-Motivation	10	0.126	.642**	Valid
11	Self-Motivation	11	0.126	.712**	Valid
12	Self-Motivation	12	0.126	.551**	Valid

No	Construct	Question	r table	r count	Description
13	Self-Motivation	13	0.126	.709**	Valid
14	Self-Motivation	14	0.126	.607**	Valid
15	Self-Motivation	15	0.126	.654**	Valid
16	Patient Perception of Disease	1	0.126	.574**	Valid
17	Patient Perception of Disease	2	0.126	.640**	Valid
18	Patient Perception of Disease	3	0.126	.797**	Valid
19	Patient Perception of Disease	4	0.126	.688**	Valid
20	Patient Perception of Disease	5	0.126	.757**	Valid
21	Patient Perception of Disease	6	0.126	.642**	Valid
22	Patient Perception of Disease	7	0.126	.769**	Valid
23	Patient Perception of Disease	8	0.126	.686**	Valid
24	Patient Perception of Disease	9	0.126	.704**	Valid
25	Patient Perception of Disease	10	0.126	.560**	Valid
26	Self-Efficacy	1	0.126	.656**	Valid
27	Self-Efficacy	2	0.126	.719**	Valid
28	Self-Efficacy	3	0.126	.624**	Valid
29	Self-Efficacy	4	0.126	.808**	Valid
30	Self-Efficacy	5	0.126	.587**	Valid
31	Self-Efficacy	6	0.126	.550**	Valid
32	Self-Efficacy	7	0.126	.704**	Valid
33	Self-Efficacy	8	0.126	.702**	Valid
34	Self-Efficacy	9	0.126	.713**	Valid
35	Self-Efficacy	10	0.126	.791**	Valid
36	Self-Regulation	1	0.126	.502**	Valid
37	Self-Regulation	2	0.126	.742**	Valid
38	Self-Regulation	3	0.126	.583**	Valid
39	Self-Regulation	4	0.126	.858**	Valid
40	Self-Regulation	5	0.126	.773**	Valid
41	Self-Regulation	6	0.126	.610**	Valid
42	Self-Regulation	7	0.126	.767**	Valid
43	Self-Regulation	8	0.126	.734**	Valid
44	Support	1	0.126	.819**	Valid
45	Support	2	0.126	.715**	Valid
46	Support	3	0.126	.545**	Valid
47	Support	4	0.126	.763**	Valid
48	Support	5	0.126	.801**	Valid
49	Support	6	0.126	.752**	Valid
50	Support	7	0.126	.606**	Valid
51	Support	8	0.126	.744**	Valid
52	Support	9	0.126	.703**	Valid
53	Support	10	0.126	.620**	Valid
54	Healthy Lifestyle Adherence	1	0.126	.679**	Valid
55	Healthy Lifestyle Adherence	2	0.126	.718**	Valid
56	Healthy Lifestyle Adherence	3	0.126	.483**	Valid
57	Healthy Lifestyle Adherence	4	0.126	.473**	Valid
58	Healthy Lifestyle Adherence	5	0.126	.838**	Valid
59	Healthy Lifestyle Adherence	6	0.126	.870**	Valid
60	Healthy Lifestyle Adherence	7	0.126	.513**	Valid
61	Healthy Lifestyle Adherence	8	0.126	.567**	Valid
62	Healthy Lifestyle Adherence	9	0.126	.815**	Valid
63	Healthy Lifestyle Adherence	10	0.126	.589**	Valid

Source: Primary data processed by researchers (2024)

Validity testing was performed using Pearson's correlation on each questionnaire item (Table 1). A critical R-value of 0.126 (n = 30) was used as the threshold. All items related to motivation, disease perception, self-efficacy, self-regulation, social support, and healthy lifestyle adherence were found to have correlation coefficients (r) greater than 0.126 ($p < 0.05$), indicating that all items were valid for use in the main study.

Table 2. Reliability Analysis

Variable	Cronbach's Alpha	Description
X1	0.905	Reliable
X2	0.889	Reliable
X3	0.874	Reliable
X4	0.848	Reliable
X5	0.889	Reliable
Y	0.849	Reliable

Source: Primary data processed by researchers (2024)

Reliability was assessed using Cronbach's Alpha. All constructs showed high internal consistency: As all values exceeded 0.6, the instruments were considered reliable (Table 2).

Table 3. Homogenity Analysis

Variable	Levene Statistic	df1	df2	Sig. (p-value)
X1 (Individual Characteristics)	0.922	28	59	0.583
X2 (Environmental Factors)	1.544	28	59	0.222
X3 (Personal Factors)	1.544	28	33.212	0.454
X4 (Motivation)	1.300	28	59	0.196
X5 (Disease Perception)	1.300	28	30.915	0.238
Y (Healthy Lifestyle Adherence)	0.848	28	26.150	0.666

Source: Primary data processed by researchers (2024)

Levene's test for homogeneity of variances was applied. All variables yielded p-values > 0.05, indicating homogeneity across groups (Table 3).

Most respondents were classified within the early adulthood age group (26–35 years), comprising 65 individuals, followed by those in late adulthood (36–45 years) with 53 individuals. The smallest subgroup consisted of late adolescents (19–25 years). Regarding educational attainment, most participants had completed secondary education (45.6%), while 27.2% had only elementary education and an equal proportion (27.2%) had attained higher education, indicating that the majority possessed at least a moderate level of formal education.

Based on Body Mass Index (BMI) classification, nearly half of the respondents (47.3%) were within the normal weight range, followed by 30.1% classified as overweight, and 22.2% as obese. A minimal proportion (0.4%) were categorized as underweight.

Occupationally, the largest segment of respondents were labourers (58.2%), with others working as housewives (18.8%), farmers (11.7%), and teachers (11.3%). Most participants (82.4%) reported having more than two children, whereas 17.6% had two or fewer. Additionally, a majority (64.9%) reported no family history of hypertension, while 35.1% indicated a positive family history.

Table 4. Correlation between sociodemographic and Motivation

No	Sociodemographic Variable	Analyzed Variable	p-value	Remarks
1	**Age**	Motivation	0.001	**Significant**
2		Illness Perception	0.501	Not Significant
3		Self-Efficacy	0.001	**Significant**
4		Self-Regulation	0.005	**Significant**
5		Social Support	0.175	Not Significant
6		Adherence to Healthy Lifestyle	0.713	Not Significant
7	**Gender**	Motivation	0.770	Not Significant
8		Illness Perception	0.611	Not Significant
9		Self-Efficacy	0.556	Not Significant
10		Self-Regulation	0.327	Not Significant
11		Social Support	0.213	Not Significant
12		Adherence to Healthy Lifestyle	0.458	Not Significant
13	**Education**	Motivation	0.285	Not Significant
14		Illness Perception	0.406	Not Significant
15		Self-Efficacy	0.427	Not Significant
16		Self-Regulation	0.420	Not Significant
17		Social Support	0.269	Not Significant
18		Adherence to Healthy Lifestyle	0.957	Not Significant
19	**Body Mass Index (BMI)**	Motivation	0.273	Not Significant
20		Illness Perception	0.002	**Significant**
21		Self-Efficacy	0.051	Borderline Significance
22		Self-Regulation	0.025	**Significant**
23		Social Support	0.009	**Significant**
24		Adherence to Healthy Lifestyle	0.004	**Significant**
25	**Occupation**	Motivation	0.322	Not Significant
26		Illness Perception	0.668	Not Significant
27		Self-Efficacy	0.457	Not Significant
28		Self-Regulation	0.505	Not Significant
29		Social Support	0.379	Not Significant
30		Adherence to Healthy Lifestyle	0.713	Not Significant
31	**Number of Children**	Motivation	0.010	**Significant**
32		Illness Perception	0.187	Not Significant
33		Self-Efficacy	0.023	**Significant**
34		Self-Regulation	0.033	**Significant**
35		Social Support	0.017	**Significant**
36		Adherence to Healthy Lifestyle	0.002	**Significant**
37	**Family History of HTN**	Motivation	0.130	Not Significant
38		Illness Perception	0.052	Borderline Significance
39		Self-Efficacy	0.074	Not Significant
40		Self-Regulation	0.014	**Significant**
41		Social Support	0.005	**Significant**
42		Adherence to Healthy Lifestyle	0.001	**Significant**

Source: Primary data processed by researchers (2024)

The Chi-Square analysis showed that age, BMI, number of children, and family history of hypertension were significantly associated with key behavioural factors such as motivation, self-

efficacy, self-regulation, social support, and adherence to a healthy lifestyle ($p < 0.05$) (Table 5). In contrast, gender, education, occupation, and marital status did not show significant associations with most variables. These findings suggest that personal and familial health factors have a stronger influence on healthy lifestyle behaviours among hypertensive patients than general demographic characteristics.

The analysis of sociodemographic data shows that most respondents were in the early and late adulthood categories, reflecting a predominance of individuals in the productive age group. In terms of education, most respondents had completed secondary education. The Body Mass Index (BMI) distribution revealed that most respondents were in the normal range, although a considerable proportion fell into the overweight and obese categories, which can serve as health risk factors. Most respondents worked as labourers, a group typically engaged in high physical activity but with potentially limited access to healthcare services. Regarding the number of children, most respondents had more than two, which may influence lifestyle patterns and the family's economic status. Meanwhile, the majority reported no family history of hypertension, although a significant proportion did, indicating a potential genetic risk.

Individual characteristics of age were found to be associated with personal factors in hypertensive patients (Table 5), as demonstrated by the significant relationship between age and motivation, self-efficacy and self-regulation. The analysis showed that age had a significant association with average self-efficacy and regulation levels ($p < 0.001$, 0.001 & 0.005), with distinct distributions across age groups. A study conducted by Liu et al. (2024) found that among older adults aged 60–80, age influenced patients' willingness to take medication regularly and their understanding of the risks involved in non-compliance. In another study, age was found to be significantly associated with medication adherence ($p = 0.046$) where patients aged 40–59 years, 55.0% were non-adherent and 45.0% were adherent. In contrast, among patients aged 60 years and older, a lower proportion (47.2%) were non-adherent, and 52.8% were adherent, indicating that older patients were more likely to adhere to their treatment (Anh Hien et al., 2025). In research with 357 participants, the adjusted odds ratio (AOR) on 18–39 age group, for adherence was 0.82 (95% CI: 0.44–1.51) for those aged 40–59 and 1.85 (95% CI: 0.80–4.25) for those aged ≥60, with p-values of 0.533 and 0.147, respectively (Yousuf et al., 2025).

In some research, BMI is an important factor in hypertension control. A survey shows that males and females with high BMI have significantly higher rates of uncontrolled hypertension (53.9% and 49.3%, respectively) compared to those with normal BMI (44.6% and 28.2%) (Sai Sushma et al., 2025). Research about mask obesity shows that from 2004 to 2018, higher BMI is strongly linked to increased hypertension in Bangladesh as overweight/obesity rates rose, hypertension also increased in both genders. This trend was more pronounced in wealthier and urban populations (Nguyen et al., 2022). From Table 5, Body Mass Index (BMI) showed a significant relationship with several psychosocial variables related to hypertension prevention. Although BMI was not significantly associated with motivation ($p = 0.273$), it had a strong association with illness perception ($p = 0.002$), self-regulation ($p = 0.025$), social support ($p = 0.009$) and adherence to a healthy lifestyle ($p = 0.004$).

The number of children was significantly associated with several psychological and behavioural factors. Specifically, it showed a significant relationship with motivation ($p = 0.010$), self-efficacy ($p = 0.023$), self-regulation ($p = 0.033$), social support ($p = 0.017$), and adherence to a healthy lifestyle ($p = 0.002$). A large cohort study from the Malmö Preventive Project involving over 22,000

childless men showed higher odds of having high blood pressure (OR 1.28; 95% CI: 1.14–1.45) (Elenkov et al., 2020). Among 2,851 couples from the Tehran Lipid and Glucose Study, the results showed that parity had differing effects on HTN risk depending on gender and age group. In women aged 40–50, having one, two, or three or more children was associated with an increased risk of HTN by 14%, 5%, and 12%, respectively, compared to childless women. Among those aged 50–60, having two or more children increased the risk by 4%, and in women aged 60–70 with three or more children, the risk rose by 2%. In men aged 30–40 with two children, HTN risk increased by 17%, but decreased by 13% in those with three or more children. In men aged 40–50, the risk increased by 6% with two children and 11% with three or more (Rahmati et al., 2023). Other research shows that women with more than three children had the highest proportion of self-reported high blood pressure (45.3%) (Musilanga et al., 2025). Patients' understanding and attitudes toward their condition were significantly influenced by the involvement and encouragement of family members. Support from family can help improve adherence to treatment and foster positive health behaviours, while lack of support may contribute to difficulties in managing the disease effectively. This finding emphasizes the importance of considering the patient's social environment when designing interventions to improve hypertension control (Galson et al., 2023).

Family history of hypertension was significantly associated with self-regulation ($p = 0.014$), social support ($p = 0.005$), and adherence to a healthy lifestyle ($p = 0.001$). In a research study, individuals with a family history of HTN were more likely to present with more advanced stages of the condition. Specifically, while only 36.2% of those with elevated blood pressure had a family history of HTN, this proportion increased markedly to 51.0% in Stage 1, 71.0% in Stage 2, and peaked at 80.6% among those in hypertensive crisis (Yagoub et al., 2022). Adherence in consumption of antihypertensive medication was associated with family history with the crude odds ratio (COR) for non-adherence among those with a family history of HTN is 1.31 (95% CI: 0.97–1.78) with a p-value of 0.07, indicating a trend toward increased risk but not reaching conventional significance (Stanikzai et al., 2023). In Bangladesh, non-adherence to antihypertensive medication is influenced by factors such as forgetfulness, busy schedules, and social aspects like marital status, with unmarried patients showing lower adherence which also proves family history, behavioural, and clinical factors to improve adherence among hypertensive patients (Sharif et al., 2025).

Lifestyle plays an important role in maintaining blood pressure. A randomized controlled trial to seek the association between a Healthy Lifestyle Index (HLI) and hypertension in 456 Sri Lankan adults aged 27–65 years found hypertension prevalence was 39%. Compared to the low HLI group (score 0–2), the adjusted odds of hypertension were significantly lower in the high HLI group (score 4–5) with an AOR of 0.28 (95% CI: 0.15–0.54; p-trend < 0.001) (Fukunaga et al., 2020). To assess predictors of self-care behaviour using the Health Belief Model, a cross-sectional online survey among adults in Selangor and Kuala Lumpur without a hypertension diagnosis was conducted. Among 1,187 respondents, health motivations ($\beta = 0.217$) and perceived barriers ($\beta = 0.571$) were the strongest predictors of hypertension-preventive self-care behaviours (Tan et al., 2022). Social support from family and healthcare providers further reinforces healthy habits; for instance, individuals with a family history of hypertension are more likely to appreciate the importance of blood pressure control and have higher expectations for healthcare quality, which positively influences their adherence to healthy lifestyle practices (Prabasari, 2021; Debora et al., 2023).

CONCLUSION

The study demonstrated significant associations between age, Body Mass Index (BMI), and the number of children with crucial psychological and behavioural factors in hypertension management, including motivation, self-efficacy, self-regulation, social support, and adherence to a healthy lifestyle. Furthermore, a family history of hypertension was significantly linked to self-regulation, social support, and adherence to a healthy lifestyle. Conversely, gender, education, and occupation did not exhibit a significant influence on these factors. These findings underscore the importance of personal and family-related factors in shaping healthy behaviours among hypertensive patients. Therefore, interventions aimed at improving adherence and outcomes in hypertension management should be tailored to address these specific individual and familial characteristics.

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