



MALAHAYATI INTERNATIONAL JOURNAL
OF NURSING AND HEALTH SCIENCE
ISSN 2620-9152 (Print)
ISSN 2621-4083 (Online)
DOI: 10.33024



ARTICLE INFORMATION

Received: July, 16, 2026

Revised: July, 30, 2026

Available online: July, 31, 2026

at : <https://e-jurnal.iphorr.com/index.php/minh>

Clean and healthy living behaviors are associated with hypertension prevention and control: A systematic review

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Abstract

Background: Hypertension is one of the most prevalent non-communicable diseases and a major risk factor for cardiovascular complications. Most individuals with hypertension are asymptomatic, and is therefore commonly described as a silent killer. Clean and Healthy Living Behavior (PHBS) is a promotive and preventive approach that plays an important role of Clean and Healthy Living Behavior (PHBS) in hypertension prevention and control.

Purpose: To identify the role of Clean and Healthy Living Behavior (PHBS) in the prevention and control of hypertension based on evidence from previous studies.

Method: A systematic review method by searching scientific articles from bibliographic sources including Google Scholar, PubMed, ResearchGate, Elsevier, and NCBI. The article selection process was conducted systematically through identification, screening, eligibility assessment, and narrative synthesis. A total of 15 relevant articles published between 2019 and 2026 were included in the review.

Results: The findings indicated that the implementation of PHBS, including healthy dietary patterns, salt intake restriction, regular physical activity, smoking cessation, weight management, stress control, routine health examinations, and medication adherence, was associated with lower hypertension risk and better blood pressure control. Furthermore, health education, PHBS promotion, and community-based interventions contributed to improving knowledge, attitudes, and healthy lifestyle practices among the community, thereby reducing the risk of cardiovascular complications.

Conclusion: Clean and Healthy Living Behavior (PHBS) is potentially important non-pharmacological strategy for both preventing hypertension and achieving long-term blood pressure control. Integrating PHBS into primary healthcare systems significantly lowers the risk of cardiovascular complications.

Suggestion: Multidisciplinary collaboration, community empowerment, and sustainable health promotion strategies should be strengthened within primary care. Additionally, future research utilizing longitudinal and interventional designs is required to assess the long-term efficacy of PHBS programs across diverse populations.

Keywords: Clean and Healthy Living Behavior; Hypertension; Literature Review; PHBS; Prevention.

INTRODUCTION

Hypertension is both a disease and one of the leading risk factors for cardiovascular morbidity and mortality worldwide. It is considered a challenging public health problem because most affected individuals remain asymptomatic for years, while treatment primarily focuses on long-term management and blood pressure control rather than palliation (Gabb, 2020). Clinical manifestations often appear only after serious complications, such as stroke, myocardial infarction, heart failure, or chronic kidney disease, have developed. Consequently, hypertension is widely recognized as the “silent killer” (Trismimanda & Avisha, 2025).

Based on its etiology, hypertension is classified into primary (essential) hypertension and secondary hypertension. Essential hypertension accounts for the majority of cases and has no identifiable underlying cause, although genetic predisposition and family history are considered important contributing factors. Lifestyle-related factors, including unhealthy dietary habits, physical inactivity, obesity, smoking, excessive salt consumption, and chronic stress, substantially increase the risk of developing hypertension. Secondary hypertension, in contrast, results from identifiable medical conditions such as renal disease or endocrine disorders. Advances in diagnostic technology have enabled better identification of secondary causes; however, lifestyle-related hypertension remains the predominant form worldwide (Carey, Wright Jr, Taler, & Whelton, 2021; Charchar, Prestes, Mills, Ching, Neupane, Marques, & Tomaszewski, 2024).

According to the World Health Organization (WHO), hypertension continues to represent one of the most significant contributors to the global burden of non-communicable diseases. Indonesia has experienced a particularly high prevalence of hypertension among adults aged 30-79 years, exceeding the global average (World Health Organization, 2023). Approximately half of Indonesian adults within this age group are estimated to have hypertension. This high prevalence is closely associated with inadequate adoption of healthy lifestyles, including insufficient physical activity, excessive sodium intake, frequent consumption of processed foods, and limited participation in routine

health examinations (NCD Risk Factor Collaboration, 2021; Trismimanda & Avisha, 2025).

Clean and Healthy Living Behavior (Perilaku Hidup Bersih dan Sehat—PHBS) represents a comprehensive set of health-promoting behaviors consciously adopted through continuous learning and health education. PHBS enables individuals and families to maintain, improve, and protect their health while actively contributing to community health promotion. Achieving optimal health requires behavioral transformation from unhealthy to healthy lifestyles and the creation of supportive environments within households and communities. Therefore, PHBS has become one of the Indonesian government's primary public health strategies to encourage healthier lifestyles among the population (Aswita, 2023; Alfian & Wulansari, 2023).

The PHBS program aims to provide health education and create supportive conditions that enable individuals, families, and communities to implement healthy living practices. This program emphasizes health communication, dissemination of information, and educational interventions designed to improve health knowledge, attitudes, and behaviors. PHBS implementation involves collaboration among community leaders, local health volunteers, and healthcare professionals to empower communities in recognizing health problems and adopting preventive health measures (Aswita, 2023; Andriani, Wartiningsih, Kodrat, Silitonga, Suryadarma, Handayani, & Ginting, 2025).

PHBS serves as a fundamental component of health promotion and disease prevention strategies. By consistently practicing healthy behaviors, individuals can reduce their risk of both communicable and non-communicable diseases while simultaneously fostering healthier environments for their families and communities. In the context of rapid urbanization, lifestyle transitions, population aging, and increasing prevalence of chronic diseases, sustained implementation of PHBS has become increasingly important. Continuous health education is therefore essential to ensure that healthy behaviors become integrated into everyday life rather than temporary interventions (Makmun, Cahyani, Sabir, Nirwana, Mulyadi, & Husen, 2026; Andriani et al., 2025).

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Hypertension prevention and control require an integrated continuum of care extending from community-based prevention programs to primary healthcare centers, hospitals, and long-term home-based management. Effective hypertension management depends not only on pharmacological treatment but also on sustained adherence to healthy lifestyle practices throughout an individual's life course. Consequently, understanding the role of PHBS in hypertension prevention is essential for strengthening health promotion programs and reducing the burden of cardiovascular diseases (Charchar et al., 2024; Rachmawati, Novindra, Syarifah, & Aisy, 2024). Therefore, this literature review was conducted to synthesize current scientific evidence regarding the relationship between Clean and Healthy Living Behavior (PHBS) and hypertension prevention. The findings are expected to provide an evidence-based foundation for improving health promotion strategies and preventive interventions aimed at reducing the risk of hypertension development and its associated complication.

RESEARCH METHOD

A Systematic Literature Review (SLR) method to synthesize scientific evidence regarding the role of Clean and Healthy Living Behavior (Perilaku Hidup Bersih dan Sehat/PHBS) in hypertension prevention and control. The literature search was conducted using several electronic databases, including Google Scholar, PubMed, ResearchGate, Elsevier (ScienceDirect), and NCBI. Articles published in English and Indonesian between 2019 and 2026 were considered for inclusion.

The literature search strategy was developed using Boolean operators with the following keywords: ("Clean and Healthy Living Behavior" OR PHBS OR "Healthy Lifestyle") AND (Hypertension OR Hipertensi) AND (Prevention OR Pencegahan). The inclusion criteria consisted of studies discussing the implementation of PHBS, healthy lifestyle behaviors,

or community-based health interventions related to hypertension prevention and control; studies involving individuals, families, or communities; and articles available in full-text format. Articles published before 2019, duplicate publications, studies unrelated to PHBS and hypertension, non-research articles, and publications without sufficient methodological information were excluded.

The study selection process was conducted systematically based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, consisting of four stages: identification, screening, eligibility assessment, and final inclusion. The initial database search identified 647 records, consisting of 643 articles from Google Scholar, 4 articles from ScienceDirect, and no articles from PubMed. During the screening stage, 258 articles were assessed based on title and abstract relevance, while 389 articles were excluded because they were unrelated to PHBS or lifestyle-related interventions for hypertension prevention.

Subsequently, 97 full-text articles were assessed for eligibility based on the predefined inclusion criteria. A total of 82 articles were excluded after eligibility assessment due to reasons including irrelevant study topics, duplicate publications, insufficient research outcomes, or failure to meet the required methodological criteria. Finally, 15 articles published between 2019 and 2026 were included in the systematic review and analyzed further.

Data extraction was performed by reviewing the selected studies based on study characteristics, including authors, publication year, country, study design, population characteristics, intervention or exposure, comparison, outcomes, and main findings. The extracted information was organized using the PICOS framework (Population, Intervention, Comparison, Outcome, and Study Design) and analyzed through a descriptive narrative synthesis approach to summarize evidence regarding the contribution of PHBS implementation in preventing and controlling hypertension.

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RESEARCH RESULTS

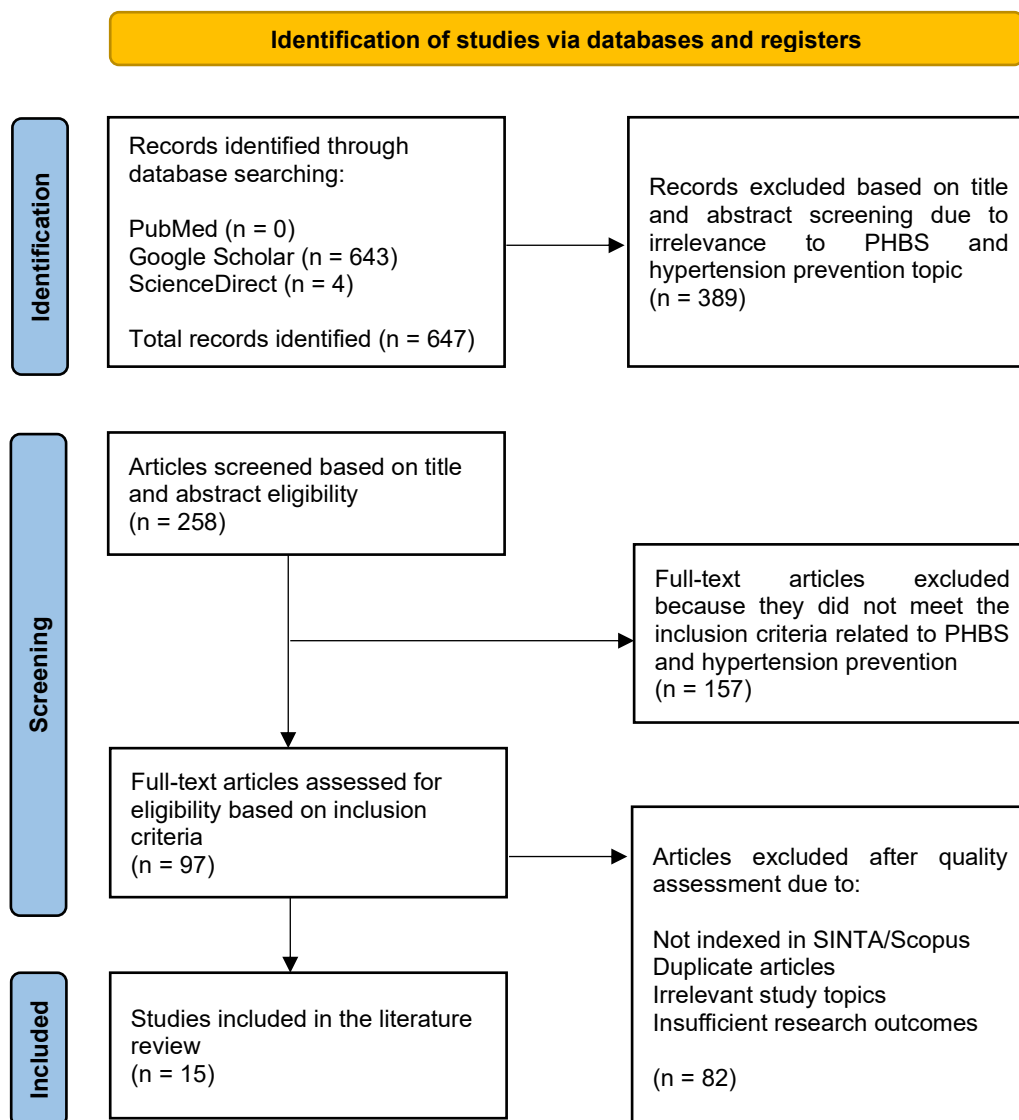


Figure 1. PRISMA Flow Diagram

Figure 1. illustrates the study selection process using the PRISMA flow diagram. A total of 647 records were initially identified through database searching, consisting of 643 articles from Google Scholar, 4 articles from ScienceDirect, and no articles from PubMed. After screening based on titles and abstracts, 258 articles were considered potentially relevant, while 389 articles were excluded due to irrelevance to the topic of Clean and Healthy Lifestyle Behavior (PHBS) and hypertension prevention. Subsequently, 97 full-text articles were assessed for eligibility based on the predefined inclusion criteria, and 82 articles were excluded due to reasons such as not meeting the eligibility criteria, lack of relevance, duplicate publications, or insufficient research outcomes. Finally, 15 studies were included in this literature review and underwent further analysis to synthesize evidence regarding the role of PHBS in hypertension prevention and management.

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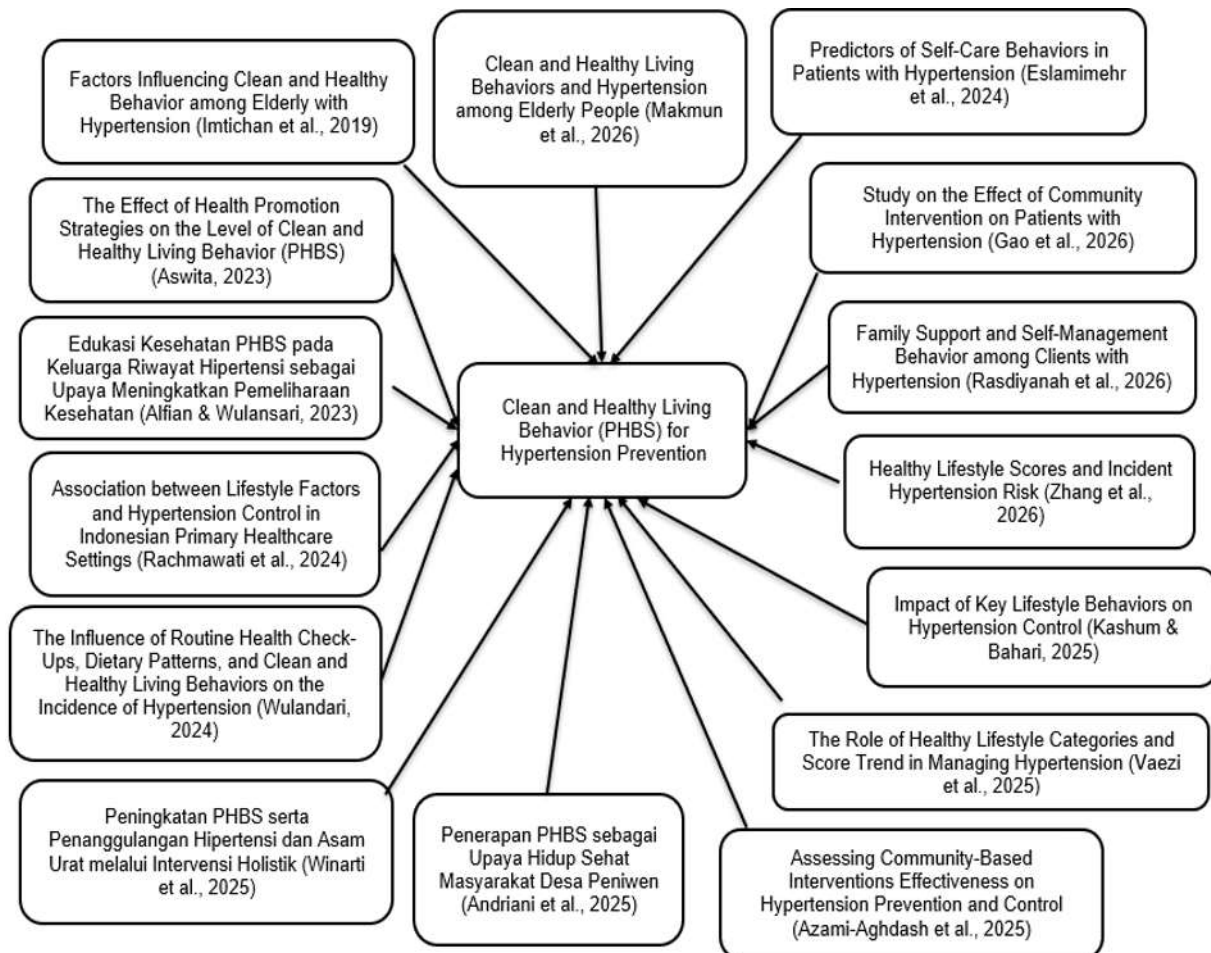


Figure 2. Conceptual map of the literature

The conceptual map summarizes the selected studies centered on Clean and Healthy Living Behavior (PHBS) for Hypertension Prevention. The literature landscape synthesizes diverse empirical findings regarding the determinants, interventions, and outcomes of PHBS practices. Specifically, the included studies examine factors influencing health behavior among the elderly, health promotion strategies and community empowerment, and the pivotal roles of self-care, family support, and health check-ups in controlling hypertension. Together, these interconnected domains provide a comprehensive baseline that reinforces how integrating PHBS within primary healthcare and community settings contributes to effective hypertension prevention and management.

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Table 1. Characteristics of Included Studies

(Author, Years) (Country)	Population	Intervention / Exposure	Comparison	Outcome	Study Design
(Imtichan, 2019) (Indonesia)	200 elderly patients with hypertension in Ngawi Regency, East Java, Indonesia. Samples were selected using multistage random sampling during June–July 2019.	Factors associated with Clean and Healthy Living Behavior (PHBS), including perceived susceptibility, perceived benefits, attitude, and family support based on the Health Belief Model (HBM).	No control group. Comparison was based on different levels of perceived susceptibility, perceived benefits, attitude, and family support using multiple linear regression analysis.	Higher perceived susceptibility (OR=4.38), perceived benefit (OR=4.51), positive attitude (OR=9.81), and strong family support (OR=2.61) significantly improved PHBS among elderly hypertensive patients.	Analytical observational study with a cross-sectional design using multiple linear regression.
(Makmun et al., 2026) (Indonesia)	98 elderly individuals aged ≥60 years from Maccini Sawah and Tamangapa Primary Health Centers, Makassar, Indonesia.	PHBS measured using a validated 12-item questionnaire covering healthy diet, physical activity, smoking cessation, and routine health monitoring.	Comparison between low, moderate, and high PHBS categories regarding hypertension incidence using Chi-square analysis.	Low PHBS was associated with a higher prevalence of hypertension. A significant relationship was found between PHBS and hypertension occurrence ($p=0.000$).	Quantitative analytical observational study with a cross-sectional design.
(Winarti et al., 2025) (Indonesia)	Community members in Pagertoyo Village, Limbangan District, Kendal Regency, including adults with hypertension risk, gout, and elementary school students (30 community participants and 45 school children).	Holistic community-based health intervention consisting of health education about hypertension prevention, health screening (blood pressure, blood glucose, and uric acid), hypertension exercise, autogenic relaxation techniques, health promotion media, and PHBS education (hand washing and proper tooth brushing demonstration).	Comparison of participants' knowledge and behavior before and after the intervention using pre-test and post-test evaluation and participatory observation.	The intervention increased community awareness and knowledge regarding hypertension prevention and healthy behaviors. Among 30 participants, several individuals were identified with elevated blood pressure, while PHBS education improved children's ability to practice proper hand washing and tooth brushing; 35 of 45 children (78%) demonstrated correct practices after the intervention.	Community service program (health promotion intervention) with pre-test–post-test evaluation and participatory observation.

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(Author, Years) (Country)	Population	Intervention / Exposure	Comparison	Outcome	Study Design
(Alfian & Wulansari, 2023) (Indonesia)	Adult families with a history of hypertension in Kebumen Village, Banyubiru, Semarang Regency, Indonesia.	Health education intervention to improve PHBS understanding, medication adherence, and health maintenance behavior.	No comparison group (single case study).	Knowledge improved from 8/10 to 10/10 after education, accompanied by better PHBS understanding and commitment to routine health control.	Descriptive case study in nursing.
(Aswita, 2023) (Indonesia)	100 household heads from Penanggalan District, Subulussalam City, Indonesia.	Health promotion strategies including advocacy, supportive environment, and community empowerment to improve PHBS.	Comparison between different levels of health promotion implementation using multiple linear regression.	Advocacy, supportive environment, and empowerment significantly influenced PHBS, explaining 56.6% of PHBS variation ($R^2=0.566$).	Explanatory survey with cross-sectional analytical design.
(Rachmawati et al., 2024) (Indonesia)	265 hypertensive patients treated at Batu and Junrejo Primary Health Centers, Indonesia, during June–December 2022.	Lifestyle-related behaviors associated with hypertension control.	No control group. Comparison based on lifestyle categories and hypertension control status using logistic regression.	Lifestyle factors were analyzed to determine their association with hypertension management outcomes.	Cross-sectional exploratory study using binary logistic regression and generalized linear model.
(Azami-Aghdash et al., 2025) (Iran)	Systematic review and meta-analysis including 68 studies involving adults aged ≥ 18 years with hypertension or hypertension risk from various countries.	Community-based interventions including health education, lifestyle modification, physical activity improvement, dietary modification, blood pressure screening, and healthy behavior promotion.	Intervention groups compared with control groups or non-intervention groups based on included studies.	Community interventions reduced systolic blood pressure by 7.26 mmHg and diastolic blood pressure by 2.77 mmHg.	Systematic review and meta-analysis following PRISMA guidelines using random-effects models.
(Kashum & Bahari, 2025) (Saudi Arabia)	136 hypertensive patients aged ≥ 18 years receiving treatment at Primary Healthcare Centers in Saudi Arabia.	Healthy lifestyle behaviors including diet, physical activity, stress management, and self-confidence/self-efficacy.	Comparison based on lifestyle behavior levels and blood pressure control using Pearson correlation, t-test, ANOVA, and regression analysis.	Physical activity was associated with lower stress and higher self-confidence. Age, education, and residence were significant predictors of blood pressure status.	Analytical observational cross-sectional study.

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(Author, Years) (Country)	Population	Intervention / Exposure	Comparison	Outcome	Study Design
(Wulandari, 2024) (Indonesia)	154 adults from Mlinjeng Village, Sumberrejo District, Bojonegoro Regency, East Java, Indonesia.	Routine health examination, healthy dietary practices, and PHBS implementation.	Comparison between participants with optimal and poor healthy lifestyle practices.	Hypertension prevalence was 16.9%. Healthy lifestyle practices contributed to hypertension and diabetes prevention.	Quantitative observational study using descriptive and inferential statistics.
(Andriani et al., 2025) (Indonesia)	200 participants from Peniwen Village, Malang Regency, Indonesia; 180 completed pre-test and post-test evaluations.	PHBS education through interactive counseling, health screening, and disease prevention education.	Comparison between knowledge scores before and after education.	PHBS knowledge increased by 33% after intervention. Screening identified hypertension and other non-communicable diseases.	Community service study with one-group pre-test post-test design.
(Rasdiyanah et al., 2026) (Indonesia)	164 hypertensive patients aged 19–59 years registered at Rappokalling Primary Health Center, Makassar, Indonesia.	Family support measured using Family Support Questionnaire and hypertension self-management using HPB-SCP.	Comparison between family support levels and self-management behavior using Spearman correlation.	Family support was significantly related to self-management behavior ($r=-0.199$; $p=0.007$), although it was not an independent predictor.	Quantitative analytical cross-sectional study.
(Gao et al., 2026) (China)	721 patients with high-normal blood pressure aged 18–80 years from Shenyang, China.	12-month community-based hypertension management program including education, salt reduction, physical activity promotion, smoking cessation, medication adherence support, and follow-up.	Comparison between pre-intervention and post-intervention conditions in the same group.	Blood pressure control improved from 19.7% to 36.3%, with significant improvement in healthy behaviors and hypertension knowledge.	Quasi-experimental one-group pre-test post-test study.
(Eslamimehr et al., 2024) (Iran)	344 hypertensive patients aged ≥ 30 years in Khamir County, Iran.	Psychosocial factors based on Theory of Planned Behavior (TPB) and Protection Motivation Theory (PMT) affecting hypertension self-care behavior.	Relationship analysis among psychosocial variables without control group.	Behavioral beliefs, control beliefs, normative beliefs, and perceived rewards were significant predictors of self-care behavior.	Cross-sectional analytical study.

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(Author, Years) (Country)	Population	Intervention / Exposure	Comparison	Outcome	Study Design
(Zhang et al., 2025) (China)	3,743 adults aged ≥ 18 years in Guizhou, China without hypertension at baseline.	Healthy Lifestyle Score (HLS) consisting of smoking, alcohol consumption, physical activity, BMI, sleep, and dietary factors.	Comparison based on HLS categories and lifestyle changes during follow-up.	Higher HLS reduced the risk of developing hypertension by 14% per one-point increase (HR=0.86).	Prospective cohort study using Cox proportional hazards regression.
(Vaezi et al., 2025) (Iran)	9,388 hypertensive patients aged ≥ 18 years from urban and rural areas in 31 provinces of Iran.	Healthy Lifestyle Index (HLI) including physical activity, BMI, alcohol consumption, smoking, and diet.	Comparison between poor, moderate, and good HLI categories regarding hypertension control.	Healthier lifestyles were associated with lower systolic and diastolic blood pressure. Each one-point increase in HLI reduced SBP by 0.75 mmHg and DBP by 0.76 mmHg.	Analytical observational cross-sectional study using logistic and linear regression.

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DISCUSSION

The synthesis of the fifteen included studies indicates that Clean and Healthy Living Behavior (PHBS) is an important component in the prevention and control of hypertension. Across different populations and study designs, healthier lifestyle practices were consistently associated with improved hypertension-related outcomes, including better blood pressure control, reduced risk of hypertension development, and improved self-management behaviors. PHBS represents a multidimensional concept involving dietary patterns, physical activity, smoking cessation, stress management, routine health monitoring, treatment adherence, and health-seeking behaviors. These findings are consistent with international recommendations emphasizing lifestyle modification as a fundamental approach for hypertension prevention and control (Charchar et al., 2024).

Several observational studies demonstrated an association between PHBS implementation and hypertension occurrence among community populations. Lower levels of PHBS were associated with a higher prevalence of hypertension among elderly individuals, indicating that inadequate healthy behaviors may contribute to increased hypertension risk (Makmun et al., 2026). Similarly, healthy dietary practices, routine health examinations, and PHBS implementation were reported to support hypertension and non-communicable disease prevention efforts in community settings (Wulandari, 2024). These findings highlight the importance of strengthening preventive health behaviors, particularly among populations at higher risk of hypertension-related complications.

Among the various components of PHBS, physical activity and dietary modification were the most frequently reported factors associated with hypertension management. Lifestyle-related behaviors were associated with hypertension control among patients receiving healthcare services, suggesting that behavioral modification may support better blood pressure outcomes (Rachmawati et al., 2024). Furthermore, physical activity, healthy dietary behaviors, stress management, and self-confidence were identified as important factors related to hypertension management outcomes (Kashum &

Bahari, 2025). Individuals with higher healthy lifestyle index scores also demonstrated lower systolic and diastolic blood pressure levels compared with those with poorer lifestyle patterns (Vaezi, Karimi, Mirzad, Khosravi, Rezaei, Golestani, & Azadbakht, 2025).

The long-term protective role of healthy lifestyle behaviors was supported by longitudinal evidence. Higher Healthy Lifestyle Scores were associated with a reduced risk of developing hypertension during follow-up periods, suggesting that sustained healthy behaviors may contribute to long-term hypertension prevention (Zhang, Liu, Wu, Zhou, Li, Li, & Ji, 2025). These findings indicate that PHBS implementation should not only focus on short-term behavioral improvement but also encourage continuous lifestyle maintenance throughout the life course.

In addition to individual lifestyle modification, health education was identified as an important strategy for improving PHBS implementation. Family-based health education improved understanding of PHBS, medication adherence, and health maintenance behaviors among families with a history of hypertension (Alfian & Wulansari, 2023). Similarly, community-based PHBS education combined with health screening increased participants' knowledge and strengthened awareness regarding healthy behaviors (Winarti, Thama, Astuti, Malichaturofi'ah, Nopitasari, & Robiyah, 2025; Andriani et al., 2025). These findings suggest that educational interventions may enhance health literacy and encourage individuals to adopt healthier practices.

Community-based health promotion strategies also contributed to strengthening PHBS practices. The implementation of advocacy, supportive environments, and community empowerment was significantly associated with improved household PHBS implementation, demonstrating the importance of social and environmental support in promoting healthy behaviors (Aswita, 2023). In addition, a community-based hypertension management program involving health education, lifestyle promotion, and follow-up support improved hypertension knowledge, healthy behaviors, and blood pressure control (Gao, Gao, Yang, Wang, & Xu, 2026). These findings emphasize that successful PHBS implementation requires collaboration between

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individuals, families, communities, and healthcare systems.

The effectiveness of community-level approaches was further supported by evidence from a systematic review and meta-analysis. Community-based interventions involving health education, lifestyle modification, physical activity promotion, dietary improvement, and blood pressure monitoring were associated with significant reductions in systolic and diastolic blood pressure among individuals with hypertension or hypertension risk (Azami-Aghdash, Joudyian, Jafari, Karami, & Rezapour, 2025). This evidence supports the integration of PHBS-oriented interventions into primary healthcare and community-based hypertension prevention programs.

However, the influence of social support factors on hypertension-related behaviors remains complex. Although family support is commonly considered an important factor in promoting healthy behaviors, family support was associated with hypertension self-management behavior but was not identified as an independent predictor in one study (Rasdiyanah, Dila, Asrul, Sutria, & Andani, 2026). This suggests that PHBS implementation is influenced by multiple interacting factors, including individual motivation, self-efficacy, health literacy, education level, and healthcare accessibility. Behavioral beliefs, subjective norms, and perceived behavioral control were also identified as important determinants of hypertension self-care behaviors (Eslamimehr, Hosseini, Aghamolaei, Nikparvar, & Ghanbarnejad, 2024).

Lastly, the findings from the fifteen included studies indicate that PHBS is strongly associated with hypertension prevention and management through multiple mechanisms, including lifestyle modification, health education, community empowerment, and improved self-management practices. Although variations in study designs and populations limit direct comparison between studies, the available evidence consistently supports the integration of PHBS-based strategies into hypertension prevention and control programs. Future interventions should focus on sustainable behavior change through comprehensive approaches involving education, supportive environments, family participation, and community empowerment to improve hypertension-related outcomes.

CONCLUSION

Clean and Healthy Living Behavior (PHBS) is an effective strategy for hypertension prevention and control. Consistent implementation of PHBS, including a healthy diet with reduced salt intake, regular physical activity, smoking cessation, stress management, routine health screening, maintenance of a healthy body weight, and adherence to antihypertensive therapy, is associated with a lower risk of hypertension, improved blood pressure control, and a reduced incidence of cardiovascular complications. In addition, health education, community-based interventions, and health promotion programs play a significant role in improving knowledge, attitudes, and long-term adherence to healthy lifestyle behaviors. These findings highlight the importance of integrating PHBS into primary healthcare and community-based hypertension prevention programs.

SUGGESTION

Strengthening multidisciplinary collaboration, community empowerment, and sustainable health promotion strategies may further enhance hypertension control and reduce the burden of cardiovascular disease. Future studies with longitudinal and interventional designs are warranted to evaluate the long-term effectiveness of PHBS interventions across diverse populations.

REFERENCES

- Alfian, J., & Wulansari, W. (2023). Edukasi Kesehatan PHBS pada Keluarga Riwayat Hipertensi sebagai Upaya Meningkatkan Pemeliharaan Kesehatan Tidak Efektif. *Indonesian Journal of Nursing Research (IJNR)*, 6(2), 49–58.
- Andriani, N. D. A., Wartiningsih, M., Kodrat, D. S., Silitonga, H. T. H., Suryadarma, A. Y., Handayani, L., & Ginting, A. (2025). Penerapan PHBS sebagai Upaya Hidup Sehat Masyarakat Desa Peniwen. *Jurnal Pengabdian kepada Masyarakat Nusantara*, 6(4), 5239-5244.
- Aswita, R. (2023). The Effect of Health Promotion Strategies on the Level of Clean and Healthy Living Behavior (PHBS) in Household Settings in

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DOI: <https://doi.org/10.33024/minh.v9i5.3940>

- Penanggalan Sub-district of Subulussalam. *Journal of Complementary and Alternative Medical Research*, 22(2), 15-29.
- Azami-Aghdash, S., Joudyian, N., Jafari, S., Karami, S., & Rezapour, R. (2025). Assessing Community-Based interventions effectiveness on hypertension prevention and control: A systematic review and Meta-Analysis. *BMC Public Health*, 25(1), 3253.
- Carey, R. M., Wright Jr, J. T., Taler, S. J., & Whelton, P. K. (2021). Guideline-driven management of hypertension: an evidence-based update. *Circulation research*, 128(7), 827-846.
- Charchar, F. J., Prestes, P. R., Mills, C., Ching, S. M., Neupane, D., Marques, F. Z., & Tomaszewski, M. (2024). Lifestyle management of hypertension: International Society of Hypertension position paper endorsed by the World Hypertension League and European Society of Hypertension. *Journal of hypertension*, 42(1), 23-49.
- Eslamimehr, F., Hosseini, Z., Aghamolaei, T., Nikparvar, M., & Ghanbarnejad, A. (2024). Predictors of self-care behaviors in patients with hypertension: The integrated model of theories of "planned behavior" and "protection motivation". *Journal of education and health promotion*, 13(1), 213.
- Gabb, G. (2020). What is hypertension?. *Australian prescriber*, 43(4), 108.
- Gao, Q., Gao, Z., Yang, Q., Wang, L., & Xu, L. (2026). Study on the effect of community intervention on patients with hypertension in high-normal blood pressure. *Frontiers in Medicine*, 13, 1761106.
- Imtichan, S. N., Tamtomo, D., & Sulaeman, E. S. (2019). Factors influencing clean and healthy behavior among elderly with hypertension. *The International Conference on Public Health Proceeding*, 4(02).
- Kashum, S., & Bahari, G. (2025). Impact of Key Lifestyle Behaviors on Hypertension Control: Implications for Optimizing Patient Management. In *Healthcare*, 14(1), 10.
- Makmun, A., Cahyani, N., Sabir, N. I., Nirwana, Mulyadi, M. S., & Husen, S. H. A. (2026). Clean and healthy living behaviors and hypertension among elderly people in the community. *Malahayati International Journal of Nursing and Health Science*, 8(12), 1741–1746.
- NCD Risk Factor Collaboration. (2021). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: A pooled analysis of 1201 population-representative studies with 104 million participants. *The Lancet*, 398(10304), 957–980.
- Rachmawati, E., Novindra, Q. A., Syarifah, N. A., & Aisy, N. R. (2024). Association between lifestyle factors and hypertension control in Indonesian primary healthcare settings: A cross-sectional study. *Malaysian Family Physician: the Official Journal of the Academy of Family Physicians of Malaysia*, 19, 18.
- Rasdiyanah, R., Dila, N. F., Asrul, N. A. M., Sutria, E., & Andani, N. (2026). Family support and self-management behavior among clients with hypertension: A Cross-Sectional Study. *Jurnal Ilmiah Kesehatan Sandi Husada*, 15(1), 112-121.
- Trismimanda, R., & Avisha, F. (2025). *Kenali dan kendalikan hipertensi: Si silent killer*. Ministry of Health of the Republic of Indonesia. Accessed from: https://keslan.kemkes.go.id/view_artikel/4119/kenali-dan-kendalikan-hipertensi-si-silent-killer
- Vaezi, A., Karimi, K., Mirzad, M., Khosravi, S., Rezaei, N., Golestani, A., & Azadbakht, L. (2025). The role of healthy lifestyle categories and score trend in managing hypertension among hypertensive adults. *Scientific Reports*, 15(1), 31194.

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DOI: <https://doi.org/10.33024/minh.v9i5.3940>

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- Winarti, R., Thama, B. N. A., Astuti, D. P., Malichaturofi'ah, I., Nopitasari, M., & Robiyah, S. (2025). Peningkatan Perilaku Hidup Bersih dan Sehat (PHBS) serta Penanggulangan Hipertensi dan Asam Urat melalui Intervensi Holistik di Masyarakat Kelurahan Pagertoyo Kecamatan Limbangan Kabupaten Kendal. *Jurnal Pengabdian Masyarakat Kesosi*, 8(2), 127-141.
- World Health Organization. (2023). Hypertension. Accessed from <https://www.who.int/news-room/fact-sheets/detail/hypertension>
- Wulandari, N. A. (2024). The influence of routine health check-ups, dietary patterns, and clean and healthy living behaviors on the incidence of hypertension and diabetes mellitus. *Jurnal Bidang Ilmu Kesehatan*, 14(3), 260-267.
- Zhang, J., Liu, T., Wu, Y., Zhou, J., Li, L., Li, X., & Ji, W. (2025). The associations between healthy lifestyle scores, their long-term changes, and incident hypertension risk in adults: a prospective cohort study. *Frontiers in Cardiovascular Medicine*, 12, 1678746.

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