DETERMINANTS OF SELF-CARE BEHAVIOR BASED ON THE THEORY OF PLANNED BEHAVIOR IN HYPERTENSIVE PATIENTS: A SYSTEMATIC REVIEW

Dwi Puji Lestari[1*], Abu Bakar[2], Herdina Mariyanti[3]
[1]Master of Nursing, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
[2]Departement of Advance, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
[3]Departement of Basic Nursing, Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
dwi.puji.lestari-2024@fkp.unair.ac.id

Abstract

Hypertension management largely depends on patients' self-care behavior, including lifestyle modification and medication adherence. The Theory of Planned Behavior (TPB) offers a comprehensive framework to explain behavioral determinants influencing self-care practices. A systematic search was conducted in Scopus, PubMed, Web of Science, ScienceDirect, and ProQuest for English-language studies published between 2019 and 2025. Cross-sectional studies examining self-care behavior and determinants aligned with TPB constructs were included. Data were synthesized narratively following PRISMA guidelines, and methodological quality was assessed using the Joanna Briggs Institute checklist. Fifteen studies were included. Self-care behavior was generally suboptimal. Attitude (knowledge and beliefs), subjective norms (social and family support), and perceived behavioral control (self-efficacy) were consistently associated with self-care behavior, with perceived behavioral control emerging as the strongest determinant. TPB is a relevant framework for understanding self-care behavior in hypertensive patients. Interventions should focus on enhancing self-efficacy and social support alongside improving patient knowledge.

* Corresponding author :
Address : Kampus C Unair Jl Mulyorejo, 60115, Surabaya, Indonesia
Email   : dwi.puji.lestari-2024@fkp.unair.ac.id
Phone   : 082233371221

INTRODUCTION

Hypertension remains one of the most prevalent non-communicable diseases worldwide and represents a major public health challenge due to its high morbidity, mortality, and long-term complications. Effective hypertension management requires not only pharmacological treatment but also sustained adherence to healthy lifestyle behaviors, including regular physical activity, low-salt diet, smoking cessation, stress management, healthy dietary patterns, and consistent medication intake. However, evidence indicates that adherence to these self-care behaviors among patients with hypertension remains suboptimal.

Previous studies have shown that most hypertensive patients demonstrate low adherence to recommended lifestyle modifications and antihypertensive therapy, despite having adequate knowledge regarding their condition (Riswanto et al., 2021; Adinkrah et al., 2020). This gap between knowledge and behavioral implementation suggests that adherence is influenced by complex psychological, social, and contextual factors beyond individual awareness alone. Globally, hypertension control remains alarmingly low. According to the World Health Organization, only 54% of adults with hypertension are diagnosed, 42% receive treatment, and merely 21% achieve blood pressure control (WHO, 2023). Empirical evidence has shown that non-adherence to antihypertensive medication and unhealthy lifestyle behaviors contributes to uncontrolled blood pressure, increasing the risk of cardiovascular diseases such as stroke, myocardial infarction, heart failure, and chronic kidney disease (Abaynew & Hussien, 2021).

Despite various interventions aimed at improving adherence, including health education, routine screening, medication provision, community-based programs, and home visits, adherence among hypertensive patients remains low, particularly in rural settings. Studies have demonstrated that medication adherence tends to decline over time due to treatment fatigue, side effects, forgetfulness, and insufficient family or social support (Gavrilova et al., 2021). Similarly, unhealthy lifestyle behaviors such as physical inactivity and excessive salt consumption persist among a large proportion of patients (Setiadi et al., 2022). These findings indicate that existing interventions often focus predominantly on cognitive or motivational aspects without adequately addressing the interaction between individual beliefs, social influences, and perceived behavioral control. Consequently, many adherence studies remain fragmented and lack a comprehensive theoretical framework that integrates psychological, social, and behavioral determinants.

Self-care theory, as proposed by Orem, emphasizes the individual's capacity to perform actions necessary to maintain health and manage chronic illness. Although self-care–based interventions have been shown to improve adherence behaviors in patients with hypertension, this theory does not explicitly explain how self-care behaviors are formed or influenced by psychosocial determinants. In contrast, the Theory of Planned Behavior (TPB) provides a robust behavioral framework by explaining how attitudes toward behavior, subjective norms, and perceived behavioral control shape behavioral intentions and actual behavior.

Given the persistent problem of low adherence and the lack of integrated theoretical approaches, a comprehensive synthesis of evidence on the determinants of self-care behavior based on the Theory of Planned Behavior is needed. A systematic review is essential to identify, evaluate, and synthesize existing empirical evidence regarding TPB constructs that influence self-care behaviors among patients with hypertension. Understanding these determinants will provide a stronger theoretical foundation for the development of effective, theory-driven interventions aimed at improving lifestyle and medication adherence. Therefore, this systematic review aims to examine the determinants of self-care behavior based on the Theory of Planned Behavior in patients with hypertension.

METODE

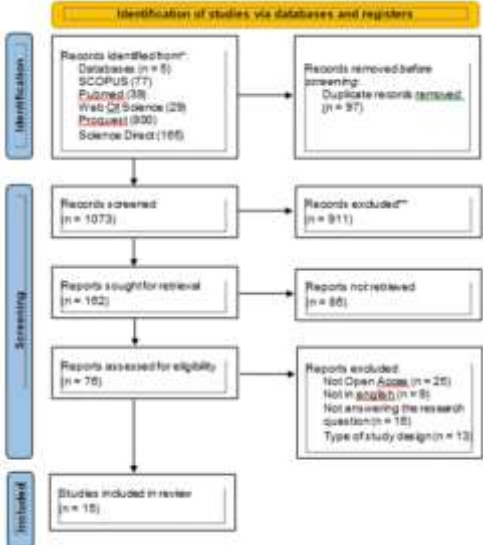This systematic review was conducted according to PRISMA guidelines.

Figure 1 PRISMA flow diagram showing the screening and selection process (Haddaway et al., 2022)

Search Strategy

A comprehensive literature search was conducted to identify relevant studies examining the the determinants of self-care behavior based on the Theory of Planned Behavior in patients with hypertension. The search process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure methodological transparency and reproducibility. Five major electronic databases Scopus, PubMed, Web of Science, ScienceDirect, and ProQuest were systematically searched for studies published between 2019 to 2025. Boolean operators and Medical Subject Headings (MeSH) terms were used to maximize the search sensitivity, with the final search string including combinations such as ("hypertension" OR "high blood pressure") AND ("self-care" OR "self care behavior" OR "self-management" OR "self management") AND ("theory of planned behavior" OR "TPB") AND ("determinants" OR "factors" OR "predictors" OR "adherence" OR "compliance").

Table 1 Search Strategy

Database	Search Query	Results
Scopus	TITLE-ABS-KEY ("self-care" OR "self management" OR "self-care behavior") AND TITLE-ABS-KEY ("Theory of Planned Behavior" OR TPB OR attitude OR "subjective norm" OR "perceived behavioral control") AND TITLE-ABS-KEY ("hypertension" OR "high blood pressure") AND PUBYEAR > 2018 AND PUBYEAR < 2026 AND LIMIT-TO (DOCTYPE, "ar") AND LIMIT-TO (LANGUAGE, "English")	3
PubMed	("Self Care"[MeSH] OR "Self-Management"[MeSH]) AND ("Hypertension"[MeSH]) AND ("Health Behavior"[MeSH] OR "Lifestyle"[MeSH]) AND ("Theory of Planned Behavior"[All Fields] OR attitude OR "perceived behavioral control") AND ("2019/01/01"[PDAT] : "2025/12/31"[PDAT]) AND English[lang]	4
Web of Science	ALL=("self-care" OR "self management" OR "personal health") LL = ("self-care" OR "self management") AND ALL = ("Theory of Planned Behavior" OR TPB) AND ALL = ("hypertension" OR "high blood pressure") AND LANGUAGE: (English) AND DOCUMENT TYPES: (Article) AND PUBLICATION YEARS: (2019–2025)	2
ScienceDirect	TITLE-ABS-KEY("self-care" OR "self management" OR "personal TITLE-ABS-KEY ("self-care" OR "self management") AND TITLE-ABS-KEY ("Theory of Planned Behavior" OR attitude OR "perceived behavioral control") AND TITLE-ABS-KEY ("hypertension") AND PUBYEAR > 2018 AND PUBYEAR < 2026 AND LANGUAGE (English) AND DOCTYPE (Article)	2
ProQuest	TI ("self-care" OR "self management") AND TI ("Theory of Planned Behavior" OR TPB) AND TI ("hypertension" OR "high blood pressure") AND publicationDate:20190101-20251231 AND language: English	2

Eligibility Criteria

The next step is to discuss based on the points obtained from the selection results (Zakaria et al., 2025. The PICOS (Population, Intervention, Comparison, Outcome, and Study Design) framework was used to identify studies eligible for inclusion in this systematic review. The inclusion criteria were as follows: (a) quantitative primary studies, including observational or analytical designs; (b) studies focusing on patients with hypertension; (c) studies applying the Theory of Planned Behavior or its core constructs; (d) outcomes measuring self-care behavior, lifestyle adherence, and/or medication adherence using validated instruments; and (e) articles published in peer-reviewed journals in the English language.

The exclusion criteria were as follows: (a) review articles, meta-analyses, study protocols, editorials, and conference abstracts; (b) qualitative-only studies; (c) studies not involving patients with hypertension; (d) studies not using the Theory of Planned Behavior framework; and (e) studies that did not report relevant self-care or adherence-related outcomes. The authors independently screened titles and abstracts against the eligibility criteria. Any discrepancies were resolved through discussion and consensus.

Study Selection and data extraction

A comprehensive search was conducted across four databases. All identified references were imported into Mendeley Desktop, where duplicate entries were removed prior to the initial screening phase. The screening process began with an independent review of titles and abstracts by the author. Studies that met the preliminary criteria were retrieved for full-text review. Any disagreements that emerged during the selection process were addressed through discussion and resolved in consultation with a third reviewer. Upon finalizing the list of included studies, the author independently extracted essential information, including author names, publication year, country of origin, study design, intervention setting, demographic characteristics of participants, intervention specifics, and reported outcomes.

Study Risk-of-bias Assesment

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies. This checklist evaluates key aspects such as clarity of inclusion criteria, validity and reliability of exposure and outcome measurements, identification and control of confounding factors, appropriateness of statistical analysis, and completeness of data reporting. All included studies met acceptable methodological quality and were therefore retained for the final analysis.

Table 2 Quality Assesment JBI

No	Author , Years	Study Design	1	2	3	4	5	6	7	8	9	10	11	12	13	Result
1.	Dong et al., 2024	Cross Sectional	√	√	√	√	√	√	X	√	√	√	√	√	√	12/13= 92 %
2.	Lee et al., 2022	Cross Sectional	√	X	√	√	√	√		X	√	√	√	√	√	11/13= 85%
3.	Adinkrah et al., 2020	Cross Sectional	√	√	√	√	√	√	√	√	√	√	√	√	√	13/13= 100%
4.	Zhu & Wang, 2024	Cross Sectional	√	√	√		X	X	√	X	√	√	√	√	√	10/13= 77%
5	Abera et al., 2024	Cross Sectional	√	√	√	√	√	√		X	√	√	√	√	√	12/13= 92%
6	Pinto et al., 2024	Cross Sectional	√	√	√		X	X	√	√	√	√	√	√	√	11/13= 85%
7	Abza et al., 2024	Cross Sectional	√		X	√	X	X	√	√	√	√	√	√	√	10/13= 77%
8	Algabbani, 2020	Cross Sectional	√	√	√		X	X	√	√	√	√	√	√	√	11/13= 85 %
9	Giakoumidakis et al., 2024	Cross Sectional	√	√	√		X	X	√	√	√	√	√	√	√	11/13= 85%
10	Guo et al., 2023	Cross Sectional	√	√	√	√	√	√		X	√	√	√	√	√	12/13= 92%
11	Pourmand et al., 2020	Cross Sectional	√	√	√		X	X	√	√	√	√	√	√	√	11/13= 85%
12	Alsofyani et al., 2020	Cross Sectional	√		X	√	X	X	√	√	√	√	√	√	√	10/13= 77%
13	Ahmed et al., 2024	Cross Sectional	√	√	√		X	X	√	X	√	√	√	√	√	10/13= 77%
14	Alefan et al., 2019	Cross Sectional	√	√	√	√	√	√	X	√	√	√	√	√	√	12/13= 92 %
15	Edward et al., 2024	Cross Sectional	√	√	√	√	√	√	√	√	√	√	√	√	√	13/13= 100%

Data Synthesis

A narrative synthesis approach was employed to integrate findings from the included studies. Data were systematically extracted into summary tables detailing the author, year of publication, study design, measurement instruments, Theory of Planned Behavior constructs, and key findings related to self-care behavior. Studies were included if they explicitly applied the Theory of Planned Behavior or examined determinants conceptually aligned with TPB constructs. The extracted data were coded, verified, and categorized to identify consistent patterns and determinants across studies, particularly attitudes, subjective norms, perceived behavioral control, and intention influencing self-care, lifestyle adherence, and medication adherence among patients with hypertension

RESULTS AND DISCUSSION
Characteristics of included studies

Table 3 Characteristic of included studies

No	Study ID	Study Design	Country	Main Outcomes
1.	(Dong et al., 2024)	Cross Sectional	China	Healthy lifestyle score was significantly associated with better hypertension control in both treated and untreated patients.
2.	(Lee et al., 2022)	Cross Sectional	South Korea	Medication adherence was influenced by age, living arrangement, and depressive symptoms among older adults.
3.	(Adinkrah et al., 2020)	Cross Sectional	United States	Adherence was associated with beliefs about medication, healthcare access, mental health status, and perceived health.
4.	(Zhu & Wang, 2024)	Cross Sectional	United States	Point adherence to healthy diet and physical activity reduced the odds of hypertension by 23%.
5	(Abera et al., 2024)	Cross Sectional	Ethiopia	Dietary adherence was low; knowledge, smoking behavior, and physical inactivity were significant determinants.
6	(Pinto et al., 2024)	Cross Sectional	Portugal	Self-care subscales explained

				variance in adherence; medication-taking adherence was particularly low in rural areas.		et al., 2024)	Sectional		control was strongly correlated with medication adherence, diet, physical activity, and stress management.
7	(Abza et al., 2024)	Cross Sectional	Ethiopia	Self-care adherence was generally low; demographic, clinical, and social support factors significantly influenced adherence.		14	(Alefan et al., 2019)	Cross Sectional	Jordan	Lifestyle adherence was very low; knowledge, beliefs, and gender were significant influencing factors.
8	(Algabbani, 2020)	Cross Sectional	Saudi Arabia	Higher knowledge levels were strongly associated with better medication adherence.		15	(Edward et al., 2024)	Cross Sectional	Tanzania	Lifestyle adherence was low; education, self-efficacy, and patient–provider relationship were key determinants.
9	(Giakoumidakis et al., 2024)	Cross Sectional	Greece	Medication adherence remained low despite adequate knowledge; age and disease duration influenced adherence.						
10	(Guo et al., 2023)	Cross Sectional	China	Education, health literacy, and social support were significant predictors of medication adherence						
11	(Pourmand et al., 2020)	Cross Sectional	Iran	Perceived behavioral control was the strongest predictor of intention and self-care behavior.						
12	(Alsofyani et al., 2022)	Cross Sectional	Saudi Arabia	High adherence was observed; physical activity, non-smoking status, and demographic factors were associated with adherence.						
13	(Ahmed	Cross	Sudan	Blood pressure						

This systematic review synthesized evidence from 15 cross-sectional studies conducted across diverse geographical settings, including China, South Korea, the United States, Ethiopia, Portugal, Saudi Arabia, Greece, Sudan, Jordan, and Tanzania. Despite variations in population characteristics and healthcare systems, the included studies consistently highlighted suboptimal levels of self-care behavior, lifestyle adherence, and medication adherence among patients with hypertension.

Studies from China and the United States (Dong et al., 2024; Zhu & Wang, 2024) demonstrated that healthy lifestyle behaviors particularly dietary quality and physical activity were significantly associated with better blood pressure control and lower odds of uncontrolled hypertension, emphasizing the importance of integrated lifestyle modification. In several African settings, including Ethiopia, Sudan, and Tanzania (Abera et al., 2024; Ahmed et al., 2024; Edward et al., 2024), adherence to dietary and lifestyle recommendations was notably low, often below 35%, with knowledge deficits, limited physical activity, and unhealthy behavioral habits identified as key contributing factors.

Across Asian and European contexts, such as South Korea, Portugal, Greece, and Saudi Arabia (Lee et al., 2022; Pinto et al., 2024; Giakoumidakis et al., 2024; Alsofyani et al., 2022), medication adherence varied substantially, ranging from low to high levels. These studies consistently reported that patient knowledge, health literacy, social support, and psychological

factors including depressive symptoms and self-efficacy were significant determinants of adherence. Older adults living alone or experiencing mental health challenges were particularly vulnerable to poor self-care practices.

Several studies explicitly examined behavioral determinants aligned with theoretical constructs. For example, Pourmand et al. (2020) identified perceived behavioral control as the strongest predictor of self-care behavior, supporting the relevance of the Theory of Planned Behavior in understanding hypertension self-management. Other studies similarly emphasized the roles of beliefs, knowledge, motivation, and perceived support in shaping lifestyle and treatment adherence.

Overall, the evidence indicates that self-care behavior among patients with hypertension is influenced by a complex interplay of sociodemographic, cognitive, psychological, and social factors rather than a single determinant. Although most patients demonstrated awareness of hypertension management, this knowledge did not consistently translate into optimal self-care practices. These findings underscore the need for comprehensive, theory-based strategies that address behavioral determinants to improve long-term self-care and hypertension control.

Discussion

This systematic review examined determinants of self-care behavior among patients with hypertension through the lens of the Theory of Planned Behavior (TPB), synthesizing evidence from 15 cross-sectional studies conducted in diverse global contexts. Overall, the findings indicate that self-care behavior in hypertensive patients remains suboptimal and is shaped by a multifactorial interaction of cognitive, psychosocial, and sociodemographic determinants that closely align with TPB constructs.

Across studies, **perceived behavioral control (PBC)** emerged as the most consistent determinant of self-care behavior. Several articles demonstrated that patients with higher self-efficacy, greater confidence in managing medication, diet, and physical activity, and stronger perceived ability to overcome barriers were significantly more likely to adhere to recommended self-care behaviors (Pourmand et al., 2020; Edward et al., 2024; Pinto et al., 2024). These findings support TPB theory, which posits that individuals are more likely to engage in health behaviors when they perceive greater control over their actions. In elderly populations and rural settings, lower PBC often due to physical limitations, comorbidities, or restricted access to healthcare was associated with poorer adherence, particularly to lifestyle recommendations.

Attitudinal factors, including knowledge, beliefs, and perceived benefits of treatment, were also strongly associated with self-care behavior. Studies conducted in Ethiopia, Sudan, Jordan, and Tanzania consistently reported low levels of dietary and lifestyle adherence, largely attributed to limited knowledge, misconceptions about hypertension, and weak beliefs in the effectiveness of lifestyle modification (Abera et al., 2024; Ahmed et al., 2024; Alefan et al., 2019; Edward et al., 2024). Conversely, studies from Greece, China, and Saudi Arabia found that better hypertension-related knowledge and health literacy were positively correlated with medication adherence and blood pressure control (Giakoumidakis et al., 2024; Guo et al., 2023; Alsofyani et al., 2022). These results indicate that favorable attitudes toward self-care behaviors are essential but insufficient on their own to ensure sustained adherence.

The role of **subjective norms**, reflected through social support, family involvement, and patient–provider relationships, was evident across multiple studies. Social support consistently emerged as a protective factor for medication adherence and lifestyle compliance, particularly among older adults (Guo et al., 2023; Lee et al., 2022). Patients living alone, experiencing depressive symptoms, or lacking family support demonstrated significantly lower adherence levels, highlighting the influence of social expectations and encouragement in shaping health behavior. Strong patient–doctor relationships were also associated with improved adherence, suggesting that healthcare providers play a critical normative role in reinforcing self-care behavior.

Importantly, several studies revealed a **knowledge behavior gap**, where patients demonstrated adequate awareness of hypertension management yet failed to translate this knowledge into consistent self-care practices (Giakoumidakis et al., 2024; Dong et al., 2024). This discrepancy underscores a central premise of TPB: knowledge alone does not guarantee behavior change unless accompanied by positive attitudes, strong perceived control, and supportive social norms. This finding was particularly prominent in large population-based studies, where healthy lifestyle scores were significantly associated with blood pressure control, but adherence remained uneven across demographic groups.

Lifestyle-related self-care behaviors such as diet, physical activity, smoking cessation, and stress management were consistently reported as the weakest components of adherence across settings. Studies from the United States and China emphasized that combined lifestyle behaviors exert a synergistic effect on hypertension control, supporting a multi-behavioral approach rather than isolated recommendations (Zhu & Wang, 2024; Dong et al., 2024). However, cultural, economic, and environmental constraints were frequently cited as barriers, particularly in low- and middle-

income countries, limiting patients' perceived ability to maintain healthy behaviors.

Overall, the findings of this review reinforce the applicability of the Theory of Planned Behavior as a comprehensive framework for understanding self-care behavior in patients with hypertension. The evidence suggests that effective hypertension management strategies should move beyond information dissemination and address psychological readiness, perceived control, and social influences. Future research should incorporate longitudinal and theory-driven designs to further clarify causal pathways between TPB constructs and sustained self-care behavior, as well as to inform the development of context-specific behavioral interventions.Simpulan menyajikan ringkasan dari uraian mengenai hasil dan pembahasan, mengacu pada tujuan penelitian. Berdasarkan kedua hal tersebut dikembangkan pokok-pokok pikiran baru yang merupakan esensi dari temuan penelitian.

CONCLUSSION

This systematic review highlights that self-care behavior among patients with hypertension remains suboptimal and is influenced by a complex interplay of determinants consistent with the Theory of Planned Behavior. Evidence from 15 cross-sectional studies across diverse settings demonstrates that attitude, subjective norms, and perceived behavioral control collectively shape patients' engagement in lifestyle modification and medication adherence.

Positive attitudes, reflected through adequate knowledge and favorable beliefs about hypertension management, were associated with better self-care practices; however, knowledge alone was insufficient to ensure sustained behavior change. Subjective norms, particularly social support from family members and healthcare providers, played a critical role in reinforcing adherence, especially among older adults and socially vulnerable populations. Perceived behavioral control emerged as the most influential determinant, with higher self-efficacy and confidence in managing daily treatment routines strongly associated with improved self-care behavior.

Overall, the findings support the applicability of the Theory of Planned Behavior as a robust framework for understanding self-care behavior in hypertensive patients. Effective hypertension management strategies should therefore move beyond information-based approaches and incorporate interventions that enhance self-efficacy, strengthen social support, and address contextual barriers to behavior change. Future research should employ longitudinal and theory-driven designs to further clarify causal pathways and inform the development of comprehensive, culturally sensitive self-care models for hypertension management.

REFERENCES

Haddaway, N.R. et al. (2022) 'PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis', Campbell Systematic Reviews, 18(2), p. e1230. Available at: https://doi.org/https://doi.org/10.1002/cl2.1230.

Mikkonen, U. et al. (2025) 'The relationship between self-care preparedness and quality of life in a 3-year-follow-up: a study in primary health care.', Family practice, 42(1). Available at: https://doi.org/10.1093/fampra/cmae069.

Abera, B. et al. (2024) 'Dietary adherence and associated factors among hypertensive patients in governmental hospitals of Guji zone, Oromia, Ethiopia', Journal of Health, Population and Nutrition, 43(1), pp. 1–9. Available at: https://doi.org/10.1186/s41043-024-00598-0.

Abza, L.F. et al. (2024) 'Self-care adherence and associated factors among hypertensive patients at Guraghe Zone, 2023', Heliyon, 10(17), p. e36985. Available at: https://doi.org/10.1016/j.heliyon.2024.e36985.

Adinkrah, E. et al. (2020) 'Adherence to hypertension medications and lifestyle recommendations among underserved african american middle-aged and older adults', International Journal of Environmental Research and Public Health, 17(18), pp. 1–15. Available at: https://doi.org/10.3390/ijerph17186538.

Ahmed, A. et al. (2024) 'A cross-sectional analysis on hypertension: Exploring the impact of lifestyle modifications and antihypertensive drug adherence in Sudan', ARYA Atherosclerosis, 20(5), pp. 38–45. Available at: https://doi.org/10.48305/arya.2024.42582.2952.

Alefan, Q. et al. (2019) 'Factors affecting hypertensive patients' compliance with healthy lifestyle', Patient Preference and Adherence, 13, pp. 577–585. Available at: https://doi.org/10.2147/PPA.S198446.

Algabbani, F.A.M. (2020) 'Treatment adherence among patients with hypertension: Findings from a cross-sectional study', Clinical Hypertension, 26(1), pp. 1–9. Available at: https://doi.org/10.1186/s40885-020-00151-1.

Alsofyani, M.A. et al. (2022) 'Factors related to treatment adherence among hypertensive patients: A cross-sectional study in primary healthcare centers in Taif city', Journal of Family and Community Medicine, 29(3), pp. 181–188. Available at: https://doi.org/10.4103/jfcm.jfcm_153_22.\

Dong, T. et al. (2024) 'Association of healthy lifestyle score with control of hypertension among treated and untreated hypertensive patients: a large cross-sectional study', PeerJ, 12(4), pp. 1–17. Available at: https://doi.org/10.7717/peerj.17203.

Edward (2024) 'Adherence to Lifestyle Recommendations among Adults Attending Hypertension Clinics in Selected Hospitals in Tanzania: A Cross-Sectional Study', East African Health Research Journal, 8(1), pp. 25–31. Available at: https://doi.org/10.24248/eahrj.v8i1.748.

Giakoumidakis, K. et al. (2024) 'Patient Knowledge, Medication Adherence, and Influencing Factors: A Cross-Sectional Study among Hypertensive Patients in Greece', Healthcare (Switzerland), 12(9). Available at: https://doi.org/10.3390/healthcare12090916.

Guo, A. et al. (2023) 'Impact of health literacy and social support on medication adherence in patients with hypertension: a cross-sectional community-based study', BMC Cardiovascular Disorders, 23(1), pp. 1–10. Available at: https://doi.org/10.1186/s12872-023-03117-x.

Lee, Sunmin et al. (2022) 'A Study on Types of Medication Adherence in Hypertension among Older Patients and Influencing Factors', Healthcare (Switzerland), 10(11). Available at: https://doi.org/10.3390/healthcare10112322.

Pinto, C. et al. (2024) 'Exploring Lifestyle Factors and Treatment Adherence among Older Adults with Hypertension Attending a Mobile Health Unit (MHU) in a Rural Area of Central Portugal', Nutrients, 16(8), pp. 1–12. Available at: https://doi.org/10.3390/nu16081112.

Pourmand, G. et al. (2020) 'An application of the theory of planned behavior to self-care in patients with hypertension', BMC Public Health, 20(1), pp. 1–8. Available at: https://doi.org/10.1186/s12889-020-09385-y.

Zhu, Y. and Wang, Z. (2024) 'Association between joint physical activity and healthy dietary patterns and hypertension in US adults: cross-sectional NHANES study', BMC Public Health, 24(1), pp. 1–9. Available at: https://doi.org/10.1186/s12889-024-18346-8.

Appendix 1 Summary of included study

No	Tittle/ Author/Year/ Country	Study design	Instrument	Findings	Limitations
1	Association of Healthy Lifestyle Score with Control of Hypertension (Dong et al., 2024, China)	Cross Sectional	*Lifestyle score* based on diet, physical activity, BMI, smoking, alcohol; BP measurement from public health database; logistic regression	Higher healthy lifestyle score *significantly associated with better BP control* in treated and untreated patients	Cross-sectional design; cannot infer causality; lifestyle data self-reported → recall bias
2	Medication Adherence Types among Older Patients with Hypertension (Lee et al., 2022, South Korea)	Cross Sectional	*Latent Profile Analysis* and logistic regression using Korea Health Panel data	Identified two adherence groups (87.1% adherent; 12.9% non-adherent); age, living alone, depressive symptoms influence adherence	Secondary data; possible unmeasured confounders (e.g., healthcare behavior variables)
3	Adherence to Hypertension Medications and Lifestyle Recommendations (Adinkrah et al., 2020, USA)	Cross Sectional	Blood Pressure Self-Care Scale (medication & lifestyle)	Adherence associated with beliefs, healthcare access, mental health, and perceived health	Bivariate analysis only; limited generalizability
4	Joint Physical Activity and Healthy Diet Patterns and Hypertension (Zhu & Wang, 2024, USA)	Cross Sectional	Healthy Eating Index-2015; NHANES physical activity questionnaire	Combined healthy diet and physical activity reduced odds of hypertension by 23%	Cross-sectional NHANES data; self-reported lifestyle
5	Dietary Adherence among Hypertensive Patients in Ethiopia (Abera et al., 2024, Ethiopia)	Cross Sectional	FFQ (diet); WHO STEPS (smoking); FAST; IPAQ-SF	Dietary adherence very low; knowledge, smoking, and inactivity significant determinants	Facility-based study; limited external validity
6	Lifestyle Factors and Treatment Adherence in Rural Portugal (Pinto et al., 2024, Portugal)	Cross Sectional	Self-Care with Hypertension Scale; CAGE questionnaire	Self-care explains adherence variance; medication adherence particularly low	Small rural sample; cross-sectional
7	Self-Care Adherence among Hypertensive Patients (Abza et al., 2024, Ethiopia)	Cross Sectional	Hypertension Self-Care Activity Level Scale (HSCALE)	Self-care adherence low; social support and clinical factors significant	Cross-sectional; self-reported adherence
8	Treatment Adherence among Patients with	Cross Sectional	MMAS-4; hypertension knowledge questionnaire	Higher knowledge strongly associated with better medication adherence	Short adherence scale (MMAS-4); recall bias

No	Tittle/ Author/Year/ Country	Study design	Instrument	Findings	Limitations
	Hypertension (Algabbani, 2020, Saudi Arabia)				
9	Patient Knowledge and Medication Adherence in Hypertension (Giakoumidakis et al., 2024, Greece)	Cross Sectional	Hypertension Knowledge Level Scale (HKLS); sociodemographic questionnaire	Knowledge adequate but adherence low; age and disease duration influential	Small sample; single-country setting
10	Health Literacy, Social Support, and Medication Adherence (Guo et al., 2023, China)	Cross Sectional	MMAS-8; HeLMS; Social Support Rate Scale	Education, health literacy, and social support predict adherence	Community-based self-report; cross-sectional
11	Theory of Planned Behavior and Self-Care in Hypertension (Pourmand et al., 2020, Iran)	Cross Sectional	TPB questionnaire; Health-Promoting Lifestyle Profile	Perceived Behavioral Control strongest predictor of intention and behavior	Self-care behavior very low; cross-sectional SEM
12	Factors Related to Treatment Adherence in Taif City (Alsofyani et al., 2022, Saudi Arabia)	Cross Sectional	MMAS-4 (Arabic version); structured clinical-demographic form	High adherence associated with non-smoking and physical activity	Adherence self-reported; possible social desirability bias
13	Lifestyle Modification and Drug Adherence in Sudan (Ahmed et al., 2024, Sudan)	Cross Sectional	Structured lifestyle & medication adherence questionnaire	BP control strongly correlated with medication adherence and lifestyle	Correlational design; no causal inference
14	Factors Affecting Compliance with Healthy Lifestyle (Alefan et al., 2019, Jordan)	Cross Sectional	Structured lifestyle compliance questionnaire	Lifestyle adherence very low; influenced by knowledge, beliefs, and gender	Self-report; lifestyle not objectively measured
15	Lifestyle Adherence among Hypertensive Patients in Tanzania (Edward et al., 2024, Tanzania)	Cross Sectional	WHO STEPS questionnaire; self-efficacy scale	Only 32.4% adhered to lifestyle recommendations; education and self-efficacy key	Cross-sectional; limited behavioral depth