Adherence to Self-Care Practices and Associated Factors among Patients Diagnosed with Hypertension Visiting the Medical Outpatient Clinic at Kenyatta National Hospital

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Abstract

Background: Self-care practices in hypertension describe proactive behaviours undertaken by patients to manage their condition and prevent complications. These include medication adherence, dietary changes, such as low-sodium intake and adherence to the Dietary Approaches to Stop Hypertension (DASH) diet, regular physical activity, weight control, alcohol moderation, and smoking cessation. This study assessed adherence to self-care practices and associated factors among hypertensive patients attending the medical outpatient clinic at Kenyatta National Hospital (KNH), Kenya's largest national referral hospital.

Methodology: A hospital-based analytical cross-sectional study was conducted among 167 adult patients receiving antihypertensive treatment at KNH. Systematic random sampling was used, where every third eligible patient was selected after the first was chosen via lottery. Data were collected using an interviewer-administered structured questionnaire incorporating the validated Hypertension Self-Care Activity Level Effect (H-SCALE) and Hypertension Evaluation of Lifestyle and Management (HELM) scale. Data analysis was done using SPSS version 26. Descriptive statistics and binary logistic regression were used to determine associations between independent variables and self-care adherence.

Results: The mean age of participants was 43.4 years (SD±6.1). Only 34.7% demonstrated good adherence to self-care practices, while 65.3% had poor adherence. Among individual behaviours, smoking cessation had the highest adherence (92.7%), followed by medication adherence (86.5%) and alcohol moderation (57.8%). Lower adherence was observed for weight management (30.9%), physical activity (27.3%), and low-salt diet (15.1%). Sociodemographic characteristics were not significantly associated with self-care adherence. However, participants with good knowledge of hypertension were significantly more likely to adhere to self-care practices (OR = 3.20, 95% CI: 1.64–6.24, $p = 0.001$), indicating that knowledge is a key independent predictor.

Conclusion and Recommendations: Adherence to self-care among hypertensive patients remains low, especially in dietary salt reduction and physical activity. While sociodemographic factors were not significant, adequate knowledge of hypertension markedly improved self-care adherence. This underscores the importance of structured, culturally sensitive health education in outpatient settings. Programmes should focus on diet and physical activity, use interactive approaches, and involve family support to sustain long-term behavioural change.

Keywords: *Self-care practice, Adherence, Hypertension, Knowledge, Kenya*

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Introduction

Despite the fact that hypertension affects approximately 24% of the Kenyan population [1], poor adherence to self-care practices driven by modifiable factors such as inadequate knowledge, low income, lifestyle habits, and health system limitations continues to undermine effective blood pressure control and management. Self-care, defined by the World Health Organisation as the ability of individuals and communities to promote health, prevent disease, and cope with illness with or without the support of a healthcare provider, plays a central role in managing hypertension and preventing its progression to severe complications [2]. These practices include adherence to antihypertensive medication, dietary modifications, regular physical activity, and moderation of alcohol intake, smoking cessation, and weight control components. These components are evaluated using validated tools such as the Hypertension Self-Care Activity Level Effects (H-SCALE) scale [3].

Globally, hypertension remains a serious public health challenge. It affects over 1.13 billion people, the majority of whom live in low- and middle-income countries where healthcare systems are overstretched and awareness is limited [3]. By the end of 2025, this number is projected to rise to 1.56 billion [2, 4]. In sub-Saharan Africa, the prevalence of hypertension ranges from 6% to 48% depending on the population studied [5]. The World Health Organisation estimates that 46% of adults with hypertension globally are unaware of their condition, while age-standardised data indicates a higher prevalence among women (35%) compared to men (31%) [6]. Between 2017 and March 2020, the prevalence in the United States reached 48.1% among adults aged 18 years and above (Hussen, Adem, Roba, Mengistie, Assefa, 2020).

In Kenya, hypertension prevalence is reported as between 18.4% and 32.6%, with a population-based study in 2020 placing it at 28.6%. The Ministry of reported that only 15% of hypertensive individuals are aware of their diagnosis, just 8% adhere to medication, and a mere 4.6% have their hypertension under control. Alarmingly, over 56% of Kenyans have never undergone blood pressure screening. An investment case by the World Bank further revealed that among individuals previously diagnosed with hypertension, only 22.3% were on medication, while 23.8% of Kenyans were hypertensive and unaware [1,7].

A study at Kenyatta National Hospital (KNH), Kenya's largest referral hospital, documented approximately 1,680 hypertension cases seen annually at the medical outpatient clinic, yet no detailed exploration exists regarding the associated barriers to effective self-care in this setting.

Existing studies in Kenya, such as from Kilifi and MOH report low adherence rates but fail to identify why patients struggle with self-care [8]. For instance, is poor adherence linked to lack of knowledge, cost of medications, cultural beliefs, or clinic accessibility? Understanding these factors is critical to designing targeted interventions. Without understanding these underlying drivers, interventions remain generic and ineffective. Moreover, while multiple studies suggest that variables such as age, income level, education, marital status, and awareness influence adherence behaviours, there is limited empirical research in Kenya that links these sociodemographic factors with hypertension self-care practices [9,10,11]. For example, a 2020 Kenyan study found only 8% medication adherence, but the sociodemographic or knowledge-related predictors were not explored and other national estimates provide prevalence and medication use statistics, but do not analyse the relationship between patient knowledge or socio-economic conditions and adherence outcome [12,13]. This study aimed to assess self-care adherence and identify associated factors among hypertensive patients at Kenyatta

National Hospital, focusing on patient knowledge, socio-demographic characteristics, and lifestyle behaviours.

Methodology

Study design

An analytical cross-sectional study was conducted at the Medical Outpatient Clinic (MOPC) of Kenyatta National Hospital, collecting data from January to March 2024. The clinic manages approximately 1,680 hypertensive cases annually, with dedicated hypertension clinic days held every Wednesday afternoon.

Study population

The study population comprised adults aged 18 to 75 years who had been diagnosed with hypertension, were on antihypertensive medication, and had attended follow-up visits for at least six months in this facility. Patients were excluded if they had co-existing terminal or debilitating conditions that could interfere with participation in self-care, including Stage IV cancer, New York Heart Association (NYHA) Class III or IV heart failure, end-stage renal disease, or advanced diabetes with complications such as neuropathy or retinopathy [13].

Patient exclusion was conducted by a medical officer who was part of the study team and well-versed with the inclusion and exclusion criteria.

During routine clinic visits, the medical officer screened medical records and verified eligibility based on age, diagnosis, medication use and follow-up duration. Patients older than 75 years or not on hypersensitive medications were flagged for exclusion. This approach ensured consistent, accurate selection and enhanced the study's validity and replicability.

Sample size and sampling

Using Fisher's formula the initial sample was 280 considering 95% CI, 5% precision, and 24% prevalence. However, after finite correction (N=420), a total of 167 participants were to be enrolled. Every 3rd patient was applied after the random selection of the first participant.

$$n=\frac{Z^2P(1-P)}{d^2}$$

Where:

n=signified sample size when the population size was greater than 10000

Z=signified the standard normal deviation i.e 1.96 set at a 95% confidence level

P=signified the proportion of population with desired characteristics

1-P=signified the proportion of population without the desired characteristics

d^2=signified the degree of precision

$$= \frac{(1.96^2)(0.24)(1-0.24)}{(1-0.95)^2 = (0.05)^2}$$

$$= \frac{3.8416 \times 0.1824}{0.0025}$$

$$= \frac{0.70070784}{0.0025}$$

$$= 280.283136$$

$$n=280.$$

Since the population was less than 10000, the researcher used the finite correction factor formula to calculate the required study sample size as coined by.

$$nf = n/1 + (n/N)$$

Where:

nf=signified the desired sample when the population was less than 10000

n=signified the desired sample size when the population was greater than 10000

N=signified the study population estimate.

$$nf = 280/1 + (280/420)$$

$$= \frac{280}{1+0.666}$$

$$= \frac{280}{1.666}$$

$$nf = 167.$$

Sampling procedure

Systematic sampling was used to recruit study participants. Since both new and follow-up patients were included and a complete sampling frame was not available, participants were

enrolled consecutively based on their arrival. The first eligible participant was selected through a simple lottery method, after which every third eligible patient was selected. The sampling interval (k = 3) was estimated based on an average patient flow of approximately 140 hypertensive patients per month and a three-month data collection period (N ≈ 420), divided by the target sample size of 167. The respondents selected for the study were all clinically ascertained by a qualified doctor.

Data collection and procedure

Data were collected using a pretested interviewer-administered questionnaire adapted from the validated Hypertension Self-Care Activity Level Effect (H-SCALE) and the Hypertension Evaluation of Lifestyle and Management (HELM) scale [14]. The questionnaire captured socio-demographic characteristics, hypertension self-care behaviour, and patient knowledge. The H-SCALE tool assessed adherence across six self-care domains: medication use, physical activity, low-salt diet, weight management, alcohol moderation, and smoking cessation. The HELM scale consisted of 12 items grouped into three domains: general understanding of hypertension, lifestyle and medication management, and monitoring and treatment goals. Research assistants were trained over two days on the study objectives, interview techniques, ethical considerations, and administration of the questionnaire to ensure consistency and data quality.

To ensure validity, the researcher sought expert judgment from the academic supervisor, one medical officer and one nurse working at Kenyatta National Hospital.

Reliability of the instrument was tested using Cronbach's Alpha to check the internal consistency of the instrument's items and features. A composite Cronbach Alpha of at least 0.7 for all items under consideration is necessary for a study to be considered successful, therefore, a dependability coefficient of 0.7 is regarded as satisfactory. The questionnaire was considered reliable with a scale combination of 0.784.

Data analysis

Data was entered, cleaned, and analysed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarise socio-demographic characteristics and self-care adherence levels. Chi-square tests were used to examine associations between categorical variables, while binary logistic regression was applied to identify significant predictors of self-care adherence at a 95% confidence level ($p < 0.05$).

Hypertension knowledge was assessed using the validated Hypertension Evaluation of Lifestyle and Management (HELM) scale, which includes 12 items across three domains: general hypertension knowledge, lifestyle and medication management, and monitoring and treatment goals. Scores were dichotomised as 'good knowledge' (score ≥ 9) and 'poor knowledge' (score < 9), based on established cut-offs.

Self-care adherence was measured using the Hypertension Self-Care Activity Level Effects (H-SCALE), covering six domains: medication use, weight management, physical activity, alcohol moderation, smoking cessation, and low-salt diet. Adherence was classified as 'good' if a participant reported adherence in four or more domains and 'poor' if in fewer than four, per H-SCALE criteria. Domain-specific adherence was also categorised using standard thresholds from the original H-SCALE tool.

Ethical considerations

This study received ethical approval from the Ethics and Research Committee (ERC) of the University of Nairobi and Kenyatta National Hospital (Ref: P399/04/2023); and a research permit from the National Council for Science, Technology, and Innovation (NACOSTI), Permit No. NACOSTI/P/23/28690.

Administrative authorisation was also granted by the management of Kenyatta National Hospital.

Written informed consent was obtained from each participant prior to data collection. Participation was entirely voluntary and confidentiality was maintained throughout the study by anonymising participant data and restricting access to all information collected.

Results

A total of 175 hypertensive patients were approached between January and March 2004, five did not meet the inclusion criteria while three declined to consent due to personal reasons while 167 met the inclusion criteria and were included in the study representing 100% response rate.

Socio-demographic characteristics

The study included 167 hypertensive patients, mostly middle-aged (47.3%, 39–59 years) and female (52.7%). Most were married (66.5%), urban residents (74.9%), and had at least a college education (50.3%). Over half reported incomes >10,000 KES (56.3%) and a family history of hypertension (56.9%) (Table 1).

Table 1
Socio-Demographic Characteristics of the Study Participants (n =167)

	Variable	Frequency	Percent
Age	19-38 years	46	27.5
	39-59 years	79	47.3
	60+ years	42	25.1
Gender	Male	79	47.3
	Female	88	52.7
Marital status	Single	38	22.8
	Married	111	66.5
	Divorced	8	4.8
	Windowed	10	6.0
Level of education	Uneducated	7	4.2
	Primary education	27	16.2
	Secondary education	49	29.3
	College and above	84	50.3
Employment status	Employed	135	80.8
	Unemployed	32	19.2
Residence	Urban	125	74.9
	Rural	42	25.1
Income	≤10,000	73	43.7
	>10,000	94	56.3
Duration of disease	≤10years	122	73.1
	>10 years	45	26.9
Family history of hypertension	Yes	95	56.9
	No	72	43.1

Table 2
Self-Care Domains and Variation among Participants

Domain	Good adherence	Poor adherence
Alcohol drinking	96(57.6)	42.4(70)
Smoking	152(92.7)	12(7.3)
Medication	134(86.5)	21(13.5)
Physical activity	45(27.3)	120(72.7)
Low-salt diet	25(15.1)	141(84.9)
Weight management	51(30.9)	114(69.1)

Adherence to self-care practices among hypertensive patients

Self-care adherence varied widely across domains (Table 2). While most participants showed strong adherence to smoking cessation (92.7%) and medication use (86.5%), adherence to lifestyle-related practices was considerably lower. Less than one-third of participants adhered to recommended levels of physical activity, weight management, or low-salt diet. Adherence to alcohol moderation was moderate, with slightly over half of the participants meeting the recommended guidelines. These findings highlight a gap between pharmacologic compliance and lifestyle modification, indicating the need for targeted interventions to strengthen non-pharmacological self-care among hypertensive patients.

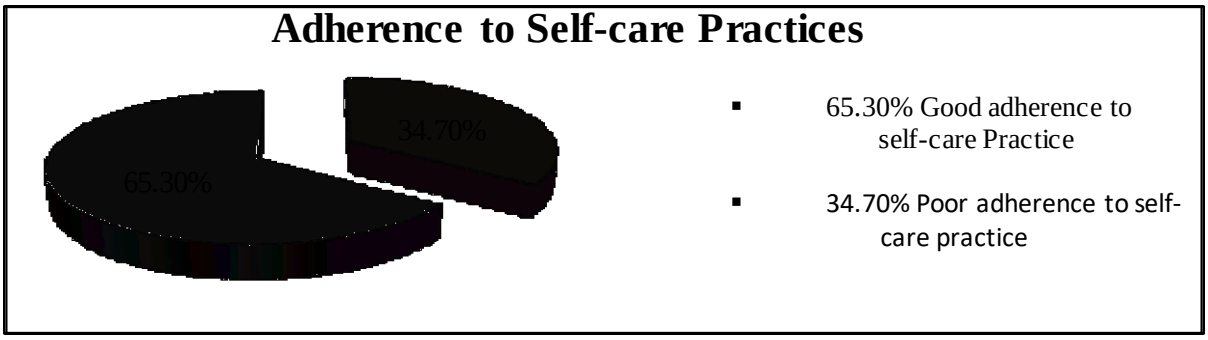

Figure 1
Socio-Demographic Characteristics Associated with Adherence to Self-Care Practice

Table 3
Association between Socio-Demographic Characteristics and Self-Care Practices

	Variable	Adherence to self-care practice(N=167)		Chi-square	df	p-value
		Poor	Good			
Age	19-38	27	18	0.925	2	0.63
	39-59	53	26			
	>60 <75	29	13			
Gender	Male	52	27	0.020	1	0.887
	Female	57	31			
Marital status	Single	40	16	1.41		0.447
	Married	69	42			
Level of education	Uneducated	6	1		3	0.238
	Primary education	18	9			
	Secondary education	36	13			
	College and above	49	35			
Employment status	Employed	91	44	1.142	1	0.348
	Unemployed	18	14			
Residence	Urban	80	43	0.008	1	0.929
	Rural	27	15			
Income	<Kshs 5,000	20	12	0.258	2	0.879
	Kshs 5000-10000	24	12			
	>10,000	62	30			
Years since diagnosis	≤10years	80	42	0.127	1	0.988
	>10 years	29	16			
Family history of hypertension	Yes	62	32	0.008	1	0.927
	No	47	25			

Key: ***Kshs = Kenya shillings

Overall, only 34.7% (n=58) met the threshold for good adherence (>4 domains) [Figure 1]. On adherence to self-care practices, 34.7% (n=58) and 65.3% (n=109) of the study participants had poor and good adherence to self-care practices, respectively (Figure 1). No socio-demographic factors (age, gender, income, education, or residence) were associated with adherence (all $p > 0.05$; Table 3).

Association between knowledge and adherence to self-practice

The findings revealed a statistically significant association between the level of knowledge and adherence to self-care practices among hypertensive patients. Participants with good knowledge were over three times more likely to adhere to recommended self-care behaviours compared to those with poor knowledge (OR = 3.20, 95% CI: 1.64–6.24, p = 0.001). This association remained significant even after adjusting for potential confounding variables such as age, education level, and income (adjusted OR = 3.15, 95% CI: 1.60–6.20, p = 0.001), as shown in Table 4. No participants were excluded from the analysis due to missing data, as all 167 completed questionnaires were fully analysed.

Discussion

This study assessed self-care adherence and its associated factors among hypertensive patients attending the outpatient clinic at Kenyatta National Hospital. Overall, only 34.7% of participants demonstrated good adherence across at least four of the six measured domains of self-care, indicating a significant gap in the behavioural management of hypertension despite a clinical care setting.

this finding is slightly better than that reported in a study from Ethiopia, where only 29% of participants adhered to self-care practices [15]. The variation may be attributed to differences in study population, particularly the higher urban residence rate in this study, which might have facilitated access to healthcare services, information, and follow-up support. Overall, the presence of a structured hypertension clinic in a tertiary hospital setting such as KNH may positively influence adherence.

When examined by domain, the highest adherence was seen in smoking cessation (92.7%) and medication use (86.5%), while the lowest adherence was reported in low-salt diet (15.1%), physical activity (27.3%), and weight management (30.9%). These findings mirror the disparity between pharmacologic and non-pharmacologic self-care observed in previous studies in Kenya and Ethiopia [6, 16]. The high medication adherence recorded in this study is encouraging and aligns with a similar study out of Uganda, which reported a 79.5% adherence; although it surpasses the 69.2% adherence rate found in another Ethiopian study. This may reflect differences in healthcare delivery systems, with KNH offering consistent drug availability, specialist care, and more frequent health education sessions, which are known to enhance adherence.

Despite good medication adherence, the poor adherence to lifestyle-related practices such as physical activity and dietary salt reduction is concerning. The 27.3% adherence to physical activity in this study is substantially lower than the 63.1% reported in Uganda [17]. This difference may be explained by methodological variations.

Table 4
Association between Knowledge and Adherence to Self-Care Practice

Level of Knowledge	Adherence		OR (95% CI)	*p*-value
	Poor n (%)	Good n (%)		
Good knowledge (n = 63)	31 (49.2%)	32 (51.6%)	3.20 (1.64 – 6.24)	0.001
Poor knowledge (n = 104) *(Ref)*	78 (75.0%)	26 (25.0%)	Reference	–

The current study used binary questions (yes/no), while others tend to employ Likert-scale type responses, thus capturing more nuanced behaviour. Moreover, the urban setting of most participants (74.9%) may limit opportunities for physical activity due to a lack of safe open spaces, long work hours, and sedentary lifestyles. In contrast, rural populations often engage in physical activity through farming and manual labour, as noted in prior regional studies.

Similarly, only 15.1% of participants adhered to a low-salt diet, a proportion drastically lower than the 82% reported in an Ethiopian study [18, 19]. This discrepancy may reflect differences in dietary habits, awareness, and socioeconomic status. In Kenya, high salt consumption is often driven by traditional food preparation practices, reliance on processed foods, and limited access to healthier alternatives in urban informal settlements [20]. The American College of Cardiology 2017 guidelines emphasise that dietary salt reduction is essential for controlling blood pressure and minimising cardiovascular risks [21], reinforcing the need for dietary education in hypertension management programs.

Additionally, 57.6% of participants adhered to alcohol moderation, and 30.9% practised weight control, indicating moderate adherence in these areas. These behaviours may be influenced by individual awareness, cultural norms, and family support, although further qualitative studies are needed to explore these dimensions. A key finding in this study was the statistically significant association between hypertension knowledge and adherence to self-care. Participants with good knowledge were over three times more likely to adhere to self-care recommendations than those with poor knowledge (OR = 3.20, 95% CI: 1.64–6.24, p = 0.001). This association remained strong even after adjusting for confounding variables such as age, education, and income. Similar findings have been reported in Ethiopia, where patients with a good understanding of their condition, treatment, and potential complications were four times more likely to engage in self-care practices [22]. However, it is concerning that only 37.3% of respondents in this study had good knowledge of hypertension, despite receiving care at a national referral facility.

Interestingly, none of the assessed sociodemographic factors, such as age, gender, income level, education, or residence, were significantly associated with adherence to self-care practices. While some studies have reported associations between these factors and adherence, the findings in this study suggest that personal knowledge and behaviour change may have a stronger influence than structural or demographic characteristics. This implies that interventions focusing solely on population characteristics may be less effective than those that enhance patient understanding and empowerment.

Study Limitations

The reliance on self-reported data introduces the possibility of recall bias and social desirability bias, which may overestimate adherence levels. Although efforts were made to train research assistants and ensure consistency in data collection, there may have been unintentional interviewer influence or misinterpretation. Additionally, as the study was conducted in a tertiary urban facility (KNH), where patients are more likely to access information and specialist care, the results may not be generalisable to patients in rural or lower-tier health facilities.

Conclusions

Overall adherence to hypertension self-care practices remains suboptimal, particularly in non-pharmacologic domains such as physical activity, low-salt diet, and weight control. Despite most patients adhering to medication and smoking cessation, these alone are insufficient to ensure effective long-term blood pressure

control. The findings point to the important role of patient knowledge in promoting adherence, with good knowledge significantly improving the likelihood of engaging in recommended self-care behaviours.

There remains a critical need for culturally sensitive and accessible patient education on hypertension. The findings highlight the importance of integrating structured hypertension education into routine healthcare delivery, with emphasis on salt reduction, regular physical activity, and weight management. Existing literature suggests that digital platforms, community health volunteers, and peer-led initiatives serve as effective avenues for improving hypertension awareness and promoting sustained lifestyle change. Integrating such strategies into the routine care is necessary in addressing persistent educational gaps. This is relevant to the urban Kenyan settings where modifiable risk factors are on the rise and hypertension-related complications are increasingly common.

Recommendations

Structured health education programs should be prioritised within outpatient services, with targeted emphasis on improving awareness of diet and physical activity in blood pressure control. Additionally, the public health facilities, including Kenyatta National Hospital, should strengthen their efforts in providing targeted education programs to patients and family members on hypertension, management and complications to promote a better understanding and adherence to management. Education sessions should be interactive and culturally tailored, and supported by family-centred interventions to reinforce long-term adherence to self-care practices.

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