

Factors associated with hypertension among adult patients attending the outpatient department at Apac General Hospital in Apac district. Cross-sectional study.

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Abstract

Background:

Hypertension is a major public health problem worldwide and a leading risk factor for cardiovascular diseases such as stroke, heart failure, and kidney disease. This study, therefore, assessed the factors associated with hypertension among adult patients attending the outpatient department at Apac General Hospital in Apac District.

Methodology:

A descriptive cross-sectional study design employing quantitative methods was used. The study was conducted at Apac General Hospital among hypertensive patients attending the outpatient department. Data were collected using a structured questionnaire. Collected data were edited, coded, and analyzed using the Statistical Package for the Social Sciences (SPSS), and results were presented in tables, charts, and percentages.

Results:

Most respondents were female (56.6%) and had a primary education (45.7%). Behavioral factors associated with hypertension included lack of physical activity (54%), alcohol consumption (56.5%), smoking (41.3%), and high salt intake (60.9%). Medical-related factors included family history of hypertension (65.2%), older age (50–64 years: 47.8%), and overweight status (47.8%). Health facility-related factors included unaffordability of antihypertensive drugs (52.2%), poor adherence to prescriptions (69.6%), inadequate counseling (54.3%), and infrequent clinic visits.

Conclusion:

Hypertension among adults attending Apac General Hospital is influenced by behavioral, medical, and health facility-related factors, which contribute to poor blood pressure control.

Recommendations:

The Ministry of Health and local health authorities should strengthen community health education on lifestyle modification, improve access to affordable antihypertensive drugs, and enhance counseling and follow-up services to improve hypertension prevention and management.

Keywords: Hypertension, Outpatient Department, high salt intake, antihypertensive drugs, Apac General Hospital.

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Background.

Hypertension is defined as a sustained elevation of systolic blood pressure (≥ 140 mmHg) and/or diastolic blood pressure (≥ 90 mmHg), measured on at least two different occasions (WHO, 2021). It is a major modifiable risk factor for cardiovascular diseases such as stroke, heart failure, ischemic heart disease, and chronic kidney disease (Mills et al., 2020).

Hypertension is often referred to as a “silent killer” because most patients are diagnosed incidentally, either during hospital admission for unrelated illnesses or through pre-employment and preoperative medical checkups. (Asresahegn et al., 2017).. It is among the leading causes of death globally, significantly increasing the risk of stroke, heart disease, kidney failure, and other complications.

Raised blood pressure alone is estimated to cause 7.5 million deaths annually, accounting for 12.8% of all global deaths. (Awoke et al., 2016).

Worldwide, nearly 1.28 billion adults aged 30–79 years live with hypertension, two-thirds of whom are in low- and middle-income countries, making it a major contributor to non-communicable diseases and a leading cause of premature mortality and morbidity (WHO, 2021). Hypertension caused approximately 10.8 million deaths in 2019, nearly 20% of all global deaths, yet despite effective treatments, awareness, treatment, and control rates remain unacceptably low, especially in low- and middle-income countries (Zhou et al., 2021).

In Africa, hypertension prevalence has been rising rapidly due to urbanization, lifestyle changes, dietary transitions,

and population aging. (Noriega de la Colina et al., 2022), with a study in Nigeria reporting that about 30% of adults are hypertensive, and urban populations are more affected due to dietary patterns, sedentary lifestyles, and increased stress (Adeke et al., 2024).

Sub-Saharan Africa (SSA) is experiencing a growing public health challenge, with hypertension emerging as a major problem and urbanization contributing to its rise, and recent estimates suggest that nearly half of adults may be affected. (Olack et al., 2016). A study published in *The Lancet* in 2023 provided pooled estimates of high blood pressure prevalence and mean levels in adolescents aged 10–19 years across sub-Saharan Africa. (Chen et al., 2023). In East Africa, hypertension affects 23–30% of adults, with Uganda reporting a growing burden where 26.4% have elevated blood pressure, only 7.7% are on treatment, and less than 4% have controlled blood pressure. (Guwatudde et al., 2016), while in Kenya, about one in three adults aged 35 and above is hypertensive (Olack et al., 2016).

Uganda's health sector faces challenges in addressing hypertension due to competing priorities and a focus on infectious diseases, with a nationwide survey reporting that approximately 27% of adults have hypertension, yet awareness, treatment, and control remain low. (Majumdar et al., 2022). In the Apac District, like many rural settings, facility-level data on hypertension prevalence and associated factors remain scarce. Therefore, because of the generally limited information in the study setting to explain the high burden and poor control of hypertension, the need for further studies has become imperative. The study, therefore, aims to determine the factors associated with hypertension among adult patients attending the outpatient department at Apac General Hospital in Apac District.

Methodology.

Study Design.

This study adopted a cross-sectional descriptive design employing quantitative data collection techniques. This approach was selected because it enables numerical analysis of responses as percentages, with all information collected at a single point in time.

Study setting.

The study took place at Apac General Hospital, located in Apac Municipality, Apac District, in northern Uganda. The district lies at coordinates 01°59'N 32°32'E (1.983°N, 32.533°E), north of Lake Kyoga, and shares borders with Oyam, Kole, Kwanja, Dokolo, Amolatar, Nakasongola, and Kiryandongo districts.

The district headquarters are in Apac Municipality, approximately 250 km north of Kampala, Uganda's capital. Apac General Hospital provides a range of services, including Obstetrics and Gynecology, Surgery, Pediatrics and Child Health, Internal Medicine, and Outpatient

Department (OPD) services, and operates 24 hours a day, seven days a week.

The OPD serves as the main entry point for patients and offers services such as registration, triage, consultation, diagnosis, treatment, and referrals. It is staffed by medical officers, clinical officers, nurses, laboratory technicians, pharmacists, and records assistants and cleaners who ensure smooth patient care and hygiene within the department.

Study population.

The study population consisted of all hypertensive patients attending the OPD during the study period.

Sample size determination

In this study, the sample size was calculated using a formula that was originally developed by

$$\text{Yamane (1967)} \quad n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{52}{1 + 52(0.05)^2}$$

$$n = \frac{52}{1.13} = 46.0 \cong 46$$

$$n = 46$$

Where;

n- The sample size

N- Average monthly number of hypertensive patients attending OPD

e- The acceptable sampling error

(95% confidence level and e = 0.05 are assumed)

Therefore, the study population consisted of 46 participants, which was considered adequate to ensure reliable data representation and meet the minimum requirements for research sample size as guided by the Uganda Health Professionals Assessment Board (UHPAB).

Sampling method and procedure

The study employed a purposive sampling technique. Participants were deliberately selected based on their relevance to the study objectives and their availability during the data collection period. Specifically, adults attending the outpatient department who had been diagnosed with or were receiving treatment for hypertension were identified and invited to participate. This approach ensured that only respondents with adequate knowledge and experience related to hypertension were included. Data collection continued until the target sample size of 46 participants was achieved.

Inclusion Criteria:

Adult patients aged 18 years and above attending the Outpatient Department (OPD) at Apac General Hospital. Individuals who had been diagnosed with hypertension or were receiving antihypertensive treatment at the time of data collection.

Participants who provided informed consent and were willing to respond to the study questionnaire.

Exclusion Criteria:

Patients below 18 years of age.

Adults attending the OPD for conditions unrelated to hypertension.

Patients who were critically ill or unable to communicate effectively at the time of data collection.

Individuals who declined to consent or withdrew from participation during the study period.

Study variables.

Independent variables

The independent variable is the input variable that causes a change in a particular outcome.

These were behavioral, medical-related, and health care-related factors.

Dependent variable

The dependent variable is a variable that results from the manipulation of the independent variable.

This was hypertension among adults.

Research instruments

A questionnaire was employed to collect data on factors associated with hypertension among adults attending the outpatient department at Apac General Hospital in Apac District. The questionnaire was organized into five parts: Part A – Introduction, Part B- Socio-demographic characteristics, Part C – behavioral factors, Part D medical-related factors, and Part E – health facility-related factors.

Data collection procedure

The proposal was presented to the Florence Nightingale School of Nursing and Midwifery IRC for approval. The principal gave the researcher an introductory letter to seek permission from the Research Committee of Apac General Hospital. Data collection was done using a researcher-administered approach, which involved the researcher asking respondents questions one by one as laid out in the questionnaire while recording their responses. This was done over a period of five days, with nine (9) respondents interviewed on each data collection day, except on the last day, which will be ten (10) participants.

Data management and analysis

Data management

The data collected in raw form were edited, coded, and reviewed daily to ensure accuracy, consistency, and completeness, with this process carried out immediately after the respondent completed the questionnaire. The questionnaires were securely stored under lock and key, accessible only to the researcher, and will be destroyed three

years after the report submission. Analyzed data stored on flash disks and computers was protected using personal passwords.

Data analysis

During the study, the collected data were cleaned by filling in any missing information from respondents, compiling the data, and assigning appropriate codes to organize the responses. The compiled data were then analyzed using the Statistical Package for the Social Sciences (SPSS) and presented in the form of graphs, charts, and tables.

Validity

To ensure validity, the researcher submitted the questionnaire to the research supervisor, who evaluated each item for its relevance in achieving the study objectives. Any inappropriate or irrelevant questions were replaced with items better suited to meet the study objectives.

Reliability

To ensure reliability, the researcher used a standardized questionnaire and pre-tested it among hypertensive patients attending OPD at Aduku H/C IV. The pilot study involved 5 respondents to assess how participants understand and interpret the questions in the data collection tool.

Ethical Considerations

A letter of introduction was obtained from Florence Nightingale School of Nursing and Midwifery to introduce the researcher to the District Health Officer (DHO) of Apac District and request permission to conduct the study. Once permission was granted, DHO introduced the researcher to the person in charge of Apac General Hospital, who then introduced the researcher to the respondents. Respondents were assured of strict confidentiality, and only numbers, rather than names, were used to identify them. The study commenced only after the objectives were clearly explained to the participants and they had given their consent to participate.

Limitation of the Study

The study employed a cross-sectional design, which allowed for the collection of data at a single point in time but inherently limits the ability to infer causality or generalize findings to the entire population.

Social desirability bias arose, with participants potentially providing responses they believed were expected rather than the truth.

RESULTS.

Socio-demographic characteristics of the respondents.

Table 1: showing Socio-demographic characteristics of the respondents (n=46)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	20	43.4
	Female	26	56.6
Education level	Primary	21	45.7
	Secondary	10	21.8
	Post-secondary	9	19.5
	None	6	13
Marital status	Married	15	32.6
	Not married	31	67.4
Next of kin	Husband	10	21.8
	Wife	5	10.8
	Mother	20	43.4
	Others	11	24
Source of income	Salary	13	28.3
	Farming	22	47.8
	Business	7	15.2
	Others	4	8.7

Table 1 shows that most of the respondents were female, 26(56.6%), while the least were males, 20(43.4%). In terms of education level, the majority had primary education, 21(45.7%), whereas the fewest had no formal education, 6(13%). Most respondents were not married, 31(67.4%),

while the least were married, 15(32.6%). Regarding next of kin, the majority mentioned their mother, 20(43.4%), while the least indicated wife, 5(10.8%). The main source of income for most respondents was farming, 22(47.8%), while the least depended on other sources, 4(8.7%).

Behavioral factors associated with hypertension among the respondents.

Figure 1: showing engagement in physical activity by the respondents (n=46)

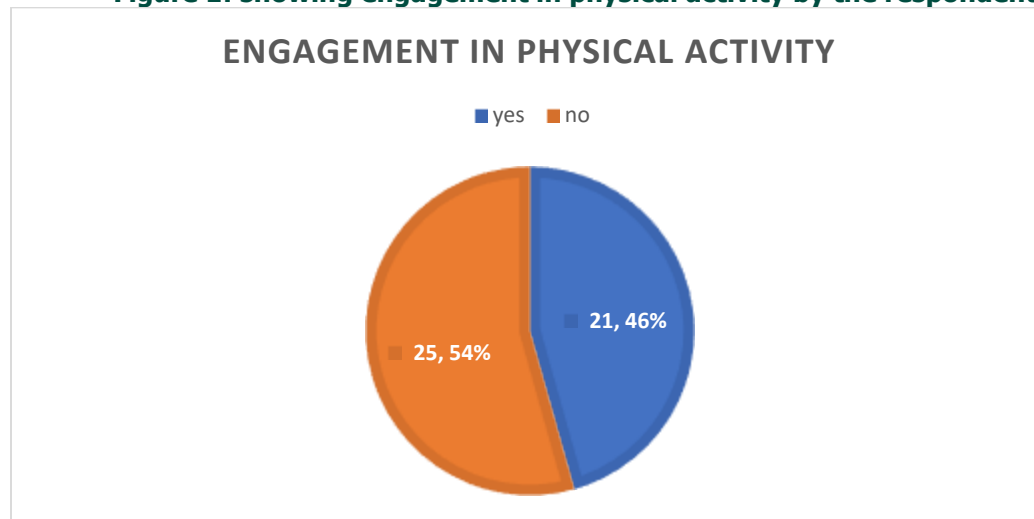


Figure 1 shows that most of the respondents did not engage in physical activity, 25(54%), while the least participated in physical activity, 21(46%).

Table 2: showing behavioral factors associated with hypertension among the respondents (n=46)

Variable	Category	Frequency (f)	Percentage (%)
Extra salt added to food	Yes	28	60.9

Consumption of fruits and vegetables	No	18	39.1
	Never	4	8.7
	1-3 days a week	22	47.8
	4-7 days a week	17	37
Alcohol consumption	Daily	3	6.5
	Yes	26	56.5
Smoking	No	20	43.5
	Yes	19	41.3
	No	27	58.7

Table 2 shows that most of the respondents reported adding extra salt to their food, 28(60.9%), while the least did not add extra salt, 18(39.1%). Nearly half consumed fruits and vegetables 1–3 days a week 22(47.8%), whereas the fewest consumed them daily 3(6.5%). More than half reported

alcohol consumption, 26(56.5%), while the least did not consume alcohol, 20(43.5%). Regarding smoking, the majority did not smoke 27(58.7%), whereas the minority smoked 19(41.3%).

Medical-related factors associated with hypertension among the respondents

Table 3: showing medical-related factors associated with hypertension among the respondents (n=46)

Variable	Category	Frequency (f)	Percentage (%)
Family history of hypertension	Yes	30	65.2
	No	16	34.8
Age	18-34	5	10.9
	35-49	10	21.7
	50-64	22	47.8
	65 years and above	9	19.6
Ever been diagnosed with diabetes?	Yes	17	37
	No	29	63
Regularly check BP	Yes	15	32.6
	No	31	67.4

Table 3 shows that most of the respondents reported having a family history of hypertension, 30(65.2%), while the least had no family history, 16(34.8%). The majority were aged 50–64 years, 22(47.8%), whereas the fewest were aged 18–34 years, 5(10.9%). Most had not been diagnosed with

diabetes, 29(63%), while the least had been diagnosed 17(37%). Regarding blood pressure monitoring, most respondents did not check their BP regularly, 31(67.4%), while the fewest did 15(32.6%).

Figure 2: showing body mass index of the respondents (BMI) (n=46)

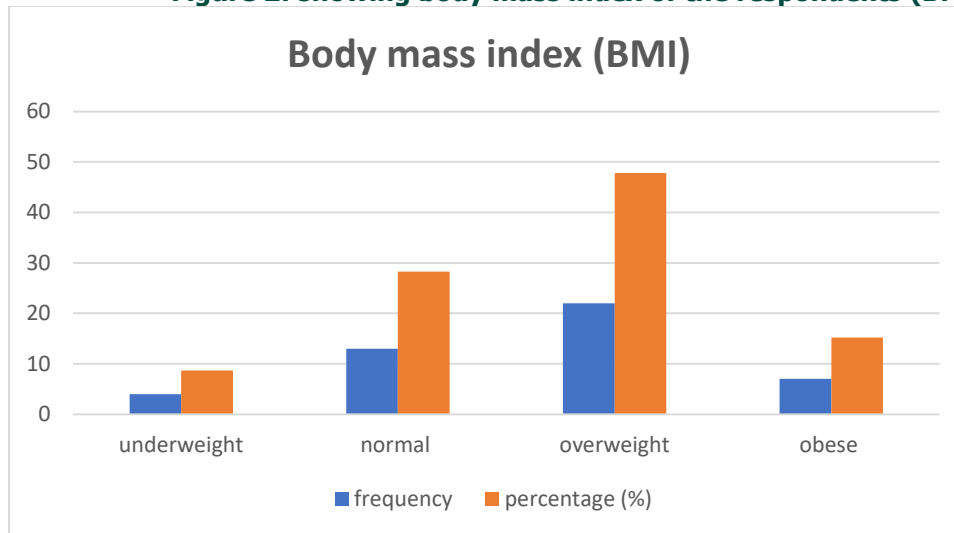


Figure 2 shows that most of the respondents were overweight, 22(47.8%), while the least were underweighted 4(8.7%).

Health facility-related factors associated with hypertension among the respondents

Table 4: showing health facility-related factors associated with hypertension (n=46)

Variable	Category	Frequency (f)	Percentage (%)
Affordability of anti-hypertensive drugs	Yes	22	47.8
	No	24	52.2
Visits to health care for a hypertensive checkup	Never	10	21.8
	Once a year	22	47.8
	2-3 times a year	8	17.4
	4 or more times	6	13
Follow the prescription by the health care provider	Yes	14	30.4
	No	32	69.6
Adequate counselling sessions on hypertension	Yes	21	45.7
	No	25	54.3

Table 4 shows that most of the respondents reported that anti-hypertensive drugs were not affordable, 24(52.2%), while the least said they were affordable, 22(47.8%). Nearly half visited a health facility once a year for a hypertensive checkup, 22(47.8%), whereas the fewest visited four or more times, 6(13%). The majority did not follow

prescriptions given by health care providers, 32(69.6%), while the least 14(30.4%) followed them. Most respondents stated that they did not receive adequate counselling sessions on hypertension, 25(54.3%), while fewer said they did, 21(45.7%).

Figure 3: showing distance of facility from home (n=46)

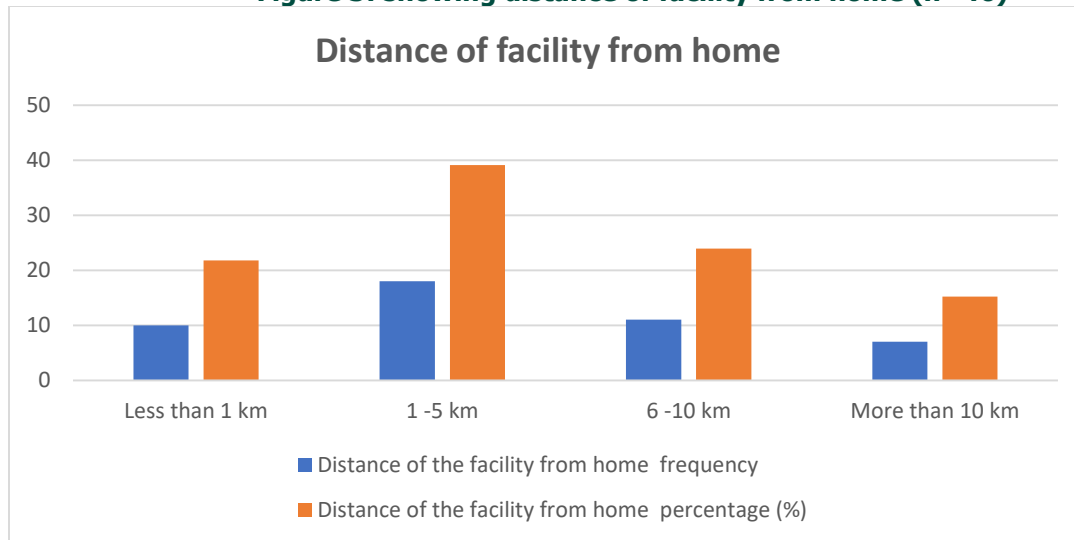


Figure 3 shows that most of the respondents lived 1–5 km from the health facility 18(39.1%), while the least lived more than 10 km away 7(15.2%).

Discussion

Socio-demographic characteristics

About half of the respondents were female, showing that women were slightly more affected by hypertension. This could be due to hormonal changes, stress from household responsibilities, and less physical activity compared to men. Nearly half had primary education, meaning many had limited knowledge about healthy diets, regular exercise, and blood pressure control. Low education levels often make it difficult for people to understand medical advice or recognize the long-term risks of hypertension.

Around two-thirds were not married, suggesting that lack of emotional and social support may contribute to poor stress management and unhealthy habits such as drinking or irregular clinic attendance, all of which can raise blood pressure.

Behavioral factors associated with hypertension

More than half of the respondents reported alcohol consumption, while slightly less than half did not. Alcohol can raise blood pressure by increasing sympathetic nervous system activity, altering vascular tone, and contributing to weight gain, all of which strain the cardiovascular system and increase the risk of hypertension. A similar finding was reported by Asemu et al. (2021) in Addis Ababa, where alcohol use, high blood sugar, and family history were linked to hypertension. Awoke et al. (2016) in Gondar also found that harmful alcohol use, smoking, and high salt intake significantly increased blood pressure, supporting the

role of lifestyle behaviors as major contributors to hypertension among adults attending outpatient services. Most of the respondents did not engage in physical activity (54%), while slightly less than half did some exercise. Lack of physical activity can increase the risk of high blood pressure because it may lead to weight gain and weaken the heart and blood vessels over time. A similar finding was reported in the United States, where inactive adults had a higher risk of hypertension (Benjamin et al., 2018). Supporting this, Olack et al. (2016) in Kenya found that adults with only moderate activity were more likely to have high blood pressure than those who exercised more. Encouraging regular exercise can help prevent and control hypertension and improve overall heart health.

Medical-related factors associated with hypertension

Most of the respondents reported having a family history of hypertension (65.2%), while about a third had no family history. Family history increases the risk of hypertension because genetic factors can affect how the body regulates blood pressure, including salt sensitivity, vascular tone, and kidney function. A similar finding was reported by Asresahegn et al. (2017) in Ethiopia, showing that individuals with a family history were nearly six times more likely to develop hypertension compared to those without. Individuals with a family history should be prioritized for regular blood pressure screening and lifestyle interventions to prevent or manage hypertension early.

Most of the respondents had not been diagnosed with diabetes (63%), while a smaller proportion had the condition. Diabetes can increase the risk of hypertension because high blood sugar can damage blood vessels, reduce their elasticity, and affect how the body regulates blood pressure. A similar finding was reported in a population-

based study in India by Siasos et al. (2018), which showed that adults with diabetes and other cardiovascular conditions were more likely to have uncontrolled hypertension. Early screening and management of diabetes alongside hypertension is essential to prevent complications and improve overall health outcomes.

Health facility-related factors associated with hypertension

Most of the respondents reported that anti-hypertensive drugs were not affordable (52.2%), while slightly less than half said they were affordable. Limited affordability can lead to irregular or skipped medication, resulting in poor blood pressure control and increased risk of complications. A similar finding was reported by Noreen (2023) in Pakistan, where drug unaffordability, long waiting times, and inadequate counseling were linked to ineffective hypertension management. Ensuring access to affordable medications and improving healthcare support is crucial for better blood pressure control and the prevention of hypertension-related complications.

Nearly half of the respondents visited a health facility once a year for hypertensive checkups (47.8%), while only a few visited four or more times (13%). Infrequent follow-ups can lead to poor blood pressure monitoring and delayed adjustments in treatment, increasing the risk of uncontrolled hypertension. A similar finding was reported by Habtegiorgis et al. (2024) in Southern Ethiopia, where infrequent clinic visits, medication stock-outs, and long distances were linked to uncontrolled blood pressure. Encouraging regular follow-ups and improving access to care are essential for effective hypertension management.

Conclusion

The study found that behavioral factors significantly influence hypertension. Many respondents did not engage in regular physical activity, frequently added extra salt to their meals, and over half reported alcohol consumption. These behaviors increase blood pressure and highlight the need for health education and lifestyle modification programs.

Medical factors such as family history, older age, overweight, and diabetes contribute to hypertension, highlighting the need for early screening, regular blood pressure monitoring, and integrated management of related conditions.

Health facility-related barriers, including the unaffordability of anti-hypertensive drugs, inadequate counseling, poor adherence to prescriptions, and infrequent clinic visits, limit effective hypertension management.

Recommendations

The Ministry of Health (MoH) should strengthen policies and programs that promote lifestyle modification, including regular physical activity, healthy diets, and reduction of alcohol and salt consumption.

The hospital should improve patient counseling on hypertension management, adherence to medications, and the importance of regular blood pressure monitoring. Hospitals should also implement strategies to reduce waiting times and enhance the overall quality of care.

The community should engage in awareness campaigns and peer-support initiatives to encourage healthy behaviors, regular exercise, proper diet, and routine blood pressure checks. Community leaders can also help address misconceptions about hypertension and its management.

The District Health Office (DHO) should organize outreach programs and mobile clinics, particularly in rural areas, to increase access to hypertension screening and treatment services. The DHO should also support training of health workers on patient education and follow-up for hypertensive patients.

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List of abbreviations.

BP – Blood Pressure

BMI – Body Mass Index

OPD – Outpatient Department

MoH – Ministry of Health

DHO – District Health Office

UHPAB – Uganda Health Professionals Assessment Board

SPSS – Statistical Package for the Social Sciences

WHO – World Health Organization

SSA – Sub-Saharan Africa

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Conflict of interest.

There is no conflict of interest.

Availability of data.

Data used in this study are available upon request from the corresponding author.

Author's contribution.

MA designed the study, conducted data collection, cleaned and analyzed data, and drafted the manuscript.

DO supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

DO supervised all the research process.

TMO supervised the research process.

LO supervised the research process.

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