WOLKITE UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE DEPARTMENT OF INTERNAL MEDICINE

ADHERENCE TO ANTIHYPERTENSIVE MEDICATIONS AND ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS ON FOLLOW UP AT GURAGHE ZONE HOSPITALS,CENTRAL ETHIOPIA NOV-DEC,2025

BY Dr.DANIEL FUJAGA (POST GRADUATE)

A THESIS TO BE SUBMITTED TO WOLKITE UNIVRSITY DEPARTMENT OF INTERNAL MEDICINE, COLLEGE OF MEDICINE AND HEALTH SCIENCE FOR PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE SPECIALITY DEGREE IN INTERNAL MEDICINE

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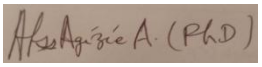
APPROVAL SHEET

We hereby certify that we have read and evaluated this Thesis titled "Adherence to Antihypertensive medications and associated factors among hypertensive patients on follow up at Guraghe Zone Hospitals, Central Ethiopia, Nov-Dec, 2025**"** prepared under our guidance by **Dr. Daniel Fujaga**. We recommend that the Thesis shall be submitted as fulfilling the requirements for the award of **Certificate of Specialty in Internal Medicine.**

Dr. Agize Asfaw (PhD)  09/02/2026

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As members of the Board of Examiners of the Certificate of Specialty in Internal Medicine thesis open defence examination, we have read and evaluated this thesis prepared by **Dr. Daniel Fujaga,** and examined the candidate. We hereby certify that, the thesis is accepted for fulfilling the requirements for the award of the **Certificate of Specialty in Internal Medicine.**

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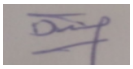
4. Dean, SGS	Signature	Date

DECLARATION

By my signature below, I declare and affirm that this thesis entitled "Adherence to Antihypertensive medications and associated factors among hypertensive patients on follow up at Guraghe Zone Hospitals, Central Ethiopia, Nov-Dec, 2025" is my own work and I declare that this thesis has not been submitted to any other university anywhere for the award of any academic degree and I have cited and referenced all sources and material used in this document.

Dr. Daniel Fujaga (MD, final year resident)

Signature: 

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Contents

ABBREVIATIONS AND ACRONYMS

BP Blood Pressure

CVD Cardiovascular Disease

CI Confidence Interval

ETB Ethiopian Birr

ECS European Society of Cardiology

HTN Hypertension

HCP Health Care Professional

NCD Non Communicable Disease

USA United States of America

WHO World Health Organization

SPSS Statistical Package for Social Science

ABSTRACT

Background: Optimal blood pressure control depends largely on patients' adherence to prescribed antihypertensive medications. However, medication non-adherence continues to be a major challenge. In Ethiopia, although several studies have examined antihypertensive medication adherence, findings on associated factors vary, and evidence from Guraghe Zone hospitals is lacking.

Method: A health institution-based cross-sectional study was conducted from November-1 to December-30, 2025 in three selected Hospitals of Guraghe Zone. A simple random sampling technique was used to select hospitals and study subjects were proportionally allocated. A total of 368 adult hypertensive patients on follow-up who visit during the study period were consecutively enrolled until the required sample attained. Medication adherence was assessed using the eight-item Morisky Medication Adherence Scale (MMAS-8). Data was entered into Epi Data version 4.7 and exported to SPSS version 23 software for further analysis. Bivariate and multivariable logistic regression analysis was done at a 95% confidence interval (CI). A variable with a P-value <0.05 was declared as statistically significant.

Results: The overall adherence rate to antihypertensive medication was 61.1% (95% CI 56.14-66.14%). Factors found to be significantly associated with antihypertensive medication adherence were urban residence (AOR = 2.39; 95% CI: 1.27–4.51),level of education who are able to read and write (AOR = 2.80; 95% CI: 1.04–7.55), uncontrolled blood pressure status (AOR = 0.16; 95% CI: 0.09–0.29),health insurance coverage use(AOR = 2.43; 95% CI: 1.37–4.33) and duration of antihypertensive treatment for less than five years (AOR = 0.31; 95% CI: 0.10–0.94).

Conclusion: Adherence to antihypertensive medication was found to be suboptimal. This study identified place of residence, educational level, blood pressure control status, use of health insurance coverage and duration of hypertension treatment as independent predictors of medication adherence. Therefore targeted counseling more focusing on first years of therapy and strengthening health insurance coverage is recommended.

Key words: Medication adherence, Blood pressure control, Guraghe Zone Hospital, Ethiopia

1. INTRODUCTION

1.1 Background

Non-communicable diseases (NCDs) have emerged as a pressing global health challenge, imposing a significant burden of morbidity and mortality(1). NCDs are the leading cause of death globally, claiming 41 million lives annually, which accounts for 71% of all global fatalities(2).

Hypertension (HTN) is the strongest or one of the strongest risk factors for almost all different cardiovascular diseases acquired during life, including coronary disease, left ventricular hypertrophy and valvular heart diseases, cardiac arrhythmias including atrial fibrillation, cerebral stroke and renal failure(3).

Complications of HTN accounts for 9.4 million deaths worldwide every year and it is responsible for at least 45% of deaths due to heart disease and 51% of deaths due to stroke(4).

The prevalence of hypertension in Ethiopia is reported as 16% (22% urban versus 13% rural (5). Uncontrolled blood pressure (BP) has been higher in Sub Saharan Africa (SSA) than in Western countries in recent decades, meaning that three-quarters of hypertensive patients live with uncontrolled hypertension (HTN)(6).A systematic review and meta-analysis of institutional-based observation studies in Ethiopia revealed that the pooled prevalence of uncontrolled BP was 48%(7).

Anti HTN medication adherence level refers to the extent to which an individual patient takes their prescribed antihypertensive medications as directed by their health care provider in terms of the correct dose, timing and frequency over a given period. Taking antihypertensive medications properly is a central point in the management of HTN. Effective antihypertensive treatment should be maintained indefinitely to reduce the relative risk of stroke and other cardiovascular disease events (8). However, due to the asymptomatic nature of the disease and indefinite treatment duration, medication adherence remains a significant challenge among these patients. Therefore, adherence to antihypertensive medication therapy is the main predictor of treatment success and an effective step in controlling BP and preventing complications (9).

1.2 Statement of problem

High blood pressure is one of the most important risk factors for ischemic heart disease, stroke, other cardiovascular diseases (CVDs), chronic kidney disease and dementia (10). Elevated blood pressure is a leading preventable cause of CVD mortality and disease burden, globally and in most regions of the world (11).

Despite the evidences of the availability of effective treatment for HTN, its management remains suboptimal. Medication adherence is the most crucial factor for blood pressure control (12). Only the availability of effective antihypertensive medications does not bring a good outcome in controlling BP, rather than adhering to their medication(13).

The World Health Organization (WHO) identifies poor adherence as the most significant cause of uncontrolled BP and estimates that 50–70% of people do not take their antihypertensive medication as prescribed(14).Furthermore Poor adherence is a global public health concern with substantial health and cost implications worldwide. It is responsible for 125,000 deaths and $US100 billion annually cost in USA (15).

It is also responsible for unnecessary over prescription of drugs, substantial worsening of diseases, increases in avoidable hospital admission rates and longer hospital stays which all leading to a significant medical burden such as reduced optimal clinical benefit and increased risk of cardiovascular events(9).

Globally the proportion of hypertensive individuals whose condition is treated or controlled with medication remains low especially on developing countries (16).

In Ethiopia, studies have shown that a significant proportion of patients do not adhere to their prescribed antihypertensive medications, which negatively impacts medication effectiveness and the health care system(17, 18).There are various factors that affect adherence to antihypertensive treatments including the presence of co-morbidity, self-purchasing of the medications and combinations of antihypertensive medications(17).

Although the importance of treatment adherence has been recognized in Ethiopia by prior studies, most studies were conducted on patients often drawn from a single health institution and to current knowledge of the author there are no previous studies that examined adherence with antihypertensive medication or the characteristics of the non-adherent patients in Guraghe zone.

Therefore, the present study aimed to assess medication adherence in management of HTN in Guraghe Zone Hospitals, Central Ethiopia. The study also is expected to identify some of these factors influencing non-adherence to antihypertensive medications.

1.3 Significance of study

Despite the availability of effective therapies, poor medication adherence remains a major barrier to successful HTN management in many healthcare settings. In Ethiopia, including Guraghe Zone, the growing burden of HTN and the observed rise in HTN- related morbidity and mortality suggest that adherence challenges are contributing significantly to poor health outcomes.

Although follow-up clinics in Guraghe Zone hospitals provide routine care for hypertensive patients, there is limited local evidence on the level of adherence to antihypertensive medications and the factors influencing it. Previous studies conducted in other regions indicate that adherence may be affected by a complex interaction of different factors. However, these findings cannot be directly generalized to the Guraghe Zone due to differences in cultural practices, health care infrastructure and socio-economic conditions.

Generating context-specific evidence is therefore crucial to inform targeted interventions that address the unique barriers faced by patients in this setting.

This study aimed to assess adherence to antihypertensive medication and associated factors among patients with hypertension on follow-up at hospitals of Guraghe zone.

The findings from this study would be used by Guraghe zone health bureau officers to plot strategy for reducing non adherence to this essential drug and prevent associated complications.

1.4 Objectives

General Objective

- To assess antihypertensive medication adherence and associated factors among hypertensive patients at Guraghe zone hospitals, Central Ethiopia Nov-Dec, 2025.

Specific Objectives

- To determine patients level of antihypertensive medication adherence among adult hypertensive patients at Guraghe zone hospitals, Central Ethiopia
- To assess associated factors of antihypertensive medication adherence among adult hypertensive patients at Guraghe zone hospitals, Central Ethiopia

2. LITRATURE REVIEW

Medication adherence can be defined as the extent to which a patient's behavior corresponds with the prescribed medication dosing regimen, including time, dosing and interval of medication intake (19). Failure to adherence is a serious problem which not only affects the patient but also the health care system. Medication non adherence in patients leads to substantial worsening of disease, death and increased health care costs (20). This literature review summarizes on anti-hypertensive medication adherence and its associated factors.

2.1 Adherence to anti hypertension medication

Globally while high prevalence of anti-hypertensive medication nonadherence was detected, higher prevalence was detected in low-to middle-income and non-Western countries.

A global analysis of data showed ≈27% to 40% of patients with hypertension are nonadherent to their medications (21).

A cross sectional study at India 2024, showed around half (45%) of the patients had high adherence to anti-hypertensive medication and 55% of the patients had low adherence(22) .A study at Nepal on 2022 showed more than half (61%) of the study participants had moderate to high levels of medication adherence (21). Korean study showed 81.7% good adherence (23). Palestine (54.2%) had poor adherence and 45.8% good adherence (medium to high)(24).

Various studies in Africa shows there is low adherence to anti-HTN medication. A crossectional study conducted at Central Nigeria on 2018 showed 39.2% overall adherence of participants to medication (25), at Egypt 46.12% (26), at Tanzania 76.9%(27) and Eritrea 69.2% (28).

In Ethiopia the percentage of medication adherence among hypertensive's was wide ranging across studies with overall pooled prevalence of 65.41%(29).A cross-sectional study conducted among hypertensive patients on follow up at Nedjo General Hospital, Western Wollega zone showed 31.4% of the study participants were adherent to their treatment(30). while the other study showed prevalence of 83.4% was reported from Gimbi (31). According to study conducted among hypertensive patients on 2020 at Dessie Referral Hospital 51.9% of participants were adherent to the medication regimen whereas the remaining were not (32). Study conducted on 2021 at Dilla University Referral Hospital showed 65.3% anti-HTN medication adherence(33),North Showa zone 56.9% (34),Hawassa Referral Hospital 67% (13) and Shashemene Referral Hospital 63.5% (35).

2.2 Factors Associated to Anti-Hypertensive Medication Adherence

2.2.1 Socio-demographic Factors

Adherence to anti-HTN medication is influenced by a multitude of sociodemographic factors including age, sex, educational level, occupation, place of residence and marital status as supported by the following literatures.

From cross-sectional study at India age, marital status, occupation and educational level have significant association with treatment adherence. More non-adherences observed in older age group than younger, non-adherence observed less among married (19.2%) and divorcee (16.4%) participants than widow/widower (64.4%).

Adherence observed more among professionals, semi-professionals and semi-skilled workers than farmers, clerical workers, and unskilled workers (36). Lebanon study carried out on 2019 showed 83.7% adherence level and older patients, divorced/separated patients, married patients, widowed patients were more likely to exhibit non-adherence (37).

A descriptive study at Kenya showed a significant negative correlation between age and non-adherence and non-significant relationship between non-adherence and marital status and patients' level of education(38).

Educational status is another factor that determines anti-HTN medication adherence, and a study at Dilla University Referral Hospital, 2021 showed participants who can't read and write were 60% less likely to adhere to antihypertensive medication when compared to participants who completed college or university level. Similarly, respondents who had a primary school level of education were 50% less likely to adhere than college or university graduates(33).A multicenter study at Adama,2022 showed age, marital status and place of residence were found to be independently associated with adherence to anti-HTN medications. Accordingly, respondents with younger age, widowed (currently single) compared to those who were married, and urban residents were more likely to be adherent to medication.(39).

2.2.2 Personal Factors

Having good knowledge about HTN and its treatment have been shown to be associated with adherence to anti-HTN medications. A study at Riyadh, Saudi Arabia reported the predictors of

medication nonadherence to be: unawareness of target BP values, lack of BP monitoring, and unawareness of medication indications(40).

From study at Central Kenya ,Patients who had poor knowledge of hypertension were 5.6 times more likely to be non-adherent to their medications compared to those with good knowledge(41).

Institution-based case–control study conducted at Hawassa Referral Hospital reviled those who have good knowledge about HTN were three times more likely adherent than whose knowledge was poor (13). In addition other patient related factors including alcohol ingestion and traditional drug use for BP control has been associated with anti-HTN medication nonadherence(17, 33) .

2.2.3 Clinical Factors

Adherence to anti-HTN medication is influenced by various clinical factors that impact patient's ability and willingness to maintain consistent treatment. Korean study showed longer HTN diagnosis duration, co-morbid diabetes mellitus and ischemic heart disease were associated with adherence(42). Similar study at Nepal showed there was a significant association between the BP status with medication adherence. Among the respondents with uncontrolled BP, nearly half of the participants (45.8%) had low level of adherence while only 33.2% of participants with controlled BP had low adherence level. having medication side-effect has also been associated with non-adherence (12). Another study at Pakistan also showed presence of comorbidities is associated with good adherence(43).

From the study at Hawassa Referral Hospital those with no co-morbidity were three times more likely adherent than clients with co-morbidity and those clients who controlled their BP were two times more likely adherent than those not controlling their BP (13).

Pill burden of anti-HTN-medication was another clinical factors associated with poor medication adherence (44).

2.2.4 Organizational Factors

The success of HTN therapy is dependent on the healthcare systems and healthcare professionals in supplying enough medication and providing supportive care.

A study at Gujarat, India showed from the total non-adherence of respondents 28.8% comprises of poor patient-physician relationship that patients didn't get enough information from the health care provider and not satisfied with the health facility (36).

Financial constraint is another factor that determines adherence level. From study at Nepal participants who missed medicines due to high cost were 3.8 times more likely to have a low level of adherence compared to those who did not miss medicines due to cost (12).
Long waiting times in the health care facility is another factor associated with poor adherence, and good adherence determinants included adequate counseling and education (43).
From study at Kenya, participants who routinely discussed BP targets with HCPs had their medication adherence(MA) scores increased by 1.27 units compared to those who did not. Moreover, participants who always discussed personal problems related to specific antihypertensive medications had their MA increase by 2.45 units compared to those who did not (45). Lack of a health insurance, frequent unavailability of drugs at health institution and running out of medication before the next appointment found to be independent associated factors for poor adherence (27).Distance to health care facility is an other determinant of adherence with long distance to health facility associated with poor adherence (46).

2.2.5 Social Supporting Factors

Beyond patient Knowledge and regimen factors social support including help from family, friends, peers and community shows a positive association with adherence in hypertension. From study at China, social support was strongly and positively associated with the hypertensive treatment adherence (47). A study at Namibia showed lack of encouragement from family and friends, and attendance of follow-ups on schedule were factors significantly associated and are therefore predictors of adherence (48).

From similar study at Eastern Ethiopia respondents with social support were 1.86 times more likely to adhere to their antihypertensive medication than their counterparts (46).

2.3 **Conceptual Framework**

The conceptual framework is developed by reviewing different literatures which show the associated factors of antihypertensive medication adherence. It is adopted and modified from the listed articles (12, 13, 17, 18, 22, 23, 29, 33, 36, 49).

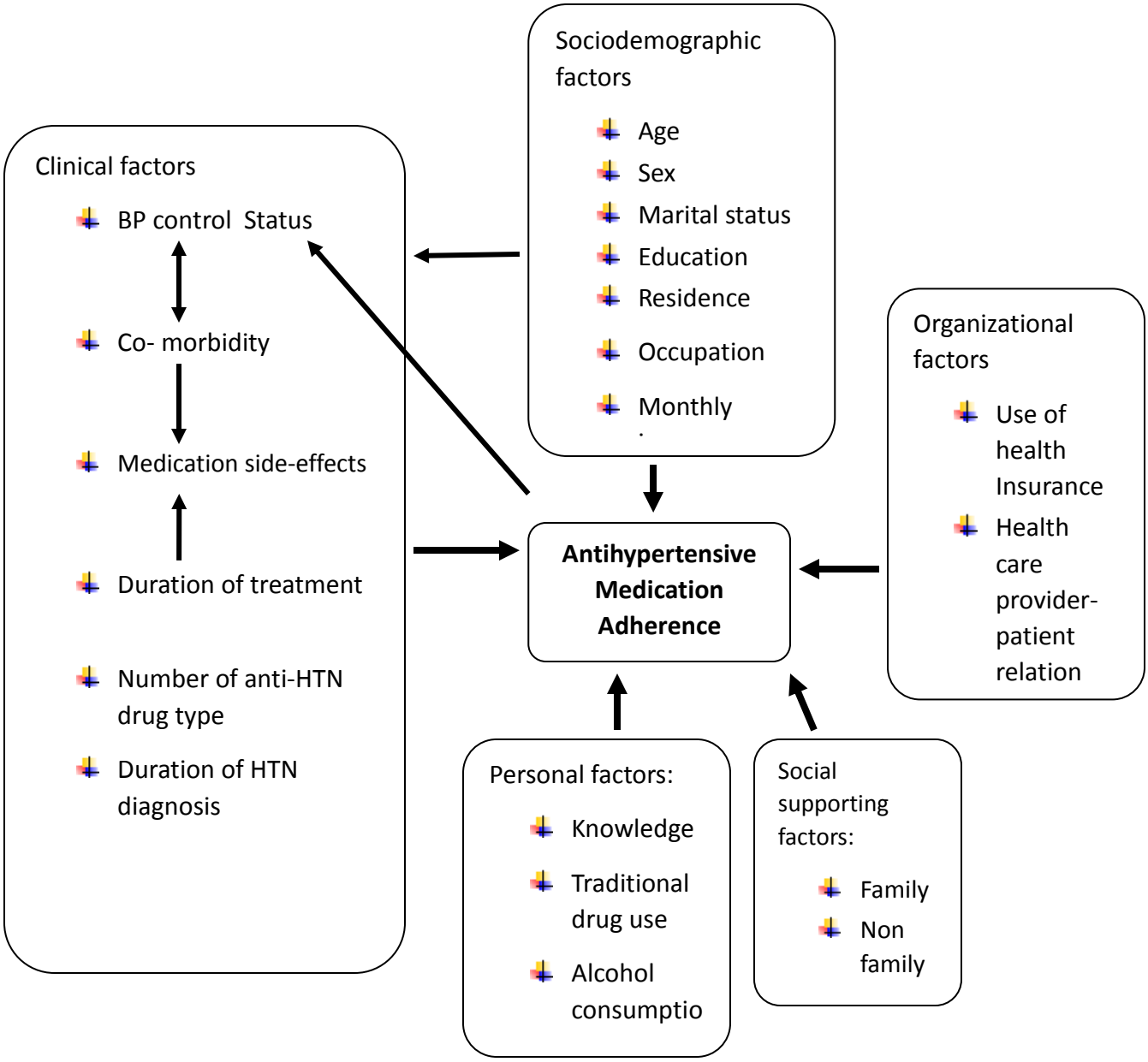


Figure 1 The conceptual framework that shows the associated factors of anti-hypertensive medication adherence 2025.

3. METHODS

3.1 Study Area and Period

The study was conducted at Guraghe Zone Hospitals. Guraghe Zone is located 158km far from capital city of Addis Ababa, and bordered southeast by Hadiya Silte,and Yem , on the west, North and East by the Oromia Region. Its highest point is Mount Guraghe and Report estimated from the CSA, the total population in 2023 was 1,870,368 (projected from CSA 2007). Guraghe Zone has seven Hospitals (1specialized teaching hospital and 6 primary hospitals) and the study setting was at Attat our lady Lourdes catholic primary Hospital, Gunchrie primary Hospital and Wolkite University Specialized Teaching Hospital. Wolkite University Specialized Hospital (WUSH) is a federal teaching and referral hospital designed to serve an estimated population of approximately four million people, including communities from the surrounding Oromia region. All hospitals included in this study provide services through the four major clinical departments: Internal Medicine, Surgery, Obstetrics and Gynecology, and Pediatrics and Child Health. In addition to these core departments, WUSH has additional specialty units including Dental Clinic, Dermatology, Psychiatry, and Emergency and Critical Care services. HTN follow-up service given at medical referral clinic of WUSH and chronic follow-up clinics of Attat and Gunchrie primary hospitals. The total number of HTN follow up in Wolkite university specialized hospital with a year is 1032, Attat our lady Lourdes catholic primary hospital 427 Gunchre primary hospital 1296. The study was conducted from NOV-1 to DEC-30 2025.

3.2 Study Design

A health facility-based Cross-sectional study was conducted at Guraghe zone selected Hospitals.

3.3 Source population

All hypertensive patients who had follow up at Guraghe Zone Hospitals, Central Ethiopia regional state.

3.4 Study population

The study populations were all adult (18 years and above) patients with hypertension who was on treatment and follow-up in Guraghe Zone Hospitals and available during the data collection.

3.5 Inclusion and exclusion criteria

3.5.1 Inclusion criteria;

Patients with hypertension who had been on follow-up for at least 6 months in the health facility was included in the study.

3.5.2 Exclusion criteria;

All hypertensive patients who are critically ill and unable to respond during the data collection Period were excluded.

3.5 Sample size determination

To determine sample size a single population proportion formula was used with the following assumption: A prevalence (P) value of 65.3%, from previous similar study at Dilla University Referal Hospital at 2024(33).Margin of error (d) of 5%,confidence interval=95% and Zα/2 = 1.96 (value of Z)at α 0.05 or 95% CI.

The sample size calculated using the following formula:

$$n = \frac{Z^2 (p)(1-p)}{D^2}$$

$$n = \frac{(1.96)^2 (0.653)(1-0.653)}{(0.05)^2} \quad n = 350$$

Where:

Z=1.96 (for 95 confidence level)

p=0.653(prevalence)

d = margin of error (0.05)

n=sample size

Table 1*:* Sample size determination for associated factors of anti-HTN medication adherence at Guraghe Zone Hospitals, 2025.

Variables	% of exposed	% of unexposed	AOR	Power	CI	n per group	Total sample size	Reference
Good Knowledge of HTN	61.5%	39.2%	2.2	80%	95%	78	156	(32)
Health insurance coverage use	63.74%	47.62	2	80%	95%	148	296	(46)
controlled BP	79%	51.4%	2.77	80%	95%	46	92	(50)

Based on sample size determination objective 1 sample size=350 objective 2 sample size=296>156>92

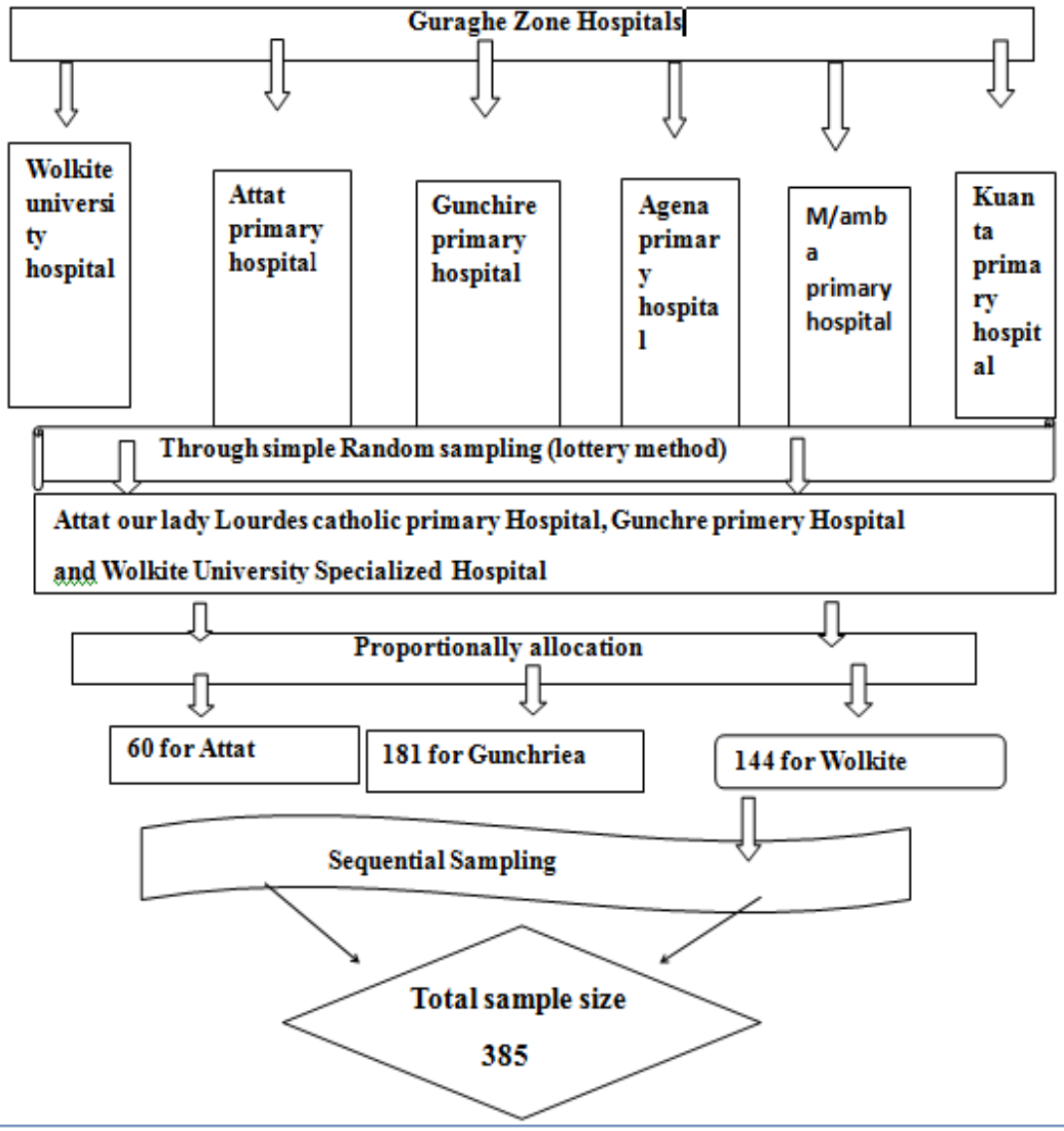
So the largest sample size is 350, considering nonresponse rate of 10% added the total sample size is =**385**

3.6 Sampling procedure and Technique

There are 7 hospitals in Guraghe Zone. The Study areas were Attat our lady Lourdes Catholic primary Hospital, Wolkite University Specialized Teaching Hospital and Gunchire Primary Hospital, selected by using simple random sampling technique. To ensure a representative sample, 385 participants were allocated proportionally to these three hospitals based on their average monthly patient visits.

The total number of HTN follow up in Wolkite University Specialized Hospital with a year was 1032, Attat our lady Lourdes Catholic primary hospital 427 Gunchre primary hospital 1296. This data is obtained by reviewing the registration books of each facility's medical records. Accordingly **144** participants were allocated to Wolkite university specialized hospital, **181** to Gunchrie primary hospital and **60** to Attat our lady Lourdes catholic primary hospital. Finally, hypertensive patients who visit during the study period were consecutively enrolled until the required sample attained (Fig-2).

Figure2. The diagrammatic presentation of the sampling technique used for the anti hypertensive medication adherence and associated factors in the Hospitals of Guraghe Zone, Ethiopia, 2025.



3.7 Study variables

Dependent variable

Adherence to anti-hypertensive medication

Independent variable

1. Socio-demographic Factors: age, sex, marital status, educational status, residence, monthly income and occupation
2. Clinical Factors: duration of diagnosis of HTN, duration of treatment, Comorbidities, BP control status, number of anti-HTN drugs used, Presence of medication side-effect
3. Personal Factors: Knowledge about HTN, traditional drug use, alcohol consumption
4. Organizational Factors: Health insurance coverage use, cost of medication, health professional-patient relation, drug availability in hospitals, drugs changed by physician and distance to health care facility.
5. Social Supporting Factors: Family and non-family support

3.8 Operational definition

Adherent: respondents who scored ≥ 6 points on the Morisky medication adherence scale (17).

Non-adherent: respondents who scored <6 in MMAS-8 (17).

Co-morbidities: respondents with one or more medical conditions in addition to HTN including diabetes mellitus, chronic kidney disease, stroke, coronary artery disease (51).

Good knowledge about HTN:- respondents who scored points at the mean and above from the item knowledge questions prepared on hypertension.

Controlled hypertension: refers to a BP measurement <140/90 mmHg and ≤130/80 mmHg for hypertensive patients with diabetic mellitus and chronic kidney disease (52).

Uncontrolled hypertension: refer to when the BP measurement is ≥ 140/90 mmHg and ≥130/80 mmHg for hypertensive patients with diabetic mellitus and chronic kidney disease(52).

Social support: respondents whose score above the mean value on the Duke Social Support and Stress scale will be taken as having social support (53).

Alcohol use: participants who adhere to the Joint National Committee 7 recommendations were deemed to be alcohol abstinent. Participants who reported that they didn't drink alcohol at all or not drink any alcohol in the last 7 days were considered abstainers (54).

Number of pills: - all types of oral ant hypertension medications classified as ≥2 and <2, taken on a regular basis and prescribed by health care providers(55).

3.9 Data collection instruments and Methods

A structured and pretested interviewer-administered questionnaire adopted from similar study done before and some standard guidelines tools was used to collect data. On the adherence status of antihypertensive medication an eight item Morisky's Medication Adherence Scale was employed. It is a self-report questionnaire with a total of 8 items. Items from 1 through 7 are dichotomous based on "Yes" or "No" response. Concerning scoring of these items each 'No" response was rated as ''1" and each ''Yes" was rated as ''0" except for item 5, in which case, a 'Yes' response was rated as ''1" and a ''No" was rated as ''0". The last item (item8) had a 5-point Liker response choice. The choices were never, once, sometimes, usually, and always. The score for each choice respectively were 1, 0.75, 0.50, 0.25, and 0. The total score of all the 8 items ranges from 0 to 8 points and it was categorized into two: ≥ 6 points adherent and <6 points non-adherent.

The Duke Social Support and Stress Scale, that contain 12 items was used to assess social support gained from family, friends or significant others.

Blood pressure was measured using a standardized procedure following the 2024 European Society of Cardiology (ECS) guideline for the management of HTN recommendations (56). Participants were seated comfortably with the arm supported at heart level after resting for at least 5 minutes. Two consecutive readings were taken one to two minutes apart using a digital BP apparatus and the average of the two readings was recorded.

3.10 Data quality assurance

Training was given to both the data collectors and supervisors for two days on the purpose of the study, details of the questionnaire, on interviewing techniques, importance of privacy, and ensuring the confidentiality of the respondents. The questionnaire was translated into Amharic and back translated into English. Before the data collection, a 5% pre-test was conducted in

unselected health facilities. The supervisor with the principal investigator closely followed the data collection process; the questionnaire was checked for completeness, accuracy, clarity and consistency.

3.11 Data processing and analysis

Once interviewed questionnaires collected, they were checked manually for completeness, then entered into Epi Data version 4.7 and exported to SPSS version 23 software package for further analysis.

Bivariate logistic regression analysis was carried out to examine the crude association between adherence and each independent variable at a time. Variables with a P-value < 0.25 in bivariate analysis were entered in to multivariate logistic regression model to control for potential confounding factors. Adjusted odds ratio (AOR) with 95% confidence interval (CI) was calculated and statistical significance was declared at P-value <0.05.

Prior to regression analysis, independent variables were checked for multicollinearity using the variance inflation factor (VIF) and for Model fitness Hosmer-Lemshow Goodness-of-fit test applied and it was fit.

3.12 Ethical consideration

Ethical clearance was obtained from the institutional review board (IRB) of Wolkite University, College of Medicine and Health science. Letter of permission was obtained from Guraghe zone health office and given to the respective study hospitals. Verbal and written consent was obtained for the willingness of patients to participate in the study. The patient's privacy was maintained by conducting the interview in a private place.

3.13 Dissemination of results

The result of this study was presented in open defense and it will be submitted to Wolkite University College of Medicine and Health Science Department of Internal Medicine.

It will be disseminated to the Guraghe Zone health bureau and all facilities found under the study.

4. RESULTS

4.1 Socio-demographic characteristics of study participants

A total of 368 study participants were interviewed, achieving a response rate of 95.6%. Among the respondents more than half, (57.6%) were female and majority (54.3%) were in the age group of ≥ 60 years and 38.6% were in the age group of 40-59 years, while 7.1% were in the age group of 18-39. Out of the total participants, 270 (73.4%) were married. With regard to educational level,38.6% respondents report they cannot read and write, 22.8% can read and write, 12.5% primary education,12% secondary and 14.1% were college or university level. As to occupational status 188 (51.1%) respondents reported that they were farmers, while 62 (16.8%) were governmental employee, 56 (15.2%) were merchants and 32(8.7%) were daily laborer. Regarding residence of living majority, 63%) were rural residents and. Half (51.4%) of the respondents have monthly income of ≥ 5000ETB, 44.3% have monthly income of 1000-5000 ETB and 4.3% have <1000ETB (Table 2).

Table-2 Sociodemographic characteristics of adult hypertensive patients on follow up at Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368).

Variables	Category	Adherence status		Frequency(N)	Percentage (%)
		Adherent	Non-adherent		
Age(yrs)	18-39	20	6	26	7.1%
	40-59	86	56	142	38.6%
	≥ 60	113	87	200	54.3%
Sex	Male	93	63	156	42.4%
	Female	132	80	212	57.6%
Marital status	Single	48	16	64	17.4%
	Married	145	125	270	73.4%
	Divorced	6	0	6	1.6%
	Widowed	26	2	28	7.6%
Residence	Urban	108	28	136	37.0%
	Rural	117	115	232	63.0%
Level of education	Cannot read and write	60	82	142	38.6%
	Can read and write	60	24	84	22.8%
	Primary (grade 1-8)	37	9	46	12.5%
	Secondary (grade 9-12)	32	12	44	12.0%
	College or university	36	16	52	14.1%
Occupation	Farmer	120	68	188	51.1%
	Merchant	29	27	56	15.2%
	Governmental employee	44	18	62	16.8%
	Daily labor	12	20	32	8.7%
	Other			30	8.2%
Monthly income(ETB)	< 1000	9	7	16	4.3%
	1000-5000	101	62	163	44.3
	≥ 5000	225	143	189	51.4%

4.2 Clinical and medication-related characteristics

Among the respondents, 201(54.6%) of them have their BP controlled. Regarding duration of diagnosis, less than half (40.8%) diagnosed as having HTN five and more years ago and 130 (35.3%) of respondents begun antihypertensive medication five and above years ago. More than half (52.7%) of respondents have comorbidities and Diabetes mellitus was the most common reported co-morbidity (43.3%). Regarding the number of medication type patient took, 214(58.8%) of participants were on monotherapy and most (88.0%) of respondents, didn't have any antihypertensive medication associated side effects (Table 3).

Table 3 Clinical characteristics of adult hypertensive patients on follow up at Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368)

Variable	**Category**	**Adherence status**		**Frequency(N)**	**Percentage (%)**
		Adherent	Non-adherent		
BP control status	uncontrolled	62	105	167	45.4%
	controlled	163	38	201	54.6%
Duration of HTN (yrs)	<5 years	118	100	218	59.2%
	≥ 5 years	107	43	150	40.8%
Duration of treatment (yrs)	<5 years	130	108	238	64.7%
	≥ 5 years	95	35	130	35.3%
Have Co morbidities	No	109	65	174	47.3%
	Yes	116	78	194	52.7%
Number of medication type	<2	155	59	214	58.8%
	≥ 2	68	82	150	41.2%
have any of medication side-effects	yes	26	18	44	12.0%
	No	199	125	324	88.0%

4.3 Personal and social support related characteristics

Regarding knowledge about hypertension, nearly half of the respondents, 186 (50.5%), had poor knowledge, while 182 (49.5%) demonstrated good knowledge. Concerning alcohol consumption, the majority of participants, 294 (79.9%), reported that they did not consume alcohol.

With respect to the use of traditional medicine for blood pressure control, 158 (42.9%) of the respondents reported using traditional medicine. Out of the total respondents 204 (55.4%) has no social support. (Table 4).

Table 4:Personal and social support related characteristics of adult hypertensive patients on follow up at Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368)

Variable	**Category**	**Adherence status**		**Frequency (N)**	**Percentage (%)**
		Adherent	Non-adherent		
Knowledge about HTN	Poor Knowledge	97	89	186	50.5%
	Good Knowledge	128	54	182	49.5%
Alcohol consumption	Yes	46	28	74	20.1%
	No	179	115	294	79.9%
Use traditional medicine to control BP	yes	76	82	158	42.9%
	No	149	61	210	57.1%
Social support	No social support	105	99	204	55.4%
	Has social support	120	44	164	44.6%

4.4 Organizational related characteristics

Among the respondents, 208 (56.5%) reported having health insurance coverage. Regarding the availability of antihypertensive drugs in the hospital pharmacy, 198 (53.8%) of the respondents reported that drugs were available. A large majority of the participants, 324 (88.0%), reported having a good relationship with health care providers. Concerning medication management, 100 (27.2%) of the respondents indicated that their drugs had ever been changed by doctors. With respect to patient education, 294 (80.3%) of the participants reported that they had been informed by their doctor about the importance of taking antihypertensive medication. In terms of access to health care facilities, 110 (29.9%) of the respondents lived within less than 10 km from the hospital, 126 (34.2%) lived 10–20 km away, and 132 (35.9%) resided more than 20 km from the hospital (Table 5).

Table 5: Hypertensive patients Organizational characteristics at Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368)

Variable	**Category**	**Adherence status**		**Frequency (N)**	**Percentage (%)**
		Adherent	Non-adherent		
Health insurance coverage use	Yes	156	52	208	56.5%
	No	69	91	160	43.5%
Are drugs available in the hospital pharmacy	yes	165	33	198	53.8%
	No	60	110	170	46.2%
Good relationship with health care providers	Yes	192	132	324	88.0%
	No	33	11	44	12.0%
Drugs ever changed by Doctors	yes	49	51	100	27.2%
	No	176	92	268	72.8%
Ever told by your Dr the importance of taking Med	yes	183	111	294	80.3%
	No	40	32	72	19.7%
Distance from hospital (KM)	<10	90	20	110	29.9%
	10-20	68	58	126	34.2%
	>20	67	65	132	35.9%

4.5 Medication Adherence Status of the Study Participants

The overall adherence rate to anti-HTN medication was found to be 61.1% (95% CI 56.14, 66.14%). Regarding forgetfulness, 234 (63.6%) of the respondents reported that they had ever forgotten to take their medication. In the last two weeks 156 (42.4%) of the participants reported missing their medication on at least one day.

Concerning intentional non-adherence, 102 (27.7%) of the respondents reported that they had ever stopped or reduced their medication because they felt worse. Additionally, 120 (32.7%) reported forgetting to take their medication when traveling. With respect to recent medication intake, 226 (61.4%) of the participants reported taking their antihypertensive medication on the day preceding the interview. Furthermore, 156 (42.4%) reported stopping their medication when they felt their blood pressure was under control. Regarding psychosocial aspects of adherence, 134 (36.4%) of the respondents reported feeling distressed about strictly following their hypertension treatment regimen. In relation to difficulty remembering to take all antihypertensive medications, 141 (38.3%) reported never having difficulty, 81 (22.0%) reported difficulty sometimes, 90 (24.5%) reported difficulty usually, and 22 (6.0%) reported always having difficulty (Table 6).

Fig 2. Overall antihypertensive medications adherence among adult hypertensive patients in Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368)

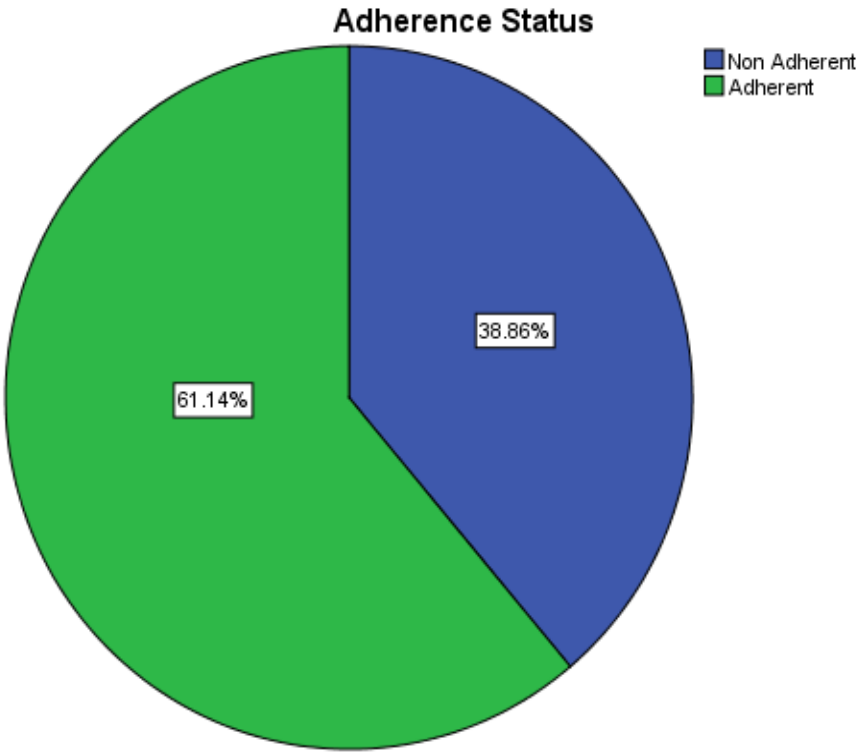


Table 6. Respondent's responses to the Morisky medication adherence scale-8 items at Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368)

Variable	Category	Adherence status		Frequency (N)	Percentage (%)
		Adherent	Non-adherent		
Ever forget to take your medicine	No	132	2	134	36.4%
	Yes	93	141	234	63.6%
Any day in last two wks not to take medicine	No	182	30	212	57.6%
	Yes	43	113	156	42.4%
ever stopped or decrease medication because you felt worse	No	185	81	266	72.3%
	Yes	40	62	102	27.7%
forget to take medicine when travel	No	189	58	247	67.3%
	yes	36	84	120	32.7%
Do you take your high BP med yesterday	yes	156	70	226	61.4%
	No	69	73	142	38.6%
stop meds when you feel BP controlled	No	159	53	212	57.6%
	Yes	66	90	156	42.4%
ever felt distressed for strictly following for HTN	No	210	24	234	63.6%
	Yes	15	119	134	36.4%
How often do you have difficulty to remember taking all your BP medications	Never	136	5	141	38.3%
	Once	57	24	81	22.0%
	Some times	34	56	90	24.5%
	Usually	2	32	34	9.2%
	Always	2	20	22	6.0%

4.6 Factors associated with antihypertensive medication adherence

The bivariate analysis showed significant association between antihypertensive medication adherence and level of education, residence, BP control status, health insurance coverage use, duration of HTN diagnosis, duration of HTN treatment, knowledge about HTN and social support.

All these variables were entered in to multivariable logistic regression analysis to identify independent predictors of adherence to antihypertensive medications. From multivariate logistic regression analysis the five variables, residence of living, level of education, BP control status, health insurance coverage use and duration of anti-HTN treatment showed significant association with adherence to anti-HTN medication (Table 6).

Accordingly patients residing in urban areas were 2.39 times more likely to be adherent compared to those living in rural areas (AOR = 2.39; 95% CI: 1.27–4.51; p = 0.007). Patients who were able to read and write had 2.80 times higher odds of adherence compared to those with college or university education (AOR = 2.80; 95% CI: 1.04–7.55; p = 0.042). Other educational categories did not demonstrate a statistically significant association after adjustment. BP control status was a strong predictor of adherence. Patients with uncontrolled blood pressure had significantly lower odds of adherence to antihypertensive treatment compared with patients with controlled blood pressure (AOR = 0.16; 95% CI: 0.09–0.29; $p < 0.001$).Health insurance coverage was also independently associated with medication adherence. Patients who had health insurance were 2.43 times more likely to be adherent than those without insurance coverage (AOR = 2.43; 95% CI: 1.37–4.33; p = 0.002), highlighting the role of financial access in long-term medication use. Duration of antihypertensive treatment showed a statistically significant association with adherence. Patients who had been on treatment for less than five years were less likely to be adherent compared to those treated for a long duration (AOR = 0.31; 95% CI: 0.10–0.94; p = 0.038). This suggests that prolonged exposure to treatment may improve patients' adherence behavior over time (Table **7**).

Table 7: Bivariate and multivariate logistic regression analysis result showing factors associated with ant hypertension medication adherence at Guraghe Zone Hospitals, Central Ethiopia, 2025 (n=368)

Variable	Category	Adherence status		COR(95% C.I)	AOR(95% C.I)	P-value
		Adherent	Non-adherent			
Residence	Urban	108	28	3.791(2.325-6.182)	2.392(1.270-4.505)	.007*
	Rural	117	115		1	
Level of education	Cannot read and write	60	82	.325(.165-.640)	.441(.163-1.192)	.107
	Can read and write	60	24	1.111(.522-2.365)	2.799(1.037-7.550)	.042*
	Primary	37	9	1.827(.716-4.662)	2.119(.625-7.186)	.228
	Secondary	32	12	1.185(.488-2.878)	.575(.173-1.914)	.367
	College/University	36	16		1	
BP control status	Controlled	163	38		1	
	Uncontrolled	62	105	.138(.086-.221)	.160(.089-.286)	0.001*
Health insurance use	Yes	156	52	3.957(2.540-6.163)	2.434(1.368-4.331)	.002*
	No	69	91		1	
Duration of HTN	<5 years	118	100	.474(.305-.738)	1.453(.502-4.203)	.491
	≥ 5 year	107	43		1	
Duration of treatment	< 5 yrs	130	108	.443(.279-.705)	.313(.104-.939)	.038*
	≥ 5 year	95	35		1	
Knowledge about HTN	Poor	97	89	.460(.299-.706)	.644(.366-1.132)	.126
	Good	128	54		1	
Social support	Has NO social support	105	99	.389(.250-.605)	.596(.341-1.040)	.069
	Has social support	120	44		1	

*Statistically significant

5 Discussion

In the present study, the overall adherence rate to antihypertensive medication was 61.1%, indicating that slightly more than half of adult hypertensive patients were adherent to their prescribed treatment. The finding that more than one third of patients are non-adherent has important clinical implications for HTN management. Suboptimal adherence increases the risk of poor BP control, treatment failure, and long-term cardiovascular complications. From a public health perspective, the suboptimal medication adherence level observed in this study represents a significant barrier to achieving population-level BP control. Given the high and growing burden of HTN in Ethiopia, poor adherence may undermine national efforts to reduce cardiovascular morbidity and mortality.

Comparable findings were reported from Public health facilities of Adama (63.4%)(39), Shashemene Referral Hospital (63.5%)(35), and Dilla University Referral Hospital (65.3%)(33).The similarity in adherence levels may be explained by comparable socio-demographic characteristics of the study populations, similar health system structures, and the use of related adherence measurement tools.

However this finding is higher than reports from a study conducted at Egypt where the adherence level was (46.12%) (26),Dessie Referral Hospital (32) where the adherence level was 51% and from Northern Ethiopia which reported an adherence rate of 56.9% (49). It is also marginally higher than findings from Eastern Ethiopia (59.94%) (46). The observed difference may be attributed to variations in study settings, patient education, availability of medications, and differences in health care delivery and follow-up practices across the study areas.

The adherence level observed in this study is lower than those reported from studies conducted in Hawassa Referral Hospital(67%),(13), Gujarat, India (75.7%),(36), and Tanzania (76.9%)(27). This discrepancy may be due to differences in health system organization, accessibility of antihypertensive medications, patient counseling practices, health insurance coverage, and levels of health literacy. In addition, variations in cultural beliefs, social support systems, and methodologies used to assess medication adherence may have contributed to the higher

adherence rates observed in these settings. Overall, the adherence rate found in the current study suggests a substantial gap in optimal antihypertensive medication adherence.

In the present study, place of residence was significantly associated with antihypertensive medication adherence, with patients residing in urban areas being 2.39 times more likely to be adherent compared to those living in rural areas. This finding is consistent with studies conducted in Eastern Ethiopia(46), and multicenter study at Oromia(39), where urban residence was positively associated with better medication adherence, suggesting that urban residents generally benefit from better access to health facilities, pharmacies, health information, and regular follow-up services. In contrast, rural residents often face challenges such as long travel distances, transportation costs, and limited availability of medications, which may negatively affect adherence.

The level of education was also found to be associated with medication adherence. Patients who were able to read and write had 2.80 times higher odds of adherence compared to those with college or university education, while other educational categories did not show a statistically significant association. Although this finding appears counterintuitive, similar patterns have been reported in studies from Tertiary Hospital at India(22) and Chuka Referral Hospital, Kenya(38),where higher educational attainment did not consistently translate into better adherence. This may be explained by the possibility that individuals with higher education levels are more likely to have demanding occupations and busy schedules, which may interfere with regular medication-taking behavior. Additionally, more educated patients may be more inclined to question treatment necessity, modify prescribed regimens, or intentionally skip doses based on perceived symptom improvement or concerns about long-term medication use. In contrast, patients with basic literacy skills may adhere more strictly to health professionals' instructions and perceive the disease as more serious. However, this finding is inconsistent to Indian study (36), where education was tied to better compliance, suggesting that the relationship between education and adherence may be context-specific and influenced by sociocultural and health system factors.

Blood pressure control status showed a strong association with medication adherence in this study. Patients with controlled blood pressure were shown to be more adherent to

antihypertensive medications compared to those with uncontrolled blood pressure. This finding is in line with previous studies conducted in Libanen(37), Pakistan(43) and Shashemene Referral Hospital(35) which demonstrated that good adherence is closely linked to effective blood pressure control. This relationship is likely bidirectional, as adherence leads to better blood pressure outcomes, while improved clinical status may reinforce patients' motivation to continue their medications.

Health Insurance coverage was also found to be associated with adherence. Patients who had health insurance were 2.43 times more likely to be adherent than those without insurance coverage. This finding is consistent with studies conducted in Tanzania (27), and Eastern Ethiopia(46).The explanation for this association may be due to insurance coverage may facilitate regular clinic visits, continuity of care, and uninterrupted access to antihypertensive drugs, all of which contribute to improved adherence.

In addition, duration of antihypertensive treatment was significantly associated with adherence. Patients who had been on treatment for less than five years were less likely to be adherent compared to those treated for a longer duration. This finding is supported by studies from Northwest Ethiopia (57) which reported improved adherence among patients with longer treatment duration. This may be due to increased familiarity with the medication regimen, better understanding of the long-term consequences of non-adherence, and the establishment of stable medication-taking habits over time.

Strength and Limitations of the study

Strengths of the study: The use of the validated eight-item Morisky Medication Adherence Scale (MMAS-8) enhances the reliability and comparability of adherence measurement. The multicenter design involving three hospitals in Guraghe Zone improves the representativeness of the findings. In addition, the inclusion of socio-demographic, clinical, and health system–related factors allowed for a comprehensive assessment of determinants of antihypertensive medication adherence. Finally, the study provides context-specific evidence from an under-studied setting, which is valuable for guiding local clinical and public health interventions.

Limitations of the study: The cross-sectional design nature of this study limits the ability to establish causal or temporal relationships between antihypertensive medication adherence and BP control. Secondly, medication adherence was assessed using self-reported measures, which may be subject to recall and social desirability biases. In addition, blood pressure was measured during a single clinic visit, which may not accurately reflect long-term blood pressure control patterns.

6 Conclusion and Recommendation

Conclusion

This study found that 61.1% of adult hypertensive patients were adherent to antihypertensive medication, indicating that a substantial proportion remained non-adherent. Medication adherence was significantly associated with place of residence, educational status, blood pressure control, health insurance coverage, and duration of treatment. Urban residence, basic literacy, controlled blood pressure, insurance coverage, and longer treatment duration were positively associated with adherence. These findings highlight persistent gaps in optimal hypertension management and underscore the influence of socio-demographic, clinical, and health system factors on medication adherence.

Recommendations

To Guraghe zone health care providers:

Strengthen patient education and counseling, with particular emphasis on patients from rural areas, those newly diagnosed with hypertension and those with uncontrolled blood pressure.

To Guraghe zone health bureau:

Expand and strengthen health insurance coverage to reduce financial barriers to antihypertensive medication and health care services.

Develop and implement community-based interventions targeting rural populations to improve awareness and adherence to hypertension treatment.

Integrate medication adherence support into existing chronic disease management programs.

To researchers:

Future studies should consider prospective cohort or longitudinal designs to establish the temporal and causal relationship between antihypertensive medication adherence and BP control.

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8.APPENDEX

WOLKITE UNIVERSITY

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DEPARTMENT INTERNAL MEDICINE

Annex I: **Information sheet**

Hello. My name is _____ I am working on behalf of a research conducted by Dr.Daniel Fujaga, a post graduate student from Wolkite University, College of Medicine and Health Sciences, and department of Internal Medicine. I kindly request you to give me your attention to explain about the study. If you allow me, I would like to ask few questions which takes 20minutes after you understand the following information sheet.

Study title:

Antihypertensive medication adherence and its associated factors among hypertensive patients on follow up at Guraghe zone hospitals, 2025

Objective of the study:

To assess antihypertensive medication adherence and its associated factors among hypertensive patients on follow up at Guraghe zone hospitals, 2025

Procedure and duration:

I will be interviewing you using structured questionnaire to provide a data that is helpful for the study and the interview will take about 20 minutes.

Risk and benefit of the study:

The risk of being participating in this study is very minimal, it only take your time. There won't be any payment for participating in this study. But the findings from this research may reveal necessary information for the Zonal health bureau.

Right of the participants:

Participation for this study is fully voluntary. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdrawal from the study at any time. You don't have to answer any questions that you don't want to answer

Confidentiality:

The information you will provide us will be confidential. There will no information that will identify you in particular. Any information forward will be kept private and name will not be specified

Contact address:

If there are any question or enquiries at any time about the study or the procedure you can contact by using the following address.

Principal investigator: Dr. Daniel Fujaga

E-mail: fujagadaniel49@gmail.com

Mobile phone: ----------

Annex II: Informed Consent

I have read this form or it has been read to me in the language I understand. I have clearly understood the purpose of the research, the procedure, the risk and benefits, issue of confidentiality, the right of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have be unclear. I was informed that I have the right to withdrawal from that study at any time or not to answer any questions that I don't want. Are you willing to participate in this study?

A. No---------- (say thanks!)

B. Yes-------Continue with the interview

Thank you for being voluntary to participate in the study

Name of the interviewer _____ Sign. _____ Date _____

Identification Code Number:_____

Annex III**: Data collection for English version Questionnaire**

Part I – Socio-demography factors: This section is about sociodemographic characteristics of the respondent. Tick (√) on the responses from the given alternatives.

No.	**Question**	**Category**
101	Gender of the respondent	Male □ Female □
102	Age of the respondents	----------Years
103	Marital status	1= Single □ 2 = Married □ 3 = Divorced □ 4 = Widowed □
104	Residence	1= Urban 2= Rural
105	Level of education	1= Can't read and write □ 2 = Read and write □ 3 = Primary □ 4 = Secondary □ 5 = College/University □
106	Occupation	1=Farmer □ 2: Merchant □ 3: Governmental employee □ 4 = Daily labor □ 99 = Other (Specify)------)------
107	Monthly income	---------ETB

Part II: **Clinical Factors:** This section is about the general health condition of the respondent. Ask the questions and fill the given answer from the respondent on the space provided.

No	**Questions**	**Category**
201	What was the respondent's blood pressure measurement today?	------- in mmHg
202	How long has it been since you were diagnosed with hypertension	----------months/years?
203	How long have you been taking anti-hypertensive medications?	----------months/years?
204	How many types of anti-hypertensive medications do you take?	----------
205	Do you have any of these comorbidities?	1=No comorbidities □ 2=Diabetes mellitus□ 3 = CKD □ 4 = Stroke □ 5=CAD □ 99Others (Specify)-
206	Do you have any of medication side-effects	1 yes 2 No

Part IIIA– Personal Factors (knowledge of hypertension): This section is about knowledge regarding hypertension, measurement of BP and its management. Tick (√) on the box in front of the alternative that is given as an answer by the respondents.

No	**Question**	**Category**
301	Which of the following is true about hypertension?	1=Raised BP □ 2=Raised blood sugar □ 3=Increased stress □ 4= Don't know □
302	A person is considered to have hypertension if either their systolic blood pressure is 140 or their diastolic is 90 or higher on two separate occasions.	True □ False □
303	Most people can tell when their blood pressure is high because they feel bad or sever headache	True □ False □
304	Which of the following increases your risk of having hypertension? (select all that apply)	1=Family history of HTN □ 2=Aging □ 3= Overweight □ 4= Eating high fat contents & salt □
305	Hypertension is a treatable diseases	True □ False □
306	People with hypertension do not need to take medicine if they exercise regularly	True □ False □
307	It is okay to stop taking anti-hypertension medication when your BP becomes normal	True □ False □
308	Uncontrolled hypertension can lead to which of the following	1= Stroke □ 2 = Lung cancer □ 3= Brain cancer□ 4= High cholesterol

Part III B Other personal factors

309	Do you currently consume alcohol	1 yes 2 No
310	If yes how often do you have a drink containing alcohol	1 Never 2 Monthly or less 3 2-4 times a month 4 2-3 times a week

		5 4 or more times a week
311	Do you ever use traditional medicine to control your BP	1 Yes 2 No

Part IV: Organizational Factors: This section is about health care system and health care provider-patient relationships. Ask the questions and fill or tick (V) the given answer from the respondents on the space provided

No	**Questionnaire**	**Responds**
401	Are you a health insurance coverage user?	1.Yes □ 2No □
402	If not what is the average cost of your hypertension medication per month?	_____ETB
403	Are those drugs readily available in the hospital pharmacy?	1 Yes □ 2 No □
404	Have you good relationships with your health care provider?	1 Yes □ 2 No □
405	Have you ever been the **drugs changed by your Doctor**?	1 Yes □ 2 No □
406	If yes how many times?	_____
407	Have you ever been told by your Doctor the importance of taking your high blood pressure medication?	1 Yes □ 2 No □
408	How far is the health institution you have follow-up from your home in KM.	----------

Part V – Social Support Factors: This section is about support gained from family and non-family members. After stating the family or non-family member, tick on:-

None - if there is no support at all from the stated individual

Some – if there is minimal support from the stated individual

A lot – if the individual stated is very supportive.

NA – if there is no such family or non-family member

No	Questions				
	Do you get support from these family members?	None: 0	Some :1	A lot :2	NA: 9
501	Your wife, husband, or significant other person				
502	Your children or grandchildren				
503	Your parents or grandparents				
504	Your brothers or sisters				
505	Your other blood relatives				
506	Your relatives by marriage (for example: in-laws, ex-wife, ex-husband)				
	Do you get support from these non-family members?				
507	Your neighbors				
508	Your co-workers				
509	Your religious peers				
510	Your other friends				
511	Do you have one particular person whom you trust and to whom you can go with personal difficulties?	2=Yes 0=No			
512	Which of the above types of person is he or she?	1=Family member 2=Non family member			

Part VI – Adherence to Medications: This section is concerned with the respondents adherence to the prescribed anti – hypertensive medications. Tick (√) on the box based on the respondent response.

No	Question	Category
601	Do you ever forget to take your medicine?	1= Yes □ 0=No □
602	In the last two weeks, is there any day when you did not take your high blood pressure medication?	1= Yes □ 0=No □
603	Have you ever stopped taking your medications or decreased the dose without your doctor order, because you felt worse when you took them?	1= Yes □ 0=No □

604	Do you forget to take your medications, when you travel or leave the house?	1= Yes □ 0=No □
605	Did you take your high blood pressure medication yesterday?	0= Yes □ 1=No □
606	Do you stop taking your medications, when you feel your blood pressure is controlled?	1= Yes □ 0=No □
607	Have you ever felt distressed for strictly following your high blood pressure treatment?	1= Yes □ 0=No □
608	How often do you have difficulty to remembering taking all you blood pressure medication?	1=Never □ 2=Once □ 3=Sometimes □ 4=Usually □ 5=Always □

Annex IV: Data Collection for Amharic Version Questionnaire

ወልቂጤ ዩኒቨርሲቲ

ህክምና እና ጤና ሳይንስ ኮሌጅ

የውስጥ ደዌ ትምህርት ክፍል

አባሪ I: - የመረጃ ወረቀት

ሠላም ፡ስሜ _____ ነው የምሰራው ከወልቂጤ ዩኒቨርሲቲ ህክምና እና ጤና ሳይንስ ኮሌጅ የውስጥ ድዌ ት/ት ክፍል የድህረ ምረቃ ተማሪ ዶ/ር ዳንኤል ፉጃጋ በሚካሄደው ጥናት ወክዬ ነው ።ስለ ጥናቱ ለማብራራት ትኩረት እንዲሰጡኝ በአክብሮት እጠይቃለሁ ።ከፈቀዱልኝ የሚከተለውን የመረጃ ወረቀት ከተረዱ በኋላ ከ 20 ደቂቃ በላይ የማይወስድ ጥቂት ጥያቄዎችን መጠየቅ እፈልጋለሁ ።

የጥናቱ ርዕስ-

የደም ግፊት ህመምተኞች የደም ግፊት መድሐኒት አወሳሰድ እና ተያያዥ ነገሮች ፤ በጉራጌ ዞን ሆስፒታሎች ፣ ማዕከላዊ ኢትዮጵያ 2025 ውስጥ

የጥናቱ ዓላማ

የደም ግፊት ህመምተኞች የደም ግፊት መድሐኒት አወሳሰድ እና ተያያዥ ነገሮች ስለማወቅ ፤ በጉራጌ ዞን ሆስፒታሎች ፣ ማዕከላዊ ኢትዮጵያ 2025 ውስጥ

የአሠራር ሂደት እና የቆይታ ጊዜ-

ለጥናቱ ጠቃሚ መረጃን ለማቅረብ የተዋቀረ መጠይቅ ተጠቅሜ ቃለ መጠይቅ አደርጋለሁ ፡ቃለመጠይቁ 20 ደቂቃ ያህል ይወስዳል ፣ ስለሆነም ፈቃደኛ እንዲሆኑልኝ በትህትና እጠይቃለሁ ።

የጥናቱ አደጋ እና ጥቅም-

በዚህ ጥናት ውስጥ የመሳተፍ አደጋ በጣም አናሳ ነው ፣ ጊዜዎን ብቻ ይወስዳል ፡በዚህ ጥናት ውስጥ ለመሳተፍ ምንም ክፍያ አይኖርም ።ነገር ግን ከዚህ ጥናት የተገኙት ግኝቶች ለዞን ጤና ቢሮ አስፈላጊ መረጃዎችን ሊያሳዩ ይችላሉ ።

የተሳታፊዎች መብትና ምስጢር ጠባቂነት

የዚህ ጥናት ተሳትፎ ሙሉ በሙሉ በፈቃደኝነት የሚደረግ ነው ፡በዚህ ጥናት ውስጥ ለመሳተፍ ወይም ላለመሳተፍ የማወጅ መብት አለዎት ።ለመሳተፍ ከወሰኑ በማንኛውም ጊዜ ከጥናቱ የመውጣት መብት አለዎት። ለመመለስ የማይፈልጉትን ማንኛውንም ጥያቄ መመለስ የለብዎትም: ለእኛ የሚሰጡን መረጃዎች፡በተለይ እርስዎን የሚለይ መረጃ አይኖርም ።ማንኛውም መረጃ ላይ የግለሰብ ስም አይገለጽም ።

አድራሻ-

ስለ ጥናቱ ወይም ስለ አሰራሩ በማንኛውም ጊዜ ጥያቄ ካለ የሚከተሉትን አድራሻ በመጠቀም ሊያነጋግሩ ይችላሉ ፡

የርእሰ ምርምሩ አጥኚ ዶ/ር ዳንኤል ፉጃጋ

ኢሜል ----------

የሞባይል ስልክ ቁጥር ----------

አባሪ II-በመረጃ ላይ የተመሠረተ ስምምነት

ይህንን ቅጽ አንብቤዋለሁ / በተረዳሁት ቋንቋ ተነቦልኛል ።የምርምሩን ዓላማ ፣ አሰራሩን ፣ ስጋት እና ጥቅማጥቅሞችን ፣ የምስጢራዊነትን ጉዳይ ፣ የተሳትፎ መብትን እና ለማንኛውም ጥያቄ አድራሻውን በሚገባ ተረድቻለሁ።ግልጽ ባልሆኑ ነገሮች ላይ ጥያቄዎችን የመጠየቅ እድል ተሰጥቶኛል ።ከዚያ ጥናት በማንኛውም ጊዜ ራሴን የማግለል ወይም የማልፈልገውን ማንኛውንም ጥያቄ ያለመመለስ መብት እንዳለኝ ተገልጸልኛል ።

በዚህ ጥናት ውስጥ ለመሳተፍ ፈቃደኛ ነዎት?

ሀ አይ ---------- አመሰግናለሁ በሉ!

ለ አዎ ------- በቃለ መጠይቁ ይቀጥሉ

በጥናቱ ውስጥ ለመሳተፍ ፈቃደኝነት ስለሆኑ እናመሰግናለን::

የቃለ መጠይቅ አድራጊው ስም _____ ፊርማ።_____ ቀን _____

የመጠይቅ መለያ ቁጥር----------

ክፍል 1 - የተጠያቂ ማህበራዊ መረጃ

የሚከተለትን ጥያቄዎች በመጠየቅ አማራጭ መልሶች ፊት ለፊት ባለው ሳጥን ላይ ምልክት ያድርጉ።

አማራጭ መልስ ለሌላቸዉ ጥያቄዎች የተሰጠው ክፍት ቦታ ላይ የተጠያቂውን መልስ ያስቀምጡ።

ተ.ቁ	ጥያቄዎች	አማራጭ መልስ
101	የተሳታፊው ፆታ	1 =ወንድ □ 2 =ሴት□
102	ዕድሜ	------
103	የትዳር ሁኔታ	1 = ያላገባ/ች □ 2 = ያገባ/ች □ 3 = የፋታ/ች □ 4 = በሞት የተለዩ□
104	መኖሪያ ቦታ	1 = ከተማ 2 = ገጠር
105	የትምህርት ደረጃ	1 = ማንበብ እና መጻፍ የማይችል □ 2 = ማንበብ እና መጻፍ የሚችል□ 3 = የመጀመሪያ ደረጃ □ 4 = የሁለተኛ ደረጃ □ 5 = ኮሌጅ/ዩኒቨርስቲ □
106	የስራ ዓይነት	1 = አርሶአደር □ 2 ነጋዴ □ 3= የመንግስት ሰራተኛ □ 4 = የዕለት ተዕለት የጉልበት ሥራ □ 99 = ሌላ (ይግለጹ) ------
107	ወርሃዊ ገቢ	----------ብር

ክፍል II-ክሊኒካዊ ምክንያቶች-

ይህ ክፍል ስለ የተጠያቂዉ አጠቃላይ የጤና ሁኔታ ነው ።ጥያቄዎቹን በመጠየቅ በተሰጠው ቦታ ላይ

ከተጠያቂዉ የተሰጠውን መልስ ይሙሉ

ተ.ቁ	ጥያቄዎች	አማራጭ መልስ
201	የተጠሪ የደም ግፊት ልኬት ዛሬ ስንት ነዉ?	------mmHg
202	የደም ግፊት እንዳለብዎ ከተመረመሩ ምን ያህል ጊዜ ቆየ?	--------- ወራት / ዓመታት?
203	ለደም ግፊት የሚሰጡ መድሀኒቶችን ለምን ያህሌ ጊዜ ወሰዱ?	----ወራት / ዓመታት?
204	ስንት ዓይነት የደም ግፊት መከላከያ መድኃኒቶችን ይወስዳሉ?	_____
205	ከእነዚህ ተዛማጅ በሽታዎች አንዳቸው አሉዎት?	1= ምንም የለም □ 2 = ስኳር □ 3 = የኩሊሉት ስራ ማቆም □ 4 = የአእምሮ ደም ፍሰት መቋረጥ □ 5 = የልብ ደም ቧንቧ መጥበብ □ 99 = ሌላ ካለ ይጠቀሱ------
206	የመድሃኒት የጎንዮሽ ጉዳት ገጥሞዎት ያውቃል	ነ አዎ 2 የለም

ክፍል III ሀ:- ስለ ደም ግፊት እውቀት የሚመለከት

ቀጣዩ ክፍል ስለ ደም ግፊት እውቀት ፣ የደም ግፊት አለካክ እና መቆጣጠር እውቀትን የመለከታል።

መልስዎን ከጥያቄው ፊትለፊት ከሚታየው ሳጥን ውስጥ ምልክት ያደረጉ።

ተ.ቁ	ጥያቄዎች	አማራጭ መልስ
301	ከሚከተሉት ውስጥ ስለ ደም ግፊት ትክክል የሆነው የቱ ነው?	1 = የደም ግፊት ሲጨምር □ 2 = ከፍ ያለ የደም ስኳር □ 3 = የጭንቀት መጨመር □ 4 = አላውቅም □
302	አንድ ሰው የደም ግፊት አለበት የሚባለው በሁለት በተለያየ ልኬት የላይኛው 140 ወይም ከዚያ በላይ እና የታችኛው 90 ወይም ከዚያ በላይ ሲሆን ነው።።	1 = እውነት □ 2 = ሐሰት□
303	ብዙ ሰዎች መጥፎ ስሜት ወይም ራስምታት ስለሚሰማቸው የደም ግፊታቸው ከፍ ማለቱን መናገር ይችላሉ	1 = እውነት □ 2 = ሐሰት□
304	ከሚከተሉት ውስጥ የትኛው የደም ግፊት የመያዝ እድልን	1 = የደም ግፊት የቤተሰብ ታሪክ □

	ይጨምራል?(ትክክል የሆኑት ሁሉም ላይ ምልክት ያድርጉ)	2 = እርጅና □ 3 = ከመጠን በላይ ክብደት □ 4 = ከፍተኛ የስብ ይዘት እና ጨው መመገብ □
305	ደም ግፊት ሊታከም የሚችል በሽታ ነው	1= እውነት □ 2 = ሐሰት□
306	ሁልጊዜ የአካል ብቃት እንቅስቃሴ የሚያደርጉ የደም ግፊት ህመምተኞች መድሃኒት መውሰድ አይጠበቅባቸውም	1= እውነት □ 2 = ሐሰት□
307	የደም ግፊት መድሃኒት እየወሰድን ሲስተካከል መድሃኒት ብናቆም ችግር የለውም	1= እውነት □ 2 = ሐሰት□
308	የደም ግፊትን ካልተቆጣጠርነው ምን ያስከትላል ?	1 = ስትሮክ □ 2 = የሳንባ ካንሰር □ 3 = የአንጎል ካንሰር □ 4 =ከፍተኛ ኮሌስትሮል□

ክፍል III ለ:ሌሎች ግለሰባዊ ምክንያቶች

309	የአልኮል መጠጦችን ይጠጣሉ	1አዎ 2 አይደልም
310	አዎ ከሆነ በምንያህል ጊዜ ይጠጣሉ	1 በፍጹም 2 በወር አንድ ጊዜ 3 በወር ከ2-4 ጊዜ 4 በሳምንት 2-3 ጊዜ 5 በሳምንት 4 ጊዜእና በላይ
311	የደም ግፊትዎን ለመቆጣጠር የባህላዊ መድሃኒት ተጠቅመው ያውቃሉ	1 አዎ 2 አይደለም

ክፍል IV:- ድርጅታዊ መንስኤዎች

ቀጣዩ ክፍል ስለ ጤና ተቋም እና ጤና ባለሙያ - ተገልጋይ ያላቸውን ግንኙነት ይመለከታል። መልስዎን ከጥያቄው ፊት ለፊት ከሚታየው ሳጥን ውስጥ ምልክት ያደረጉ።

ተ.ቁ	ጥያቄዎች	መልስ
401	የጤና መድህን ተጠቃሚ ነዎት?	1= አዎ □ 2= አደለም □
402	መልስዎ አይደለም ከሆነ ለመድሃኒት በአማካኝ በወር ውስጥ ስንት ብር ያወጣሉ?	----------ብር
403	መድሃኒቶቹ ሁሌም በሆስፒታሉ መድሃኒት መደብር ይገኛሉ?	1= አዎ □ 2=አደለም□
404	ከጤና በለሙያዎች ጋር ጥሩ ግንኙነት አለወት?	1,=አዎ □ 2= አደለም□

405	መድሃኒትዎት በሀኪሞች ተቀይሮ ያውቃል?	1,=አዎ □ 2= አደለም□
406	መልስዎ አዎ ከሆነ ስንት ጊዜ?	----------
407	ስለ መድሃኒቱ ጠቀሜታ በሀኪሞች ተነግሮዎት ያውቃል?	1=አዎ □ 2= አደለም□
108	ክትትል የሚያደርጉበት የጤና ተቋም ከቤትዎ በምን ያህል እርቀት ይገናል	---------ኪሎ ሜትር

ክፍል V – ከማህበረሰብ ስልሚገኝ ድጋፍ

ይህ የመጠይቅ ክፍል ተሳታፊው ከቤተሰብ እና ከቤተሰብ ውጪ ካሉ አካላት ምን ያህል ድጋፍ ያገኛል የሚለውን ይዳስሳል። ወደ መጠይቁ ከማለፍዎት በፊት በአማራጭ መልሶች ላይ የሚከተለውን ማብራሪያ ይስጡ።
በተሳታፊው መልሶች ስር ምልክት (√) ያድርጉ።

· **ምንም አይደግፈኝም** - የምጠቅስልዎ አካል ፈፅሞ ድጋፍ የማይሰጥዎ ከሆነ

· **ትንሽ ይደግፈል** - የምጠቅስልዎ አካል አልፎ አልፎ (የተወሰነ) ድጋፍ የሚሰጥዎ ከሆነ

· **ሁሌም ከጎኔ ናቸው** - የምጠቅስልዎ አካል ሁሌጊዜ (ብዙ ጊዜ) ድጋፍ የሚሰጥዎ ከሆነ

· **ጥያቄው አይመለከተኝም** - የምጠቅስልዎ አካል በህይወትዎ ውስጥ ከሌለ

ተ.ቁ	ጥያቄዎች				
	ከነዚህ የቤተሰብ አባላት ምን ያህል ድጋፍ ያገኛሉ?	ምንም አይደግፈኝም (0)	ትንሽ ይደግፈኛል (1)	ሁሌም ከጎኔ ናቸው (2)	ጥያቄው አይመለከተኝም (9)
501	ባልቤትዎ/ፍቅረኛዎ				
502	ሌጆችዎ /የሌጅ ሌጆችዎ				
503	እናትዎ/አባትዎ/አያቶችዎ				
504	ወንድምዎ/ እህትዎ				
505	ሌላ የስጋ ዘመድዎ				
506	በጋብቻ የተዛመደዎት /የሚስት እናት/አባት ወዘተ...../				
	ከእነዚህ ከቤተሰብ ውጪ ካሉ አካላት ምን ያህል ድጋፍ ያገኛሉ				

507	ጎረቤቶችዎ				
508	አብርዎት የሚሰሩ				
509	የሀይማኖት አቻዎችዎ(ጓደኞችዎ)				
510	ጓደኛዎ				
511	ችግር ቢሚገጥምዎት ጊዜ ሊረዳዎት የሚችል ወይም የሚተማመኑበት ሰው አለ?	2=አዎ 0 = የለም			
512	ከላይ ከተጠቀሱት ውስጥ የቱ ነው?	1=የቤተሰብ አባል 2=ከቤተሰብ ውጪ			

ክፍል V:- ስለ መድሃኒት አጠቃቀም ጥብቅ እምነት በተመለከተ።

ከዚህ ከጥሎ የቀረቡት ጥያቄቆች ለሚታዘዙ የደም ግፊት መድሃኒቶች የተሳታፊዎች ጥብቅ እምነትን ይመለከታል። ከተሳታፊው መልስ ፊትለፊት ከሚታየው ሳጥን ውስጥ ምልክት ያደረጉ።

ተ.ቁ	ጥያቄዎች	አማራጭ መልስ
601	መድሃኒትዎን መውሰድዎን ረስትዉ ያውቃሉ?	1=አዎ □ 0 = አይደለም □
602	ባለፉት ሁለት ሳምንቶች የደም ግፊት መድሃኒትዎን ያልወሰዱበት ቀን ይኖር ይሆን?	1=አዎ □ 0 = አይደለም □
603	መድሃኒት ሲወስዱ ጥሩ ስሜት ባለመሰማት ምክንያት ያለ ሀኪም ትዕዛዝ የደም ግፊት መድሃኒትዎትን መውሰድ አቁመው ወይም ቀንሰው ያውቃሉ?	1=አዎ □ 0 = አይደለም □
604	ሲጓዙ ወይም ከቤት ሲወጡ መድኃኒቶችዎን መውሰድዎን ይረሳሉ?	1=አዎ □ 0 = አይደለም □
605	ትናንት የደም ግፊት መድሃኒትዎን ወስደዋል?	0=አዎ □ 1 = አይደለም □
606	የደም ግፊትዎት የተቆጣጠሩት መስሎ ሲሰማዎት መድሃኒተዎትን መውሰድ ያቆማሉ ?	1=አዎ □ 0 = አይደለም □
607	የከፍተኛ የደም ግፊት ህክምናዎን በጥብቅ በመከታተሉ ጭንቀት ተሰምቶዎት ያውቃል?	1=አዎ □ 0 = አይደለም □
608	ሁሉንም የደም ግፊት መድኃኒቶችን መውሰድዎን ለማስታወስ ምን ያህል ጊዜ ይቸግረዎታል?	1=በጭራሽ □ 2=አንዴ □ 3=አንዳንድ ጊዜ□ 4=ብዙውን ጊዜ □ 5=ሁልጊዜ□

ለትብብርዎ ከልብ አመሰግናለሁ!!!