Blood Pressure Control and Determinants of Poor Blood Pressure Control among Adult Hypertensive Patients at Jimma University Specialized Hospital, Southwest Ethiopia

By: Solomon Weldegebreal (B.Pharm)

A Thesis Report Submitted to Department of Pharmacy, College of Health Sciences, Jimma University in Partial Fulfillment for the Requirements of Master of Science Degree in Clinical Pharmacy

October, 2015

Jimma, Ethiopia

Abstract

Background: rate of blood pressure control is small among hypertensive patients and the reasons for poor control of blood pressure remain poorly understood globally.

Objective: To assess rate of blood pressure control and determinants of poor blood pressure control among adult hypertensive patients at Jimma University Specialized Hospital.

Methods: A retrospective cross sectional study among adult hypertensive patients at Jimma University Specialized Hospital follow up clinic was conducted from March 4, 2015 to April 3, 2015. Socio demographic characteristics and medication adherence were collected from patients by face to face interview with pretested semi-structured questionnaire. Comorbidities, antihypertensive medications and blood pressure measurements were collected retrospectively from medical records with a data abstraction format. Biviriate logistic regression model was used to identify factors associated with poor blood pressure control and multivariate logistic regression model was used to identify determinants of uncontrolled blood pressure. P value <0.05 was assumed as statically significant.

Results: A total of 286 hypertensive patients were studied. The response rate was 92%. One hundred fifty four (53.8%) of the participants were males and the mean age of the participants was 54.8± 12.6 years ranging from 26 to 94. The rate of blood pressure control was 50.3% and 60.5% of the participants were adherent to their antihypertensive medication. Seventy eight (27.2%) of the participants had diabetes mellitus and 66 (23.1%) had peripheral neuropathy. Salt intake with food (AOR=24.42, CI=17.05-522.9, p<0.001), age 55-64 years old (AOR=1.15, CI=1.02-5.86, p=0.009), age≥ 65 (AOR=3.3, CI=1.30-17.2, p<0.001) and physical inactivity (AOR=7.097, CI=1.711-29.44, p=0.007) are determinants of uncontrolled blood pressure.

Conclusion: Almost half of the hypertensive patients on follow up had controlled blood pressure and more than half of the participants were adherent to their antihypertensive medication. Diabetes mellitus and peripheral neuropathy were the most common encountered comorbidities. Better health education is recommended to enhance rate of Blood Pressure control.

Key Words: Blood pressure control, Determinants, Jimma University Specialized hospital

Acknowledgments

Table of Contents

List of Tables

List of Figures

Abbreviations and Acronyms

ACEI – Angiotensin Converting Enzyme Inhibitor

AMI – Acute Myocardial Infraction

ARB – Angiotensin Receptor Blocker

BMI – Body Mass Index

BP – Blood Pressure

CCB – Calcium Channel Blocker

CHD – Coronary Heart Disease

CHF- Congestive Heart Failure

CKD – Chronic Kidney Disease

CVD – Cardio vascular Disease

DASH – Dietary Approach to Stop Hypertension

DBP – Diastolic Blood Pressure

DM – Diabetes Mellitus

ICS- Isfahan Cohort Study

JUSH – Jimma University Specialized Hospital

MMAS – Morisk's Medication Adherence Scale

SBP – Systolic Blood Pressure

SPSS – Statistical Package for the Social Sciences

T2DM– Type 2 Diabetes Mellitus

USA- United States of America

UTI – Urinary Tract Infection

1. Introduction

1.1 Background

Hypertension is a common disease that is defined as persistently elevated arterial blood pressure(BP) (1,2,3). It is identified as one of the most significant risk factors for cardiovascular disease (4-7). The prevalence of hypertension continues to increase worldwide and it is projected to increase from approximately 1.0 billion in 2000 to 1.5 billion by 2025 (1,8). Almost three-quarters of people with hypertension (639 million people) live in developing countries with limited health resources and where people have a very low awareness of hypertension and poor BP control (4). Although there is shortage of data, the prevalence of hypertension in Ethiopia ranges from 19.6-30% (9,10,11).

Different epidemiological surveys have revealed that rate of BP control (SBP<140 & DBP < 90 mmHg) is small among hypertensive patients (6). The number of uncontrolled hypertensive patients varies with countries. Rate of BP control among treated cases were (<140/90) 65%,50%, 40%, 32.8% and 30% in Bahrain, USA, England, Zimbabwe, and Germany respectively (12-16). Globally the degree to which current cardiology practice achieves BP control and the reasons for poor control of BP remain poorly understood (14).

Elevated BP has many risk factors that are of behavioral, dietary or genetic origin (17,18). Studies proposed that age, health habits, comorbidities, obesity, poor compliance, antihypertensive regimen, high salt intake and physical inactivity as determinants of poor BP control (12,14,15,19). Further identification of patients at risk of poor BP control can lead to targeted intervention to improve management of hypertension. Besides, in order to improve the BP control rate, a more complete understanding of the determinants of BP control is vital (12).

1.2 Statement of the Problem

Developing countries are increasingly faced with the double burden of hypertension and other cardiovascular diseases along with infection and malnutrition (7,20,21). Hypertension remains one of the most important preventable contributors to disease and death globally (22,23). Despite the availability of effective therapies, hypertension control remains elusive (14,24). Analysis of the global burden of hypertension revealed that over 25% of the world's adult population had hypertension in the year 2000, and the proportion is expected to increase to 29% by 2025. Among the total expected hypertensive patients, Almost three-quarters of people with hypertension live in developing countries (1,4,25,26).

The majority of patient's Blood pressure remain uncontrolled in all societies (27,28,29). Studies indicate that, despite the availability of effective medical therapy more than half of the hypertensive patients on treatment have blood pressures over 140/90 mmHg threshold (1,28).The relationship between BP and the risk of cardiovascular events is continuous, consistent, and independent of other risk factors (30,31). In developing countries the high prevalence of hypertension and poor hypertension control are important factors in rising the epidemic of cardiovascular disease (12).

Uncontrolled hypertension is a major risk factor to coronary heart disease, acute myocardial infarction, peripheral vascular disease, stroke, congestive heart failure and renal failure (18,32). Because of these it is the leading cause of morbidity and mortality among non-communicable diseases, which ranks third as a cause of disability adjusted life-year worldwide and accounts for 13% of all deaths globally. In Ethiopia, hypertension accounted for 1.4 percent of all deaths reported to Federal Ministry of Health of Ethiopia in 2000/01, making it the 7th leading cause of death in the country for the year (8).

Hypertension is a global public health concern that may result to worldwide crisis (25,33,34). Among the factors that contribute to this crisis, poor control of hypertensive patients is a major concern (2). Determinants of poor BP control in hypertension are an area in which research is

lacking probably due to numerous determining factors that interact and influence many outcomes of the disease. Data from a few studies that have examined this area may not be very informative because most of the factors that determine better control of a disease are dependent on specific variables, such as the country and population studied (35,36). In-addition factors such as healthcare delivery systems, co-morbidities and cultural and socioeconomic factors vary from one country to another. Despite understanding of patient characteristics and treatment factors associated with uncontrolled hypertension will help improve patients' outcomes (29,35). Little is known about the magnitude and determinants of uncontrolled hypertension in Ethiopia. However, recent evidences indicate that hypertension and elevated BP are increasing partly because of the increase in risk factors including smoking, obesity, and harmful use of alcohol and lack of exercise (6,8,36). Thus, this study is aimed to assess BP control and determinants of poor BP control among adult hypertensive patients.

2. Literature Review

Hypertension is the largest risk factor for cardiovascular diseases, growing in prevalence and poorly controlled virtually everywhere (37,38). Controlled BP prevents cardiovascular risks (15,16,34). Controlled BP requires determining the prevalence of uncontrolled hypertension and identifying factors associated with uncontrolled hypertension amongst sufferers (15,16,29). Despite difficulty of identifying determinants of BP control different scientific studies have tried to identify the predictors of uncontrolled BP (16).The variables mostly identified by literatures are age, gender, obesity, co morbidity, complexity of antihypertensive regimen, medication adherence, physical inactivity and salt intake (13,16,24,25,39).

Age and sex are among the common Socio demographic characteristics of a patient that can predict the BP control. A cross sectional study from Germany shows that older age (>50 years) and male sex was associated with uncontrolled high BP (39). A survey study from Spain also shows that poor BP control is occurred in older patients and female sex patients (13). Another cross sectional study from Bahrain identifies patients with age group of 45-65 years as an independent predictor of poor BP control (16). In addition a retrospective cohort study from Durham assess that female sex was associated with worse BP control in multivariate analysis (21). On the other hand the Isfahan cohort study (ICS), Iran, an ongoing longitudinal study of adults shows that being men was significantly associated with uncontrolled BP (25).

Obesity is a chronic health problem affecting increasing numbers of people worldwide and is now recognized as a global epidemic (22). Many serious medical problems including hypertension are associated with obesity (30). It is implicated in pathogenesis of various diseases particularly cardiovascular diseases like hypertension and type 2 diabetes mellitus (40). Some literatures also identify it as a risk factor for BP control. Survey from Spain showed that poorer BP control is occurred in obese patients (13). Another analytical cross sectional study from Lupane district hospital (Zimbabwe) and Tikur Anbessa hospital (Ethiopia) also found obesity to be associated with uncontrolled BP (15,41).

Regular aerobic exercise can help to reduce blood pressure (3). Despite the fact, analytical cross sectional study that was carried out at Lupane district hospital (Zimbabwe) and a prospective cohort study from Lebanon assessed physical inactivity not to be significantly associated with uncontrolled BP (12,15). However, a study from Tikur Anbessa hospital(Ethiopia) showed that blood pressure control is relatively difficult for patients who are minimally active or inactive than those who are physically active (41).

High salt diets are common in many communities. Reduction of salt intake is recommended because it can reduce BP and decrease the need for medications in patients who are salt sensitive (3,29). Analytical cross sectional study that was carried out at Lupane district hospital(Zimbabwe) identified adding salt to food at the table was an independent factor associated with uncontrolled BP (15). Moreover cross sectional study from Tikur Anbessa Hospital(Ethiopia) also found that self reported excessive salt addition habit was significantly associated with uncontrolled blood pressure (41).

Poor control of comorbidities in hypertensive patients contributes to significant cardiovascular morbidity and mortality. Improving control of both comorbidities and hypertension has been found very effective in reducing morbidity and mortality (36). Comorbidities may be associated with controlled or uncontrolled BP control. A cross sectional study from Germany showed that history of CVD was associated with controlled BP (39). In addition a retrospective cohort study from Durham showed that patients with a co morbid diagnosis of coronary disease or CHF were more likely to have controlled BP (21). The Isfahan cohort study from Iran also considers diabetes as a powerful predictor of controlled BP control(25).

A survey study from Spain found that poorer BP control was occurred in diabetic patients(13). In addition another cross sectional study from Bahrain shows that uncontrolled BP was seen among diabetic and renal impairment patients. It also identifies poorly controlled diabetes as an independent predictor of uncontrolled BP(16). In a study from Tikur Anbessa Hospital (Ethiopia) having diabetes mellitus or CKD was found to be significantly associated with uncontrolled blood pressure (41).

Regarding Antihypertensive regimen and BP control level, a retrospective cohort study from USA reported that, the more antihypertensive medications a patient was provided the more likely he /she would have uncontrolled hypertension (28). A univariant analysis of survey from Spain also showed that poorer BP control was occurred in patients who was treated with greater or equal to two antihypertensive drugs (13). The Isfahan cohort study from Iran also shows that patients who were naïve to mono-therapy without considering the type of antihypertensive drug were found to be associated with uncontrolled BP (25). Another cross sectional study from Bahrain also identifies multiple drug regimens was an independent predictor of uncontrolled BP (16). On the other hand Analytical cross sectional study at Lupane district hospital(Zimbabwe) identified that those patients who were on a single dose medication regimen were less likely to have uncontrolled BP when compared to those on multiple dose regimen. It also showed that taking traditional herbs in the last 12 months were risk factor for uncontrolled BP (15).

Another major factor that contributes to uncontrolled hypertension is low medication adherence especially in developing countries and blacks (18). Regarding non adherence a cross sectional study in South Africa Republic reported that poor compliance with medication was significantly associated with poor BP control (42). Another cross sectional study from Tikur Anbessa Hospital (Ethiopia) also assessed non adherence to be associated with uncontrolled blood pressure. It also found long duration of hypertension as determinant of uncontrolled BP (41).

2.1 Conceptual Frame Work
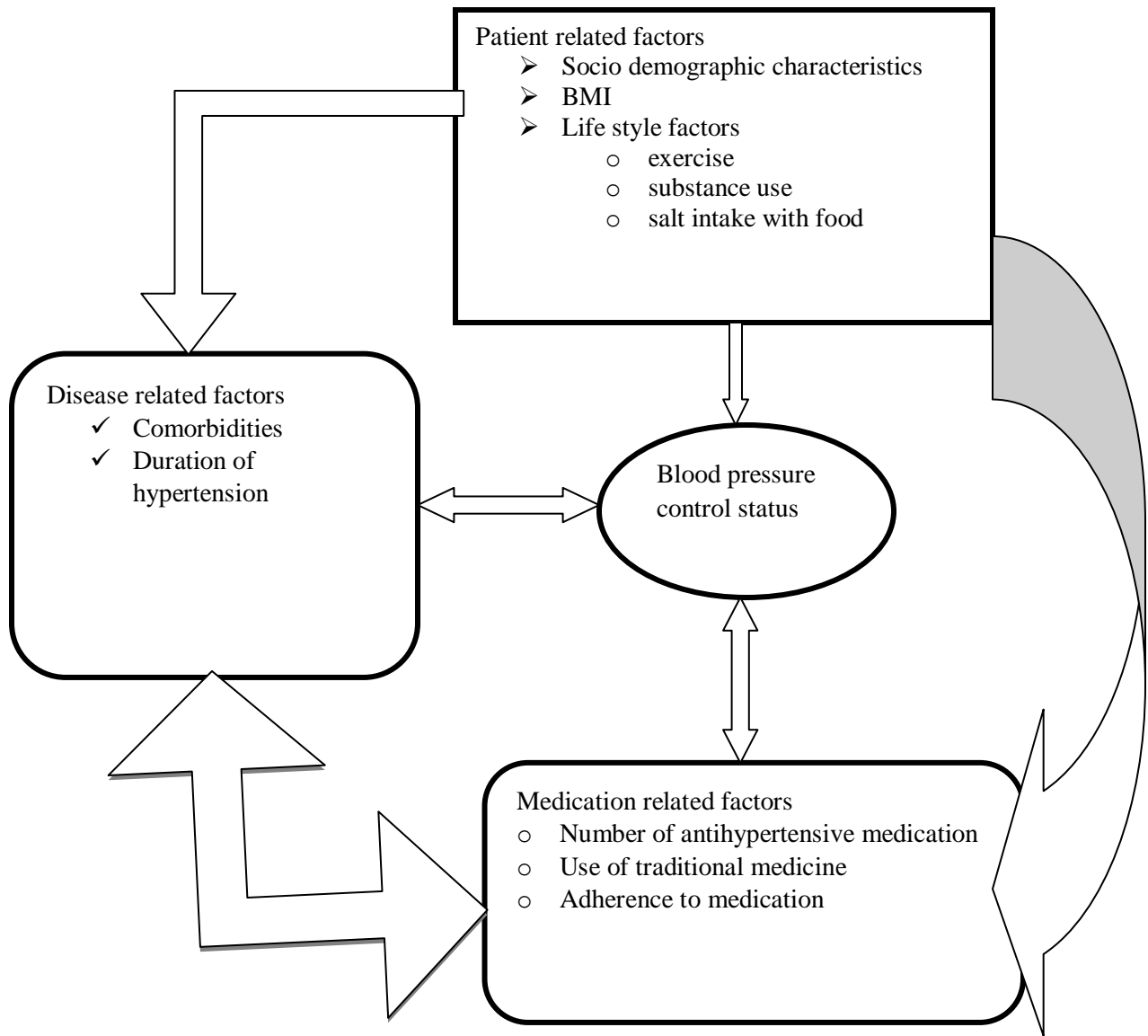
Figure 1: Conceptual frame work for blood pressure control and determinants of poor blood pressure control among adult hypertensive patients at JUSH.

3. Significance of the Study

Hypertension and cardiovascular diseases are becoming a double burden of developing countries like Ethiopia and uncontrolled BP is increasing worldwide (9,22). This study will have role on identifying the prevalence of risk factors of uncontrolled BP and finding strategies to develop effective interventions to overcome these factors. Results from this study will serve to inform practitioners on the impact of different determinant factors on uncontrolled BP, which ultimately reduces the burden of illness in hypertensive patients at the Hospital.

The finding of the study will serve as an input for policy makers in targeting specific intervention areas to improve the quality of care in hypertension as well as other non communicable diseases. It also will have a great role to enable stake holders to avail and afford appropriate antihypertensive and other medications for comorbidities. Moreover it will have also a great relevance on minimizing hospitalization and improving the quality of life of the hypertensive patients so that increases productivity of the whole nation. It also informs practitioners about the status of care and initiates their motivation to improve the level of hypertensive care. Eventually it serves as a base line for further research.

4. Objectives of the Study

4.1 General Objective

- ✓ To assess rate of blood pressure control and determinants of poor blood pressure control among adult hypertensive patients at Jimma University Specialized Hospital, Southwest Ethiopia.

4.2 Specific Objectives

- ✓ To assess rate of blood pressure control.
- ✓ To identify determinants of poor blood pressure control.
- ✓ To asses self-reported adherence to antihypertensive medications.
- ✓ To determine the commonly encountered comorbidities associated with hypertension.

5. Methods and Participants

5.1 Study Area and Period

The study was conducted at Jimma University Specialized Hospital, Southwest Ethiopia. JUSH is a teaching and referral hospital under ministry of education of Ethiopia. The hospital is meant to serve 5 million people as per the four tier system of the National Ministry of Health. Chronic illness care of hypertension is one of the services the hospital provides to the population. The service is given once weekly on Wednesday. There were 1694 hypertensive patients on follow up at the chronic illness care unit. The study was conducted from March, 4, 2015 to April, 3, 2015 at the outpatient chronic illness follow up clinic of Jimma University Specialized Hospital (JUSH).

5.2 Study Design

Retrospective cross sectional study design was used.

5.3 Participants

5.3.1 Source Population

The source population for this study was all adult hypertensive patients who had regular follow-up at chronic illness follow up clinic of JUSH.

5.3.2 Study Population

The study population was all adult hypertensive patients who had come for follow up at the chronic illness clinic of JUSH from March, 4, 2015 to April, 3, 2015 that fulfilled the inclusion criteria.

5.3.3 Inclusion and Exclusion Criteria

5.3.3.1.1 Inclusion Criteria

➢ Hypertensive patient's ≥18 years old and who were on follow up for at least 12 months.

5.3.3.2 Exclusion Criteria

➢ Hypertensive patients who are seriously ill to complete interview.

➢ Patients with incomplete medical records

5.4 Sample Size and Sampling Technique

The minimum sample size required is calculated using single proportion sample size estimating formula.

$$n = \frac{\left(Z_{1-\alpha/2}\right)^2 P(1-P)}{d^2} \quad \text{For population} >10000$$

Since the total population is < 10000(1694) the final sample size is given as:

$$n_f = \frac{N\left(Z_{1-\alpha/2}\right)^2 P(1-P)}{d^2(N-1)+\left(Z_{1-\alpha/2}\right)^2 P(1-P)}$$

Where:

- n is minimum sample size

- P is estimate of the prevalence rate for uncontrolled hypertension (0.67)

- d is the margin of sampling error tolerated which is 0.05

- $Z_{1-\alpha/2}$ is the standard normal variable at (1-α)% confidence level and α is 5%

• 95% confidence level = 1.96

- N population size = 1694

  Therefore n_f =283

Taking 10% of total sample size as non-response rate, the minimum sample size required for the study was 311. Any patient who can fulfill the eligibility criteria was included in the study consecutively until the sample size is achieved with in the study period.

5.5 Measurement and Variables

5.5.1 Variables

5.5.2.1 Independent Variables
- ✓ Socio demographic characteristics
- ✓ Adherence scale
- ✓ BMI
- ✓ Duration of hypertension
- ✓ Life style factors
  - o Exercise
  - o Substance use
  - o Salt intake with food
- ✓ Number of antihypertensive medications
- ✓ Use of traditional medicine
- ✓ Co morbidity

5.5.2.2 Dependent Variables

- ✓ Blood pressure control status

5.6 Data collection procedure

A semi structured interviewer administered questionnaire developed and translated in to local languages (Amharic and Afan Oromo) was administered to solicit information on socio demographic, life style and other variables. The questionnaire was developed after literatures were reviewed thoroughly. Morisky's Medication Adherence Scale (MMAS-8), an 8-item questionnaire with a high reliability and validity, which has been particularly useful in chronic conditions such as hypertension, was used to measure self reported compliance to antihypertensive medication. Physical activity was assessed by asking the participants the number of minutes per day and the number of days per week spent doing vigorous activity.

Body weight was measured to the nearest 0.1kg using a digital scale and height to the nearest 0.1cm in the standing position using a portable height board. Body mass index was calculated as weight (in kg) divided by squared height (in meter squared). Data abstraction format was developed to collect information from the participant's medical records on the treatment regimens, BP, and presence of comorbidities after the participants finish face to face interview. The Data for this study was collected by six clinical nurses and principal investigator as a supervisor.

5.7 Data Processing and Analysis

The statistical analysis was carried out using Statistical Package for the Social Sciences (SPSS) version 20 software. First data was edited and checked for completeness and consistence then entered in to SPSS for analysis. Sample descriptive statics, including frequencies, percentages, means and standard deviation were calculated to summarize the Secoidemographic and clinical characteristics of the study. Continuous variables were expressed as means and standard deviations and categorical variables as percentages. Bivariable logistic regression model was conducted to see the association of each variable with poor BP control. Variables with $p<0.25$ were reanalyzed with multivariable logistic regression to identify determinants of uncontrolled BP. The risks were reported as odds ratio (OR) with corresponding 95% confidence interval. All stastical analyses were performed and a p value of less than 0.05 was considered as statically significant.

5.8 Data Quality Management

Data collectors were trained by the principal investigator for two days about the study. They were given an orientation on the protocol and details concerning participation in the study. Pre-test was conducted on 20 participants before the actual data collection to assess the data collection tool. The pre tested participants were included in the analysis. Based on the finding amendments and arrangements were made on the data collection tool.

Data collection was closely supervised by the principal investigator. At the end of each data collection the data was checked for completeness and consistency.

5.9 Ethical Consideration

Ethical clearance and approval of the study was obtained from Jimma University ethical review board, College of Health Sciences before starting the actual data collection. Subsequent permission was granted from JUSH to access data and interview patients.

Participation of patients in this study was entirely voluntary and confidential and private information like name and address was protected. Non participation did not affect participants' care at the clinic. Each participant was asked to sign a written informed consent before data collection. The right of participants to withdraw from the interview or not to participate was respected. All interviews were carried out at a separate room to keep the patients privacy.

5.10 Dissemination Plan

The finding of the study will be submitted to the Jimma University, College of Health Sciences Department of Pharmacy. The finding will be presented during thesis defense, as a partial fulfillment of Master degree in Clinical Pharmacy. Finally attempts will be made to present the finding on scientific conferences and to publish it in peer reputable journal.

5.11 Operational Definitions

Hypertension: a sustained high blood pressure (SBP≥140 or DBP ≥90mmHg) or reported regular use of anti-hypertensive medications (1).

Uncontrolled hypertension: systolic blood pressure of ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg despite treatment(43).

Controlled blood pressure: systolic blood pressure of <140 mmHg and/or diastolic blood pressure of < 90 mmHg (43).

Rate of blood pressure control: The rate of hypertension control was defined as the number of hypertensive individuals with controlled BP divided by the total number of participants(43).

Adherent: participants with Morisky's medication adherence scale (MMAS-8) less than 3(44).

Non adherent: participants with Morisky's medication adherence scale (MMAS-8) ≥3(44).

Physically active: A person that reports regular aerobic exercise (walking, jogging) of at least 30 min 5 days a week or whose occupation requires physical exertion daily (29).

Physically inactive: A person whose occupation does not require physical exertion daily or that reports regular aerobic exercise (walking, jogging) of less than 30 min or that reports regular aerobic exercise (walking, jogging) of at least 30 min but less than 5 days a week (29).

Obese: if a person has BMI >30kg/m2 (45).

Overweight: if a person has BMI within the range of 25–29.9 kg/ m2 (45).

Ex-smokers: people who were formerly daily smokers but currently do not smoke at all (46)..

Never-smokers: people those who have never smoked at all (46).

A smoker: someone who, at the time of the survey, smokes any tobacco product either daily or occasionally (46).

Alcohol drinker: someone who takes any type of alcohol at the time of survey either daily or occasionally.

Chat chewer: someone who takes chat at the time of survey either daily or occasionally.

Coffee drinker: someone who takes coffee at the time of survey daily.

Incomplete medical records: medical record that lacks 15-20% of the information needed to be collected by the data abstraction format.

6. Results

6.1 Socio Demographic Characteristics

In this study, a total of 311 participants were interviewed and of this, 286 had complete data and studied. The response rate was 92%. The flow diagrammatic presentation of study participant's selection is depicted in **figure 2**.
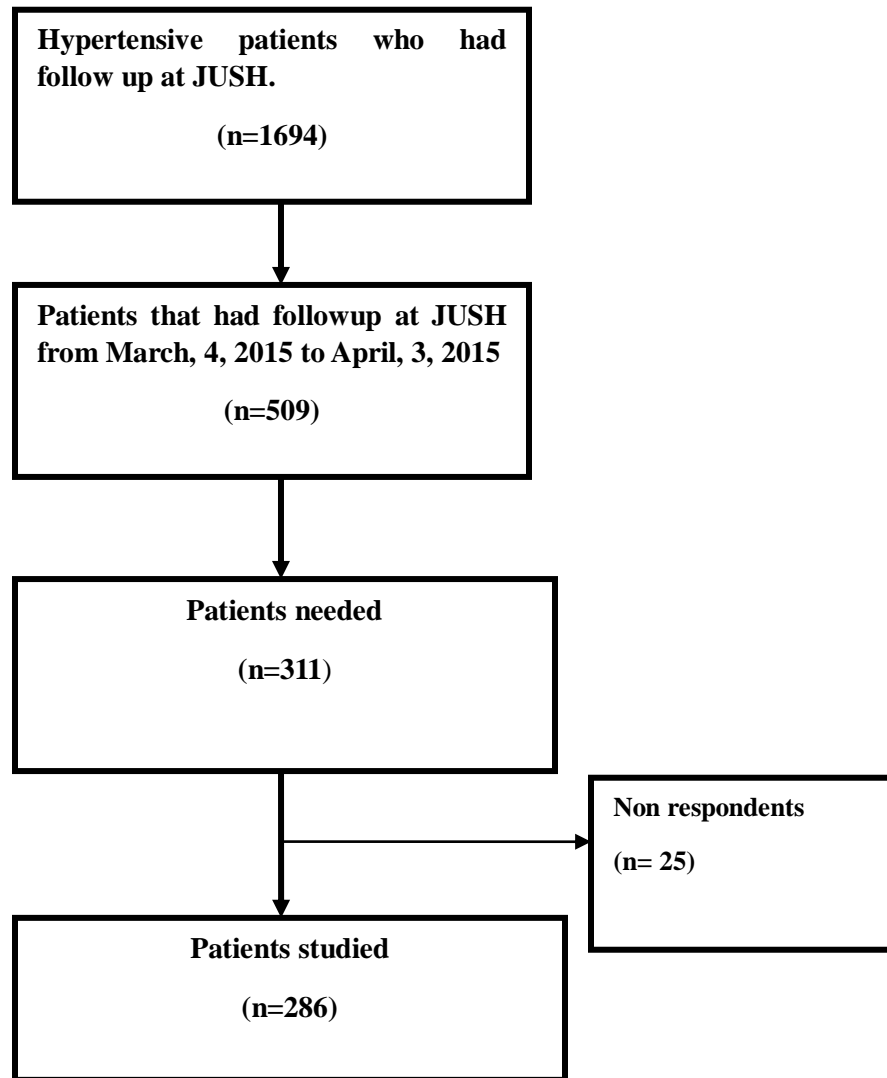
Figure 2; flow chart for the study participant's selection in JUSH from March 4, 2015 to April 3, 2015

As shown in **table 1** One hundred fifty four (53.8%) of the participants were males. The mean age of the participants was 54.8±12.6 year ranging from 26 - 94 year's. Eighty (28.0%) of the participants were 45-54 years and 76(26.6%) 55-64 years old. Two hundred twenty six (79.0%) of the participants were married and 41(14.3%) were divorced. By religion classification 145 (47.2%) of the participants were Muslim and 125(43.7%) were orthodox Christian in religion.

Table1: Frequency distribution of socio demographic characteristics of hypertensive patients on treatment at JUSH from March 4, 2015 to April 3, 2015.

Characteristics	Number (N=286) and percentage (%)
Age in years, mean ±SD	**54.8±12.6**
Below 35	10(3.5)
35-44	49(17.1)
45-54	80(28.0)
55-64	76(26.6)
65 and above	71(24.8)
Gender	
Male	154(53.8)
Female	132(46.2)
Marital status	
Single	4(1.4)
Married	226(79)
Divorced	41(14.3)
widowed	15(5.2)
Educational level	
No formal education	111(38.8)
Primary education(1-8grade)	67(32.4)
Secondary education(9-12 grade)	46(16.1)
Tertiary education(diploma and above)	62(21.7)
Religion	
Islam	135(47.2)
Orthodox Christian	125(43.7)
Protestant	25(8.7)
Others*	1(0.3)
Current occupation	
Civil servant	80(28)
Merchant	35(12.2)
Farmer	49(17.1)
House wife	91(31.8)
Retired	23(8)
Jobless	8(2.8)
BMI, mean ±SD	**26.2 ± 3.00 kg/m2**
<18.5	84(29.4)
18.5-29.9	173(60.5)
30-35	29(10.1)
Duration of hypertension in years, mean ±SD	**5±4.1 years**
<5 years	165(57.7)
≥5 years	121(42.3)

* wakifeta, BMI: body mass index, SD: standard deviation, N: number of participants

6.2. Medication Adherence

As depicted in **table 2,** 173(60.5%) of the participants were adherent and the others were non adherent to their antihypertensive medication. The MMAS-8 score of the participants ranges from 0-7. No participant had scored MMAS-8 score of 8. Seventy four (25.9%) of the participants scored MMAS-8 score of 2 and 64(22.3%) scored MMAS-8 score of 1. Ninety six (33.6%) of the participants reported Forgetting medications while leaving their home as the reason for non adherence.

Table 2: Morisky's medication adherence scales score among adult hypertensive patients at JUSH from March, 4, 2015 to April, 3, 2015.

Adherence	MMAS-8	Number of participants (%)
Adherent	0	35(12.2)
	1	64(22.4)
	2	74(25.9)
Total		173(60.5)
Non adherent	3	46(16.1)
	4	37(12.9)
	5	15(5.3)
	6	7(2.4)
	7	2(0.7)
Total		107(37.4)

MMAS-8: Morisky's medication adherence scale-8

6.3 Life Style Factors

While dealing with life style factors of the participants, 160 (55.9%) of the participants took salt in their food and 158(55.2%) were physically inactive. Regarding social drug use behavior, nine (3.11%) of the participants have been smoking cigarettes, 48(16.8%) have been drinking alcohol and 122(42.7%) were chat chewers.

Table 3: Frequency distribution of life style factors among adult hypertensive patients at JUSH from March 4, 2015 to April 3, 2015.

Factors	Frequency (%) N=286
Salt intake with food	
Yes	160(55.9)
No	126(44.1)
Alcohol intake	
Yes	48(16.8)
No	238(83.2)
Chat chewing	
Yes	122(42.7)
No	164(57.3)
Cigarette smoking status	
Never smoked	268(93.7)
Ex smoker	9(3.1)
Current smoker	9(3.1)
Physical activity	
Physically active	128(44.8)
Physically inactive	158(55.2)
Coffee intake	
Yes	167(58.4)
No	119(41.6)
Traditional medicine intake	
Yes	42(14.7)
No	244(85.3)

N; number of participants

6.4. Comorbidities

While dealing with co morbidity status, more than half 167 (58.4%) of the participants had at least one written evidence of co-morbidity. Seventy eight (27.2%) of the participants had diabetes, 66 (23.1%) of the participants had peripheral neuropathy and 32(11.2%) had dyspepsia. The frequency of comorbidities is presented in **table 4**.

Table 4: Frequency of comorbidities among adult hypertensive patients at JUSH from March 4, 2015 to April 3, 2015

Comorbidities	Frequency (%) N=286
Diabetes mellitus	78(27.2%)
Peripheral neuropathy	66(23.1%)
Dyspepsia	32(11.2%)
HHD	14(4.9%)
HF	8(2.8%)
CKD	6(2.1%)
UTI	6(2.1%)
HIV	4(1.4%)
IHD	4(1.4%)
Asthma	3(1.1%)
Sexual dysfunction	3(1.1%)
Others*	9(3.1%)

*:Thyrotoxicosis, arrhythmia, left ventricular hyperthrophy, nephritic syndrome, Gynecomastia, Constipation, generalized tonic clonic seizure, IHD: ischemic heart disease, HHD: hypertrophic heart disease, HF: heart failure, CKD: chronic kidney disease, UTI: urinary tract infection HIV: human immuno deficiency virus, N; number of participants

6.5. Antihypertensive Medications

Among the 286 participants, 196 (68.53%) were prescribed with more than one antihypertensive medication. One hundred forty nine (52.1%) were on two medications and 84 (29.4%) were on mono-therapy. Seventy seven (27%) of the participants on two combination had uncontrolled BP. Fifty three (18.6%) of the participants on mono-therapy had controlled blood pressure. Number of antihypertensive medications prescribed were not associated (P=0.094) with blood pressure control status. Regarding the cost of antihypertensive medications 92(32.2%) of the participants were getting their medication for free. The frequency of antihypertensive medications prescribed is presented in **figure 3**.
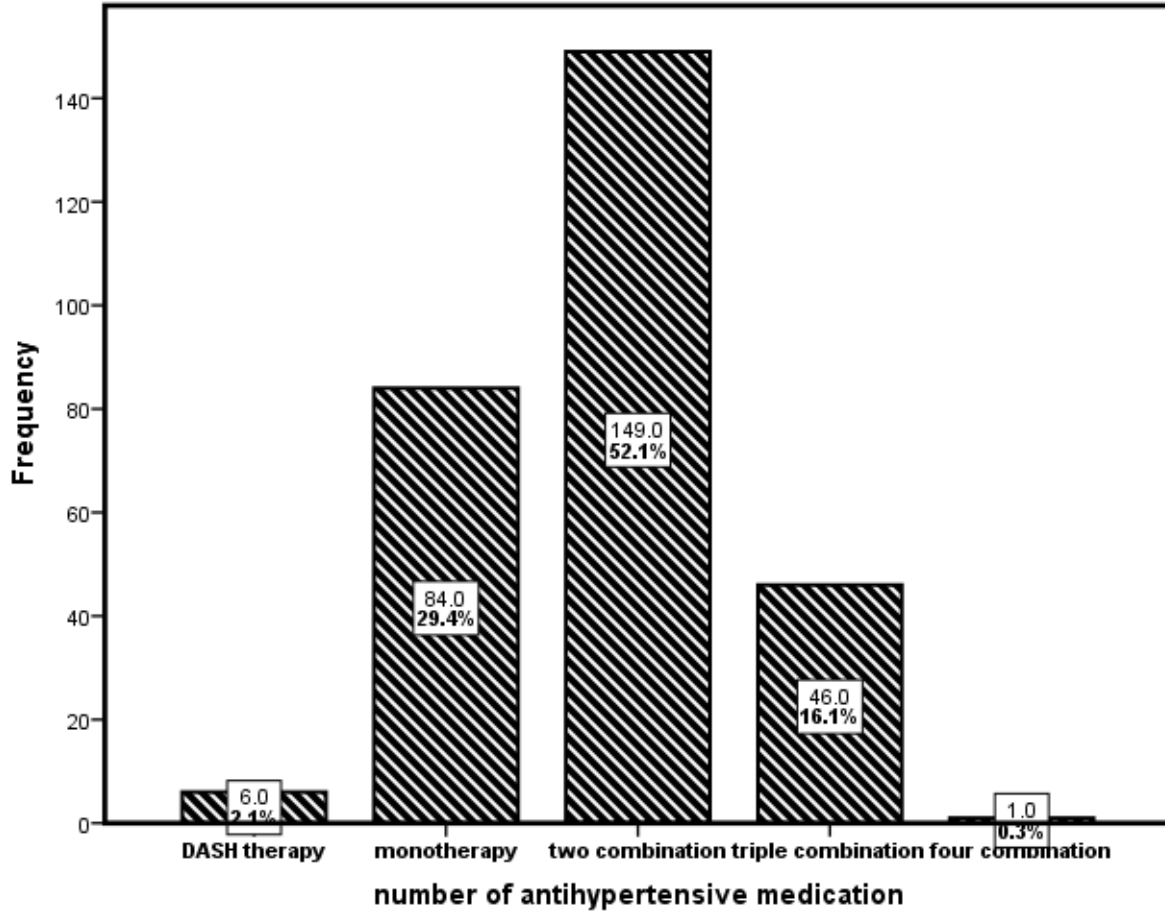
Figure 3: Distribution of Patient's Number of Antihypertensive Agents Prescribed among Adult Hypertensive Patients at JUSH from March 4, 2015 to April 3, 2015.

Regarding antihypertensive regimens, Angiotensin converting enzyme inhibitors *(*ACEIs) and diuretics were prescribed in 88(30.8%) of the participants. The remainder of the combination prescription is presented in **table 5**.

Table 5: Frequency of Anti-hypertensive Medication Combination Regimens among Adult Hypertensive Patients at JUSH from March 4, 2015 to April 3, 2015.

Combination regimen	Frequency (%)
ACEI + Di	88(30.8)
ACEI + BB+ Di	23(8)
ACEI + BB	15(5.2)
CCB+ Di	15(5.2)
BB + Di	14(4.9)
ACEI + CCB	12(4.2)
ACEI + CCB+ Di	10(3.5)
ACEI + BB + CCB	7(2.4)
BB+ CCB+ Di	6(2.1)
DASH therapy	6(2.4)
Others	6(2.4)

BB: β-blockers, CCB: calcium channel blockers, ACEI: angiotensin converting enzyme inhibitors, ARB: angiotensin II receptor blockers, Di: Diuretics, DASH: Dietary approach to stop hypertension, *: BB+CCB, ACEI+ BB+ CCB+ Di, Diuretic + methyldopa, ARB +CCB and ARB + BB

By drug class, 206 (72.0%) of the participants were prescribed with angiotensin-converting enzyme inhibitors (ACEIs) and 182 (34.7%) with diuretics. Commonly prescribed antihypertensive medications pharmacologic classes are presented in **table 6**.

Table 6: Antihypertensive Agents Used among Adult Hypertensive Patients at JUSH from March 4, 2015 to April 3, 2015.

Antihypertensive medication class	Number of patient and percentage
ACEIs	**206(72.0%)**
Enalapril	206(100%)
Diuretics	**182(63.6%)**
Thiazides(HCT)	182(100%)
β- Blockers	**73(25.5%)**
Atenolol	72(98.6%)
Metoprolol	1(1.4%)
CCB	**59(20.6%)**
Amilodipine	55(93.2%)
Nifedipine*	4(6.8%)
ARB	**2(0.7%)**
losartan	2(100%)
Others	**2(0.7%)**

Others: methyldopa, HCT: hydrochlorothiazide, * extended release

6.6. Blood Pressure Control and Associated Factors

The rate of blood pressure control in this study was 50.3%. The overall mean SBP was 132.13 ±20.30 and overall mean DBP was 81.5±12.1. The bi-variable logistic regression showed that many factors are associated with uncontrolled blood pressure. As shown in **table 7,** the variables that are associated with uncontrolled BP are salt intake with food (COR=63.3, CI=44.82-286.57, P<0.001), coffee intake (COR=67.5, CI=28.697-158.76 p<0.001), chat chewing (COR=8.759, CI: 5.078-15.109, P<0.001), age 55-64 (COR=6.67, CI=1.260-35.3, p=0.045), age ≥65 years (AOR=4.12, CI=2.14-7.93, p=0.008), traditional medicine intake (COR= 2.019, CI=1.024-3.983 P=0.043) and physical inactivity (COR= 70.342, CI=31.57-156.71 p<0.001).

Table 7: **Bivariate logistic regression analysis of factors associated with uncontrolled blood pressure among adult hypertensive patients on treatment at JUSH from March 4, 2015 to April 3, 2015.**

Variables	Blood pressure status		COR	95%CI	P-value
	Uncontrolled (%)	Controlled (%)			
Sex					
Male	80(51.9)	74(48.1)	1.221	0.766-1.944	p=0.401
female(1)	62(47)	70(53)	(1)	(1)	(1)
Age					
Below 35	3(30)	7(70)	0.271	0.065-1.128	p=0.073
35-44	23(46.9)	26(53.1)	0.56	0.273-1.149	p=0.114
45-54(1)	49(61.3)	31(38.8)	(1)	(1)	(1)
55-64	39(51.7)	37(48.7)	6.67	1.260.35.3*	p=0.045
65 & above	28(39.4)	43(60.6)	4.12	2.14-7.93*	p=0.008
Marital status					
Single/widowed	9(47.4)	10(52.6)	0.900	0.352-2.298	p=0.826
Married(1)	113(50)	113(50)	(1)	(1)	(1)
divorced	20(48.8)	21(51.2)	0.952	0.490-1.853	p=0.886
Religion					
Orthodox	63(50.4)	62(49.6)	1.233	0.757- 2.007	p=0.400
Protestant/wakifeta	18(69.2)	8(30.8)	2.73	1.111- 6.708	p=0.029
Muslim(1)	61(45.2)	74(54.8)	(1)	(1)	(1)
Occupation					
Civil servant	42(52.5)	38(47.5)	1.303	0.740-2.292	p=0.359
Merchant	19(54.3)	16(45.7)	1.400	0.658-2.976	p=0.382
Farmer	25(51)	24(49)	1.228	0.632-2.384	p=0.545
Unemployed(1)	56(45.9)	66(54.1)	(1)	(1)	(1)
DM					
Yes	46(59)	32(41)	1.677	0.99-2.841	p=0.055
No(1)	96(46.2)	112(53.8)	(1)	(1)	(1)
P.neuropathy					
Yes	26(39.4)	40(60.6)	0.583	0.333-1.020	p=0.059
No(1)	116(52.7)	104(47.3)	(1)	(1)	(1)
Dyspepsia					
Yes	16(50)	16(50)	1.016	0.487-2.119	p=0.967
No(1)	126(49.6)	128(50.4)	(1)	(1)	(1)
HHD					
Yes	7(50)	7(50)	1.015	0.347-2.971	p=0.979
No(1)	135(49.6)	137(50.4)	(1)	(1)	(1)
BMI(kg/m2)					
<18.5	35(41.7)	49(58.3)	0.706	0.417-1.195	p=0.195
18.5-29.9(1)	87(50.3)	86(49.7)	(1)	(1)	(1)
30-35	20(69)	9(31)	2.197	0.947-5.095	p=0.067

26

Table 7. continued

Variables	Blood pressure status		COR	95%CI	P-value
	Uncontrolled (%)	Controlled (%)			
Adherence scale					
adherent	88(50.9)	85(49.1)	1.016	0.627-1.646	p=0.948
non adherent(1)	54(50.5)	53(49.5)	(1)	(1)	(1)
No of anti-HTN medications					
≤1 combination	36(40)	54(60)	0.623	0.367-1.059	p=0.081
2 combination(1)	77(51.7)	72(48.3)	(1)	(1)	(1)
≥3 combination	29(61.7)	18(38.3)	1.506	0.771-2.945	p=0.231
Coffee intake					
Yes	135(80.8)	32(19.2)	67.5	28.697-158.76*	p<0.001
No(1)	7(5.9)	112(94.1)	(1)	(1)	(1)
Salt intake					
Yes	136(85)	24(15)	63.3	44.82-286.57*	p<0.001
No(1)	6(4.8)	120(95.2)	(1)	(1)	(1)
Physical activity					
Physically active(1)	9(7.0)	119(93)	(1)	(1)	(1)
Physically inactive	133(84.2)	25(15.8)	70.342	31.57-156.71*	p<0.001
Alcohol intake					
Yes	24(50)	24(50)	1.017	0.547-1.89	p=0.958
No(1)	118(49.6)	120(50.4)	(1)	(1)	(1)
Chat chewing					
Yes	95(76.6)	27(23.4)	8.759	5.078-15.109*	p<0.001
No(1)	47(28.7)	117(71.3)	(1)	(1)	(1)
Traditional medicine intake					
Yes	27(64.3)	15(35.7)	2.019	1.024-3.983	p=0.043
no(1)	115(47.1)	129(52.9)	(1)	(1)	(1)
Cigarette smoking					
Non smoker(1)	133(49.6)	135(50.4)	(1)	(1)	(1)
Ex-smoker	6(66.7)	3(33.3)	2.03	0.497-8.286	p=0.324
Current smoker	3(33.3)	6(66.7)	0.508	0.124-2.071	p=0.345
Duration of HTN					
<5 year(1)	99(49)	103(51)	(1)	(1)	(1)
≥5 years	43(51.2)	41(48.8)	1.182	0.739-1.89	p=0.484
Co morbidity					
Yes	82(49.1)	85(50.9)	0.949	0.593-1.518	p=0.826
No(1)	60(50.4)	59(49.6)	(1)	(1)	(1)
Cost of medicine					
Paid	97(50)	97(50)	1.044	0.636-1.716	p=0.864
Free(1)	45(48.9)	47(51.1)	(1)	(1)	(1)

*statically significant, (1): Reference category, CI: confidence interval, COR: Crude odds ratio: DM: diabetes mellitus, HHD: hypertensive heart disease, BMI: body mass index, p.neuropathy: peripheral neuropathy

As shown in **table 8**, after multivariate logistic regression analysis, the determinants of uncontrolled BP are salt intake with food (AOR=24.42, CI=17.05-522.9, p<0.001), age 55-64 years old (AOR=1.15, CI=1.02-5.86, p=0.009), age≥ 65 (AOR=3.3, CI=1.30-17.2, p<0.001) and physical inactivity (AOR=7.097, CI=1.711-29.44, p=0.007)**.** Participants who took salt with their food are 24 times more likely to have uncontrolled than those who did not take salt with their food (AOR=24.42, CI=17.05-522.9, p<0.001). Physically inactive participants are 7 times more likely to have uncontrolled BP than physically active participants (AOR=7.097, CI=1.711-29.44, p=0.007). Participants with age 55-64 years are more likely to have uncontrolled BP as compared to age group of 45-54 years old (AOR=1.15, CI=1.02-5.86, p=0.009). In addition, participants with age ≥65 years are three times more likely to have uncontrolled BP than participants with age of 45-54 years old (AOR=3.3, CI=1.30-17.2, p<0.001).

Table 8: **Multivariate logistic regression analysis of factors associated with uncontrolled blood pressure among adult hypertensive patients on treatment at JUSH from March 4, 2015 to April 3, 2015.**

Variables	Blood pressure status		COR(95%CI)P-value	AOR(95%CI)P-value
	Uncontrolled (%)	Controlled (%)		
Age**				
Below 35	3(30)	7(70)	0.271(0.065-1.128)p=0.073	0.22(0.005-10.77)p=0.447
35-44	23(46.9)	26(53.1)	0.56(0.0273-1.149)p=0.114	0.412(0.077-2.197)p=0.299
45-54(**1**)	49(61.3)	31(38.8)	(**1**)	(**1**)
55-64	39(51.7)	37(48.7)	6.67(1.260-35.3)p=0.045	1.15(1.02-5.86*)p=0.009
65 & above	28(39.4)	43(60.6)	4.12(2.14-7.93*)p=0.008	3.3(1.30-17.2*)p<0.001
Religion				
Orthodox	63(50.4)	62(49.6)	1.233(0.757-2.007)p=0.400	1.172(0.46-2.99)p=0.734
Protestant/wakifeta	18(69.2)	8(30.8)	2.73(1.111-6.708)p=0.029	2.65(0.348-20.3)p=0.346
Muslim(**1**)	61(45.2)	74(54.8)	(**1**)	(**1**)
DM				
Yes	46(59)	32(41)	1.677(0.99-2.841)p=0.055	1.52(0.558-4.183)p=0.41
No(**1**)	96(46.2)	112(53.8)	(**1**)	(**1**)
Peripheral neuropathy				
Yes	26(39.4)	40(60.6)	0.583(0.333-1.020)p=0.059	0.382(0.14-1.043)p=0.06
No(**1**)	116(52.7)	104(47.3)	(**1**)	(**1**)
BMI(kg/m2)				
<18.5	35(41.7)	49(58.3)	0.706(0.417-1.195)p=0.195	0.70(0.272-1.79)p=0.458
18.5-29.9(**1**)	87(50.3)	86(49.7)	(**1**)	(**1**)
30-35	20(69)	9(31)	2.197(0.947-5.095)p=0.067	3.971(0.82-19.02)p=0.085
No of anti-HTN medications				
≤1 combination	36(40)	54(60)	0.623(0.367-1.059)p=0.081	0.907(0.29-2.752)p=0.863
2 combination(**1**)	77(51.7)	72(48.3)	(**1**)	(**1**)
≥3 combination	29(61.7)	18(38.3)	1.506(0.771-2.945)p=0.231	1.995(0.464-8.57)p=0.353
Coffee intake				
Yes	135(80.8)	32(19.2)	67.5(28.69-158.76*) p<0.001	1.33(0.202-8.749)p=0.767
No(**1**)	7(5.9)	112(94.1)	(**1**)	(**1**)
Salt intake**				
Yes	136(85)	24(15)	63.3(44.82-286.57*) p<0.001	24.4(17.05-522.9*)p<0.001
No(**1**)	6(4.8)	120(95.2)	(**1**)	(**1**)
Physical activity**				
Physically active(**1**)	9(7.0)	119(93)	(**1**)	(**1**)
Physically inactive	133(84.2)	25(15.8)	70.34(31.57-156.71*) p<0.001	7.09(1.71-29.44*)p=0.007
Chat chewing**				
Yes	95(76.6)	27(23.4)	8.75(5.078-15.109*) p<0.001	1.233(0.433-3.51)p=0.694
No(**1**)	47(28.7)	117(71.3)	(**1**)	(**1**)
Traditional medicine intake				
Yes	27(64.3)	15(35.7)	(**1**)	(**1**)
no(**1**)	115(47.1)	129(52.9)	2.019(1.024-3.983)p=0.043	1.27(0.305-5.3)p=0.742
Duration of HTN				
<5 year(**1**)	99(49)	103(51)	(**1**)	(**1**)
≥5 years	43(51.2)	41(48.8)	1.182(0.739-1.89)p=0.484	1.593(0.64-3.96)p=0.317

**: Determinants of uncontrolled blood pressure, *statically significant, (1): Reference category, AOR: adjusted odds ratio, CI: confidence interval, COR: Crude odds ratio, DM: diabetes mellitus, HHD: hypertensive heart disease, BMI: body mass index.

7. Discussion

In this study, 50.3%, of the participants had controlled blood pressure. More than half, 60.5%, of the participants were adherent to their antihypertensive medications and care. Diabetes mellitus followed by peripheral neuropathy were the commonly encountered comorbidities. The determinants of uncontrolled blood pressure in this study are salt intake with food, age 54-65, age $\geq$ 65 years old and physical inactivity.

The rate of BP control in this study was 50.3%. This is higher than the finding reported by Goverwa TP et al(32.8%) from Zimbabwe (15). This might be due to high prevalence of physical inactivity, bad dietary habits and obesity in study from Zimbabwe. The level of rate of BP control was relatively similar with rate of BP control in Addis Ababa, Ethiopia (40.1%) and Gonder, Ethiopia (46.6%) (41,47). This could be due to socioeconomic similarity of the participants. However the rate of BP control of JUSH was lower than the findings reported from Bahrain (66.3%) and USA (69.7%) (16,19). This might be due to better medical as well as pharmaceutical care provision and access to patients in these countries.

In this study, age is significantly associated with uncontrolled blood pressure. Multivariate logistic regression showed that patients with age group of 55-64(AOR=1.15, CI=1.02-5.86, p=0.009) & 65 and older (AOR=3.3, CI=1.30-17.2, p<0.001) are determinants of uncontrolled BP. Participants with age 55-64 years are more likely to have uncontrolled BP as compared to age group of 45-54 years old (AOR=1.15, CI=1.02-5.86, p=0.009). In addition, participants with age $\geq$65 years are three times more likely to have uncontrolled BP than participants with age of 45-54 years old (AOR=3.3, CI=1.30-17.2, p<0.001).This is coherent with a study from Bahrain and Germany (16,39). In fact literatures showed that age is most strongly related to systolic blood pressure and isolated systolic hypertension accounts for the majority of cases with uncontrolled BP in individuals greater than 60 years of age (48). However, according to JNC8 guide line the systolic threshold for controlled hypertension is 150mmHg which is higher than the threshold for uncontrolled blood pressure (140mmHg) (2). This could account for the high prevalence of uncontrolled Hypertension in elder age groups.

While dealing with association of physical inactivity and blood pressure control, physical inactivity is determinant of uncontrolled BP (AOR=7.097, CI=1.711-29.44, p=0.007). In this study, physically inactive participants are 7 times more likely to have uncontrolled BP than physically active participants. This is coherent with the study from Addis Abeba, Ethiopia(41). This supports the benefit of aerobic exercise on blood pressure reported by other studies that remind that Regular aerobic exercise can lower the BP by as much as 5 to 15 mmHg in patients with essential hypertension (49,50).

In JUSH, salt intake with food is determinant of uncontrolled BP (AOR=24.42, CI=17.05-522.9, p<0.001). Participants who took salt in their meal are 24 times more likely to have uncontrolled BP than participants who did not take salt in their meal. This is consistent with a study from Zimbabwe (15). This could be due to similar life standards of the participants in those countries. In fact guide lines recommend restriction of sodium salt intake to less than 2.3gm/day rather than absolute forbidden of salt intake (2).However in our set up participants sedentary life could not enable them to restrict salt intake to less than 2.3gm/day. Even if ideal method of determining salt consumption at the population level would be through the measurement of 24 hour urinary sodium excretion, this was not possible in the present study largely due to logistics limitations. In the absence of such laboratory methods, a qualitative assessment of the salt use behavior may offer important clues on salt intake.

For many hypertensive patients, combination therapy is believed to achieve better control than mono-therapy (51). However, 12.6% of participants were on one type of medicine despite of the uncontrolled blood pressure. This is in lined with a study from Zimbabwe (15). This may be due to shortage of doctors as hypertensive medications can only be initiated by a doctor. The availability of other types of medicines may also be a challenge thus forcing the prescribers to continue with mono-therapy even when it is inadequate.

More than half, 60.5%, of the study subjects in JUSH were found to be adherent to their antihypertensive medication treatment. It is higher than the findings depicted in Malaysia (44.2%) and Gambia (27%) (52,53). This difference is possibly because 32.2% of the participants in this study receive free medical care and drugs whereas in the other study patients had to pay for their treatment. The level of adherence of JUSH is quite similar with findings in local studies conducted at Gonder, Northwest Ethiopia (64.6) and Adama, Ethiopia (59.5%) (47,54). This might be due to similarity of socioeconomic characteristics of the participants. However adherence of antihypertensive treatment of JUSH was lower than the studies done in Egypt (74.1%), Pakistan (77%) and Scotland (91%) (55,56,57). This could be due to better care and access of health facilities in these countries.

Out of the 286 participants, 27.2% of the participants in JUSH had diabetes mellitus as co morbidity. It is coherent with the finding that has been reported in Brazil (29.8%).However it is lower than what has been reported from Bahrain by which 55.8% of the patients had diabetes mellitus (16). This might be due to high prevalence of obesity (43.6%) in the participants enrolled in Bahrain (16). The low prevalence of other comorbidities in this study as compared to other studies could be due to low availability of diagnostic materials and laboratory facilities.

8. Strengths and Limitations of the Study

8.1. Strengths

The Strength of the study was that the data collectors underwent rigorous training and close super vision to ensure good validity of the data. Data were collected both from patients card and patients themselves this helped the investigator to have more complete information. Efforts were done to standardize adherence scale using validated 8 item Morisky's medication adherence scale. Physical activity was also tried to be standardized by asking the number of minutes and days he/she spent on exercising.

8.2. Limitations

The study is cross sectional study and has some limitations like social desirability bias and recall bias. Due to self-presentation concerns, patients may understate socially undesirable activities like non-adherence; smoking, alcohol intake and chat chew and overstate socially desirable ones like adherence. In addition, this is a single centre study with modest number of individuals, which may limit the generalization of the findings to wider contexts. On the other hand, for the restriction of survey methods and research ethics, patients with severe acute diseases were excluded, who may represent a substantial amount of hypertensive patients.

9. Conclusion and Recommendations

9.1 Conclusions

Almost half of the participants had controlled BP. More than half of the participants were adherent to their medication. Diabetes mellitus and peripheral neuropathy were the most commonly encountered comorbidities associated with hypertension. Salt intake with food, age 55-64 years old, age ≥65years old and physical inactivity are the determinants of uncontrolled blood pressure.

9.2.   Recommendations

9.2.1 Health Care Provider

- ✓ Health care providers should intently focus on the proper advice of the patients regarding life style modifications.
- ✓ Health care providers should establish strategies to provide hospital based and home based health education regarding life style modification.
- ✓ Health care providers should avail adequate antihypertensive medications.

9.2.2   Jimma University Specialized Hospital

- ✓ The hospital should develop its own guideline that properly address specifically for chronic illness like hypertension that ensures the provision of quality care.
- ✓ The hospital should provide laboratory facilities that can help health care providers to provide quality care for the patients.
- ✓ The hospital should facilitate involvement of clinical pharmacy specialist to enhance rate of BP control.

9.2.3   For Researchers

- ✓ Further research is needed about the rate and determinants of uncontrolled BP.

References

1. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. Lancet. 2005;365(9455):217-223. [PubMed].

2. Paul A. James, Suzanne O, Barry L. Carter, William C. Cushman M, Chery Dennison-Himmelfarb, Handler J, Daniel T. Lackland D, Michael L. LeFevre, Thomas D. MacKenzie, Olugbenga Ogedegbe M, Sidney C. Smith Jr, Laura P. Svetkey, Sandra J. Taler, Raymond R. Townsend M, Jackson T.Wright Jr, Andrew S. Narva, Eduardo Ortiz M. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014;311(5):507–20.

3. Weber MA, Schiffrin EL, White WB, Mann S, Lindholm LH, Kenerson JG, et al. Clinical Practice Guidelines for the Management of Hypertension in the Community A Statement by the American Society of Hypertension and the International Society of Hypertension. J Clin Hypertens. January 2014;16(1).

4. George S. Stergiou, Georgia C. Thomopoulou, Irini I. Skeva and TDM. Prevalence, Awareness, Treatment, and Control of Hypertension in Greece The Didima Study. Am J Hypertens. 1999;12(10):959–65.

5. Wong ND, Lopez VA, Italien GL, Chen R, Kline SEJ, Franklin SS. Inadequate Control of Hypertension in US Adults With Cardiovascular Disease Comorbidities in 2003-2004. Arch Intern Med. 2007;167(22):2431–6.

6. Appel LJ, Brands MW, Daniels SR, Karanja N, Elmer PJ, Sacks FM. Dietary Approaches to Prevent and Treat Hypertension A Scientific Statement From the American Heart Association. Hypertension. 2006;47:296–309.

7. Mufunda J, Mebrahtu G, Usman A, Nyarango P, Kosia A, Ghebrat Y, et al. The prevalence of hypertension and its relationship with obesity : results from a national blood pressure survey in Eritrea. J Hum Hypertens. 2006;20:59–65.

8. Lester FT, Oli K: Epidemiology and Ecology of Health and Disease in Ethiopia. In Chronic Noninfectious Diseases in Ethiopian Adults 1st edition. Edited by: Berhane Y, Mariam HD, Kloos H. Shama Books, Addis Ababa;2006:702-719..

9. Gudina K, Bonsa F, Gudina EK, Hajito KW. Prevalence of Hypertension and Associated Factors in Bedele Town, Southwest Ethiopia. Ethiop J Heal Sci. 2014;24(1).

10. Helelo TP, Gelaw YA, Adane AA. Prevalence and Associated Factors of Hypertension among Adults in Durame Town, southern Ethiopia. PLoS One. 2014;9(11):1–9.

11. Tesfaye F, Byass P, Wall S. Population based prevalence of high blood pressure among adults in Addis Ababa: uncovering a silent epidemic. BMC Cardiovasc Disord. 2009;9(39). (PUBMED).

12. Mallat SG, Samra SA, Younes F, Sawaya M-T. Identifying predictors of blood pressure control in the Lebanese population - a national, multicentric survey -- I-PREDICT. BMC Public Health [Internet]. 2014 Jan ;14(1):1142. Available from: http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4246605&tool=pmcentrez&rendertype=abstract

13. Banegas JR, Segura J, Ruilope LM, Luque M, García-Robles R, Campo C, et al. Blood pressure control and physician management of hypertension in hospital hypertension units in Spain.Hypertension[Internet].Jun.2004;43(6):1338–44.Available from: http://www.ncbi.nlm.nih.gov/pubmed/15117908

14. Navar-Boggan AM, Boggan JC, Stafford J A, Muhlbaier LH, McCarver C, Peterson ED. Hypertension control among patients followed by cardiologists. Circ Cardiovasc Qual Outcomes [Internet].May2012;5(3):352–7.Available from: http://www.ncbi.nlm.nih.gov/pubmed/22550131

15. Goverwa TP, Masuka N, Tshimanga M, Gombe NT, Takundwa L, Bangure D, et al. Uncontrolled hypertension among hypertensive patients on treatment in Lupane District, Zimbabwe, 2012. BMC Res Notes [Internet]. Jan 2014;7(1):703. Availablefrom:http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4197296&tool=pmcentrez&rendertype=abstract

16. Rashed Al Bannay, Aysha Husain MB. Blood Pressure Control and Predictors of Uncontrolled Hypertension. Bahrain Med Bull. 2014;36(3).

17. Getahun W, Gedif T, Tesfaye F. Regular Khat (Catha edulis) chewing is associated with elevated diastolic blood pressure among adults in Butajira, Ethiopia : A comparative study. BMC Public Health. 2010;10(390):4–11.

18. Stern LN, Subrahmanyam MG. Patient Adherence to the Dietary Approaches to Stop Hypertension (DASH) Diet for Non - Primary English Speakers by Lily Mundy An honors thesis submitted in partial fulfillment of the requirements for the degree of Bachelor of Science Undergraduate Colle.2005;15(3).

19. Wolf-Maier K, Cooper RS, Kramer H, Banegas JR, Giampaoli S, Joffres MR, et al. Hypertension treatment and control in five European countries, Canada, and the United States: Hypertension.Jan,2004;43(1):10-7.
Availablefrom:http://www.ncbi.nlm.nih.gov/pubmed/14638619

20. Reddy K.S., Naik N., and Prabhakaran D. Hypertension in the developing world: a consequence of progress. Curr Cardiol Rep. 2006; 8: 399-404. http://dx.doi.org/10.1007/s11886-006-0096-9.

21. Omuemu, VO, Okojie, OH Omuemu CE. Blood pressure pattern and prevalence of hypertension in a rural community in Edo State. *J Biomed Sci. 2006; 5 (2): 79-86*

22. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden hypertension: analysis of worldwide data. Lancet. 2005;365:217–23.

23. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair- Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2013;380:2224- 60.

24. Hyman DJ, Pavlik VN: Characteristics of Patients with Uncontrolled Hypertension in the United States. N Engl J. Med 2001; 345:479-86.

25. Falase AO, Stewart S, Sliwa K. Blood pressure, prevalence of hypertension and hypertension related complications in Nigerian Africans: A review. World J Cardiol. 2008;4(12):327–40.

26. Ong KL, Tso AWK, Lam KSL, Cheung BMY. Gender Difference in Blood Pressure Control and Cardiovascular Risk Factors in Americans With Diagnosed Hypertension: Hypertension. 2008;51:1142–9.

27. Misganaw A, Mariam DH, Ali A, Araya T. Epidemiology of Major Non-communicable Diseases in Ethiopia : A Systematic Review Search strategy: J Heal Popul NUTR. 2014;32(1):1–13.

28. Egan BM, Zhao Y, Axon RN, Brzezinski WA, Ferdinand KC. Uncontrolled and Apparent Treatment Resistant Hypertension in the United States, 1988 to 2008: Circulation. 2011;124:1046–58.

29. Knight EL, Bohn RL, Wang PS, Glynn RJ, Mogun H, Avorn J. Predictors of Uncontrolled Hypertension in Ambulatory Patients: Hypertension. 2001;38:809–14.

30. Aucott L, Poobalan A, Smith WCS, Avenell A, Jung R, Broom J. Effects of Weight Loss in Overweight / Obese Individuals and A Systematic Review: Hypertension. 2005;45(6):1035–41.

31. Rosendorff C, Black HR, Cannon CP, Gersh BJ, Chb MB, Gore J, et al. Treatment of Hypertension in the Prevention and Management of Ischemic Heart Disease A Scientific Statement From the American Heart Association Council for High Blood Pressure Research and the Councils on Clinical Cardiology and Epidemiology and Preventio: Circulation. 2007;115:2761–88.

32. Asch SM, Mcglynn EA, Hiatt L, Adams J, Hicks J, Decristofaro A, et al. Quality of care for hypertension in the United States: BMC Cardiovasc Disord. 2009;5(1):1–9.

33. Esposti ED, Martino M Di, Sturani A, Russo P, Dradi C, Falcinelli S, et al. Risk factors for uncontrolled hypertension in Italy: J Hum Hypertens. 2004;18:207–13.

34. Muhamad W, Ahmad AW, Arif M, Awang B, Aleng NA, Halim NA, et al. Association of Hypertension with Risk Factors Using Logistic Regression. 2014;8(52):2563–72.

35. Aghababaei I, Sadeghi M, Talaei M, Rabiei K, Sarrafzadegan N. Is prehypertension a risk factors for cardio-vascular diseases among Iranian women? J Res Med Sci. 2012; 17(10):947–51. Pubmed PMCID: PMC3698654. [PubMed: 23825995] .

36. Baynouna LM, Nagelkerke NJD, Ameri TA Al, Zein SM, Deen A, Ali HI. Determinants of Diabetes and Hypertension Control in Ambulatory Healthcare in Al Ain, United Arab Emirates: Oman Med J. 2014;29(3):234–8.

37. Segura J, Banegas JR, Ruilope LM. Frontiers in Research Review : Ambulatory and Home Blood Pressure Measurement in the Management of Hypertension Usefulness of ambulatory blood pressure monitoring (ABPM) in daily clinical practice : Data from the Spanish ABPM registry " More than. Clin Exp Pharmacol Physiol. 2014;41:30–6.

38. Lloyd-jones DM, Evans JC, Larson MG, Donnell CJO, Roccella EJ, Levy D. Differential Control of Systolic and Diastolic Blood Pressure. Factors Associated With Lack of Blood Pressure Control in the Community: Hypertension. 2000;36:594–9.

39. Balijepalli C, Bramlage P, Lösch C, Zemmrich C, Humphries KH, Moebus S. Prevalence and control of high blood pressure in primary care-results from the German metabolic and cardiovascular risk study (GEMCAS): Hypertens Res [Internet]. 2014 Jun ;37(6):580–4. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24621471

40. Khosravi A, Pourheidar B, Sadeghi M, Moezzi M, Mousavi M, Hajiannejad A, et al. Evaluating factors associated with uncontrolled hypertension: Isfahan cohort study, Iran. ARYA Atheroscler. 2014;10(6):311–8.

41. Tesfaye A, Kumela K, Wolde M. Blood Pressure Control Associates and Antihypertensive Pharmacotherapy Patterns in Tikur Anbessa General Specialized Hospital Chronic Care Department , Addis Ababa, Ethiopia. Am J Biomed Life Sci. 2015;3(3):41–8.

42. Duncan P, Howe L, Manakusa Z, Purdy S. Determinants of blood pressure control in rural KwaZulu-Natal, South Africa. South African Fam Pract.2014 56(6):297–304.

43. Universitário H, Fraga C, Federal U, Salles GF. Demographic and clinical characteristics of hypertensive patients in the internal medicine outpatient clinic of a university hospital in Rio de Janeiro: Sao Paulo Med J. 2004;122(3):87–93.

44. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. Med Care. 1986;24:67–74.

45. National Institutes of Health. National Cholesterol Education Program.Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on.Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III): NIH Publ. 2(5215).

46. Weitkunat R, Coggins CRE, Sponsiello-wang Z, Kallischnigg G, Dempsey R, Consulting CW. Assessment of Cigarette Smoking in Epidemiologic Studies . Beiträge zur Tab Int to Tob Res. 2013;25(7):638–48.

47. Abere DA, Getahun AA, Solomon MW, Zelalem BM. Adherence to antihypertensive treatment and associated factors among patients on follow up at University of Gondar Hospital , Northwest Ethiopia. BMC Public Health [Internet]. BioMed Central Ltd; 2012;12(282). Available from: http://www.biomedcentral.com/1471-2458/12/1471-2458-12-282.

48. Franklin SS, Jacobs MJ, Wong ND, L'Italien GJ, Lapuerta P: Predominance of Isolated systolic hypertension among middle –aged and elderly US hypertensives : analysis based on National Health and Nutrition Examination Survey (NHANES) III. Hypertension. 2001; 37:869–874.

49. Whelton SP, Chin A, Xin X, He J. Effect of aerobic exercise on blood pressure:A meta analysis of randomized, controlled trials.Ann Intern med. 2002;136:493.

50. Stewart KT, Bacher AC, Turner KL.et al.Effect of exercise on blood pressure in older persons:A randomized controlled trial: Arch intern med. 2005;165:756.

51. Zhang M, Meng Y, Yang Y, Liu Y, Dong C, Li F. Major inducing factors of hypertensive complications and the interventions required to reduce their prevalence: an epidemiological study of hypertension in a rural population in China. BMC Public Health. 2011, 11:301.

52. Youssef RM, Moubarak II. Patterns and determinants of treatment compliance among hypertensive patients. East Mediterr Health J. 2005; 8: 4 5

53. Van der Sande MA, Milligan PJ, Nyan OA, Rowley JT, Banya WA, Ceesay SM, Dolmans WM, Thien T, McAdam KP, Walraven GE: Blood pressure patterns and cardiovascular risk factors in rural and urban gambian communities. J Hum Hypertens. 2000; 14(8):489–496.

54. Hareri HA, Molla BS, Simeng B. Assessment of prevalence and associated factors of adherence to anti- hypertensive agents among adults on follow up in Adama Referal hospital , East Shoa , Ethiopia-cross sectional study. IntJCurrMicrobiolAppSci. 2014;3(1):760–70.

55. Inkster ME, Donnan PT, MacDonald TM, Sullivan FM, Fahey T: Adherence to antihypertensive medication and association with patient and practice factors. J Hum Hypertens. 2006; 20(4):295–297.

56. Hashmi SK, Afridi MB, Abbas K, Sajwani RA, Saleheen D, Frossard PM, Ishaq M, Ambreen A, Ahmad U: Factors associated with adherence to antihypertensive treatment in Pakistan. PLoS One. 2007; 2(3):280.

57. Rm Y: II M: Patterns and determinants of treatment compliance among hypertensive patients. East Mediterr Health J. 2002; 8(4–5):579–592.

Annexes

I. Patient Information Sheet

Name of the principal investigator: Solomon Weldegebreal Asgedom

Name of study area: Jimma University Specialized Hospital, Hypertensions Follow up Clinic

Research budget covered by: Jimma University

Research objective: To asses blood pressure control and determinants of poor blood pressure control level at Jimma University Specialized Hospital.

Significance of the study: The study will be used to develop guide line for better level of hypertension care and help to practice antihypertensive medications to the most effective dose and regimen at the hypertension follow up clinic. It will also have great relevance as a base line for interventions of healthcare programs targeting improved hypertension control at large.

Study procedure: The data collectors will interview patients using questioners after obtaining consent from the patient. Then data will be extracted from medical records.

Risks: No risks except the time that patient spend during the interview.

Participant right: The patient has a right to stop the interview at any time, or to skip any question that he/she does not want to answer.

Benefit: The study is beneficial for the patient in improving quality of service delivery in future visits. It informs health care providers about the status of care. It also can be used as a source of information for the hospital and policy makers.

Incentives: You will not be provided any specific incentive for taking part in the research other than acknowledgment.

Confidentialities: The study result will not include patient's name and address and any information communicated will be kept confidential.

Agreement: Patients are expected to be fully voluntary to participate in the study.

Whom to contact: If you have any kind of inconvenience about the study, you can contact the following individuals:

1. Mr.Tigeestu Alemu, Clinical Pharmacist, Jimma University (adviser of the study)

   ➢ Tel: 0923533706

   ➢ email: tgfrekidan16@gmail.com

2. Mr. Solomon Weldegebreal(principal investigator)
   ➢ Tel: 0920871064

   ➢ Email: s.weldegebreal@gmail.com

II. Patient Informed Consent form
Name of principal investigator: Solomon Weldegebreal **(Jimma University)**

Research title: To assess blood pressure control and determinants of poor blood pressure control among hypertensive patients at JUSH.

Card number_____
Code number_____

1. I confirm that I understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is completely voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.
3. I understand that my medical notes will be looked at by data collectors of this study and necessary information will be extracted. I give permission for these individuals to have access to my records.
4. I agree to take part in the above study. I would like to confirm my agreement by signing.

Participant's name _____ Signature_____   date_____

Name of the data collector: _____ Signature: _____   date_____

Name of the principal investigator: _____ Signature: _____   date_____

Thank you for your participation and cooperation!

Greetings!

My name is Sr. / Ato --

I am data collector for master student Solomon Weldegebreal currently working his research work for graduation in Clinical Pharmacy in Jimma University, College of Health Sciences, and Department of Pharmacy.

The objective of the research is to assess blood pressure control and determinants of poor blood pressure control level at Jimma University Specialized Hospital.

I would like to assure you that the study is confidential. I will not keep a record of your name and address. You have a right to stop the interview at any time, or to skip any question that you do not want to answer. Your correct answer to the questions can make the study achieve its goals. Therefore, you are kindly requested to respond genuinely and voluntary with patience. The interview may take few minutes. I would greatly appreciate your help in responding to this study.

Result of the interview: 1. Completed   2. Partially completed

3. The interviewee refused   4. Others_____

III. Questionnaire English Version

Instruction: Tick (√) in the box provided and fills the blank spaces by asking the patient.

A. Participants' Secoidemographic Characteristics and hypertension Related Variables

N<u>o</u>	Questions	
1	Patient's sex	1. Male ☐ 2. Female ☐
2	How old are you?	_____years
3	Marital stutus	Single ☐ Married ☐ Divorced ☐ Widowed ☐ Separated ☐
4	What is your religion?	1.Orthodox ☐ 2.Protestant ☐ 3. Muslim ☐ 4. others_____
5	What is the highest education level you completed?	1. No formal education ☐ 2. Primary education (1-8 grade) ☐ 3. Secondary education (9-12 grade) ☐ 4. Tertiary education (diploma and above) ☐

6	What is your current occupation?	1.Civil servant ☐ 2. Merchant ☐ 3. Farmer ☐ 4. House wife ☐ 5. Others (specify) _____
7	How much is your monthly income in Ethiopian Birr?	_____ Birr
8	How long it had been since you were diagnosed with hypertension?	_____ years
9	Do you take salt with food?	1.Yes ☐ 2. No ☐
10	Do you perform physical exercises?	1. Yes ☐ 2. No ☐
11	If yes to Q.10 How many times per week do you exercise and for how long?	_____times per week For _____ minutes
12	Do you use Traditional Medicines for the management of your hypertension?	1. Yes ☐ 2. No ☐
13	If yes to Q.12 How many times do you use traditional medicine?	_____
14	If yes to Q. 12 What type of traditional	_____

	medicine do you use?	
15	Do you use substance?	1. Yes ☐ 2. No ☐
16	If yes to Q.15 What type of substance do you use currently?	Chat ☐ Alcohol ☐ Cigarette ☐ others_____
17	Cigarette smoking status	Never smoked ☐ Ex smoker ☐ Current smoker ☐
18	If current smoker what is the amount of cigarette you smoke per day?	_____/day
19	If Ex smoker for how long have you been on smoking?	_____year
20	If alcohol to Q. 16 What type of alcohol do you take?	Beer(how many)_____ Caticala ☐ Teg ☐ Tela ☐ others_____
21	How do you get your medicines?	Free ☐ Paid ☐ Others(specify)_____

B. **Adherence scale of the patient**

   i. Do you sometimes forget to take your pills?

      1. Yes ☐

      2. NO ☐

  ii. People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medicine?

      1. Yes ☐

      2. NO ☐

 iii. Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?

      1. Yes ☐

      2. NO ☐

  iv. When you travel or leave home, do you sometimes forget to bring along your medicine?

      1. Yes ☐

      2. NO ☐

   v. Did you take all your medicine yesterday?

      1. Yes ☐

      2. NO ☐

  vi. When you feel like your symptoms are under control, do you sometimes stop taking your medicine?

      1. Yes ☐

      2. NO ☐

 vii. Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?

      1. Yes ☐

      2. NO ☐

viii. How often do you have difficulty remembering to take all your medicine?

       ___A. Never/rarely   ☐

       ___B. Once in a while ☐

       ___C. Sometimes   ☐

       ___D. usually   ☐

       ___E. All the time   ☐

B. Participants' Clinical Characteristics (From Patients' Medical Record Review, Measurement)

    A. Diagnosis_____

    B. Weight (kg)_____

    C. Height (m)_____

    D. BMI_____

C. Data collection format for BP, antihypertensive medications and comorbidities.

Date of Visit	BP	Antihypertensive medications(name, dose,frequency)	complications			Other diagnosis/complains	Medications for other medical Conditions(name,dose,frequency,duration)	Laboratory investigation
			renal	cardiac	eye			

IV. Questionnaire Amharic Version

የታካሚ መረጃ ወረቀት

የተመራማሪ ስም: ሰሎሞን ወ/ኤል አስገዶም

ጥናት የሚካሄድበት ቦታ: ጂማ ዩኒቨርስቲ ስቴሻላይዝድ ሆስፒታል

የትናቱ በጀት ከፋይ: ጂማ ዩኒቨርስቲ

የትናቱ አላማ:ደም ግ ፊትን አቆጣጠር መገምገም እና የ ደካማ ደም ግፊትን አቆጣጠር ወሳኝ ነገሮችን መለየት።

የጥናቱ መቀሜታ:ጥናቱ ለበለጠ የደም ግፊት ቁጥጥር መምሪያ ማኛል ለመመስረት እና የደም ግፊት መቆጣጠርያ መድሃኒቶችን ለማቅረብ ይተቅማል።በተጨማሪ ለበለጠ የጤና አጠባበቅ መርሃግብር የደምግፊትን አቆጣጠር ስርአት ለማሻሻል እንደማመሳከሪያ ያገለግላል።

የጥናቱ ሂደት: መረጃ ሰብሳቢ ሰዎች የተሳታፈውን ፍቃድ ካገኙ በኋላ በማስጠየቅያ ወረቀት ቃለመጠይቅ ያረጋሉ።ከዛ በመቀጠል ከመዝገብ ካርዱ የተመዘገበውን መረጃ ይወስዳሉ።

ጉዳት: ጥናቱ ምንም አይነት ጉዳት የለውም።

የተሳታፊ መብት:ተሳታፊው ቃለመጠይቁን በፈለገው ሰአት ማቋረጥ እንዲሁም ያልፈለገውን ጥያቄ አለመመለስ ይችላል።

ጥቅም:ጥናቱ ለቀጣይ ግዜ ጥሩት ያለውን አገልግሎት ለመስጠት ይጠቅማል።

ማበረታቻ:በጥናቱ ላይ ተሳታፊ በመሆን የሚሰጥ ምንም አይነት ማበረታቻ የለውም።

ምስጢር ጠባቂነት: ጥናቱየተሳታፊውን ስም፣አድራሻ እና ሌላ ያስተላለፈውን መልእክት በተገቢው መልክ ይጠብቃል።

ስምምነት: ታካሚው በሙሉ ፍላጎት ተሳታፊ እንደሚሆን ይጠበቃል።

ለተጨማሪ መረጃ የዚህ ጥናት አስተባባሪዎች ማነጋገር ይችላሉ።
1. አቶ ትዕግስቱ አለሙ: በጂማ ዩኒቨርስቲ የፋርማሲ ትምህርት ክፍል መምህር እና የጥናቱ አስተባባሪ

   ➤ ስልክ: 0923533706

   ➤ ኢሜል: tgfrekidan16@gmail.com

2. አቶ ሰሎሞን ወ/ኤል: የጥናቱ ተመራማሪ
   ➤ ስልክ: 0920871064
   ➤ ኢሜል: s.weldegebreal@gmail.com

በጥናቱ ለሚሳተፉ የስምምነት ማረጋገጫ

እኔ ስለዚህ ጥናት ሙሉበሙሉ ተነግሮኛ ተረድቻለሁ፡፡አላማውም የደም ግፊት ቁጥጥር ደረጃ ለማወቅ እና የደካማ የደም ግፊት ቁጥጥር ደረጃ ወሳኝ ነገሮችን ለመለየት ነው፡፡

ይህ ተሳትፎ በፈቃደኝነት ላይ የተመረኮዘ መሆኑን ተረድቻለሁ፡፡በተጨማሪም የተረዳሁት በዚህ ተሳትፎየ አገኛለሁ የምለው ምንም አይነት የተለየ አገልግሎት: ክፍያ ወይም ስጦታ እንደማይኖር ተረድቻለሁ፡፡

ይህ ውል የሚያገለግለው ለዚህ ብቻ ነው፡፡

ከዚህ በታች ስሜ ያለው በዚህ ጥናት ለመሳተፍ ተስማምቼለሁ፡፡

የተሳታፊ ስም_____ ፊርማ_____   ቀን_____

የመረጃ ሰብሳቢ ስም: _____ : ፊርማ _____   ቀን_____

የተመራማሪ ስም: _____ ፊርማ: _____   ቀን_____

ለተሳታፊዎችሁ እና ድጋፋቹሁ አመሰግናለሁኝ!

ስሜ:አቶ/ወ/ሪት_____
 እኔ የሰሎሞን ወ/ኤል የሚባል በአሁን ሰአት ለምረቃ ማስተርስን የሚሰራ መረጃ ሰብሳቢ ነኝ፡፡

የጥናቱ ዋና አላማ የደም ግፊት ቁጥጥር ደረጃን መገምገምና የደካማ ደም ግፊት ቁጥጥር ደረጃ ወሳኝ ነገሮችን በጅማ ዩኒቨርስቲ ስፔላይዝድ ሆስፒታል መለየት ነው፡፡

ጥናት ምስጥር ጠባቂ መሆኑን ላረጋግጥላቹ እወዳለሁኝ ቃልመጠይቁን በፈለጋችሁት ሰአት ማቋረጥ ትችላላችሁ በዚህ ጥናት ምላስ በመስጠት በማገዛችሁ በጣም አመሰግናለሁኝ፡፡

የቃለመጠይቁ ውጤት

አልቀዋል_____   በከፊል አልቀዋል_____

ሌላ_____   ተነፍገዋል _____

51

ሀ. የታካሚ ማህበረሰባዊ ጥያቄዎች/ባህርያቶች

መምርያ: በተዘጋጀውን √ ሳጥን ምልክትያድርጉ በተጨማሪ ታካሚውን በመጠየቅ ክፍት ቦታውን ይምሉ።

ተራ ቁጥር	ጥያቄዎች	
1.	የታካሚ ጾታ	ወንድ ☐ ሴት ☐
2.	እድሜህ ስንት ነው?	_____ አመት
3	የጋብቻ ሁኔታ	ያላገባ ☐ ያገባ ☐ የተፋታ ☐ የተለያዩ ☐ ባሏ/ሚስቱ የሞተባት/በት ☐
4	ሃይማኖትህ ምንድ ነው?	ኦርቶዶክስ ☐ ፕሮቴስታንት ☐ ሙስሊም ☐ ሌሎች _____
5	ከፍተኛ የትምህርት ደረጃህ ስንት ነው?	መደበኛ የትምህርት ደረጃ የለኝም ☐ ከ1_8 ☐ ከ9.12 ☐ ዲፕሎማ እና ከዛ በላይ ☐
6	ስራህ ምንድን ነው?	መንግስት ሰራተኛ ☐ ነጋዴ ☐ ገበሬ ☐ የቤት እሜቤት ☐ ሌላ _____
7	ወርሃዊ ገቢህ ስንት ነው?	_____ ብር
8	ደም ግፊትህ መቼ ነው የታወቀው?	_____

9	ምግብህ ላይ ጨው ታረጋለህ	እዎ⬜
		አይደለም⬜
10	አካላዊ እንቅስቃሴ ታረጋለህ?	እዎ⬜
		አይደለም⬜
11	ጥያቄ 10 አዎ ካልክ በሳምንት ስንት ጊዜ እና ለስንት ሰአት ነው አካላዊ እንቅስቃሴ የምትሰራው?	_____ ጊዜ
		_____ ደቂቃ
12	ባህላዊ መድሃ ወስደህ ታቃለህ? አዎ ካሉ ወደ ቁጥር ይሂዱ	እዎ⬜
		አይደለም⬜
13	ጥያቄ 12 አዎ ካልክ ስንት ጊዜ ባህላዊ መድሃኒት ወሰድክ?	_____
14	ጥያቄ 12 አዎ ካልክ የወሰድከው ባህላዊ መድሃ ምን አይነት ነው?	_____
15	ጎጂ ንጥረ ነገር ትወስዳለህ?	እዎ⬜
		አይደለም⬜
16	ጥያቄ 15 አዎ ካልክ ምን አይነት ንጥረ ነገር ትወስዳለህ?	ጫት⬜
		አልኮሆል⬜
		ሲጋራ⬜
		ሌላ⬜
17	የሲጋራ ማጨስ ሁኔታ?	አጭሼ አላውቅም⬜
		አጨስ ነበር⬜
		አ ሁንም አጨስአለሁኝ⬜
18	አሁን የምታጨስ ከሆነ በቀን የምታጨሰው ሲጋራ ብዛቱ ስንት ነው?	_____ በቀን
19	ድሮ አጨሽ ከነበርክ ለስንት ጊዜ አጫሽ ነበርክ?	ለ _____ አመት
20	ጥያቄ 16 መልሱ አልኮሆል ከሆነ ካልክ ምን አይነት አልኮሆል ትወስዳለህ?	ቢራ⬜ _____ (ብዛቱ ጻፍ)
		ካቲካላ⬜
		ጠጅ⬜
		ጠላ⬜
		ሌላ _____

20	መድኃኒት በምን መልክ ታገኛለህ?	በነጻ☐
		በክፍያ☐
		ሌላ_____

ሐ. የታካሚ የመድኃኒት አወሳሰድ ደረጃ

I. አንድ አንዴ መድኃኒት መውሰድ ረስተህ ታቃለህ?
አዎ☐
አይደለም☐

II. አንድ አንድ ሰዎች ከመርሳት ውጪ መድኃኒት ያለመውሰድ ችግር አለ ባለፈው 2 ሳምንት ውስጥ መድኃኒት ያልወሰድክበት ቀን አለ?
አዎ☐
አይደለም☐

III. ሃኪምህን ሳታማክር በበስታ ብሶት ምክንያት መድኃኒት መውሰድ አቁርጠህ ታቃለህ?
አዎ☐
አይደለም☐

IV. ወደ ሌላ ቦታ ስትጓዝ ወይንም ከቤት ወጥተህ ስትሄድ መድኃኒት ይዘህ መሄድ ረስተህ ታቃለህ?
አዎ☐
አይደለም☐

V. ትላንትና ሁሉንም መድኃኒት በትክክል ወስደሃል?
አዎ☐
አይደለም☐

VI. የበስታ ምልክቶቹ አልቀነሱም ብለህ አንድ አንዴ መድኃኒት መውሰድ አቁርጠህ ታካለህ?
አዎ☐
አይደለም☐

VII. መድኃኒት በትክክል አለመውሰድ የአንድአንድ ሰዎች ዋነኛ ችግር ነው የህክምና መርሃግብርህ በትክክል መከታተል ችግር ሁኖብህ ያቃል?
አዎ☐
አይደለም☐

VIII. ሁሉኑም መድኃኒት መውሰድህን ማስታወስ የከበደህ ስንት ግዜ ነው?
ሀ ፈጽሞ☐
ለ የሆነ ግዜ አንድ ግዜ☐
ሐ አንድ አንድ ግዜ☐
መ አብዛኛው ግዜ☐
ሰ ሁሉኑም ግዜ ☐

54

V. Questionnaire Afan Oromo version
1 Waraqaa Ragaa Yaalamaa

Maqaa Qormaamata;- Solomon Waldegabr'eel

Iddoo xinxallichi Godhamu;- Hospitaala Speeshaalayizdii Yuniversitii Jimmaa

Baajata xinxalichaa kaffalu;- Yunivarsitii Jimmaa

Kaayyoo xinxalichaa;- to'annaa cunqurssaa dhiiga qorachuufi to'annaa murteessaa dadhabina cunqursaa dhiigaa addaan baasuu,

Faayidaa xinxalichaafi xinxalichi qajeelcha maanuwaalii to'annaa cunqurssaa dhiigaa irra caalaa hundeesuufi qoricha to'annaa cunqurssaa dhiigaa dhiyeesuuf ni fayyada.dabalatanis adeemssa egumssa fayyaa irra caalaa ta'eef naamuusa to'annaa cunqurssaa dhiigaa fooyyeesuuf akka ragummaa ni tajaajila.

Adeemssi xinxalichaa ;- Namoona ragaa sasaabanu hayyama hermaatoota erga argatan booda waraqaa ittiin gaafataman irrati gaafii afaanii ni godhu. Itti aansuudhaanragaa kaardii galmee irrati galmaa'e ni fudhatu.

Miidhaa;- xinxalichi midhaa gosa kamiyuu hin qabu.

Mirga hemaatichaa;- hermaataan gaafii afaanii yeroo barbaadeti addaan kutuu akkasumas gaafii inni hin barbaadne deebisuu diduu ni danda'a.

Faayidaa;- xinxalichi yeroo itti aanuuf tajaajila qulqulina qabu kennuuf ni fayyada.

Jajjabeessaa;- xinxalicha irrati hermaachuudhaan faayidaa jajjabeessaa kennamu gosa kamiiyuu hin jiru.

Iccitii Eeguu;- xinxalichi maqaa hermaatichaa teessoofi ergaa kan biraa dabarsse bifa seera qabeessa ta'een ni eggata.

Walta'inssa;- yaalamaan fedhii guutuudhaan hermaataa ta'uun irraa egama.

Ragaa dabalataaf qindeesoota xinxalicha kana dubisuun ni danda'ama.

1. Obbo Tigistuu Alamuu;- Yunivarsitii Jimmaati barsiisaa qajeelcha kutaa barumssa faarmaasiifi qinddeessaa xinxalichaa

    Bilbila;- 0923533706

    Emeail;- tgfrekidan16 (a) gmail.com

2. Obbo Solomoon Waldagabr'eel;- Qormaamataa Xinxalichaa

    Bilbila;- 0920871064

    Emeail;- S.Weldegebr'eel (a) gmail.com

55

waligaltee mirkaneessaa namoota xinxalicha irrati hermaataniif

Ani waa'ee xinxala kana guutuun guutummaan nati himamee hubadheera.kaayyoon isaas Sadarkaa to'annaa cunqurssaa dhiigaa beekuufi sadarkaa murteessaa dadhabaa cunqurssaa dhiigaa addaan baasuufidha.

Hermaannaan kun fedhii irrati kan hirkate ta'uu isaa hubadheera. Dabalataanis kan ani hubadhe hermaannaa koo kanaan waliti qunnamsiisa kan jedhu tajaajila addaa gosa gamiiyuu kaffaltii ykn kennaan akka hin jirre hubadheera.

Walta'insi kun kan tajaajilu kanumaaf qofadha.

Maqaan koo armaan gaditi jiru xinxala kana irrati hermaachuuf waligaleera.

Maqaa hermaatichaa _____Mallattoo_____Guyyaa_____

Maqaa sassaabataa ragaa_____Mallattoo_____Guyyaa_____

Maqaa Qormaamatichaa _____Mallattoo_____Guyyaa_____

Hermaannaafi deggarssa keessaniif ni galateeffadha.

Maqaan koo Obbo/Adde_____

 Ani Solomon W/Gabr'eel kan jedhamu yeroo hammaa Eebba koof maastarsii kan hojjadhu sassaabaa ragaadha.

Kaayyoon xinxalichaa inni guddaan sadarkaa cunqurssaa dhiigaa qorachuufi murteessaa to'annaa sadarkaa cunqursaa dhiigaa isa dadhabaa Hospitaala Speeshaalaayzdii Yunivarsitii jimmaati addaan baasuufidha.

Xinxalichi iccitii eegaa ta'uu isaa isiniif mirkaneessu ni jaalladha.gaafii afaanichaa sa'atii barbaadaniti addaan kutuu ni dandeessan xinxala kanati deebii kennuudhaan waan na gargaartaniif baayyee isin galateeffadha.

 Firiin gaafii afaanii

 Dhumeera_____ gamtokkeen Dhumeera_____

kan biroo_____ dhowwamaniiru_____

Qajeelffama;- Sanduuqa qophaa'eti mallttoo gudhaa, Dabalataan yaalamaa gaafachudhaan iddoo banaa guutaa

Lakka dabaree	Gaafiwwaan	
1	Saala Yaalamaa	Dhiira ☐ Dubara. ☐
2	Umuriin kee meeqadha.?	Waggaa _____
3	Akkaataa fuudhaaf heeruma	Kan fuudhe ☐ Kan hin fuune ☐ Kan walhiike ☐ Addaan kan bahan ☐ Dhirssa (niitiin kan irraa ☐ du'e(duute) ☐
4	Amanttaan kee maalidha?	Ortodoksii☐ Pirootestaanttii ☐ Musliima☐ Kan biro_____
5	Sadarkaan Barumassa kee inni ol'aanaan meeqadha?	Sadarkaa barumssa idalee hin qabu☐ 1-8☐ 9-12☐ Dipiloomaafi isaanol☐
6	Hojiin kee maalidha?	Hojjataa Mootummaa ☐ Daldaalaa ☐ Qote bulaa ☐ Hadha manaakan

		biro_____
7	Galiin kee inni ji'aa meeqadha	Qarshii _____
8	Dhiiga cunqursaan kee kan beekame yoomidha?	_____
9	Nyaata kee irrati ashaboo ni gootaa	Eeyyee ☐ Miti ☐
10	Sochii qaamaa ni gootaa?	Eeyyee ☐ Miti ☐
11	Gaafii 12 eeyyee yoo jette torbbee keessaa yeroo meeqa sa'aatii hammamiifidhasochii qaamaa kan gootu?	yeroo_____f Daqiiqaa _____f
12	Qoricha aadaa fudhattee ni beekttaa? Eeyyee yoo jettan gara lakkati deemaa.	Eeyyee ☐ Miti ☐
`13	Gaafii lakka 12ffaa eeyyee yoo jette yeroo meeqaaf qoricha aadaa fudhate?	_____
14	Gaafii lakka 12 ffaa eeyyee yoo jette qurichi aadaa ati fudhate gosa akamitidha?	_____
15	Albuudaa Miidhu Fudhattee ni beekttaa?	Eeyyee☐ Miti ☐
16	Gaafii 15 eeyyere kan jetu yoo ta'e albuudaa qulqulluu gosa kam fudhataa jirta?	Caatii ☐ Dhugaatii ☐ Sijaaraa ☐
17	Akkaataa tanbboo (sijaaraa) aarsuu?	Aarsee (xuuxee) hin beeku☐ Arsaan (xuuxaan) ture☐ Hammas arsaan(xuuxaan)jira ☐
18	Hamma kan arsitu (xuuxxu) yoo ta'e bay'ina sijaaraa guyyaati arsitu meeqadha?	Guyyaati _____

19	Dur nama arsitu(xuuxxu) yoo taate yeroo meeqaaf arsaa(xuuxaa) turte	Waggaa _____f
20	Gaafii 16 deebiin isaa dhugaatii dha yoo jette dhugaatii gosa kam ni fudhata?	Biiraa☐ Kaatikaalaa ☐ Daadhii☐ Farsoo ☐ Kan biroo_____
21	Qoricha bifa kamiin ni argatta	Bilisaan☐ Kaffaltiidhaan☐ Kan biroo_____

B.Sadaerkaa yaalamaan qoricha fudhatu

I.Yeroo tokko tokko qorcha osoo hin fudhatin raanfattyee ni beektaa?

Eeyyee ☐

Miti☐

II.Namoonni tokko tokko raanffachuun ala rakina qoricha fudhachuu hafuun jira, yeroo torbee 2 darbe keessati guyyaa qoricha hin fudhane jiraa?

Eeyyee ☐

Miti ☐

III.Haakimii kee osoo hin maryachisin sababa cimina dhukubichaan qoricha osoo hin fudhatin addaan kuttee beektaa

Eeyyee ☐

Miti ☐

1V.Gara iddoo biraa yemmuu deemtu ykn manaa baatee yemmuu deemtu qoricha qabdee deemuu kee raanfattee ni beektaa ?

Eeyyee☐

Miti ☐

V. Kaleessa qoricha hunduma sirriiti fudhateettaa?

Eeyyee ☐

Miti ☐

V1. Mallatowaan dhukubichaa hin hanqifamne jettee al tokko tokko qoricha fudhachuu kee addaan kuttee ni beekttaa?

Eeyyee ☐

Miti ☐

V11. Qoricha sirriiti fudhachuu hafuun rakkina ol'aanaa namoota tokko tokkodha.adeemssa yaalaa sirriiti hordofuu irrati rakkina sitti ta'ee beekaa?

Eeyyee ☐

Miti ☐

V111. Qoricha hunduma fudhachuu kee yaaduu irrati kan sitti ulfaate al meeqadha?

a. Dhumaa isaaf ☐

b. Yeroo ta'e al tokko ☐

c. Yeroo tokko tokko ☐

d. Yeroo baayyee ☐

e. Yeroo hunduma ☐