

**COMPLIANCE TO ANTI-HYPERTENSIVE TREATMENT AND
ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS
ON FOLLOW UP IN JIMMA UNIVERSITY SPECIALIZED
HOSPITAL, JIMMA, SOUTH WEST ETHIOPIA**

By:

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A THESIS SUBMITTED TO JIMMA UNIVERSITY, COLLEGE OF
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JIMMA UNIVERSITY
COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCES,
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Abstract

Introduction: - Hypertension is defined as systolic blood pressure greater than 140 mm Hg and a diastolic blood pressure greater than 90 mm Hg over a sustained period, based on the average of two or more blood pressure measurements taken in two or more contacts with the health care provider after an initial screening. Hypertension is the single most common and most important risk factor for cardiovascular disease. Uncontrolled blood pressure increases the risk of ischemic heart disease 3-to 4-fold and the overall cardiovascular risk by 2-to 3-fold. Long-term compliance with treatment is always a problem which requires a change in behavior which may be extremely difficult. Multiple factors contribute to poor compliance with long-term antihypertensive therapy.

Objective: - the aim of this study was to assess compliance to antihypertension treatment and associated factors among hypertension patients on follow up in Jimma University specialized hospital.

Methods: - Institution based cross sectional study was conducted by using Simple random sampling technique to select 332 participants. A pre tested structured questionnaire was used. Data was entered by using Epidata3.1 and then exported to SPSS version 16 for analysis. Frequency distributions were used to organize the data and present the responses obtained. Multivariate logistic regression analysis was used to predict the factors which affect compliance.

Result: - Out of 332 hypertensive patients planned to be included in the study 314 hypertension patients were participated in the study. The mean age of the participant was 53.8 years. In this study 55.7% of patients were Compliant to antihypertensive medication and 24.8% were compliant to lifestyle instructions. Age of the patient, Educational level, number of drugs the patient using, knowledge about hypertension treatment, patient perception about severity of their disease and patient perception on benefits of compliance to hypertensive treatment were found to be significantly associated with compliance to antihypertensive medications.

Conclusion and recommendations: - Compliance to antihypertension medication is only reported by 55.7% of patients and compliance to lifestyle instructions was found to be only 24.8% among the patients in the study area. In the study area patients know little

about hypertension and its management. Implementing education campaigns to increase awareness about the risk factors, natural history, complications and treatment of hypertension through media and establishing patient support groups as this would help compliant and non-compliant patients to meet interact and share experiences may help patients to be compliant.

Key words: - *hypertension, patient compliance, lifestyle instructions*

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List of abbreviations

BP	Blood pressure
CVD	Cardio vascular disease
DASH	Dietary approaches to stop hypertension
DBP	Diastolic blood pressure
HF	Heart failure
HTN	Hypertension
JUSH	Jimma University specialized hospital
MI	Myocardial infarction
PI	Principal Investigator
SBP	Systolic blood pressure

Chapter I: Introduction

1.1 Background

Hypertension is defined as systolic blood pressure greater than 140 mm Hg and a diastolic blood pressure greater than 90 mm Hg over a sustained period, based on the average of two or more blood pressure measurements taken in two or more contacts with the health care provider after an initial screening[1]. Hypertension (HTN), or high blood pressure is an overwhelming global challenge which ranks third as a cause of disability-adjusted life-year [2].

According to the Seventh Report of the Joint National Committee on Hypertension, there are approximately 1 billion hypertensive individuals worldwide[1]. About 1 in 8 deaths worldwide is due to hypertension and 4 million people die annually thus making it the third largest killer in the world. The seriousness of hypertension as a global public health problem is evident by its high prevalence and associated increase in cardiovascular complications in virtually all countries of the world[3]. 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 blood pressure control [2].

In Africa, 15% of the population has hypertension [4]. In sub-Saharan Africa, the prevalence of hypertension once thought to be low, has now assumed epidemic proportions. About 10 to 20 million people are affected with hypertension in the region. Effects of Westernization, urbanization, changes in dietary patterns and sedentary lifestyles are among the factors fuelling the epidemic of hypertension in sub-Saharan Africa [5]. Although there is shortage of extensive data, the prevalence of hypertension is estimated to be < 10% in rural Ethiopia and to be in range from 20% -30% in urban Ethiopia[6]. Approximately 30% of adults in Addis Ababa have hypertension above 140/90 mmHg or reported use of anti-hypertensive medication[7].

Despite improvements in the detection and treatment of hypertension since the 1970s, recent survey results illustrate that the condition continues to contribute, significantly, to mortality and morbidity in adults and that it is often poorly controlled in clinical

practice[1]. Similarly, other studies suggest that the treatment's efficacy, in patients under care, is attenuated mainly by patient non-compliance with medication and lifestyle advice [8] .

Compliance is defined as “the extent to which a person’s behavior (taking medicines, or executing lifestyle changes) coincides with medical or health advice”[9]. On the other hand World Health Organization defines adherence as "the extent to which a person's behavior - taking medications, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider. The main difference with compliance is that adherence requires the patient’s agreement to the recommendations.[10].

Compliance consists of three components namely, acceptance of medication prescribed, adhering to it and continuing with it [11]. Thus compliance is a complex and dynamic health enhancing behavior that involves acts of appointment keeping, obtaining and ingesting medications and persisting with health provider recommendations such as lifestyle changes. Non-compliance on the other hand represents the opposite of compliance behavior and is defined as a constant neglect of treatment or advice rather than mere temporary forgetfulness [12].

Compliance with treatment at the individual level improves the quality of life by preventing complications and thereby premature death. To the immediate family, it prevents the negative psychological impact associated with sudden death or living with a family member suffering from a chronic debilitating disease such as a stroke. It also conserves family resources that would have been utilized to obtain health care. To the larger society, compliance with drug treatment is a cost saving measure since it decreases the incidence of complications and the need for additional medications[10]

1.2 Statement of the problem

Hypertension is the single most common and most important risk factor for cardiovascular disease. It has been well documented that uncontrolled blood pressure increases the risk of ischemic heart disease 3-to 4-fold and the overall cardiovascular risk by 2-to 3-fold[10]. Treating SBP and DBP to targets that are <140/90 mmHg is associated with a decrease in CVD complications. In patients with hypertension and diabetes or renal disease, the BP goal is <130/80 mmHg [13]. Antihypertensive therapy has been associated with reductions in (1) stroke incidence, averaging 35–40 percent; (2) myocardial infarction (MI), averaging 20–25 percent; and (3) HF, averaging >50 percent. It is estimated that in patients with stage 1 hypertension (SBP 140–159 mmHg and/or DBP 90–99 mmHg) and additional cardiovascular risk factors, achieving a sustained 12 mmHg reduction in SBP over 10 years will prevent 1 death for every 11 patients treated. In the added presence of CVD or target organ damage, only nine patients would require such BP reduction to prevent one death[1]. Therefore, access to treatment with antihypertensive medication and compliance with treatment are key factors in the control of hypertension.

Despite the availability of effective treatment, hypertension, the leading cause of mortality and the third largest cause of disability, is poorly controlled worldwide. Over half of the patients being treated for hypertension drop out of care entirely within a year of diagnosis and of those who remain under medical supervision only about 50% take at least 80% of their prescribed medications [14-15].

The failure to control hypertension takes an unacceptable toll on patients and their families. In addition to the personal cost, to the individual patient, uncontrolled hypertension creates huge, avoidable economic burdens when viewed in terms of the general population. Uncontrolled blood pressure has been demonstrated to be a major risk factor contributing to more than 500,000 cases of stroke and one million myocardial infarction cases reported each year in the United States alone[16]. Poor compliance with treatment is the most important cause of uncontrolled blood pressure (11). Long-term compliance with treatment is always a problem which requires a change in behavior

which may be extremely difficult. Introducing individual behavioral change is often met with some difficulty and skepticism which are attributable to personal characteristics such as beliefs, attitudes, knowledge and motivation regarding the behavior [17]. However, evidence to support any specific approach or intervention for improving patient adherence to antihypertensive drugs or prescribed lifestyle changes is lacking [18].

Multiple factors contribute to poor compliance with long-term antihypertensive therapy. Many patients have negative attitudes towards taking medication, especially if they 'feel well' [19]. Some factors reported to have a significant effect on compliance are: poor socioeconomic status (poverty), low level of education, unemployment, lack of effective social support networks, unstable living conditions, long distance from treatment centre, high cost of transport, cultural and lay beliefs about illness and treatment, and forgetfulness[20]. A lack of knowledge about the severity of the disease and the importance of adhering to the prescribed treatment, and a lack of motivation to make some lifestyle changes in terms of diet and physical exercise may constitute barriers to compliance behavior[21].

Thus such factors must be understood, however the principal investigator didn't come across any study done particularly in the study area. Therefore this study assessed compliance to anti hypertension treatment and associated factors.

Chapter II: Literature review

2.1 Literature review

Since hypertension has no cure patients are expected to take medications for life. Treatment of hypertension demands that patients comply with their medications and adopt health actions that are recommended to lower their blood pressure [22].

Studies on hypertension related to compliance have focused on the extent of and determinants of non-compliance, and strategies to improve compliance but vary markedly in estimates of compliance; levels as different as 20 and 80% are quoted. This variation relates to differences in study groups, duration of follow-up, methods of assessment of adherence and drug regimens used in different studies[10, 23].

Compliance to anti hypertensive treatment

Self-report method of compliance measurement is measuring compliance through questionnaires or by interviewing patients directly about drug taking and lifestyle habits[24]. A study done in UK states that self reported Compliance was high with only 112 (22%) patients in the poor compliance category[25]. A study done in Seychelles revealed that compliance with the medications regimen as reported by the respondents (71.57%) was almost similar to that observed in the clinic notes (70.59%). This similarity implies that the respondents were willing to reveal their level of compliance to their doctors [26]. Another study done in Nigeria gets Over one-half (50.7%) of the respondents had high self-reported compliance with treatment as they claimed to be taking their medication regularly whereas 41.5% had poor self-reported compliance at different levels ranging from regularly missing to take their medication to rarely taking their medication [27]. A cross sectional study done in Gondar, north west Ethiopia on adherence to anti hypertension treatment shows that 64.6% of the study participants were found to be adherent to their treatment[28].

Factors associated with anti hypertension treatment

Socio demographic characteristics

The World Health Organization considers socio-economic status of patients as an important factor influencing compliance behavior. A patient's age could influence the decision to comply with antihypertension medications[10]. A study conducted in Seychelles demonstrates significant statistical associations with treatment compliance and variables like age (44 years and older were more compliant) (p-value = 0.0032), gender (females being more compliant than the males) (p-value=0.043), and Employment (p-value =0.0198). Also the study revealed that there was no significant associations between treatment compliance and the following factors: Ethnic background (p-value = 0.7057) Marital status (p-value = 0.7495) , and Household income (p-value = 0.3639)[26].

A research done in Gondar, north west Ethiopia shows that as the distance from the hospital decreased, the adherence to treatment of HTN got improved (AOR =2.02, 95% CI= 1.19, 3.43)[28].

Clinical factors

A study in Seychelles shows that duration of illness (p-value = 0.0001), doses of medication skipped (p-value = <0.0001) and alcohol intake per week (p-value = 0.0012) have significant statistical associations with treatment compliance. The study also shows a statistically significant difference between the means of the two groups (normal weight BMI \leq 24.9kg/m² and overweight BMI \geq 25kg/m) with those who are overweight were more compliant with treatment than those who had a normal weight (p-value = 0.0055). But there is no significant association between Number of pills taken daily (p-value = 0.6577) , and Number of cigarettes smoked per day (p-value 0.2136) and treatment compliance[26]. But in another study done in UK, increased compliance with a single daily dose compared with multiple daily doses noted [29]. A meta-analysis of eight studies reports that the average adherence for once-daily dosing was Significantly higher than for multiple daily dosing(91.45 vs 83.2%, respectively P<0.001 [30]. A study done in Pakistan shows that although the presence of a single co-morbid condition slightly increased the adherence, the presence of two or more co-morbid led to a gradual decrease in adherence (P>0.05)[19]. Regarding control of BP a study done in Gondar reveals that those who have controlled HTN had a significantly higher chance of being adherent to their

treatment (AOR = 2.93, 95% CI (1.73, 4.96). Also the study shows the odds of adherence among study participants with no or one co-morbidity were 2.5 and 2.68 times higher than the odds adherence among those who had two co-morbidities (adjusted OR = 2.50, 95%CI 1.01, 6.21) or more than two co-morbidities (adjusted OR = 2.68, 95%CI 1.07, 6.71), respectively[28].

Knowledge about hypertension treatment

A study done in tel aviv Israel on Factors Associated with Hypertensive Patients' Compliance with Recommended Lifestyle Behaviors shows that patients' beliefs about hypertension management (OR= 0.44*CI 0.25–0.79), patients' knowledge about hypertension and its management (OR= 0.28* CI 0.12–0.64), and physician counseling on a healthy lifestyle and self-care(OR=1.59* CI 1.06–2.34) each have an independent effect on hypertensive patients' reported compliance with the recommended lifestyle behaviors[31].

In the previous study done in Gondar signifies knowledge about hypertension as a major factor in the treatment compliance as the odds of adherence to anti-HTN treatment among knowledgeable Clients was 6 times (AOR = 6.21, 95%CI = 3.22, 11.97) higher than the odds of adherence among HTN patients who were not knowledgeable[28].

Perceptions of the patient

The Health Belief Model hypothesizes that patients who perceive benefits from adopting particular health behavior are more likely to demonstrate the required health behavior than those who do not hold such a perception[32]. Applying this to the current study, those persons who perceive that taking antihypertension medications and adopting lifestyle changes would benefit them, would be more likely to be compliant than those who do not hold such as a perception. Such perceptions are based on knowledge of the disease and its progression.

Research done on compliance to anti hypertensive treatment in Seychelles shows a Significant relationships between treatment compliance and variables namely **Perception of benefits** ($r = 0.46$ $P = < .0001$) indicating that patients who perceived benefits of taking medications and effecting lifestyle modifications were likely to be compliant with their treatment, **Perception of**

risks ($r = 0.30$, $P = 0.0020$) implies that patients who perceived risks of developing complications of hypertension were likely to comply with their treatment[26].

Locus of control

Findings show that participants who attended follow-up regularly, satisfactory compliance was found initially in a large proportion of participants (in of participants), but in only 52.2% by the sixth month and 54.5% by the twelfth month. In contrast, among participants attending follow-up irregularly, satisfactory compliance was found only in of the participants by the first month and 5.9% by the twelfth month[33]. The researchers inferred that those respondents who honor their appointments comparatively have a higher internal locus of control with regards to health seeking behavior than patients who do not honor their appointments. But a study done in Malaysia on Health Locus of Control among Non-compliance Hypertensive Patients Undergoing Pharmacotherapy indicates that respondents with high internal locus of control (50.6%) had high drug non-compliance. There was significant different between drug compliance with the internal locus of control[34].

Service related factors

In the previous study done in Seychelles respondents had positive perceptions on service related factors as indicated that they had confidence in their doctors (97.06%), the doctors treat me with respect (96.08%), the availability of medicines at the clinic (88.12%), effectiveness of the medicines (88.12%) and the waiting time at the clinic (65.69%) were perceived positively by the majority of the respondents[26].

Conclusion

The literature review provided findings about level of compliance to anti-hypertension treatment and factors that have been shown to contribute to non-compliance to anti-hypertension treatment like socio-demographic factors, the patient's understanding and perception of hypertension, the health care provider's mode of delivering treatment, the relationships between patients and health care professionals, health systems influences and complex antihypertensive drug regimens.

2.2 Conceptual frame work

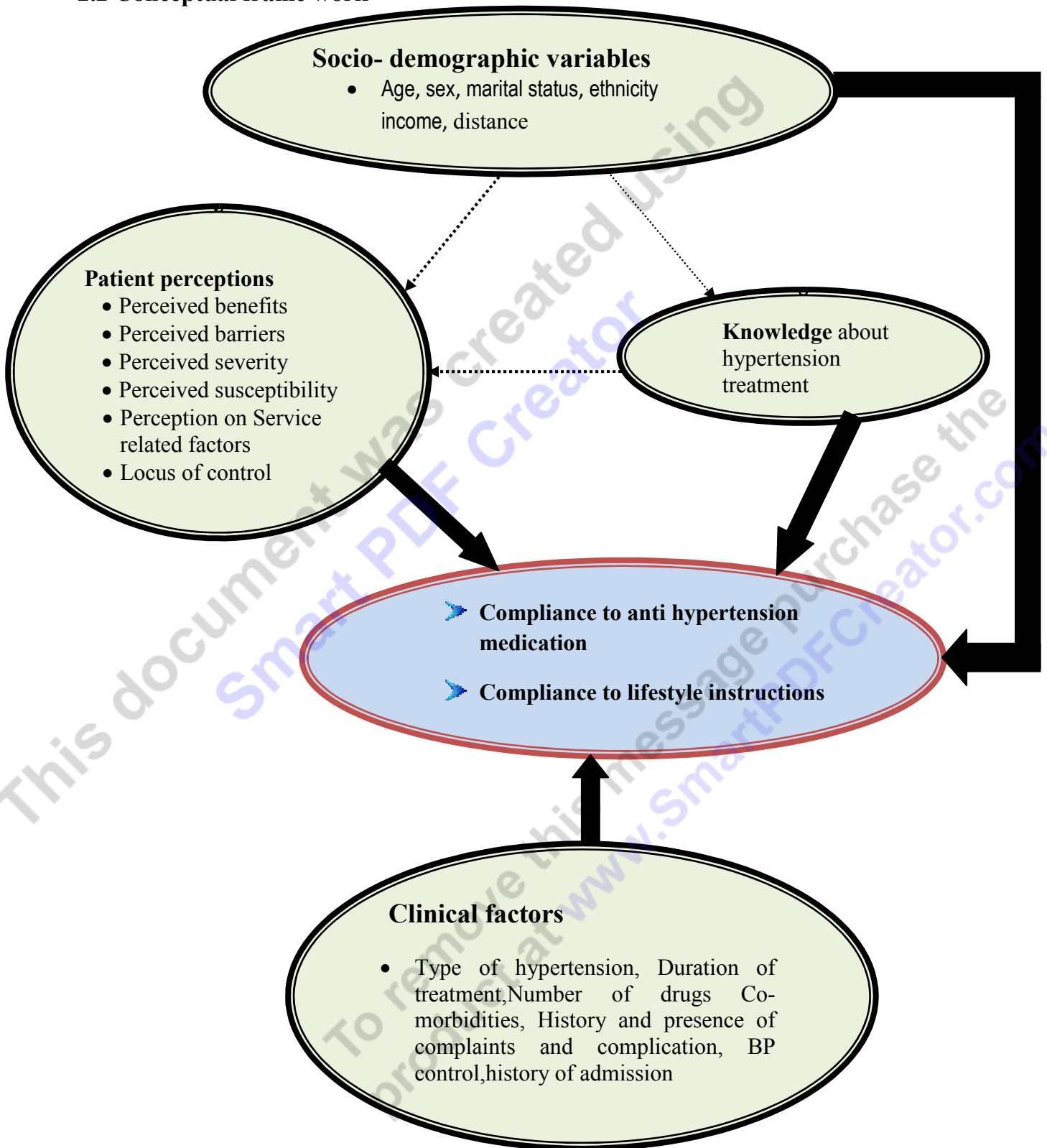


Figure 1: Conceptual framework of the study developed after searching literature.

2.3 Significance of the study

Various explanations have been proffered to explain why a large percentage of patients have resistant hypertension, including secondary hypertension and endogenous resistance to treatment. However, the main reason for inadequate control of BP is poor compliance with the treatment regimen; both pharmacological and behavioral (e.g. weight reduction, sodium intake restriction, and exercise). Understanding the reasons for patient noncompliance with antihypertensive treatment is essential if BP is to be more effectively managed.

This study aims to examine various factors responsible for compliance and non-compliance in the research context and make clear relationships existing between them.

The finding of this study will assist health care professionals to understand factors related to treatment compliance this enables them to manage hypertension appropriately both with medication and advising lifestyle interventions, also this study will be helpful to implement effective strategies that would lead to improved compliance, increased levels of controlled blood pressure and reduced occurrences of complications.

Finally since there is a limited research at country and lower level this study can be used as resource for other studies to be conducted related to hypertension.

Chapter III: Objectives

3.1 General objective

- To assess compliance to anti-hypertension treatment and associated factors among hypertensive patients on follow up in JUSH from February to April 2013G.C.

3.2 Specific objectives

- To determine level of compliance to anti - hypertension medication among hypertension patients on follow up in JUSH.
- To determine level of compliance to lifestyle instructions among hypertension patients on follow up in JUSH.
- To assess factors associated with compliance to anti hypertensive medications.

Chapter IV: Methods and Material

4.1 Study area

This study was conducted in Jimma University Specialized Hospital (JUSH) which is found in Jimma town. The town is located 357 kms south west of Addis Ababa. The town was divided in to 19 kebeles, which are now merged in to 13 kebeles, because of a recent administrative restructuring. JUSH is the only teaching and referral hospital in the southwestern part of the country. It runs an annual governmental budget of 25.06 million Birr with bed capacity of 450 and a total of more than 750 staffs of both supportive and professional. It provides services for approximately 9000 inpatient and 80000 outpatient attendances a year. The hospital gives both inpatient and outpatient services. As one of the outpatient services, the hospital has specialty clinics where patients with specific chronic disease are referred for follow-up. Hypertension clinic is one of those clinics which give service for patients with hypertension disorder. The clinic currently gives service for about 2237 hypertension patients once a week. On average 100 -120 patients are visiting the clinic on a day. The clinic is staffed with internist, residents and nurses who are trained in specific chronic disease patient follow-up.

4.2 Study Period

The study was conducted from February 2013 – April 2013G.C

4.3 Study design

This study used institution based Cross sectional quantitative study design.

4.4 Population

4.4.1 Source population

All hypertensive patients attending hypertension clinic of JUSH for follow up which are 2237 in number were used as a source population.

4.4.2 Study population

Hypertensive patients on follow up in hypertension clinic of JUSH who fulfill the inclusion and exclusion criteria were used as a study population.

4.4.3 Inclusion criteria

Patients eligible for inclusion in this study were those:-

- Aged greater than 18 years
- Placed in treatment for at least 3 months.

4.4.4 Exclusion criteria

- Patients who were too sick to be interviewed
- Patients who had a disease that affects their perceptions like mental illness

4.5 Sample size and Sampling technique/ procedure

4.5.1 Sample size

The sample size was determined by using sample size determination for estimation of a single population proportion formula as follows.

$$n = \frac{(Z_{\alpha/2})^2 P (1-P)}{D^2} = \frac{(1.96)^2 0.65(1-0.65)}{(0.05)^2} = 350$$

Assumption:

P = estimate of % hypertensive patient who are compliant to antihypertension treatment (65%)
[28]

D = Margin of sampling error tolerated- 5% (0.05)

α = Critical value at 95% confidence interval of certainty (1.96)

Since the source population was 2237 hypertensive patients that is below 10,000 finite population corrections was needed. After the correction it becomes 302 and adding non response rate of 10% the total sample size becomes 332. So 332 hypertensive patients were included as study participants.

4.5.2 Sampling technique/ procedure

Patient's card number was used as a sampling frame and individual patients was selected by using simple random sampling from a total of 2237 patients on follow up in chronic illness clinic.

4.6 Study variables

4.6.1 Dependent Variables

- Compliance to anti -hypertensive medications
- Compliance to lifestyle instructions

4.6.2 Independent variables

- **Socio - Demographic variables:**

E.g. Age, Sex, marital status, educational level, religion, ethnicity, income, distance from the hospital, occupation, cost covered

- **Clinical factors** E.g. type of hypertension, degree of control, history and presence of compliant and complication, co morbidity, duration of treatment, number of drugs, frequency of dosage, history of hospital admission, BP control.

- **Knowledge about hypertension treatment**

- **Internal Locus of control**

- **Perception on Service related factors:**

E.g. waiting time, patient confidence, health care provider respect and availability of medicine

- **Perceived susceptibility** to hypertension complication
- **Perceived severity** of hypertension
- **Perceived benefits of compliance to hypertension treatment**
- **Perceived barriers for compliance to hypertension treatment**

4.7 Data collection procedures (Instrument, data collection procedures)

4.7.1 Data collection instrument

The data was collected from hypertensive patients using pre tested structured questionnaires and by reviewing patient chart. Questions were developed for this study to assess socio demography, clinical characteristics, knowledge about hypertension treatment, compliance to lifestyle instructions, perceptions of the patients, locus of control, and service related factors. Compliance to medication regimen was assessed by using the revised morisky 8 item medication adherence scale which has a high reliability (Alpha Reliability=0.83)[35].

The response of the study participants for perception of severity, perception on susceptibility, perception of benefit, perception of barrier, locus of control and perception on service related factors was noted on a 4 point likert scale. Some questions were formulated in a negative format and the scoring was coded in the reversed order.

All the sections of the questionnaires with corresponding number of items are described below.

Table 1 : The structure of the questionnaire with corresponding number of items

Section	Variable	Number of items
A	Socio demography	10
B	Clinical factors	7
C	Knowledge about hypertension treatment	7
D	Compliance with medication regimen	8
E	Compliance with lifestyle modification regimen	7
F	Perception of severity	3
G	perception on susceptibility	5
H	Perception of benefits	4
I	Perception of barriers	4
J	Internal Locus of control	4
K	Perception on Service related factors	4

4.7.2 Data collection procedure

The data was collected by 5 nurses working in JUSH other than chronic illness department who can speak both Amharic and Affan Oromo through face to face interview and record review. One supervisor was assigned at the time of data collection.

The data was collected every Wednesday; a day hypertension patient comes for follow up by using a pre tested structured questionnaire, and by reviewing patient chart. Patients were interviewed after they get the service they required from the hypertension clinic. Also Patient chart was reviewed by using structured instrument. The items were formulated in a manner that elicits the required data from the chart.

4.8 Data analysis procedure

Data was entered by using Epidata3.1 and then exported to SPSS version 16 for analysis. Frequency distributions were used to organize the data and present the responses obtained. Measures of central tendency was calculated and utilized for appropriate variables to describe the data. Bivariate and multivariate logistic regression were done using Compliant vs. non-compliant status as the outcome variable, while various study variables were used as independent variables. Those variables with a p value < 0.2 in bivariate analysis were included in multivariate analysis. using backward stepwise regression approach. Odds ratios (with 95% confidence intervals) were calculated. A p-value of less than 0.05 was considered to be statistically significant in multivariate analysis. Finally results were displayed using text, graphs and tables.

4.9 Data quality management

Questionnaire was prepared in English and translated to Amharic & Affan Oromo and re translated back to English.

One day training was given for five Bsc nurse data collectors ahead of the actual data collection period. The training was focused on familiarizing interviewers with the questionnaire and giving them the opportunity to practice using it. The training also includes holding discussion about different sections of the questionnaire, using question by question description of the questionnaire. Data collectors practiced interviewing to identify any possible future problems and to take remedial measures.

Questionnaire was pre-tested on 5% of sample a week before actual data collection period in Limmu hospital; after pre-test necessary modification was done. At time of data collection, filled questionnaires were checked for completeness and consistency of information by the supervisor on daily basis and typographic errors was manually edited. Any ambiguity and other problems of data collectors were addressed by communicating with the data collectors before the following week.

4.10 Operational and conceptual definitions

- **Disability adjusted life year:** - is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death.
- **Compliance with the medication regimen:** - Respondents who score 80% and above on the revised Morisky 8-Item Medication Adherence Scale were considered as compliant and respondents with a score < 80% were considered as non compliant[36].
- **Compliance with the lifestyle modification regimen:** - A measure was built by counting the number of times participants reported healthy health behaviors (maintain normal weight, restrict salt and alcohol intake, adopt DASH, stop smoking and doing regular exercise). Respondents who scored above 80% were considered compliant to lifestyle instructions and those who scored below 80% were considered non compliant.
- **Perception on severity of hypertension:** - Respondents with an average score of 3 and above were regarded as having a high perception of severity of hypertension and those with average score of below 3 as having a low perception of severity of hypertension.
- **Perception on benefits of compliance to hypertension treatment:** - Respondents with an average score of 3 and above were regarded as having a positive perception of benefits and those with scores of below 3 as negative perception of benefits.
- **Perception on barriers for compliance to hypertension treatment:-** Respondents with an average score of 3 and above were regarded as having a high perception of

barriers and those with scores of below 3 regarded as having a low perception of barriers

- **Perception on susceptibility to hypertension complication:** - Respondents with an average score of 3 and above were regarded as having a high perception on susceptibility and those with scores of below 3 regarded as having a low perception on susceptibility.
- **Internal Locus of control:** - is the extent to which individuals believe that they can control events that affect them. In this study Respondents with an average score of 3 and above were regarded as having a high locus of control and those with an average score of below 3 regarded as having low locus of control.
- **Knowledgeable about hypertension management:** - Respondents who scored above mean for knowledge questions were regarded as knowledgeable and those who scored below mean were regarded as less knowledgeable.
- **Perception on Service related factors:** - Respondents with a score of 3 and above were regarded as having a good perception for the service related factors and those with a score of below 3 as having a poor perception for service related factors.
- **One standard drink of alcohol:** - A standard drink is equivalent to 125ml wine, 340ml beer, 60ml sherry and 25ml liquor.
- **Body mass index:** - Is a measure of overweight and obesity. It is obtained by dividing body weight by the height squared. Individuals with a Body Mass Index of $18.5 - 24.9\text{kg/m}^2$ are considered to have optimal weight for height, those with a Body Mass Index of $25-29.9\text{kg/m}^2$ are overweight and those with a Body Mass Index greater than 30kg/m^2 are considered obese.
- **DASH:** - An approach for hypertension patient with a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat.

4.12 Ethical considerations

Before the data collection, ethical clearance letter was obtained from ethical review committee of JU College of public health and medical sciences. The respondents were informed about the purpose of the study, and their oral consent was obtained. The respondents' right to refuse or withdraw from participating in the interview was fully maintained and the information provided by each respondent was kept strictly confidential.

4.13 Dissemination of findings

The result of the study will be communicated to Jimma University college of Public Health and Medical Sciences Graduate School, Department of Nursing to concerned bodies in the study area. Finally an effort also will be made to publish in a local or international journal.

Chapter V: Result

Socio demographic characterstics

Out of 332 hypertensive patient planned to be included in the study 314 were interviewed, 12 were not present during data collection period, 4 refused to participate and 2 were too sick to be interviewed, which gives a response rate of 94.5%. Among the study participants, 163(51.3%) and 153(48.7%) were females and males respectively. The mean age of the participant was 53.8 years with a standard deviation of 12.8 years. Half of the participants (50.3%) were Oromo ethnic group. The majority of participants, namely 214 (68.2%) were married, 10(3.2%) were single and 64(20.4%) were widowed. Almost half (47.8%) of the participants were illiterate, only 29 (9.2%) were completed grade 12 and above. Muslim and orthodox Christian accounted 48.1% and 40.8% of the study participants. The average monthly family income of the participants was 729 ETB. For one hundred forty (55.4%) participants it tooks more than one hour for a single trip to the hospital. Among the study participants, 173(55.1%) covered their own treatment costs, only 67(21.3%) study participant's treatment cost were covered by their family.

Table 2:- Socio demographic characteristics of hypertension patients on follow (n = 314), JUSH, 2013.

Variables	Category	Frequency	percentage
Age in years	18 -40	62	19.7
	41-60	168	53.5
	>=60	84	26.8
Sex	Male	153	48.7
	Female	161	51.3
Ethnicity	Oromo	158	50.3
	Amhara	78	24.8
	Dawero	30	9.6
	Yeme	25	8
	Other	23	7.3
Religion	Orthodox	128	40.8
	Muslim	151	48.1
	Protestant	33	10.5
	Others ¹	2	0.6
Marital status	Single	10	3.2
	Married	214	68.2
	Divorced	26	8.3
	Widowed	64	20.4
Occupation	Gov't employed	46	14.6
	Merchant	27	8.6
	Farmer	109	34.7

	House wife	64	20.4
	Daily laborer	17	5.4
	Have no work	33	10.5
	Others ²	18	5.7
Educational status	Illiterate	150	47.8
	Grade 1- 8	103	32.8
	Grade 9- 12	32	10.2
	12 and above	29	9.2
Family income	< 500 birr	155	49.4
	500 -1000 birr	94	29.9
	>1000 birr	65	20.7
Time to reach hospital(single trip)	Up to one hour	174	55.4
	Greater than one hour	140	44.6
Cost covered	Self	173	55.1
	Family	67	21.3
	Free	72	22.9
	Employer organization	2	0.6

¹:- Includes Tigrie, Gurage, kaffa

²:- Includes students and retired individuals

Clinical characteristics

More than half 189(60.2%) of the study participant do not have any health compliant currently. Evidence of co morbidity, like DM, heart failure or renal disease was not noted among 213(67.8%) of the study participants, but 92(29.3%) had one and 9(2.9%) had two or more co morbidities. This study showed that blood pressure was controlled in 174(55.4%) and uncontrolled in 140(44.6%) of patients. Regarding medication, nearly half (47.5%) of the participants took 2 drugs and those participants who took their medication once daily were 167(53.2%).

Table 3:- Clinical characteristics of hypertension patients on follow (n = 314), JUSH, 2013.

Variables	Category	Frequency	percentage
Duration on treatment	1 year or less	79	25.2
	1 – 3years	134	42.7
	3 – 5 years	57	18.2
	5 – 7 years	27	8.6
	> 7 years	17	5.4
Presence of health compliant	None	189	60.2
	One	79	25.2
	Two and above	46	14.6
Number of co morbidity	None	213	67.8
	One	92	29.3

Number of drugs	Two and above	9	2.9
	One	51	16.2
	Two	149	47.5
	Three	97	30.9
	Four and above	17	5.4
Dosage	Once	167	53.2
	BID	142	45.2
	TID and above	5	1.6
Type of hypertension	Primary	297	94.6
	Secondary	17	5.4
BP status	Controlled	174	55.4
	Uncontrolled	140	44.6
History of hospital admission (n=314)	Yes	90	28.7
	No	224	71.3
Hypertension related complication	Yes	116	36.9
	No	198	63.1

This study showed that blood pressure was controlled in 174(55.4%) and uncontrolled in 140(44.6%) of patients. Regarding medication, nearly half (47.5%) of the participants took 2 drugs and those participants who took their medication once daily were 167(53.2%).

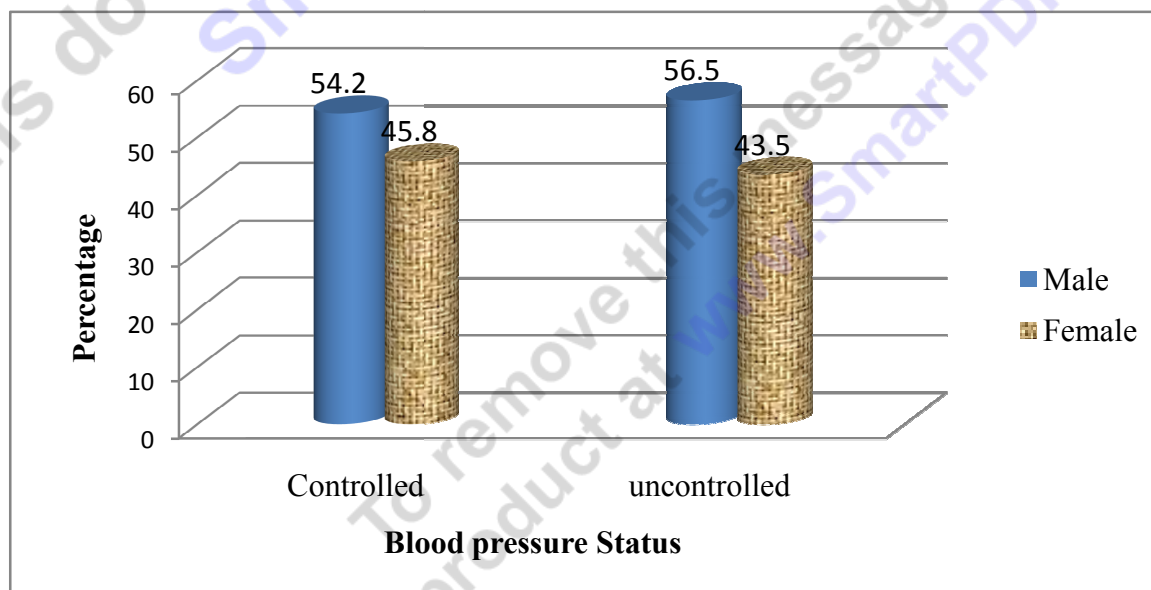


Figure 2:- Distributions of blood pressure status by sex among hypertension patient on follow in JUSH 2013

Knowledge and perceptions of the study participants

Regarding participant's knowledge about hypertension treatment only 138(43.9%) were knowledgeable. Two hundred fifty (79.6%) study participants were found to have high perception on benefits of compliance to anti-hypertensive treatment. The majority of participants, namely 251(79.9%) had high perceptions on susceptibility to hypertension related complications while 63(20.1%) had low perceptions. In this study more than half (61.8%) of the participants perceived their disease as severe. Also this study showed that 63.7% of participants had good perception on service related factors.

Table 4:- Distribution of hypertension patients on follow up based on knowledge and perceptions (n=314), JUSH, 2013

Variables	Category	Frequency	%
Knowledge status (n=314)	Knowledgeable	138	43.9
	Less knowledgeable	176	56.1
Perceived severity of hypertension (n=314)	High	194	61.8
	Low	120	38.2
Perceived susceptibility to hypertension complication (n=314)	High	251	79.9
	Low	63	20.1
Perceived benefits of compliance to hypertension treatment (n=314)	High	250	79.6
	Low	64	20.4
Perceived barriers for compliance to hypertension treatment (n=314)	High	54	17.2
	Low	260	82.8
Perception on Service related factors (n=314)	Good	200	63.7
	Poor	114	36.3
Internal locus of control(n=314)	High	237	75.5
	Low	77	24.5

Compliance to antihypertension medication

According to 80% cutoff level using MMAS, 175(55.5%) of the study participants complied with antihypertension medication regimen while the rest 139 (44.3%) were non compliant to anti hypertensive medication regimen. From the total 314 study participants 66 (21%) skipped taking medication once or more in the past three days, of them 34 (51.5%), 17(25.8%), 9 (13.6%) and 5(7.6%) mentioned forgetting to take medication, feeling better, unable to buy, and due to side effects respectively for the reason to skip dosage.

Table 5:-Respondents level of compliance to anti hypertension medications (n=314), JUSH, 2013

Variable	Category	Frequency	Percentage
Compliance to antihypertension medication(n=314)	Compliant	175	55.7
	Non compliant	139	44.3
Medication skipped in past three days(n=314)	Don't skipped	248	79.0
	One or more	66	21.0
Reason given for medication skipping(n=66)	Forgetting	34	51.5
	Feeling better	17	25.8
	Unable to buy	9	13.6
	Due to side effects	5	7.6

Compliance to lifestyle interventions

Out of 314 hypertensive patients participated in the study only 4.5% of them were smokers, 172 (54.8%) were not having salt restriction, 59.2% adapted DASH plan, 63.7% maintained their normal weight and 36.3% use to do regular physical exercise. Two hundred eighty (89.2%) participants were compliant to instruction about alcohol consumption. In this study the overall compliance to lifestyle instructions was noted only on one fourth (24.8%) of the participants, the others 236(75.2%) are non compliant to lifestyle instructions.

Table 6:- Distributions of hypertension patients on follow up based on compliance to lifestyle instructions (n=314), JUSH, 2013

Variables(n=34)	Category	Frequency	%
Smoking	Yes	14	4.5
	No	300	95.5
Alcohol	Compliant	280	89.2
	Non compliant	34	10.8
Salt intake	Compliant	142	45.2
	Non compliant	172	54.8
DASH	Compliant	128	59.2
	Non compliant	186	40.8
Regular Exercise	Compliant	114	36.3
	Non compliant	200	63.7
Body mass index(n=314)	Normal weight	211	67.2
	Over weight	103	32.8

Khat use	Yes	85	27.1
	No	229	72.9
Overall compliance to lifestyle instructions	Compliant	78	24.8
	Non compliant	236	75.2

Factors associated with compliance to anti hypertensive medications

From socio demographic variables in bivariate analysis Sex, Marital status and educational level were found to be significantly associated with compliance to antihypertension medications. In addition to these variables age in years, time to reach hospital and cost covered were candidate for multivariate analysis.

Table 7:-Association of sociodemographic characteristics with compliance to antihypertension medications among hypertension patients on follow up, JUSH, 2013

Variables	Category	Compliance to antihypertensive medication		COR(95%CI)
		Compliant	Non Compliant	
Age in years	18 -40	29(46.8)	33(53.2)	1
	41-60	101(60.1)	67(39.9)	1.7(0.9,3.1)
	>=60	45(53.6)	39(46.4)	1.3(0.7,2.5)
Sex	Male	71(46.4)	82(53.6)	0.5(0.3,0.7)
	Female	104(64.6)	57(35.4)	1
Ethnicity	Oromo	87(55.1)	71(44.9)	1
	Amhara	44(56.4)	34(43.6)	1.1(0.6,1.8)
	Dawero	16(53.3)	14(46.7)	0.9(0.4, 2.0)
	Yeme	13(52.0)	12(48.0)	0.9(0.4, 2.1)
	Others	15(65.2)	8(34.8)	1.5 (0.6,3.8)
	Religion	Orthodox	71(55.5)	57(44.5)
	Muslim	85(56.3)	66(43.7)	1
	Protestant and others	19(54.3)	16(45.7)	0.9(0.4,1.9)
Marital status	Single	7(70.0)	3(30.0)	1.6(0.4,6.5)
	Married	126(58.9)	88(41.1)	1
	Divorced	14(53.8)	12(46.2)	0.81(0.4,1.8)
	Widowed	28(43.8)	36(56.2)	0.5(0.3,0.9)
Occupation	Government employed	25(54.3)	21(45.7)	1
	Merchant	17(63.0)	10(37.0)	1.4(0.5,3.8)
	Farmer	59(54.1)	50(45.9)	1.0(0.5,2.0)
	House wife	37(57.8)	27(42.2)	1.2(0.5,2.4)
	Daily laborer	8(47.1)	9(52.9)	0.7(0.2,2.3)
	Have no work	15(45.5)	18(54.5)	0.7(0.3,1.7)

	Others	14(77.8)	4(22.2)	2.9(0.8,10.3)
Educational level	Illiterate	70(46.7)	80(53.3)	1
	Grade 1- 8	65(63.1)	38(36.9)	1.9(1.2,3.3)
	Grade 9- 12	26(81.2)	6(18.8)	4.9(1.9,12.7)
	12 and above	14(48.3)	15(51.7)	1.1(0.5,2.4)
Family monthly income	< 500 birr	82(52.9)	73(47.1)	1
	500 -1000 birr	56(59.6)	38(40.4)	1.3(0.8,2.2)
	>1000 birr	37(56.9)	28(43.1)	1.2(0.7,2.1)
Time to reach hospital(singles trip)	Up to one hour	103(59.2)	71(40.8)	1.4(0.9,2.1)
	Greater than one hour	72(51.4)	68(48.6)	1
Cost covered	Self or employer organization	100(57.1)	75(42.9)	1
	Family	42(62.7)	25(37.3)	1.3(0.7,2.2)
	Free	33(45.8)	39(54.2)	0.6(0.4,1.1)

In bivariate analysis regarding clinical factors and lifestyle factors number of drugs the patient took, presence of co morbidity, experiencing hypertension related complications, Blood pressure status, BMI and khat use were found to be significantly associated with compliance to antihypertension medications. Other variables with P-value > 0.2 were excluded in multivariate analysis.

Table 8:- Association of clinical and lifestyle factors with compliance to antihypertension medications among hypertension patients on follow up JUSH, 2013

Variables	Category	Compliance to antihypertensive medication		COR(95%CI)
		compliant	Non compliant	
Duration on treatment	1 year or less	49(62.0)	30(38.0)	2.0(0.9,4.1)
	1 – 3years	62(59.0)	43(41.0)	1.7(0.8,3.5)
	3 – 5 years	27(46.6)	31(53.4)	1.0(0.5,2.2)
	5 – 7 years	17(60.7)	11(39.3)	1.8(0.7,4.8)
	> 7 years	20(45.5)	24(54.5)	1
Presence of health compliant	None	107(56.6)	82(43.4)	1.4(0.7,2.7)
	One	46(58.2)	33(41.8)	1.5(0.7,3.2)
	Two and above	22(47.8)	24(52.2)	1
Number of co morbidity	None	133(62.4)	80(37.6)	2.3(1.4,3.8)
	One and above	42(41.6)	59(58.4)	1
Number of drugs	One	31(60.8)	20(39.2)	7.2(1.8,28.4)
	Two	81(54.4)	68(45.6)	5.6(1.5,20.2)
	Three	60(61.9)	37(38.1)	7.6(2.0,28.1)
	Four and above	3(17.6)	14(82.4)	1
Dosage	Once	91(54.5)	76(45.5)	0.9(0.6,1.4)
	BID and above	84(57.1)	63(42.9)	1

Type of hypertension	Primary	167(56.2)	130(43.8)	1.4(0.5,3.8)
	Secondary	8(47.1)	9(52.9)	1
BP status	Controlled	107(61.5)	67(38.5)	1.7(1.1,2.7)
	Uncontrolled	68(48.6)	72(51.4)	1
Body mass index	Normal weight	126(59.7)	85(40.3)	1.6(1.0,2.6)
	Over weight	49(47.6)	54(52.4)	1
History of hospital admission	Yes	46(51.1)	44(48.9)	0.8(0.5,1.3)
	No	129(57.6)	95(42.4)	1
Hypertension related complications	Yes	52(44.8)	64(55.2)	0.5(0.3,0.8)
	No	123(62.1)	75(37.9)	1
Alcohol	Compliant	18(52.9)	16(47.1)	1.1(0.6,2.3)
	Non compliant	157(56.1)	123(43.9)	1
Khat use	Yes	36(42.4)	49(57.6)	1
	No	139(60.7)	90(39.3)	2.1(1.3,3.5)

The bivariate result showed that knowledge status of the participant, perceived severity; perceived benefits, perceived barriers and internal locus of control were significantly associated with compliance to antihypertension medications. In addition to these variables perceived susceptibility to hypertension complications was included in multivariate analysis.

Table 9:-Associations of patient knowledge and perceptions with compliance to antihypertension medications among hypertension patients on follow up, JUSH, 2013

Variables	Category	Compliance to antihypertensive medication		COR(95%CI)
		compliant	Non compliant	
Knowledge status	Knowledgeable	96(69.6)	42(30.4)	2.8(1.8,4.5)
	Less knowledgeable	79(44.9)	97(55.1)	1
Perceived severity	High	144(74.2)	50(25.8)	8.3(4.9,13.9)
	Low	31(25.8)	89(74.2)	1
Perceived susceptibility	High	151(60.2)	100(39.8)	1.5(0.9,2.5)
	Low	24(38.1)	39(61.9)	1
Perceived benefits	High	167(66.8)	83(33.2)	14.1(6.4 ,30.9)
	Low	8(12.5)	56(87.5)	1
Perceived barriers	High	8(14.8)	46(85.2)	1
	Low	167(64.2)	93(35.8)	10.3(4.7 ,22.8)
Perceived service related factor	Good	114(57.0)	86(43.0)	1.2(0.7,1.8)
	Poor	61(53.5)	53(46.5)	1
Internal	High	151(63.7)	86(36.3)	3.9(2.2,6.7)

Locus of control	Low	24(31.2)	53(68.8)	1
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The association between compliance to antihypertension medications and certain explanatory variables was further investigated using multivariate logistic regression backward stepwise approach putting criteria 0.05 for entry and 0.1 for removal of variable from the equation. Those variables with P-value < 0.05 were considered as predictors of compliance to anti hypertension medication.

Age of the patient, Educational level, number of drugs the patient took, knowledge about hypertension treatment, patient perception about severity of their disease and patient perception on benefits of compliance to hypertensive treatment were found to have statistically significant association with compliance to anti hypertensive medication.

Multivariate logistic regression revealed that compliance was more likely among patients in age group between 41 to 60 years (OR= 3.4 95% CI 1.5, 7.6) and above 60 years (OR= 2.8 95%CI 1.6, 6.9) than those who are between age 18 to 40 years. Participants who completed their education from grade 9 -12 were more than 6 (OR=6.2 95%CI 1.8, 20.9) times compliant to anti hypertensive medication compared to those who were illiterate.

Table 10:- Multivariate logistic regression model showing predictors of compliance to antihypertension medications among hypertension patients on follow up, JUSH, 2013G.C

Variables	Category	Compliant to antihypertension medications	AOR(95%CI)
Age	18 -40	29(46.8)	1
	41-60	101(60.1)	3.4(1.5,7.6)*
	>=60	45(53.6)	2.8(1.6,6.9)*
Educational level	Illiterate	70(46.7)	1
	Grade 1- 8	65(63.1)	1.4(0.7,2.8)
	Grade 9- 12	26(81.2)	6.2(1.8,20.9)*
	12 and above	14(48.3)	0.6(0.2,1.7)
Number of drug	One	31(60.8)	10.1(1.9,51.7)*
	Two	81(54.4)	8.4(1.9,38.3)*
	Three	60(61.9)	10.9(2.2,53.4)*
	Four and above	3(17.6)	1

Knowledge status	Knowledgeable	96(69.6)	2.2(1.1,4.3)*
	Less knowledgeable	79(44.9)	1
Perceived severity	High	144(74.2)	3.1(1.6,5.8)*
	Low	31(25.8)	1
Perceived benefits	High	167(66.8)	10.3(3.8,27.8)*
	Low	8(12.5)	1

The odds of compliance to antihypertension medication was higher among hypertensive patients who took only one, two and three drugs in relation to those who took four and above drugs (OR= 10.1 95%CI 1.9, 51.7) (OR=8.4 95%CI 1.9, 38.3)(OR=10.9 95%CI 2.2,53.4) respectively.

Compliance to anti hypertensive medication was also higher (OR=2.2 95%CI 1.1, 4.3) among study participants who were knowledgeable about hypertension treatment compared to those who had less knowledge about the treatment. In this study patient perception about the disease severity and benefits of compliance to the treatment had positive association with compliance to antihypertensive medication. The odds of compliance to antihypertension medication was higher among hypertensive patients who highly perceived their disease severe (OR= 3.1 95%CI 1.6, 5.8) and benefits of compliance to antihypertensive treatment (OR= 10.3 95%CI 3.8, 27.8) than those who have low perceptions.

Chapter VI: Discussion

Compliance to treatment, to advice or to lifestyle changes is the key link between process and outcome in medical care. Lack of regard for levels of compliance may have a major impact on conclusions drawn from clinical research[37]. Non-compliance is a serious problem and should be understood as one of the major obstacles to the success of the treatment of hypertension. Identifying factors determining low compliance of hypertensive patients to treatment is, therefore, of vital importance in applying therapeutic strategy and in obtaining satisfactory results[38].

Compliance to antihypertensive medications among study participants as measured in this study was 55.7% when defined by the 80% cut off. It is comparable with a study done in Pakistan (57%)[39] and Nigeria (50.5%) [27], but the level of compliance to antihypertensive medications was lower compared to other studies done in Gondar Ethiopia (64.6%) and Egypt (74.1%) [28,19]. The difference can be because of the large variation in knowledge level of the study group and the inability of the study participants to afford for medication fee since most (55.1%) of the study participants were expected to pay for their medication expenses. The compliance level in the study area is unacceptable since hypertension medications should be taken as prescribed and not intermittently.

One of the aims of this study was determining the level of compliance to lifestyle instructions. The result of the study showed that many patients did not lead a healthy lifestyle with only (24.8%) of study participants being compliant to lifestyle instructions. Specific to each instruction, 59.2% of the study participants were compliant to a special diet to reduce hypertension. This finding is higher compared with the study done in Israel (45%) [31]. Salt restriction is one of the recommendations in hypertension management but in this study practicing this recommendation was low (45.2%) when compared with other study done in Pakistan (55.1%)[40]. Since dietary salt restriction is essential component of non pharmacological treatment of hypertension stronger efforts are needed on counseling the patients.

This study reports a high (95.5%) number of non smokers. This is also higher compared to the previous study done in Israel. This might be due to socio cultural and economic differences.

Research has shown that regular moderate exercise such as walking briskly or performing aerobics (lasting at least 30 minutes three times per week) can lower systolic and diastolic blood pressure considerably. The finding of this study revealed that only 36.3% of participants use to do physical activity but it is higher when it is compared with the previous study done Pakistan (23.6%)[40].

One of the public health goals of lifestyle modifications is to help individuals who are overweight or obese to achieve a normal Body Mass Index. Maintaining normal body weight among the study participants can be considered higher (67.2%) in contrast to a study done in Seychelles (12.75%) and Israel (35%) [26,31].

Many factors have been shown to contribute to compliance with hypertension treatment previously. In this study factors showing independent significant association with compliance to antihypertension medication were Age, Educational level, number of drugs, knowledge about hypertension treatment, patient perception about severity of their disease and patient perception on benefits of compliance to hypertensive treatment.

Age was found to be significantly and independently associated with compliance to antihypertension medications in this study, with better adherence observed in older people. This finding is consistent with a number of other studies [19, 26]. Poor compliance in younger patients may be due to ignorance of the true nature of hypertension, denial of the existence of the disease or becoming busy with activities outside home that makes them forget taking medications.

Education may lead to better understanding of the risks involved in non-compliant behavior. Literate persons and those who are motivated to know more about their illness are more susceptible to health education than illiterate persons. Patients who completed grade 9 -12 were found to become more compliant to antihypertension medications than those who are illiterate. The finding is in line with research done in Nigeria[41] but the finding of this study is inconsistent with many studies showing no significant associations between the variables [26,28,34][42].

The complexity of the regimen is one of treatment-related factor that has been identified as a possible cause of non compliance. Number of drugs were found to have strong association with compliance to antihypertension medication. Patients who took three or less drugs daily were more likely to be compliant than those who took four or more drugs daily. This is in contrast with study in Pakistan [19] and Nigeria [41] that demonstrates patients who took multiple drugs were more likely to be compliant. The good compliance in patients who took fewer drugs may perhaps be that when patients have to take fewer drugs, they may not feel the pill burden and gets compliance easy.

Good knowledge about hypertension and its management is an essential part of successful treatment. The finding of this study revealed that there is positive association between knowledge about hypertension treatment and compliance to anti hypertensive medications. The finding is in line with other studies done in Gondar Ethiopia and Pakistan [19,28].

Health belief model posits that individuals' overall perception of the degree of severity of the disease and their susceptibility to the consequences of the disease in one hand, and the benefits of or barriers to taking a recommended health action on the other hand, determine their behavior (compliance) towards the disease [43]. The finding of this study is concordant with the model showing perceived severity and perceived benefits to have a positive association with compliance to antihypertension medications. In the study patients who highly perceive hypertension as severe and those who have high perceptions on benefits of compliance to hypertension treatment were more likely to be compliant with antihypertension medication. Also the strong positive association between perceived benefit and compliance to antihypertension medication is in line with other study done in Seychelles [26] and also supported by a study in England that revealed compliant respondents reported the perceived benefits they derived from taking medication as one of the reasons for their compliance [29].

Unlike other studies which show significant association between sex [26,28,38], comorbidity [26,28], BP status [26,44] and compliance to antihypertension medication, there is no significant association between these variables in this study. The inconsistency may be attributable to the complex nature of compliance behaviour and because it involves several underpinning personal and social factors.

Strength and limitations

Strength

This study used reviewing patient charts and self reporting as a method of data collection which increased the reliability of the result. The use of validated tool (MMAS) in this study further strengthens the reliability of our results.

Limitations

Since it is difficult to assess the characteristics of non responders, this study assumed that responders and non-responders are similar in distribution of the recorded variables. Cause and effect cannot be ascertained since it was a cross sectional study.

Chapter VII: Conclusion and recommendations

7.1 Conclusions

It is concluded that the compliance to hypertension treatment both for anti hypertension medications and lifestyle modification is still suboptimal among hypertension patient on follow up. Compliance to antihypertension medication is only reported by 55.7% of patients and compliance to lifestyle instructions was found to be only 24.8% among the patients in the study area. In the study area patients know little about hypertension and its management. Even though more than half of patients maintained their blood pressure normal, it is not at satisfactory level.

The factors associated with compliance to antihypertensive medications includes Age, Educational level, number of drugs, knowledge about hypertension treatment, patient perception about severity of their disease and patient perception on benefits of compliance to hypertensive treatment.

The study found younger age (18- 40 years) and taking many drugs to be negatively associated with compliance to antihypertension medication. Higher Educational level(Grade 9-12), good knowledge about hypertension treatment, high perception on severity of the disease and benefits of compliance to hypertension treatment were found to be as important factors for compliance to antihypertension medication.

7.2 Recommendations

Based on the findings of this study, the following two-pronged recommendations were made:

Recommendations for clinical practice

- JUSH should implement education campaigns to increase awareness about the risk factors, natural history, complications and treatment of hypertension through the mediums of radio and television, posters and pamphlets. It will be good for JUSH to establish patient support groups as this would help compliant and non-compliant patients to meet interact and share experiences like benefits of compliance to anti hypertension treatment.
- Health care providers working in the clinic must pay special attention to patient education and counseling about their disease with specific emphasis on its causes, the severity of the disease, how their medications work and the consequences of non-compliance with treatment when treating hypertensive patients. Health care providers must also encourage and motivate their patients to adopt lifestyle changes.

The following aspects require further research:

- A study using inclusion of direct methods and other indirect methods such as pill-counts should be conducted to assess compliance more accurately.
- Research should be conducted to demonstrate the effectiveness of the hypertension lifestyle modifications and medication regimens with regard to improved prognosis. No doubt, evidence from such studies would act to motivate not only patients to comply but also health care professionals to intensify strategies to improve compliance.

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Annex

Annex 1: Document review checklist

Respondent's identification number _____

Please review patient chart and record the data as follows for those options listed please circle the options and if it is not listed put the information on the space provided.

1. Type of hypertension _____.
2. B/P measurement in 3 appointments
 - A. ____/____
 - B. ____/____
 - C. ____/____
3. Weight _____ k.g
4. Height _____ m.
5. Evidence of co morbidities noted
 - A. DM
 - B. Heart failure
 - C. Renal failure
 - D. Neurological disorder
 - E. Other (specify) _____.
6. Evidence of previous history of admission.
 - A. Yes
 - B. No

Annex II: Questionnaire

Jimma University

College of Public Health and Medical Sciences

Department of nursing

Questionnaires for the assessment on compliance to anti- hypertension treatment and associated factors among hypertension patients attending follow up at JUSH.

Consent form:

Hello: My name is ----- and I 'm from Jimma University. We are conducting an assessment on compliance to anti- hypertension treatment and associated factors among hypertension patients attending follow up at JUSH. As part of this you are kindly requested to be included in the assessment which has great importance to improve the medical care which patients receive for hypertension and ultimately their quality of life. The interview will take a maximum of 20 minutes. It will not cause you any physiological, financial or psychological harm nor affect the health care service you are getting. No information concerning you as an individual will be passed to another individual or institution. Your participation will be based on your willingness and you have the right not to participate fully or partially. If you agree to be included in the study, I will start my question by asking general identification questions.

May I continue? 1.) Yes ----- Continue the interview

2.) No----- Stop and thank the respondent

Name of the interviewer ----- Date ----- Signature -----

Name of the supervisor ----- Date ----- Signature -----

Card number _____

PART ONE: - SOCIO - DEMOGRAPHY DATA

Please ask the respondents the following questions and record the response as follows for closed ended questions please circle the response of the respondents and put the response of the respondents for open ended and for semi- closed questions (if the response is not listed) on the space provided.

1. How old are you? -----Years
2. Sex
 - A. Male
 - B. Female
3. What is your Ethnic group?
 1. Oromo 2. Amhara 3) Dawuro 4) Yeme
 - 5) Others (specify)_____
4. What is your Religion?
 1. Muslim
 2. Orthodox
 3. Protestant
 4. Catholic
 5. Other(specify)_____
5. What is your marital status?
 1. Married
 2. Single
 3. Divorced
 4. windowed
 5. other(specify)_____
6. What is your Occupation?
 1. Gov't employed
 2. Merchant
 3. Farmer
 4. House wife
 5. Daily laborer
 6. Other (specify)_____
7. Highest educational level you completed? _____.

8. Annual average family income (cash and kind) _____ Birr.

9. Who covered the cost of the drug?

- i. My self
- ii. Family
- iii. Free
- iv. Employer organization
- v. Other (specify) _____

10. Distance from the hospital _____ hour.

PART TWO: CLINICAL CHARACTERISTICS

1 When were you first start your hypertension treatment? _____ Year before.

2 What health complaints other than high blood pressure do you have currently? (More than one answer can be selected)

- 1. None
- 2. Heart problems
- 3. Paralysis of a limb
- 4. Swelling of the feet or leg
- 5. Visual impairment
- 6. Kidney problems
- 7. Shortness of breath
- 8. Irregular heartbeats (palpitations)
- 9. Other specify _____

3 Do you encounter any hypertension related complication in the past?

- i. Yes
- ii. No

4 How many pills are you taking for your high blood pressure daily? _____.

5 How often do you take your medications? _____ times/day.

6 How many doses of medication did you skip during the past three days? _____.

7 If the response for Q.No. 6 is one or more. What is the reason?

- A. Feeling better
- B. Forget to take medication

C. Other (specify) _____

PART THREE: KNOWLEDGE ON HYPERTENSION TREATMENT

Please ask the respondents the following questions about knowledge on hypertension management? And Please place a tick (✓) in the appropriate place.

Item	Yes	No
1. High blood pressure can damage blood vessels and lead to heart attacks and strokes.		
2. Being overweight affects blood pressure.		
3. Salt consumption raises blood pressure.		
4. Physical activity helps reduce blood pressure.		
5. Medication is all that is needed to treat hypertension.		
6. Hypertension is cured once and for all.		
7. Hypertension is controlled with local herbs other than the prescribed medication.		

PART FOUR: - COMPLIANCE TO THE MEDICATION REGIMEN

Please ask the respondents the following questions about compliance to medication regimen?

And Please place a tick (✓) in the appropriate place.

Item	Yes	No
1. Do you sometimes forget to take your high blood pressure pills?		
2. Over the past two weeks, were there any days when you did not take your high blood pressure medicine		
3. Have you ever cut back or stopped taking your medication without telling your doctor, because you felt worse when you took it?		
4. When you travel or leave home, do you sometimes forget to bring along your medications?		
5. Did you take your high blood pressure medicine yesterday?		
6. When you feel like your blood pressure is under control, do you sometimes stop taking your medicine?		
7. Taking medication everyday is a real inconvenience for some people. Do you ever feel hassled about sticking to your blood pressure treatment plan?		
8. Do you have difficulty remembering to take all your blood pressure medication?		

PART FIVE: - COMPLIANCE TO THE LIFESTYLE MODIFICATION REGIMEN

Please ask the respondents the following questions and record the response as follows for closed ended questions please circle the response of the respondents and put the response of the respondents for semi- closed questions (if the response is not listed) on the space provided.

1. How much cigarette you smoke per day?
 - A. I don't smoke
 - B. Other specify _____ pack/day
2. How much alcohol you drink daily?
 - A. I don't drink
 - B. < 1 standard drink per day
 - C. < 2 standard drinks per day
 - D. >2 standard drinks per day
3. How often do you eat a meal high in animal fat?
 - A. I don't eat
 - B. Other specify _____ meal /week
4. How much salt you sprinkle on your food daily?
 - A. I don't sprinkle
 - B. < ½ tea spoon
 - C. > ½ tea spoon
5. How often do you exercise for more than 30 minutes per session, which will increase your heart rate?
 - A. >= 3 times per week
 - B. < 3 times per week
 - C. I don't perform exercise
6. How often do you eat fruits and vegetables?
 - A. Daily
 - B. Every other day
 - C. < 3 times per week
7. Do you use any substances like chat and others?
 - A. Yes
 - B. No

PART SIX: PERCEPTIONS OF SEVERITY

Please ask the respondents how much they agree or disagree with the following statements about the severity of hypertension? Please place a tick (✓) in the appropriate place.

To what extent do you agree with the following statements?	Strongly agree	agree	Disagree	Strongly disagree
My blood pressure condition is serious				
I am worried about my blood pressure condition because I have symptoms				
I think I am cured because I do not have symptoms				

PART SEVEN: PERCEPTIONS ON SUSCEPTABILITY

Do you think that the following can happen on you due to hypertension?	Strongly agree	agree	disagree	Strongly disagree
to have a stroke				
to develop visual impairment				
to develop heart problems				
to develop kidney problems				
to develop paralysis				

PART EIGHT: PERCEPTIONS OF BENEFITS

Please ask the respondents how much they view the benefits of complying with hypertension treatment? Please place a tick (✓) in the appropriate place.

How do you view the benefits of complying with the treatment of hypertension?	Extremely beneficial	beneficial	Somewhat beneficial	Not at all beneficial
keeping my blood pressure under control				
increasing my quality of life				
protecting me from complications				
decreasing my chance of dying				

PART NINE: PERCEPTIONS OF BARRIERS

Please ask the respondents how much they agree or disagree with the following statements about the barriers to compliance? Please place a tick (✓) in the appropriate place.

Which aspects are problematic and hinder you from complying with your treatment	Extremely problematic	Problematic	Somewhat problematic	Not at all problematic
ineffectiveness of the medicine to stabilize my blood pressure				
lack of motivation because I cannot be cured				
not having enough time to exercise				
Fear of medication side effect				

PART TEN: LOCUS OF CONTROL

Please ask the respondents how much they agree or disagree with the following statements about the locus of control? Please place a tick (✓) in the appropriate place.

To what extent do you agree with the following statements?	Strongly agree	Agree	disagree	Strongly disagree
I think that I can cure my hypertension with local herbs other than the prescribed medication				
I have the ability to manage my hypertension by taking prescribed medication and following life style modification				
I am primarily responsible for managing my hypertension				
My physical health is determined largely by what I do or what I don't do				

PART ELEVEN: PERCEPTION ON SERVICE RELATED FACTORS

Please ask the respondents how much they agree or disagree with the following statements about service related factors? Please place a tick (✓) in the appropriate place.

To what extent do you agree with the following statements?	Strongly agree	Agree	disagree	Strongly disagree
The waiting time at the clinic is acceptable				
I have confidence with health care provider				
The health care provider treat me with respect				
The availability of medicine when I need it is good				

Thank you!

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1	የደም ግፊት ሁኔታዬ አደገኛ ነው				
2	ምልክቶች ስለሚሰሙኝ የደም ግፊት ሁኔታዬ ያሳስበኛል				
3	ምልክት ስለማይሰማኝ ድኛለሁ ብዬ አስባለሁ				

ክፍል ስባት:- ለደም ግፊት ተዛማጅ ችግሮች ተጋላጭነት ያላቸው አመለካከት

ተ.ቁ.ፕር	ጥያቄዎች	መልሶች			
		በጣም	እስማማለሁ	አልስማማም	በጣም
	በደም ግፊት ምክንያት ከታች የተዘረዘሩት ችግሮች				

ምን ያህል ሊከሰቱ ይችላሉ ብለው ያስባሉ	አልስማማም			አልስማማም
1	የጭንቅላት ደም መፍሰስ			
2	የአይታ ችግር			
3	የልብ ህመም ችግር			
4	የኩላሊት ህመም ችግር			
5	የአግርና የእጅ ያለመንቀሳቀስ ችግር			

ክፍል ስምንት:- ስለ ደም ግፊት ህክምና ጥቅም ያላቸው አመለካከት

ተ.ቁ	ጥያቄዎች	መልሶች			
		በጣም ይጠቅመኛል	ይጠቅመኛል	የተወሰነ ጥቅም አለው	ጭራሽ አይጠቅመኝም
	የደም ግፊት ህክምናን በትክክል መከታተል ምን ያህል ይጠቅመኛል ብለው ያስባሉ				
1	የደም ግፊትን እንደሚፈለገው እንዲሆን ያግዘኛል።				
2	የኑሮዬን የጥራት ደረጃ ከፍ ያደርግልኛል				
3	ከተዛማጅ ችግሮች ይከላከልልኛል				
4	ለሞት የመጋለጥ እድሌን ይቀንስልኛል				

ክፍል ዘጠኝ:- ህክምናን በአግባቡ እንዳይከታተሉ ስለሚያደርጉ መሰናከሎች ያላቸው አመለካከት

ተ.ቁ	ጥያቄዎች	መልሶች			
		በጣም ችግር አለው	ችግር አለው	የተወሰነ ችግር አለው	ጭራሽ ችግር የለውም
	እነዚህ ምክንያቶች ምን ያህል ችግር ፈጥረውብታል				
1	መድሃኒቱ የደም ግፊትን እንዲረጋጋ ስላላደረገኝ				
2	ተነሳሽነት ማጣት				
3	ለመተግበር በቂ ጊዜ ማጣት				
4	የመድሃኒቱን የጎንዮሽ ጉዳት መፍራት				

ክፍል አስር :- ሁኔታዎችን ስለመቆጣጠር

ተ.ቁ	ጥያቄዎች	መልሶች			
		በጣም አስማማለሁ	አስማማለሁ	አልስማማም	በጣም አልስማማም
	በነዚህ ዓ.ነገሮች ምን ያህል ይስማማሉ				
1	የደም ግፊትን በባህላዊ ህክምና ከታዘዘልኝ መድሃኒት ውጭ አድናለሁ ብዬ አስባለሁ				
2	የታዘዘልኝን ህክምና በመተግበር የደም ግፊትን የመቆጣጠር አቅም አለኝ ብዬ አስባለሁ				
3	የደም ግፊትን መቆጣጠር በዋነኛነት የኔ ሃላፊነት ነው				

4	በአብዛኛው የሰውነት ጤንነት የሚወሰነው እኔ በማደርገውና በማላደርገው ነው				
---	--	--	--	--	--

ክፍል አሰራ አንድ :- ስለ ህክምና መስጫው ያላቸው አመለካከት

ተ.ቁ	ጥያቄዎች	መልሶች			
		በጣም እስማማለሁ	እስማማለሁ	አልስማማም	በጣም አልስማማም
	በነዚህ ዓ.ነገሮች ምን ያህል ይስማማሉኝ				
1	እዚህ ክሊኒክ የምጠብቀው ወረፋ ተገቢ ነው				
2	በህክምና ሰጪዎች እምነት አለኝ				
3	ህክምና ሰጪዎቼ በአክብሮት ነው የሚያስተናግዱኝ				
4	የምፈልገውን መድኃኒት በአግባቡ (በጊዜው) ነው የማገኘው				

Gaffilee fi Safartuuwan

Yuuniversitii Jimmaa

Kolleejii Fayyaa Hawaasaa fi saayiinsii meedikaala

Muummee Narsiingii

Gaaffiilee qorrannoo dhibamtootin dhibbaa dhiigaa hospiitaala yuniversiti jimmaa keessatti hordofii godhan dawaa/qoricha dhiibbaa dhigaatiif fudhatan irraattii yaada qabanii fi rakkinoota dawaa kana waaliin walqatee jiru qorachuu taha.

Unka Eeyyama Gaafachuu:

Dursiinee harka fuune. Ani maqaan koo kaniin jedhamu kaniin dhufee Yuuniversiitii Jimmaa irraati. Nuti waa'ee dhibamtootini dhiibba dhigaa Hospitaala Yuuniversiitii Jimmaatti hordofan, dawaa/qoricha dhiibbaa dhigaatiif fudhatan irraattii yaada qabanii fi rakkinoota dawaa kana waaliin walqatee jiru qorachuufidha. Qorannoo kana keessatti hirmaanaan isin gootan fooyya'insa yaalii dhibamtootni dawaa dhiibbaa dhiigaa fudhatan keessatti bakka olaana qaba. Gaafiin kun yoobayyate daqiiqaa 20 fudhata. Sababa qorannoo kana keessatti hirmaataniif rakkini qaamaa, kaffaltii fi xiinsammuu, akkasuumas tajaajila fayyaa fudhatan irratti rakkoo tokkoollee hin jiru. Hicciitiin yaada isin kenniitanii dhuufaadhan ifati bahee nama biraatiif ykn dhaabata kamiif iyyuu kan hin laatamne tahuu isaa waada isiniif galla. Qorannoo kana keessaatti hirmaachuu fi hirmaachuu dhiisuu, akkasumas addaan kutuuf mirga guutuu qabdu. Qorannoo kana keessaatti hirmaachuuf fedha qabdu?

1. Eyyee Gaafii kee itti fufi.
2. Lakkii..... Achuma dhaabiiti gaafatamaa galatoomfadhu.

Maqaa Gaafataa..... Guyyaa

Mallattoo.....

Maqaa nama qorannoo kana hordofaa jiruu.....guyyaa.....

mallattoo.....

Lakkoofsa kaardii _____

KUTAA TOKKO: GAAFIWAN WALIIGALAA

Gaaffiilee armaan gaditti qopha'an gafadhuutii bakka duwaa jirutti guuti. Kanneen filannoo qabaniif deebii gaafatamaan kenne itti mari. Kanneen filannoo hin qabneef deebii gaafatamaan kennee bakka duwaa jirutti guuti.

1. Umuriin kee meeqa? Wagga _____
2. Saala
 - a. dhiira
 - b. dhalaa
3. Sabni kee maali?
 1. Oromoo
 2. Hamaara
 3. Dawuroo
 4. Yeemi
 5. Kan biraa (adda baasi) _____
4. Amantiikee maalii?
 1. Muusiliima
 2. Ortodoxii
 3. Protestaantii
 4. kaatolikii
 5. Kan biraa (adda baasi) _____
5. Haala fuudhaa fi heruma
 1. Fuudheera/herumeera
 2. Hin fuune/hin heerumne
 3. Walhiikneerra
 4. Narraa duhe/duute
 5. Kan biraa (adda baasi) _____
6. Dalagaan kee maali?
 1. Hojjetaa mootummaa
 2. Daldalaa/daldaltuu
 3. Qote bulaa
 4. Haadha warraa manaa
 5. Hojjetaa guyyaa
 6. Kan biraa (adda baasi) _____
7. Sadarkaa barumsaa isa olaanaa ati barattee _____

8. Wagaattii galii ati argattuu osoo qarshiitti jijjiramee ammaami tahaa? _____.
9. Gatii dawaa kanaa eyyuutuu kafalaa?
 - i. Ofii kootii
 - ii. Warraa koo
 - iii. Bilisaan
 - iv. Dhabata ani keessaa hojjedhu
 - v. Kan biraa(adda baasi) _____
10. Fageeyyi mana kee fi Hospitaala gidduu jiru sa'a meeqa fudhataa? Sa'a _____.

KUTAA LAMMAFFAA: Mallattoolee dhibeen dhiibaa dhiigaa argisiisan

1. Guyyaan ati dawa dhiibaa dhigaa kana fudhachuutti kaatee? Waggaa _____ dura.
2. Dhibee dhibbaa dhigaa kana ala dhibee isin yeroo ammaa kana qabdan jiraa? (deebii tokkoo ol filachuun ni danda'ama).
 1. Lakkii
 2. Dhukkuba onnee
 3. Millikoo sochohuu hin dandahu
 4. Millikoo/fuulli koo dhitahee jira
 5. Ijikoo na hin hubatu
 6. Rakkoo kale
 7. Afuura na kuta
 8. Lapheen koo na rukkuta
 9. Kan biraa (adda baasi)
3. Sababa dhibee dhibbaa dhigaa kanaan rakkoon cimaan isin mudate jirra?
 - i. eeyyee
 - ii. lakkii
4. Guyyaatti kiniina meeqa fudhattuu dhibee dhibba dhiigaa kanaaf? _____
5. Guyyaatti almeeqa fudhattuu dawa kana? Guyyaatti al _____
6. Guyyoota sadan darbaan keessaattii dawwaa osoo hin fudhatiin almeeqa osoo hin fudhatiin haftanii? _____
7. Deebiin lakkoofsa 6^{ffaa} tokkoof isaa ol yootahee, sababni isaa maalii?
 - A. Waan nattii foyya'eef
 - B. Dawa fudhachuu dagadheeni
 - C. Kan biraa (adda baasi) _____

KUTAA SADAFFAA: HUBANOO YAALAA DHIBEE DHIBBAA DHIGAA IRRATTI QABANI

Gaafilee armaan gadii waa'ee hubannoo dhibee dhibaa dhigaa yaaluuf godhamuu gaafadhuu bakkaa barbaachisuttii mallaattoo (✓) guuti

Waantota	Eyyee	Lakkii
1. Dhibbaa dhiigaa yoo baayyee ol kahe ujummoo dhigaa ni midhee rakkoo onnee fi dhiibee of nama wallalchisuu fiduu danda'a		
2. Ulfaatini human olii rakkoo dhibaa dhiigaa fiduu danda'a		
3. Nyaata soogidaa qabu nyaachuun dhibbaa dhigaa ol kaasa		
4. Sochiin qamaa dhibbaa dhigaa hirdhisuu keessatti fayyidaa qaba.		
5. Dawaa kun hundiinuu dhibba dhigaa yaaluuf ni barbaachisa		
6. Dhibaan dhigaa irraa fayyuun ni danda'ama		
7. Dhibbaa dhigaa dawa adaan yaalamuun kan dawaa ammyaa caala.		

KUTAA ARFAFFAA: RAKKOO DAWAA KENNAMU IRRATTI QABANI

Gaafilee armaan gadii waa'ee rakkoo dawaa kennamu irratti qaban gaafadhuu bakkaa barbaachisuttii mallaattoo (✓) guuti.

Waantota	Eyyee	Lakkii
1. Dawa dhibee dhibbaa dhigaaf siif kenname altokkotokkoo ni dagattaa?		
2. Torbn lamaan darban keessatti dawaa dhibbaa dhigaa guyyaa itti hin fudhatiin hafte qabdaa?		
3. Sababa yeroo dawa fudhatuu dhukkubni sitti caaleef doktara keettii oso hin himni yeroo itti dawaa fudhachuu addaan kutee jiraa?		
4. Yeroo karaa deemtu al tokko tokko dawaa kee fudhatee demuu hirraafatee beektaa?		
5. Kaleessaa dawaa dhibbaa dhigaaa fudhatteettaa?		
6. Yoo dhibbaa dhigaa kee waan sirraayee sitti fakkaate altokko tokkoo dawaa fudhachuu ni dhiiftee beektaa?		
7. Guyya guyyaan dawa fudhachuun namoota tokkotokkoof baay'ee rakkisa. Wantoni tokko tokko sagantaa yaalii dhibbaa dhigaa kee kana irrati rakkoo qaba jettee yaadu ni jiraa?		
8. Rakkoo yaadachuu dawaa hunda yaalii dhibbaa dhigaa keef godhamuu qabdaa?		

KUTAA SHANAFFAA: RAKKOO HAALA JIREENYAA FOYYEESSUU IRRATTI QABAN

Gaaffiilee armaan gaditti qophahan gafadhuutii bakka duwaa jirutti guuti. Kanneeni filannoo qabaniif deebii gaafatamaan kenne itti mari. Kanneen filannoo hin qabneef deebii gaafatamaan kenne bakka duwwaa jirutti guuti.

1. Guyyaatti tabboo meeqa xuuxxaa?
 - A. Lakkii ani hoo hin xuuxu
 - B. Other (adda baasi) pakketti _____ guyyaatti
2. Guyyattii Dhugaatii alkoolii hammami dhugdaa?
 - A. Lakkii ani hoo hin dhuguu
 - B. Guyyaattii dhugatii dhabata tokkoo gadi
 - C. Guyyaattii dhugatii dhabata lamaa gadi
 - D. Guyyaattii dhugatii dhabata lamaa olii
3. Yeroo meeqaaf nyaata coomaa qabuu nyaattee beektaa?
 - A. Lakkii ani hin nyaadhu
 - B. Kan biraa (adda baasi) _____
4. Guyyaatti Soogidda hammam tahuu nyaatatatti dabaluu
 - A. Lakkii ani itti hin godhuu
 - B. Waalakkaa maankaa ol
 - C. Waalakkaa maankaa gadi
5. Yeroo meeqaaf sochii qamaa daqiiqaa 30^{maaf} gootaa. Kun immoo rate dhahaana onnee keetii dabala?
 - A. Torbeetti harka sadiif isaa oli
 - B. Torbeettii harka sadii gadi
 - C. Lakkii ani hoo sochii
6. Yeroo meeqaaf firaa firee fi hashaakiltii nyaattaa?
 - A. Guyyaadhaan
 - B. Guyyaa tokkoo gidduu oolchuun
 - C. Torbeettii harka sadii gadi
7. Waantoota akka jimaa fi kan biro ni fayyadamtaa?
 - A. Eyyee
 - B. lakkii

KUTAA JA'AFFAA: ELAALCHA CHIMINA DHIBEE DHIBBAA DHIGAA

Gaaffiilee armaan gaditti qophahan gafadhuutii bakka duwaa bakkaa barbaachisuttii mallaattoo (✓) guuti.

Ammami waantoota armaan gadii kana sirridha jettanii yaaddu?	Sirritin deggera	Nan deggera	Hin deggeru	Gonkumaayyuu hin deggeru
Waa'ee dhibbaa dhigaa koo kun baayyee cimaa dha.				
Waa'een dhibbaa dhigaa koo kun baayyee na yaaddeessa jira sababa mallattoo isa kan irraa ka'e				
Akkaan yaaduti dhibee koo kana irraa nan fayya. Mallattoo isaas natty dhagahamaa hin jiru				

KUTAA TORBEFFAA: ILAALCHA CARRAA DHIBEE BIRAATIIN QABAMUU

Gaaffiilee armaan gaditti qophahan gafadhuutii bakka duwaa bakkaa barbaachisuttii mallaattoo (✓) guuti.

Sababa dhibbaa dhigaan dhibeewan armaan gadii umamuu ni dandahu jettee yaaddaa?	Sirritin deggera	Nan deggera	Hin deggeru	Gonkumaayyuu hin deggeru
Dhibee ofwalaalchisu				
Iji hubachuu dididuu				
Dhibee onnee fiduu				
Dhibee kale fiduu				
Milli hojichuu diduu				

KUTAA SADDEETEFFAA: ILAALCHA BU'AA GAARII FIDUU DANDA'U

Dawa kennamu sirriti fudhachuun bu'aa akkamii akka qabu gafadhuu bakka duwaa jirutti mallattoo (✓) guuti.

Dawa kennamu sirriti fudhachuun bu'aa akkamii qaba jettee yaadda?	Sirritin deggera	Nan deggera	Hin deggeru	Gonkumaayyuu hin deggeru
Dhibbaa dhigaa koo akka sirratee turu godha.				
Faayyaa koo irratti bu'aa guddaa qaba rakkoo cimmaa uumamuu danda'u irraa na dhorka.				
Carra duwaa xiqeesa				

KUTAA SALGEFFAA: ILAALCHA AKKA DAWA HIN FUDHANNEEF GUFUU TAHE

Gaaffiilee armaan gaditti qophahan gafadhuutii bakka duwaa bakkaa barbaachisuttii mallaattoo (✓) guuti.

Waantota kanaa gadii kessaa akka ati dawaa kee hin fudhannne si dhorku maalii?	Rakkoo guddaa dha	Rakkoo dha	Rakkoo xiqoodha	Gonkummaa rakkoo miti
Dawaa kenname dhibba dhigaa koo sirresuu waan dadhabeef.				
Waan fayyuuu hin dandeenyeef garaa kutadheeni				
Sa'a gahaa waanin hin qabneef sochii qamaa gochuu hin dandeenye				
Dawaa kun rakkoo waan narraan gaha jedhee waanin sodadhuuf				

KUTAA KURNEFFAA: YAALII DHIBEE KANA KESSAATI GAHEE DHIBAAN QABU

Gaaffiilee armaan gaditti qophahan gafadhuutii bakka duwaa bakkaa barbaachisuttii mallaattoo (✓) guuti.

Ammami waantoota armaan gadii kana sirridha jettanii yaaddu?	Sirritin deggera	Nan deggera	Hin deggeru	Gonkumaayyuu hin deggeru
Akka ani yaaduti dawaan aadaa dawaa ammayyaa caalaa dhibee dhibbaa dhiigaa fooyyessa.				
Dawaa naaf kenname sirriti fudhachuu fi haala jireenya koo sirressu nan danda'a				
Ani yaalii naaf godhamu keessatti bakka jalqabaan fudha				
Fayyaan qaama kootii waanta ani godhuu fi godhuu dhisu irrati hunda'a				

KUTAA KUDHA TOKKO: ILAALCHA GARAARSA HOSPITAALA IRRAA KENNAMU WAJJIIN WALQABATE

Gaaffilee armaan gaditti qophahan gafadhuutii bakka duwaa bakkaa barbaachisuttii mallaattoo (✓) guuti.

Ammami waantoota armaan gadii kana sirridha jettanii yaaddu	Sirritin deggera	Nan deggera	Hin deggeru	Gonkumaayyuu hin deggeru
Hopitaala erga dhuftanii tajaajila argachuu yeroo turtii madaalaa dha				
Ogeessota fayyaa irraa amantee guddaa qabna				
Ogeessoni fayyaa kabajaan nu yaalu.				
Dawaa nuuf ajajamu akka gaariitti ni argana				

Galatoomaa!!