NON-ADHERENCE TO LIFESTYLE MODIFICATIONS AND ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS ATTENDING CHRONIC FOLLOW-UP UNIT IN ARBAMINCH GENERAL HOSPITAL, SOUTHERN ETHIOPIA.

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 RESEARCH THESIS SUBMITTED TO JIMMA UNIVERSITY INSTITUTE OF HEALTH, FACULTY OF PUBLIC HEALTH, DEPARTMENT OF POPULATION AND FAMILY HEALTH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTERS OF SCIENCE IN HUMAN NUTRITION

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ABSTRACT

Background: Hypertension is an important public health problem in the world for both developed and developing country. The prevalence of hypertension and its complications are increasing worldwide. Non-adherence to Lifestyle modification is one of the reasons for uncontrolled blood pressure and its complications among hypertensive patients. However, there are limited studies in Ethiopia on non-adherence to life style modification practice of hypertension management.

Objective: To assess the magnitude of non-adherence to lifestyle modifications and associated factors among hypertensive patients attending chronic follow-up unit in Arbaminch General Hospital, Southern Ethiopia.

Methods: Facility based, cross-sectional study disign was conducted among 270 diagnosed hypertensive patients in Arbaminch General Hospital from March 1, to April15, 2019. Systematic sampling was used from total of 1277 patients on chronic follow up to get the study participants every 4th interval. The data were collected through face to face interview using a structured questionnaire. Quantitative data was checked and entered in to Epidata version 3.1, and were exported to SPSS version 20 for analysis. Associations between independent variables and dependent variables were analyzed using multivariable logistic regression analysis, with P-values <0.05 at 95% CI was considered statistically significant.

Result: The study included 270 respondents with 97.8% response rate. The respondent's non-adherence to lifestyle modifications was 59.3%. One hundred ninety one (70.7%) of respondent were not adherent to exercise recommendation. 26.3% of the respondents were non adherent to diet related recommendations. More than half (53.3%) of respondents had poor weight management practice. Educational status (AOR=0.84 95% CI: 0.08, 0.35) and duration of counseling (AOR=2.08, 95% CI: (1.09, 3.69) Patients with poor relationship with health professional were. AOR: 1.45, CI(1.10 ,2.39) associated with non-adherence to lifestyle modifications. **Conclusion and recommendation** -The magnitude of non-adherence to life-style changes were generally found to be high; therefore health care providers should advise the patients to focus on lifestyle modifications practice.

Key word: lifestyle modification, non-adherence, hypertension

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List of abbreviations and acronyms

AOR	Adjusted Odds Ratio
BP	Blood pressure
BMI	Body Mass Index
COR	Crude Odds Ratio
CVD	Cardiovascular Diseases
DASH	Dietary Approaches to Stop Hypertension
DBP	Diastolic Blood Pressure
DALYs	Disability Adjusted Life Years
ETB	Ethiopian Birr
H-SCALE	Hypertension Self-Care Activity Level Effects
JNC7	The Seventh Report of the Joint National Committee
NCD	Non-Communicable Diseases
SBP	Systolic Blood Pressure
SPSS	Statistical package for social science
SNNPR	Southern Nations Nationalities Peoples Region
SSA	Sub-Saharan Africa
WHO	World health organization

CHAPTER ONE: INTRODUCTION

1.1 Background

Non-Communicable Diseases (NCDs) are the leading cause of morbidity and mortality in many countries and has reached epidemic proportions globally. The 2017 WHO progress monitor showed that, NCDs kill 41 million people each year, 71% of all deaths globally. And, each year, 15 million people die from a NCD between the ages of 30 and 69 years; over 85% of these "premature" deaths occur in low- and middle-income countries (1).

Hypertension is defined as systolic blood pressure(SBP) greater than or equal to 140 mm Hg and diastolic blood pressure(DBP) greater than or equal to 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(2).

Globally, Hypertension is an important public health problem. Now it is becoming important cause of morbidity and mortality in developing countries and associated with more than 10 million deaths and more than 212million DALYs in 2015 (3).

Currently, evidences indicate that occurrence of hypertension and its complication are increasing because of the increase in modifiable risk factors including smoking, obesity, and high sodium intake, physical inactivity, consumption of large amounts of alcohol and Khat chewing (5).

Adherence to recommended life style practice are critical for the prevention of high blood pressure and are an indispensable part of the management of those with hypertension (6)

Scientific studies have consistently demonstrated that a modest reduction in salt intake lowers blood pressure in people with hypertension (6,7). Weight loss can lower blood pressure and 30 minutes' physical activity most day of the week contributes to weight loss and reduces the risk of cardiovascular disease and the overall mortality. Reduction of alcohol is very important part of recommended life style practice because alcohol is a risk factor for hypertension, contributes

excess calories, can reduce efficacy of antihypertensive medications and increase the risk of stroke (7).

Non adherence to lifestyle modifications refers to the extent to which respondents who are not adhere to diet, exercise, weight management, smoking, and alcohol consumption-related recommendations in the way intended by the health care provide and also measures reduces the risk of cardiovascular problems. Non-adherence can worsen the quality of life and add to the cost of medical care (8) .

The most important initial step when managing a hypertensive patient is lifestyle modification which includes low sodium intake, physical exercise, cease smoking, moderate alcohol intake and adopt dietary approach to stop hypertension(DASH) (9).

These lifestyle modifications can have a significant effect on the general mortality rates. For example, a reduction in systolic blood pressure as small as 3-mmHg can result in a 5%reduction in cardiac mortality, and 8% reduction in strokes mortality (10)

Life style modification activities advocated as a first line therapy for hypertension are usually performed by the individuals and planned together with the healthcare providers. Health professionals are key in this process as they play a chief role, in counseling and mentoring patients to achieve the desired outcomes(4).

1.2 Statement of problems

Hypertension is one of the most common and growing global health problems in the world, which contributes to the burden of heart disease, stroke and kidney failure and premature mortality and disability(11). Worldwide, Hypertension accounts for 45% of all heart disease deaths and 51% of all stroke-related death(12).Evidence indicates that hypertension and elevated BP are increasing gradually due to the increase in risk factors including smoking, obesity, harmful use of alcohol and lack of exercise (11).

In Africa, about 46% of adults aged 25 years and older of people affected by hypertension compared to 35 to 40% elsewhere in the world. Many hypertensive Africans are unaware of their status, and are rarely treated or poorly controlled, making them at highest risk for stroke, and heart and renal disease. Around 50% of participants with hypertension are not aware of their raised blood pressure in Africa(13,14)

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In Sub-Saharan African countries, the prevalence of hypertension is increasing and 75 million adults living with hypertension and the prevalence will rise to 125.5 million in the coming 10-15 years(4)

In Ethiopia, the prevalence of hypertension is ranged from 27.8% to31.5%.(16) and large proportion (78.8%) of subject with hypertension was unaware of their hypertension status(16). From those, (67% -72.7 %) of patients diagnosed with hypertension were not adherence to recommended life style practice(17,18).

According to The Seventh Report of the Joint National Committee, all hypertensive patients should practice lifestyle modification regardless of whether they take antihypertensive medication or not. Recommended life style practices are not reducing blood pressure but also reduce risk of complication and enhance medication efficacy. Lifestyle modifications are an important part of hypertension management which include weight reduction, increase fruit and vegetable intake, salt restriction, and physical activity, smoking cessation and abstaining from alcohol(6, 19).

Physical activity like aerobic exercise with at least one 40-minute session of moderate intensity per week is associated with a drop in SBP of about 5 mm Hg and a drop in DBP of about 4 mm Hg. The DASH diet lowered SBP for hypertensive patients by an average of 11 mm Hg and DBP by an average of 5.5 mm Hg. a reduced-salt diet results in a mean SBP and DBP reductions of 5 mm Hg and 3 mm Hg, for alcohol moderation reduction 4 mm Hg for SBP and nearly 2.5 mm Hg for DBP(9).

Evidence from previous study on life style modifications that include diet, body weight reduction, smoking cessation and regular physical activity in combination with medical therapy are very effective measures and promising for optimum treatment of hypertension(20–22).

Non adherence affects the health care provider and the health care delivery system as well as the patient as the patient has to suffer from the poor quality of life and long duration of hospital stay and increased cost and burden of the disease(20,23).

The main barriers to non-adherence to diet were unwillingness (48.6%), to exercise were lack of time (39.0%), coexisting diseases (35.6%), and adverse weather conditions (27.8%)(8).

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Different studies showed that the rates of non-adherence to medications and lifestyle changes were generally high and the causes of non-adherence is different according to the type of adherence of the studied domains. reason for poor adherence to recommended life style practice were lack of motivation, lack of social and family support, unwillingness, tendency to eat out, increasing number of fast food outlet, frequent social gatherings, depression, stress, smoking, patient-physician communication, trust in health-care provider, insufficient information on benefits and use of prescribed medicines and proposed lifestyle changes(23–25).

The WHO Global Action Plan for the Prevention and Control of NCDs set nine global NCD targets to reduce the prevalence of raised blood pressure by 25%, relative reduction in mean population intake of salt/sodium by 30% and relative reduction in the prevalence of insufficient physical activity by a 10% (11).

The consequence of hypertension is devastating, and may include stroke, myocardial infarction, cardiac failure, and renal failure among others if it is not controlled. To control hypertension prevalence and it complication difficulty in changing lifestyles, and false health beliefs that hypertension is curable, due to poor patient education(26).

To avert the consequence of hypertension explained above, our country Ethiopia try to include non-communicable disease in the national nutrition program II and sustainable development goals.(27,28) even though it is government agenda because of lack of food based guideline in the country and low adherence to life style practice among diagnosed hypertensive individual the prevalence of hypertension and its complication are not controlled.

Previous study tried to explain, factors that could decrease or enhance adherence to life style modification. Most of these studies gave emphasis on the influence of socio-demographic factors. Even though socio-demographic factors have major impact on how patients deal with their illness, multiple independent factors that could influence patient's adherence to life style modification are hardly studied. Though the issue of life style and its non-adherence requires strong devotion and considerable attention, limited studies are conducted in Ethiopia to show the gap and magnitude of the problem. There is little study in Ethiopia and there is no study done in GamoGofa zone and Arba Minch town on non- adherence to life style practice and its associated factors among diagnosed hypertensive patients of chronic follow up clinic in the hospital. This

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study was tried to assess non-adherence to life style modification and its associated factors among hypertensive patients.

1.3 Significance of the study

Non-adherence to Lifestyle modification is one of the most important reasons for uncontrolled blood pressure and hypertension complications among hypertensive patients. A better understanding of the risk factors and poor adherence to recommended life style practice related to hypertension would improve prevention and management approaches aimed at overcoming this problem. The information generated from this study is used to aid in putting in place interventions for optimal blood pressure maintenance and thus reducing time spent in hospital visits and consequently improving productivity, longevity and quality of life and also to assist health care professionals to manage hypertension in a better way and develop plan that improve non- adherence of life style modification to hypertension and reduce the complications occur due to uncontrolled hypertension. For ministry of health and researchers as source of baseline information for further study after published in known journal.

CHAPTER 2: LITERATURE REVIEW

According to the 2017 American College of Cardiology/American Heart Association Guideline on trends in Prevalence and Control of Hypertension, the estimated number of women and men with hypertension was 53 million and 55.2 million respectively in 2015–2016(29).

Africa is one of the regions highly affected by hypertension. More recent study shows that the prevalence of hypertension in Africa is 25.9%(13) and the prevalence of hypertension among Ethiopian population was estimated to be 19.6 % (30).

The most neglected causes of uncontrolled hypertension are unhealthy lifestyles. Most research on patient adherence with hypertension control guidelines focuses on medication, adverse events of the medication, and the patients" sense of well-being. Populations in low and middle countries are especially being affected through engagement to easily modifiable risk factors like unhealthy diet, tobacco use, harmful use of alcohol and physical inactivity (10).

Among hypertensive patient non-adherence to recommended lifestyle changes that should be considered and that help in lowering the blood pressure include: adoption of Dietary Approach to Stop Hypertension (DASH) –eating plans, dietary sodium reduction, physical exercise and weight reduction in overweight(7,20,24).

2.1. Non-adherence to life style modification

Cross-sectional study done in Jordan showed that regarding health-related behaviors, 40.4 % of the participants were not adherence to a low sodium diet, 52.2% did not measure their blood pressure. More than half did not do any exercise(31).

Cross-sectional study conducted in Nepal 2015 revealed that non-vegetarian after diagnosis of hypertension decreased unhealthy life style behavior from 95.2% to 74.6%. Lifestyle modification like amount of salt intake, smoking, and alcohol consumption were significantly reduced whereas physical exercise and stress reduction activity were significant increased.(21)

Cross-sectional study done in Turkey which assessed diet, exercise, measurement, smoking and medication related non-adherences found out that each patient was adherent to at least one recommendation, while 89% of patients were not adherent to one recommendation, 77% to two,

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71% to three, 76% to four and 87% to all the specified behaviors. The presence of three or more types of adherence was related to income level and presence of any other chronic disease(32).

Cross-sectional Study conducted in Serbia, Kragujevac in 2015, showed that rate of non-adherence to life style modification is 65%; they exercised regularly, avoided smoking for at least five years and consumed special healthy diet prescribed for hypertension(22).

Cross-sectional Study conducted in Saudi Arabia in 2013, showed that 95.8% of the participants were found to be non- adherent from 144 patients recruited in two hospitals. Rates of non-adherence to exercise, a healthy diet and medications were 79.9%, 88.2% and 65.4% respectively(20).

Cross-sectional Study conducted Juaso, Ghana in 2017, showed that 28 % of the participants were non-adherent t to lifestyle modification (33).

Cross-sectional study done in Durame, South Ethiopia in 2016, reported that 72.7% patients were not practiced recommended lifestyle modification. 83.9% were not practiced physical activity for 30 min per day. 58.1% had not good weight management practice. 12.1% of patient did drink alcohol in the last 7 days. and 8.8 % were a smoker (18).

A cross-sectional study conducted at Addis Ababa in 2015 reported that 77% of the respondents non-adhered to all studied lifestyle recommendations; 30.9% non-adhered to diet; 14% were smokers and 25.2% were non-adherent to moderation of alcohol consumption. Majority (68.6%) did not engage in regular physical exercise. 65.1% of the study participants non- adhered to two components of recommended lifestyle modification followed by those who non-adhered to three components (70.3%) (17).

Hospital based cross sectional study among adult hypertensive patients at Jimma University Specialized Hospital hypertension clinic in 2016 showed that 52.7% of the patients had uncontrolled hypertension. Low awareness about hypertension, low adherence to alcohol, smoking and use of Khat had associated to high blood pressure(34).

Cross-sectional Study done in Dessie reported that 51% had poor hypertension self-care practice(35).

Cross-sectional Study conducted in America showed that adhering to prescribed physical activity levels (52.2 %,) Following practices related to weight management was less frequent, (30.1%) and adherence to low-salt diet recommendations was also low (22.0%). Three-fourths were nonsmokers and 65% abstained from alcohol (7).

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Cross-sectional Study conducted in Jimma in 2016 reported that respondents were non- adherent to low salt diet(69.5%), physical activity(55.1%), non-alcohol drinking11.7%), non-smoking(6.5%) and weight management respectively(43.1%)(36).

2.2 Factors associated with of lifestyle modification practices

2.2.1 Patient related factors

Cross-sectional Study conducted in Serbia, Kragujevac showed that counseling by the primary care physician adherence to healthy lifestyle behavior(22). Another study conducted in Turkey showed that income level and who had been informed were adhere to diet-related adherence(31). Cross- sectional Study which is conducted in Saudi Arabia indicated that level of monthly income was found to be strongly associated with practice of both a healthy diet and regular exercise. Patients of ages <65 year were found to be more adherent to a healthy diet compare to elderly ones. Only 6 (4.2%) patients were found to be practice to all studied domains. Practice of all lifestyles was increased significantly with educational level(20).

Cross- sectional Study conducted in Ghana reported that level of education (secondary and tertiary education), marital status significantly influenced the general rate of adherence to lifestyle modifications. Participants who reported of being educated on the effect of smoking and alcohol consumption, and exercise were significantly associated with high rate of adherence to lifestyle modification(33).

A cross-sectional study conducted in south Ethiopia Durame town among two hospitals reported that older age ≥ 65 years 72% were less likely to have good lifestyle modification practice. High income and low educational status were 2 times likely practice good lifestyle modification(18).

Cross-sectional Studies done in Addis Ababa and Korea reported that Age ≥65 years old, female sex and good knowledge about disease were more likely to adherent to recommended lifestyle modifications. Unemployed were found less likely to be adherent(17,38).

Study conducted in Aksum town, northern Ethiopia reported that awareness about hypertension, treatment and control of hypertension were 43%, 2.1% and 18.2%, respectively(39) .

Cross-sectional Study conducted in Gondar in 2012 , showed older age (Age≥55 years), raised fasting glucose alcohol consumption and raised BMI were significantly associated with hypertension., obesity, family history of hypertension, physical inactivity and self-reported diabetes were associated with hypertension(5,40).

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Facility based cross-sectional Study done in Jimma in 2016 showed that middle age and old age, educational level knowledge about hypertension were significant predictors of uncontrolled hypertension(41–44).

Major factors responsible for non-adherence were busy schedule, low socioeconomic status, low education level, beliefs, health condition, and lack of motivation, lack of social and family suppor (8,23).

Study conducted in Gondar Northwest Ethiopia Showed that when a person got older by one year, the odds of hypertension occurrence increased by 6%. Urban dwellers were more likely to be hypertensive(40).

2.2.2 *Disease related factors*

Cross-sectional Study done in south Ethiopia reported that five to 10 years' treatment duration were 2.5 times more likely to practice lifestyle modification. Patients who were with co-morbidity were 72% less likely to practice good lifestyle modification as compared to those without co-morbidity.

Cross-sectional Study conducted in Saudi Arabia showed Presence of other co-morbidity was found to be an important factor in the commitment to a healthy diet, regular exercise and medications. patients with longer history of hypertension have high lifestyle practice(20).

Cross-Sectional Study conducted in Ghana showed patients with longer history of hypertension (5 – 10) years have high adhering to lifestyle modifications(33).

Cross-sectional Study done among hypertensive patients in black loin hospital , Addis Ababa in 2016,showed that respondents without co-morbidity were three times more likely to practice dietary management (17).

Meta- analysis Study in Ethiopia which was done in 2015 revealed that Diabetes mellitus and peripheral neuropathy were the commonly encountered co-morbidities among hypertensive patients(18).

2.2.3 Health system/ health care team related factors

Cross-sectional Study done in Jimma Ethiopia in 2015 showed that majority (90.7%) of participants get information from health professional about avoiding salt in their diet and Majority (90.7%) of them reported that health care provider taught them about danger of too much salt(43).

Study reported that patient-physician communication; trust in health-care provider, insufficient information on benefits and use of prescribed medicines and proposed lifestyle changes were affect adherence to life style modification practice(23).

Cross- sectional study conducted in Zambia in 2010 reported that patients who were counseled for more than 5 years were 60% less likely to be non-adherent than those patients who were counseled for 5 years or less(45)

Other factors that influence adherence is patient-provider communication. Systematic review done in Saudi Arabia in 2012 showed that a good patient provider relationship has a positive impact on patient's health outcome and medication taking behavior(46).

2.3 Conceptual frame work
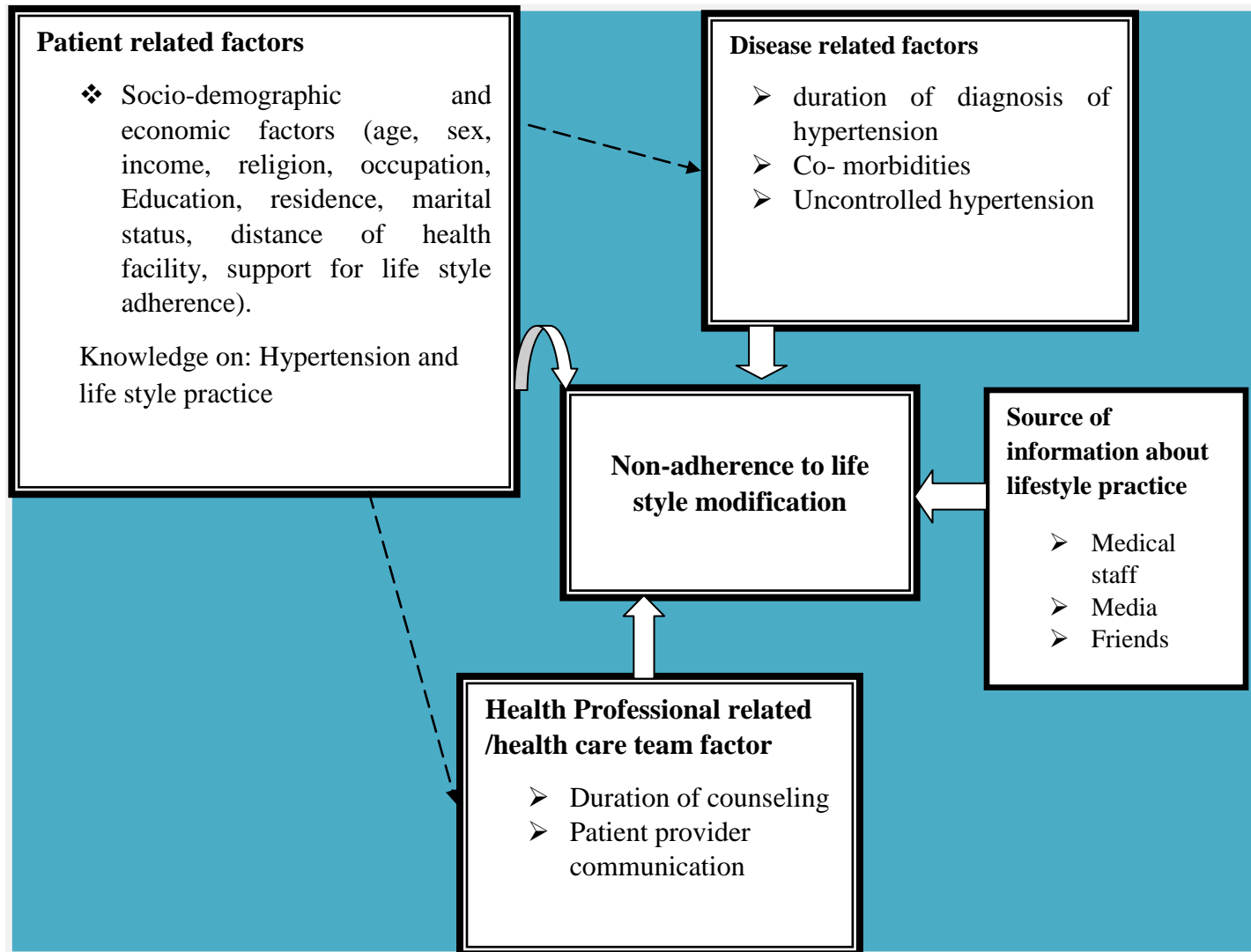
figure 1: conceptual framework developed after review of different literature regarding factor of non-adherence to lifestyle modification practice, 2019(7,17,18,23).

CHAPTER THREE: OBJECTIVES

3.1. General objective

To assess Non-adherence to lifestyle modifications and associated factors of hypertensive patients undergoing chronic follow-up unit of Arbaminch General Hospital, Southern Ethiopia, 2019.

3.2. Specific objectives

- ➢ To determine the magnitude of non-adherence to lifestyle modifications among hypertensive patients attending chronic follow up units of Arbaminch general hospital.
- ➢ To identify factors associated with non- adherence to lifestyle modifications among patients attending chronic follow-up unit of Arbaminch General Hospital.

CHAPTER FOUR: METHODS AND MATERIALS

4.1 Study Area and Period

The study was conducted in Arba Minch town,GamoGofa Zone, Southern Ethiopia. It is located at 505 Km south of Addis Ababaand 275km far from Hawasa, regional city of SNNPR near to Lake Abaya. The town is organized by four sub-cities and eleven kebeles having a total population of 74843 of which 38740 are males. The town is known for abundant Banana, Apple and fish. Even though Ministry of Health scheduled traffic free days for the towns, there is no practice of traffic free days in the town. Since ArbaMinch General Hospital is the referral hospital for the GamoGofa zone and surrounding zone. Many complicated cases are referred to the hospital. The hospital has a total capacity of 200 beds as inpatient management of the patients and out patient's management services from which chronic follow up units currently gives service for more than 1277 hypertensive adults. There are about 6 physicians and 10 nurses which are working at chronic follow up units and there is existing health education program me in the Hospital and as well as in the unit. The study was conducted from March 1- April15, 2019

4.2 Study design

Facility-based cross-sectional study design was conducted

4.3. Population

4.3.1. Source population
  ✓ All hypertensive patients currently on chronic follow up in the hospital
     was considered as the source population

4.3.2 Study population
  ✓ Selected Hypertensive patients who was available during the time of data collection

4.3.3 Study unit
  ✓ Hypertensive clients

4.4. Inclusion and Exclusion criteria

4.4.1. Inclusion criteria

All hypertensive patients who are on medical treatment (antihypertensive) for at least 6 months and coming to follow up unit during data collection time.

4.4.2. Exclusion criteria

Patients who are severely ill and unable to communicate and pregnant women during the data collection period were excluded from the study.

4.5 sample size and sampling procedure

4.5.1 Sample size determination

The sample size was determined using the single population proportion formula by considering the following assumptions.

95% confidence interval (CI), 73% of non- adherence rate to lifestyle modifications among hypertensive patients in Southern Ethiopia Durame(19) 5% marginal error computed as follows:

$$n = \frac{z^2 p(1-p)}{w^2}$$

Where n = Minimum sample size

Z = standard normal distribution value at 95% confidence level of a/2= 1.96

P = Proportion of non-adherent hypertensive patients to recommended life style modification

W = Margin of Error = 0.05

n= $\frac{(1.96)^2 \times 0.73(1-0.73)}{(0.05)^2}$ = 303

By using correction formula, a sample size n =245

But when we used associated variables to determine the sample size by using Epi-info version7.1 the maximum sample size 276 is expressed by informal education**.**

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So applying correction formula the sample size is 227which is < 245(sample size by using single population formula for proportion of non-adherent hypertensive patients to life style modification.

Then the final sample size n=245by adding 10% non-response rate increases to n= 276.

Table1. Sample size determination of non-adherence to lifestyle modifications and associated factors among hypertensive patients attending chronic follow-up by using previous study done at Durame

Associated variables	Power	Two sided confidence level	% of outcome in unexposed group	Ratio	AOR	Total sample size	Reference
Informal education	80%	95%	32.2	1	2	276	(18)
Income(500-999	80%	95%	27.9	1	2.41	178	

Our final sample size was 276

4.5.2 Sampling procedure

Systematic sampling technique was used to recruit our sample from 1277 hypertensive patients who have appointment during our data collection period. The k (sampling interval) value was calculated by dividing 1277 to 270, then k taken with value 4. Samples were collected by taking every 4[th]patients since the k value of the sample is 4.The first patient was selected randomly from the first four using lottery method in the log book. Repeat visit was avoided by taking the patient's card number and asking them if they were interviewed.

4.6 Study variables

4.6.1 Dependent variable:

Non - Adherence to lifestyle modifications.

4.6.2. Independent variables

Patient related factors

> ➢ Socio-demographic and economic factors (age, sex, income, religion, occupation, Educational status, marital status, support for life style adherence
> ➢ Knowledge about hypertension and life style practice

Source of information
> ➢ Medical staff
> ➢ Media
> ➢ Friends

Disease related factors

> ➢ duration of diagnosis of hypertension
> ➢ Co- morbidities
> ➢ Uncontrolled hypertension

Health professional related /health care team factors

> ➢ Duration of counseling
> ➢ Patient- provider communication

4.7. Data Collection Instruments

The questionnaire had Socio-demographic and economic factors, source of information about lifestyles, knowledge on hypertension and lifestyle modification practices and health professional related factors. The lifestyle modification practices was measured using questionnaires adapted from hypertension WHO STEPS questionnaires and H-SCALE (Hypertension Self-Care Activity Level Effects). After customized to local context(7,47)

Non-adherence to life style modification was assessed in terms of DASH and low sodium diet, regular exercise, weight management, minimizing alcohol consumption and cessation of smoking. Since there are no available standard questionnaires to assess adherence to lifestyle modifications, it was prepared by the principal investigator from review of pertinent literatures. Knowledge about hypertension and life style of study participants was measured by using 10 items developed after review of different literature(39). One point was given for the correct answers and zero for the incorrect answers. The items were summed up and mean was calculated. The patients who score on mean and above mean was categorized as good knowledge and below means value were poor knowledge by considering as the population is normally distributed.

Height was measured using a portable Stadiometer (Seca, Germany) and recorded to the nearest 0.1cm. During height measurement shoes, bulky clothing, pins and braids from the hair that could affect the measurement were removed. Height was measured with the head of participants at the Frankfurt plane, knees straight and the heels buttocks and the shoulders blades touching the vertical surface of the stadiometer.

Weight of each participant was taken using standardized and calibrated equipment. Weight was measured using UNICEF Seca digital weighing scale (Germany) with light clothing & no shoes and recorded to nearest 0.1 kg.

Blood pressure measurements: Blood pressure (BP) was measured all three times in the left arm with sphygmomanometer. Three seated BP measurements were taken for each subject spaced three minutes apart. The BP was taken using a mercury sphygmomanometer from the left upper arm after the subject was seated quietly for at least 5 min (average of three measurements).

4.8 Data collection procedures

Data was collected using structured questioner with face to face interview, adapted from WHO stepwise approach to chronic disease risk factor surveillance in developing countries and H-SCALE (Hypertension Self-Care Activity Level Effects)(7,47)and after reviewing similar literatures. Physical measurement like Weight, height and BP was measured. Patients were interviewed only once on their first visit during the data collection period. Repeat visit were avoided by taking the patients card number and asking them if they were interviewed.

The interview was conducted in private room to create an atmosphere of empathy and confidence. Three Bsc nurses who are not working in the chronic follow up unit was selected as data collectors and two Bsc nurses was serving as supervisors.

4.9 Data Quality Management

To assure the quality of data collectors and supervisors who are fluent in local language and working in Arbaminch General hospital other than chronic care clinics were recruited two days training for the data collectors for the objective of the study, measurement procedures and ethical issues prior to the pretest and an additional one day of training was given with the final version of the questionnaire before the start of the actual data collection. A pre-test was conducted on 5% of the sample size in the nearby hospital to improve clarity and modify the data collection instruments. The questionnaire were first prepared in English and then translated to Amharic, again to English in order to increase the consistency. Interviewer administered structured questionnaire were used for data collection. Data was collected by three BSC nurses and the principal investigator and one additional supervisor was making the overall supervision.

4.10 Data processing and analysis

Data were checked manually for completeness and consistency before data entry then data were entered in to Epidata version 3.1. Data were exported to SPSS version 20 for analysis and then cleaned to evaluate outliers and missing value. Data was summarized and presented using descriptive statistics. Model fitness was checked with the assumptions of Hosmer and Lemeshow goodness of fit test (0.68). Multicollinearity was checked by using variance inflation factors (VIF) greater than 10.Binary logistic regression analysis was conducted to identify candidate variables for the final model and those variables found to have p-value of less than 0.25were considered for the multivariable Logistic regression for controlling the possible confounders. Adjusted Odds Ratios with their 95% CI was computed and variables having p - value less than 0.05 in the multivariable logistic regression model was considered as significantly associated with the dependent variable.

4.11 Operational Definitions

Non-Adherence to life style modifications: was assessed by using 5 components of lifestyle modifications:

- ✓ Exercise non-adherence

- ✓ Non-adherence to Alcohol and Smoking abstinence

- ✓ Diet(DASH diet and salt reduction) non-adherence and

- ✓ Weight management non- adherence.

Participants with the score below 4 out of 5 were considered as non-adherent to life style practice(7)

Non-adherent to DASH diet and salt: in this study, those respondents who reported that not consumed a diet rich in fruits and vegetables, grains, fishes and consumed salt; consumed food rich in spices and saturated fat were considered to be non- adherent to DASH diet and salt.

9 items with 63 total score and mean was calculated, below mean considered non-adherent(7)

Alcohol abstainer: Participants who reported not drinking any alcohol in the last 7 days or who indicated that they usually did not drink at all(7)

Smoking: Smoking status were assessed with 1 item, "How many of the past 7 days did you smoke a cigarette or cigar, even just one puff?" Respondents who reported 0 days were considered a non-smoker.

Exercise-related non-adherence: respondents who are not reported, they exercise150 minutes per week of moderate-intensity physical activity OR 75 minutes per week of vigorous-intensity physical activity (45).

Weight management—10 items were assessed using activities undertaken to manage weight through dietary practices such as reducing portion size and making food substitutions as well as exercising to lose weight. Items assessed agreement with weight management activities during the past 30 days. Response categories ranged from strongly disagree (1) to

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strongly agree (5) by Likert scale. Responses were summed creating a range of scores from 10 to 50. Participants who report that they agreed or strongly agreed with all 10 items above mean was considered to have good weight management practice. (7)

Co-morbidities: a known hypertensive patient with other chronic disease like heart disease, diabetes mellitus and other disease (6).

Good Knowledge: if the total knowledge score was above the mean score (5.29)

Poor knowledge: if the total knowledge score was below the mean score (5.29)

Social support: is the support gained from family and non-family members. In this study, respondents whose score was above the mean value were taken as having social support.

The patient -health care provider relationship/communication: was assessed using four questions, designed based on the Relationship Scales Questionnaire (RSQ), a valid and reliable instrument (48). These questions were intended to assess health care providers" communication with the patient, patient participation in decision making and patient satisfaction with the health providers" relationship. Questions were answered as yes or no and were scored 1 for yes and 0 for no answers. Total score were summed and ranges between 0 and 4. Scores was interpreted as good (total score 3 and 4), poor(total score below 3) relationship a patient had with his/her health care provider.

Uncontrolled Hypertension: a sustained high blood pressure (SBP≥140 or DBP ≥90mmHg) or (SBP>130 or DBP>80) in the presence of co morbidities (DM and CKD) (6)

4.12 Ethical   considerations

Ethical clearance was obtained from Institutional Review committee of institute of health, Jimma University. Verbal consent was obtained from each participant before the start of interview and participant's autonoymity and confidentiality was kept. The respondents had the right not to participate in or withdraw from the study at any stage. Non-adherent patient during the data collection period was informed to the health care providers.

4.13 Dissemination of results

The results of the study were disseminated to Jimma University, the department of population and family health. Moreover, the results will also be disseminated to   different level managers of Arbaminch General Hospital for possible implementation of the recommendations. On top of that, the results will be disseminated to the international community after being published in a known peer-reviewed.

CHAPTER FIVE   RESULT

1. Socio-demographic characteristics of participants

In this study out of the total 1277 patients who were attending chronic follow up unit of Arbaminch general hospital during the study period, initially 276 clients were planned to included in the study and six patients refused to participate in the study with response rate of 97.8%.The study consisted of 58.1% males. The mean age of the respondents was 51 ±12.71 years while majority of the respondents 44.4% were in 40 - 59 age group. About 49.6% of the respondents were Gamo by ethnicity. Majority of the respondents 124(45.9%) were orthodox by religion and 80.7% were married. Out of the respondents 42.6% had formal education and 35.7% of respondents were government employee. Two hundred twenty six (83.7%) respondents were urban residence and 51.1%of respondents had an income >2000 Ethiopian Birr (ETB).Regarding to social support to lifestyle modification, 73.7%) of respondents had no social support. The mean score for knowledge was 5.29 and out of the 270 participants 100(37%) were found to be knowledgeable about hypertension. Regarding to the average distance travelled to reach the hospital 222(82.2 %) of the respondents were traveled less than 10minutes.

Table 1: Socio demographic characteristics of respondents attending chronic follow up unit of Arbaminch General Hospital, SNNPR, Ethiopia, 2019 (n=270)

Variables		Frequency	Percent (%)
Sex	Male	157	58.1
	Female	113	41.9
Age category	20-39	60	22.2
	40-59	120	44.4
	60 and above	90	33.3
Religion	Orthodox	124	45.9
	Muslim	24	8.9
	protestant	115	42.6
	catholic	3	1.1
	others[1]	4	1.5

		Frequency	Percentage (%)
Variables			
Marital status	Single	11	4.1
	married	218	80.7
	divorced	13	4.8
	widowed	28	10.4
Ethnicity	Gamo	134	49.6
	Gofa	36	13.3
	Amhara	34	12.6
	Wolaita	40	14.8
	Oromo	19	7.0
	Others[2]	7	2.6
Educational level	Formal education	204	75.6
	Informal education	66	24.4
Working status	government employee	97	35.9
	private employee	48	17.8
	private business	39	14.4
	non employed	47	17.4
	retired	27	10.0
	others[3]	12	4.4
Monthly income	<1000ETB	69	25.6
	1001-2000 ETB	63	23.3
	>2000 ETB	138	51.1
Residence	Urban	226	83.7
	Rural	44	16.3

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Social support for lifestyle practice	Yes	71	26.3	
	No	199	73.7	
Distance from health facility	<10minutes	222	82.2	
	≥10minutes	48	17.8	
Knowledge about HTN	Good	100	37	
	Poor	170	63	

1 =Java, Wakeffatta, 2=Gurage, Silte, Tigre, kefa 3=House wife, prisoners

Disease related characteristics

Out of the total 270 respondents, 156 (57.8%)were five and below 5 years since they diagnosed of hypertension. Sixty eight (25.2%) of the respondents had co-morbidities, of which, diabetes mellitus was found to be the most frequent co morbidity with 57.4% of the respondents having it; 13.2 % had coronary artery disease, 17.6 % had a history of stroke, 14.7% have chronic kidney disease.

Table 2: Disease related characteristics of respondents attending chronic follow up unit of Arbaminch General Hospital, SNNPR, Ethiopia, 2019 (n=270).

	VARIABLES	FREQUENCY	%
Time since diagnosis of hypertension	≤5 years	156	57.8
	6-10 years	91	33.7
	≥11years	23	8.5
Co-morbidities	Yes	68	25.2
	No	202	74.8
Uncontrolled HTN	Yes	159	58.8
	No	111	41.2

Non-adherence to lifestyle modifications

The mean score for lifestyle modification practice were 3.29. This study found out that 59.3% of the respondents were found to be non-adherent to all studied lifestyle practice. Majority 70.7% of respondent were not adherence to exercise recommendation. Seventy one (26.3%) of the respondents was non adherent to diet related recommendations. More than half (53.3%) of respondents had poor weight management practice. Only 15.9% of participants were non adherent to alcohol consumption, 9.3% of the participants were smokers.

Table 3: Non-adherence to lifestyle practice among hypertensive patients attending chronic follow up unit of Arbaminch general hospital in SNNPR, Ethiopia, 2019 (n=270).

Variables		Frequency	Percent (%)
Adherence to lifestyle modifications	Non-adherent	160	59.3
	Adherent	110	40.7
Exercise lifestyle practice	Non-adherent	191	70.7
	Adherent	79	29.3
Weight management	Poor	144	53.3
	Good	126	46.7
Diet	Non-adherent	71	26.3
	Adherent	199	73.7
Smoking	Poor	25	9.3
	Good	245	90.7
Alcohol	Poor	43	15.9
	Good	227	84.1

5.3. Socio-Economic characteristics and lifestyle modification practice.

One hundred twenty five (78.1%) of Patients with married marital status practiced non-adherent lifestyle modification while 3.8% of patients with single marital status practiced non-adherent lifestyle modification. Around half (49.4%) of patients with income of greater than two thousand birr practiced poor lifestyle modification.

Table 4:. Binary logistic regression analysis of socio-demographic variables for lifestyle modification practices among HTN patients in Arbaminch General Hospitals, SNNP, 2019(n=270)

Variables	Non-adherent practice		COR(95%CI)		p-value
	Yes N (%)	No N (%)			
Sex					
Male	95(60.5)	62(39.5)	1		
Female	65(57.5)	48(42.5)	0.88	(0.54,1.45)	0.622
Age in years					
20-39	35(21.9)	25(22.7)	1		
40-59	69(43.1)	51(46.4)	.0.96	(0.52,1.81)	0.915
>=60	56(35.0)	34(30.9)	1.17	(0.61,2.29)	0.63
Religion					
Orthodox	78(62.9)	46(37.1)	1		
Muslim	14(58.3)	10(41.7)	0.83	(0.34,2.01)	**0.67**
protestant	63(54.8)	52(45.2)	0.71	(0.43,1.19)	**0.20**
Others	5(71.4)	2(28.6)	1.47	(0.27,7.91)	**0.65**
Marital status					
single	6(54.5)	5 (45.5)	1		
married	125(57.3)	93 (42.7)	1.12	(0.33,3.78)	**0.31**
divorced/widowed	29 (70.7)	12 (29.3)	2.01	(0.52,7.88)	**0.11**
Educational status					
Informal education	128(75.6)	32(77.8)	1		
Formal education	76(24.4)	34(22.2)	0.55(0.31,0.97)		**0.04**

Variables	Non-adherent lifestyle practice		COR(95%CI)		p-value
	Yes(%)	No(%)			
Working status					
government employee	48(30.0)	49(44.5)	1		
private employee	29(18.1)	19(17.3)	1.56	(0.77,3.15)	**0.21**
private business	24(15.0)	15(13.6)	1.63	(0.76,3.48)	**0.20**
non employed	32(20.0)	15(13.6)	2.17	(1.05,4.52)	**0.03**
retired	19(11.9)	8(7.3)	2.42	(0.97,6.06)	**0.05**
others[3]	8(5.0)	4(3.6)	2.04	(0.57,7.23)	**0.26**
Residence					
urban	136(85.0)	90(81.8)	1		
rural	24(15.0)	20(18.2)	0.79	(0.41,1.52)	0.48
Distance of health facility					
≤10minute	131(81.9)	91(82.7)	1		
≥11minute	29(18.1)	19(17.3)	1.06	(0.56,2.01)	0.857
Social support					
Yes	118(73.8)	81(73.6)	1.01	(0.58,1.75)	0.983
No	42(26.3)	29(26.4)	1		

Table 4: Binary logistic regression analysis of Health Professional , Knowledge and Disease related predictors of lifestyle modification practices among HTN patients in Arbaminch General Hospitals, SNNP, 2019(n=270)

Variables	Lifestyle modification practice		COR(95%CI)	p-value
	Non - adherent N (%)	Adherent N (%)		
Time since diagnosis of hypertension				
=<5 years	94(58.8)	62(56.4)	1.51 (0.58, 3.87)	0.394
6-10 years	50(31.3)	41(37.3)	1.87 (0.71,4.99)	**0.209**
=>11 years	16(10.0)	7(6.4))	1	
Co-morbidity				
Yes	38(23.8)	30(27.3)	1	
NO	122(76.3)	80(72.7)	0.831 (0.48 ,1.45)	0.513
Heard information about lifestyles				
yes	71(44.4)	58(52.7)	1	
no	89(55.6)	52(47.3)	0.72(0.44,1.16)	**0.178**
Knowledge about HTN				
poor	105(65.6)	65(59.1)	1	
good	55(34.4)	45(40.9)	0.76(0.46,1.25)	**0.25**

Variables	Lifestyle modification practice		COR(CI 95%)	p-value
	Yes(%)	No(%)		
Duration of Counseling				
=<5 years	226(83.7)	86(78.2)	1	
>5 years	44(16.3)	24(21.8)	0.41(0.20,0.83)	**0.013**

Around One third (31.3%) of patients who since diagnosis of hypertension from 6-10 years practiced poor lifestyle modification and more than half (55.6%) of those who had no information practiced poor lifestyle modification. One hundred five (65.6%) of the patients who had no basic knowledge about hypertension practiced poor lifestyle modification. 87.5% of patients having with less than five years of counseling practiced poor lifestyle modification.

Factors associated with non-adherence to lifestyle modification practice among hypertensive patients.

After binary logistic regression analysis *marital status*, *educational level*, *ethnicity*, *monthly income, duration of HTN diagnosis, counseling duration, knowledge, Heard information about lifestyles and patient physician relation and working status (10 variables)* was a candidate for multivariable logistic analysis.

Table 5: Multivariable logistic regression analysis of factors associated with Non-adherence to lifestyle practice among hypertensive patients attending chronic follow up unit of Arbaminch general hospital in SNNPR, Ethiopia, 2019 (n=270).

Variables	Lifestyle modification Practice		COR (95%CI)	AOR (95%CI)
	Non adherent N (%)	Adherent N (%)		
Educational status				
Informal education	128(75.6)	32(88.2)	1	1
Formal education	76(24.4)	34(11.8)	0.55(0.31,0.97)*	0.84(0.08,0.35)**
Monthly income				
<1000ETB	46(28.8)	23(20.9)	1	1
1000-2000ETB	35(21.9)	28(25.5)	0.67(0.37,1.22)	1.75(0.81,3.75)
>2000 ETB	79(49.4)	59(53.6)	1.01(0.58,1.95)	1.01 (0.46,2.23)

Variables	Non-adherent	adherent	COR(95%CI)	AOR(95%CI)
Working status				
government employee	48(30.0)	49(44.5)	1	1
private employee	29(18.1)	19(17.3)	0.64 (0.32,1.29)	0.71(0.30 ,1.67)
private business	24(15.0)	15(13.6)	0.61 (0.28,1.31)	0.68(0.28, 1.67)
non employed	32(20.0)	15(13.6)	0.46 (0.22,0.95)	0.58(0.19,1.75)
retired	19(11.9)	8(7.3)	0.41(0.16,1.03)	0.46(0.16,1.26)
others	8(5.0)	4(3.6)	0.49 (0.14,1.74)	0.87(0.18,4.13)
Knowledge Poor	105(65.6)	65(59.1)	1	1
Good	55(34.4)	45(40.9)	0.76 (0.46,1.25)	1.16 (0.68, 2.00)
Time since diagnosis of hypertension				
=<5 years	94(58.8)	62(56.4)	1.51 (0.58,3.87)	1.68(0.58,4.90)
6-10 years	50(31.3)	41(37.3)	1.87(0.71,4.99)	1.92(0.66,5.61)
=>11 years	16(10.0)	7(6.4)	1	1

Variables	Non-adherent	adherent	COR(95%CI)	AOR(95%CI)
Duration of Counseling				
>5 years	20(12.5)	24(21.8)	1.95(1.02,3.75)*	2.08(1.06 ,4.01)**
=<5 years	140(87.5)	86(78.2)	1	1
Patient physician relation				
Poor	95(63.8)	54(36.2)	1.52(1.03,2.47)*	2.01(1.09,3.69)**
Good	65(53.7)	56(46.3)	1	1

*=p<0.25 and ** p-value< 0.005, 1=reference group. others: housewife, prisoners

NB. Hosmer and Lemeshow goodness-of-fit test has chi-square of 6.332with p-value of 0.610, omnibus test of p-value of 0 .032.

According to result of multivariable analysis, Duration of Counseling in years, educational status and patient physician relation were independent variables that were associated with non-adherence to lifestyle modification practice among hypertensive patients. Patients with formal education were 16% less to practice non-adherence lifestyle modification practice (AOR=1.84(1.08, 0.35) than patients with formal education. On the other hand hypertensive patients with duration of Counseling greater than five years were 2 times less likely to practice non-adherence lifestyle modification (AOR=2.08, 95% CI: (1.06, 4.01) as compared to patients with duration of Counseling =<5years. Patients with poor relationship with health professional were 2.01 times more likely to practice non-adherence lifestyle modification as compared to patients with good patient physician relationship. AOR: 2.01   CI(1.09 ,3.69)

CHAPTER SIX   DISCUSSION

In this study, we explored the level of life style practice and associated factors among hypertensive patients in Arbaminch general Hospital.

The finding of this study showed that the overall non- adherence (including diet, exercise, smoking cessation and moderation of alcohol consumption) was 59.3% which is comparable with the finding from Serbia and Dessie (22,35) where 65% and 51% of patients were non-adherence. But it is lower than those reported from Saudi Arabia, Durame, Addis Ababa(17,18,20).This discrepancy could be explained by methodological factors where the Saudi study had small sample and included only male participants. Other reason for Durame and Addis Ababa study discrepancy could time in which 3 years before current study made patients were get health education..

Our finding is higher than the finding of study done in Ghana in which(28 %) were non-adhere(49).This inconsistency might be sample size difference and difference in population characteristics. Another reason could be difference in exposure to lifestyle information and the tools used the measure lifestyle practice.

In this study, the exercise related non-adherence was 70.7 %. Similar studies conducted in Addis Ababa found a 68.6% were non- adherence which is closer to our findings.(17) It was higher compared to reports from Jimma(55.1%), Jordan(50%) and African Americans(48.8%) were not adherent (7,36,50)but lower compared to the studies done in Durame and Saudi Arabia where 83.9 % and 79.9 % were not adherence to exercise related modification practice (18,20). The possible explanation for Jordan and American study could be lack of organized setups which are favorable for exercise and due to difference to educational back ground of patients and level of awareness about lifestyle modification and its advantages.

Diet related non-adherence in this study was 26.3%.this finding is in line with study conducted in Addis Ababa(30.9%) (17)but lower than in study done in Jimma (69.5%),, Jordan (40.4%) and Saudi Arabia (88.2%) were found to be non-adherent respectively (17,20,50). The discrepancy between the one local study and the study from Saudi Arabia and Jordan could be due to the difference between the dietary habits between the two countries and residence of study participants. This may be due to difference in socio-cultural practice of the community and difference in knowledge about effect of high salt diet in blood pressure control.

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This study revealed that non-adherence to weight management practice was 53.3% and it is consistent with a study done Durame where 58.1 were had poor weight management practice (18) however the result of this study were higher than study done in Jimma 43.1% were had poor weight management practice(36). This could be due to methodological difference in which Jimma study uses small sample size (130).

A small portion (9.3%) of respondents in this study smoked currently. Our finding related to poor adherence to smoking are in line with studies conducted in Addis Ababa(7.8%) and Durame(14% and Jimma(6.5%)(17,18,36).However it is lower than study done in American(25%) (7).This could be due to Socio- cultural practices that discourage smoking.

 In this study respondents who had poor adherence to their alcohol consumption were found to be 15.9% which is consistent with a study done in Durame (12.1%) and Jimma (11.7%) (18,36)however lower compared to the studies done in Addis Ababa (25.2%) and America (25%)(7,17).This difference could be explained by geographical (urban setting) and other differences between the population involved in our study and the previous study.

Association between socio-demographics and non-adherence to lifestyle modification showed that, Educational level was significantly influenced the general rate of non-adherence. Patients who had no formal education are 16% less to practice non-adherence to lifestyle modification practice compare to patients with informal education. AOR: 0.84 CI(0.08,3.35).

This finding was in line with study done in Durame and Ghana (18)

This consistency could be due to less educated people may more likely overestimate their adherence in trying to impress the care giver.

This could be due to the fact that less educated persons have no exposure to different source of information like internet, written materials and they don't easily grasp different information from it and they might have also low level of understanding.

Finding revealed Patients with duration of Counseling greater than five years were 2 times less likely to practice non-adherence lifestyle modification compared to patients with duration of counseling less than 5 years. This is in line to study conducted in Zambia.(45)AOR: 2.08 CI(1.09 ,3.69).

Patients with poor relationship with health professional were 1.45 times more likely to practice non-adherence lifestyle modification as compared to patients with good patient physician relationship. AOR:1.45 CI(1.10 ,2.39) .This finding is comparable with Systematic review done in Saudi Arabia.

This could be due to patient does not trust provider and patient develop low self-esteem and to continue their poor life style practice and Patient do not want to wait with providers to get detail understanding about their illnesses and life style practices.

Limitations of the study

The study did not include hypertensive patients attending follow-up in private health facilities.

Some potential Influencing factors such as self-esteem, perceived health state were not measured in this study.

The data was self-report from the participants; thus subject to recall bias may affect the result of study.

CHAPTER SEVEN   CONCLUSION

More than half of the study participants were found to be non-adherent to their life style modification.

Most of the study participants reported non-adherence to exercise and weight management life style practice

Educational status of the patient, duration of Counseling and patient physician relation were found to be significantly associated with non-adherence lifestyle modification.

CHAPTER EIGHT   RECOMMENDATIONS

Based on the findings of study the following recommendations were forwarded for:

Hospital

➢ The hospital should arrange educational program on recommended lifestyle practice and follow its implementation.

Health service provider

➢ Design educational sessions that especially focus on lifestyle modifications and ongoing support for patients.

➢ The health care provider should educate hypertensive patients about their disease and importance of life style modification for prevention of hypertension complication.

➢ Counsel for the family members should be involved in education program.

Patient

➢ Patients should have to attend the health information dissemination program of the hospital.

For researchers

➢ Research in different settings that explore non adherence rate to recommended lifestyle practice for hypertension by considering qualitative methods.

➢ On future researcher to consider potential Influencing factors such as self-esteem, perceived health state   by health belief model were not measured in this study.

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QUESTIONERS

Annex-I: Information and consent sheet
A structured questionnaire designed for the study of non-adherence to life style modification and associated factors at Arba Minch General Hospital.

Good morning/afternoon;

My name is ----------------------------we are interviewing patients in this hospital to assess their non-adherence to the life style modification among hypertensive medication and you are selected to be one of the participants in the study. The interview is about 20 minutes.

Dear respondents

Thank you for being cooperative to answer for the valid and effective completion. All what you have told will be kept in secret and you are not expected to tell your name and your name is not going to be registered. A code number will identify every participant.

The interview is voluntary; you have the right to participate or not to participate at any time during the interview. Your refusal will not have any effect on the services that you or any of your family receives. Your participation is important to fulfill the study and in order to help to design appropriate intervention to increase adherence of hypertensive patients to recommended life style modification in this hospital and other similar setups. Therefore, you are kindly requested to give genuine answers according to the questions. You can ask questions to the interviewer for clarification.

Is the information/ objective clear?   1) Yes   2) No
If the answer is "no" elaborate again
Are you willing to participate in the interview?   1) Yes   2) No

Thank you!

Contact address:
If there is anything that is unclear or you need further information;

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Please contact; (PI): FirehiwotZewudie,at mobile phone;0916378774

Email address: nanule2015@gmail.com

If you have any doubt about this study you can contact head of institutional review committee of Jimma University

Office phone: or P.o. Box:378

Annex II : English version Questionnaire
Questionnaire identification number _____

PART 1 – Socio-demographic characteristics related questions

This section is about socio-demographic characteristics of the respondent. Tick(√) on the responses from the given alternatives.

No	Questions	Category
101	Sex of the respondent	1= Male 2 = Female
102	Age of the respondent	_____years
103	Religion	1 = Orthodox 2 = Muslim 3 = Protestant 4 = Catholic 5 =others (Specify) _____
104	Marital status	1 = Single 2 = Married 3 = Divorced 4 = Widowed
105	Ethnicity	1. Gamo 2 Gofa

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		2. Amhara
		3. Tigre
		4. Oromo
		5.Others(specify)-------------)
106	Level of education	1 = Can't read and write 2 = Read and write 3 = Primary education (1-8) 4 = Secondary and above (12+)
107	Work status	1 =Governmental employee 2 = Private employee 3 = Private business 4 = Non-employed 5 = Retired 6=Other (Specify) _____
108	Monthly income	------------------Birr
109	Residence	1.urban 2. rural
110	Is there anyone who supports you in reminding the time you take the practice healthy life style?	1=yes 2=no
111	If yes to Q"110" who is it?	1. Husband 2. Wife 3. Daughters/son 4. Friends

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		5.Others(specify)------
112	What is average distance between your home and health institution you monitored?	_____minute?

PART II – HEALTH RELATED ASSESSMENT

No	Questions	Category
201	How long has it been since you were diagnosed with hypertension	_____years
202	Do you have any of these co morbidities?	1= No co morbidities 2= Diabetes mellitus 3= chronic kidney diesease 4= Stroke 5= Coronary artery disease 6.Others(Specify) _____
203	Have you ever heard about healthy lifestyles before?	1.yes 2. No
204	What is your source of information about lifestyle?	1. medical staff 2.media 3.family and friend
205	For how long do you take counseling	_____years

PART III– Knowledge about hypertension and life style practice

This section is about knowledge regarding hypertension, measurement of BP and its management. Tick (√) on the box in front of the alternative that is given as an answer by the respondent (Only one answer should be prompted)

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Q.N	Questions	Response		Skip
301	Patients with hypertension cannot drink alcoholic beverages	1.	Yes	
		2.	No	
		3.	Don't know	
302	Individuals with increased blood pressure must not smoke	1.	Yes	
		2.	No	
		3.	Don't know	
303	Individuals with increased blood pressure must eat fruits and vegetables frequently	1.	Yes	
		2.	No	
		3.	Don't know	
304	The best type of meat for individuals with increased blood pressure is red meat.	1.	Yes	
		2.	No	
		3.	Don't know	
305	If the medication for increased blood pressure can control blood pressure, there is no need to change lifestyles.	1.	Yes	
		2.	No	
		3.	Don't know	
306	Increased blood pressure is the result of aging, so treatment is unnecessary	1.	Yes	
		2.	No	
		3.	Don't know	

307	Increased blood pressure can cause heart diseases, such as heart attack, if left untreated.	1. Yes 2. No 3. Don't know	
308	Increased blood pressure can cause strokes, if left untreated.	1. Yes 2. No 3. Don't know	
309	Increased blood pressure can cause kidney failure, if left untreated.	1. Yes 2. No 3. Don't know	
310	Most people can tell when their blood pressure is high because they feel bad	1.Yes 2 .No	

PART IV – Adherence to life style modifications

Low-salt Diet and DASH diet How many of the past 7 days did you…from 0-7days		
401	Follow a healthy eating plan as prescribed by physician?	_____days
402	Eat potato chips, salted nuts, or salted popcorn?	_____days
403	Eat smoked meats or smoked fish?	_____days

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404	Eat salted vegetables	_____days
405	Eat ≥5 servings of fruits and vegetables?	_____days Servings (a serving in this case refers to slice or one full fruit, eg.orange, banana, mango, cup for vegetables..)
406	Eat store bought or packaged bakery goods?	_____days
407	Salt your food at the table?	_____days
408	Add salt to food when you're cooking?	_____days
409	Avoid eating fatty foods?	_____days

	Questions	Responses	Skip Pattern
Adherence to cessation of smoking			
410	Are you currently smoking?	1. Yes 2. No	
411	If yes, how many of the past 7 days did you smoke…from 0-7 d	_____days	
Adherence to exercise			
412	Have you involved vigorous intensive activity that causes large increases in breathing or heart rate for at least 10 minutes continuously?	1. Yes 2. No	If No skip to No 418

413	On average how many days do you do vigorous intensive activities as part of your work in a week?	_____(days)	
414	How much time do you spend doing vigorous-intensive activities at work on a typical day?	_____(hours) _____(minutes)	
415	Does your work involve moderate-intensive activity that causes small increases in breathing or heart rate such as brisk walking, or swimming, for at least 10 minutes continuously?	1. Yes 2. No	If No skip to No 418
416	On average how many days do you do moderate intensive activities as part of your work in a typical week?	_____(days)	
417	How much time do you spend doing moderate-intensity activities at work on a typical day?	_____(hours) _____(minutes)	
alcohol consumption			
418	Have you drinking alcohol?	1 Yes 2 No	If NO skip to Q 501
419	On average, how many days per week do you drink alcohol?	_____days	
420	On a typical day that you drink alcohol, how many drinks do you have?	_____number	
421	What is the largest number of drinks that you've had on any given day within the last month?	_____number	
Part V:Weight management			

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501	I am careful about what I eat	1. strongly disagree 2. Dis agree 3. Neutral 4. Agree 5.strongly agree	
502	I read food labels when I grocery shop	1. strongly disagree 2. Dis agree 3. Neutral 4. Agree 5.strongly agree	
503	I exercise in order to lose or maintain weight	1. strongly disagree 2. Dis agree 3. Neutral 4. Agree 5.strongly agree	
504	I have stopped sugary sodas and sweet tea	1. strongly disagree 2. Dis agree 3. Neutral 4. Agree 5.strongly agree	
505	I have stopped buying or bringing unhealthy foods into my home	1. strongly disagree 2. Dis agree 3. Neutral 4. Agree 5.strongly agree	
506	I have limit some foods that I like but that are not good for me	1. strongly disagree 2. Dis agree	

		3. Neutral				
		4. Agree				
		5.strongly agree				
507	I eat at restaurants or fast food places less often	1. strongly disagree				
		2. Dis agree				
		3. Neutral				
		4. Agree				
		5.strongly agree				
508	I substitute healthier foods for things that I used to eat	1. strongly disagree				
		2. Dis agree				
		3. Neutral				
		4. Agree				
		5.strongly agree				
509	I have modified my recipes when I cook	1. strongly disagree				
		2. Dis agree				
		3. Neutral				
		4. Agree				
		5.strongly agree				
510	I eat smaller portions or fewer portions	1. strongly disagree				
		2. Dis agree				
		3. Neutral				
		4. Agree				
		5.strongly agree				

Part VI: PATIENT-PROVIDER COMMUNICATION				
601.	Does your doctor /clinician communicate you well on your status of blood pressure control?	1. yes 2 .No		

602.	Do you participate in decision making while your doctor recommends you to take some treatments?	1. yes 2 .No				
603.	Does your doctor or clinician counsel you well on how to take your treatment?	1. yes 2 .No				
604.	Are you satisfied with the relationship you have with your doctor or clinician	1. yes 2 .No				

Part VII: Physical body measurements

S. No	Questions	Response	Skip pattern
701	**Blood pressure**		
	Blood Pressure: reading 1	Systolic(mmHg) _____ Diastolic(mmHg)_____	
	Blood Pressure: reading 2	Systolic(mmHg) _____ Diastolic(mmHg)_____	
	Blood Pressure: reading 3	Systolic(mmHg) _____ Diastolic(mmHg)_____	
Height and Weight			
702	Height1 (cm) Height2 (cm) Height3(cm)	_____ _____	
703	Weight 1 (kg) Weight2 (kg) Weight3(kg)	_____ _____	
604	Calculated BMI (Kg/m^2)	_____	