LIFESTYLE MODIFICATION PRACTICE AND ASSOCIATED FACTORS AMONG DIAGNOSED HYPERTENSIVE PATIENTS IN SELECTED HOSPITALS IN SOUTHERN ETHIOPIA, 2016

By

EYASU SIYUM (BSc)

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BY   : EYASU SIYUM (BSC)

ADVISORS: DESTA HIKO (BSc. MPH, Assistant prof.)
        : ABIOT GIRMA (BSc. MPH)

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ABSTRACT

Background: -Hypertension is one of the leading causes of disability and death in both developed and developing countries that need urgent strategies to implement interventions that control it. Appropriate lifestyle changes often called non-pharmacological approaches which often overlooked are the cornerstone for the prevention and control of hypertension

Objective: - The aim of this study is to assess practice of lifestyle modifications and associated factors among diagnosed hypertensive patients in Durame and Nigist Elleni Mohamed Memorial Hospitals in southern Ethiopia.

Methods:-Facility based cross-sectional study was conducted among 205 hypertensive patients in Durame and Nigist Elleni Mohamed Memorial General Hospitals in SNNPR, from March 1-30 2016. Simple random sampling were used to select study subjects. Structured, pretested and interviewer administered questionnaire was used to collect data from the patients. Data were checked for completeness and accuracy during data collection and entered to Epidata 3.1 and was analyzed using SPSS 20.0. Descriptive statistics were used to summarize the data. Bivariate and multivariable analysis were done to determine the association between dependent and independent variables. Adjusted odds ratio at 95%CI were used to declare independent effect of each variable on the outcome variable and significance were declared at p-value<0.05.

Result: - Two-hundred five (97.5%) patients participated in the study. Only 33(16.1%) had good physical activity practice. Eighty six (41.9%) of the participants had good weight management practice. one hundred eighteen (57.5%) of the study subjects had poor low salt diet practice. One hundred eighty (87.9%) were abstainers from alcohol and one hundred eighty seven (91.2%) were non- smokers. From the participants only 56(27.7%) practiced good lifestyle modification. Age above 65 years(AOR=0.27,95%CI:0.13-0.61), Educational status(AOR=2.00,95%CI:1.33-6.75),monthly income (AOR=2.46,95%CI:1.32-4.63), 5-10 years since diagnosis(AOR=2.48,95%CI:1.32-4.69), and co-morbidity (AOR=0.28,95% CI: 0.13-0.61) were factors significantly associated with lifestyle modification practice.

Conclusion: Generally lifestyle modification practices among hypertensive patients were low in this study. Therefore, Patients should be educated on the recommended lifestyle modifications which help patients to control of their blood pressure.

 Key words: hypertension, lifestyle modification, practice

ACKNOWLEDGMENT

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ABBREVIATIONS AND ACRONYMS

AOR	Adjusted odds ratio
BMI	Body mass index
BP	Blood pressure
CHD	Coronary heart disease
CI	Confidence interval
CNCD	Chronic non communicable diseases
COR	Crude odds ratio
CVD	cardiovascular disease
DALY	disability adjusted life years
DASH	Dietary approach to stop hypertension
DBP	diastolic blood pressure
HTN	hypertension
IEC	Information education and communication
JNC	joint national committee
JUSH	Jimma University specialized hospital.
KATA	Kambata and Tambaro
LMIC	low and middle income countries
NCD	non-communicable diseases
OPD	outpatient department
SBP	systolic blood pressure
SD	standard deviations
SNNPR	Southern Nations Nationalities Peoples Region
SPSS	Statistical package for social science
SSA	sub-Saharan Africa
WHO	world health organizations

CHAPTER ONE

Introduction

1.1. Background

Hypertension is major health problem in developed countries and now becoming increasingly important cause of morbidity and mortality in developing countries. Cardiovascular causes account for around 20% of mortality worldwide and that 50% of deaths occur in the developed countries. By the year 2025, 1.5 billion people are expected to have hypertension which is to be 29% of world adult population. However, today one in three adults has hypertension. Hypertension is a global public health challenge due to its high prevalence and the associated risk of stroke and cardiovascular diseases in adults. It is estimated to cause 7.5 million deaths worldwide and about 12.8% of the total annual deaths in SSA *(1-3)*

The risk factors include tobacco use, obesity, high cholesterol and diabetes mellitus. Tobacco use increases the risk of complications among those with hypertension. In 2008, 1 billion people were smokers and the global prevalence of obesity has nearly doubled since 1980*(4, 5).*

Alcohol consumption has been identified as an important risk factor for chronic disease and injury. Disease burden is closely related to average volume of alcohol consumption, and, for every unit of exposure, is strongest in poor people and in those who are marginalized from society. The costs associated with alcohol amount to more than 1% of the gross national product in high-income and middle-income countries, with the costs of social harm constituting a major proportion in addition to health cost *(6, 7).*

In 2012, about 3.3 million deaths, or 5.9% of all global deaths, were attributable to alcohol consumption. In 2012 7.6% of deaths among males and 4.0% of deaths among females were attributable to alcohol. In 2012 139 million DALYs (disability-adjusted life years), or 5.1% of the global burden of disease and injury, were attributable to alcohol consumption *(8)*

Physical Inactivity causes 9% of premature mortality, or more than 5·3 million of the 57 million deaths that occurred worldwide in 2008. If inactivity were not eliminated, but decreased instead by 10% or 25%, more than 533, 000 and more than 1·3 million deaths, respectively, could be averted every year*(9,10)*

Reducing dietary salt by 3 g per day is projected to reduce the annual number of new cases of CHD by 120,000 to 60,000 to, stroke by 66,000 to 32,000 and myocardial infarction by 99,000 to 54,000 and to reduce the annual number of deaths from any cause by 92,000 to 44,000. Such an intervention would be cost-saving even if only a modest reduction of 1 g per day were achieved gradually between 2010 and 2019 and would be more cost-effective than using medications to lower blood pressure in all persons with hypertension.*(11)*.

In 2010, overweight and obesity were estimated to cause 3·4 million deaths, 3·9% of years of life lost, and 3·8% of disability-adjusted life-years (DALYs) worldwide. Body mass index (BMI) is positively and independently associated with morbidity and mortality from hypertension, cardiovascular disease, type II diabetes mellitus and other chronic diseases *(12, 13)*.

Studies worldwide indicate that despite the availability of effective medical therapy, over half of all hypertensive do not take any treatment and more than half of those on treatment have blood pressures over 140/90 mmHg threshold. Although there is increasing emphasis on treatment with medication, lifestyle modification is an important part of hypertension management. Blood pressure increases with weight, excessive alcohol consumption, and high sodium intake but decreases with regular physical activity. Lifestyle modification is the foundation of preventive management in individuals with cardiovascular disease risks such as obesity, hypertension, dyslipidemia, and diabetes. In hypertensive individuals, lifestyle modification can be recommended as an initial treatment before the start of drug therapy and as an adjunct to medication in those already on drug therapy. In hypertensive individuals with medication-controlled blood pressure, lifestyle modification may facilitate drug step-down and drug withdrawal in highly motivated individuals who achieve and maintain lifestyle changes. In non-hypertensive, lifestyle modification has the potential to prevent hypertension, and more broadly, to reduce blood pressure and thus lower the

risk of blood pressure-related clinical complications in general populations *(15, 24-26)*

So this indicates an urgent need for strategies and programs to prevent and control high blood pressure by promoting healthy lifestyle behaviors primarily among the hypertension population. Appropriate lifestyle changes may safely and effectively delay or prevent hypertension in non-hypertensive subjects, delay or prevent medical therapy in grade I hypertensive patients and contribute to blood pressure (BP) reduction in hypertensive individuals already on medical therapy, allowing reduction of the number and doses of antihypertensive agents.

1.2.   **Statement of the problem**

Hypertension is an increasingly important medical and public health issue. It is among the most important life-threatening conditions in both industrial and developing countries. While as many as 1 billion cases of hypertension are estimated worldwide, approximately 7.1 million deaths annually may be attributable to hypertension. The World Health Organization (WHO) reported that hypertension is responsible for 62% of cases of cerebrovascular disease and 49% of cases of ischemic heart disease. In addition, hypertension is the topmost risk factor for death worldwide. *(14, 15)*

Although some lifestyle modifications may seem to offer only minimal blood pressure–lowering effects, they should not be ignored for some reasons. A reduction in systolic blood pressure of 5mm Hg has been associated in observational studies with reductions of 14 % in mortality caused by stroke, 9 % in mortality caused by heart disease, and 7 % in all-cause mortality Also, a weight loss of 4.5 kg, a realistic goal for most individuals who are overweight, can reduce or prevent hypertension. In addition, even when not adequate in themselves to control hypertension, they may reduce the number and doses of antihypertensive medications needed to achieve good control. Finally, lifestyle modification is particularly helpful in the large proportion of hypertensive patients who have additional risk factors for premature cardiovascular diseases, especially dyslipidemia and diabetes. *(16)*

The use or misuse of addictive substances, such as cigarettes and alcohol is increasingly prevalent in Ethiopia. A few studies have addressed the health effects of using cigarettes and smoking in Ethiopia, focusing on psychiatric morbidity and psychosocial problems and their association with unsafe sexual behavior, but in contrast the contribution of substance use to risk for high blood pressure and other cardiovascular diseases has not been emphasized *(17)*

Study done in Bishoftu hospital in Ethiopia among hypertensive patients indicate that one point seven percent (1.7%) of the respondents consumed fried meat regularly, 18.3% consume salt regularly, while 3.3% ate beef, pork and lamb regularly. The significant number of participants led sedentary lifestyles according to the physical activity score, with 33.3% having little or no activity which indicates poor practice of non-drug intervention to achieve the ultimate goal of improving health by controlling hypertension. *(18)*

In different studies age, marital status, income, source from which they get information, existence of co-morbidity, sex differences and individual's knowledge on hypertension are factors found to influence lifestyle modification practice. *(19-24)*

In spite of emerging empirical evidence of the efficacy of lifestyle modification in blood pressure control, little is known about practice of lifestyle modification and associated factors among hypertensive patients in Ethiopia. The study considers that practice of lifestyles and associated factors and their relationships will guide to facilitating for actions for greater practice among the hypertensive patients. Therefore, finding from study would alert health professionals, government and other stakeholders on lifestyles and factors associated for the practice of these lifestyles to control hypertensions.

1.3. Significance of the study

Since HTN is one of the major Non-communicable Disease having double burden in addition to Communicable disease in developing countries that needs health lifestyle change to control the disease. Much of the risks associated with hypertension can be prevented by establishing effective blood pressure control. Although there is increasing emphasis on treatment by medication, lifestyle modification is an important part of hypertension management. The finding of study would assist health care professionals to manage hypertension in a better way. It will also assist policy makers in developing context specific and relevant policies capable of improving the management of hypertension in the hospital and other health facilities. Eventually, the finding of this study would be input for the implementation of effective strategies that will lead to improve practice on lifestyle modifications to increase levels of controlled blood pressure that will reduce occurrences of complications and death from hypertension.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Modifiable factors related to hypertension

2.1.1 Alcohol consumption

Moderate drinking is one drink a day for women or anyone over 65 and two drinks a day for men under 65. More than moderate drinking can be risky to develop hypertension despite the fact that drinking alcohol itself is not necessarily a problem but drinking too more can cause a series of consequences, and increase your risk for a variety of problems *(18, 27)*.

A community based cross-sectional study in Rukungiri district of Uganda reported factors found to be associated with hypertension included: past alcohol use, present alcohol use. In Nigeria majority of the respondents (72.5%) consume alcohol and about 30.0% of them consume it daily *(28, 29)*

Heavy alcohol intake is frequently seen among adults in Addis Ababa, with approximately 10% of men. The World Health Survey reported a prevalence of approximately 7.6% among men and less than 1% among women. The daily alcohol consumption among adults in Addis Ababa is much higher than the nationwide estimate of 2.1% for in school and out-of-school youth. *(30-32)*

2.1.2 Smoking

Cigarette smoking causes acute blood pressure (BP) elevation, although some studies have found similar or lower BPs in smokers compared with nonsmokers. A higher prevalence of smoking in men than in women has been reported in low- and middle-income countries, in contrast with the similarity between rates in men and women in high-income countries *(33)*. The gap between the sexes may be narrowing in many developed countries because of an increase in smoking among women and a decline among men *(34)*.

A study done in Addis Ababa among patients with high blood pressure showed smoking cigarette is more prevalent among men. Among men, the prevalence of current daily smoking was 11.0%. Drinking of alcohol was reported by 10.4% of men. Consequently, 26.6% of men and 2.4% of women reported practicing one or more of the behaviors. Current daily smoking and drinking alcohol were significantly associated with elevated mean diastolic blood pressure respectively) *(35)*.

2.1.3. Overweight/obesity

One of most important public health problems, which is causative factors to high blood pressure. The balance of energy intake and exercise is an important determinant *(36)*. As suggested WHO, the normal weight for an adult over 18 years is less than or equal to 18.5-24.9. BMI that is greater than this puts one at risk of obesity related diseases as high blood pressure *(37)*

In Africa, as elsewhere, obesity and sodium intake are risk factors for hypertension. In industrialized societies such as the United States, obesity accounts for 25% of cases of hypertension. However, the relative leanness of Africans means that the contribution of obesity to high blood pressure is only around 10 % *(38)*

A population survey study done in Korea to identify association between BMI and in obese and lean hypertensive patients indicated there is significant association between BMI and hypertension in both obese and normal weight populations. *(39)*

Across sectional study done in three countries in Africa and Asia shows mean blood pressure levels increased with increasing BMI. The risk of hypertension was higher among population groups with overweight and obesity. BMI was significantly and positively correlated with both SBP and DBP in all the three populations. *(40)*

2.1.4. Physical inactivity

Moderate physical exercises like brisk walking, tennis, weight lifting, vigorous physical exercises like gymnastic, volleyball, football, basketball, running, swimming, weight lifting, riding bicycle for at least 20–30 min/d to a total of 75–150 min/wk. help hypertensive patients to control their blood pressure. *(41, 42)*.

In a meta-analysis of randomized controlled trials it was reported that aerobic exercise was associated with a significant reduction in mean systolic (-3.84 mm Hg) as well as diastolic BP (-2.58 mm Hg). This reduction was observed in hypertensive as well as normotensive individuals and in normal weight as well as overweight participants. On the other hand in another meta-analysis involving 72 trials with 105 study groups, significant reduction in daytime and ambulatory BP was observed, more in hypertensive groups than in other groups. Cross-sectional and longitudinal studies have shown in London a direct positive correlation between physical inactivity and hypertension *(42-44)*

2.1.5. Excess dietary salt

Sodium serves as an important nutrient in the body and helps nerves and muscles to function correctly. It is also involved in the auto-regulation of the water and fluid balance of the body. High dietary salt intake presents a major challenge to the kidneys to excrete large amounts of salt administered. One of the main organ systems vulnerable to the adverse effects of excessive sodium in the diet is the cardiovascular system. Excess dietary sodium predisposes to high BP *(45)*

The largest of the dose response trials, the DASH-Sodium trial tested the effects of 3 different doses of sodium intakes separately in two distinct diets: the DASH diet and a control diet. BP reduction was the highest in the group with the lowest sodium levels. *(45).*

In addition, clinical trials have documented that a reduced sodium intake can prevent hypertension (relative risk reduction of about 20% with or without concomitant weight loss), can lower BP in the setting of antihypertensive medication, and can facilitate hypertension control. In observational studies, reduced sodium intake is associated with a reduced age-related rise in systolic BP. In other observational studies, reduced salt intake is associated with a reduced risk of atherosclerotic cardiovascular events and congestive heart failure. *(46)*

2.2. Lifestyle modification practice among hypertensive patients.

Practice of healthy lifestyles is crucial importance of preventing and managing hypertension. According to JNC7, all hypertensive patients should practice lifestyle modification regardless of whether they take antihypertensive medication or not. This not only reduces 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, salt restriction, and physical activity, smoking cessation and abstaining from alcohol. *(48, 49).*

Findings from cross-sectional study done among African Americans (n=186) indicated that weight management and low salt diet practice were low. From the participants 30.1% practice physical activity and 22.0% practiced low salt diet. Seventy five percent and sixty five percent were nonsmokers and abstained from alcohol respectively *(54).*

Study done in India among male hypertensive patients showed that 89 %(n=144) hypertensive patients were physically active for 30 minutes per day, 72% didn't

consume alcohol, 89% were non-smokers but 25% were adding extra salt in their diet *(19)*

Another study done in china revealed that 81% of study participants reported they consume low salt diet. Seventy two percent were non-smokers and seventy nine percent of participants were abstainers from alcohol. Also revealed that most of the women were abstained from alcohol and older people had good low salt diet practice *(47)*

Study done in kingdom of Saudi Arabia showed that rates of adherence to exercise and healthy diet were (20.1%) and (11.8%) from 144 patients recruited in two hospitals. Also the study revealed that adherence to lifestyle modification was low among the patients *(20)*.

Cross- sectional study done in Israel among hypertensive patients revealed half of (n=1125) respondents had good physical activity practice and 13% of them were non-smokers Another Study from Ghana indicated that, from three hundred twenty respondents (62%) and (37%) of respondents practiced low salt diet and avoiding cigarettes smoking. *(23)*.

Cross-sectional study conducted in Nigeria reported among adult hypertensive patients showed that from individuals with knowledge of salt restriction (n=88), 68% of the participants practiced low salt diet. The finding from this study also revealed that there was negative correlation between level of good lifestyle practices and both systolic and diastolic blood pressure. *(21)*

Another study done in Botswana revealed that (3.8%) of the study participants were smoking and (12%) of the participants were consuming alcohol and majority were drinking occasionally. Majority of participants (67.8%) were engaged with some form of physical activity and 59% of the participants taking low salt diet. *(22)*

Study done in black lion hospital (Addis Ababa), indicated that from two hundred subjects 64.7% practice dietary management and 43.7% were physically active. In this study rates of lifestyle changes were generally found to be low. *(55)*

Descriptive study done in jimma (Ethiopia) showed out of the 130 participants, 80% of participants said they avoid salt in their diet and 15% of them drink alcohol. Only 1.5% of them were smoking and large majority (94.6%) were having salt restriction. Majority (90.7%) of them reported that health care provider taught them about danger of too much salt. But the study showed practice of lifestyle modification was inadequate. *(51)*.

2.3. Factors associated with of lifestyle modification practices

2.3.1. Socio-Economic characteristics related factors

A cross sectional study which was conducted among males with hypertension in the age group of 30-59 years in India among 100 males with hypertension indicated that lifestyle modification practice were less among males *(19)*

Study which is conducted (n=144) among patients 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)*

Another hospital based cross-sectional study reported from Nigeria showed participants who were currently married were more likely to practice salt restriction 1.10–5.00). But none of the socio-demographic variables assessed were associated with physical activity practice. Those with only secondary level of formal education were less likely to attempt weight reduction, despite being aware of its importance in blood pressure control *(21)*.

2.3.2. Individual related factors

Facility based cross sectional study which was conducted in Botswana on total of 446 showed that non-smokers were more likely to know more about HPT than smokers. Participants' level of knowledge varied from average to high as almost all of them 96% and 97% gave a correct response for practices related to prohibiting smoking and reducing the levels of stress respectively. Only 37% of the participants have knowledge regarding the acceptable lifestyle practices for persons with hypertension and cumulatively 59% can be rated as having acceptable knowledge of lifestyle practices in relation to their chronic disease. A significant relationship between alcohol intake and knowledge of hypertension was identified. A majority (91%) of those who reported to be trying to lose weight had a good knowledge of hypertension. Also, a negative association was revealed between participants' knowledge of hypertension and gaining weight recently. *(22)*.

A cross-sectional study which was conducted among 64 hypertensive patients in India showed that More than half (54.7%) of the patients were non-vegetarian before diagnosis and after diagnosis the proportion of non-vegetarian study subjects reduced by 14%. Similarly, the reduction in consumption of meat, eggs, salt, and oil by hypertensive patients was also noted. Likewise, smoking and consumption of alcohol was also reduced after diagnosis of hypertension. However physical activity increased among 30% of the respondents. Also the study showed most of the patients changed their lifestyle after diagnosis of hypertension. Similar study conducted in Ghana among 516 hypertensive patients, 320(62%) and respondents were aware of lifestyle modification such as reducing dietary salt intake and 195 (37%) aware of avoiding cigarette smoking. *(23, 24)*

2.3.3. Health profile related factors

Cross-sectional study done among hypertensive patients in Beijing, china showed that patients with longer history of hypertension have high lifestyle practice. Another study done in African Americans showed alcohol abstainers had been living with hypertension longer than participants who drank alcohol. Cross sectional study done in two hospital in Saudi Arabia showed presence of other co-morbidity was found to be an important factor in the practice of a healthy diet, regular exercise and medications adherence *(19, 20, 47).*

Study done among hypertensive patients in black loin hospital in Addis Ababa showed that respondents without co-morbidity were three times more likely to practice dietary management and also co-morbidity was significantly associated with physical exercise practice. (55)

2.3.4. Source of information

Different studies revealed that source of information affects lifestyle practice, study done in adult hypertensive populations in Nigeria showed a poor level of perception of hypertension and awareness of the lifestyle-modification measures through the mass media, but a high level of practice of the lifestyle measures. Study done in Ethiopia showed that majority (90.7%) participants get information from health professional about avoiding salt in their diet and (94.4) the reported avoiding salt in their diet. *(48, 51)*

Conceptual frame work which comprises socio-economic, individual related factor, source of information about lifestyle modification, and health profile related factors that affect lifestyle modification practice.
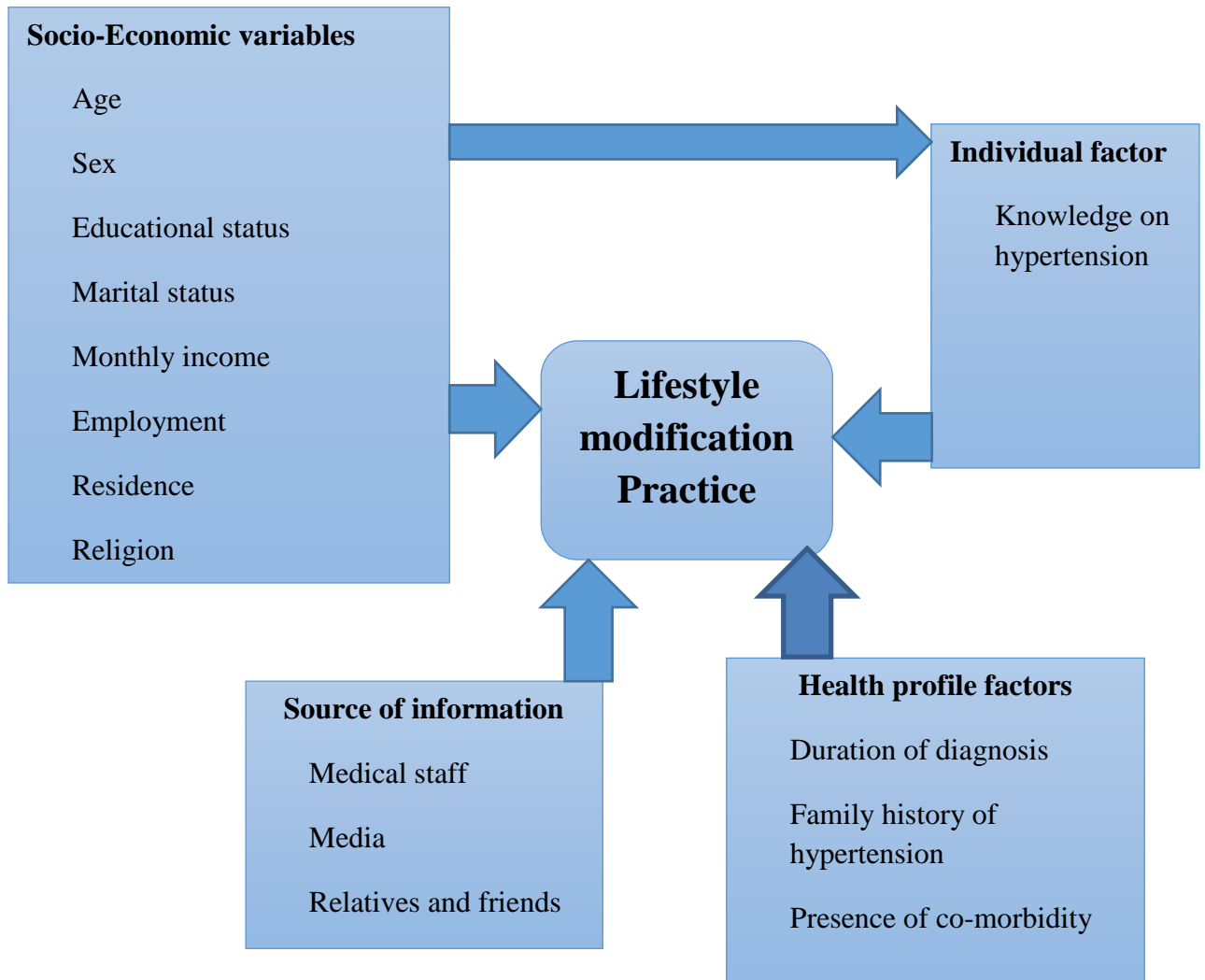
Figure 1.Conceptual frame work developed by reviewing different literatures (19, 20, 22)

CHAPTER THREE

OBJECTIVES

3.1. General Objective

❖ To assess the lifestyle modifications practices and associated factors among diagnosed hypertensive patients in selected general hospitals, SNNPR, Ethiopia,2016

3.2. Specific objectives

❖ To assess lifestyle modification practices among hypertensive patients in selected general hospitals.

❖ To identify factors associated with lifestyle modification practices among hypertensive patients in selected general hospitals.

CHAPTER FOUR

METHODS AND MATERIALS

4.1. Study area and period

The study was conducted in durame and hosanna towns. Durame is the administrative town of kembata tembaro zone (KATA) which is found SNNPR and located 285km from Addis Ababa and 125km from hawassa which is capital city of the region. The zone has 7 woredas and 3 town administration with estimated population of 857,084. Durame hospital is the general hospital found in the zone. Hosanna town is also the administrative town for Hadiya zone which is 232kms from the capital Addis Ababa and 194 km west of hawassa. The zone has estimated population of 1,506,733. Nigist Ellen Mohammed memorial General Hospital is governmental hospital which is found in the Hosanna town. The study was conducted from March 1to April 30, 2016.

4.2 . Study design

Facility-based cross-sectional study was conducted in durame and Nigist Elleni Mohamed memorial general hospitals.

4.3.   Population

4.3.1   Source population

All hypertensive patients who were treated in Durame general hospital and Nigist Ellen Mohammed memorial general hospitals.

4.3.2. Study population

Randomly selected hypertensive patients who came for follow up during the study period.

4.4.   Inclusion and Exclusion criteria

4.4.1. Inclusion criteria

All hypertensive patients age $\geq$ 18 years were included in the study.

4.4.2. Exclusion Criteria

Patients who were severely ill and not able to communicate were excluded from the study.

4.5. Sample size determination and Sampling technique

4.5.1. Sample size determination

The sample size was determined using a single population proportion by assuming that 50% proportion of the patients practiced lifestyle modifications with 95% confidence interval and 5% margin of error.

$$n = \frac{(Za/2)2p(1-p)}{d^2} \quad n = \frac{1.96^2 * 0.5(1-0.5)}{0.05^2}, \quad \text{n=384 subjects}$$

Where, n= required sample size

$Za/2$ critical value for normal distribution at 95% confidence interval which equals 1.96 (Z value at alpha = 0.05)

p- The magnitude of lifestyle modifications practice among hypertensive patients.

Since the number of hypertensive patients currently registered for follow up in both hospitals is less than 10,000, using population correction formula.

Nf = n/ (1+n/N)),   nf=384/ (1+384/375))

N_f = 191, finally by adding 10% non-response rate which is 19

N_f = 210 subjects.

4.5.2. Sampling technique

Total adult hypertensive follow-up patients are 165 in Durame and 210 in Nigist Ellen Mohammed memorial hospital. So the total patients registered for follow up in both hospitals were 375. The sample size was allocated for both hospitals proportionally. All previously registered 375 patients were included in the sampling frame. Then the study respondents were selected using random sampling technique. The list of patients (sampling frame) was obtained from the registration books of the patients registered for follow up in hospitals and study subjects were selected by lottery method.
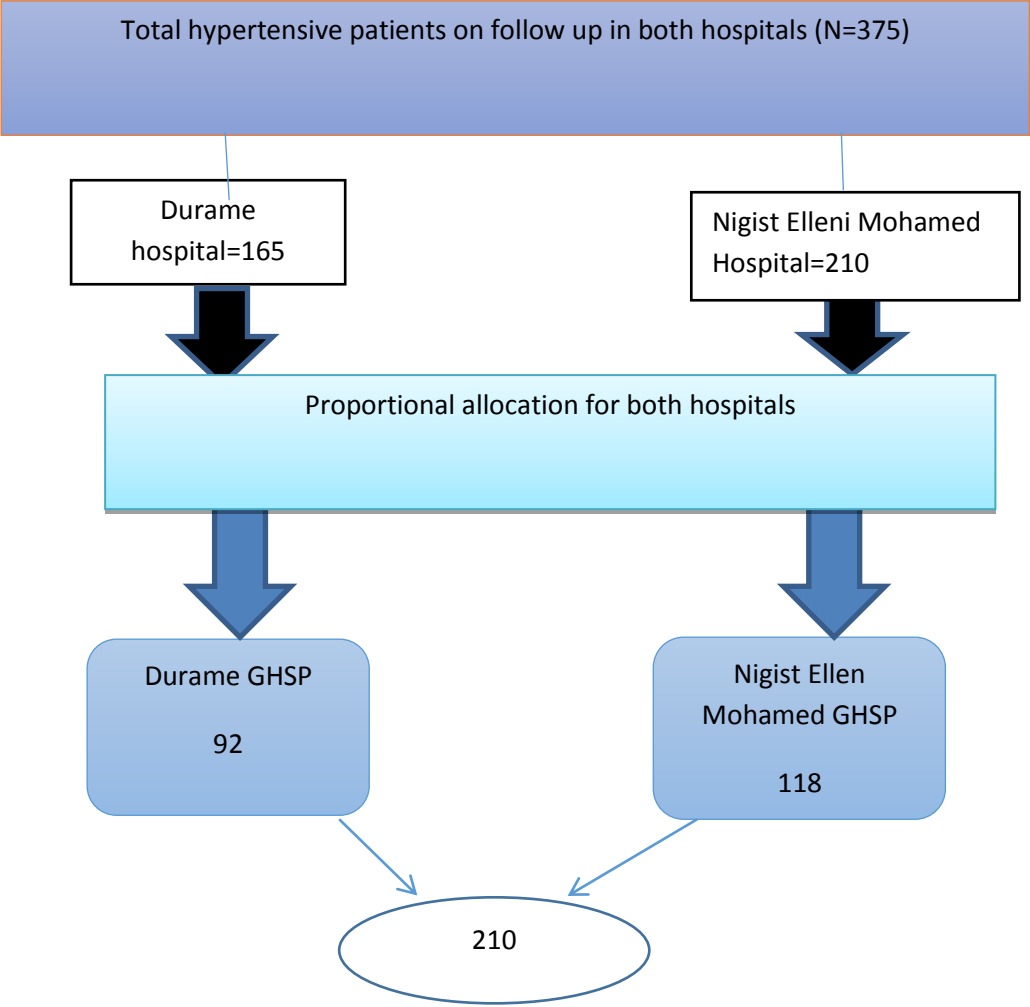
Figure 2. Schematic presentation of sampling procedure

4.6. Variables of the study

4.6.1. Dependent variable

Practice of lifestyles modifications.

Independent variables

Socio-Economic variables; Age, sex, income, marital status, educational status, religion, occupation, ethnicity, residence

Health profile of the patients; Duration of diagnosis, presence of co-morbidity, family history of hypertension.

Source of information about lifestyles; - medical personnel, media, friends and family

Individual factors; knowledge on hypertension

Data collection Instrument

The questionnaire have socio-Economic, questions related with source of information about lifestyles, knowledge on hypertension and lifestyles, questions related with lifestyle modification practices and questions about health profile of the patients. The lifestyle modification practices were measured using questionnaires adapted from hypertension self-care practice questions which are recommended by joint national committee on detection, prevention evaluation and treatment of hypertension (JNC7) and WHO STEPS questionnaires. *(49, 50)*

Measurements

Low-salt diet— ten items were used to assess practices related to eating a healthy diet, avoiding salt while cooking and eating, and avoiding foods high in salt content. A mean score was calculated. Scores of 5 or better indicates that patients followed low-salt diet and considered as having good low salt diet practice.

Physical activity—Physical activity was assessed by 2 items. "How many of the past 7 days did you do at least 30 minutes total of physical activity?" and "how many of the past 7 days did you do a specific exercise activity (such as swimming, walking, or biking) other than what you do around the house or as part of your work?" Responses were summed (Range 0-14) patients who scored 8 and above were coded as a having good physical activity practice. All others coded as poor practice.

Smoking—Smoking status were assessed with 1 item, "How many of the past 7 days did you smoke a cigarette?" Respondents who reported 0 days were considered a nonsmoker.

Weight management—10 items 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 strongly agree (5). 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 (score ≥40) were considered to have good weight management practice.

Alcohol—Alcohol intake were assessed using 3-item Participants who report not drinking any alcohol in the last 7 days or who indicated that they usually did not drink at all were considered abstainers. All others were considered as not having good practice of alcohol consumption.

Height was measured using portable stadiometer without participant wearing shoes to the nearest 0.5 cm. reading was taken after the participant was requested to have feet together heals against the back board, knees straight and look straight forward. And weight, to the nearest 0.1 kg. Body mass index (BMI) was calculated from the weight and height. BMI (kg/m2) was categorized as normal weight ($18.5 \leq BMI < 24$), overweight ($24 \leq BMI < 28$), and obese ($BMI \geq 28$) using the using WHO recommendations.(50)

4.7. Data collection procedures

Data was collected by two trained diploma nurses and using face to face interview method. One BSc nurse supervisor was assigned in each hospital. The socio-demographic, health profiles of participants, knowledge on hypertension, and source of information of the study participants were collected using an interview based structured questionnaire adapted from the WHO manual and reviewing different literatures. *(50).* physical characteristics (height and weight) was measured. The lifestyles practices were measured using a tool adapted to local context from hypertension self-care activity scales *(49).*

. Lifestyle modification practice were measured using physical exercise, low salt diet, alcohol consumption, smoking and weight management practices. The lifestyle modification practice were classified as 'good practice' and 'poor practice'. Respondents were labeled to have "good 'lifestyle modification practices if they scored above the mean in all recommended lifestyle questions. Weight and height of the patients were measured and BMI was calculated and classified using WHO guideline as normal weight, overweight and obese. Weight and height measurements were taken during data collection.

4.8.   Data quality control

The questionnaire was prepared in English then translated in to Amharic language and was back translated in to English language by another person to check its consistency The questionnaire was pre-tested in 5% of total eligible patients in Butajira hospital for their accuracy and consistency prior to actual data collection. Furthermore, the supervisor and the investigator were given feedback and corrections on daily basis to the data collectors. Completion, accuracy, and clarity of the collected data was checked carefully on a regularly basis. The data was carefully entered and cleaned before the beginning of the analysis.

4.9.   Data processing and analysis

After collection, data were checked for completeness and were entered to Epidata 3.1 version and exported to SPSS 20.0 version for further analysis. Descriptive statistical analysis such as Proportion, frequency distribution, means, and measure of dispersion was used to describe data and analytical statistics including bivariate and multivariable logistic regression analysis was done. Bivariate logistic regression was done to examine association between dependent and independent variables. After running bivariate logistic regressions, all variables with $p< 0.25$ was considered as candidate for the final model and corresponding p-value of <0.05 was considered as statistically significant. Adjusted odds ratio at 95% CI was considered to declare independent effect of independents variables on the outcome. Finally results were presented using charts and tables.

4.10.   Ethical consideration

Ethical approval and clearance was obtained from Jimma University Institutional Review Board of College of Health Sciences. Both hospitals were asked for

Permission to collect data. Objective of the study was clearly explained to participants before conducting the interview and informed consent was taken from each participant. To assure privacy, each completed questionnaires was given unique code after they return to the investigators. Data was confidential throughout the conduct of the study.

4.11. Dissemination plan

The finding of this study will be presented to Jimma University, distributed to kembata Tembaro (KATA) and Hadiya zone health department and other organization working in related area. Again the findings will be disseminated to durame and Nigist Ellen Mohamed memorial hospital and other related bodies. Efforts will be made to publish the findings in research journal and disseminate to the scientific community.

4.12. Operational definitions

Good lifestyle modification Practice: when patients respond the mean or above the mean score on practice questions.

Poor lifestyle modification practice: when patients respond below the mean score on practice questions.

Good knowledge if the patients answer two and more correct answers from four questions regarding hypertension.

Poor knowledge – when the respondents answer less than two from four questions regarding hypertension.

Good Physical activity: - if patients score 8 or above for questions about their physical activity practice

Alcohol intake: - Any alcohol consumption in the last seven days will be considered as alcohol consumption.

Good Low salt diet practice- if patients score mean or above the mean for low salt diet questions.

Smoker – if the participant smoke at least one day in last seven days is he/she were considered as smoker.

CHAPTER FIVE

RESULT

5.1. Socio-demographic characteristics of study subjects

Out of 210 study participants, 205(97.5%) participated in the study. More than half (51.2%) of them were females. The mean age of respondents was 53.9(SD $\pm$ 9.64 years). About two-third (66.3%) of participants were married. The majority (61%) were residents of urban. Regarding educational status of subjects, 87(57.6%) had formal education and 118(42.4%) have no formal education. Concerning their employment status (30.7%) were government employees and (11.2%) were housewives. 105(51.7%) were Protestants in their religion and 41% of the study subjects were Hadiya in Ethnicity. Average monthly income for (23.4%) of them were less than 500 ETB. (Table. 1)

Table 1. Socio-demographic characteristics of hypertensive patients in Durame and Nigist Elleni Mohamed Memorial General Hospitals, SNNPR, May 2016 (N=205)

Variables	Frequency	Percent (%)
Age		
<65 years	174	84.9
>=65 years	12	15.1
Sex		
Male	100	48.8
female	105	51.2
Marital status		
married	136	66.3
single	24	11.7
divorce	15	7.3
widowed	30	14.6
Educational status		
Formal education	87	57.6
No formal education	118	42.4

Employment status		
Government employee	63	30.7
Private employee	63	30.7
merchant	36	17.6
housewife	23	11.2
Daily laborer	14	6.8
retired	6	2.9
Religion		
orthodox	65	31.7
protestant	105	51.2
Muslim	10	4.9
catholic	25	12.2
Ethnicity		
Hadiya	102	49.8
Kambata	57	27.8
Gurage	21	10.2
Wolaita	16	7.8
others	9	4.4
Average monthly Income		
<500ETB	48	23.4
500-999 ETB	61	29.8
>=1000 ETB	96	46.8

5.2. Lifestyle Modification Practice

The mean score for lifestyle modification practice were 40(SD$\pm$14.36). Only 56(27.3%) patients practiced recommended lifestyle modification. The mean (+SD) score for physical activity was 4.46($\pm$3.45) with the maximum score of 14. Only thirty three (16.1%) practiced physical activity for thirty minutes per day. The mean (+SD) score of weight management practice of the patients were 29.36($\pm$13.43) with the maximum score of 50. Eighty six (41.9%) had good weight management practice. The mean ($\pm$SD) score for low salt diet was 4.59($\pm$2.03). From the patients one hundred eighteen (57.5%) practiced recommended low diet salt. One hundred eighty (87.9%) did not drink alcohol in the last seven days. One hundred eighty seven (91.2%) were not smoker.

5.3. Socio-Economic characteristics and lifestyle modification practice.

Among age below 65 years 45(25.9%) practiced good lifestyle modification while from those above 65 years old only 11(35.5%) practiced good lifestyle modification.

From patients without formal education 38(32.2%) practiced good lifestyle modification. Thirty-one (32.3%) of patients with income of greater than thousand birr practiced good lifestyle modification. Residents of urban 34(16.6%) practiced good lifestyle modification. After bivariate analysis of socio-demographic variables with dependent, Age (p=0.246), educational status (p=0.069), monthly income (p=0.049), had crude association with dependent variable and were candidate variables for multivariable analysis. (Table 2)

Table2.Bivariate analysis of socio-demographic variables for lifestyle modification practices among HTN patients in Durame and Nigist Elleni Mohamed Memorial General Hospitals, SNNP, 2016(N=205)

Variables	Good lifestyle modification practice N (%)	Poor lifestyle modification practice N (%)	COR(95%CI)	p-value
Age				
<65yrs	45(25.9)	129(74.1)	**1**	
>= 65 yrs.	11(35.5)	20(64.5)	**1.58(0.70-3.54)**	**0.246***
Sex				
Male	30(30)	70(70)	1.30(0.41-1.42)	0.401
Female	26(24.8)	79(75.2)	1	
Residence				
Urban	34(27.2)	91(72.8)	1	
Rural	22(27.5)	58(72.5)	1.01 (0.52-1.85)	0.962
Marital status				
Married	34(25.0)	102(75.0)	1	
Single	10(41.7)	14(58.3)	2.14(0.45-2.68)	0.801
divorced	4(26.7)	11(73.3)	0.92(0.27-3.06)	0.888
widowed	8(26.7)	22(73.3)	1.09(1.04-4.06)	0.890
Educational status				
No formal education	38(32.2)	80(67.8)	**1.82(1.01-3.48)**	**0.069***
Formal education	18(20.7)	69(79.3)		
Employment				
Government employed	20(31.7)	43(68.3)	1	
Private employed	18(27.8)	45(72.2)	1.16(0.54-2.49)	0.698
Merchants	10(21.4)	26(78.6)	1.21(0.49-2.98)	0.680
others	8(18.6)	35(81.4)	0.49(0.21-6.52)	0.830**
Religion				
orthodox	15(23.1)	50(76.9)	**1**	
Protestant	32(30.5)	73(69.5)	0.68(0.33-1.39)	0.296
Muslim	2(20.0)	8(80.0)	1.20(0.23-6.77)	0.829
Catholic	7(28.0)	18(72.0)	0.77(0.27-2.19)	0.627
Average Monthly income				

<500ETB	8(16.7)	40(83.3)	1	
500-999ETB	17(27.9)	44(72.1)	0.52(0.20-1.33)	0.271
>1000ETB	31(32.3)	65(67.7)	**2.38(1.15-5.70)**	**0.049***
Ethnicity				
Hadiya	28(27.5)	74(72.5)	1	
Kambata	14(24.6)	43(75.4)	0.86(0.55-2.44)	0.780
Gurage	7(33.3)	14(66.7)	1.32(0.28-5.10)	0.567
others	7(33.3)	18(66.7)	1.02(0.39-2.73)	0.956***

*p-value<0.25   others***- Amara, Halaba, Wolaita, Sidama

Others** Daily laborer, housewife, retired

5.4. Health profile related, individual related and source of information related factors and lifestyle modification practice.

From the patients who had basic knowledge about hypertension twenty three (25%) practiced good lifestyle modification and those who were on treatment for five to ten years (13.6%) practiced good lifestyle modification. From those who had family history of hypertension 6(13.6%) practiced good lifestyle modification. Twenty three (25.8%) of patients with co-morbidity practiced good lifestyle modification. In bivariate analysis of health profile related factors, source of information about lifestyles and individual related factors, Duration since diagnosis (p=0.103), heard information about lifestyles (p=0.034), source of information about lifestyles (p=0.060), and co-morbidity (p=0.084) had crude association with good lifestyle modification practice and were candidate variables for multivariable analysis. (Table 3)

Table 3. Bivariate analysis of other variables and lifestyle modification practices among HTN patients in Durame and Nigist Elleni Mohamed Memorial General Hospitals, SNNP, 2016(N=205)

Variables	Good lifestyle modification practice N (%)	Poor lifestyle modification practice N (%)	COR(95% CI)	p-value
had basic Knowledgeable about HTN				
Yes	23(25.0)	68(75)	0.81(0.43-1.51)	0.502
No	33(29.2)	80(70.8)	1	
Duration since diagnosis				
<2years	6(13.6)	38(86.4)	1	
2-5 years	30(33.3)	60(66.7)	3.17(0.38-6.58)	0.506
5-10 years	19(28.4)	48(71.6)	**2.51(1.25-6.89)**	**0.103***
>10 years	1(25.0)	3(75.0)	2.11(0.12-12.14)	0.890
Family hx of				

HTN				
Yes	20(31.7)	43(68.3)	1.51(0.66-2.19)	0.537
No	36(25.4)	106(74.6)	1	
Hear information about lifestyles				
Yes	39(33.1)	79(66.9)	1	
No	17(19.5)	70(80.5)	**0.49(0.25-0.95)**	**0.034***
Source of information				
Health professionals	31(35.2)	57(64.8)	1	
Different medias	6(33.3)	12(66.7)	**0.91(0.53-12.53)**	**0.060***
Family and friends	3(21.4)	11(78.6)	1.99(0.52-27.72)	0.513
Co-morbidity				
Yes	23(25.8)	66(74.2)	**0.87(0.03-0.93)**	**0.084***
No	33(28.4)	83(71.6)	**1**	

*p-value<0.25

5.5. Factors associated with Good lifestyle modification practice among hypertensive patients.

According to result of multivariable analysis, Age, duration since diagnosis, average monthly income, educational status and co-morbidity were independent predictors of good lifestyle modification practice among hypertensive patients.

Patients aged greater than 65 years were 72% less likely to have good lifestyle modification practice (AOR=0.28, 95% CI: 0.13-0.61) than patients with below 65 years. On the other hand hypertensive patients with income of 1000 ETB were 2.4 times more likely to practice good lifestyle modification (AOR=2.38, 95% CI :1.15-5.57) as compared to patients with income of less than 500ETB.

Patients without formal education were 2 times more likely practice good lifestyle modification (AOR=2.00, 95% CI: 1.33-6.75) as compared to those who had formal education.

 Individuals with five to ten years treatment duration were 2.5 times more likely to practice lifestyle modification (AOR=2.48, 95% CI: 1.32-4.69) as compared to those on treatment for less two years treatment. On the other hand patients who were with co-morbidity were 72% less likely to practice good lifestyle modification (AOR=0.28, 95% CI: 0.13-0.61) as compared to those without co-morbidity (Table 4)

Table 4. Predicators of good lifestyle modification practice among patients with HTN in Durame and Nigist Elleni Mohamed Memorial General Hospitals, SNNP, 2016(N=205)

Variables	Good lifestyle modification practice N (%)	Poor lifestyle modification practice N (%)	AOR(95%CI)
Age			
<65yrs	45(25.9)	129(74.1)	1
>= 65 yrs.	11(5.4)	20(9.8)	**0.27(0.13-0.61)***
Marital status			
Married	34(25.0)	102(75.0)	1
Single	10(41.7)	14(58.3)	1.08(0.45-2.58)
divorced	4(26.7)	11(73.3)	1.09(0.22-1.78)
widowed	8(26.7)	22(73.3)	1.33(0.60-2.94)
Educational status			
No Formal Education	38(32.2)	80(67.8)	**2.00(1.33-6.75)**
Formal Education	18(20.7)	69(79.3)	1
monthly income			
<500ETB	8(16.7)	40(83.3)	1
500-999ETB	17(27.9)	44(72.1)	1.23(0.61-2.49)
>1000ETB	31(32.3)	65(67.7)	**2.41(1.32-4.63)****
Duration of diagnosis			
<2years	19(28.4)	48(71.6)	1
2-5 years	30(33.3)	60(66.7)	3.81(1.27-6.51)
5-10 years	6(13.6)	38(86.4)	**2.48(1.32-4.64)***
>10 years	1(25.0)	3(75.0)	1.19(0.12-12.14)
Hear information about lifestyles			
yes	39(33.1)	79(66.9)	1
No	17(19.5)	70(80.5)	0.64(0.29-1.38)
Source of information			
Health professionals	31(35.2)	57(64.8)	1
Different medias	6(33.3)	12(66.7)	2.64(0.77-9.09)
Family and friends	3(21.4)	11(78.6)	4.44(0.81-27.72)
Co-morbidity			
yes	23(25.8)	66(74.2)	**0.28(0.13-0.61)***
No	33(28.4)	83(71.6)	**1**

* Significant at p-value<0.05, **p-value<0.001

CHAPTER SIX

Discussion

This study was conducted in intention to assess lifestyle modification practices and associated factors among hypertensive patients. Control of hypertension represents a major challenge and requires attention to both pharmacological and non-pharmacological treatment. Measurement of the rates of lifestyle practices and medications together with the identification of its determinants is of ultimate importance for the design effective strategies to control hypertension. The study revealed that ninety two (44.9%) had good basic knowledge regarding hypertension which is low compared with study done in Jimma showed 67.7% participants have good knowledge regarding hypertension. *(51)*. however, the finding of study in Egypt is supports with the current finding. *(52)*

Eighty eight (73.2%) reported their source of information about recommended lifestyle were health professionals. This is supported by finding from study in Nigeria *(48)*

From the participants (92.2%) were non-smokers and (89.7%) were abstained from alcohol drinking. Which is supported with study finding *(19)*. This could be due to social and cultural practices that discourage alcohol drinking and smoking.

Adequate physical activity has been shown to have many health promoting effects and has direct role in reducing blood pressure. *(42, 53)*. In this study very fewer patients 56(27.7%) practiced lifestyle modification. This finding is lower than study done in china in which (70%) of participants practice lifestyle modification and higher than from study done in Saudi Arabia *(20, 47)*. This might be due to difference educational back ground of patients and level of awareness about lifestyle modification and its advantages. It also might be due to patients relay only on medication considering lifestyle modification has no effect on their blood pressure.

Among lifestyles modifications only (16.1%) of the participants practice regular exercise 30 minutes per day for most of the days in a week. Which is lower than (89%) and (43.7%) patients physically active in studies done India and Addis Ababa respectively *(19, 55)*. Possible explanation could be lack of organized setups which are favorable for exercise. Another possible explanation could be poor knowledge on

the importance of physical activity in management of hypertension. Similar study done in Saudi Arabia showed that only (11.1%) of patients practiced physical activity most of the days in a week. Another study done in USA in African Americans also showed majority of the patients practiced physical activity which is higher than this study's finding. *(54).*

The mean (+SD) practice score of low salt diet was 4.59($\pm$ 2.03). One hundred eighteen subjects (57.5%) have poor low salt diet practice. This finding was higher than study done in Saudi (20) but this finding is lower than the finding of study done in hypertensive patients in jimma university specialized hospital (Ethiopia) which showed 80% of hypertensive patient avoid salt in their diet. Also a study done in United States showed low salt diet practices among African Americans *(54).* This may be due to socio-cultural practice of the community and poor knowledge about effect of high salt diet in blood pressure control. Also it could be due to the intention of individuals to make the food tastier by adding salt which is common in Africa. *(51, 53)*

The mean (+SD) of weight management practice of study subjects was 29.36($\pm$13.43) with the maximum score of 50. Eighty six (41.9%) only have good weight management practice. The finding is consistence with study done in United States. This finding was also supported with study in Saudi and Nigeria. *(16, 20, 54).*

Higher age (>65 years) was significantly associated with lifestyle modification practice Patients. Age Above 65 years old were 73% less likely to practice lifestyle modification (AOR=0.27, 95%CI: 0.13-0.61). Which is in line with study done in China and Nigeria *(47, 21).* This could be due to older persons have less education, decreased cognitive function and have more co-morbidities which may inhibit practice of the lifestyles. Another explanation might be younger patients were more likely to be educated, eager to control their blood pressure by practicing the lifestyle modification.

The results from the analysis showed patients without formal education were 2 times more likely to practice lifestyle modification (AOR=2.00 95%CI: 1.33-6.75) as compared to those who attended formal education. This is inconsistent with study

done Nigeria and Botswana in which as educational status increase practice of lifestyle modification was higher. *(21, 22).*

Average monthly income were significantly associated with lifestyle modification practice. Participants with monthly income of more than 1000ETB were 2.4 times more likely to practice lifestyle modification (AOR=2.41, 95%CI: 1.32-4.63). This is supported by the finding from study in Saudi in which level of monthly income was highly significantly associated with lifestyle modification practice *(20).* This could be due to individuals with low income could face to manage their diet properly and could not get favorable setups to do physical exercise. This also might be due to cultural differences which influence the living style of the individuals.

Patients on treatment for 5-10 years were 2.48 times (AOR=2.48 95%CI: 1.32-4.64) more likely to practice lifestyle modification as compared to those patients who were on treatment for less than two years. This finding is supported with different studies that show patients on longer duration on treatment had good lifestyle modification practice *(16, 20).* This might be due to continued counseling's and health education given by health professionals.

Patient with co-morbidity were 72% less likely to practice lifestyle modification practices (AOR=0.28, 95%CI: 0.13-0.61) compared to patients without co-morbidity. Hypertension with the presence of other co-morbidity is very difficult to control. Co-morbidities can worsen the conditions of the patient and make them unable to adhere to practice lifestyle changes. *(55).*This finding is consistent with study done in India and Ethiopia (Addis Ababa) that showed patients without co-morbidity were more likely to practice lifestyle modification. *(19, 55).* This difference could be due to difference in living standard and cultural differences. Also it might be due to difference educational status. Peoples in urban area are more educated and might have awareness about their blood pressure.

Limitations of the study

The main limitation in this study is lack of adequate similar studies in our country which made comparison difficult for the lifestyle changes. In addition, the data was self-report from the participants, there may be denial of poor practices from the respondents which affects the result of stud

CHAPTER SEVEN
CONCLUSION AND RECOMMENDATION
7.1. **Conclusion**

This study revealed lifestyle modification practice is low among the hypertensive patients. Lifestyle modification through changes in eating patterns, abstaining from alcohol, weight management, smoking cessation and regular physical activity forms part of important and effective treatment strategies for hypertension. Regardless of other indicated treatments, all hypertensive patients who need to control their blood pressure should be given advice and support to achieve and maintain lifestyle practices. Age, Duration of HTN diagnosis, educational status, average monthly income, and co-morbidity were factors significantly associated with lifestyle modification practice.

7.2. Recommendations

For Durame and Nigist Elleni Mohamed Memorial Hospital

- Patients should be educated on the recommended lifestyle modifications for better control and prevention of their blood pressure.

- Older age patients and those with co-morbidity should be focused and advised on advantages of lifestyle modification.

- The health care providers should motivate and enable the patients to control their BP by giving regular advices on the lifestyle modifications especially on physical activity, low salt diet and how to manage their weight.

For Ministry of health and stakeholders

- The ministry of health, non-governmental organizations and other interested bodies in health services should promote lifestyle modification to control patient's blood pressure.

For researchers: - Research in different settings that explore practices of recommended lifestyle for hypertension by considering qualitative methods are also advisable.

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Annex 1

English version Questionnaire

Jimma University College of Health Sciences School of public health questionnaire on assessment of practice on lifestyle modification among diagnosed hypertensive patients in selected hospitals in southern Ethiopia

Questionnaire ID:------------------------

I. Information sheet

Greeting: Good morning/afternoon

My name is--------------------------------------I am working on behalf of research team which is conducted by Jimma University. I would like to ask few questions which take 30 munities about practice of lifestyle modifications. Your genuine information that you are going to give is very important to identify problems related practice of lifestyle practices and associated factors. You are selected randomly to be participant of this study if you give me consent after you have understood the following information sheet:

Annex 2

Objective of the study: To assess lifestyle modification practice among diagnosed hypertensive patients in selected hospitals in southern Ethiopia.

Rights of participants: Participating and not participation is the full right and participants can stop for participating in the study at any time. They can also skip any question which they don't want to respond. They can ask any question which is not clear for them.

Confidentiality: Any information forwarded will be kept private and his/her name will not be specified.

II. Informed consent

I have read this form or it has been read to me in the language and understands all conditions stated above. Therefore I am willing to participate in this study.

Part 1. Assessment of Socio-demographic characteristics of respondents.

No	Questions	Category
101	Sex	1. Male 2. female
102.	Age	….………years
103.	Marital status?	1 Married 2 single 3 divorce 4. Widow
104	Where are you live now?	1. Urban 2. rural
105.	Education status?	1. Illiterate 2. Read and write only. 3.Elementary 4. Secondary 5. Higher education
106.	Employment ---------?	1. Government employed 2. Private employed 3 Merchant 4.Daily laborers 5.housewife 6.Retired
107.	Monthly income	1. <500 birr 2. 500-999birr 3. >=1000birr
108.	Religion	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. others

109.	Ethnicity	1. Hadiya
		2. Kambata
		3. Gurage
		4. Sidama
		5. Wolaita
		6. others

Part 2. Basic Knowledge of Respondents on hypertension.

110.	What is hypertension?	1. blood pressure higher than normal 2. When blood pressure is high enough to cause problems. 3. Too much blood in the body
111. .	Do you know risk factor for hypertension?	1.Family history 2.Alcohol 3. Obesity/overweight 4. Unhealthy eating/ eating too much fat/increase salt intake 5. Smoking 6. I don't know
112.	Do you know treatment/management options for hypertension?	1. Injections 2. Oral medication/ tablet 3. Dietary management 4. Exercise 5. Others

113.	Do you know complications of hypertension?	1. Heart attack 2. stroke 3. renal failure 4. Others specify………

Part 3. Source of information about lifestyles

Did u hear about healthy lifestyles before?	1. es 2. o
What is the source of information about lifestyles ?	1. edical staff 2. edia 3. amily and friends 4. thers specify

Part4. Questionnaires on health profile of patients

1	Duration of diagnosis?	1. 2years 2. -5 years 3. -10 years **4.** 0 yeers

1	Is there anybody in the family with hypertension?	1. es 2. o	
1	Have u diagnosed for other chronic disease?(like diabetes)	1. es 2. o	

Part 5. Lifestyles practice questionnaires.

No	Questions	Category
118.	Do you smoke before you ill?	1. Yes 2. No ,
119.		If NO for q118 go to q121.
120. .	If **yes** for q118 how frequently please?	1. daily' 2. once/week 3. 2-3days/week 4. 4-5 days/week 3. Others specify…..
121. .	How many days of the past 7days you smoke?	1. I don't smoke 2. Daily 3. Twice/week 4. 2-3 days/week 5. Others specify
122.	How many of the past 7 days you did at least 30 minute physical activity practice?	1 daily 2 .2-3 days/week 3 .4-7days

123. .	Do you do specific exercise activity like swimming, walking, or biking other than what you do around the house or as part of your work?	1. Yes 2. No
124.	Did you drink alcohol in the last 7 days?	1. Yes 2. No
125. .	If yes q124. How often?	1. Daily 2. Once/week 3. 2-3days/week 4. 4-5days/week 5. Others specify
126.	In the past 7 days how many days you eat low-salt diet?	1. 1-3 days 2. 3-4 days 3. 5-6 days 4. 6- 7days 5.
127.	Did you follow a healthy eating plan?	1. Yes 2. No
	Did you Eat potato chips, salted foods? .	1. Yes 2. No
	Did you Eat processed meats?	1. Yes 2. No
	Did you eat smoked meats?	1. Yes 2. No
	Did you eat ≥5 servings of fruits and vegetables?	1. Yes 2. No
	Did you eat frozen prepared dinners or frozen foods?	1. Yes 2. No
	Did you eat store bought or packaged bakery goods?	1. Yes 2. No
	Did you Salt your food at the table?	1. Yes 2. No
	Did you Add salt to food when you're cooking?	1. Yes 2. No
	Did you Avoid eating fatty foods?	1. Yes 2. No
128.	BMI height in centimeters………….. Weight in kilograms……….	

	Strongly disagree dis-agree agree strongly agree
129. Weight management	I am careful about what I eat -------------- ----------- ------- ------------------
	I read food labels when I grocery shop._____ _____ ____ ____ ____
	I exercise in order to lose or maintain weight___. ____ _____ _____ ____

practice?	I have stopped sugary sodas and sweet tea._____ _____ ____ ____ ____
	I eat smaller portions or eat fewer portions.____ ____ ____ ____ ____
	I have stopped buying or bringing unhealthy foods into my home.___ ___ ___ ___
	I have limit some foods that I like but that are not good for me.___ ___ ____ ___
	I eat at restaurants or fast food places less often._____ _____ _____ _____
	I substitute healthier foods for things that I used to eat._____ _____ _____
	I have modified my recipes when I cook._____ _____ _____ _____

Annex 2

Amharic version questionnaire

ክፍል አንድ

እንደ ምን አደርክ/ሽ ዋልክ/ሽ ስሜ ----------------------ስሆን ጅማ የኒቨርሲቲ አወክለለሁ በንግስት ኤሌን ማተሳቢያ ሆስፒተልና ዱረሜ ሆስፒተል ጥናት እያደረግን ነዉ፡፡ የጥናቱ ዋና ዓላማ የደም ጊፉት ያለበቸዉ ሰዎች የደም ጊፉት መጠናቸዉ ከፍ እንዲይል ምን እንደምያደርጉና ስለ ደም ጊፉተቸዉ ምን ያህል እንደምያዉቁ ለማዎቅ ነዉ፡፡ መጠይቁ በጤናህ/ሽ ዙሪያ መመለስ እንድትችል/ ይ ተደርጎ ነዉ፡፡ የሚሳጡት ምልስ ሌሎች የደም ጊፉት ለለበቸዉ ሰዎች ትምህርት ለማዘጋጀት ይጠቅማል፡፡ ይህን በተመለከተ አንደንድ ጥያቄዎችን እጠይቅታለሁ፡፡ አንደንዶቹ ጥያቄዎች ስለ እርስዎ አጠቀለይ ሁኔታ ስሆን የሚሰጡት መልስ ለ ማንም አይተይም፡፡

1. አዎ
2. አይደለም(መጠይቁን አቁም)

ስለ ትብብርዎ በጠም አመሰግናለሁ፡፡

የተጀመረበት ሰዓት ---------------------

ያለቀበት ሰዓት……………………

1. እርስዎን በተመለከተ የቀረብ ጥያቄ

101	ፆታ	1. ወንድ 2. ሴት
102	ዕድሜ	..........በአመት
103	የጋብቻ ሁኔታ	1. ያገባ/ች 2. ያላገባ/ች 3. የፋታ/የፋታች 4. ባል/ሚስት የሞተባት/የሞታባት
104	የመኖሪያ ቦታ	1. ገጠር 2. ከተማ
105	የትምህርት ደረጃ	1. ያልተማራ 2. መጻፍና ማንበብ ብቻ 3. የመጀመሪያ ደረጃ 4. ሁለተኛ ደረጃ 5. ከፍተኛ ትምህርት ደረጅ
106.	ስራ	1. መንግስት ስራተኛ 2. የግል ሥራ 3. ነጋዴ 4. የቀን ስራተኛ 5. የቤት እማቤት 6. ጡራታ የወጣ/ች
107	የወር ገቢ መጠን	1. <500 ብር 2. 500-999 ብር 3. 1000 ብር
108	ብሔር	1. ሀድያ 2. ከምበተ 3. ወላይታ 4. ጉራጌ 5. ስደማ 6. ሌሎች...............
109	ሀይማኖት	1. ኦርቶዶክስ 2. ፕሮቴስታንት 3. ሙስልም 4. ከቶልክ 5. ሌሎችም......

ክፍል 2. በደሚ ግፊቲ ላይ ያላቸዉን እዉቀት የሚላካ ጥያቄ

109.	የ ዳም ጌፉት ምንድናዉ?	1. የ ዳም ጌፉት መጣኑ ካፍ ስል ነዉ. 2. የዳም ጌፉት ችግር ሚያዳርስ ዳራጅ ስዳርስ ነዉ 3. ብዙ ዳም በሰዉናተችን ዉስት ስኖር ነዉ
110.	የዳም ጌፉት እንድካስት ሚያራት ነጋሮችን ያዉቁሉ?	1. ደም ጌፉት ቤተሰብ ዉስጥ መኖር 2. አልኮል መጠጠት 3. ከመጠን በላይ ዉፍራት 4. የአማጋገብ ስረአት /ስብ/

			5. ማጨስ
			6. አላዉቅም
111.	የዳም ጊፈት መታካሚያ/ማስተካካል የምንችልባቸዉ መንገዶችን ያዉቃሉ?		1. መርፌ ባመዋጋት
			2. ክንን በመዉሳድ
			3. አማጋጋብ በማስተካካል
			4. እንቅስቃሴ በማረግ
			5. ሌሎችም.........................
112.	የደም ጊፈት ሚያመጣቸዉን ችግሮን ያዉቃሉ?		1. የልብ ችግር
			2. የጭንቅላት ደም መፍሰስ
			3. የኩላሊት ሥራ ማቆም
			4. ሌሎችም..................

ክፍል 3. ስላ አኗኗር ዘይቤዎች

113	ስላ ጤናማ አኗኗር ዘይቤዎች ሰምተዉ ያዉቃሉ?		1. አዎ
			2. አይደለም
114.	113 መልሱ አዎ ከሆነ ስላ ጤናማ አኗኖር ከማን ነዉ የሰሙት?		1. ከህክምና በለሙያ
			2. ከተለያዩ ሚዲያዎች
			3. ከጎደኛ ና ዘመድ
			4. ሌሎችም..................

ክፍል 4. ስላ ጤናዋ ሁኔታ በተመለከተ

115.	የደም ጊፈት የተገኘባቸዉ መቼ ነዉ?		1. <2 አመት
			2. 2-5 አመት
			3. 5-10 አመት
			4. 10 አመት ባላይ
116.	ቤተሳብ ዉስጥ ሌላ የደም ጊፈት ያላበት ሰዉ አለ?		1. አዎ
			2. የለም
117.	ከደም ጊፈት ዉጭ ሌላ የተገኘባቸዉ ህመም አለ?		1. አዎ
			2. የለም

ክፍል 5. ስለ ጤናማ አኗኗር ዘይቤዎች አተገባባር ሁኔታ

118.	ከመተመምዖ በፍት ስጋራ ያጨሱ ነበር?		1. አዎ
			2. አይደለም
119.			መልሱ አይደለም ከሆና ወደ 121 ይህዱ
120.	118 መልሱ አዎ ከሆና በሰምንት ስንት ጊዜ?		1. በየቀኑ
			2. በሰምንት አንድ ቀን
			3. 2-3 ቀን/ሳምንት
			4. 4-5ቀን/ሳምንት
			5. ሌሎች..............
121.	በላፈዉ ሳምንት ምን ያህል ጊዜ አጭሳዋል?		1. አላጨኮስኩም

		2. በየቀኑ 3. 2 ቀን/በሳምንት 4. 3-4 ቀን/በሳምንት 5. ሌሎችም…………
122.	ባላፈዉ ሳምንት ስንት ቀን የአካል እንቅስቃሴ ቢያንስ ለ 30 ደቅቃ አድርገዋል?	1. በየቀኑ 2. 2-3 ቀን/ በሳምንት 3. 4-6 ቀን/በሳምንት
123.	እንደ ዋና፣የአግር ጉዞ፣ሳይክል መንደት ፣ሥራ ቦታ እና ቤት ከሚሳሩ ሥራ ዉጭ አድርገዉ ያዉቀሉ?	1. አዎ 2. አላዉቅም
124.	የአልኮል መጠጥ ባላፈዉ ሳምንት ጠጥተዉ ያዉቀሉ?	1. አዎ 2. አልጠጠሁም
125.	124 ጥያቄ መልሱ አዎ ከሆና ስንት ቀን?	1. በየቀኑ 2. 1 ቀን ባሳምንት 3. 2-3 ቀን/ባሳምንት 4. 4-6 ቀን ባሳምንት
126.	ባላፉዉ ሳምንት ዉስጥ ጫዉ ያልባዘበትን/የሌላበትን ምግብ ስንት ቀን ተመግባዋል?	1. ባየቀኑ 2. 2-4 ቀን/በሳምንት 3. 5-6ቀን/በሳምንት 4. አልተመገብኩም
127.	ጤናማ የአማጋገብ ሥርዓትን ይከተለሉ አትክልትና ፍራፍሬ አዘዉትሮ መመገብ?	1. አዎ 2. አይደለም
127.1	የድንችች ችፕስ ፣ጫዉ የባዘበት ምግብ ይመገባሉ?	1. አዎ 2. አይደለም
127.2	በፋብሪካ የተመረተ ምግብ ይመገባሉ?	1. አዎ 2. አይደላም
127.3	የተጠባሳ ሥጋ ይመገባሉ?	1. አዎ 2. አይደላም
127.4	ፍራፍሬና አትክልት ከአምስት ጊዜ በላይ በሳምንት ይመገባሉ ?	1. አዎ 2. አይደለም
127.5	ፍሪጅ ዉስጥ የተቀመጠ ምግብ ይጠቀሙሉ?	1. አዎ 2. አይደላም
127.6	የተሸጡ ምግቦችን ይጠቀሙሉ?	1. አዎ 2. አይደላም
127.7	ምግብ ላመብለት ከተዘጋጁ በኋላ ጫዉ ይጨምራሉ?	1. አዎ 2. አይደላም
127.8	ምግብ ስሰሩ ጫዉ ይጨምራሉ?	1. አዎ 2. አይደላም
127.9	ጨማ አብዝተዉ ይመገባሉ?	1. አዎ 2. አይደለም
128.	ቁመት በ ሴንትሜትር …………………………………… ክብደት በ ክሎግራም ……………………………………	

128.		የደም ጌፈት መጠን				
		ሰይስቶልክ..				
		ደይስቶልክ..				

129.	ከብደት ለመቀነስ ም'ደረጉ ነገሮች		በጣም አልስማማም	አልስማማም	እስማማለሁ	በጣም እስማማለሁ
		ስለ ም'በላዉ ነገር ጠንቀቀ ነኝ	------------------ --	---------------	-----------	------------
		የተሸጉ ም'ግቦች ላይ ያላዉን ጽሑፍ አነባለሁ		----------	----------	--------------	----------
		ጠፋጭ ነጋሮችን መጠጠትም ሆና መብላት አቁሜላሁ		-------------	-------------	-----------	------
		ከብደት ለመቀነስ የአካል እንቅስቃሴ አደርጋለሁ		---------	-----------	---------	---------
		ም'በላዉን ም'ግብ መጠን ቀንሼለሁ		--------------	-------------	------------	----------
		ለጤናዬ ጥሩ ያልሆኑ ም'ግቦች ገዝቼ ወደ ቤት አላመጠም			-----------	--------	-------	-------
		በጣም ም'ወደቻዉን ም'ግቦችን አቁሜላሁ		-------------	----------	----------	------------
		ም'ግብ ቤት/ ሆቴል ገብቼ ም'ግብ አልበላም		-------	----------	---------	---------
		ድሮ ም'ባላቸዉን ም'ግቦች በሌላ ም'ግቦች ተክቼአቸዋለሁ		------	-----------	-----------	-----
		ም'ግብ ሥሠራ ቅማማቅመም ም'ጪም'ራዉ ተጠንቅቄ ነዉ -		---------	--------	---------	-------