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Healthy Lifestyle Practice and Associated Factors Among Diagnosed Hypertensive Patients in Selected Health Centers in Gelan Sub-City, Shaggar City, Oromia, Ethiopia

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Abstract

Background: *Hypertension is the commonest non-communicable disease and the leading cause of cardiovascular disease in the world. An unhealthier lifestyle and changing environments cause a rapid increase in the incidence of hypertension across the world. Low and middle-income countries are disproportionally affected with the burden of hypertension. Healthy lifestyle approach is the most important intervention to overcome the burden of hypertension. However, there is limited evidence on the level of healthy lifestyle practice and associated factors among patients with hypertension.*

Objective: *This study aims to assess level of healthy lifestyle practice and associated factors among people diagnosed for hypertension in selected health center in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024*

Methods: *An institution-based cross-sectional study design was conducted among 301 hypertensive patients older than 18 years who were on medical treatment at three selected health centers in Gelan sub-city from May to August 2024. All three health centers found in the sub-city was included to this study by quota sampling method. A systematic random sampling technique was employed. The data were collected by structured questionnaire, and administered by trained data collectors. Data were entered to Epi- Info 7.2.1.0, and exported to SPSS version 26 for analysis. Data were analyzed using descriptive statistics and multivariate logistic regression method to identify predictors of the outcome ($p<0.05$)*

Results: *The study included 301 respondents with 100% response rate.156 (51.8%) were females and mean age was 56 (±12.43 SD) years. The overall level of healthy lifestyle practice in this study was only 27.2%. The study found that the patients Age older than 55 years (AOR 2.34; 95% CI: 1.11, 4.93), formal education (AOR = 0.45; 95% CI: 0.22, 0.89), the patients who had hypertension with 5 to 10 years' diagnosis time (AOR = 2.98: 95% CI: 1.10–8.04), and good knowledge about healthy lifestyle (AOR = 0.44: 95% CI: 0.25-0.78) have an independently associated with adherence to healthy lifestyle practices.*

Conclusions: *The Level of healthy lifestyle practice among hypertensive patients was low in this study. Age, education, duration of hypertension, and knowledge of lifestyle were identified as predictors of the outcome. Therefore, the health sector needs to develop intervention strategies to improve adherence to recommended healthy lifestyle for hypertensive patients.*

Keywords: Healthy Lifestyle, Hypertension, Non-communicable Diseases, Health Behavior.

Introduction

Background

Hypertension is one of the most important risk factors of cardiovascular diseases and its complication. It is a major leading cause of mortality and disability worldwide [1]. It is the major leading risk factor attributable which accounted for 10·8 million deaths each year throughout the globe [2].

Globally, 1.39 billion people have developed hypertension, and one-third of adults are living with the condition [3]. Moreover, 349 million people are in high-income countries are diagnosed for hypertension while 1.04 billion are in low- and middle-income countries [4]. The prevalence of hypertension is rising globally owing to the ageing of the population and increases in exposure to lifestyle risk factors including unhealthy diets. The prevalence of hypertension is highest in the African Region (46%) than other World Health Organization (WHO) regions and lowest in the region of the Americas (35%) [5]. In terms of economic burden, poorly controlled blood pressure is a considerable important public health concern among older adults in the world [6, 7]. Several studies revealed that most hypertensive patients do ot have enough knowledge about lifestyle modification to prevent hypertension Around 74.7 million people have hypertension in Sub-Saharan Africa (SSA), and this number is anticipated to reach 125.5 million people and prevent achieving to the set target to decrease the prevalence of hypertension by 25% globally by 2025 [8, 9].

The WHO and the United States Centers for Disease Control and Prevention launched the Global Hearts Initiative to support governments to help and treat cardiovascular conditions [10]. Ethiopia is one of the countries that started to implement the global hearts initiative to respond to the risk factors that are associated with non-communicable disease. Most of the behavioral risk factors of hypertension such as tobacco use, and alcohol consumption are more prevalent among men than women [11]. Healthy lifestyle like avoiding consumption of alcohol, and avoiding smoking are highly recommended to decrease the risk of developing hypertension Healthy lifestyle practices is significantly prevent hypertension and associated complication in addition to medication adherence. Therefore, this study aims to assess healthy lifestyle practice and associated factors among hypertensive patients in selected health centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia.

Methods and Materials

Study Setting and Period

The study was conducted at selected health institutions in Gelan sub-city, Shaggar city, Oromia region, Ethiopia from May to August 2024. Gelan sub-city is one of the 12 major sub-city under the administration of the Shaggar city, Oromia region. The sub-city is found 25-kilo meters southeast of Addis Ababa. The Sub-city has three health centers, seven health posts, and twenty private clinics.

The Sub-city has a total of 51,519 population based on 2024 projection. Of the total population 26,190 are older than 18 years. There are a total of 678 hypertensive patients on follow up in three health centers. All of them visit health centers every month for medical checkup. Therefore, this study was conducted in non-communicable diseases follow up units at health center found in Gelan sub-city.

Study Design

Institutional-based cross-sectional study was conducted to determine the level of healthy lifestyle practice among diagnosed hypertensive patients at selected health centers in Gelan Sub-city

Population

Source Population

All adult hypertensive patients lining in Gelan Sub-city were the source population for the study.

Study Population

All adult hypertensive patients on follow up at selected health centers in Gelan sub-city.

Inclusion and Exclusion Criteria

Inclusion Criteria

All hypertensive patients older than 18 years who were on medical treatment for at least one-month period before the beginning of the study were included in the study.

Exclusion Criteria

Pregnant women, and severely sick hypertensive patients were excluded from the study.

Sample Size Determination and Sampling Procedures

Sample Size Determination using a Healthy Lifestyle Practice

The sample size was calculated using a single population proportion formula for this study by assuming 23% for the proportion of recommended healthy lifestyle among hypertensive patients from a study done at the Dessie Referral Hospital, a 5% marginal error, and a 95% confidence level (CL) and 10% non-response rate to increase power [12].

$$n = \frac{Z^2_{1-\alpha/2} * p(1-p)}{d^2}$$

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Where, n-required sample size, Z-is critical value under standard normal distribution (Z = 1.96 for 95% confidence level), p-true population propulsion of healthy lifestyle (p = 0.23 based on pervious study), and d-desire margin of error (d = 0.05). After substituting the appropriate numbers in the formula above the sample size will be:

$$n = \frac{1.96^2 * 0.23(1 - 0.23)}{0.05^2} = \text{n} = 273$$

After accounting for 10% for non-response rate and registration related errors, the final sample size will be 301.

Sample Size Determination using Risk Factors Associated with a Healthy Lifestyle Among Hypertension Patients

The sample size needed to identify the risk factors associated with healthy lifestyle modifications practice among hypertensive patients were calculated considering variables significantly associated with hypertension in previous studies and fixing the level of confidence at 95%, power at 80% of the study. I have taken some of the factors from previous Ethiopian studies that have a strong association with healthy lifestyle practice among hypertensive patients.

Table 1: Sample size calculation for the factors that are associated with healthy Lifestyle practice among diagnosed hypertensive patients at selected health centers in Gelan sub-city , Oromia region, Ethiopia, 2024

Risk factors		Level of healthy Lifestyle practice		Out-come in exposed (%)	Out-come in non-ex-posed (%)	Power	AOR	Sample size	10% non-re-sponse rate	Referenc-es
		Yes N (%)	No N (%)							
Age in years	< 65	45 (25.9)	129 (74.1)	25.9	5.4	80%	0.27	205	225	(13)
	> 65	11(5.4)	20(9.8)							
Educa-tional status	No formal education	38 (32.2)	80(67.8)	32.2	20.7	80%	2.00	210	231	(13)
	Formal education	18 (20.7)	69(79.3)							
Presence of comor-bidity	Yes	28 (9.3)	155 (51.5)	9.3	14.3	80%	2.37	273	301	(12)
	No	43 (14.3)	75(24.9)							

The sample size for the first objective is larger than the sample size for the second objective. Thus, the final sample size was calculated by adding a 10% non-response rate to the larger sample size of 273. Accordingly, the calculated sample size for this study was 301. Hence a total of 301 hypertensive patients wer included to this study.

Sampling Technique and Procedures

Patients who were found during the study period at selected health centers in Gelan Sub-city who fulfilled the inclusion criteria was included in the study and exclusively for healthy lifestyle practice. The study participants were chosen using a systematic random sampling technique from hypertensive patients visiting the health centers at chronic follow-up departments who were known to be hypertensive based on monthly report health centers arrangements that have only follow-up anti-hypertensive treatment appointments for every month. The health centers were diagnosing and treating a total of 678 hypertensive patients in 2024 which is divided by the sample size (n = 301) to yield k=2.3. A sampling stages were used to select the required study participants. In the sub-city, there are three health centers that offer chronic follow-up services and three health centers were selected. Then, the sample size is allocated to three health centers proportionally (based on the number of patients reporting per month). Study participants were selected by systematic random sampling in the sites of every second chronic follow-up units visiting hypertensive patients known to have hypertension. The list of patients (sampling frame) was obtained from the registration books of the patients registered for follow up in selected health centers [13].

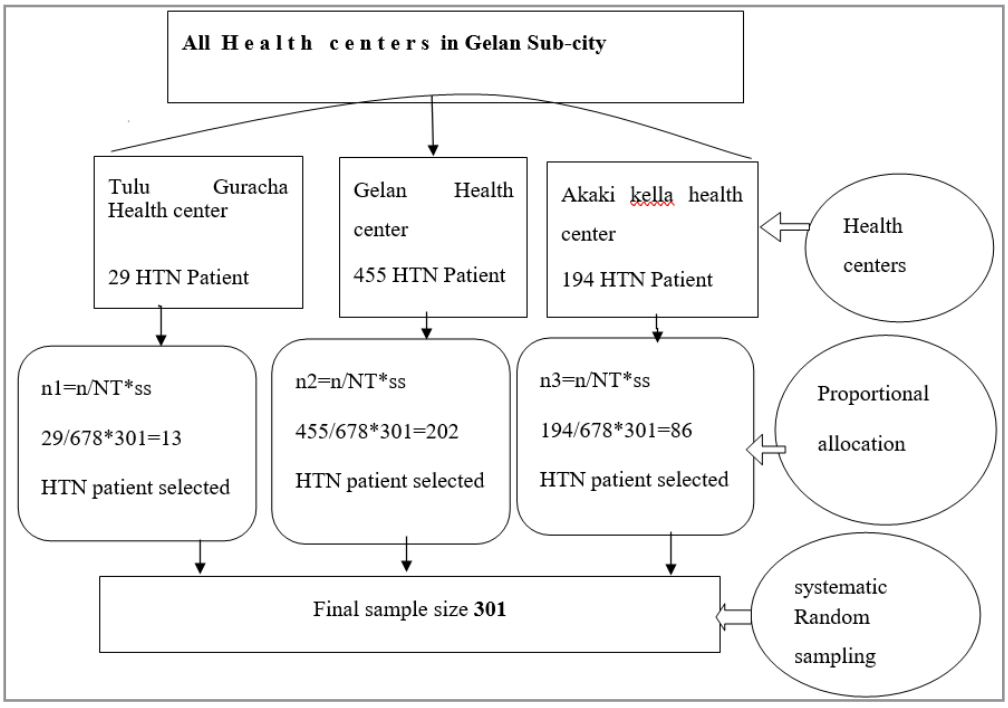

Figure 1: Schematic presentation of sampling techniques used to select study subjects from public health centers in Gelan Sub-city, 2024

Measurement
Study Variables
Dependent variable
Healthy lifestyle practice
The independent variables
Socio-demographic factors: -Age, sex, marital status, level of education, occupation, residence, and family size.
Health profile of the patients: -Presence of co-morbidity, duration of the disease, and family history of hypertension.
Individual factors: - knowledge of healthy lifestyle practice.

Data Collection Method, Tool, and Procedures
The data collection questionnaire is adapted from the WHO STEP survey (14). There are no available standard questionnaires to assess healthy lifestyle practice. The interview takes on average a total of 30 minutes. The questionnaire contains information on socio-demographic, personal, knowledge, and healthy lifestyle practice-related variables which can be expressed in terms of Adherence to dietary approaches to stop hypertension, regular exercise, limiting alcohol consumption, and cessation of smoking.

Measurements: The dependent variable, which is healthy lifestyle practice was assessed by adapting tools from a similar study. In this study components of lifestyle practice was measured on the Likert scale (all the time, most of the time, some of the time, and never did so). Each component (adherence to regular exercise, dietary approach to stop hypertension, quitting smoking, and limiting of alcohol consumption) will be asked with specific questions for participants to respond from alternatives of all the time, most of the time, some of the time, and never did so (15,16).

Data Collection and Data Collectors
Data was collected by using face-to-face interviews. The investigator will be responsible for the overall management of the research, the development of the final questionnaire securing the participation of selected cases, identifying, training, and assignment of data collectors and supervisors. Data collectors were selected by three Bachelor of Science (BSC) professional nurses based on their experience in outpatient clinics, and a Master of Public Health (MPH) professional was recruited for supervisory activities. The principal investigator was making the overall supervision daily. The study procedures protected the patient's privacy by allowing anonymous and voluntary participation.

Data Quality Control
Both the data collectors and supervisors were trained for one day on the objective, methodology of the research, and data collection approach. The purpose of the training is to secure that all the data collectors have the same information about the study instrument and followed the same interview procedures. The training dealt with the purpose of the study, confidentiality, and how to approach and promote questions to the clients. Primarily the questionnaire is prepared in English and translated to Afaan Oromo language and back-translated into English by another person to check for consistency. Preliminary testing was carried out in 15(5%) of samples in health facilities that were not included in the final study. Based on the finding, grammatical sequences of questions were arranged on questionnaires.

The Principal Investigator and Supervisor checked the completeness, accuracy, and clarity of the daily data collection with the data collectors, and any necessary corrections were made before the start of the next data collection day. Finally, Data were entered into EPI -info version 7.2.1.0 and imported to SPSS version 26 for data cleaning, coding, and crosschecking before data analysis.

Data Processing and Analysis
To minimize logical errors, the data was cleaned, coded, edited, and entered into Epi-Info version 7.2.1.0 software, and then exported to SPSS version 26 for further analysis.

Descriptive statistics such as frequency, percent, mean with standard deviation or median with interquartile range was used to summarize data. Logistic regression model was applied to assess the factors associated with health lifestyle practice among hypertensive patients. Independent variables reached p-value ≤ 0.25 during bivariate analysis was included to multivariable logistic regression model by stepwise model building method. Multicollinearity assumption was assessed by variance inflation factor (VIF) at cut-off point10%. Hosmer and Lemeshow goodness-of-fit test was used to assess the model fitness. level of significance set at p-value <0.05.

Ethical Considerations
Ethical clearance was obtained from the institutional review board (IRB) (Ref.No.57762/RVUA//2016) of Rift Valley University, and Oromia Regional Health Bureau Public Health Emergency Management and Public health research Directorate. Written informed consent was obtained from each participant after explaining the purpose and procedure of the study. The participants have the right to withdraw from the study at any stage without providing any explanation. The confidentiality of respondents and collected data were kept by conducting interview in secured place, restricting data access not collecting participant identifying information.

Operational Definitions and Measurements
Healthy lifestyle Practice is measured using the four recommended lifestyles. lifestyles advised by JNC 7 as non-pharmacological management is the cornerstone of helping out hypertensive patients to attain lifestyle behaviors that are healthy measured using physical exercise, low salt diet, and moderation of alcohol intake and stop smoking. In this study, the respondents who practice to all these four healthy lifestyles were considered as adherent otherwise non-adherent (17).

Dietary approach to stop hypertension: a diet rich in fruits, vegetables, low sodium, reduced saturated and total fat (18).
Diet-related practice: Who usually or always consumed a diet rich in vegetables, grains, and fruits, rarely or nowise consumed salt, rarely or nowise consumed foods rich in spices and saturated fat at least 3 times per week were considered to be practice (17).

Physical exercise practice is physical activities that increase breathing or heart rate within the month, including brisk walking, jogging or running, riding a bicycle or exercise bicycle, swimming, aerobic exercise, aerobic dancing, and the like. Respondents who reported engaged in moderate-intensity physical

activity greater than 150 minutes per week or vigorous-intensity physical activity for at least 75 minutes per week, or an equivalent combination of moderate and vigorous-intensity activity and otherwise. If the respondent is answered yes to the exercise question, he/she was considered as adherent to exercise recommendation (16).

Avoiding smoking practice: Smoking status was assessed, How many of the past 7 days did you smoke a cigarette?, Respondents who reported 0 days were considered a nonsmoker (never smoking or stopped smoking) (18).

Avoiding alcohol consumption-related practice: Daily consumption of lower than 30 mL net alcohol. The net alcohol is calculated from the type of alcoholic beverage consumed based on their net alcohol percent and volume of alcohol consumed habitually. Respondents who reported that either never consumed alcohol or Kept daily alcohol intake below 30 mL net alcohol were taken as adherent to moderation of alcohol consumption (19). Knowledge of healthy lifestyle: good if the total knowledge score is above the mean score otherwise low (12).

Results

Socio-Demographic characteristics of Participants

Out of the total hypertensive patients who attended the outpatient chronic follow-up department at selected health centers in Gelan sub-city during the study period, 301 hypertensive patients were included in the study, giving a response rate of 100%. The majority of 210 (69.8%) study participants lived in an urban area. The mean age of the participants was 56 years (±12.43 SD), slightly higher than half of 162 (53.8%) of the participants were found to be above the age of 55 years. The majority of participants were married 209 (69.4%), females 156 (51.8%), and 239(79.4%) of them attended formal education. Around 223(74.1%) of the participants were an employed by occupational status (Table 2).

Table 2: Socio-demographic chxs of participants with among diagnosed hypertensive patients at selected health centers in Gelan sub-city , Oromia region, Ethiopia, 2024

Variables	Category	Frequency	Percent (%)
Residency	Urban	210	69.8
	Rural	91	30.2
Sex	Male	145	48.2
	Female	156	51.8
Age in years	18-35	20	6.6
	36-45	35	11.6
	46-55	84	27.9
	>55	162	53.8
Marital status	Married	209	69.4
	Single	17	5.6
	Divorced	30	10.0
	Widowed	45	15.0
Educational status	No formal education	62	20.6
	Formal education	239	79.4
Occupation	Employed	223	74.1
	Unemployed	78	25.9
Family Size(in number)	<5	163	54.2
	>5	138	45.8

Others (House wife and private workers or contract ***)

Health profile of the Patients and Individual related factors

Of the 301 study participants, 128 (42.5%) have a family history of hypertension and 117(38.9%) were hypertensive for five or more years. Among the study participants, 126 (41.9%) participants had co-morbidities diseases (such as diabetes mellitus and chronic kidney disease) (Table 3).

Table 3: Sample size calculation for the factors that are associated with healthy Lifestyle practice among diagnosed hypertensive patients at selected health centers in Gelan sub-city , Oromia region, Ethiopia, 2024

Variable	Category	Frequency	Percent (%)
Family history of hypertension	No	173	57.5
	Yes	128	42.5
Duration of hypertension (years)	<5	93	30.9
	5-10	117	38.9
	10-15	52	17.3
	>15	39	13.0

Presence of comorbidity	No	175	58.1
	Yes	126	41.9

Knowledge on a Healthy Lifestyle

The knowledge on a healthy lifestyle among hypertension patients was determined using ten (10) questions for hypertension evaluation on a healthy lifestyle practice. The average knowledge score was (2.01 ± 0.41) as the cut-off point, indicating that 133 (44.2%) of the 301 participants were good knowledge on a healthy lifestyle (Figure 2).

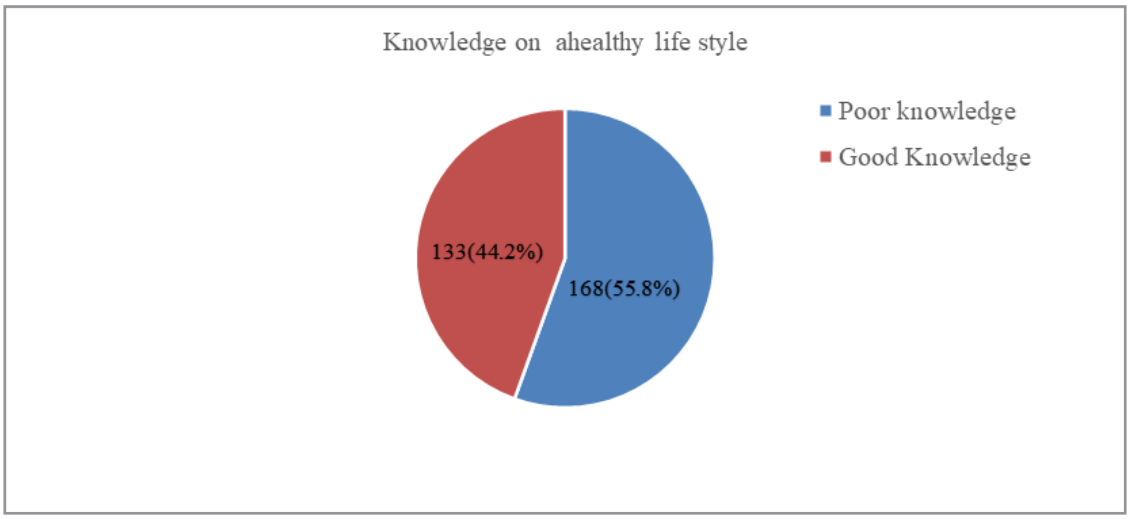

Figure 2: Knowledge on a healthy lifestyle among respondents attending outpatient department at selected health centers in Gelan sub-city, 2024(n = 301)

Healthy Lifestyle Practices

Adherence to the Recommended Diet

The majority 173(57.5%) of participants included fruits, vegetables, and grains in their diet after being diagnosed with hypertension. The average dietary score was found to be (3.25 ± 0.59). Among 166(55.1%) respondents sometimes ate foods rich in saturated fats, and 35(11.6%) participants never ate spicy foods after diagnosis. About 102(33.9% of participants sometimes eat salt in food during their meals (Table 4).

Table 4: Adherence to the recommended diet practice among diagnosed Hypertensive Patients at selected Health Centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024(n = 301)

Variables	Always	Often	Sometimes	Rarely	Never
Included fruits, vegetables, and grains in the diet	70(23.3%)	34(11.3%)	132(43.9%)	40(1.33%)	25(8.3%)
Consuming foods that contain high saturated fat	24(8%)	16(5.3%)	166(55.1%)	60(19.9%)	35(11.6%)
Consuming spicy foods	31(10.3%)	40(13.3%)	110(36.5%)	85(28.2%)	35(11.6%)
Consuming salt in your food	7(2.3%)	17(5.6%)	102(33.9%)	63(20.9%)	112(37.2%)

Adherence to Related-Exercise practice

About 150(49.8%) of participants said they do physical activity, with 69(22.6%) claiming they exercise at least 3 times a week, and about a similar number 71(23.6%) confirming that they engage in an activity that takes greater than 30 minutes of practice. Aerobic exercise (including brisk walking, jogging or running, riding a bicycle and swimming) was the most common physical activity among those found to be consistent at 125(41.5%) (Table 5).

Table 5: Adherence to related-exercise practice among hypertensive patients attending at selected Health Centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024 (n = 301)

Variables	Category	Frequency	Percent (%)
Do you perform physical exercise?	No	151	50.2
	Yes	150	49.8

Frequency of exercise in a week	<Three times per week	43	14.3
	Three times per week	71	23.6
	>Three times per week	44	14.6
Duration of exercise per session	Less than 30 minutes	35	11.6
	From 30 minutes to 1 hour	65	21.6
	More than 1 hour	60	19.9
Type of exercise performed	Aerobics(walking, Jogging)	125	41.5
	Weight-bearing	17	5.6
	Driving	13	4.3
	Dancing	5	1.7

Avoiding Alcohol Consumption

All 272 (90.4%) hypertensive patients were adhering to moderation in alcohol consumption. About 105(38.4%) of the participants consumed less than one drink per week and 25(8.2%) of the participants consumed more than seven drinks per week. Approximately 246(90.6) of these participants confirmed that a relative/health care professional was concerned about their alcohol use and advised them to reduce their alcohol consumption during the last year (Table 6).

Table 6: Participant response related to alcohol consumption among hypertensive patients attending at selected Health Centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024 (n = 301)

Variables	Category	Frequency	Percent (%)
Alcohol consumption	Not moderated	29	9.6
	Moderated	272	90.4
How often do you usually drink alcohol	<1 drink a week	105	38.6
	1-3 drinks a week	96	35.3
	4-6 drinks a week	47	17.3
	≥ 7 drinks a week	25	8.2
	Never	29	10.7
Tried to quit Alcohol consumption	No	26	9.6
	Yes	246	90.4

Smoking Cessation

Of the 301 participants, 274 (90.7%) had never smoked, while 28 (9.3%) of them are still smokers. Among the 28 participants who still smoked cigarettes, 25(89.3%) had tried to quit smoking (Table 7).

Table 7: Participant response on Smoking cessation among among hypertensive patients attending at selected Health Centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024 (n = 301)

Variables	Category	Frequency	Percent (%)
Ever smoked cigarette	No	273	90.7
	Yes	28	9.3
Advice by a health worker to quitting smoking	No	1	3,6
	Yes	27	96.4
Tried to quit smoking	No	3	10.7
	Yes	25	89.3

Overall Adherence to Healthy Lifestyle Practices

The overall the level of adherence to healthy lifestyle (including diet, exercise, moderation of alcohol consumption, and smoking cessation) in this study found that only 27.2% of participants adhere to all recommended healthy lifestyle practices. About 173(57.5%) of participants adhere to related to the diet. Most 178(59.1%) participants did not engage in regular exercise at least 3 days per week, with a minimum duration of 30 minutes. About 273 (90.7%) participants did not smoke, and 272(90.4%) participants remained with moderate alcohol consumption (Table 8).

Table 8: Overall adherence to healthy lifestyle practices among hypertensive patients attending at selected Health Centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024 (n = 301)

Variables	Category	Frequency	Percent (%)
Diet-related adherence	Non-adherent	128	42.5
	Adherent	173	57.5
Exercise-related adherence	Non-adherent	178	59.1
	Adherent	123	40.9
Alcohol moderation	Not moderated	29	9.6
	Moderated	272	90.4
Smoking	Ceased	273	90.7
	Did not ceased	28	9.3
Overall Level of recommended healthy lifestyle	Non-adherent	219	72.8
	Adherent	82	27.2

Factors associated with Adherence to Healthy Lifestyle Practices

In Bivariable logistic regression analysis study showed that age, marital status, educational status, residency, duration of hypertension, and knowledge about lifestyles were significantly associated with a healthy lifestyle practice at a p-value ≤ 0.25. The Hosmer and Leme show the goodness of fit test gave a p-value = 0.871 suggestive of evidence of fitness of the model. After controlling for the influence of other factors (confounders) in a multivariable logistic regression, age, educational status, duration of hypertension, and knowledge about lifestyles were found to be significantly associated with a healthy lifestyle practice at a p-value ≤ 0.05.

Respondents in the elderly group were found to be nearly two times more adherent than respondents in the young age group (AOR 2.34; 95% CI: 1.11, 4.93).

Formal education respondents were 55% more likely to be adherent to healthy lifestyle practice (AOR = 0.45; 95% CI: 0.22, 0.89) compared to respondents with no formal education.

Patients who had hypertension for long-duration were almost three times as likely to adhere to patients as short as diagnosis (AOR = 2.98: 95% CI: 1.10–8.04).

Patients with good knowledge about healthy lifestyles were 56% more likely to adhere to recommended healthy lifestyle practices than those with less knowledge about healthy lifestyles practice (AOR = 0.44: 95% CI: 0.25-0.78) (Table 9).

Table 9: Bivariable and Multivariable Logistic regression output indicating factors associated with Adherence to recommended Healthy lifestyle practices among patients with hypertension attending the outpatient department at selected Health Centers in Gelan sub-city, Shaggar city, Oromia, Ethiopia, 2024 (n=301)

Variables	Category	Healthy Lifestyle practice		COR (95%CI)	AOR (95%CI)	P-value
		Adherent N (82)	Non-adherent N (219)			
Age in years	18-35	7	13	1.00	1.00	
	36-45	10	25	0.85(0.25-2.84)	0.48(0.15-1.53)	0.219
	46-55	12	72	0.87(0.0.34-2.21)	0,67(0.25-1.77)	0.424
	>55	53	109	0.38(0.18-0.80) *	2.34(1.11-4.93) **	0.025
Marital status	single	7	10	0.47(0.14-1.56) *	0.44(0.13-1.46)	0.182
	Married	46	163	0.51(0.11-2.37)	0.47(0.10-2.20)	0.342
	Divorced	6	24	1.52(0.38-6.00)	1.42(0.35-5.67)	0.613
	Widowed	23	22	1.00	1.00	
Educational status	No- formal education	25	37	0.48(0.25-0.91) *	0.45(0.22-0.89) **	0.024
	Formal-education	57	182	1.00	1.00	
Residency	Urban	50	160	1.74(0.96-3.18)	1.21(0.65-2.22)	
	Rural	32	59	1.00	1.00	

Duration of hypertension (years)	<5	19	74	2.44(1.02-5.83) *	2.98(1.10-8.04) **	0.031
	5-10	30	87	1.84(0.80-4.23) *	1.67(0.73-3.79)	0.218
	10-15	15	37	1.43(0.56-3.66)	1.51(0.59-3.83)	0.383
	>15	18	21	1.00	1.00	
Knowledge level	Poor	59	109	0.44(0.24-0.78) *	0.44(0.25-0.78) **	0.006
	Good	23	110	1.00	1.00	

Notes: *Variables having a (p≤ 0.25) in bivariable analysis, **statistically significant at (p≤ 0.05) in the multivariable analysis.

Discussion

This study aimed to investigate the level of healthy Lifestyle practice and associated factors among diagnosed hypertensive patients at selected health centers in Gelan Sub-City, Shaggar city, Oromia, Ethiopia. In this study, the level of good adherence to healthy lifestyle practice among patients with hypertension was found to be 27.2%. Age, educational status, duration of hypertension, and knowledge about healthy lifestyle were significantly associated with adherence to recommended healthy lifestyle practice. So, hypertension is the most important public health problem, if poorly managed and poor adherence to a healthy lifestyle this factor that can lead to disability and mortality. Therefore, having a healthy lifestyle is a useful strategy for lowering blood pressure.

Overall, the level of adherence to recommended healthy lifestyle practices in this study was only 27.2%. This is low compared to studies conducted in Ghana and eastern Ethiopia that reported adherence rates of (72%) and (28.7), respectively [20, 21]. The discrepancy in adherence rates between our study and other studies may be due to the various study methods (like sample size) and inadequate health promotion given to the client regarding knowledge on a healthy lifestyle of hypertension prevention and control. According to this study, although a large number of people keep maintaining unhealthy lifestyles, this raises the prevalence of chronic illnesses like hypertension.

In this study dietary adherence was described by including more fruits, vegetables, and grains in the diet, as well as eating low-sodium and low fat. The prevalence of dietary-related practice in this study was 34.6%. In contrast, in Korea, this study shows that a majority (77.5%) of the study participants followed dietary modification and another study from Addis Ababa found that only (64.7%) of the respondents were found to be adherent [22, 23]. Discrepancies in local studies may be due to differences in dietary habits and the place of residence of study participants. Those who adhered to the recommended diet had an effective decrease in their hypertension.

In this finding, exercise-related adherence was 40.9%. Similar studies done in Georgia and Bangladesh revealed significantly a higher-level healthy lifestyle of rates of 46.6% and 46.6%, respectively [24, 25]. This finding is comparable with the adherence level of participants to exercises at a public health hospital in Addis Ababa, in which (33.9%) adhere to exercise regularly [26]. Discrepancies in the study area could be the result of hard-working conations, a lack of knowledge about promotions for those with low educational attainment, cultural variations, and unorganized ways of lifestyles. This suggests that one of the leading causes of hypertension and cardiovascular disease is a lack of adherence to an exercise practice.

The majority in this study 90.4% of respondents were found to moderate their alcohol consumption. In similar studies conducted in Malaysia and Korea and almost (90%) and (80%) of the study, participants were limited to alcohol consumption [16, 27]. Another study conducted in Addis Ababa, Ethiopia, when compare the results shows that (74.8%) of respondents moderated their alcohol consumption [28]. This disparity can be explained by social and cultural norms that encourage the consumption of alcoholic beverages. In other words, drinking alcohol increases the chance of developing hypertension.

The majority in this study 90.7% of participants reported never having smoked before a year, which is consistent with findings from studies conducted in Turkey (83%) and Zimbabwe (97%) where the majority of respondents were found to be adherent to smoking cessation [19, 29]. In a similar study in selected hospitals, in southern Ethiopia, 91.2% were non-smokers [13]. One of the leading causes of hypertension is smoking. Social and cultural norms that discourage smoking in society might account for these shared characteristics.

In this study, age, education level, duration of hypertension, and knowledge about healthy lifestyles were strongly associated with adherence to the recommended healthy lifestyle practices.

It was found that older respondents are more adherent to healthy lifestyle practice than younger age groups. In a similar study conducted in the Kingdom of Saudi Arabia and Addis Ababa, Ethiopia, it was found that individuals above the age of 60 years were more likely to recommend healthy lifestyle practice (28,30). The reason for the older age differences may be a greater explained by increased awareness of the management and controlling of hypertension during visits to health care professionals.

Those with formal education were 55% more likely to adhere to healthy lifestyle practice than respondents with no formal education. This study is supported by Eritrea and Gondar, Ethiopia [31, 32]. A possible explanation might be that patients' knowledge of the important role of adhering to recommended healthy lifestyle practices for preventing hypertension has increased with higher levels of formal education.

In this study respondents who reported that they have been di-

agnosed longer period since diagnosis with hypertension for a short period were found more likely to be adherent. This is comparable to a study from southern Ethiopia and Ghana, which found that Patients on treatment with a long history of hypertension were more likely to adhere to healthy lifestyle [13, 20]. The findings indicated that while those with hypertension for more than five years are more likely to stick to lifestyle practices, individuals with the disease for less than five years are less likely to view it as a life-threatening condition. The differences are due to the continuous counseling and health education provided by healthcare providers.

This study indicated that knowledgeable patients were 56% more likely to adhere to healthy lifestyle practice than less knowledgeable patients. Knowledge of hypertension is crucial for managing the condition, and an awareness its prevention and management is a key component of the chronic care strategy. This finding was consistent with findings of studies conducted in hospitals in Gondar, Ethiopia, and Eastern Ethiopia [32, 33]. This might be the result of poorly knowledgeable patients not understanding the disease's causes or the best ways to manage and to prevent it. It's critical to improve patient access to knowledge about risk factors and recommended a healthy way of life.

Strengths and Limitations of the Study

Strengths of the Study

The response rate in this study was 100%. This study can provide valuable information that can serve as a guide for further study.

Limitations of the Study

The main limitation of this study it was conducted only at selected public health institutions and did not include patients with hypertension who were seen in private clinics. Furthermore, research methodologies involving self-reported measures depend largely on individuals. This method is simple but less accurate in patients who deny poor adherence, and social desirability bias which is particularly typical of smokers.

Conclusions and Recommendations

Conclusions

This study revealed the level of healthy lifestyle practice was low among patients with hypertension. Of the variables studied, age, educational level, duration of hypertension, and knowledge about healthy lifestyle were independent predictors of adherence to healthy lifestyle practices.

Recommendations

Based on the results of the study, the following recommendations for healthy lifestyle practices to prevent and control hypertension are suggested to the concerned bodies working in this area:

- Overall, the level of healthy lifestyle practices in this study were very low, the Federal Ministry of Health and the Regional Health bureau should develop intervention strategies to promote a healthy lifestyle for the prevention and control of hypertension.
- Oromia Regional Health Bureau and health facility managers should facilitate training for healthcare professionals about healthy lifestyle practice to prevent and control hypertension.
- The Gelan sub-city Health Office should coordinate with non-health sectors such as education, agriculture, sport and involve other development partners in implementing modifiable risk factors, such as promoting physical activity, healthy eating habits, limitation of alcohol consumption, and smoking cessation through behavior change communication (BCC) and awareness-raising for the prevention and control of hypertension
- Health professionals should strictly screen and targeting those subgroups noted to be at higher risk factors of poor adherence to healthy life style practice e.g. elderly age group, respondents who had no formal education, and those less knowledgeable and educate on recommended healthy lifestyle at a health facility.
- Health extension workers should provide health education continuously on healthy diet, limit alcohol intake and physical activity at community level.

Abbreviations and Acronyms

AOR: Adjusted Odd Ratio, BP: Blood Pressure, BSC: Bachelor of Science, CVD: Cardiovascular Diseases, DASH: Dietary Approaches to Stop Hypertension, DC: Data Collector, EDHS: Ethiopian Demography and Health survey, ETB: Ethiopian Birr, HTN: Hypertension, HC: Health Center, JNC7: Seventh Report of Joint National Committee 7, MmHg: Millimeters of Mercury, MPH: Master of Public Health, NCD: Non-Communicable Disease, PI: Principal Investigator, WHO: World Health Organization

Declarations

Author's Contributions

MF, GM, and HH conceptualized, designed the study, analyzed, interpreted the data, drafted the manuscript and critically reviewed the manuscript. All the authors read and approved the manuscript.

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Conflict of Interest

The authors declare that they have no conflicts of interest for this work.

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References

1. World Health Organization. (2018). Noncommunicable diseases. WHO. https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases
2. Abbafati, C., Abbas, K. M., Abbasi-Kangevari, M., Abd-Allah, F., Abdelalim, A., Abdollahi, M., … Murray, C. J. L. (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. The Lancet, 396(10258), 1223–1249. https://doi.org/10.1016/S0140-6736(20)30752-2
3. Mills, K. T., Stefanescu, A., & He, J. (2020). The global epidemiology of hypertension. Nature Reviews Nephrology, 16(4), 223–237. https://doi.org/10.1038/s41581-019-0244-2
4. Zhou, B., Perel, P., & Mensah, G. A. (2021). Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension. Nature Reviews Cardiology. Advance online publication. https://doi.org/10.1038/s41569-021-00559-8
5. Dhar, L., Dantas, J., & Ali, M. (2017). A systematic review of factors influencing medication adherence to hypertension treatment in developing countries. Open Journal of Epidemiology, 7(3), 211–250. https://doi.org/10.4236/ojepi.2017.73017
6. Al-Wehedy, A., Hassan, S., Elhameed, A., & El-Hameed, D. A. (2014). Effect of lifestyle intervention program on controlling hypertension among older adults. Journal of Education and Practice, 5(5), 61–71.
7. Appel, L. J., Champagne, C. M., Harsha, D. W., Cooper, L. S., Obarzanek, E., Elmer, P. J., Stevens, V. J., Vollmer, W. M., Lin, P. H., Svetkey, L. P., Stedman, S. W., & Young, D. R. (2003). Effects of comprehensive lifestyle modification on blood pressure control. Journal of the American Medical Association, 289(16), 2083–2093. https://doi.org/10.1001/jama.289.16.2083
8. Omar, S. M., Musa, I. R., Osman, O. E., & Adam, I. (2020). Prevalence and associated factors of hypertension among adults in Gadarif in eastern Sudan: A community-based study. BMC Public Health, 20(1), 1–9. https://doi.org/10.1186/s12889-019-8139-6
9. Cohen, D. L., Townsend, R. R., Angell, S. Y., & Dipette, D. J. (2014). The World Health Organization recognizes noncommunicable diseases and raised blood pressure as global health priority for 2025. Journal of Clinical Hypertension, 16(9), 624. https://doi.org/10.1111/jch.12369
10. World Health Organization. (2016). Technical package for cardiovascular disease management in primary health care. WHO. https://www.who.int/publications/i/item/technical-package-for-cardiovascular-disease-management-in-primary-health-care
11. World Health Organization. (2016). Ethiopia STEPS report on risk factors for non-communicable diseases and prevalence of selected NCDs. WHO.
12. Andualem, A., Gelaye, H., & Damtie, Y. (2020). Adherence to lifestyle modifications and associated factors among adult hypertensive patients attending chronic follow-up units of Dessie Referral Hospital, North East Ethiopia, 2020. Integrated Blood Pressure Control, 13, 145–156. https://doi.org/10.2147/IBPC.S265352
13. Buda, E. S., Hanfore, L. K., Fite, R. O., & Buda, A. S. (2017). Lifestyle modification practice and associated factors among diagnosed hypertensive patients in selected hospitals. Ethiopian Journal of Health Sciences, 27(5), 1–9. https://doi.org/10.4314/ejhs.v27i5.5
14. World Health Organization. (2016). WHO STEPwise approach to noncommunicable disease risk factor surveillance (STEPS). WHO. https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/steps
15. Angelo, A. T., & Geltore, T. E. (2020). Lifestyle modification practice and associated factors among diagnosed hypertensive patients in Mizan Tepi University Teaching Hospital, Southwest Ethiopia, 2019: A cross-sectional study. PAMJ Clinical Medicine, 2, 1–12. https://doi.org/10.11604/pamj-cm.2020.2.20.23437
16. Baharudin, M. I., Zainudin, S., Ismail, R., & Yusof, A. (2020). Lifestyle modification practice in rural community at Kedah in Malaysia: A cross-sectional study. Malaysian Journal of Public Health Medicine, 1(1), 19–26.
17. Verdecchia, P., & Angeli, F. (2003). The Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The weapons are ready. Journal of Hypertension, 21(5), 843–847. https://doi.org/10.1097/00004872-200305000-00001
18. Nadewu, A. N., & Geda, B. (2018). Adherence to healthy lifestyle among hypertensive patients in Harar Region, Eastern Ethiopia. Primary Health Care: Open Access, 8(4), 1–6. https://doi.org/10.4172/2167-1079.1000308
19. Tozivepi, S. N., Takawira, S., Chikaka, E., Mundagowa, P., Chadambuka, E. M., & Mukora-Mutseyekwa, F. (2021). The nexus between adherence to recommended lifestyle behaviors and blood pressure control in hypertensive patients at Mutare Provincial Hospital, Zimbabwe: A cross-sectional study. Patient Preference and Adherence, 15, 1027–1037. https://doi.org/10.2147/PPA.S304181
20. Obirikorang, Y., Obirikorang, C., Acheampong, E., Anto, E. O., Amoah, B., Fosu, E., … Acheampong, F. (2018). Adherence to lifestyle modification among hypertensive clients: A descriptive cross-sectional study. Journal of Clinical Hypertension, 5(1), 1–13. https://doi.org/10.1186/s40885-018-0080-3
21. Nadewu, A. N. (2018). Adherence to healthy lifestyle among hypertensive patients in Harar Region. Primary Health Care: Open Access, 8(1), 1–6. https://doi.org/10.4172/2167-1079.1000308
22. Shim, J. S., Heo, J. E., & Kim, H. C. (2020). Factors associated with dietary adherence to the guidelines for prevention and treatment of hypertension among Korean adults with and without hypertension. Clinical Hypertension, 26(1), 1–11. https://doi.org/10.1186/s40885-020-00146-1
23. Ababa, A., Patients, H., Black, A., Hospital, L., Follow, C., & Unit, U. (2013). Assessments of adherence to hypertension managements and its influencing factors among patients in Addis Ababa. International Journal of Research in Medical Sciences, 4(3), 1086–1095.
24. Islam, F. M. A., Hosen, M. A., Islam, M. A., & Lambert, E. A. (2021). Knowledge of and intention to participate in physical activity programs and their associated sociodemographic factors in people with high blood pressure in a rural area of Bangladesh: Initial investigation from a cluster randomized controlled trial. International Journal of Environmental Research and Public Health, 18(6), 1–14. https://doi.

org/10.3390/ijerph18063054
25. Fang, J., Moore, L., Loustalot, F., Yang, Q., & Ayala, C. (2016). Physical activity in U.S. adults with hypertension and in hypertensive adults with physician advice to exercise. American Journal of Preventive Medicine, 50(3), 252–256. https://doi.org/10.1016/j.amepre.2015.07.014
26. Aynalem, G. A., Alemu, T., Tadesse, T., & Bekele, G. E. (2021). Factors affecting adherence to lifestyle modification among patients with hypertension at Yekatit 12 Hospital Medical College, Addis Ababa, Ethiopia, 2019. Integrated Blood Pressure Control, 14, 1–11. https://doi.org/10.2147/IBPC.S289385
27. Kim, Y., & Kong, K. A. (2015). Do hypertensive individuals who are aware of their disease follow lifestyle recommendations better than those who are not aware? PLoS ONE, 10(8), e0136858. https://doi.org/10.1371/journal.pone.0136858
28. Tibebu, A., & Mengistu, D. (2017). Adherence to recommended lifestyle modifications and factors associated for hypertensive patients attending chronic follow-up units of selected public hospitals in Addis Ababa, Ethiopia. Journal of Hypertension and Management, 3(1), 1–8. https://doi.org/10.23937/2474-3690/1510031
29. Arslan, F. (2014). The assessment of adherence of hypertensive individuals to treatment and lifestyle change recommendations. Journal of Hypertension Research, 20(2), 50–57.
30. Elbur, A. I. (2015). Level of adherence to lifestyle changes and medications among male hypertensive patients in two hospitals in Taif, Kingdom of Saudi Arabia. International Journal of Pharmacy and Pharmaceutical Sciences, 7(4), 168–172.
31. Idris, B. I. M., Wolday, S. J., Abraham, B., Abraham, D., Negassi, F., Mezgebo, H., … Tewelde, T. (2020). Factors influencing lifestyle modification practice among hypertensive patients: A cross-sectional study in two selected Eritrean hospitals. Journal of Hypertension: Open Access, 20(4), 1–9.
32. Smachew, M., Melak, M. F., Atenafu, A., & Belew, A. K. (2022). Lifestyle modification practice and associated factors among diagnosed hypertensive patients in selected hospitals in Central Gondar Zone, Northwest Ethiopia. BMJ Open, 12(6), e057233. https://doi.org/10.1136/bmjopen-2021-057233
33. Bogale, S., Mishore, K. M., Tola, A., Mekuria, A. N., & Ayele, Y. (2020). Knowledge, attitude, and practice of lifestyle modification recommended for hypertension management and the associated factors among adult hypertensive patients in Harar, Eastern Ethiopia. SAGE Open Medicine, 8, 1–9. https://doi.org/10.1177/2050312120965322