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Knowledge and Attitude Towards Lifestyle Modification Among Hypertensive Patients: A Cross-sectional Study In Ghana.

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Abstract

Introduction: Hypertension stands as a silent yet pervasive health challenge affecting millions worldwide. Appropriate lifestyle modification which are often overlooked are the linchpin for the prevention and control of hypertension. This study aimed at assessing the knowledge and attitude towards lifestyle modification among hypertensive patients at Methodist Hospital, Wenchi, Ghana.

Methods: A facility-based cross-sectional study was conducted employing a quantitative approach. A structured questionnaire was administered to hypertensive patients and data collected through an interview. A multivariate logistic regression model was set up to determine independent predictors of knowledge and attitude towards lifestyle modification among hypertensive patients.

Results: The study revealed that 36% of respondents had good knowledge and 59% had favourable attitude towards lifestyle modification recommended for hypertension management. Educational status (AOR: 4.32, 95% CI: 1.25 – 14.55), marital status (AOR: 2.12, 95% CI: 1.02 – 4.40), employment status (AOR: 1.73, 95% CI: 0.26 – 3.58) and average monthly income (AOR: 2.13, 95% CI: 0.33 – 5.62) were factors significantly associated with good knowledge of lifestyle modification. Knowledge level was significantly associated with attitude towards lifestyle modification (AOR: 3.19, 95% CI: 1.10 – 9.27).

Conclusion: In this study, knowledge on lifestyle modification was poor but attitude was favourable. Concerted strategies are required to increase knowledge and attitude towards lifestyle modification.

Keywords: Lifestyle modification; Hypertension; Knowledge; Attitude; Ghana

1. Introduction

Hypertension, more commonly referred to as high blood pressure, stands as a significant health concern that transcends geographical boundaries, affecting populations in both the developed and the developing world. This condition is not only a major public health issue but also a key modifiable risk factor leading to premature deaths globally (1). It is a primary focus in the World Health Organization's (WHO) strategic plan to combat non-communicable diseases, underscoring the need for effective management and prevention strategies (2). Hypertension elevates the risk of critical health issues such as stroke, heart disease and kidney disease, making its control a healthcare priority. Clinically, it is defined by a systolic blood pressure measurement exceeding 140mmHg and or a diastolic measurement above 90mmHg (3).

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The impact of hypertension is profoundly felt across the globe, notably contributing to the overall burden of non-communicable diseases. This impact is more pronounced in developing countries where late diagnosis is a common feature, leading to complications and worsening health outcomes (4). Recognizing the severity of this health challenge, the World Health Assembly in 2013 established a global target to reduce the prevalence of hypertension by 2025 (5). This goal highlights the critical need for comprehensive health policies and initiatives that not only focus on treatment but also emphasize prevention, early detection and education to mitigate the risks associated with this prevalent condition.

Hypertension, often referred to as a 'silent killer,' poses a significant health risk, primarily because it tends to be detected only after inflicting serious harm to vital organs such as the heart, brain and kidneys. This delayed detection often leads to severe complications including kidney failure, stroke and various heart diseases. Highlighting the stealthy nature of this condition, Musinguizi et al (6) emphasized its late diagnosis and the severe impact it has on health. Furthermore, the global health landscape is increasingly burdened by non-communicable diseases, with a rising incidence in Africa that is particularly concerning.

In Africa, hypertension and other non-communicable diseases often co-exist with infectious diseases, complicating the health scenario. According to Nkyi (7), these diseases are frequently diagnosed in African populations at advanced stages, underscoring the need for improved early detection and management strategies.

The World Health Organization (WHO) reported in 2021 that approximately 1.28 billion adults aged between 30 and 79 years are affected by hypertension, with two-thirds of these individuals living in low to middle-income countries (8). The year 2019 saw hypertension contribute to an estimated 10 million deaths globally, with the majority occurring in these economically challenged regions as reported by the Global Burden of Disease Study (9). The increasing prevalence of hypertension worldwide is a growing concern. Projections by Hadiza et al (10) suggest that there could be as many as 23 million cardiovascular deaths by 2030, with a staggering 85% of these deaths expected to occur in low- and middle-income countries. Focusing on Africa, around 15% of the population is affected by hypertension, as per the findings of Khan et al (11). Among adults aged 50 and older, the prevalence of hypertension is particularly high, ranging from 22.3% to 90% (12). This data underscores the urgent need for targeted interventions and healthcare strategies to combat the growing epidemic of hypertension, especially in regions where healthcare resources are limited.

In 2021, the Center for Disease Control and Prevention estimated the global economic burden of hypertension to be $131 billion to $198 billion per year (13). The leading cause of the burden of hypertension include genetic, hormonal, metabolic and psychological factors. Other risk factors include smoking, low level of physical activity, high body mass index (BMI), excessive salt intake, alcohol consumption, hyperlipidemia and diabetes mellitus (14). In sub-Saharan Africa, more than 125 million people are expected to have hypertension by the year 2025 (15). While numerous drugs and combination therapies have emerged in the market for the purpose of reducing blood pressure, it is evident that control of high blood pressure has remained low as extrapolated from persistently high level of hypertension prevalence rate. Most of the patients diagnosed of hypertension are put on medication for the control of their blood pressure. The use of lifestyle modification strategies has not been fully implemented in most set ups in Sub-Saharan Africa (16).

Lifestyle modification is a comprehensive approach that emphasizes the adoption of various healthy practices to enhance overall well-being, particularly for individuals with or at risk of hypertension. This concept, as delineated by Dennison-himmelfarb et al (17), encompasses a range of behaviours including the consumption of a balanced and nutritious diet, regular engagement in physical activities and a focus on achieving and maintaining a healthy weight. Additionally, it includes moderation in alcohol consumption, complete cessation of smoking habits, strict adherence to any prescribed medications and effective stress management techniques. These modifications are not merely recommended practices but are considered the foundational elements of preventive management in individuals diagnosed with hypertension.

The role of lifestyle modification extends beyond just a preventative measure. It is often recommended as the initial course of action before introducing pharmacological treatments for hypertension, as well as a supportive strategy alongside drug therapy for those already undergoing such treatments. The significance of these lifestyle changes is further underscored by research conducted by Alam et al. in 2015 (18), which indicates that individuals who are highly motivated and successful in maintaining these changes can potentially reduce or even withdraw from pharmacological interventions over time.

2. Materials and methods

2.1. Study area and period

The study was conducted at Methodist Hospital, Wenchi from 20th September to 20th November 2023. Methodist Hospital, Wenchi is located in the city of Wenchi and was established in 1951. It is a referral hospital for the Wenchi municipality and its surroundings. The hospital has different departments and this study was conducted at the hypertension clinic.

2.2. Study design

A hospital-based cross-sectional study was conducted to assess the level of knowledge and attitude towards lifestyle modification among hypertensive patients at Methodist Hospital, Wenchi.

2.3. Source and study populations

All adult hypertensive patients who were on review sessions at the hypertension clinic of Methodist Hospital, Wenchi were the source population, whereas all adult hypertensive patients attending the hypertension clinic during the study period were the study population. The eligibility criteria were adult hypertensive patients on follow-up visit at the hypertension clinic during the study period and consented to the study. Adult hypertensive patients who were newly-diagnosed (less than 6 months), severely ill and unwilling to give consent were excluded from the study.

2.4. Sample size and sampling techniques

The sample size for the study was determine using Yamane's formula as follows;

$$n = \frac{N}{1 + N(e)^2}$$

Where (n) is the minimum sample size, (N) is the population size (registered hypertensive patients at the clinic) and (e) is the level of precision set at 0.05. The total number of registered hypertensive patients at the clinic was 3,528.

$$n = \frac{3528}{1 + 3528(0.05)^2} \quad \text{n= } 359$$

Then by adding 10% non-response rate, the final sample size was 395.

Eligible participants were selected using simple random sampling technique each clinic day. To ensure quality of data, only 15 patients were interviewed each day.

2.5. Data collection instrument and data collection technique

Data was collected through face-to-face interview using a pre-tested structured questionnaire. The questionnaire was adapted from similar studies on knowledge, attitude and practice of lifestyle modification recommended for hypertension management (10)(19)(20) (21)(22)(23). Two health professionals who had training on the subject matter and data collection were employed to collect data.

2.6. Data quality control

A well-designed questionnaire was prepared in English and translated into the local languages (Twi and Hausa). The questionnaire was pre-tested on 5% of sample size at Holy Family Hospital in the Techiman municipality and necessary amendments were made accordingly. Data collectors were given a day training on interview techniques and data collection. Close supervision was done by investigators during data collection period through observation and review of the questionnaires filled and giving feedback to the data collectors.

2.7. Statistical analysis

Data was cleaned, entered into Microsoft excel and then imported and analyzed using SPSS Version 25 for windows. Descriptive statistics such as mean, median and frequencies (with percentages) were used to describe study population.

Bivariate and multivariate logistic regression analysis with 95% confidence interval (CI) was employed to identify associations between dependent and independent variables. Crude odds ratio was calculated using binary logistic regression analysis with 95% confidence interval. Variables with a P-value < 0.05 in the bivariate analysis were included in the multivariate logistic model to identify the independent predictors of knowledge and attitude towards lifestyle modification. P-value < 0.05 was considered statistically significant. Hosmer-Lemeshow test was used to check fitness of goodness of the final model and was found fit.

2.8. Ethical consideration

Ethical approval was obtained from the Committee of Human Research and Ethics of the University of Energy and Natural Resources, Sunyani-Ghana. Permission was obtained from study setting before commencement of data collection. Interviews were conducted after the purpose of the study was explained to participants. Participation was voluntary and confidentiality was maintained. The information obtained from participants were made confidential.

2.9. Operational definition

Knowledge refers to having sufficient information about lifestyle modification among hypertensive patients. A total of ten questions were used to assess respondent's knowledge towards lifestyle modification. A correctly answered question was scored 1 and a wrongly answered question was scored 0. Respondent's knowledge scores were accumulated and ranged 0-10. Respondents who scored mean and above were regarded as having good knowledge while those who scored below the mean were regarded as having poor knowledge.

Attitude is a complex mental status involving beliefs, feelings and values regarding lifestyle modification among hypertensive patients. To determine the attitude of respondents towards lifestyle modification among hypertensive patients, a total of eight questions were rolled-out and responses were recorded using a five-point Likert-type scale. Respondents were asked to indicate whether they strongly agreed, agreed, were neutral, disagreed or strongly disagreed to the statements posed. Based on the accumulated scores, respondents who scored the median value and above were considered as having good attitude and those who scored below the median value were considered to have poor attitude towards lifestyle modification.

Lifestyle modification refers to adoption of healthy lifestyles such as low salt intake, regular physical activity, adequate intake of fruits and vegetables, low-fat dairy products, weight loss, cessation of smoking, moderation of alcohol intake and following the Dietary Approach to Stop Hypertension.

Reduction of salt is taking less than 5 grams (1 teaspoon) of salt per day.

Regular exercise is performing moderate-intensity exercises for at least 150 minutes a week or 75 minutes of vigorous-intensity exercises a week.

Reduction of alcohol is about beverages intake limited to 2 drinks per day (20 g/d of alcohol) for men and 1 drink per day (10 g/d of alcohol) for women.

Smoking is an active act of smoking a particulate cigarette by the study participant.

Body mass index (BMI) is the ratio of weight to height. Underweight is when the BMI is less than 18.5, Normal weight is BMI of 18.5 to 24.9, Overweight is BMI of 25 to 29.9, and Obese is BMI of 30 or more (20).

3. Results

3.1. Socio-demographic characteristics

A total of 395 hypertensive patients drawn from the hypertension clinic participated in the study. The mean age of the study participants was 55.31 (SD ± 9.62). Majority of the respondents were females (236, 59.7%). There was a preponderance of Christianity among study participants (56.7%). Most participants (41.0%) had no formal education with 20.3% being educated to the tertiary level. Majority (61.5%) were married with the rest being either single, divorced or widowed. Among the total respondents, 64.3% were employed with majority (44.8%) being self-employed individuals. Nearly half (43.0%) of the study participants had an average monthly income below GHC 1000 with 20.8% earning more than GHC 2000 monthly. Up to 35.9% of respondents had a normal body mass index with two-thirds

(64.8%) recording a high blood pressure level. One hundred and thirty-nine (35.2%) of the respondents had been on anti-hypertensive medications for one to five years [Table 1].

Table 1 Socio-demographic characteristics of hypertensive patients at the hypertension clinic of MHW, Ghana, 2023 (n=395)

Characteristic	Frequency	Percentage (%)
Age (in years)		
18 – 30	40	10.1
31 – 45	106	26.8
46 – 60	161	40.8
>60	88	22.3
Gender		
Male	159	40.3
Female	236	59.7
Religion		
Christian	224	56.7
Muslim	109	27.6
Traditionalist	62	15.7
Educational status		
No formal education	162	41.0
Primary	90	22.8
Secondary	63	15.9
Tertiary	80	20.3
Marital status		
Single	11	2.8
Married	243	61.5
Divorced	45	11.4
Widowed	96	24.3
Employment status		
Unemployed	141	35.7
Self-employed	177	44.8
Government employee	33	8.4
Private company employee	44	11.1
Average monthly income		
<GHC 1000	170	43.0
GHC 1000 – 2000	143	36.2
>GHC 2000	82	20.8

Body mass index (kg/m^2)		
Underweight (<18.5)	44	11.1
Normal (18.5 - 24.9)	142	35.9
Overweight (25 – 29.9)	161	40.8
Obese (>30)	48	12.2
Blood pressure level		
Normal (<140/90mmhg)	139	35.2
High (>140/90mmhg)	256	64.8
Duration on hypertensive medication		
<1year	71	18.0
1 – 5 years	139	35.2
5 – 10 years	116	29.4
>10 years	69	17.5

MHW: Methodist Hospital, Wenchi

3.2. Knowledge of hypertensive patients on lifestyle modification

A total of ten questions were forwarded to assess respondent's knowledge towards lifestyle modification. Of the respondents, only 164 (41.5%) were able to recall their recent blood pressure measurement which was confirmed by cross-checking their records. A total of 153 (38.7%) of study participants were able to mention at least one lifestyle modification recommended for hypertension management. Up to 61.3% (242) did not know the importance of maintaining a healthy weight as a means of controlling blood pressure. One hundred and seventy-one (43.3%) of respondents knew the importance of reducing salt intake to control hypertension. Among the respondents, 40.5% knew the role of exercise or physical activity in the control of blood pressure whilst 58.7% (232) did not know the effect of drinking alcohol on controlling blood pressure. Up to 41.3% (163) of the participants knew the effect of smoking cigarette on blood pressure. Pertaining to the overall knowledge of respondents, 36% (142) of respondents had good knowledge about lifestyle modification towards hypertension (Figure 1).

Table 2 Respondents level of knowledge on LSM among hypertensive patients at MHW, Ghana, 2023 (n=395)

Knowledge questions	**Yes**	**(%)**	**No**	**(%)**
Do you know your recent BP measurement	164	41.5	231	58.5
Are you aware that lifestyle modification is key in hypertension management.	150	38.0	245	62.0
Can you mention at least one LSM to manage hypertension.	153	38.7	242	61.3
Do you know the importance of maintaining normal body weight to controlling Blood Pressure.	153	38.7	242	61.3
Do you know the importance of diet in controlling Blood Pressure.	157	39.7	238	60.3
Do you know the importance of reducing salt intake in controlling Blood Pressure.	171	43.3	224	56.7
Does physical activity or exercise help in controlling Blood pressure.	160	40.5	235	59.5
Do you know the effect of drinking alcohol on controlling Blood Pressure.	163	41.3	232	58.7
Does smoking cigarette affect blood pressure.	163	41.3	232	58.7
Does stress affect blood pressure	261	66.1	134	33.9

LSM: Lifestyle modification; MHW: Methodist Hospital, Wenchi; BP: Blood pressure

3.3. Attitude of hypertensive patients towards lifestyle modification

To assess the attitude of respondents towards lifestyle modification among hypertensive patients, a total of eight questions were rolled-out and responses were recorded using a five-point Likert-type scale. Majority (85.5%) of the respondents either strongly agreed or agreed on the relevance of education on lifestyle modification during follow-up visits as an essential component of hypertension management. Two-thirds (66.6%) of study participants agreed that regular checking of blood pressure is paramount in the management of hypertension. A majority (56.5%) of them agreed that maintaining a normal weight is important for controlling blood pressure.

When asked about whether reducing salt intake is important for controlling blood pressure, 242 (61.3%) agreed to the statement. Regarding whether regular physical activity or exercise is important for controlling blood pressure, 45.6% agreed to this statement. Of the total respondents, 28.9% and 45.3% indicated neutral and disagree respectively to the statement that excessive alcohol intake worsens blood pressure. Regarding the overall attitude level, 233 (59%) had favourable attitude towards lifestyle modification (Figure 1).

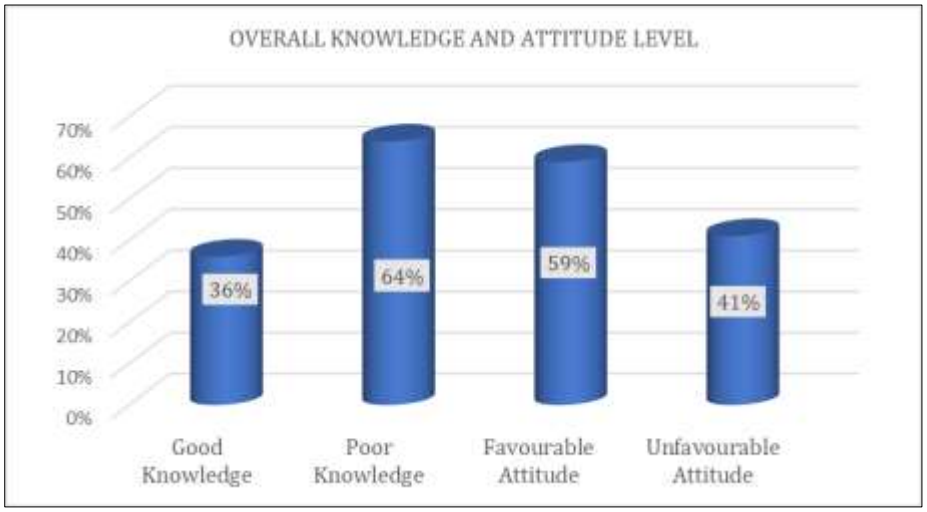

Figure 1 Overall level of knowledge and attitude towards lifestyle modification among hypertensive patients at MHW, Ghana, 2023 (n=395)

Table 3 Respondents level of attitude towards LSM among hypertensive patients at MHW, Ghana, 2023 (n=395)

Attitude question	Strongly Agree		Agree		Neutral		Disagree		Strongly disagree	
	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)	Freq.	(%)
Education during follow-up on LSM about hypertension is essential component of hypertension management.	55	13.9	283	71.6	43	10.9	11	2.8	3	0.8
Regular checking of blood pressure is an important part of BP management.	48	12.2	263	66.6	77	19.5	7	1.8	0	0
Maintaining normal body weight is important for controlling BP.	43	10.9	223	56.5	109	27.6	20	5.1	0	0
Controlling diet is important for controlling blood pressure.	43	10.9	203	51.4	126	31.9	23	5.8	0	0
Reducing salt intake is important for controlling blood pressure.	43	10.9	242	61.3	88	22.3	22	5.6	0	0
Regular physical activity or exercise is important in controlling blood pressure.	41	10.4	180	45.6	128	32.4	45	11.4	1	0.3

Excessive alcohol intake worsens blood pressure.	17	4.3	65	16.5	114	28.9	179	45.3	20	5.1
Smoking cigarette affects blood pressure.	11	2.8	59	14.9	100	25.3	200	50.6	25	6.3

LSM: Lifestyle modification; MHW: Methodist Hospital, Wenchi; BP: Blood pressure; Freq: frequency

3.4. Factors associated with knowledge and attitude towards lifestyle modification

In the multivariate logistic regression analysis, educational status, marital status, employment status and average monthly income of respondents showed a significant association with knowledge of lifestyle modification. Respondents who had secondary and tertiary education were two times (AOR: 2.41, 95% CI: 1.19 – 5.07) and four times (AOR: 4.32, 95% CI: 1.25 – 14.55) more likely to have good knowledge of lifestyle modification compared to those who had no formal education. Respondents who were married and divorced were 1.50 times (AOR: 1.50, 95% CI:0.22 – 6.70) and two times (AOR:2.12, 95% CI: 1.02 – 4.40) more likely to have good knowledge of lifestyle modification compared to their single counterparts. Respondents who were government employees were 1.73 times (AOR:1.73, 95% CI: 0.26 – 3.58) more likely to have good knowledge of lifestyle modification than those who were unemployed. The study also demonstrated that respondents who earned more than GHC 2000 monthly were two times (AOR:2.13, 95% CI: 0.33 – 5.62) more likely to have good knowledge of lifestyle modification compared to those who earned less than GHC 1000 monthly (Table 5).

Table 5 Bivariate and multivariate logistic regression analysis of factors associated with knowledge of LSM among hypertensive patients at MHW, Ghana, 2023 (n=395)

Characteristic	**Knowledge n (%)**		**COR**	**P-value**	**95% CI**	**AOR**	**P-value**	**95% CI**
	Good (n=143)	**Poor (n=252)**						
Age								
18- 30	18(45)	22 (55)	1					
31- 45	45(42.5)	61(57.5)	0.94	0.892	0.39 – 2.23	1.1	0.885	0.32 – 2.68
46 – 60	62(38.5)	99 (61.5)	2.52	0.003	1.37 – 4.64	1.92	0.085	0.91 – 4.04
>60	18(20.5)	70 (79.5)	1.68	0.076	0.95 – 2.98	1.47	0.288	0.73 – 2.96
Religion								
Christian	86(38.4)	138 (61.6)	1					
Muslim	38(34.9)	71(65.1)	4.59	0.018	2.22 – 9.48	1.87	0.131	0.83 – 4.23
Traditionalist	19(30.6)	43(69.4)	1.79	0.152	0.81 – 4.01	0.99	0.977	0.40 – 2.46
Educational status								
No formal education	65(40.1)	97(59.9)	1					
Primary	33(36.7)	57(63.3)	1.40	0.010	0.99 – 3.10	0.93	0.670	0.30 – 8.56
Secondary	20(31.7)	43(68.2)	1.62	0.021	1.05 – 3.60	2.41	0.015	1.19 – 5.07
Tertiary	25(31.3)	55(68.7)	2.51	0.001	1.70 – 6.22	4.32	0.020	1.25 – 14.55
Marital status								
Single	6(54.5)	5(45.5)	1					
Married	95(39.1)	148(60.9)	3.09	0.101	0.99 – 3.10	1.50	0.034	0.22 – 6.70
Divorced	16(35.6)	29(64.4)	4.69	0.015	2.56 – 8.60	2.12	0.045	1.02 – 4.40
Widowed	26(27.1)	70(72.9)	1.75	0.211	0.73 – 4.19	0.96	0.550	0.34 – 2.74
Employment status								
Unemployed	50(35.5)	91(64.5)	1					

Self-employed	68(38.4)	109(61.6)	1.10	0.035	0.98 – 2.60	1.51	0.388	0.20 – 2.09
Government employee	11(33.3)	22(66.7)	2.13	0.016	1.28 – 5.32	1.73	0.026	0.26 – 3.58
Private company employee	14(31.9)	30(68.1)	3.38	0.043	0.99 –11.49	2.44	0.210	0.60 – 9.87
Average monthly income								
<GHC 1000	72(42.3)	98(57.7)	1					
GHC 1000 – 2000	53(37.1)	90(62.9)	2.50	0.122	0.78 – 8.02	1.36	0.406	0.26 – 2.44
>GHC 2000	18(22)	64(78)	4.21	0.028	1.17 – 12.13	2.13	0.029	0.33 – 5.62

LSM: lifestyle modification; MHW: Methodist Hospital, Wenchi; COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval; GHC: Ghana Cedis; 1: reference group

Table 6 Bivariate and multivariate logistic regression analysis of factors associated with attitude towards LSM among hypertensive patients at MHW, Ghana, 2023 (n=395)

Characteristic	**Attitude n (%)**		**COR**	**P-value**	**95% CI**	**AOR**	**P-value**	**95% CI**
	Unfavourable (n=161)	**Favourable (n= 234)**						
Educational status								
No formal education	52 (32.1)	110 (67.9)	1					
Primary	60 (66.7)	30 (33.3)	1.87	0.001	0.20 – 3.42	1.32	0.585	0.34 – 4.45
Secondary	20 (31.7)	43 (68.3)	2.31	0.031	0.73 – 5.80	1.15	0.286	0.26 – 6.68
Tertiary	29 (36.2)	51 (63.8)	3.52	0.020	0.93 – 7.29	1.83	0.208	0.39 – 5.80
Employment status								
Unemployed	51 (36.2)	90 (63.8)	1					
Self-employed	70 (39.5)	107 (60.5)	1.33	0.179	0.29 – 2.03	1.51	0.483	0.56 – 4.82
Government employee	14 (42.4)	19 (57.6)	1.73	0.074	0.31 – 3.13	0.91	0.835	0.37 – 2.25
Private company employee	26 (59.1)	18 (40.9)	4.67	0.025	1.21 – 11.93	3.72	0.062	0.94 –14.76
Average monthly income								
<GHC 1000	78 (45.9)	92 (54.1)	1					
GHC 1000 - 2000	53 (37.1)	90 (62.9)	2.45	0.002	0.41 – 7.20	1.10	0.460	0.23 – 2.95
>GHC 2000	30 (36.6)	52 (63.4)	2.17	0.009	0.25 – 5.34	1.33	0.811	0.41 – 2.01
Knowledge level								
Poor	92 (36.5)	160 (63.5)	1					
Good	69 (48.3)	74 (51.7)	2.35	0.010	0.27 – 5.31	3.19	0.018	1.10 – 9.27

LSM: lifestyle modification; MHW: Methodist Hospital, Wenchi; COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval; GHC: Ghana Cedis; 1: reference group

Regarding attitude, only knowledge had statistically significant association with respondents' attitude towards lifestyle modification in the multivariate logistic regression analysis. Respondents who had good knowledge were three times (AOR: 3.19, 95% CI: 1.10 – 9.27) more likely to have favourable attitude towards lifestyle modification compared to those with poor knowledge (Table 6).

4. Discussion

Hypertension is a devastating global challenge and one of the leading cause of death and disability in both high and low-income countries. Despite the availability of effective anti-hypertensive medications, hypertension still remains inadequately controlled in a significant fraction of patients worldwide. This study assessed the level of knowledge and attitude towards lifestyle modification among hypertensive patients.

Findings from this study indicated that, 36% of participants had good knowledge on lifestyle modification recommended for hypertension management. This is similar to a study conducted in North-western Nigeria (10) where 31.7% of participants had good knowledge on lifestyle modification recommended for hypertension management. The resemblance between the two studies could be attributed to the integration of similar age groups and the application of a similar sampling technique. However, findings from this study were lower than studies conducted in Eastern Ethiopia (19), North-eastern Ethiopia (20) and South-eastern Nigeria (24) where 73%, 67.7% and 42.6% of study participants had good knowledge towards lifestyle modification recommended for hypertension management respectively. The reason for the disparities could be ascribed to variations in study settings. In this study, respondents were drawn from the hypertension clinic of a primary care hospital where health education on lifestyle modification might be inadequate unlike the other studies which were conducted in specialized hospitals where health services are provided by healthcare professionals from different specialized fields. Another reason for the difference could be attributed to educational status. In the present study, majority of respondents had no formal education compared to the other studies where majority of respondents had some form of formal education (19)(20)(24).

Regarding attitude towards lifestyle modification, the present study demonstrated that 59% of respondents had favourable attitude towards lifestyle modification. This present finding is lower than the scores from a study conducted in Ambo- Ethiopia (22) which revealed a 68.3% positive attitude towards lifestyle modification. The possible reason for the difference might be that hypertensive patients from the Ethiopian study might have received adequate health education on lifestyle modification recommended for hypertension management from healthcare professionals unlike the present the study. However, both scores represent a positive attitude towards lifestyle modification. The finding from this study is also found to be lower than what was reported in a similar study conducted in Harar, Eastern Ethiopia (19) where 66.4% of respondents had favourable attitude towards lifestyle modification recommended for hypertension management. This discrepancy may be attributed to the difference in study settings. From this current study, 10.9% of participants strongly agreed that reducing salt intake was important for controlling blood pressure. This finding was inconsistent with studies from Ethiopia (23) and Iraq (25) where 94.6% and 95% of respondents strongly agreed to avoiding excess salt intake as a strategy to controlling blood pressure respectively. This may be due to the improvement in knowledge of patients towards this habit. The findings from this study demonstrated that 14.9% of the participants agreed that smoking cigarette had a negative impact on blood pressure. This finding is lower compared to findings from a study conducted in Ethiopia (23) where 98.5% of participants agreed to cessation of smoking as a lifestyle modification strategy to control blood pressure. This great difference may be ascribed to the difference in study settings. Respondents from the other study were sampled from Jimma University Specialized Hospital in Ethiopia where health education is provided by health professionals from diverse specialized fields unlike this current study where participants were drawn from a primary care hospital.

In this study, educational status, marital status, employment status and average monthly income of respondents demonstrated significant association with knowledge on lifestyle modification in the multivariate logistic regression analysis. Respondents who had up to tertiary education were more than four times more likely to have good knowledge of LSM than those who had no formal education (AOR: 4.32, 95% CI: 1.25 – 14.55, P= 0.020). The association between knowledge and educational status was backed by studies conducted in Eastern Ethiopia (19) and North-eastern Ethiopia (20). Having formal education increases the knowledge of respondents about lifestyle modification recommended for hypertension management. Educated clients have better access to health-related information than uneducated clients and by extension have superior ability to make decisions and use quality health care services. On the other hand, uneducated respondents may have diminished ability to understand issues during counselling.

This study also demonstrated that, respondents who earned more than GHC 2000 monthly were 2.13 times more likely to have good knowledge compared to those who were unemployed (AOR: 2.13, 95% CI: 0.33 – 5.62, P= 0.029). Individuals with higher income may have greater access to educational resources and more likely to afford regular

check-up, screenings and preventive measures. A lower income on the other hand may result in individuals unable to access some educational resources and also afford preventive services.

Additionally, respondents who were married were 1.50 times more likely to have good knowledge of lifestyle modification compared to those who were single (AOR: 1.50, 95% CI: 0.22 – 6.70, P= 0.034). Married couples may sometimes share and influence each other's lifestyle choices which include aspects of diet, exercise and overall wellness. Furthermore, respondents who were divorced were two times likely to have good knowledge of lifestyle modification compared to those who were single (AOR: 2.12, 95% CI: 1.02 – 4.40, P= 0.045). Divorced individuals encounter significant and transformational lifestyle experiences that leads to self-improvement in health and wellbeing. Similarly, respondents who were government employees were 1.73 times likely to have good knowledge compared to those who were unemployed (AOR: 1.73, 95% CI: 0.26 – 3.58, P= 0.026). Government employees have access to resources and training programs that prioritize their health and well-being as part of their occupational wellness initiatives. Unemployed individuals on the other hand may not have same structured opportunities.

From the present study, only knowledge had statistically significant association with attitude towards lifestyle modification in the multivariate logistic regression analysis. Respondents who had good knowledge on lifestyle modification recommended for hypertension management were three times more likely to have favourable attitude towards lifestyle modification compared to those who had poor knowledge (AOR: 3.19, 95% CI: 1.10 – 9.27, P= 0.018). This implies that the better the knowledge on lifestyle modification, the better the attitude of clients towards lifestyle modification.

Despite having many strengths, this study has some limitations. First of all, the study is a single-center study and did not sample hypertensive patients from other facilities within the municipality. Also, patients may select socially acceptable responses which might influence the results of the study. Again, the study did not consider hypertensive patients who did not visit the study setting during the study period.

5. Conclusion

The findings of this study sheds light on the critical interplay between knowledge and attitude in the context of lifestyle modification. The study found that the knowledge level of participants regarding lifestyle modification was generally poor. Only 36% of participants had good knowledge on lifestyle modification recommended for hypertension management. Having tertiary education, being married, being divorced, being a government employee and earning a monthly income of more than GHC 2000 were factors that were found to be significantly associated with good knowledge of lifestyle modification. On the positive side, a favourable attitude towards lifestyle modification was observed among study participants. Fifty-nine percent (59%) of respondents had favourable attitude towards lifestyle modification. Only good knowledge had statistically significant association with attitude towards lifestyle modification. Concerted strategies are required to improve knowledge and attitude towards lifestyle modification among hypertensive patients.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

Statement of ethical approval

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Statement of informed consent

Written informed consent was obtained from all subjects before data collection.

Author contributions

- **Samuel Kyeremeh Adjei**: Conceptualization; Data analysis; Writing-original draft
- **Samuel Yaw Opoku**: Supervision; Writing- review and editing
- **Emmanuel Tettey Lartey**: Data curation
- **Helena Agyeiwaah Mensah**: Data Curation
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Data sharing statement

The datasets used and/or analyzed during this study are available from the corresponding author upon request.

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Abbreviations

AOR: Adjusted odds ratio; BMI: Body mass index; CI: Confidence interval; COR: crude odds ratio; DASH: Dietary Approach to Stop Hypertension; GHC: Ghana Cedis; LSM: Lifestyle modification; NCD: Non-communicable disease; SD: Standard deviation; SPSS: Statistical Package for Social Sciences; WHO: World Health Organization.

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