Sahel Journal of Life Sciences FUDMA (SAJOLS)
March 2025 Vol. 3(1): 367-376
ISSN: 3027-0456 (Print)
ISSN: 1595-5915(Online)
DOI: *https://doi.org/10.33003/sajols-2025-0301-45*

Research Article

Health Profiles and Blood Pressure Patterns among Residents of an Agro-Rural Settlement, South East Nigeria

***Emmanuel Ikechukwu Nnamonu[1], Blessing Uchechukwu Onyeidu[2], Chiemekam Samuel Ezechukwu[3] and Chukwudi Paul Ota[4]**

[1]Department of Biology, Federal College of Education, Eha-Amufu, Enugu State, Nigeria
[2]Department of Home Economics, Federal College of Education, Eha-Amufu, Enugu State, Nigeria
[3]Drug Discovery and Biotechnology Unit, Lion Science Park, University of Nigeria, Nsukka, Nigeria
[4]Department of Chemistry, Federal College of Education, Eha-Amufu, Enugu State, Nigeria
****Corresponding Author's email*: nnamonue@gmail.com; Phone: +2348064855635**

ABSTRACT

Hypertension is a growing health concern globally, particularly in Nigeria, where its prevalence is increasing in both urban and rural areas. Despite this, there is limited research on agro-rural settlements in South East Nigeria, creating a knowledge gap in understanding the demographic and health profiles, including blood pressure patterns, in these areas. This community-based cross-sectional study was conducted in the Isi-Uzo Local Government Area of Enugu State, involving 400 respondents aged 35 and above from five towns. Data collection included structured questionnaires, anthropometric measurements, and blood pressure assessments. The study found that 39.3% of respondents had normal blood pressure levels, 36.8% were hypertensive, and 20.8% were at risk of hypertension. Additionally, 66.0% had a normal BMI, with 23.5% overweight and 3.5% obese. Significant associations were noted between blood pressure status and educational level, weekly exercise frequency, and exercise duration. The study emphasizes the need for targeted public health interventions addressing education, physical activity, and dietary habits to mitigate the rising burden of hypertension in agro-rural populations in Southeastern Nigeria.

Keywords: Agro-rural settlement; Anthropometry; Demographics; Hypertension; South East Nigeria

Citation: Nnamonu, E. I., Onyeidu, B. U., Ezechukwu, C. S., & Ota, C. P. (2025). Health Profiles and Blood Pressure Patterns among Residents of an Agro-Rural Settlement, South East Nigeria. *Sahel Journal of Life Sciences FUDMA*, 3(1): 367-376. DOI: *https://doi.org/10.33003/sajols-2025-0301-45*

INTRODUCTION

The World Health Organisation report on hypertension shows that approximately four out of every five people with hypertension are not adequately treated, but if countries can scale up coverage, 76 million deaths could be averted between 2023 and 2050 (WHO, 2023). Hypertension affects 1 in 3 adults worldwide. This common, deadly condition leads to stroke, heart attack, heart failure, kidney damage, and many other health problems. The number of people living with hypertension (blood pressure of 140/90 mmHg or higher or taking medication for hypertension) doubled between 1990 and 2019, from 650 million to 1.3 billion. Nearly half of the people with hypertension globally are currently unaware of their condition. More than three-quarters of adults with hypertension live in low- and middle-income countries (Kario *et al*., 2023; WHO, 2023).

Hypertension, commonly known as high blood pressure, stands as a pervasive global health challenge, wielding a significant impact on cardiovascular health and amplifying the burden of associated morbidity and mortality rates. The WHO Global Report 2023 on hypertension warning the emerging hypertension burden in the globe and its treatment strategy underscores its profound implications, painting a picture of a condition that silently and insidiously erodes the well-being of millions worldwide. Within the Nigerian context, the narrative echoes a similar urgency, with studies

illuminating an escalating prevalence of hypertension across both urban metropolises and the tranquil landscapes of rural communities. Both Ulasi *et al*. (2011) and Ayogu *et al*. (2021) have sounded the alarm, revealing an unsettling uptrend in hypertension prevalence that transcends geographical boundaries.

While the urban landscape has been subjected to rigorous scrutiny, a conspicuous void persists in our understanding of the health demographics and blood pressure dynamics specific to the inhabitants of agro-rural settlements in South East Nigeria. These settlements, characterized by their unique blend of socio-economic conditions and lifestyle intricacies, remain an untapped reservoir of invaluable insights that could reshape our approach to public health interventions.

Demographic markers such as age, gender, educational attainment, and income levels have emerged as pivotal determinants shaping the prevalence landscape of hypertension in Nigeria, as highlighted by Adeloye *et al*. (2021). Yet, the intricate interplay of these factors within the agro-rural milieu remains shrouded in mystery, creating a knowledge gap that hinders the formulation of contextually relevant public health strategies.

The symbiotic relationship between lifestyle choices and blood pressure status is a well-trodden path in medical literature. Empirical evidence, such as that presented by Chijioke *et al*. (2016), underscores the protective role of regular physical activity against hypertension, while dietary patterns, as delineated by Ekwunife *et al*. (2010), have been shown to exert a profound influence on blood pressure levels. However, these insights, although invaluable, remain largely extrapolated from urban-centric studies, leaving a void in our understanding of their nuanced impact within agro-rural communities.

In light of these gaps, this study endeavours to cast a spotlight on the demographic and health profiles of residents inhabiting an agro-rural settlement in South East Nigeria. Through a meticulous exploration of blood pressure patterns and an in-depth analysis of factors such as educational attainment, monthly income, exercise frequency, intensity, dietary habits, and BMI, this research aspires to unlock a treasure trove of insights. These insights, we believe, hold the key to designing targeted interventions and sculpting public health strategies that resonate with the unique ethos and challenges of agro-rural populations in Nigeria. By bridging these knowledge gaps, we aim to pave the way for a healthier, more resilient future for these communities.

MATERIALS AND METHODS

Study Area

The study area was the Isi-Uzo Local Government Area. Enugu State is an integral part of Enugu east senatorial zone covering an area of 877km^2 and has an estimated population of 148,415 according to the 2006 census. The area is positioned on the globe at 6°43'50.38" N 7°41'34.58"E. It is bordered on the north by the Udenu local government area, on the northeast by Benue state, on the east by Ebonyi State, on the south by Enugu local government area, and the west by Nsukka Local Government Area. The community houses mostly farmers and traders (Nnamonu *et al*., 2018; Nnamonu *et al*., 2019).

Study Design

A community-based cross-sectional survey design was adopted in this study on a representative sample of 400 respondents of ages above or equal to 35 in the five towns making up Isi-Uzo, namely Eha-Amufu, Neke, Umualor, Ikem, and Mbu. Data collection lasted for 2 months with several members of the research team on the field. The study involved two approaches: first, a structured questionnaire survey and anthropometric measurements. The anthropometric measurements were made at the respondents' residences by qualified personnel using standard devices. The questionnaires were presented to the respondents, who filled them out and returned them immediately. Anthropometric measurements were used to ascertain the respondent's BMI, and these were grouped into four categories, Underweight (< 18.5 kg/m2), Normal (18.5 – 24.9 kg/m2), Overweight (25.0 – 29.9 kg/m2), and Obese (30.0 – 34.9 kg /m2).

Determination of Blood Pressure

Blood pressure measurements were conducted twice, with at least a 3-minute interval between readings, by trained research assistants using an Omron automatic sphygmomanometer (M2: HEM-7121-E, Vietnam). Blood pressure readings were interpreted based on the 2017 American College of Cardiology/American Heart Association guidelines: normal systolic blood pressure (SBP) was defined as less than 120 mmHg and diastolic blood pressure (DBP) as less than 80 mmHg; elevated SBP ranged from 120–129 mmHg and DBP was less than 80 mmHg; hypertension was characterized by SBP of 130 – and above (mmHg) and DBP of 80 and above (mmHg) (Whelton *et al*., 2017, WHO, 2020).

Study Population and Sample Size

The sample population for all residents is 217, 952. From the study population, a sample size of 400 was randomly selected. The size was deduced from the sample size estimation (Kasiulevicus *et al*., 2006) using the formula:

$n = N1+ N e^2$ (Where n = sample size, N = population size, e = level of precision, 0.05).

The number of residents recruited from each community depended on the percentage ratios available from the National Population Commission. The following number of residents were recruited from the five communities; Eha-Amufu (74), Ikem (51), Mbu (94), Neke (81), and Umualor (100).

Informed Consent

The study population comprised all adults in the five communities of Isi-Uzo Local Government Area, Enugu State, Nigeria. Participants were recruited with the assistance of community leaders. The sample size was determined using the Kasiulevičius *et al*. (2006) formula, resulting in a total of 400 participants randomly selected from the five communities. Before participation, the objectives of the study and the activities involved were clearly explained to them in their local dialect to ensure full understanding. Participants provided informed consent voluntarily, with assurances of confidentiality and anonymity throughout the study.

Data Analysis

The data collected were analyzed using Statistical Package for Social Sciences (SPSS) 20.0. The results were presented using frequencies, and percentages. Anthropometry data were used to calculate BMI as compared with WHO ecommended standard from body mass indices for age groups. Results were then classified as underweight, normal weight, overweight, and obesity.

RESULTS

Demographic characteristics of study participants in Isi-Uzo Local Government Area

The demographic characteristics of the study participants in the Isi-Uzo Local Government area are presented in Table 1. A total of 400 participants were recruited for this study greater preponderant of the study participants are females (237, 59.3%). The highest number of respondents came from the Umualor community (100, 25.0%), and were mostly elderly (> 60 years) people (163, 40.8%). Most of the participants had primary education (137, 34.3%) followed by those with no formal education (115, 28.8%).

Health-related conditions of study participants in Isi-Uzo Local Government Area

Table 2 shows the health-related conditions of the study participants in the study area. Most of the respondents' blood pressure was in the normal range (157, 39.3%), but with a comparative hypertensive population (147, 36.8%), and about 83 (20.8%) individuals at risk of hypertension. Also, the majority of the respondents have normal body mass index (264, 66.0%), followed by 94 (23.5%) overweight individuals in the area, with a few of the study population being obese (14, 3.5%). An unhealthy smoking lifestyle was recorded for a smaller number of the population (76, 19.0%), as the majority of them smoke cigarettes or any other substance.

Table 1: Demographic characteristics of study participants in Isi-Uzo Local Government Area

Demographic Indices	Variables	Frequency	Percentage (%)
Gender	Male	163	40.8
	Female	237	59.3
Community	Eha-Amufu	74	18.5
	Ikem	51	12.8
	Mbu	94	23.5
	Neke	81	20.3
	Umualor	100	25.0
Educational Status	None	115	28.8
	Primary level	137	34.3
	Secondary level	90	22.5
	Tertiary level	58	14.5
Age (Years)	20 – 40	91	22.8
	41 – 60	146	36.5
	> 60	163	40.8
Total		**400**	**100.0**

All values are expressed as frequencies and percentages (%).

Table 2: Health-related conditions of study participants in Isi-Uzo Local Government Area

Health-Related Conditions	Variables	Frequency	Percentage (%)
Blood Pressure	Low BP	13	3.3
	Normal BP	157	39.3
	Pre-hypertension	83	20.8
	Hypertension	147	36.8
Body Mass Index	Underweight (< 18.5 kg/m^2)	28	7.0
	Normal (18.5 – 24.9 kg/m^2)	264	66.0
	Overweight (25.0 – 29.9 kg/m^2)	94	23.5
	Obese (30.0 – 34.9 kg/m^2)	14	3.5
Smoking	Cigarettes or others	76	19.0
	None	324	81.0

All values are expressed as frequencies and percentages (%)

The prevalence of blood pressure status among the residents of the Isi-Uzo local government area

The prevalence of blood pressure status among the residents of the Isi-Uzo local government area in southeast Nigeria, examining associations with educational status, monthly income, weekly exercise frequency and duration, exercise intensity, and number of daily meals, are presented in Tables 3 to 8.

There were significant differences in the blood pressure status of the residents according to their educational level (Table 3), as hypertension was more prevalent (p = 0.001) among those with no formal (54, 47.0%) and primary level education (56, 40.9%), whereas normal blood pressure was more among individuals with secondary (48, 53.3%) and tertiary level education (29, 50.0%). The differences in prevalence were not significant (p = 0.309) according to the monthly income level of the participants (Table 4). However, hypertension was higher among residents with little or no monthly income level (≤ N10, 000) and also higher among high monthly income earners (N75, 001 – N150, 000). Normal blood pressure status was more prevalent among residents who earn between N10, 001 and N75, 000 per month.

Considering the frequency of weekly exercise (Table 5), there were significant differences in prevalence (p = 0.004) of blood pressure status among the studied population. The prevalence of hypertension was higher among residents who do not engage in any exercise or physical activity (7, 53.8%), and those who exercise just once per week (32, 43.2%). Increased frequency of weekly exercise among the study participants showed that normal blood pressure status was higher (p = 0.004) among residents who engaged in exercise at least twice each week. The prevalence of blood pressure status was also observed to significantly differ (p = 0.004) among the studied population, according to the duration of exercise (Table 6). Residents with just about 20 minutes' duration of exercise had higher hypertension prevalence (30, 44.1%) than other blood pressure statuses. Longer duration of exercise up to 30 minutes (60, 37.0%) and above (44, 46.3%), showed a higher prevalence of normal blood pressure status among the study participants.

The prevalence differences according to intensity of exercise (Table 7) were not significant (p = 0.086). Hypertension prevalence was higher among residents with no intense exercise (1, 100.0%) and also those with moderate intensity of exercise (48, 36.9%). Normal blood pressure status was higher (p = 0.086) among residents with light (29, 49.2%) and vigorous intensity (83, 39.9%), while pre-hypertensive blood pressure is more prevalent among those that engage in highly vigorous exercise (2, 100.0%). According to the number of daily meals (Table 8), it was observed that there were no significant differences (p = 0.360) in their prevalence. However, the prevalence of hypertension was higher among residents that eat one meal daily (4, 57.1%), and those who eat twice-daily meals (16, 50.0%). The normal blood pressure status was more prevalent among study participants who fed thrice (133, 39.6%) and 4 times (13, 52.0%) per day.

Prevalence of blood pressure status among the studied population in Isi-Uzo Local Government Area according to their body mass index

The prevalence of blood pressure status among the studied population in the Isi-Uzo Local Government Area according to their body mass index is presented in Table 9. It was observed from the result that the prevalence of normal blood pressure status was higher significantly (p = 0.04) among underweight (12, 42.9%) and normal weight (112, 42.4%) residents, whereas hypertension was more prevalent among overweight (37, 39.4%) and obese (9, 64.3%) residents.

Table 3: Prevalence of blood pressure status among the studied population in Isi-Uzo Local Government Area according to their educational status

Educational Status	Total Examined	Blood Pressure Status	Prevalence (%)
None	115	Low BP	3 (2.6)
		Normal BP	31 (27.0)
		Pre-hypertension	27 (23.5)
		Hypertension	54 (47.0)
Primary Level	137	Low BP	5 (3.6)
		Normal BP	49 (35.8)
		Pre-hypertension	27 (19.7)
		Hypertension	56 (40.9)
Secondary Level	90	Low BP	5 (5.6)
		Normal BP	48 (53.3)
		Pre-hypertension	21 (23.3)
		Hypertension	16 (17.8)
Tertiary Level	58	Low BP	0 (0.0)
		Normal BP	29 (50.0)
		Pre-hypertension	8 (13.8)
		Hypertension	21 (36.2)
		χ^2 = 29.518, *df* = 9, *p* = 0.001*	

[1]All values are expressed as frequency and percentage in parenthesis.
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2).

Table 4: Prevalence of blood pressure status among the studied population in the Isi-Uzo Local Government Area according to their monthly income level

Monthly Income Level	Total Examined	Blood Pressure Status	Prevalence (%)
None	12	Low BP	1 (8.3)
		Normal BP	3 (25.0)
		Pre-hypertension	2 (16.7)
		Hypertension	6 (50.0)
≤ N10,000	117	Low BP	2 (1.7)
		Normal BP	40 (34.2)
		Pre-hypertension	25 (21.4)
		Hypertension	50 (42.7)
N10,001 – N25,000	144	Low BP	7 (4.9)
		Normal BP	56 (38.9)
		Pre-hypertension	31 (21.5)
		Hypertension	50 (34.7)
N25,001 – N50,000	80	Low BP	3 (3.8)
		Normal BP	40 (50.0)
		Pre-hypertension	11 (13.8)
		Hypertension	26 (32.5)
N50,001 – N75,000	25	Low BP	0 (0.0)
		Normal BP	11 (44.0)
		Pre-hypertension	10 (40.0)
		Hypertension	4 (16.0)
N75,001 – N100,000	18	Low BP	0 (0.0)
		Normal BP	6 (33.3)
		Pre-hypertension	4 (22.2)
		Hypertension	8 (44.4)
N100,001 – N150,000	3	Low BP	0 (0.0)
		Normal BP	1 (33.3)
		Pre-hypertension	0 (0.0)
		Hypertension	2 (66.7)
> **N150,000**	1	Low BP	0 (0.0)
		Normal BP	0 (0.0)
		Pre-hypertension	0 (0.0)
		Hypertension	1 (100.0)
		χ^2 = 23.685, *df* = 21, *p* = 0.309	

[1]All values are expressed as frequency and percentage in parenthesis.
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2).

Table 5: Prevalence of blood pressure status among the studied population in the Isi-Uzo Local Government Area according to the frequency of weekly exercise

Frequency of Weekly Exercise	Total Examined	Blood Pressure Status	Prevalence (%)
None	12	Low BP	0 (0.0)
		Normal BP	6 (46.2)
		Pre-hypertension	0 (0.0)
		Hypertension	7 (53.8)
Once	74	Low BP	3 (4.1)
		Normal BP	26 (35.1)
		Pre-hypertension	13 (17.6)
		Hypertension	32 (43.2)
2 – 3 times	198	Low BP	6 (3.0)
		Normal BP	67 (33.8)
		Pre-hypertension	58 (29.3)
		Hypertension	67 (33.8)
4 – 5 times	64	Low BP	3 (4.7)
		Normal BP	28 (43.8)
		Pre-hypertension	10 (15.6)
		Hypertension	23 (35.9)
6 – 7 times	51	Low BP	1 (2.0)
		Normal BP	30 (58.8)
		Pre-hypertension	2 (3.9)
		Hypertension	18 (35.3)
		$\chi^2 = 28.704$, $df = 12$, $p = 0.004^*$	

[1]All values are expressed as frequency and percentage in parenthesis.
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2).

Table 6: Prevalence of blood pressure status among the studied population in Isi-Uzo Local Government Area according to the duration of the exercise

Duration of Exercise	Total Examined	Blood Pressure Status	Prevalence (%)
None	12	Low BP	0 (0.0)
		Normal BP	5 (41.7)
		Pre-hypertension	0 (0.0)
		Hypertension	7 (58.3)
5 – 10 minutes	63	Low BP	2 (3.2)
		Normal BP	21 (33.3)
		Pre-hypertension	13 (20.6)
		Hypertension	27 (42.9)
11 – 20 minutes	68	Low BP	1 (1.5)
		Normal BP	27 (39.7)
		Pre-hypertension	10 (14.7)
		Hypertension	30 (44.1)
21 – 30 minutes	162	Low BP	6 (3.7)
		Normal BP	60 (37.0)
		Pre-hypertension	51 (31.5)
		Hypertension	45 (27.8)
> 30 minutes	95	Low BP	4 (4.2)
		Normal BP	44 (46.3)
		Pre-hypertension	9 (9.5)
		Hypertension	38 (40.0)
		$\chi^2 = 28.907$, $df = 12$, $p = 0.004^*$	

[1]All values are expressed as frequency and percentage in parenthesis.
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2).

Table 7: Prevalence of blood pressure status among the studied population in Isi-Uzo Local Government Area according to intensity of exercise

Intensity of Exercise	Total Examined	Blood Pressure Status	Prevalence (%)
None	1	Low BP	0 (0.0)
		Normal BP	0 (0.0)
		Pre-hypertension	0 (0.0)
		Hypertension	1 (100.0)
Light Intensity	59	Low BP	0 (0.0)
		Normal BP	29 (49.2)
		Pre-hypertension	8 (13.6)
		Hypertension	22 (37.3)
Moderate Intensity	130	Low BP	3 (2.3)
		Normal BP	45 (34.6)
		Pre-hypertension	34 (26.2)
		Hypertension	48 (36.9)
Vigorous Intensity	208	Low BP	10 (4.8)
		Normal BP	83 (39.9)
		Pre-hypertension	39 (18.8)
		Hypertension	76 (36.5)
Highly Vigorous	2	Low BP	0 (0.0)
		Normal BP	0 (0.0)
		Pre-hypertension	2 (100.0)
		Hypertension	0 (0.0)
		$\chi^2 = 19.102$, *df* = 12, *p* = 0.086	

[1]All values are expressed as frequency and percentage in parenthesis.
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2).

Table 8: Prevalence of blood pressure status among the studied population in Isi-Uzo Local Government Area according to the number of daily meals

Number of daily meals	Total Examined	Blood Pressure Status	Prevalence (%)
Once	7	Low BP	1 (14.3)
		Normal BP	2 (28.6)
		Pre-hypertension	0 (0.0)
		Hypertension	4 (57.1)
Twice	32	Low BP	1 (3.1)
		Normal BP	9 (28.1)
		Pre-hypertension	6 (18.8)
		Hypertension	16 (50.0)
Thrice	336	Low BP	10 (3.0)
		Normal BP	133 (39.6)
		Pre-hypertension	73 (21.7)
		Hypertension	120 (35.7)
4 times	25	Low BP	1 (4.0)
		Normal BP	13 (52.0)
		Pre-hypertension	4 (16.0)
		Hypertension	7 (28.0)
		$\chi^2 = 9.883$, *df* = 9, *p* = 0.360	

[1]All values are expressed as frequency and percentage in parenthesis.
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2).

Table 9: Prevalence of blood pressure status among the studied population in Isi-Uzo Local Government Area according to their body mass index

Body Mass Index	Total Examined	Blood Pressure Status	Prevalence (%)
Underweight (< 18.5 kg/m^2)	28	Low BP	3 (10.7)
		Normal BP	12 (42.9)
		Pre-hypertension	6 (21.4)
		Hypertension	7 (25.0)
Normal (18.5 – 24.9 kg/m^2)	264	Low BP	8 (3.0)
		Normal BP	112 (42.4)
		Pre-hypertension	50 (18.9)
		Hypertension	94 (35.6)
Overweight (25.0 – 29.9 kg/m^2)	94	Low BP	1 (1.1)
		Normal BP	32 (34.0)
		Pre-hypertension	24 (25.5)
		Hypertension	37 (39.4)
Obese (30.0 – 34.9 kg/m^2)	14	Low BP	1 (7.1)
		Normal BP	1 (7.1)
		Pre-hypertension	3 (21.4)
		Hypertension	9 (64.3)
		χ^2 = 17.643, *df* = 9, *p* = 0.040*	

[1]All values are expressed as frequency and percentage in parenthesis
[2]Significant difference ($p < 0.05^*$) in prevalence using Chi-square test (χ^2)

DISCUSSION

The Isi-Uzo Local Government Area in Southeast Nigeria presents a unique setting with agro-rural characteristics, making it essential to understand the demographic and health profiles to inform targeted interventions (Nnamonu *et al*., 2019). This study aimed to unravel blood pressure patterns of various socio-economic and lifestyle factors.

Our findings revealed a significant association between educational status and blood pressure levels. Hypertension prevalence was higher among individuals with lower educational attainment, emphasizing the role of health literacy in managing cardiovascular health. This finding is in consonant with Adeloye *et al. (*2021) and Ayogu *et al. (*2021). These results suggest the need for tailored health education programs focusing on enhancing awareness and understanding of cardiovascular health among individuals with limited formal education.

Contrarily, the findings of Pandit *et al. (*2009) is at variance with our findings.

Income levels also showed an interesting pattern, although not statistically significant. Both low and high-income groups exhibited higher hypertension prevalence compared to the middle-income group. This indicates that socio-economic factors beyond income alone may influence blood pressure outcomes. Our findings also consonants with Kirschbaum *et al. (*2022) whose findings stated that "We included 1,211,386 participants in the analysis. Pooling across all countries, hypertension prevalence tended to be similar between education groups and household wealth quintiles. The only world region with a clear positive association of hypertension with education or household wealth quintile was Southeast Asia. Countries with a lower GDP per capita had, on average, a more positive association of hypertension with education and household wealth quintile than countries with a higher GDP per capita, especially in rural areas and among men".

Therefore, public health interventions should address broader socio-economic disparities, focusing on improving healthcare access and promoting healthy lifestyles across different income brackets.

Physical activity emerged as a significant determinant of blood pressure status. Individuals engaging in exercise at least twice a week demonstrated a higher prevalence of normal blood pressure, highlighting the protective effects of regular physical activity against hypertension. The duration and intensity of exercise further influenced blood pressure outcomes, with longer durations and light to vigorous intensities associated with better blood pressure profiles. This findings is in consonant with Cvejkus *et al. (*2021). This findings may underscore the importance of promoting regular and adequate physical activity as a preventive measure against hypertension.

Dietary habits, specifically meal frequency, also played a role in blood pressure outcomes. Consuming three to four meals per day was associated with a lower prevalence of hypertension compared to those consuming one or two meals. This finding is in consonant with Margerison *et al. (*2020). This suggests that maintaining a regular and

balanced meal frequency may contribute to better blood pressure regulation and overall cardiovascular health.

Lastly, body mass index (BMI) demonstrated a strong association with blood pressure status. Overweight and obese individuals exhibited higher hypertension prevalence, emphasizing the need for interventions targeting healthy weight management through lifestyle modifications, including diet and exercise. This finding is in consonant with Chijioke *et al. (*2016), Adeloye *et al. (*2021), Margerison *et al. (*2020) and Ayogu *et al. (*2021).

CONCLUSION

This study highlights the intricate interplay between socio-economic factors, lifestyle behaviors, and blood pressure outcomes in the Isi-Uzo Local Government Area. The findings reinforce the critical role of education, physical activity, dietary habits, and weight management in shaping cardiovascular health. While income levels showed a nuanced association with hypertension, other factors such as physical activity and meal frequency emerged as significant determinants of blood pressure regulation. These insights contribute to a broader understanding of hypertension risk factors in agro-rural communities, providing a foundation for future research and public health strategies aimed at mitigating cardiovascular disease burdens in similar settings.

REFERENCES

Adeloye, D., Owolabi, E. O., Ojji, D. B., Auta, A., Dewan, M. T., Olanrewaju, T. O., et al. (2021). Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: A systematic analysis of current evidence. *Journal of Clinical Hypertension, 23*(5), 963–977.

Ayogu, R. N. B., Ezeh, M. G., & Okafor, A. M. (2021). Prevalence and predictors of different patterns of hypertension among adults aged 20–60 years in rural communities of Southeast Nigeria: A cross-

Nnamonu, E., Ejilibe, O. C., Ezeude, J. I., Okeke, M. U., Nnamani, M. O., Nnamani, B. C., et al. (2019). Evaluation of predisposing factors, burden, and management of malaria among agrarian settlers, South East Nigeria. *International Journal of Mosquito Research, 6*(5), 1–5.

Nnamonu, E., Nkitnam, E., Ugwu, F., Ejilibe, O., Ezenwosu, S., & Ogbodo, G. (2018). Physicochemical assessment of vulnerability of the River Ebenyi in Eha-Amufu and environs, Southeast Nigeria. *Annual Research & Review in Biology, 27*(5), 1–9.

Pandit, A. U., Tang, J. W., Bailey, S. C., Davis, T. C., Bocchini, M. V., Persell, S. D., Federman, A. D., & sectional study. *Archives of Public Health, 79*(1), 210.

Chijioke, C., Anakwue, R., Okolo, T., Ekwe, E., Eze, C., Agunyenwa, C., et al. (2016). Awareness, treatment, and control of hypertension in primary health care and secondary referral medical outpatient clinic settings at Enugu, Southeast Nigeria. *International Journal of Hypertension, 2016*, 1–5.

Cvejkus, R. K., Miljkovic, I., Gibbs, B. B., Zmuda, J. M., Wheeler, V. W., & Kuipers, A. L. (2021). Association of physical activity with blood pressure in African ancestry men. *Preventive Medicine Reports, 23*, 101458. https://doi.org/10.1016/j.pmedr.2021.101458

Ekwunife, O. I., Udeogaranya, P. O., & Nwatu, I. L. (2010). Prevalence, awareness, treatment, and control of hypertension in a Nigerian population. *Health (Irvine, Calif.), 2*(7), 731–735.

Kario, K., Okura, A., Hoshide, S., & Mogi, M. (2024). The WHO Global Report 2023 on hypertension: Warning the emerging hypertension burden globally and its treatment strategy. *Hypertension Research, 47*(5), 1099–1102.

Kasiulevičius, V., Šapoka, V., & Filipavičiūtė, R. (2006). Sample size calculation in epidemiological studies. *Gerontologija, 7*(4), 225–231.

Kirschbaum, T. K., Sudharsanan, N., Manne-Goehler, J., De Neve, J.-W., Lemp, J. M., Theilmann, M., Marcus, M. E., Ebert, C., Chen, S., Yoosefi, M., Sibai, A. M., Rouhifard, M., Moghaddam, S. S., Mayige, M. T., Martins, J. S., Lunet, N., Jorgensen, J. M. A., Houehanou, C., Farzadfar, F., ... Geldsetzer, P. (2022). The association of socioeconomic status with hypertension in 76 low- and middle-income countries. *Journal of the American College of Cardiology, 80*(8), 804–817. https://doi.org/10.1016/j.jacc.2022.05.044

Margerison, C., Riddell, L. J., McNaughton, S. A., & Nowson, C. A. (2020). Associations between dietary patterns and blood pressure in a sample of Australian adults. *Nutrition Journal, 19*(5), 1–12. https://doi.org/10.1186/s12937-019-0519-2

Wolf, M. S. (2009). Education, literacy, and health: Mediating effects on hypertension knowledge and control. *Patient Education and Counseling, 75*(3), 381–385.

Ulasi, I. I., Ijoma, C. K., Onwubere, B. J. C., Arodiwe, E., Onodugo, O., & Okafor, C. (2011). High prevalence and low awareness of hypertension in a market population in Enugu, Nigeria. *International Journal of Hypertension, 2011*, 1–5.

Whelton, P. K., Carey, R. M., Aronow, W. S., Casey, D. E., Collins, K. J., Dennison Himmelfarb, C., et al. (2018). 2017 guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American

College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Journal of* World Health Organization. (2020). *WHO technical specifications for automated non-invasive blood pressure measuring devices with cuff*.
World Health Organization. (2023). *First WHO report details devastating impact of hypertension and ways to stop it*. Retrieved July 19, 2024: https://www.who.int/thailand/news/detail/19-09-2023-first-who-report-details-devastating-impact-of-hypertension-and-ways-to-stop-it

the American College of Cardiology, 71(19), e127–e248.