

An Impactful Health Fair in a Semi-Urban Community: Awolowo Town Case Study

Opreh Owigho Peter¹, Adeoye Bayo Olufunso^{2*}, Obisanya Akintomiwa¹, Ukangwa Ngozi Angela², Oyeleke Ibukun Oyebimpe³, Anthony G. S. Moore²

¹Lifestyle Medicine Center, Seventh-day Adventist Hospital, Ile-Ife, Osun State, Nigeria

²Department of Biochemistry, School of Basic Medical Sciences, Babcock University, Ilisan-Remo, Ogun State, Nigeria

³Department of Pharmacognosy, Faculty of Pharmacy, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

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*Corresponding Author: Adeoye Bayo Olufunso

Department of Biochemistry, School of Basic Medical Sciences, Babcock University, Ilisan-Remo, Ogun State, Nigeria

Abstract

Background: Even though most communities in developing countries understand the importance of disease prevention, they do not know how to do so. Beneficial programmes, like Health Fairs, even when relatively free, are often scorned. Understanding the importance of hypertension prevention in rural communities in developing nations is under-utilized. This study aimed to get the Awolowo community to come to terms with the benefits of an impactful Health Fair and generate convincing health information. It addressed how to motivate, generate interest and participate. Thus bridging knowledge gap and experience regarding disease prevention and medical screening. **Methodology:** This was a prospective study conducted over three days during a health fair at Awolowo town, Osun State, South-western Nigeria. A total of 178 Participants (18 years and above) were divided into three groups. Each group went through eight (8) different stations of specialized Health screening format. Blood pressure, Body mass index (BMI), and demographics were collected. Regression analyses was carried out on IBM SPSS (version 21) to examine the relationship between demographic features and blood pressure. **Results:** Our study found a high prevalence of pre-hypertension (41.6%) among participants. The study highlighted the rising rates of overweight (22.5%) and obesity (14%) in the population. Also, about 33% had hypertension, while increasing age was identified as a significant factor in its prevalence. The data demonstrates a strong correlation between obesity/overweight and hypertension. **Conclusion:** The specialized Health screening format and seminars/workshops served as motivation and interest generation. This should be adopted for similar studies. This study emphasizes the need for community interventions to address the growing prevalence of hypertension and obesity in Awolowo town and environ. Early diagnosis, heightened awareness, and lifestyle modifications are crucial approaches to mitigate health risks related to these conditions and enhance the overall health and well-being of the community.

Keywords: Obesity, Pre-hypertension, Hypertension, Health fair, Awolowo town.

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INTRODUCTION

Hypertension is commonly called a silent killer disease owing to its asymptomatic nature at the early stage (Abdelbagi *et al.*, 2021). Whereas, prehypertension is a clinical condition which usually signifies the onset of defective physiological functions (Martínez-Rueda *et al.*, 2019). Except standard treatment regimen is embarked upon as early as possible, prehypertension may degrade to lifelong, life threatening or full - blown hypertension. Apart from genetic susceptibility and sedentary lifestyle factors, being overweight or obese may also serve as baseline predisposing factors (Ebell, 2004). It is worrisome that the onset of hypertension can

be very subtle owing to the fact that it may not be detected until it has generated one comorbidity or the other. As a result, hypertensive patient usually experiences a deteriorated quality of living. Years back, city dwellers were thought to be the most susceptible to hypertension. In the past two decades, epidemiological data has shown a rising prevalence of hypertension which cuts across every domiciliary around the globe (Zhou *et al.*, 2021).

Regrettably, studies have shown that hypertension is one of the commonest cardiovascular ailments in Africa and that blood pressure assumes much more importance with increasing age (Akpa *et al.*, 2020).

Globally, the overall prevalence of raised blood pressure in adults aged 25 and over is around 40% in 2008. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths (Boateng & Ampofo, 2023). This accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS. The prevalence of hypertension among adults in the WHO Western Pacific region increased from 144 million in 1990 to 346 million in 2019, representing a growth of approximately 100% (WHO, 2023). Unfortunately, elevated blood pressure levels have been shown to be positively and continuously related to the risk for stroke and coronary heart disease. Across the WHO regions, the prevalence of raised blood pressure is highest in Africa, where it is 46% for both sexes combined (Adeloye & Basquill, 2014). Sadly, both men and women have high rates of raised blood pressure in the Africa region, with prevalence rates over 40% (Mohan *et al.*, 2013). Meanwhile, the overall crude prevalence of hypertension in Nigeria ranges from 2.1% to 47.2% in adults, depending on factors like diagnostic criteria, study setting, sex, and ethnic group (Akinlua *et al.*, 2015). Hypertension is becoming more important, but not as much is known about how common it is in rural areas of middle-income countries like Nigeria. To learn about the problem and the different ways to treat it, impactful health initiatives are highly essential at the grassroots.

METHODOLOGY

Awolowo Town Profile

The health fair at Awolowo town was executed by the Lifestyle Medicine Centre of the Seventh Day Adventist Hospital, Ile-Ife, Osun State, Nigeria. Awolowo town and environs is a lesser kingdom in Ife South Local Government Area of Osun State, Nigeria. Ife South has an area of 730 square km, and a population of 135, 338 at the 2006 census. Most adults are farmers, traders and lumberjacks. Demographic Information was obtained from respondents at the point of recruitment. The Health Exposition was a three day event consisting of two main categories i.e health screening stations and health seminar.

Health Screening Stations (HSS)

There was a total of eight (8) Health Screening Stations (HSS) following the NEWSTART acronym. As a result, each health screening station was tagged with Nutrition, Exercise, Water, Sunshine, Temperance, Air, Rest and Trust in God labels respectively (Smith, 2021). Typically, this formed the baseline of the expert medical counselling across all the health screening stations. Each HSS was made up of 2 health personnels which created the backstage for the different medical tests and medical counselling. The 8 HSS were arranged in a way that facilitated the flow of large numbers of people and took into account the physical characteristics of the grounds used. The order used is as presented in table 1.0 below.

Table 1: Showing the settings of the health screening stations using the NEWSTART acronym

Order	Health Screening Station	Activity
1	Temperance	BMI (Body Mass Index)
2	Nutrition	Blood Glucose
3	Sunshine	Blood Pressure
4	Water	Hydrotherapy demonstration
5	Exercise	Harvard Step Test (Resting Pulse, 3 min. Exercise Pulse, 5 min. Recovery Pulse)
6	Air	Peak Flow Meter
7	Rest	Anti-stress neck massage
8	Trust	Computerized tests: Health Age and Your Coronary Risk Health Counseling

Health Seminars

This took the form of an informative health campaign which was conducted simultaneously with the Health screening. The health seminars provided an opportunity to impact practical health information in details and to build confidence and contacts further. Furthermore, the participants were also educated on how to prepare fresh vegetable juices (e.g. Moringa oleifera), head and neck massage to relieve chronic stress. Short interactive lectures and demonstrations were the hallmark of the proceedings.

Data Collection

Measurements and demographic data were taken by physicians, nurses and trained lifestyle consultants. Respondents engaged in a voluntary free registration, following which they passed through the booths to assess their risk factors, and were then

counseled on primary prevention and lifestyle modification. Systemic blood pressure was measured using a standard mercury sphygmomanometer with the subject in the sitting position. The first and fifth phases of Korotkoff sounds were used for systolic (SBP) and diastolic blood pressures (DBP) respectively (Sanchez *et al.*, 2019). Height was measured without shoes to the nearest centimeter using a stadiometer, while weight was measured to the nearest 0.1 kg on an electronic scale with the subject wearing light outdoor clothing and no shoes. BMI was calculated based on the formular.

Statistical Analysis

Statistical analysis was done using Statistical Package for Social Sciences (SPSS Inc, Chicago Ill) version 21.

RESULT

One hundred and seventy eight subjects over 18 years were recruited for the study. The age and sex distribution is as shown in Table 1. The study population consisted of 73 (41%) males and 105 (59%) females (male: female = 1:1.44). The mean age of respondents was 44.4 ± 18.0 years.

Also, as shown in table 1, the mean systolic BP was 129 (± 22.9) mmHg while the mean diastolic was 81 (± 12.0) mmHg. Optimum blood pressure was recorded in only 25.3% of respondents. Meanwhile, the prevalence of overweight and obesity was 22.5% and 14% respectively (Table 1), with a mean BMI of 23.7 ± 5.9 . According to Table 2, the distribution of overweight for males and females was 20.5% and 23.8%

respectively while that of obesity was 11.0% and 16.2% respectively, indicating a slight female preponderance.

The results presented in Table 2 demonstrate the distribution of overweight and obesity among males and females. The data indicates that the percentage of females who were overweight (23.8%) was slightly higher than that of males (20.5%). Similarly, the percentage of females who were obese (16.2%) was slightly higher than that of males (11.0%). The overall prevalence of hypertension was 33.2% (Table 1) attaining greater significance with increasing age ($\chi^2 = 35.055$; $p = 0.001$) (Table 3). Furthermore, data obtained showed that hypertensive subjects were more likely to be either obese or overweight ($\chi^2 = 21.345$; $p = 0.002$), (Table 3). Regardless of BMI, About 74 (41.6%) of the study participants presented with pre-hypertension (Table 3).

Table 2: Demographics of respondents

	Frequency	Percent (%)
SEX		
Male	73	41.0
Female	105	59.0
AGE		
18-39	53	29.8
40-59	77	43.3
>60	48	27
BMI		
Underweight	15	8.4
Normal	98	55.1
Overweight	40	22.5
Obese	25	14
BP		
Normal	45	25.3
Pre-hypertension	74	41.6
Stage 1 Hypertension	40	22.5
Stage 2 Hypertension	19	10.7
TOTAL	178	100

Table 3: Association of sex and age with the body weight of participants

	Underweight N (%)	Normal N (%)	Overweight N (%)	Obese N (%)	χ^2 value	p value
SEX						
Female	11 (10.5%)	52 (49.5%)	25 (23.8%)	17 (16.2%)	3.742	0.291
Male	4 (5.5%)	46 (63.0%)	15 (20.5%)	8 (11.0%)		
AGE						
18-39	11 (20.8%)	36 (67.9%)	6 (11.3%)	0 (0.0%)	9.772	0.091
40-59	1 (1.3%)	38 (49.4%)	20 (26.0%)	18 (23.4%)		
>60	3 (6.3%)	24 (50.0%)	14 (29.2%)	7 (14.6%)		

There was no significant association among the age matched and the sex matched overweight and obese study participants.

Table 4: Association of socio-demographics and BMI with BP

	Normal	Prehypertensive	Hypertensive	χ^2 value	p value
SEX					
Female	32 (30.5%)	42 (40.0%)	31 (29.5%)	$\chi^2 = 3.899$	0.142
Male	13 (17.8%)	32 (43.2%)	28 (38.4%)		

	Normal	Prehypertensive	Hypertensive	χ^2 value	p value
AGE					
18-39	20 (37.7%)	29 (54.7%)	4 (7.5%)	$\chi^2 = 35.055$	0.001
40-59	20 (26.0%)	32 (41.6%)	25 (32.5%)		
>60	5 (10.4%)	13 (27.1%)	30 (62.5%)		
BMI					
Underweight	4 (26.7%)	9 (60.0%)	2 (13.3%)	$\chi^2 = 21.345$	0.002
Normal	31 (31.6%)	42 (42.9%)	25 (25.5%)		
Overweight	7 (17.5%)	18 (45.0%)	15 (37.5%)		
Obese	3 (12.0%)	5 (20.0%)	17 (37.5%)		

There was no significant association ($p = 0.142$) among the sex matched prevalence of hypertension, whereas increasing age was significantly ($p = 0.001$) associated with prehypertension and hypertension. Also, overweight and obesity were significantly ($p = 0.002$) associated with prehypertension and hypertension.

DISCUSSION

It is worrisome that about 41.6% of the study participants were discovered to be having prehypertension. These findings are comparable with those of Isezuo *et al.*, (2011), who reported a prevalence of 58.7% and 16.5% respectively. This highlights the importance of monitoring blood pressure regularly, even in individuals who do not have a high BMI, as prehypertension can be a precursor to hypertension (Slaviček *et al.*, 2008). Unfortunately, the poor awareness of this debilitating condition among this community members may potentially cause this underlying ailment to deteriorate to a fully blown hypertension (Odili *et al.*, 2020). This signals a red flag that a higher prevalence of chronic hypertension may likely occur at Awolowo town in subsequent years unless appropriate preventive measures are taken against the identifiable risk factor. In developing countries, the rural prevalence of chronic hypertensive stage can be attributed to late diagnosis due to a lack of primary healthcare facilities, care - free attitude, diverse cultural beliefs, reliance on herbal medications, and lack of awareness about risk factors (Azubuike & Kurmi, 2014). Hypertension is a multifactorial disease. Among the many predisposing factors, overweight and obesity are usually considered independent risk factors (Adeoye *et al.*, 2023) The prevalence of overweight and obesity in our study (22.5% and 14% respectively), was similar to the findings of (Adebayo *et al.*, 2014), working in two rural populations in Ife North local government (20.8% and 8.4% respectively). This suggests that members of this particular community may likely have sedentary dietary lifestyles which may likely be responsible for increasing susceptibility to obesity. Essentially, a regular awareness of such lifestyle habits might be very beneficial to stem the tide of obesity and associated comorbidities around this location (Opreh *et al.*, 2022). The findings suggest that there is a need for interventions aimed at improving the health status of the population, including efforts to promote healthy lifestyles and reduce the prevalence of overweight and obesity

Sadly, hypertension alone is responsible for not less than ten per cent of global mortality cases (Okello *et al.*, 2020). It is worrisome that the relative increase in hypertension related death among rural residents may have contributed to these heartbreaking statistics. According to (Kearney *et al.*, 2005), about 75% of the world's hypertensive population will be in developing countries by 2025. Data obtained in our study showed that at least one out of every three of the study participants (33%) were hypertensive. This suggests an increase in prevalence when compared with the findings of (Isezuo *et al.*, 2011). Furthermore, our findings also showed that the prevalence of hypertension increased with increasing age, highlighting the importance of age as a risk factor for hypertension.

Importantly, systolic and diastolic blood pressure are vital indicators of an individual's risk for developing hypertension. Both systolic and diastolic blood pressure can be affected by a variety of factors, including age, genetics, lifestyle, and underlying medical conditions (Schmidt *et al.*, 2020). In our findings, the mean systolic blood pressure was 129 (± 22.9) mmHg and the mean diastolic blood pressure was 81 (± 12.0) mmHg, with only 25.3% of respondents recording optimum blood pressure. Relatively, a survey conducted among four rural and urban communities in sub-Saharan Africa observed the age-standardized prevalence of hypertension was 19.3% (95%CI:17.3–21.3) in rural Nigeria (Hendriks *et al.*, 2012). Studies have shown that both systolic and diastolic blood pressure are important predictors of hypertension and cardiovascular disease. According to the American Heart Association, systolic blood pressure is a stronger predictor of cardiovascular risk than diastolic blood pressure, particularly in individuals over the age of 50 (Leisher *et al.*, 2024). In fact, elevated systolic blood pressure is considered one of the most important risk factors for cardiovascular disease, including stroke, heart attack, and heart failure (Kim, 2023).

Age is a significant risk factor for hypertension, and the prevalence of hypertension increases with age (Oparil *et al.*, 2018). The correlation study confirmed that advancement in age was significantly associated with the rate of prehypertension and hypertension among the study participants. These findings agrees with known facts that adults are usually more prone to developing

hypertension than younger individuals (Sidenur & Shankar, 2023). The increased risk of hypertension with age is likely due to age-related changes in the arteries, blood vessels, and other physiological factors that affect blood pressure regulation (Azegami *et al.*, 2021). Nevertheless, in utero and early life nutrition have equally been implicated as culminating factors in the development of cardiovascular diseases at adulthood (Alves & Alves, 2023). However, the high prevalence of overweight (22.5%) and pre-hypertension (41.6%) found in this study population underscores the need for more focused community interventions.

Our findings also showed a positive correlation of hypertension prevalence with being overweight or obese as the case may be. This finding is consistent with previous research that has demonstrated a positive association between obesity and hypertension (Wu *et al.*, 2024). The presence of pre-hypertension among 41.6% of the study participants regardless of BMI is also a significant finding. Much so that pre-hypertension is considered a precursor to hypertension and an important warning sign for potential cardiovascular disease (Li *et al.*, 2023). These findings suggest that a considerable proportion of the sample population may likely be at risk for deleterious health conditions related to being overweight or obese, such as cardiovascular disease, diabetes, and hypertension. Similar to our findings, a study conducted by (Rahmanian & Shojaie, 2012) among selected Southern Iranians, observed a relatively higher prevalence (33.7%) of pre-hypertension with obesity while being overweight was the strongest predictors of pre-hypertension.

Taken together, these results highlight the importance of regular monitoring and managing of body weight for overall health and wellbeing. Essentially, hypertensive individuals are either overweight or obese may need to adopt lifestyle changes, such as dietary modifications and increased physical activity, to manage their weight and reduce their risk of developing associated debilitating health conditions (Adeoye *et al.*, 2022a; Adeoye *et al.*, 2022b).

CONCLUSION

Data obtained from this study depicted a disturbing prevalence of prehypertension and hypertension among adults in Awolowo town, South western Nigeria. These findings have important implications for public health interventions aimed at reducing the prevalence of overweight and obesity. Essentially, targeted efforts may be needed to address the unique risk factors that contribute to higher rates of overweight and obesity in females.

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