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Prevalence, Risk factors for Hypertension among Traders in Lagos.

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Prevalence, Risk factors for Hypertension among Traders in Lagos.

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ABSTRACT

Introduction: Hypertension is a major public health problem with a devastating toll on the quality of life and the economic status of families. The prevalence of hypertension among traders in Enugu was 42% as of 2010. This study focused on the prevalence of hypertension among traders in Lagos because there are scarce data on hypertension and its risk factors among traders in Lagos.

Materials and Methods: This was a descriptive cross-sectional study conducted among a total of 391 traders selected from Tejuosho market, Iponri market and Orile Iganmu market. Data were collected using an interviewer-administered questionnaire and blood pressure was read using a digital sphygmomanometer as well as anthropometric measurements. Data obtained was analyzed using Epi-info 7.2 software. Analysis was done at a 95% confidence interval with P value of < 0.05 considered statistically significant. Associations between categorical variables were assessed using the chi-square test.

Findings: It was found that 30.9% of the traders had high blood pressure. The leading risk factors for high blood pressure among the traders were increasing age and obesity (44.7% of those with high blood pressure were obese) and physical inactivity.

Conclusions: This study showed that more than a quarter of traders in selected Lagos markets had high blood pressure, with majority being shop owners and practising sedentary lifestyles.

Recommendations: Health promotion to be inculcated in the activities of traders such as health talk, empowering market leaders and traders with access to health information, health care advertising, bonuses and enforcement of a health insurance scheme for traders in every market.

Keywords: *Hypertension, prevalence, risk factors, traders.*

INTRODUCTION

Prevalence of hypertension in Nigeria is on the rise,¹ and this has been attributed to rapid unplanned urbanization, adoption of western lifestyle and consumption of a diet high in salt and fat which is characteristic of modern-day city life.² Lagos State has an estimated population of over 21 million³ as stated by Lagos state government and is currently being suggested as one of the most populated cities in Africa. With increasing urbanization of the state like many cities of the world, there is a tendency for the consumption of energy-rich foods and a decrease in energy expenditure (through less physical activity) which could encourage the development of non-communicable diseases such as hypertension.

Traders constitute a large proportion of informal workers in an urban city like Lagos. The nature of their work predisposes them to unhealthy lifestyle practices like consumption of fast foods, energy-dense drinks, physical inactivity which lead to obesity, hypertension, stroke and other cardiovascular diseases. However, there is a lack of data reflecting the current scenario of the population-based prevalence of hypertension in Lagos traders. Data on hypertension, awareness and its risk factors among traders is sparse hence this study was therefore carried out to determine the prevalence, awareness and risk factors among traders in Lagos as this will add to the existing body of knowledge about hypertension among this category of workers in Nigeria.

METHODS

A cross-sectional descriptive study that comprises traders in Tejuosho, Iponri and Orile (Oja) markets selected from 3 levels of market graded by Lagos state market board. All consecutive verbally consenting traders at the markets were recruited for the study. Information on biodata, marital status of the traders, level of educational qualification if any, an estimate of income per month, their respective roles in the shop or stalls i.e. if they were the owners or sales representative or apprentice in the shop, an estimate of the number of hours they work per day, duration in years they have been trading (at most 6 months). Risk for hypertension was assessed based on family history of hypertension, hypertensive comorbidities (such as stroke, heart attack and diabetes mellitus), Dietary lifestyle of the traders were examined with questions based on the frequency of consumption of foods such as Eggs, Offal (like Shaki, liver, intestines), Red meat, Fatty fish and snacks (such as Doughnut, meat pie, puff puff) on weekly bases. Also the frequency of consumption of fruits and vegetables per week as well as carbonated soft drinks or packet juice consumed per week, salt consumption in terms of quantity of salt intake (whether little, moderate or high) when cooking and the number of seasoning (Iru, Maggi, Ajinomoto and any other type of seasoning) used in cooking their food per day and if they add extra salt to food at the table when eating.

Traders were asked if they smoke Cigarettes or stimulants like Marijuana, Heroin or Shisha as well as if they consume substances like kola nuts, Caffeine, Snuff with the duration of consumption, previous history of smoking and when they stopped. History of alcohol consumption, its frequency and duration of consumption as well as the level of physical activity based on if the trader engages in body exercise regularly, the type of exercise, the frequency of exercise per week and duration of exercise and the medical history of the traders were obtained. The blood pressure of the subjects was measured after 5-minutes rest with CVS digital sphygmomanometer using an appropriate cuff size in the left arm, leg uncrossed and participants

in a sitting position. Korotkoff 1st and 5th sounds were used as the systolic and diastolic blood pressure and two mean readings were used for each participant taken five minutes apart. Hypertension was defined according to the British Hypertension Society (BHS). Weights were taken with light clothing onto the nearest 0.5kg using a portable Hana China weighing scale. The height of the traders was measured to the nearest 0.01 metre using a measuring tape pinned to the wall. The trader stood on the horizontal surface with the heels, back and occiput making contact with the vertical surface. The highest point of the head was projected to the scale with a ruler and read as the trader height in meters. Body mass index was calculated using Quetelet index as an index of general obesity.

Body Mass Index (BMI) was calculated based on the formula: weight in Kg/ height in metres squared. BMI was classified using the WHO classification for adults as follows; normal for values in the range of 18.5 – 25kg/m², overweight BMI between 25 and 29.9 kg/m², Class 1 obesity BMI 30.0 to 34.9 kg/m², 2 class II 35.0 to 39.9 kg/m², Class III or extreme 2 obesity BMI = 40 kg/m². According to standard guidelines by World Health Organization (WHO). Abdominal or central obesity was defined as waist circumference of ≥ 102 cm in men and ≥ 88 cm in women

The waist circumference was measured by removing or raising clothes, the interviewer used his fingers to find the top of the participant's hips and the base of the rib cage to locate the waist which is the narrowest part of the torso. The participants were asked to stand up straight and exhale slowly, the measuring tape in centimetres was used to measure the waist circumference at the narrowest part of the waist of the participants. The measuring tape was ensured to be parallel to the floor and fit snugly around the torso without digging into the skin.

The hip circumference was measured as follows. The interviewer used his fingers to locate the largest or widest circumference of the hips and butt. The measuring tape is then used to measure this largest or widest location in centimetres with the participant standing tall and relaxed with feet together as close as possible. The measuring tape was kept horizontal around the hip and butt, well tightened but not compressed or pinched on the skin.

The waist-hip ratio was calculated based on the waist circumference in centimetres divided by the hip circumference in centimetres.

Statistical Analysis.

Data were analysed using Epi-Info 2007 statistical software. The analysed data were presented as frequency tables and charts, means and standard deviation. The comparison of risk factors for hypertension among participants with and without hypertension was calculated using a Chi-square for the hypothesis generated.

RESULTS

Demographic data.

A total of 300 (76.7%) were females and 91(23.3%) were males. The mean age of the study population is 40.5 ± 14.9 ; the age range was 18-82 years. The predominant age group was 35-44 years accounting for 24.0% while the elderly constituted 6.7% of the study population (Table 1). Thirty-one of the respondents had no formal education while majority (256; 65.5%) had some level of education, 26.6% had tertiary education. Most of the respondents 251(64.2%) were

married, 106(27.1%) of the respondents were single while 23(5.9%) of them were widowed. Majority of the respondents 289(73.9%) were Yoruba, 80(20.5%) were Igbo, 2(0.5%) were Hausa, 17(4.4%) of the respondents were from other indigenous tribes in Nigeria while 3(0.8%) of the respondents were from foreign tribes. Majority of the respondents 256(65.5%) were shop owners, 119(30.4%) were sales assistants, 6(1.5%) were managers, 8(2.1%) were apprentices and 2(0.5%) of the respondents were distributors/suppliers. In terms of years of trading, 152(38.9%) of the respondents have been trading < 5years while 50(12.8%) have been in the profession for over 30years.

Prevalence of Hypertension.

The prevalence of hypertension was 30.9% among the respondents. This study showed a statistically significant difference in the systolic blood pressure between the males and females, with more men having a high SBP than females but no significant difference in the diastolic blood pressure (DBP) of both sexes (Table ii). Eighty-seven (27.6%) had raised systolic blood pressure (>140mmHg). Mean SBP for men (131.26+15.319) mmHg and (127.41+ 15.10) mmHg for women. Maximum SBP recorded was 212.0mmHg. High DBP (DBP > 90mmHg) was recorded in 22.5% of the traders, of which 8.4% had a DBP of 100mmHg and above. The maximum DBP recorded was 149.0mmHg. The mean DBP was 79.06 +11.158 mmHg (men: 79.76+10.99; women 78.82+ 11.22). Of all the traders, 139 (34.8%) had both elevated SBP (>140mmHg) and DBP (>90mmHg) and this was significantly higher among the females (43.4%) than the males (9.7%).

Table 1: Socio-demographic, socio-economic and work status of respondents.

Variables	Frequency (n= 391)	Percentage (%)
Age in years		
18 – 24	74	18.9
25 – 34	70	17.9
35 – 44	94	24.0
45 – 54	80	20.5
55 – 64	47	12.0
≥ 65	26	6.7
Sex		
Male	91	23.3
Female	300	76.7
Marital status		
Single	106	27.1
Married	251	64.1
Widowed	23	5.9
Divorced	9	2.3
Separated	1	0.3
Engaged	1	0.3
Religion		
Christianity	212	54.2
Islam	179	45.8

Level of education		
No formal education	31	7.9
Primary	40	10.2
Secondary	216	55.3
Tertiary	104	26.6
Role in shop		
Owner	256	65.5
Sales assistant	119	30.4
Manager	6	1.5
Apprentice	8	2.1
Supplier/ distributor	2	0.5
Hours at work in a day		
< 4 hours	11	2.8
4 – 8 hours	113	28.9
9 – 12 hours	221	56.5
> 12 hours	46	11.8
Duration of trading job		
< 5 years	152	38.9
6 – 10 years	68	17.4
11 – 15 years	44	11.3
16 – 20 years	28	7.2
21 – 25 years	28	7.2
26 – 30 years	21	5.4
> 30 years	50	12.8

Table 2: Prevalence of grades of hypertension among the traders

Hypertensive	Frequency (n= 391)	Percentage (%)
Yes	121	30.9
No	270	69.1
Optimal	159	40.7
Normal	67	17.1
High normal	62	15.9
Grade 1	55	14.1
Grade 2	24	6.1
Grade 3	4	1.0
Isolated Systolic Hypertension 1	18	4.6
Isolated Systolic Hypertension 2	2	0.5

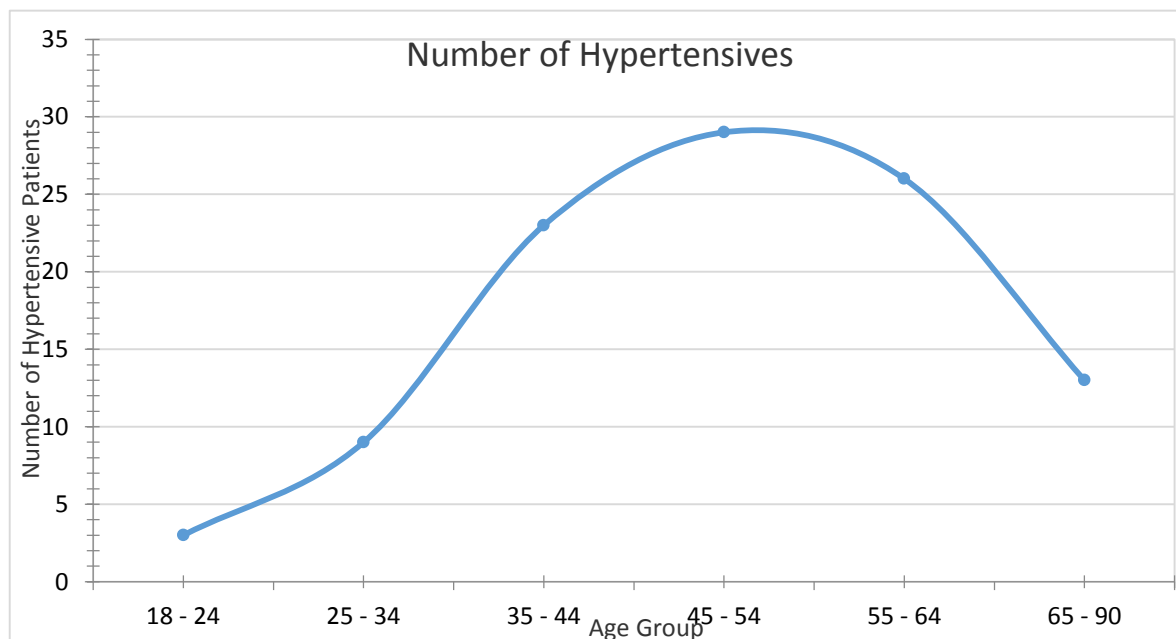


Figure 1: Relationship between number of respondents’ hypertensive and age.

The figure above shows the relationship between the age distribution of respondents and the type of hypertension. The proportion of traders with high blood pressure (>140/90mmHg) increased with increasing age. Traders in the age group 45-54 had the highest no of hypertensives (29, 28.2%).

Table 3: Comparison between scored risk factors for hypertension and prevalence of hypertension.

Risk factor	Hypertension (n=103) (%)	Non-hypertension (n=288) (%)	r	P
Age			-0.329	<0.001
18 – 44	35 (34.0)	203 (70.5)		
45 – 82	68 (66.0)	85 (29.5)		
Family history HTN	18 (17.5)	41 (14.2)	-0.040	0.432
Family history DM	13 (12.6)	29 (10.1)	-0.036	0.474
Family history stroke	9 (8.7)	17 (5.9)	-0.050	0.323
Family history heart attack	2 (1.9)	4 (1.4)	-0.020	0.696
Added salt at the table	16(15.5)	44(15.3)	0.003	0.951
Seasoning			-0.13	0.802
High risk	34 (33)	3 (1.04)		
Moderate risk	68 (66)	200 (69.4)		
Low risk	1 (0.97)	85 (29.5)		
Fruits and vegetables			-0.032	0.110
High risk	2 (1.9)	7 (2.4)		
Moderate risk	67 (65)	210 (72.9)		
Low risk	34 (33)	71 (24.7)		

Soft drinks			0.005	0.926
High risk	34 (33.01)	90 (31.25)		
Moderate risk	10 (9.71)	35 (12.15)		
Low risk	59 (57.28)	163 (56.6)		
Eggs			-0.012	0.045
High risk	3 (2.91)	24 (8.33)		
Moderate risk	15 (14.56)	50 (17.36)		
Low risk	85 (82.52)	214 (74.31)		
Red meat			0.096	0.059
High risk	31 (30.10)	117 (40.63)		
Low risk	72 (69.90)	171 (59.38)		
Offal			-0.053	0.292
High risk	27 (26.21)	65 (22.57)		
Moderate risk	18 (17.48)	42 (14.58)		
Low risk	58 (56.31)	181 (62.85)		
Fatty fish			-0.008	0.871
High risk	19 (18.45)	195 (67.71)		
Moderate risk	19 (18.45)	31 (10.76)		
Low risk	65 (63.11)	62 (21.53)		
Pastries			0.071	0.163
High risk	2 (1.94)	17 (5.90)		
Moderate risk	6 (5.83)	16 (5.56)		
Low risk	95 (92.23)	255 (88.54)		
Quantity of alcohol			-0.090	0.076
High risk	7 (6.8)	7 (2.43)		
Moderate risk	4 (3.88)	12 (4.17)		
Low risk	92 (89.3)	269 (93.4)		
Smoking			0.081	0.111
High risk	9 (8.7)	13 (4.5)		
Low risk	94 (91.3)	275 (95.5)		

The table above shows the level of association between risk factors of hypertension and prevalence of hypertension. Risk factors like age, regular exercise, frequency of weekly consumption of eggs and red meat showed they were statistically significant to hypertension with $p = <0.001, 0.024, 0.045$ and 0.059 respectively.

Smoking of cigarettes and other stimulants had a prevalence of 8.7% with hypertension, it was not statistically significant with hypertension as $p = 0.111$. Smoking was common in the age group 35-44, 45-54, and 55-64 years. The prevalence of hypertension among traders that smoke cigarettes were highest 3(2.9%) in the age group 55-64 years. There were 21(95.5%) male smokers and 1(4.6%) female smokers. Out of the 21 male smokers, 8 had $\geq 140/90$ mmHg. The only female smoker had a mean blood pressure $\geq 140/90$ mmHg, within the age group 55-64 years. Married male traders that smoke had a higher prevalence of hypertension (14.6%) than single male smokers (4.9%). About 30(7.7%) respondents take stimulants 13 males and 17 females with 6 (5.3%) prevalence for hypertension consisting of 3 males and 3 females.

Stimulants taken by respondents include: Snuff, Coffee, Kolanut and 4 respondents claimed water as a stimulant that keeps them awake while working.

About 152(38.9%) of respondents take alcohol (comprised of 56(38.8%) males and 96(61.2%) women), 7(6.8%) were at high risk of hypertension. There was a statistical relationship between gender and alcohol consumption, also between alcohol consumption and smoking with $p < 0.001$.

Table 4. Comparison between scored risk factors for obesity and prevalence of hypertension.

Risk factor	Hypertension (n=103) (%)	Non-hypertension (n=288) (%)	r	P
Regular Exercise Duration			-0.114	0.024
High risk	52 (50.49)	126 (43.75)		
Moderate risk	44 (42.72)	111 (38.54)		
Low risk	7 (6.80)	51 (17.71)		
Waist: hip			-0.115	0.023
High risk	82 (79.6)	195 (67.7)		
Low risk	21 (20.4)	93 (32.3)		
BMI			-0.204	<0.01
High risk	46 (44.7)	68 (23.6)		
Low risk	57 (55.3)	220 (76.4)		
Mean arterial pressure			-0.684	<0.01
High risk	56 (54.4)	0 (0)		
Low risk	47(45.6)	288 (100)		

Physical activity of traders based on the frequency of regular exercise is 45.5% of traders are physically inactive, 39.6% of traders are moderately physically active and 27.8% of traders are highly physically active. The duration of exercise was statistically related to age group as 57.9% of those that exercised 35-70mins weekly are in age groups 45 – 55 years, 55 – 64 years and ≥ 65 years old respectively while 81% of those that exercised ≥ 140 minutes weekly (low risk) are in age groups 18 – 24, 25 – 34 and 35 – 44 years. Respondents that exercised 35-70 minutes had the highest prevalence (49.1%) of obesity, although there was no significant relationship between obesity and duration of exercise. Traders that exercise 35 – 70 minutes weekly are nearly half of female traders (49%) and 34.1% of male traders, Traders that exercise ≥ 140 minutes weekly comprises 20.9% of male and only 13% of female traders. There was a significant association ($P < 0.01$) between the prevalence of hypertension and respondents with BMI >29.94 (obese traders). However, only 46 (44.7%) out of 114 obese traders had raised blood pressure (≥ 140 mmHg and or 90mmHg).

DISCUSSION

The study assessed the prevalence and risk factors for hypertension among traders in Lagos. All respondents in this study comprise male (23.3%) and female (76.7%). This comprised mostly of female traders (300; 76.7%). This is similar to the study done in Lagos⁴ but differs from the study done in Enugu⁵, this is due to the different study locations. This also differs from a study done in Ijebu-ode among traders with 52.3% of male traders and 47.7% of female traders⁶ as rural areas have more males in trading and commerce than in an urban city like Lagos. Most of the respondents 251(64.2%) were married, 289(73.9%) were Yoruba, 106(27.1%) of the respondents were single while 23(5.9%) of them were widowed.

The prevalence of hypertension in this study was 30.9% among the respondents, this is in congruence to studies done in Sokoto⁷ which reported a prevalence of 29.1% among 381 participants in the study, likewise, a study done in Maiduguri⁸ had a prevalence of 25%. However, a higher prevalence of 37.8% was reported among semi-urban communities in a study carried out in Umuahia, Abia State in his study⁹. Studies done among traders in specific markets in Enugu⁵ and Lagos⁴ had a higher prevalence of 42.2% and 34.8% respectively, this is due to the older age and long years of trading among the participants in the study.

However, a lower prevalence rate of hypertension 20.2%, 19.9%, 16.0%, 9.3% as reported in studies done in Edo¹⁰, among female traders in Ibadan¹¹, traders in Ijebuode⁶ and urbanized workers in Ibadan¹² respectively, where the age limitation of participants in most of them was \leq 74 years in studies. Furthermore, most of these studies were conducted in rural areas, unlike Lagos in which urbanization of individuals has led to the adoption of lifestyle in terms of diet and physical inactivity coupled with stressful city life tends to have a greater percentage of the populace prone to NCDs like hypertension.

The prevalence of hypertension was higher in female 75.2% traders than male traders 24.8% in this study. This is similar to studies done in Sokoto⁷, Hohoe municipality in Ghana¹³, among traders in Lagos⁴ and a study of the different stages of hypertension among apparently healthy individuals in Nigeria¹⁴. This is due to risk factors for hypertension (like obesity) clustering among greater percentage of female traders in this study. This is in contrast to studies done among traders in Accra Ghana¹⁵, among adults in Maiduguri⁸, urbanized workers in Ibadan¹², among residents of Ibadan North LG¹⁶.

The prevalence of hypertension increased steadily but later declined and was statistically significant across the age groups 18 -24: 4.1%, 25-34: 12.9%, 35-44: 24.5%, 45-54: 36.3%, 55-64: 55.3% and 65-90: 50%. This conforms to studies among traders in Lagos¹³, traders in a regional market Northeast Nigeria⁸, adult residents in Lagos¹⁷ and among traders in Hohoe municipality Ghana¹³ but differs from studies among traders in Sokoto Central market⁷ and among residents of Ibadan¹⁶. This is because most participants in age group \geq 65 years were few in this study compared to other age groups and they also had lower risk factors like consumption of processed foods and drinks compared to those in age groups 35-44, 45-54 and 55-64.

Prevalence of hypertension in this study was highest (84.5%) among traders that were owners of the business than sales assistants (10.7%), apprentices (0%) and managers (4.9%), as it was discovered in this study that a greater percentage (64.5%) of shop owners even though they spent \geq 9 hours daily compared to other class of traders were still hypertensive. This is as a result

of poor dietary lifestyle coupled with physical inactivity especially in the shop as the majority sit most times all through the day while monitoring activities in the shop. Moreover, a greater percentage had the wrong perception that as long as they are active in their various businesses coupled with the mentality that trekking is a form of exercise, also no need for them to exercise.

Prevalence of hypertension was highest among those with a family history of hypertension 21.5% than those with a family history of other diseases. There was also a strong relationship between the prevalence of hypertension and family history of hypertension which is similar to findings in a study done in Enugu¹⁸. In this study majority of the traders had no access to over-processed foods or caffeine but Seasonings used in cooking, added salt to food and much dependence on pastries, as much of the traders skip breakfast⁷ and buy their foods from restaurants. Most of the traders 253(54.71%) make use of Maggi and salt when cooking. Also, it was noticed that many of the traders used much of 2 or 3 seasonings per food cooked together with salt to appease taste. A renowned seasoning in Nigeria contains 22718g of sodium per 100g which ranges from 1800g to 1900g of sodium per cube.

Daily consumption of a diet with edible salt > 2300mg is at risk of hypertension. Quantifying the amount of salt in each diet is quite relative depending on individuals and other factors. However, interest on traders who use a high amount of salt when cooking, add extra salt to food at the table especially in the various restaurant where they purchase food as the majority (60-70%) eat outside of their homes at least once daily and traders who use Seasoning together with salt when preparing their meals. One hundred and two (99%) out of 103 traders that were hypertensive used two or more seasoning cooking while only one (0.97%) out of four traders that used one type of seasoning in cooking was hypertensive. Respondents that used a high amount of salt in preparing their food 3(27.3%) out of 11 of them were hypertensive. However, there was no significant relationship $p = 0.626$ between respondents that used a high amount of salt in their diet and hypertension.

Traders in this study had an average healthy diet as compared with American Dietary Guidelines especially traders that were > 55years old compared to young traders in the market. The trend of low-risk traders being hypertensive, based on the frequency of consumption of fatty and processed foods was deducted on analysis such that there was direct proportionality of the hypertensive traders in the older age group even though this age group had good diet control (low risk based on diet). This extrapolates that modification of diet should begin at an early age and when one is healthy, practiced continuously as to obtain appropriate BMI for age and optimal BP control.

CONCLUSION

This study found that the prevalence of hypertension was high among traders ≥ 45 yrs of age despite good lifestyle practices. The overall prevalence of 30.9% of the traders was hypertensive (blood pressure $\geq 140/90$ mmHg) in this study of which 26.3% of traders were screened during the study and majority (55.3%) of those hypertensive were in the age group 55-64 years. Majority of shop owners were hypertensive (84.5%) and physically inactive (46.8%).

Majority of the traders especially those young (< 45 years) are likely predisposed (high risk) to be hypertensive later in life based on their lifestyle practices of which 31.3% are based on consumption of soft drinks, 40.6% based on their diet, 43.8% based on physical inactivity and

6.9% based on smoking and alcohol consumption are at higher risk of being hypertensive later in life, especially those with a family history of Hypertension (14.2%), Stroke (5.9%), Diabetes Mellitus (10.1%) and Heart attack (1.4%).

RECOMMENDATIONS

Awareness about hypertension, prevention and its detection should be inculcated in the lifestyle and practice of traders in Lagos much earlier as to reduce its incidence among this sector especially in the young traders' age-group (< 45 years). This can be done by:

i) Implementing health promotion among the activities of the traders at least quarterly in a year, also ensure there's full participation of the traders in each market to decide appropriate times they would be available as to achieve >70% attendance on such days.

ii) Lagos state market board should stipulate policy for various market leaders to encourage aerobic exercise at least 30 minutes weekly especially before the commencement of trading on weekly sanitation day.

iii) Food regulatory agencies like the National Agency for Food, Drug Administration and Control (NAFDAC), Non-governmental organizations that encourage a healthy lifestyle to check and control the release of processed food items that mostly require preservatives containing a high amount of salt to increase their shelf life

iii) Introducing a suitable and convenient health insurance scheme and plan for traders to encourage health-seeking behavior and access to health care easily.

REFERENCES

1. Ogah OS, Okpechi I, Chukwuonye II, Akinyemi JO, Onwubere BJ, Falase AO, et al. Blood pressure, the prevalence of hypertension and hypertension related complications in Nigerian Africans: A review. *World J Cardiol* [Internet]. 2012 Dec 26 [cited 2017 Nov 12];4(12):327–40. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23272273>.
2. Ikechukwu Ekwunife O, Nze Aguwa C. A meta-analysis of prevalence rate of hypertension in Nigerian populations. *J Public Heal Epidemiol* [Internet]. 2011 [cited 2017 Nov 12];3(13):604–7. Available from: <http://www.academicjournals.org/JPHE>.
3. Lagos State Government. Search Results for “Lagos population” – Lagos State Government [Internet]. [cited 2017 Nov 12]. Available from: <https://lagosstate.gov.ng/?s=lagos population>.
4. Odugbemi TO, Onajole AT, Osibogun AO. Prevalence of cardiovascular risk factors amongst traders in an urban market in Lagos, Nigeria. *Niger Postgrad Med J* [Internet]. 2012;19(1):1–6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22430594>.
5. Ulasi II, Ijoma CK, Onwubere BJC, Arodiwe E, Onodugo O, Okafor C. High Prevalence and Low Awareness of Hypertension in a Market Population in Enugu, Nigeria. 2011;2011.
6. Oladoyinbo CA, Ekerette NN, Ogunubi TI. Obesity and Hypertension amongst Traders in Ijebu Ode, Nigeria. 2015; 18:23–7.

7. Awosan, KJ, Ibrahim, MTO, Essien, E, Yusuf, AA, Okolo, AC. Dietary pattern, lifestyle, nutrition status and prevalence of hypertension among traders in Sokoto Central market, Sokoto, Nigeria. *Int J Nutr Metab* [Internet]. 2014;6(1):9–17. Available from: <http://academicjournals.org/journal/IJNAM/article-abstract/F321BD842236>.
8. Vincent-Onabanjo GO, Adaji JO, Umeonwuka CI. Prevalence of Undiagnosed Hypertension Among Traders at A Regional Market in Nigeria Prevalence of Undiagnosed Hypertension Among Traders at A Regional Market in Nigeria. 2017;(May).
9. Okwuonu CG, Ngoka SC, Chimezie OJ, Eze TH, Uwanurochi K, Mbanaso AU. Towards prevention of hypertension in Nigeria: A study of prehypertension and its associations among apparently healthy adults in Umuahia, South-East Nigeria. *Int J Prev Med*. 2015;2015(JULY).
10. Omuemu VO, Okojie OH, Omuemu CE. Blood pressure pattern and prevalence of hypertension in a rural community in Edo State. *TSpace*. 2006;5(2):79–86.
11. Balogun MO, Owoaje ET. Work conditions and health problems of female traders in Ibadan, Nigeria. *Afr J Med Sci* [Internet]. 2007 Mar [cited 2017 Nov 14];36(1):57–63. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17874491>.
12. Kadiri S, Walker O, Salako B, Akinkugbe O. Blood pressure, hypertension and correlates in urbanised workers in Ibadan, Nigeria: a revisit. *J Hum Hypertens*. 1999;13(July 1998):23–7.
13. Bani F, Nyavor P, Agbemafle I, Takramah W, Agboli E, Tarkang E, et al. hypertension among traders in Hohoe Municipality , Ghana. 2017;4(1):22–30.
14. Fasanmade AA, Olaniyi JA, Oyewole OE, Owolabi MO, Adebusuyi JR, Hassan O, et al. Metabolic Alterations in Different Stages of Hypertension in an Apparently Healthy Nigerian Population. 2013;2013.
15. Awuah RB, Anarfi JK, Agyemang C, Ogedegbe G, Aikins A de-G. Prevalence, awareness, treatment and control of hypertension in urban poor communities in Accra, Ghana. *J Hypertens* [Internet]. 2014;32(6):1203–10. Available from: <http://content.wkhealth.com/linkback/openurl?sid=WKPTLP:landingpage&an=00004872-201406000-00010>.
16. Ajayi I, Sowemimo I, Akpa O, Ossai N. Prevalence of hypertension and associated factors among residents of Ibadan-North Local Government Area of Nigeria. *Niger J Cardiol* [Internet]. 2016;13(1):67. Available from: <http://www.nigjcardiol.org/text.asp?2016/13/1/67/165168>.
17. Daniel O, Adejumo O, Adejumo E, Owolabi R, Braimoh R, Salako A. Prevalence, Awareness and Factors Associated with Hypertension among Adult Residents in Lagos: A Population Based Study. *Br J Med Med Res* [Internet]. 2015;8(10):874–82. Available from: <http://www.sciencedomain.org/abstract.php?iid=1122&id=12&aid=9505>.
18. Umegbolu E.I, Ogamba J. O. Primary hypertension in young adults (18-40 years) in Enugu State, Southeast Nigeria: a cross-sectional study. *International Journal Of Community Medicine And Public Health*, [S.l.], v. 3, n. 10, p. 2825-2831, dec. 2016. ISSN 2394-6040. Available at: <<https://www.ijcmph.com/index.php/ijcmph/article/view/236>>. Date accessed: 28 feb. 2017. doi:<http://dx.doi.org/10.18203/2394-6040.ijcmph20163368>.