



## Prevalence Of Hypertension Among Adult Population In Katsina Metropolis

<sup>1</sup>Abdullahi Sani Charanchi; <sup>2</sup>Jamilu Abdullahi & <sup>3</sup>Muhammad Hassan Muhammad

<sup>1,2,3</sup> Department of Mathematics and Statistics,  
Hassan Usman Katsina Polytechnic Katsina, Nigeria  
<sup>1</sup>abdulsanic2@gmail.com

### ABSTRACT

The prevalence of hypertension has become a global public health problem. There are different risk factors that increase the chances of developing high blood pressure among adults. Of which, Smoking, Diabetes, Being obese or overweight, high cholesterol, unhealthy diet and physical inactivity can be controlled. Socio-Demographic factors like marital status, number of wives and behavioral factors like smoking and stressful lifestyle can also contribute in developing high blood pressure among adults. Survey was conducted using multistage systematic random sampling technique to select 95 households. The sample of the study participants was selected at random from the target population residing in the city. Socio-demographic characteristics, history of hypertension and behavioral measurements were recorded. Data was presented using descriptive statistics and analyzed using chi-square test. The result shows that there is significant relationship between marital status, number of wives, smoking, stressful lifestyle and obesity and hypertension among adults. Maintaining healthy diet, exercise, quitting smoking, getting married and remarrying were among the measures to be taken by adults to prevent or regulate their blood pressure.

**Keywords:** Adults, Hypertension, obesity, wives, stressful lifestyle

### INTRODUCTION

High blood pressure is defined as a systolic blood pressure at or above 140 mmHg and/or a diastolic blood pressure at or above 90 mmHg. High blood pressure causes the heart to have to work harder to push blood throughout the body. (Ramah, 2017). The prevalence of hypertension is still a public health problem. Being female, consuming animal source fat, family history of hypertension, excess salt consumption age greater than 50 years and body mass index  $> 25 \text{ kg/m}^2$  were significant factors of hypertension. Therefore, health sectors should take actions to tackle these modifiable risk factors. (Mihretie et al 2019).

Hypertension is a global public health issue currently. Globally, 40% adults were hypertensive with great regional and residence variations. Similarly, 46% adults in Africa were hypertensive. It contributes to the burden of heart disease, stroke, kidney failure and premature mortality and disability. From cardiovascular disorders, complications of hypertension account for 9.4 million deaths worldwide every year. Hypertension is responsible for at least 45% of deaths due to heart disease and 51% of deaths due to stroke. It is mostly detected incidentally when they are admitted to hospitals. (Asresahegn, 2017). Physical activities cause vasodilatation of the arteries of the skeletal muscles, a decrease in the sympathetic tone with a consequent reduction in the peripheral resistance and BP. (Durrani, 2015).

There are risk factors that increase the chances of developing high blood pressure. Of which, Smoking, Diabetes, Being obese or overweight, high cholesterol, unhealthy diet and physical inactivity can be controlled. However, history of high blood pressure, ethnicity, age and gender cannot be modified. (AHA, 2017).

The rate of having hypertension among who consumed animal fat source foods was six times more likely than who did not consume animal source fat. This was due to the fact that those foods which contain animal fat source foods have saturated fat, which leads excess accumulation of fat in the blood vessels, and it leads to atherosclerosis. Additionally, saturated fat obtained commonly found from animals, is the risk of cardiovascular disorders (Sabour, 2016). The odds of developing hypertension among those who drank alcohol was three times prone to hypertension than their counterparts. This finding was supported by other research findings alcohol consumption is a risk factor for hypertension (Demisse, 2017). This might be due to alcohol consumption is associated with cardiovascular diseases including hypertension. The odds of developing hypertension among females were four times more likely than when compared with those who were males. This might be due to females are more prone to accumulation of fat tissue than males because females have fat mass than lean mass (Demisse, 2017).

According to the World Health Organization (WHO), the prevalence of hypertension is highest in the African Region at 46% of adults aged 25 years and above, while the lowest was found in the American region (WHO, 2010). High prevalence of hypertension has been reported in some recent studies conducted in Nigeria (Onwabere, 2011).

Hypertension is the most common non communicable disease in Nigeria (Familoni, 2004) Hypertension and its complications constitute approximately 25% of emergency medical admissions in urban hospitals in Nigeria (Ekere, 2005). It is the most frequently diagnosed cardiovascular disorder in Nigeria (Ogunniyi, 2001).

An intermediate blood pressure level is described as a blood measurement of 120-139/80-89 mmHg. Stage one (mild) hypertension is defined as a clinic blood pressure measurement of  $\geq 140/90$  mmHg, or an average daytime ambulatory blood pressure measurement of  $\geq 135/85$  mmHg. (NICE, 2011). Stage two (moderate) hypertension is defined as a clinic blood pressure measurement of  $\geq 160/100$  mmHg, or an average daytime ambulatory blood pressure measurement of  $\geq 150/95$  mmHg. (NICE, 2011).

Severe hypertension is defined as a systolic pressure of  $\geq 180$  mmHg, or a diastolic pressure of  $\geq 110$  mmHg. (NICE, 2011). Isolated systolic hypertension is defined as a clinic systolic blood pressure of  $\geq 160$  mmHg and diastolic  $< 90$  mmHg. (NICE, 2011). Isolated diastolic hypertension is defined as a clinic diastolic blood pressure of 90 mmHg or higher and a clinic systolic pressure of less than 140 mmHg. (NICE, 2011)

### **Aim And Objectives**

This research was aimed to determine prevalence of hypertension among adult population in Katsina metropolis Katsina state Nigeria. The following objectives were achieved at the completion of this research:

1. To find the relationship between the marital status and the presence of hypertension among the adults.
2. To find the relationship between the Number of wives and the presence of hypertension among the adults.
3. To find the relationship between smoking and the presence of hypertension among the adults.
4. To find the relationship between stressful lifestyle and the presence of hypertension among the adults.
5. To find the relationship between obesity and the presence of hypertension among the adults.

### **Research Questions**

1. Is there relationship between the marital status and the presence of hypertension among the adults?
2. Is there relationship between the Number of wives and the presence of hypertension among the adults?
3. Is there relationship between smoking and the presence of hypertension among the adults?
4. Is there relationship between stressful lifestyle and the presence of hypertension among the adults?
5. Is there relationship between obesity and the presence of hypertension among the adults?

### **Research Hypothesis**

H01: There is no significant relationship between the marital status and the presence of hypertension among the adults.

H02: There is no significant relationship between the Number of wives and the presence of hypertension among the adults.

- H03: There is no significant relationship between smoking and the presence of hypertension among the adults.
- H04: There is no significant relationship between stressful lifestyle and the presence of hypertension among the adults.
- H05: There is no significant relationship between obesity and the presence of hypertension among the adults.

**MATERIALS AND METHODS**

A cross-sectional design was used for this study. The study population were adults (both sexes) aged 18 years and above. The study participants were selected by cluster sampling technique. Multistage systematic random sampling technique was used to select the required sample households. The sample of the study participants was selected at random from the target population residing in the city.

The survey was executed in two steps. Step one captured socio-demographic characteristics, history of hypertension and behavioral measurements. Stage 2 captured physical measurements, that is; height in meters (m), weight (kg), and BP measurements were measured and recorded in this stage. Hypertension was defined as systolic BP (SBP) if greater than or equals to  $\geq 140$  mmHg and or diastolic BP (DBP) if greater than or equals to  $\geq 90$  mmHg, that is, if greater than or equals to  $\geq 140/90$  mmHg. Body mass index (BMI) was calculated using weight in kilogram (kg) divided by square of height in meters (m). The BMI was classified using WHO classification of BMI.

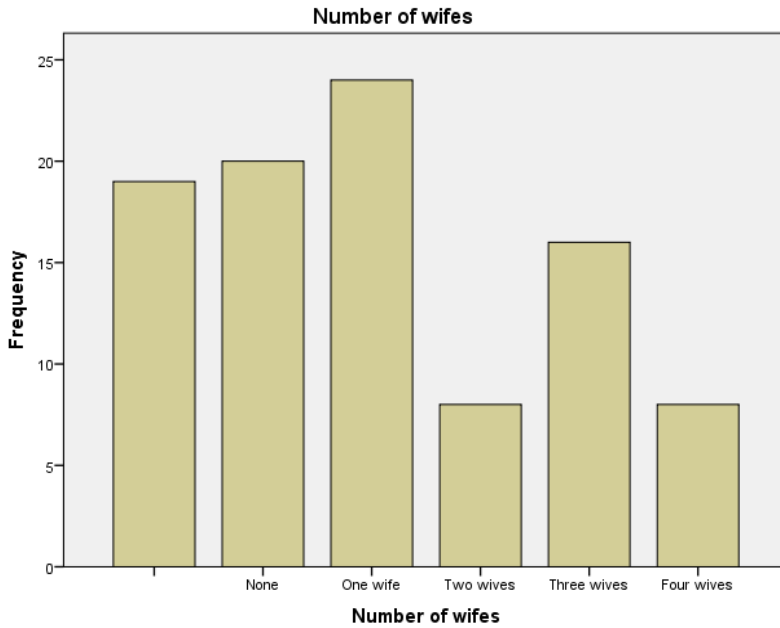
Data was presented using descriptive statistics and analyzed using chi-square test which was used to assess the relationship between the socio demographic factor and the various risk factors and hypertension. *P* value is set at value  $< 0.05$ .

**RESULTS**

**Table 1. Socio demographic information of the respondents**

		Frequency	Percent
Gender	Male	76	80.0
	Female	19	20.0
	Total	95	100.0
Marital Status	Single	23	24.2
	Married	66	69.5
	Divorced	3	3.2
	Widow	3	3.2
	Total	95	100.0
Valid		19	20.0
Number of wives	None	20	21.1
	One wife	24	25.3
	Two wives	8	8.4
	Three wives	16	16.8

The above table summarizes the demographic information of the respondents where 76(80%) of the participants were males while 19(20%) were females. However, 23(24.2%) were singles, 66(69.5%) were married, 3(3.2%) were divorced while 3 (3.2%) were widows. Among the married males, 24(25.3%) has one wife each, 8(8.4%) has two wives, 16(16.8%) has three wives while 8(8.4%) of the married respondents has four wives as shown in figure 1.

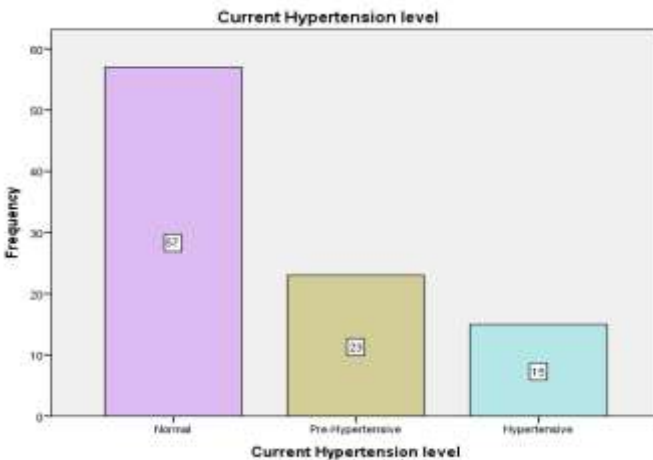


**Figure 1. Distribution of respondents by number of wives**

**Table 2. Respondents' current hypertension level**

		Frequency	Percent
Current hypertensi on level	Normal	57	60.0
	Pre-Hypertensive	23	24.2
	Hypertensive	15	15.8
	Total	95	100.0

Table 4.2 shows the current hypertension level of the respondents where 57(60%) has normal blood pressure, 23(24.2%) were pre-hypertensive while 15(15.8%) were hypertensive as shown in figure 2.

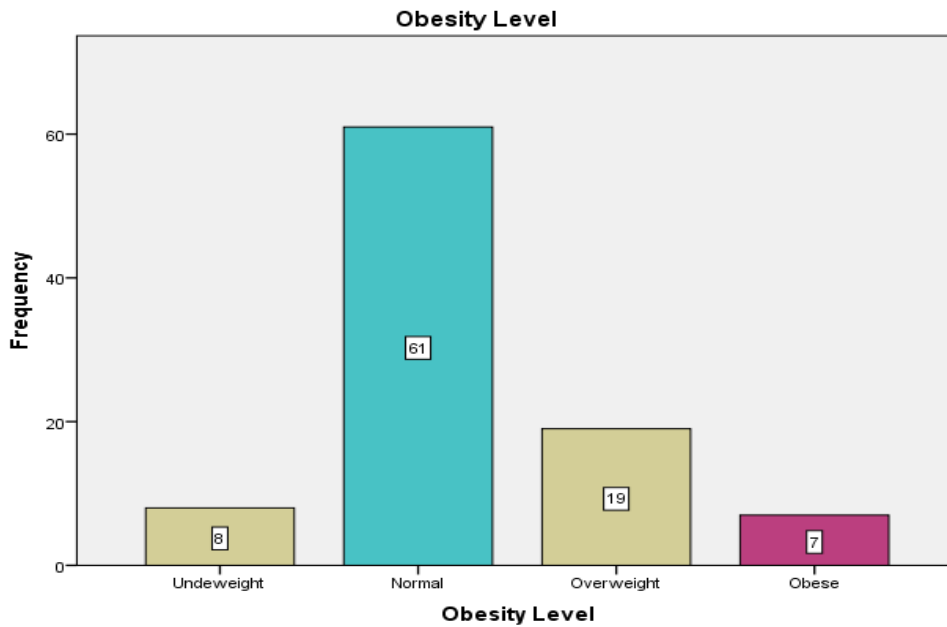


**Figure 2. Respondents' current hypertension level**

**Table 3. Respondents' current Obesity level**

		Frequency	Percent
Respondents' current Obesity level	Underweight	8	8.4
	Normal	61	64.2
	Overweight	19	20.0
	Obese	7	7.4
	Total	95	100.0

Table 3 displays the remarks of the body mass index obtained from the respondents where the results shows that 8(8.4%) of the participants were underweights, 61(64.2%) has normal weight, 19(20%) were overweight while 7(7.4%) were obese as shown in figure 3.



**Figure 3. Respondents' obesity level**

**Table 4. Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Age of the respondents	95	19	62	37.92	13.342
Systolic BP (mm Hg)	95	104	167	122.85	13.598
Diastolic BP (mm Hg)	95	58	106	78.22	11.293
Weight of the respondents	95	42.00	100.00	66.5747	14.41658
Height of the respondents	95	1.55	1.82	1.6905	.09265
Body Mass Index BMI	95	17.24	33.80	23.1859	4.21442
Valid N (listwise)	95				

Table above shows that the minimum age of those examined was 19 years, maximum was 62 years with the mean of 38 years and the standard deviation of 13 years. The minimum systolic blood pressure of those examined was 104 mm Hg, maximum was 167 mm Hg with the mean of 122.85 mm Hg and the standard deviation of 13.598 mm Hg. Similarly, the minimum diastolic blood pressure of those examined was 58 mm Hg, maximum was 106 mm Hg with the mean of 78.22 mm Hg and the standard deviation of 11.293 mm Hg.

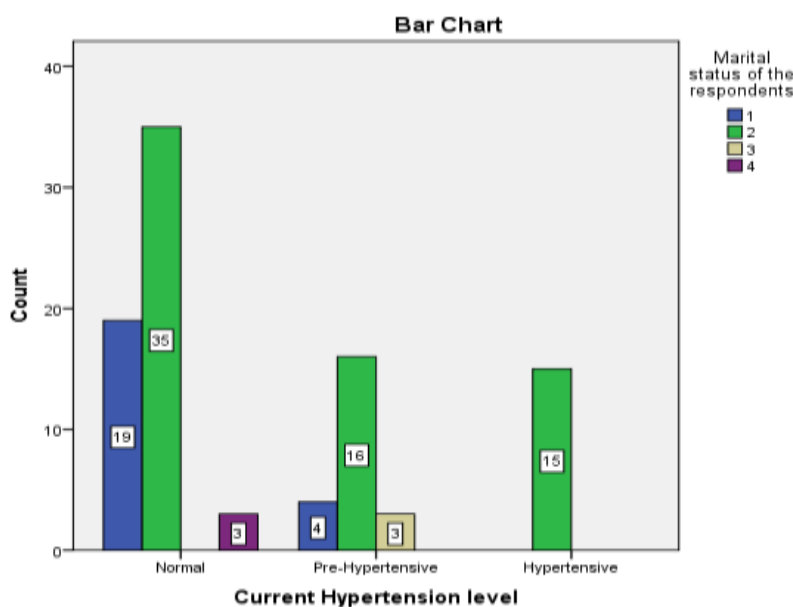
However, the minimum weight of those examined was 42kg maximum was 100 kg with the mean of 66.57 kg and the standard deviation of 14.42kg. The minimum height of those examined was 1.55 metres maximum was 1.82 metres with the mean of 1.69 metres and the standard deviation of 0.09 metres. The minimum Body Mass Index of those examined was 17.24; maximum was 33.80 with the mean of 4.21 and the standard deviation of

**Hypothesis one**

**H<sub>01</sub>:** There is no significant relationship between the marital status and the presence of hypertension among the adults.

N	Pearson Chi-Square	df	Sig (Alpha)	Asymp. Sig. (2-sided)	Remark
95	19.970	6	0.05	0.003	Significant

The result shows that the p-value = 0.003 which is less than the significant value ( $p < 0.05$ ) that is, the result is significant which resulted the rejection of the null hypothesis. It is concluded that there is significant relationship between hypertension and the marital status of the respondents as illustrated by the figure below which shows that those that those that were married were more hypertensive while those that were singles or divorced were mostly pre-hypertensive.



**Figure 4. Marital status of the respondents and their current hypertension level**

**Hypothesis two**

**H<sub>02</sub>:** There is no significant relationship between the Number of wives and the presence of hypertension among the adults.

N	Pearson Chi-Square	df	Sig (Alpha)	Asymp. Sig. (2-sided)	Remark
95	40.955	6	0.05	0.000	Significant

The result shows that the p-value = 0.000 which is less than the significant value ( $p < 0.05$ ) that is, the result is significant which resulted the rejection of the null hypothesis. It is concluded that there is significant relationship between hypertension and the number of wives of the respondents as illustrated by the figure below which shows that majority of those with one wives were either pre-hypertensive or hypertensive followed by those with two or four wives or women.

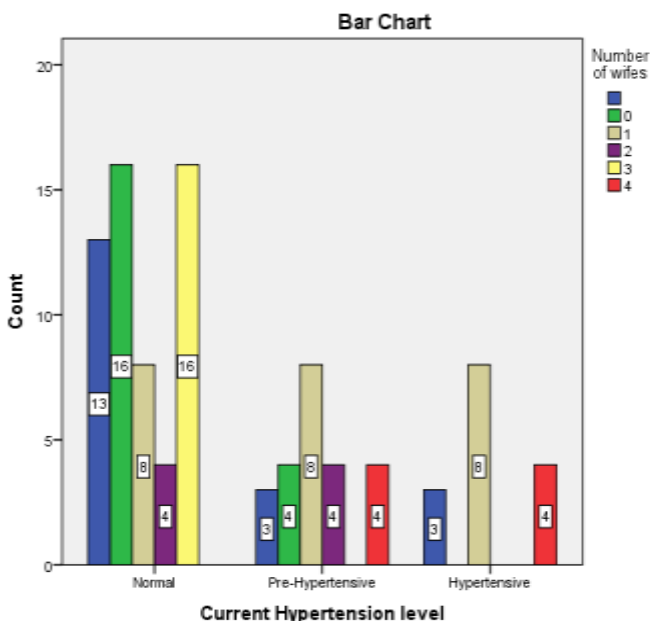


Figure 5. Respondents' number of wives and their current hypertension level

### Hypothesis three

**H<sub>03</sub>:** There is no significant relationship between smoking and the presence of hypertension among the adults.

N	Pearson Chi-Square	df	Sig (Alpha)	Asymp. Sig. (2-sided)	Remark
95	26.426	6	0.05	0.000	Significant

The result shows that the p-value = 0.000 which is less than the significant value ( $p < 0.05$ ) that is, the result is significant which resulted the rejection of the null hypothesis. It is concluded that there is significant relationship between smoking and respondents' hypertension. As shown from the figure below where 9(60%) of those confirmed hypertensive were smokers.

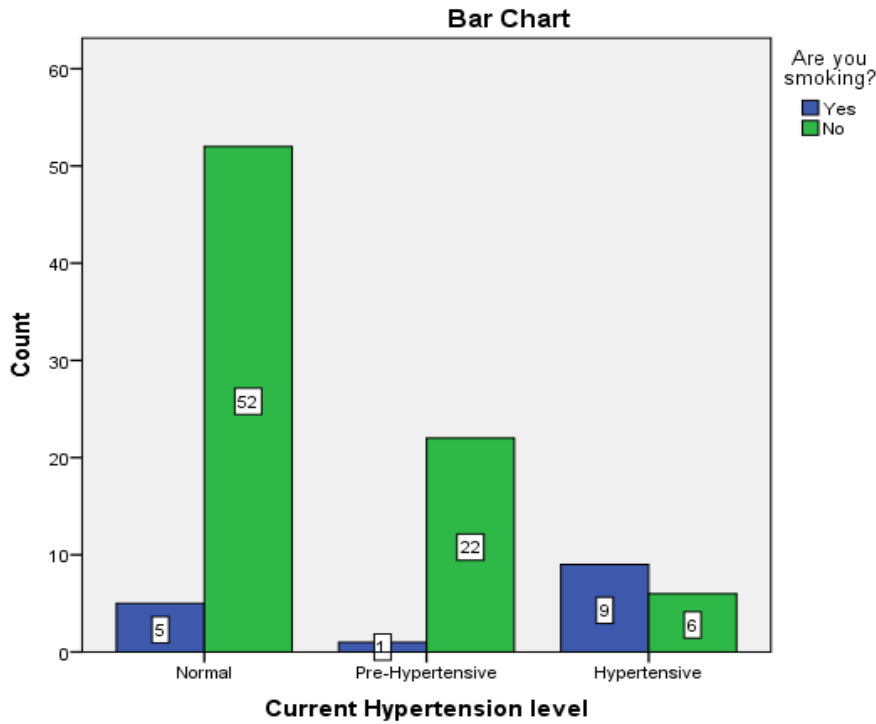


Figure 6. Respondents' smoking and their current hypertension level

**Hypothesis four**

**H<sub>04</sub>:** There is no significant relationship between stressful lifestyle and the presence of hypertension among the adults.

N	Pearson Square	Chi- df	Sig (Alpha)	Asymp. Sig. (2-sided)	Remark
95	12.980	6	0.05	0.002	Significant

The result shows that the p-value = 0.002 which is less than the significant value ( $p < 0.05$ ) that is, the result is significant which resulted the rejection of the null hypothesis. It is concluded that there is significant relationship between hypertension and the stressful lifestyle of the respondents as illustrated by the figure below which shows that among the 15 confirmed hypertensive participants, 11(73.3%) were in stressful lifestyle while 4 (27.7%) were not in stressful lifestyle.



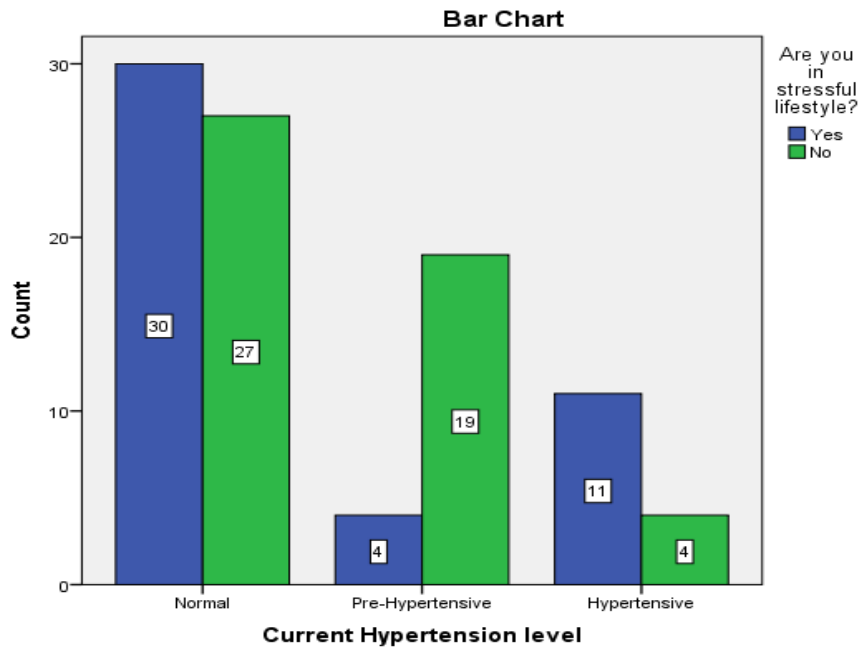


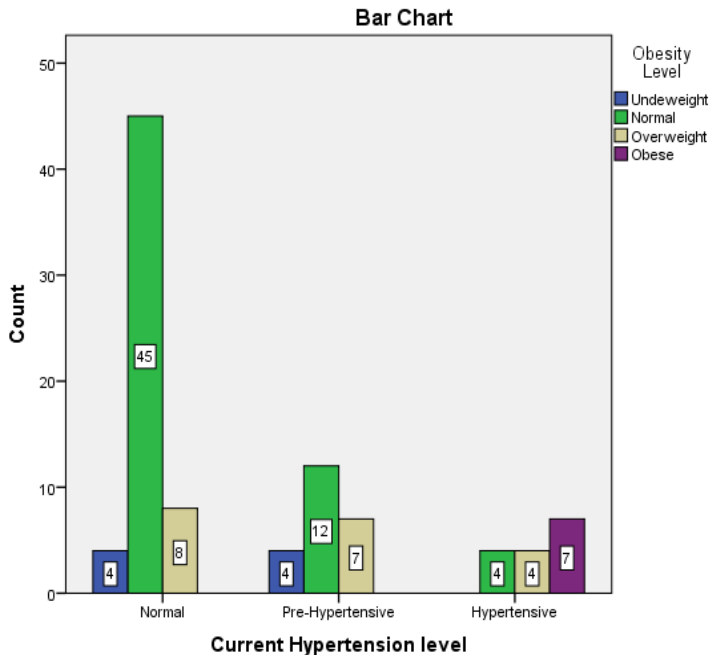
Figure 7. Respondents' stressful lifestyle and their current hypertension level

**Hypothesis five**

**H<sub>05</sub>:** There is no significant relationship between obesity and the presence of hypertension among the adults.

N	Pearson Chi-Square	df	Sig (Alpha)	Asymp. Sig. (2-sided)	Remark
95	49.267	6	0.05	0.000	Significant

The result shows that the p-value = 0.000 which is less than the significant value ( $p < 0.05$ ) that is, the result is significant which resulted the rejection of the null hypothesis. It is concluded that there is significant relationship between respondents' obesity level and hypertension. As illustrated in the figure below among those that were hypertensive, 73% were either overweight or obese.



**Figure 8. Respondents' obesity level and their current blood pressure level**

### DISCUSSION OF FINDINGS

The minimum systolic and diastolic level of the participants was 104mm Hg (<140 mm Hg normal level) and 58mm Hg (<90mm Hg normal level) respectively indicating that some of the adult participants were not hypertensive. The maximum systolic and diastolic level of the participants was 167mm Hg (>140mm Hg normal level) and 106mm Hg (>90mm Hg normal level) respectively indicating that some of the adult participants were hypertensive.

Among the 95 adults that were successfully examined and interviewed, 15 of them were found hypertensive and their socio demographic and behavioral attitudes were studied in respect of their current hypertension level. Five hypotheses were tested at significance value of 0.05. The result shows that the p-values of the five hypotheses were less than the significance value ( $p= 0.003 < 0.05$ ) for the first hypothesis, ( $p= 0.00 < 0.05$ ) for the second, third and fifth hypotheses and ( $p= 0.002$ ) for the fourth hypothesis. This shows that there is significant relationship between hypertension and the respondents' marital status, number of wives, smoking habit, stressful lifestyle and obesity. Furthermore, majority of those with high blood pressure were married and have either one or four wives.

### CONCLUSION

The presence of hypertension among adults in terms of their socio demographic characters was mostly related to their marital status where those that are married are mostly affected or the number of wives where those with one or four wives were mostly affected. There is significant relationship between smoking, stressful lifestyle or obesity and the adults' hypertensive level.

Any socio demographic character that is acceptable that can reduce the level of hypertension should be maintained accordingly. People should maintain consuming healthy diet and avoid high salty food. Quitting smoking, regular exercise and tackling stressful lifestyle could reduce the level of adults' blood pressure.

## REFERENCES

- American Heart Association . What is high blood pressure? South Carolina State Documents Depository. Dallas: American Heart Association; 2017. [[Google Scholar](#)]
- Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al. (2003). Seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure. *Hypertension* 2003;42:1206-52.
- Demisse AG, Greffie ES, Abebe SM, Bulti AB, Alemu S, Abebe B, Mesfin N. High burden of hypertension across the age groups among residents of Gondar city in Ethiopia: a population based cross sectional study. *BMC Public Health*. 2017;17(1):647. doi: 10.1186/s12889-017-4646-4. [[PMC free article](#)] [[PubMed](#)] [[CrossRef](#)] [[Google Scholar](#)]
- Durrani AM, Fatima W. Effect of physical activity on blood pressure distribution among school children. *Adv Public Health* 2015;2015:1-4.
- Ekere AU, Yellowe BE, Umune S. Mortality patterns in the accident and emergency department of an urban hospital in Nigeria. *Niger J Clin Pract* 2005;8:14-8. [[PUBMED](#)]
- Familoni BO, Ogun SA, Aina AO.(2004) Knowledge and awareness of hypertension among patients with systemic hypertension. *J Natl Med Assoc* 2004;96:620-4.
- Mihretie K., Moges W., Habtamu T., Wubetu W., and Yihalem A. B. (2019) Prevalence of hypertension and its associated factors among adults in Debre Markos Town, Northwest Ethiopia: community based cross-sectional study *BMC Res Notes*. 2019; 12: 406. , Published online 2019 Jul 15. doi: [10.1186/s13104-019-4431-9](#)
- National Institute for Health and Care Excellence (NICE). Hypertension: clinical management of primary hypertension in adults. London: NICE; 2011. Available from: [www.nice.org.uk](http://www.nice.org.uk) (Accessed October, 2020).
- Ogunniyi A, Baiyewu O, Gureje O, Hall KS, Unverzagt FW, Oluwole SA, et al. (2001). Morbidity pattern in a sample of elderly Nigerians resident in Idikan community, Ibadan. *West Afr J Med* ;20:227-31.
- Onwubere BJ, Ejim EC, Okafor CI, Emehel A, Mbah AU, Onyia U, et al. (2011). Pattern of blood pressure indices among the residents of a rural community in South East Nigeria. *Int J Hypertens* ;2011:621074.
- Ramah T, Sari KAK. (2017). Overview of adherence and factors related to medication adherence in hypertensive patients at Puskesmas Tembuk 1. *Intisari Sains Medis.*;9(1):37–42. [[Google Scholar](#)]
- Sabour H, Norouzi-Javidan A, Soltani Z, Mousavifar SA, Latifi S, Emami-Razavi SH, Ghodsi SM. (2016). The correlation between dietary fat intake and blood pressure among people with spinal cord injury. *Iran J Neurol*. 2016;15(3):121. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
- World Health Organization. (2010). *Global Status Report on Non-Communicable Diseases 2010*. Geneva, Switzerland: World Health Organization; 2011.