

Hypertension: Prevalence in a Nigerian Adult Population

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Abstract: Background: Hypertension, one of the non communicable diseases of public interest is affecting adults globally with increasing prevalence ravaging adults in developing countries especially in Africa. Hypertension, according to reports has high prevalence, low control rate and cardiovascular complications. Prevalence of hypertension is high in Nigeria and the overall awareness of raised blood pressure among hypertension cases is low in the country. The aim of this study was to evaluate the prevalence of hypertension in undiagnosed adults in Warri metropolis in a developing country of Nigeria. Methods: Total of 420 adults comprising 210 males and 210 females randomly selected across Warri metropolis aged 21-85years were recruited to participate in the study. Blood Pressure was measured using automated digital Sphygmomanometer according to standard method. The results were categorized according to World Health Organization Blood Pressure chart. Results: Total of 42.2% of the population was observed with systolic high blood pressure while 47.1% and 29.1% of the male and female populations were observed with systolic high blood respectively. About 15.0% of the total population was observed with diastolic high blood pressure. Conclusion: Need for both government and non-governmental organizations to increase public health education to increase awareness campaigns for regular community based monitoring of high blood pressure because of the associated risk factors is necessary.

Keywords: Hypertension, systolic, prevalence, adult population, Nigeria

1. Introduction

Hypertension, one of the non communicable diseases of public interest is affecting adults globally with increasing prevalence ravaging adults in developing countries especially in Africa (WHO, 2013; Adeloje and Basquill, 2014; Akinlua *et al.*, 2015 and Fryar *et al.*, 2017). Many individuals in Africa are not aware of their condition (Beaglehole *et al.*, 2011 and Lawes *et al.*, 2000). Hypertension, according to (Adeloje, and Basquill, 2014 and Filho *et al.*, 2015) has high prevalence, low control rate and cardiovascular complications. Worldwide, cardiovascular diseases due to hypertension account for about 17 million deaths, with complications from poorly controlled hypertension resulting in over 7.5 million deaths and 57 million disability adjusted life years (Adeloje *et al.*, 2014, Opie and Seedat, 2005). Non - communicable diseases have been major health burden in the industrialized countries and are increasing rapidly in the developing countries because of changing lifestyles (Adebayo *et al.*, 2011). Prevalence of hypertension is high in Nigeria and the overall awareness of raised blood pressure among hypertension cases is low in the country (Adeloje *et al.*, 2014 and Shola *et al.*, 2013). Stroke accounted for about 10% of deaths internationally and more than 4% of direct healthcare costs in developed countries (Turnbull *et al.*, 2016). Hypertension is a serious medical condition and a public health challenge that significantly increases the risk of heart attack, stroke, kidney failure and blindness and it is one of the leading causes of premature death worldwide (WHO, 2019; Arnett *et al.*, 2019; Fryar *et al.*, 2017 and Ogah *et al.*, 2012). In a report from southern and eastern Nigeria (Ogah *et al.*, 2012), the prevalence of hypertension was similar in men and women while pooled prevalence increased three fold in three decades up to 23%. Coupled with the fact that mild to moderate hypertension is generally asymptomatic (Maruf *et al.*, 2013), awareness of hypertension was generally low with attendant high burden of hypertension related diseases (Ogah *et al.*, 2012). According to Akpan *et al.*, (2016) prevalence of hypertension in Uyo, southern Nigeria was 30% and only

13% were aware of their hypertension status and there was an increasing trend in the proportion of individuals with hypertension in each higher 10 years age group. Hence, the aim of this study was to evaluate the prevalence of hypertension in undiagnosed adults in Warri metropolis in a developing country of Nigeria.

2. Materials and Methods

Warri is oil rich metropolitan city located in the Niger Delta of Southern Nigeria and is highly urbanized. A total of 420 adults comprising 210 males and 210 females randomly selected across Warri metropolis were recruited to participate in the study. Participants were adults aged 21 to 85 years and classified into age groups of 10years up to 70years and 71 to 85years. Adult males and females that were ambulant and generally of good health, with no evidence of a chronic or acute illness were included in the study. Adult males and females that were hospitalized, pregnant women, nursing mothers or obviously ill adults were excluded from the study. Ethical approval was obtained from Ethics and Research Committee of Delta State Health Management Board, Warri Medical Zone, General Hospital Warri, Delta State of Nigeria. Statistical analysis was done using student t-test, ANOVA, Graph Pad prism 6 for software (La Jolla, California, USA) windows with $P < 0.05$ considered as statistically significant. Percentage Blood Pressure deviating positively from reference range was calculated as prevalence. Socio-demographic questions including age, gender, and marital status, known HBP were documented and BP was categorized using WHO BP classification chart as follows:

$100 \leq 120 / 70 \leq 80$ mmHg = Ideal BP

$> 120 \leq 140 / > 80 \leq 90$ = High Normal BP

$\geq 140 \leq 160 / \leq 100$ = Mild HBP

$\leq 180 / \leq 110$ = Moderate HBP

$\geq 180 / \geq 110$ = Severe HBP (WHO, 2018).

Blood Pressure was measured using automated digital Sphygmomanometer (Omron, Vietnam). Each participant was subjected to five minutes rest before blood pressure

measurement. A proper-size cuff of automated sphygmomanometer was wrapped over a bare upper arm of each participant placed at heart level and supported on a table. The participant back was supported and the feet were on the floor. The digital BP machine was switched on for the first reading and this was repeated three times and average of the three readings was recorded as the final reading for systolic and diastolic blood pressure in mmHg (Handler, 2009).

3. Results

Out of the 420 apparently healthy adults tested for blood pressure in Warri metropolis, 42.2 % were observed with systolic high blood pressure, while 47.1% and 29.1% of the male and female population were observed with systolic high blood pressure respectively (table 3.0%). The prevalence of Systolic Ideal, High Normal, Mild, Moderate and Severe HBP was 8.8%, 50%, 27.6%, 9.5% and 4.1% respectively (Table 1.0). Table 1.0 and Figure 1.0 also showed that in the systolic group, the prevalence of high normal BP was highest with 50.0% followed by Mild BP with 27.6% while Prevalence of Moderate and Ideal BP was 9.5% and 8.8% respectively and the lowest prevalence of 4.1% was observed in Severe High Blood pressure. Table 3.0 showed that the Highest Prevalence of ideal, High Normal, Mild, Moderate and Severe Systolic High Blood Pressure was observed in the Age groups of 21-30yrs, 31-40yrs, 51-60yrs and 71-85yrs; 51-60yrs and 51-60yrs respectively. The highest prevalence of Ideal systolic BP of 25.7% was observed in the female age group of 21-30yrs and the highest prevalence of High Normal BP of 71.4% was observed in the female age group of 41-50yrs (Table 3.0 and figure 4.0). The highest prevalence of Mild BP of 48.6% was observed in the male age group of 51-60, 71-85yrs and female age group of 71-85yrs respectively. The highest prevalence of Moderate BP of 22.9% was observed in male age group of 51-60yrs while the highest prevalence of Severe BP of 11.4% was observed in male age group of 41-50yrs (Table 3.0 and figure 3.0). Table 2.0 and figure 2.0 showed that the prevalence of Diastolic BP decreased as degree of BP increased from Ideal to Severe BP. Table 4.0 showed that the highest prevalence of ideal diastolic (91.4%), high-normal (54.3%), mild (25.7%), moderate (14.0%) and severe BP (8.6%) was observed in the male age groups of 21-30yrs, 51-60yrs, 71-85yrs, female age group of 51-60yrs and male age group of 51-60yrs respectively. Figure 5.0 showed that there was no statistically significant relationship between diastolic BP and age groups in males.

Figure 6.0 showed that prevalence of female Diastolic high normal BP increased from 20.0% to 45.7% as age increased from lowest age group 21-30yrs to highest age group of 71-85yrs. No severe diastolic HBP was observed in all the female age groups.

4. Discussion

Our study was focused on Prevalence of hypertension of apparently healthy (undiagnosed) adults in the age group of

21-85yrs unlike some previous works which were combination of hypertension and risk factors such as Obesity, Chronic Kidney Disease and Diabetes Mellitus (Adamu *et al.*, 2015, Adebayo *et al.*, 2011, Oguejio for *et al.*, 2012, Picolli *et al.*, 2017, Cipullo *et al.*, 2011 and Joshi *et al.*, 2011). The prevalence of systolic HBP of 42.2% reported in our study (table 1.0) was higher than 30.6 % reported in Nigeria (Adeloye *et al.*, 2014), higher than 30.0% reported in the southern and eastern Nigeria (Ogah *et al.*, 2012), higher than 30% reported in Uyo, southern Nigeria (Akpan *et al.*, 2016), higher than 26.5% reported in Nigeria (Akinlua *et al.*, 2015), higher than 22.6% reported in Nigeria (Sola *et al.*, 2013). The higher prevalence of systolic hypertension observed in our study might be due to increasing urbanization and westernization with lack of enlightenment and awareness for routine health check in the region. The report in our study was also higher than systolic HBP of 26.4% reported in Uganda (Guwatudde *et al.*, 2015), higher than 22.2% reported in India (Joshi *et al.*, 2011) and 25.2% reported in Brazil (Cupillo *et al.*, 2010). According to their report, a higher percentage of the population was more aware of hypertension and had regular monitoring of their levels of blood pressure. The report in our study was lower than 55.9% reported in Ibadan Nigeria (Adebayo, 2011) which was a population of medical outreach program which must have been a congregation of different medical conditions. The higher prevalence of systolic HBP of 47.1% observed in male population (Table 3.0) against 29.1% observed in the females may not be unconnected with the higher social life style and family pressure in males than in the females. Also men have the peculiarity of not visiting health facilities for health checks. In males, there was increase in prevalence of moderate hypertension as age group increased from 31yrs to 60yrs which relates to active working age groups. In females, systolic mild blood pressure increased as age group increased from 31yrs to 85yrs. Diastolic high normal blood pressure increased from 21yrs-85yrs and mild blood pressure increased from 41 to 85yrs but no similar increase was observed in the male age groups. With the high prevalence of high blood pressure in this study population, there is therefore a need for both government and non- governmental organizations to increase public health education to increase awareness campaigns for regular community based monitoring of high blood pressure because of the associated risk factors such as chronic kidney disease, stroke, cardiac failure and ophthalmic complications.

Tables and Charts

Table 1: Classification of Systolic Blood Pressure in the population studied according to World Health Organization Chart

	Frequency	Percent
Ideal BP	37	8.8
High-Normal BP	210	50.0
Mild BP	116	27.6
Moderate BP	40	9.5
Sever BP	17	4.1
Total	420	100

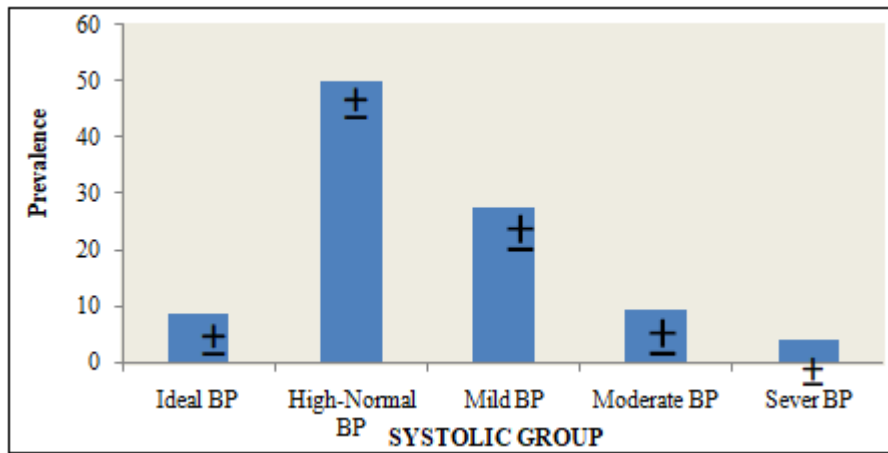


Figure 1.0: Classification of Systolic Blood Pressure in population studied

Table 4.2: Comparison of Sys BP and Dias BP ± SEM based on Age groups

Age Group	21 -30yrs	31 -40yrs	41 - 50yrs	51 - 60yrs	61 - 70yrs	71 - 85yrs	F	P
Parameters								
Sys BP	125.70±1.24 ^a	133.58±2.13 ^b	136.28±2.63 ^{bc}	146.94±2.69 ^d	141.40±1.86 ^{cd}	145.41±2.37 ^d	13.087	0.000
Dias BP	72.18±0.89 ^a	78.58±1.23 ^b	79.45±1.52 ^b	84.98±1.38 ^c	79.05±1.14 ^b	81.82±1.08 ^{bc}	11.979	0.000

Table 2: Classification of Diastolic Blood Pressure in the population studied

DIASTOLIC GROUP	Frequency	Percent
Ideal BP	223	53.1
High-Normal BP	135	32.1
Mild BP	39	9.3
Moderate BP	16	3.8
Sever BP	7	1.7
Total	420	100

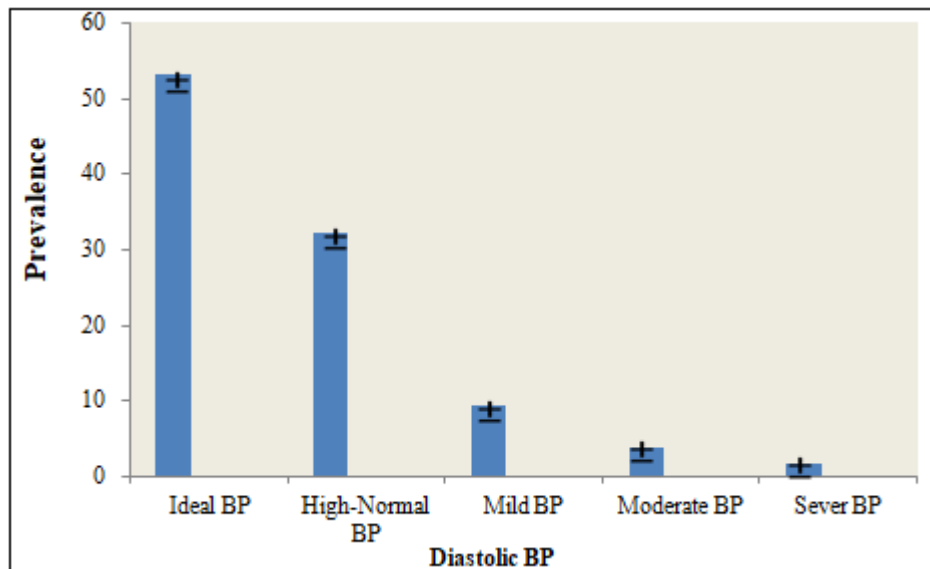


Figure 2: Classification of Diastolic Blood Pressure in population studied

Table 3: Distribution of Systolic BP in Males and Females in varying Age Groups in population studied

Sex	SYS GROUP	Age Group					
		21 -30yrs	31 -40yrs	41 - 50yrs	51 - 60yrs	61 - 70yrs	71 - 85yrs
Male	Ideal BP	5(14.3%)	1(2.9%)	2(5.7%)	0(0.00%)	1(2.9%)	2(5.7%)
	High-Normal BP	22(62.9%)	24(68.6%)	20(57.1%)	8(22.9%)	16(45.7%)	10(28.6%)
	Mild BP	8(22.9%)	6(17.1%)	5(14.3%)	17(48.6%)	13(37.1%)	17(48.6%)
	Moderate BP	0(0.00%)	2(5.7%)	4(11.4%)	8(22.9%)	3(8.6%)	3(8.6%)
	Severe BP	0(0.00%)	2(5.7%)	4(11.4%)	2(5.7%)	2(5.7%)	3(8.6%)
Female	Ideal BP	9(25.7%)	7(20.0%)	4(11.4%)	2(5.7%)	1(2.9%)	2(5.7%)
	High-Normal BP	24(68.6%)	22(62.9%)	25(71.4%)	16(45.7%)	14(40.0%)	13(37.1%)
	Mild BP	2(5.7%)	1(2.9%)	5(14.3%)	9(25.7%)	16(45.7%)	17(48.6%)
	Moderate BP	0(0.00%)	5(14.3%)	1(2.9%)	6(17.1%)	3(8.6%)	2(5.7%)
	Sever BP	0(0.00%)	0(0.00%)	0(0.00%)	2(5.7%)	1(2.9%)	1(2.9%)

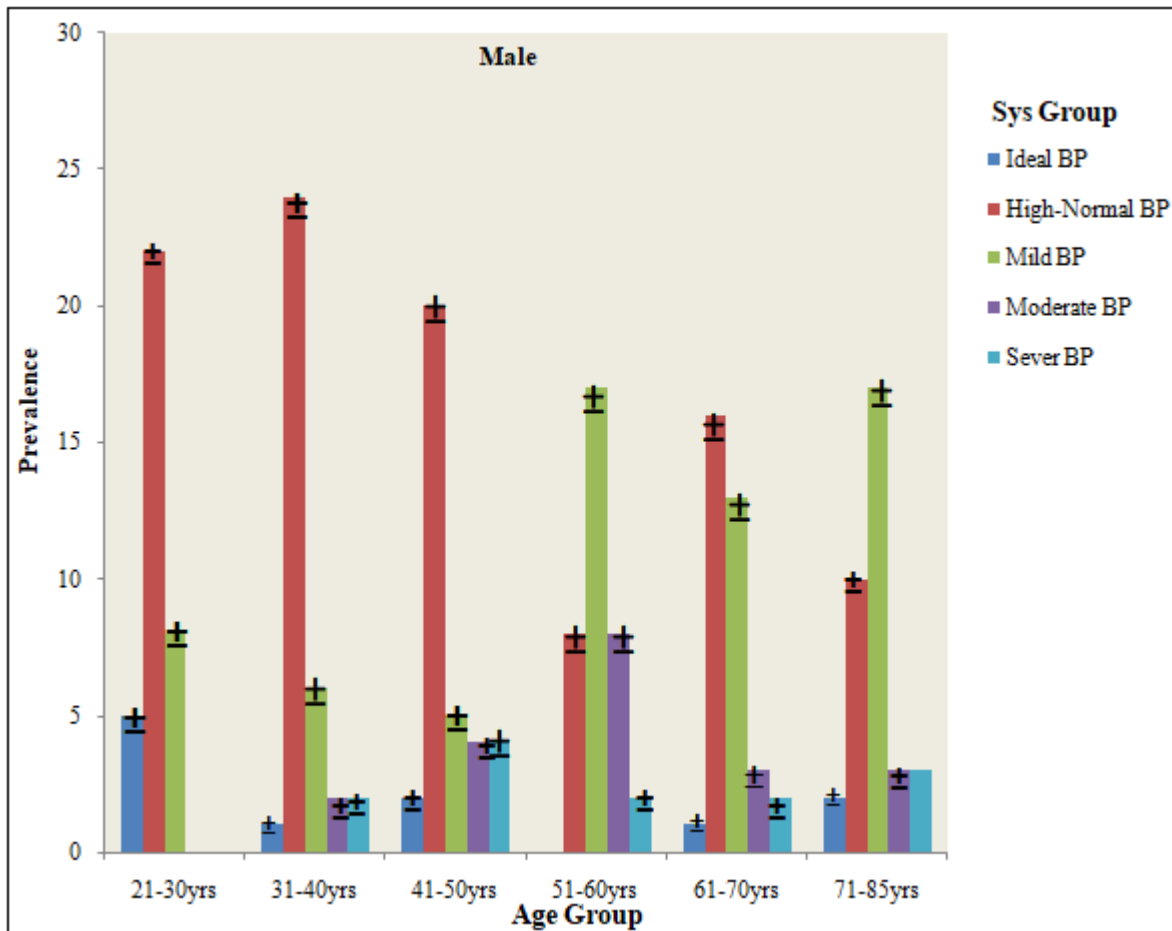


Figure 3: Distribution of Systolic BP classifications in Male subjects in population studied

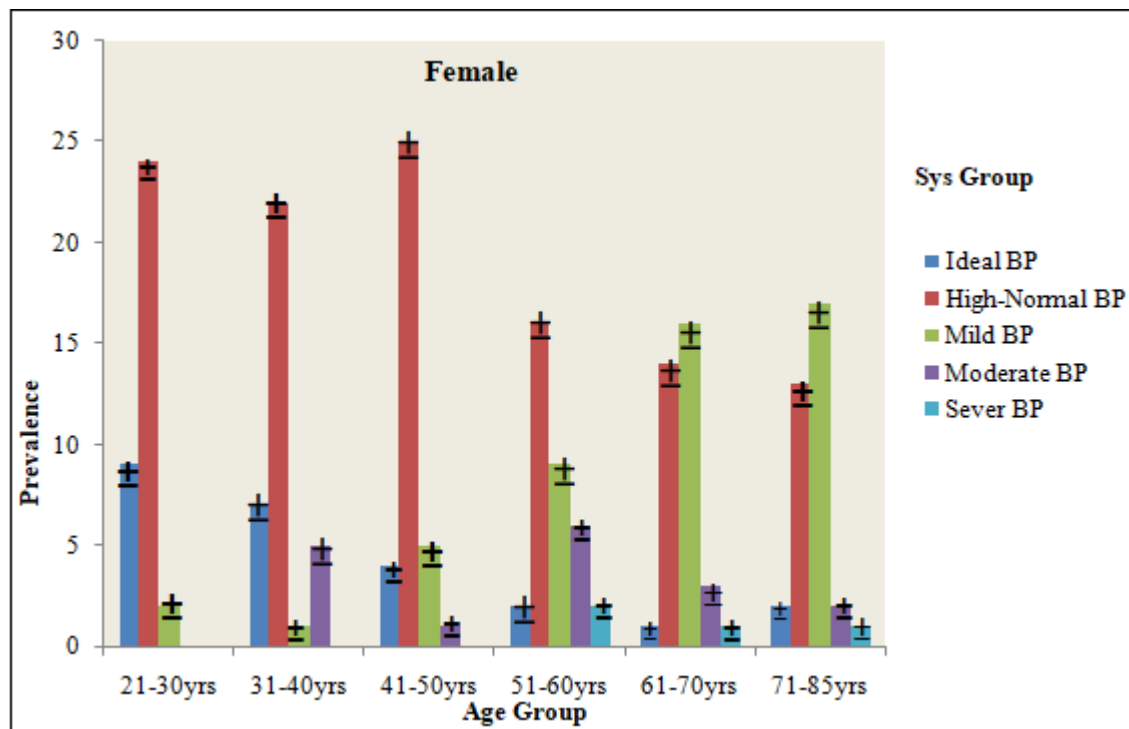


Figure 4: Distribution of Systolic BP classifications in Female subjects in population studied

Table 4: Distribution of Diastolic BP in Males and Females in varying Age Groups in population studied

SEX		Age Group					
		21 -30yrs	31 -40yrs	41 - 50yrs	51 - 60yrs	61 - 70yrs	71 - 85yrs
Male	Ideal BP	32(91.40%)	17(48.60%)	22(62.90%)	6(17.10%)	19(54.30%)	10(28.60%)
	High-Normal BP	3(8.60%)	11(31.40%)	6(17.10%)	19(54.30%)	14(40.00%)	15(42.90%)
	Mild BP	0(0.00%)	5(14.30%)	4(11.40%)	5(14.30%)	0(0.00%)	9(25.70%)
	Moderate BP	0(0.00%)	2(5.70%)	1(2.90%)	2(5.70%)	0(0.00%)	1(2.90%)
	Sever BP	0(0.00%)	0(0.00%)	2(5.70%)	3(8.60%)	2(5.70%)	0(0.00%)
Female	Ideal BP	26(74.30%)	21(60.00%)	20(57.10%)	15(42.90%)	20(57.10%)	15(42.90%)
	High-Normal BP	7(20.00%)	10(28.60%)	10(28.60%)	12(34.30%)	12(34.30%)	16(45.70%)
	Mild BP	2(5.70%)	3(8.60%)	1(2.90%)	3(8.60%)	3(8.60%)	4(11.40%)
	Moderate BP	0(0.00%)	1(2.90%)	4(11.40%)	5(14.30%)	0(0.00%)	0(0.00%)
	Sever BP	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)

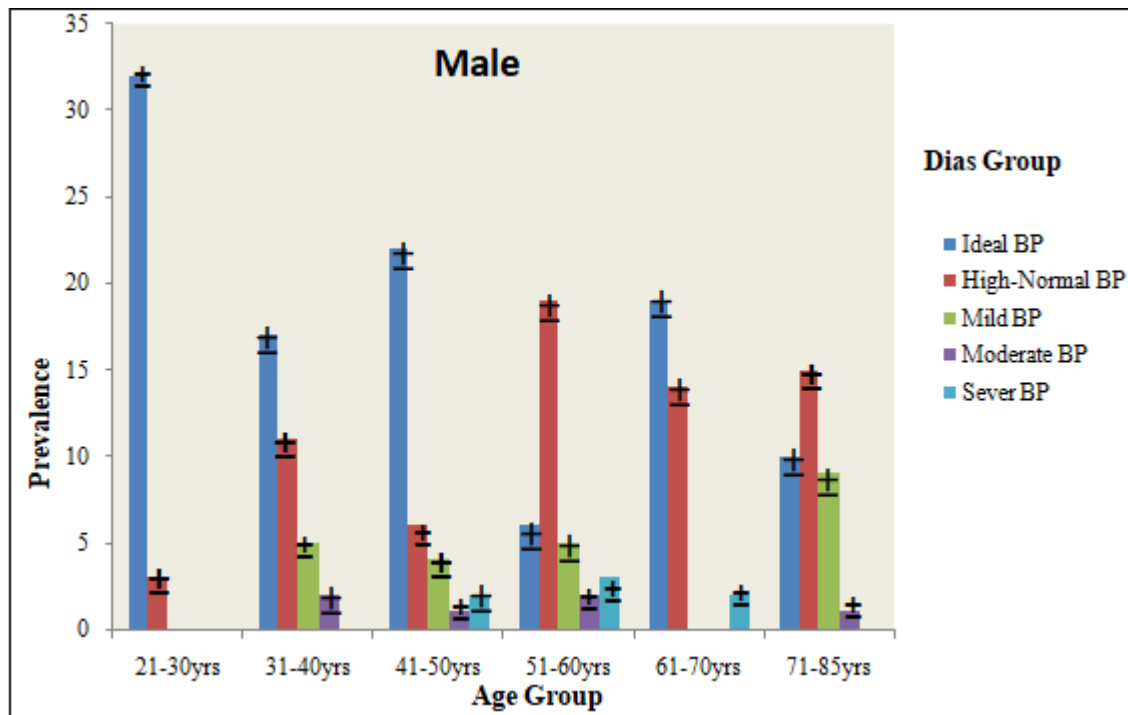


Figure 5: Diastolic Blood Pressure classification in Male subjects in population studied

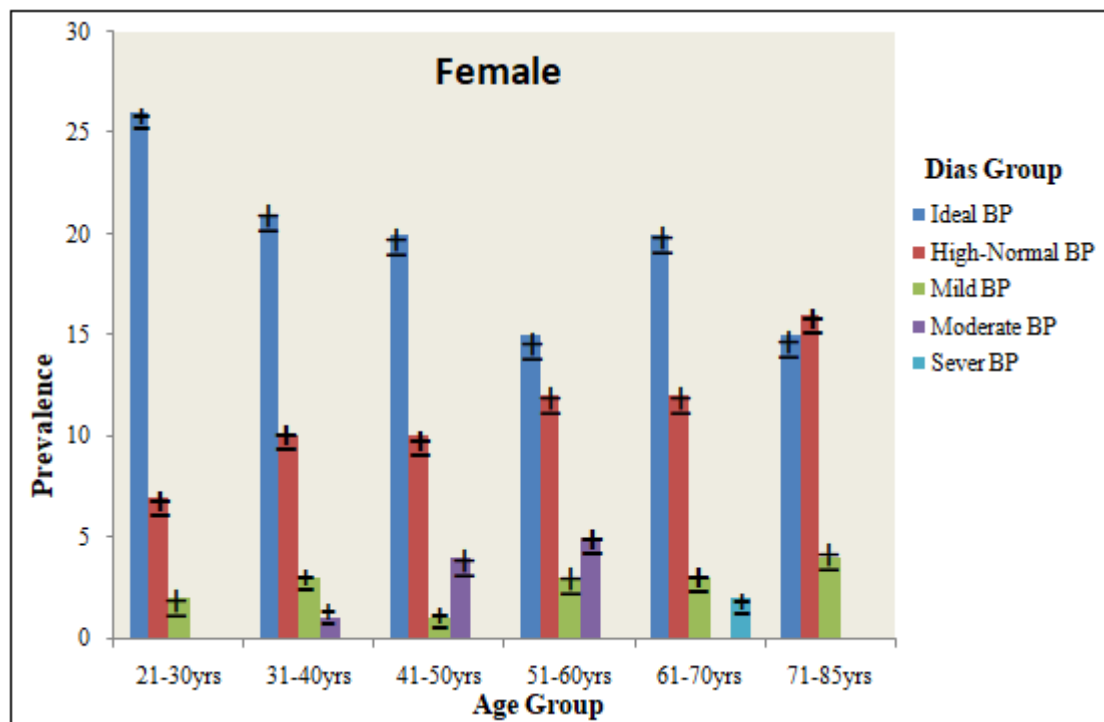


Figure 6: Diastolic Blood Pressure classification in Female subjects in population studies

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