Prevalence of Undiagnosed Hypertension among Medical Doctors in University of Benin Teaching Hospital, Edo State.

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ABSTRACT

AIM

To determine the prevalence of undiagnosed hypertension among medical Doctors in UBTH in order to remind the doctor of the need to care for himself also.

METHODS

A descriptive cross sectional study was conducted among all categories of medical doctors who were in the employ of UBTH as at 2015 and were neither known hypertensives nor were they on antihypertensive drugs. Demographic characteristics, Blood pressure and body mass index (BMI) data were obtained using standard instruments.

RESULTS

There were 280 respondents. Among them, 204 (72.9%) were males while 76 (27.1%) were females. The age range was 24-61 years with modal age group of 30-39 years as they formed 154 (55.0%) of the total respondents. Among all respondents 76 (27.1%) were Consultants, 68 (24.3%) were Senior Registrars, 87 (31.1%) were Registrars while 49 (17.5%) were House Officers.

Out of the 280 respondents, 92 (32.9%) had normal blood pressure (120/80mmHg), 134 (47.9%) were pre-hypertensive ($\geq$ 120/80 and $\leq$ 140/90) while 21 (7.5%) had systolic and diastolic hypertension ($\geq$140/90mmHg). Only 2 (0.7%) respondents had isolated systolic hypertension while 31 (11%) had isolated diastolic hypertension.

CONCLUSION

From this study, 47.9% of Medical doctors were pre-hypertensive while 19.2% had undiagnosed hypertension.

INTRODUCTION

According to global estimates, about 972million adults had high blood pressure in the year 2000 and it is now predicted to rise by 60% to a total of 1.56billion by 2025.[1] Blood pressure has been defined as the force of blood pushing against the walls of the arteries as the heart pumps blood.[1] When this pressure rises and stays high over a period it can damage several tissues and organs in the body.[1] Blood pressure is measured as systolic and diastolic pressures. Systolic refers to blood pressure when the heart beats while pumping blood and diastolic refers to blood pressure when the heart is at rest between beats. Blood pressure is written in numbers with systolic blood pressure above and diastolic blood pressure below such as 120/80mmHg.[1] The unit of measurement (mmHg) is millimetres of mercury.[1] High blood pressure increases your chance of heart disease and it is dangerous because it often has no symptoms.[1]

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Hypertension is relatively well known as a cause of ill health and death across the globe[2-5], accounting for 7% of global disability adjusted life years.[6] Despite increasing awareness of hypertension, however, many people are unaware of their hypertensive status and thus do not seek medical advice[7-9]. The lack of awareness of an individual's hypertensive status is particularly deadly as the frequency and severity of the morbidity and mortality from hypertension are more profound when it remains undiagnosed and consequently untreated.[10] There is a growing body of literature on undiagnosed hypertension with data from various populations and countries.[8,11-15] In Nigeria, the most populous country in Africa and the seventh most populous in the world, data on undiagnosed hypertension have mostly emanated from studies involving different occupational groups.[15,16] A cursory scrutiny of the available studies on occupational groups however shows a preponderance of studies involving workers in the informal sectors such as traders, drivers while data on undiagnosed hypertension involving workers in formal sector such as civil servants is sparse.[15, 16]

High blood pressure is a global health problem, accounting for substantial morbidity and mortality through renal failure, blindness, stroke or heart disease.[17] Worldwide, high blood pressure accounts for about 45% of heart disease, and 51% of death resulting from stroke.[17] High blood pressure that was once rare in sub-Sahara Africa has become a widespread problem with profound socio-economic importance.[17] Evidence has it that the prevalence of high blood pressure and cardiovascular diseases is increasing rapidly in sub-Sahara Africa.[17]

Globally, the prevalence of hypertension is on the increase.[18] 1n 2000, 972 million people had hypertension with a prevalence rate of 26.4% and it is projected to increase to 1.54 billion with a prevalence rate of 29.4% in 2025.[18]

In the past, hypertension was thought to be rare in rural Africa, but as a result of urbanisation, it is becoming more prevalent.[18] A recent study in rural and semi-urban population in Enugu, Nigeria Ulasi et al put the prevalence of hypertension in Nigeria at 32.8%.[18]

In a study done on the prevalence of hypertension and its relationship with indices of obesity in Maiduguri, Northeastern Nigeria, `Gezawa et al found the overall prevalence of high blood pressure to be 32.3%.[19]

According to the 2011/2012 National Health and Nutrition Examination Survey (NHANES) of non institutionalised US population, 36.2% of the population with uncontrolled hypertension are neither aware of their hypertension nor taking anti-hypertensive medications.[20]

In a study conducted among health professionals in two tertiary hospitals in Riyadh, Ahmed et al found a prevalence of undiagnosed hypertension to be 11%.[21]

In a systematic review and meta-analysis on the burden of undiagnosed hypertension in Sub-Saharan Africa, Atakite et al found a prevalence of undiagnosed hypertension to be 73% of the hypertensive individuals.[11]

In a study on the prevalence of undiagnosed elevated blood pressure in Okparabe community in South-South Nigeria by Ganiyu et al, undiagnosed hypertension was found to be 29.8%.[22] In a similar study in Umuahia, South-East Nigeria, Okwuonu et al found a prevalence of undiagnosed hypertension to be 27% of all hypertensive individuals.[23]

METHODS:

A semi-structured questionnaire adopted from Global Physical Activity Questionnaire (GPAQ) and international physical activity questionnaire (IPAQ) were abridged to meet the objectives of this study, and was self-administered by doctors who met the selection criteria to be recruited into the study.

A separate cubicle was created outside the seminar rooms of the various departments where

measurement was done. Blood pressure measurement for all recruited subjects were taken with appropriate precautions thus; (i) it was ensured that no respondent had smoked, drank caffeinated beverages nor exercised within 30minutes before measuring blood pressure.(ii)They were appropriately seated with the spine straight and supported on a chair, feet flat on the floor and arm supported on a flat surface, with the upper arm at the heart level and the middle of the cuff placed directly 1cm above the cubital fossa on a bare arm. Both arms were measured twice after an interval of 5minutes and the mean blood pressure value was recorded as the subject's blood pressure. The systolic blood pressure was recorded at phase 1 Korotkoff sounds, while the diastolic blood pressure was recorded at phase 5 Korotkoff sounds.

Each subject was weighed on a spring type bathroom weighing scale (Hanson model) after adjusting the scale to zero. The weight was taken with the participants/subjects pockets emptied, no shoes on and weight read to the nearest 0.1kg. The height of each of the subjects was measured in metres using a stadiometer. The respondents were bare footed and stood with heels together, arms to the side, legs straight, and shoulders relaxed. The head was positioned in the Frankfort horizontal plane ("looking straight ahead"). The heels, buttocks, scapulae, and back of the head were against the vertical board of the stadiometer. Just before the measurement was taken, each subjects was made to inhale deeply, hold his/her breath, and maintain an erect posture ("stand up tall"), while the headboard was lowered upon the highest point of the head with enough pressure to compress the hair. The measurement was read to the nearest 0.1 cm and at eye level with the headboard to avoid errors due to parallax.

RESULTS

SOCIODEMOGRAPHICS OF RESPONDENTS

Out of the 280total respondents, 204 (72.9%) of respondents were males and 76 (27.1%) were females. The age range was 24-61, with a modal age group of 30-39 as they formed 154(55.0%) of the total respondents. The mean age of all respondents was 36.92 ± 7.10 years.

Of all the respondents, 76 (27%) were consultants, 68 (24.3%) were senior registrars, 87 (31.1%) were registrars while 49 (17.5%) were house officers.

Most of the respondents, {228 (81.4%)} were married, 52 (18.6%) were single.

Table 1: Social Demographic Characteristics of Respondents

Variables	Frequency N = 280(%)
Sex	
Males	204 (72.9)
Females	76 (27.1)
Age group	
20-29	38 (13.6)
30-39	154 (55.0)
40-49	72 (25.7)
50-59	13 (4.6)
60-69	3 (1.1)
Status of doctors	
Consultants	76 (27.1)
Senior registrars	68 (24.3)
Registrars	87 (31.1)
House officer	49 (17.5)
Marital status	
Married	228 (81.4)
Single	52 (18.6)

Prevalence of high blood pressure among respondents:

Out of the 280 respondents, 92(32.9%) had normal blood pressure (blood pressure $\leq$120/$\leq$80mmHg), 134 (47.9%) were pre-hypertensive (blood pressure of $\geq$120/$\geq$80mmHg and $\leq$140/$\leq$90mmHg), 21(7.5%) had both systolic

and diastolic hypertension (blood pressure ≥140/≥90mmHg), 2(0.7%) had isolated systolic hypertension, while 31(11%) had isolated diastolic hypertension.

Table 2: Prevalence of high blood pressure among respondents:

Blood Pressure	Frequency N = 280	Percentage (%)
Normal blood pressure	92	32.9
Pre-hypertension	134	47.9
Both systolic and diastolic Hypertension	21	7.5
Isolated systolic hypertension	2	0.7
Isolated diastolic hypertension	31	11.0
TOTAL	**280**	**100**

Prevalence of high blood pressure by age:

The prevalence of high blood pressure was highest among the respondents in the age range of 50-59years, with a prevalence rate of 38.5% while the lowest prevalence of high blood pressure of 5.2% was in the age range of 20-29 years.

There was a significant association between age and high blood pressure, X^2=13.675, df= 4, P= 0.008.

Table 3: Prevalence of high blood pressure by age

Age Group	Blood Pressure: High Blood Pressure n (%)	Blood Pressure: Normal Blood Pressure n (%)	Total
20-29years	2(5.2)	36(94.8)	38(100.0)
30-39years	26(16.0)	128(84.0)	154(100.0)
40-49years	21(29.1)	51(31.9)	72(100.0)
50-59years	5(38.5)	8(61.5)	13(100.0)
60-69years	0(0.0)	3(100.0)	3(100.0)
Total	54	226	280

X^2=13.675, df= 4, P= 0.008.

Prevalence of high blood pressure by gender:

Among all male respondents, 47(23%) had high blood pressure, while 157(77%) had normal blood pressure.

Of all the female respondents, 7(9.2%) were pre-hypertensive, while 69(90.8%) had normal blood pressure.

There was a significant association between gender and high blood pressure, X^2= 6.802, df=1, P=0.009.

Table 4: Prevalence of high blood pressure by gender

Gender	Blood Pressure: High blood pressure n (%)	Blood Pressure: Normal Blood Pressure n (%)	Total
Male	47(23)	157(77)	204(100.0)
Female	7(9.2)	69(90.8)	76(100.0)
Total	54	226	280

X^2= 6.802, df=1, P=0.009

Prevalence of high blood pressure by cadre of doctors:

Of all the consultants who met the inclusion criteria, 56 (73.6%) of them had normal blood pressure while 20(26.3%) of them had high blood pressure.

Among senior registrars who participated in the study, 55(80.9%) had normal blood pressure while 13(19.1%) of them had high blood pressure.

Most registrars who participated in the study, 70(80.5%) had normal blood pressure while 17(19.5%) had high blood pressure.

Of all the house officers who met the inclusion criteria, 45(91.8%) of them had normal blood pressure while only 4(8.2%) had high blood pressure.

Among the respondents, blood pressure increased as their status (cadre) increased from house officer to consultant.

There was no significant association between high blood pressure and cadre of doctors.

χ^2= 5.405, df= 4, P=0.248

Table 5: Prevalence of high blood pressure by cadre of doctors

Status of Doctor	Blood Pressure		Total
	High Blood Pressure n (%)	Normal Blood Pressure n (%)	
Consultants	20(26.3)	56(73.7)	76(100.0)
Senior Registrars	13(19.1)	55(80.9)	68(100.0)
Registrars	17(19.5)	70(80.5)	87(100.0)
House Officers	4(8.2)	45(91.8)	49(100.0)
Total	54	226	280

X^2= 5.405, df= 4, P=0.248

Prevalence of high blood pressure by BMI

Among overweight/obese respondents, 42(23.5%) of them had high blood pressure, while only 12(11.9%) of respondents with normal BMI had high blood pressure.

With increase in BMI there was an associated increase in blood pressure.

There was a significant association between high blood pressure and BMI, X^2=15.174, df=3, P=0.002

Table 7: Prevalence of high blood pressure by BMI

Body Mass Index	Blood Pressure		Total
	High Blood Pressure n(%)	Normal Blood Pressure n(%)	
Normal BMI	12(11.9)	89(88.1)	101(100.0)
Overweight/Obese	42(23.5)	137(76.5)	179(100.0)
Total	54	226	280

χ^2=15.174, df=3, P=0.002

Prevalence of overweight and obesity among respondents

Of the 280 respondents 101 (36.1%) had normal BMI, 135 (48.2 %) were overweight and 44(15.7 %) were obese.

Table 8: Prevalence of overweight and obesity among respondents

Body Mass Index	Frequency	Percentage (%)
Normal BMI	101	36.1
Overweight	135	48.2
Obese	44	15.7
Total	280	100

4.3.2 Obesity distribution among respondents

Among respondents who were obese, 36(81.8%) had class I obesity, 6 (13.6 %) of them had class II obesity and 2 (4.6 %) had class III obesity (morbidly obese).

Table 9: Obesity distribution among respondents

	Frequency	Percentage (%)
Class I obesity	36	81.8
Class II obesity	6	13.6
Class III obesity	2	4.6
Total	44	100

DISCUSSION

Over 30 years ago, Omran had predicted the displacement of infectious diseases by non-communicable diseases as a major cause of morbidity and mortality as a community or a country develops. This theory has been confirmed by several epidemiological studies in most countries of the world.[24]

In this study, 280 respondents took part with a 100% response rate. All the 280 questionnaires' were appropriately filled and returned. This could be attributed to the high level of motivation of respondents following the presentation of the topic in the various departments visited.

The prevalence of high blood pressure among the respondents was 19.3%.This prevalence of 19.3% in this study, was lower than the prevalence recorded in a study among young Indian doctors where the prevalence of high blood pressure was 35.6%.[25] The lower prevalence of high blood pressure in this study could be attributed to the fact that known hypertensive doctors were excluded from this study.[25]

The prevalence rate of 19.3% recorded in this study is similar to the result obtained from the study among medical school lecturers in Port Harcourt Nigeria where the prevalence of high blood pressure was 21.33%.[24] This finding was not unexpected as both target population had a similar socio-demographic characteristic. However, the target population in the Port Harcourt study were medical consultants with a mean age of 46.06 ± 9.62 years compared with the mean age of respondents in this study of 36.92 ± 7.10 years. Hence the marginal increase in the prevalence of high blood pressure in the Port Harcourt study could be attributed to increased age of respondents.

In this study, there was a higher prevalence of high blood pressure among male doctors 47 (23%) than the female doctors 7 (9.2%). The higher blood pressure in males in this study could be due to the fact stated by Jervase and co-workers that males naturally have a higher blood pressure than females under the age of 60 years.[26, 27, 28, 29]

The prevalence of overweight/obesity in this study was 63.9% {(overweight of 48.2 %, and obesity 15.7 %}. This result is higher than the prevalence of overweight /obesity obtained from a study among medical doctors in Enugu Nigeria (58.0%),[17] and that obtained from a study among young doctors in Indian where the prevalence of overweight/obesity was 55.5%.[25] The disparity in the result of these studies could be due to the fact that in the Enugu study, weight and height measurements were not taken at time of data collection but based on most recent weight and height using a one month recall which may not be accurate. In India, the study was done among young Indian doctors whereas the Benin study involved doctors in all age groups.

The prevalence of overweight/obesity of 63.9% among respondents in this study was also higher than the result of a study among trainee postgraduate doctors of Karachi, Pakistan with a prevalence of overweight/obesity of 50%.[30] This lower prevalence of overweight/obesity in the Karachi study could be due to the fact that the Karachi study involved only trainee postgraduate student doctors, excluding consultants. However this Benin study is similar to what was obtained from the Mangalore study where the prevalence of overweight/obesity among physicians was 69%. This similarity could be due to the fact that both

studies were carried out in a tertiary Hospital setting with similar demographic characteristics.[31]

The prevalence of overweight/obesity (63.9%) obtained from this study is lower than results recorded from the Port Harcourt study with a prevalence of 82.67%.[24] This is attributable to the higher socio economic status of medical consultants than most respondents in the UBTH study who were mainly residents. The result from this study also differs significantly from a study among Canadian Physicians, where only 8% of respondents were obese.[32]

On the other hand, the number of female doctors who were overweight/obese (64.5%) was similar to their male counterparts (63.7%) in UBTH. These results also agree with the results obtained from the Enugu study among medical doctors where the prevalence of overweight/obesity among females (32.6%) and male (27.8%) doctors was also similar. The prevalence of overweight /obesity may have been lower in the Enugu study for both sexes because a higher BMI of $\geq$ 27.3kg/m^2 for females and 27.8kg/m^2 for males was used as a measure of overweight and obesity.[17]

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