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## Comparative study on risk factors for hypertension in a University setting in Southern Nigeria

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**ABSTRACT:** Hypertension is a *silent killer* with obvious preventable risk factors. The study aimed at assessing the risk factors of hypertension in order of prevalence in a university setting located in a semi-urban area (Ekpoma) in Southern Nigeria vis-à-vis comparing the risk factors between the junior staff and senior staff in the setting. The overall crude prevalence was 33% while the prevalence for the junior staff was 23.8% and senior staff was 38.93%. In this study, the mean diastolic hypertension for the male senior staff was  $158.3 \pm 4.5$  and significantly higher ( $P < 0.5$ ) than that for the male junior staff which was  $144.3 \pm 2.5$ . There was no significant difference between diastolic hypertension in female senior staff,  $104 \pm 3.6$ , and female junior staff,  $97.7 \pm 1.6$  ( $P > 0.5$ ). Kolanut was the dominant risk factor in this study and its effect was more pronounced among the senior staff. Other risk factors were excess salt, alcohol, cigarette smoking and sex. The study revealed the importance of assessing the risk factors for hypertension in order of dominance so that appropriate awareness programmes can be strategized to minimize the risk factors for hypertension with a resultant marginalization of the devastating effect of hypertension and its complication.

**Keywords:** Hypertension, Risk factors, Nigeria, University population, Semi-urban.

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### Introduction

Hypertension is a common health problem with widespread and sometimes devastating consequences. Elevated blood pressure often remains asymptomatic until late in its course (1). Hypertension is one of the most important risk factors in both coronary heart disease and cerebrovascular accidents and may also lead to cardiac hypertrophy with heart failure (hypertensive heart disease, aortic dissection and renal failure).

In western societies hypertension is a major risk factor for cardiovascular disease (CVD) - heart disease, stroke and related disease of blood (2,3,4). Cardiovascular disease is the single commonest cause of death in Ireland (5). Although hypertension is a risk factor for other diseases it has own risk factors which range from genetic/familial, socioeconomic, dietary as hormonal, race, sex and age (6).

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Since environmental/dietary factor play key role in the development of hypertension, it may be expected that the order of risk factors in developing countries may be different from that in developed countries and this difference may be extended to senior and junior staff in a university community. Identifying the order may help public health physicians in creating awareness programme and strategizing modalities for reducing preventable risk factors such as kolanut use, excess salt intake, cigarette smoking and alcohol use.

Studies have revealed the prevalence of hypertension in West African population (7,8,9). However, not much have been done to assess the various risk factors in order of prevalence. This comparative study is aimed at assessing the risk factors for hypertension in a university community in Southern Nigeria vis-à-vis comparing the risk factors for senior staff and junior staff. The university community chosen is Ambrose Alli University which is located in Ekpoma; a semi-urban community.

## **Materials and Method**

The materials used for this study were Bathroom Scale Hana BR-9011, Mercury Sphygmomanometer and Standard Stadiometer.

This comparative study was conducted at Ambrose Alli University, Ekpoma, Edo State after obtaining an approval from its ethical committee. A target population of 1,600 academic and non-academic staff who could either be senior staff or junior staff were selected randomly from all faculties and services units of the university.

The purpose of the study was explained to them and they were interviewed using a structured questionnaire that could extract basic socioeconomic and demographic data, positive history of hypertension and possible risk factors for hypertension. Excesses salt was a function of canned salty foods like sardine, intake of salty pastries like “gala” and adding table salt to food on the dinning table. The body mass index BMI which is expressed in  $\text{kg/m}^2$  was used to define gross obesity ( $\text{BMI} > 40\text{kg/m}^2$ ), obesity  $\text{BMI} > 30\text{kg/m}^2$  and overweight  $\text{BMI} > 25\text{kg/m}^2$ , normal weight between  $19\text{kg/m}^2$  and  $25\text{kg/m}^2$  and under weight less than  $19\text{kg/m}^2$ .

Hypertension is defined as a mean systolic blood pressure (SBP)  $\geq 140\text{mmHg}$ , and/or mean diastolic blood pressure (DBP)  $\geq 90\text{mmHg}$ , according to the report of the Joint National committee on detection, evaluation and treatment of high blood pressure (10) and/or by self reports of a medical diagnosis of hypertension or by current treatment for hypertension with prescription medication. Isolated systolic hypertension was defined as SBP of  $140\text{mmHg}$  or more but with a DBP  $< 90\text{mmHg}$ , while isolated diastolic hypertension was defined as a DBP of  $90\text{mmHg}$  or more and SBP  $< 140\text{mmHg}$  according to (11). The subjects were seated comfortably for at least five minutes, an appropriate sphygmomanometer cuff was applied to the right arm and blood pressure was measured using a Standard Mercury Sphygmomanometer. The first measurement was taken after a 10minute rest in a sitting position and was followed by another at the end of the interview. Body weight was measured using Bathroom Scale Hana BR-9011 with the subject barefooted and recorded in kilograms and approximated to one decimal place. Height was measured using a Standard Stadiometer and recorded in meters.

## **Results**

A total of 1,600 subjects formed the target population but only 1,200 respondents were studied. The other 400 were lost as per study protocol. Characteristics of the subjects who completed the study is shown in table 1. Of the 1,200 respondents studied 33% were hypertensive, 38.93% were senior staff while 23.08% were junior staff. Of the 4.6% that made up the incidental findings, 2.7% were senior staff while 1.9% were junior staff. All the obese subjects from the senior and junior staff cadre were hypertensive. Male hypertensive junior and senior staff were 58% and 70% respectively while female hypertensive junior and senior staff were 42% and 30% respectively. There was a significant difference in prevalence of hypertension between male junior staff,  $144.3 \pm 2.5$ , and male senior staff,  $158.3 \pm 4.5$ , ( $P < 0.05$ ). There was no significance difference in prevalence of hypertension between female junior staff,  $97.7 \pm 1.6$ , and female senior staff,  $104 \pm 3.6$  ( $P > 0.05$ ).

Table 2 shows the risk factors for both junior and senior staff in order of prevalence. All subjects who had three or more risk factors were all hypertensive. This group constituted 16% of the hypertensive.

**Table 1:** Characteristics of Subjects.

		<b>Junior Staff</b>	<b>Senior Staff</b>
1	Sex Female Male	384 (32%) 292 (24.3%)	328 (27.3%) 196 (16.3%)
2	Age Female Male	36.70 ± 11.2 33.80 ± 8.4	49.4 ± 7.4 46.4 ± 6.3
3	Marital Status Married Single	392 (44.8%) 284 (23.7%)	484 (40.3%) 10 (3.3%)
4	BMI (Kg/m <sup>2</sup> ) Female Male	25.68 ± 3.2 26.89 ± 5.03	26.11 ± 3.6 28.43 ± 4.79

Values are Mean ± Standard Deviation or Percentage

**Table 2:** Risk factors for Hypertension in Junior and Senior Staff of a University in a semi-urban setting.

<b>RISK FACTORS</b>	<b>HYPERTENSIVE STATUS</b>			
	<b>Non-hypertensive</b>	<b>Diastolic Hypertension</b>	<b>Systolic Hypertension</b>	<b>Diastolic systolic Hypertension</b>
Kolanut Junior Staff Senior Staff	52.3% 48%	36.4% 46%	0% 4%	11.3% 2%
Excess Salt Junior Staff Senior Staff	77.2% 53.1%	17.5% 34.7%	0% 0%	5.3% 12.2%
Cigarette Smoking Junior Staff Senior Staff	63.6% 63.6%	33.3% 33.3%	0% 0%	3% 3%
Alcohol Junior Staff Senior Staff	57.6% 54.3%	39.5% 37.6%	4.7% 6.2%	0% 0%

## Discussion

Hypertension is a cardiovascular disease and a *silent killer* with obvious risk factors which can be prevented. It is a common public health problem and the overwhelming socio-economic implications of its complication cannot be overemphasized. However, potential hypertensives or hypertensives are infected by the *silentness* of this cardiovascular disease until the complication surfaces. There is therefore need to create enlightenment programmes that will emphasize the contribution of preventable risk factors to the development of hypertension as well as instituting practicable measures that will encourage and ensure routine blood pressure checks.

This study revealed the contribution of various risk factors among the senior staff to be in the order of kolanut > excess salt > alcohol > cigarette smoking while for the junior staff, it was in the order of kolanut > alcohol > cigarette smoking > excess salt. The study therefore established kolanut as the commonest risk factor for hypertension in both categories of staff. Being a semi-urban setting, kolanut may have taken the lead because it is readily available, affordable, acceptable and portable. However, the contribution of kolanut as a risk factor for hypertension was more pronounced in the senior staff cadre because they might be consuming more than the junior staff. This increased consumption of kolanut might be a way of exploiting the caffeine it contains as an antidote to stress and to enhance work activity. Studies have shown that caffeine is a major chemical constituent of kolanut (12) and it enhances blood pressure increase. Repeated daily blood pressure invasion and increases in stress activities caused by caffeine consumption could contribute to an increased risk of coronary heart disease in adult population (13).

Again, the increased blood pressure effect of kolanut seen in the senior staff category may have been exaggerated by the sympathetic adrenal medullary responses to the stressful event of their work and the statutory attendant problem outside the work environment. The increased blood pressure as a function of sympathetic adrenal medullary responses/stress is further elaborated by the 4% systolic hypertension seen in the senior staff category as against 0% in junior staff category.

Excess salt was the second commonest risk factor for hypertension in the senior staff category while it was the fourth commonest risk factor for the junior staff. This may be traceable to transition to the western feeding habit which is more likely to be adopted by the senior staff.

This study revealed a strong positive association between obesity and hypertension. All staff that were obese were correspondingly hypertensive. This is consistent with a study which revealed that obesity is now recognized as an independent risk factor for cardiovascular diseases such as hypertension (14).

The high prevalence rate of hypertension among the male senior staff relative to male junior staff suggest that the male senior staff are more likely to be involved in consumption of high fat diet, processed food and a sedentary life style (15). The stressful work target and sex may be complementary factors.

### *Conclusion*

This study has shown hypertension to be associated with risk factors such as kolanut consumption, alcohol use, cigarette smoking and excess salt with kolanut consumption been the predominant risk factor. One can reduce the prevalence and the overall burden of its complication through changes in living habits including not using kolanut as an antidote to stress or to enhance activities, reduced cigarette smoking, altered dietary habit with no added salt on the dining table, reduced consumption of cholesterol and other saturated animal fat and routine blood pressure check.

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