

# Assessment of Anthropometry and Blood Pressure as Indicators of Health Status of Workers in Redeemer's University, Ede, Osun State, Nigeria

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## ABSTRACT

**Introduction:** Overweight and obesity are associated with high blood pressure (BP), and the combination of these factors contributes to the manifestation of non-communicable diseases which are common illness in the developing world. Health threats in the form of infectious diseases, malnutrition, and other chronic diseases such as hypertension, diabetes, and cancer are cause of high morbidity and mortality among human beings throughout the world today. **Methodology:** This study examined the hospital workers in Redeemer's University and assessed their body mass index (BMI) to identify health problems of employees. Two hundred and forty workers were recruited for the study. Their weight (kg) and height (m) were measured for BMI calculation. BP measurement was taken. **Results:** The result of this work revealed that majority of the workers (58.3%) are overweight, 21.7% are obese, while 1.7% are extremely obese. A lot of the respondents had Grade 1 and Grade 2 high BP. **Recommendations:** It is recommended that workers' general knowledge of nutritional and health education should be increased through health programs such as physical exercise, sports and fitness, nutrition education, health and safety, healthy lifestyle, and how to calculate the BMI for weight control.

**Key words:** Anthropometry, blood pressure, cardiovascular disease, healthy lifestyle, hypertension

## INTRODUCTION

Many studies have confirmed a relationship between high body mass index (BMI) and high blood pressure (BP).<sup>[1,2]</sup> According to Ramalingam and Chacko,<sup>[3]</sup> many environmental and genetic factors play a significant role in the causation of high BP such as the age, gender, body size, BMI, physical activity, diet, and stress levels. The clinical effects of these two diagnoses put an individual which possess them in state of chronic diseases such as obesity, diabetes, and cardiovascular diseases. The World Health Organization (WHO) defines overweight as a BMI of 25 kg/m<sup>2</sup> or greater and obesity as a BMI >30 kg/m<sup>2</sup>. BMI is a useful tool to determine body fatness, overweight, and obesity which are associated with metabolic disease risks.<sup>[4,5]</sup>

BMI of healthy weight is between BMI of 18.5 and 24.9.<sup>[6]</sup> Most people within this range have very few health risks which are typically associated with too-low or too-high body weight. Health risks increase as BMI falls below 18.5 or rises above 24.9, reflecting the reality that both underweight and overweight impair health status. The BMI values are also most accurate tool in assessing degrees of obesity.<sup>[7]</sup> BMI is calculated when weight in kg is divided by height in m<sup>2</sup>. The classification of BMI is as follows:

- 18.5 kg/m<sup>2</sup> or less = Underweight
- 18.5–24.95 kg/m<sup>2</sup> = Normal
- 25.0–29.9 kg/m<sup>2</sup> = Overweight
- 30.0–39.9 kg/m<sup>2</sup> = Obese
- 40 or greater = Extremely obese.

BP is measured with the use of sphygmomanometer, and the complete reading involves systolic and diastolic BP

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for an individual. According to the WHO, a normal BP reads <120 mmHg for systolic BP (SBP) and 80 mmHg for diastolic BP and high BP (hypertension) sets in when BP reading is 140/90 mmHg and above.<sup>[8]</sup>

Hypertension is one of the chronic non-communicable diseases which threaten the health of people in the world, especially in developing countries, particularly the black race.<sup>[9]</sup> Its overall prevalence was 44.9% in Nigeria.<sup>[10]</sup> In 2013, an elaborate classification of BP is provided by the European Society of Hypertension and the European Society of Cardiology. This is presented in Table 1.

Health as defined by the WHO<sup>[11]</sup> is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. At a minimum, health means freedom from physical, mental disturbances, emotional distress, spiritual discontent, social maladjustment, and other negative states. At maximum, health means wellness.<sup>[11]</sup>

Health is the level of functional or metabolic efficiency of a living organism. It is the general condition of a person's mind and body, to be free from injury, pain, and illness.<sup>[12]</sup> This implies that individuals that have high BP or high/too low BMI are far from being in good health.

The two broad aspects in which health is grouped are physical health and mental health. Physical health describes a body which is healthy due to regular physical activity (exercise), good nutrition, and adequate rest. It also refers to physical well-being, which a person can achieve by developing all health-related components as lifestyle. This involves structural and chemical healthy states of the body.<sup>[13]</sup>

Mental health refers to people's cognitive and emotional well-being. According to Frank and WHO,<sup>[11]</sup> mental health is a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.

Sedentary lifestyle is a major contributor of excessive weight gain and obesity which are risk factors of high BP.<sup>[14]</sup> However, eating balanced diet (adequate proportion of each nutrient in daily diet) and engaging in physical activity are important to good health as they would enable an individual to maintain good nutritional status and healthy weight.<sup>[15]</sup>

Chronic diseases such as Type-2 diabetes, high cholesterol, high BP, and joint pains were found to be adequately managed and reduced by eating correct portions of balanced meal coupled with physical activity. It has been found out that through education on healthy eating people made healthy food choices which enabled them to have healthy lifestyle.<sup>[16]</sup>

This study aims to evaluate the anthropometric and BP measurements of the hospital workers in Redeemer's University (RUN), Ede, Osun State, Nigeria, and to infer the possible health challenge, the workers might be suffering from.

The BP category is defined by the highest level of BP, whether systolic or diastolic. Isolated systolic hypertension should be graded 1, 2, or 3 according to SBP values in the ranges indicated.<sup>[17]</sup>

## METHODOLOGY

Two hundred and forty respondents were assessed in the Hospitality unit of RUN at Ede, Osun State, Nigeria. Measurement of weight and height was introduced to respondents initially, followed by calculation of the BMI. A nurse from the RUN Clinic took the BP of the respondents. Each respondent took adequate meal prepared by hospitality students.

The respondents are staff in RUN male and female, and their grade level ranges between 2 and 5. All the respondents are married; their age range is between 40 years and 60 years.

## RESULTS

The result of anthropometric measurement of the respondents is presented in Figure 1. It was found out that majority

**Table 1: Definitions and classification of blood pressure levels**

Classification	SBP (mmHg)	Diastolic blood pressure (mmHg)
Optimal	<120	<80
Normal	120–129	80–84
High normal	130–139	85–89
Grade 1 hypertension	140–159	90–99
Grade 2 hypertension	160–179	100–109
Grade 3 hypertension	≥180	≥110
Isolated systolic hypertension	≥140	<90
Isolated systolic hypertension with widened pulse pressure	≥160	≤70

(58.3%) of the respondents were overweight having BMI between 25.0 and 29.9 kg/m<sup>2</sup>. 21.7% of them were obese that is having BMI within 30.0–39.9 kg/m<sup>2</sup>. 1.7% of the respondents were extremely obese having BMI >39.9 kg/m<sup>2</sup>. 8.3% of the respondents were underweight with the BMI <18.5 kg/m<sup>2</sup>. Only (10%) of the respondents had normal BMI which ranges 18.5–24.9kg/m<sup>2</sup>.

On the BP measurement of the respondents, the reading of SBP of the respondents revealed that 35.0% of them were in optimal level, 29.6% had normal SBP, only 1.3% had high SBP, 13.3% of the respondents had Grade 1 SBP, 12.5% had Grade 2 SBP, and 8.3% had Grade 3 SBP [Figures 2 and 3].

## DISCUSSION

This study assessed BMI and BPs of workers in RUN. The result shows that large number of the respondents

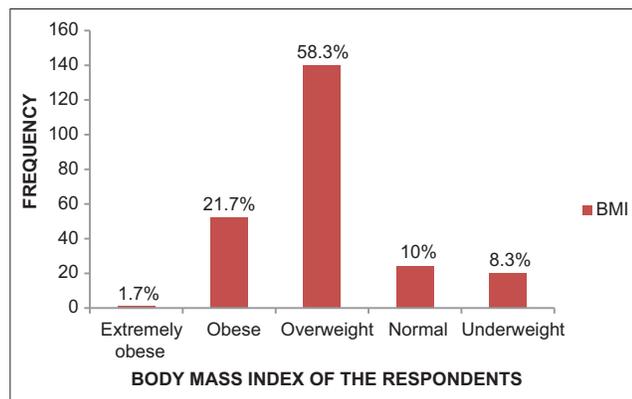


Figure 1: Summary of body mass index of the respondents

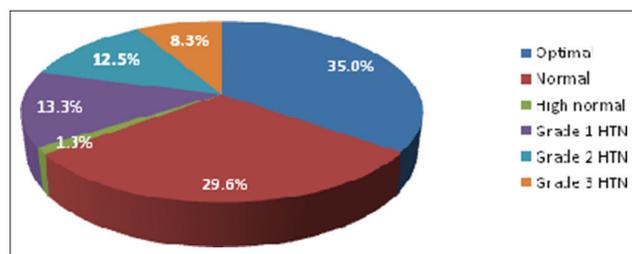


Figure 2: Systolic blood pressure of the respondents

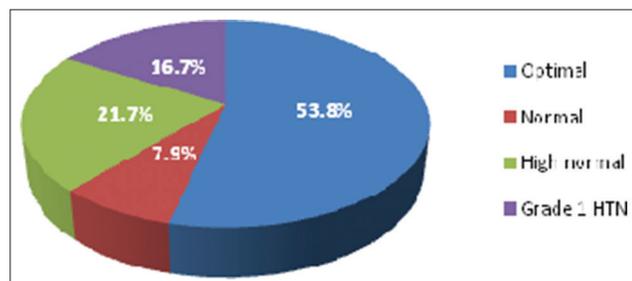


Figure 3: Diastolic blood pressure of the respondents

were overweight with very high BP while the BP of few of them were normal, 21.7% were obese, while 1.7% of the respondents were extremely obese with extremely high BP. This could be due to poor nutrition and lack of regular physical activities. This corroborates the report of Adediran *et al.*<sup>[1]</sup> in Abuja where hypertension is found common among the overweight and obese. What people eat or drink, physical activity, and how they cope with stress play an important role on our physical and mental well-being. People stay healthy or become ill often as a result of their own action or behavior on personal hygiene, balanced meal, and other health-related behaviors which make an individual keep fit and cope with stress.<sup>[18,19]</sup>

An individual could be hypertensive by falling a victim of the categories of BP levels. In optimal category, an individual who is having SBP could be measured <120 mmHg while diastolic BP patient could be <80 mmHg. If an individual is normal under SBP and diastolic BP, it could be 120–139 (mmHg) and 80–84 (mmHg), respectively.

For high normal category, the condition could result to 130–139 mmHg (SBP) and 85–89 mmHg for patient with diastolic BP. Hypertension could be Grade 1, when an individual has 140–159 (mmHg) and 90–99 (mmHg), respectively. Grade 2 hypertension is more serious condition with 160–179 mmHg/SBP and 100–109 (mmHg) diastolic BP.

The result of Grade 3 hypertension record >180 mmHg (SBP) and >110 mmHg with diastolic BP. Furthermore, there are cases of isolated systolic hypertension with >140 mmHg and 160 mmHg, respectively. For cases of isolated hypertension, <90 mmHg and <70 mmHg were recorded, respectively [Tables 2 and 3].

Table 2: SBP of the respondents

SBP	Percentage
Optimal	35.0
Normal	29.6
High normal	1.3
Grade 1 HTN	13.3
Grade 2 HTN	12.5
Grade 3 HTN	8.3

HTN: Hypertension, SBP: Systolic blood pressure

Table 3: Diastolic blood pressure of the respondents

Diastolic blood pressure	Percentage
Optimal	53.8
Normal	7.9
High normal	21.7
Grade 1 HTN	16.7

HTN: Hypertension

## CONCLUSION

The study had increased the workers' knowledge on nutritional diseases, physical activity, and how to calculate their BMI to avoid overweight and obesity. It also led to change in their behavior to make right choices of their food intake. In addition, it has changed the staff behavior on sedentary and unhealthy behavior and lifestyle.

### Recommendations

- Workers are advised to use exercise guidelines based on the ability of individuals
- Be physically active for 5 min, progress gradually and be active for 30 min, if you are uncomfortable at this stage stop
- Do one set of eight (8) repetitions twice a week progressively, breathe in and out after the exercise
- To balance, start easy by holding on a table or chair with one hand; progressively do not hold on any object as you close eyes. Do strength exercises as you progress with balance
- Start flexibility by holding stretch 3 times for 10 min, gradually progress to 30 min by holding stretch for 5 min and finally straighten 3 times a week for 20 min
- Sports and fitness and gymnastic sections should be put in place for workers in their places of work.

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