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Assessment of Blood Pressure, Pulse, and Body Weight of Selected Staff and Students of Federal University Wukari, Nigeria

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Abstract

This research study assessed the body weight, pulse and blood pressure of some staff and students of Federal University Wukari, Taraba State, Nigeria. A total of eighty-six people were used for the purpose of this research. They comprised of forty-three members of staff and forty-three students of Federal University Wukari, Nigeria. The members of staff and students' blood pressures, pulse and body weights were checked and recorded. The equipment used for this research are Wrist Digital cs70 Sphygmomanometer and a digital personal weighing scale (PH-2015A). The results showed there is a significant difference ($p<0.05$) between the mean body weight, systolic and diastolic readings of the staff and students. There is no significant difference ($p>0.05$) between the mean pulse of the staff and students. The mean body weight, systolic, diastolic and average blood pressure of the staff are higher than that of the students, while the average pulse of the students is higher than the average pulse of the staff. The blood pressure of thirty-two (32) staff is within the normal range. The blood pressure of seven (7) staff is slightly high, while the blood pressure of four (4) staff is high. The blood pressure of forty (40) students is within the normal range. The blood pressure of two (2) students is slightly high, while the blood pressure of one (1) student is slightly low. The findings of this study showed that the mean body weight of the members of staff is significantly higher than that of the students. More body mass and/or bone mass may be building up as age progresses during adulthood. The pulse of most of the staff and students are normal, showing that the hearts of the staff and students are functioning properly. The average blood pressure of both the staff and students are within the normal range, showing that most of the staff and students may not be facing any cardiovascular disease challenge which may arise as a result of hypertension or hypotension.

Keywords: Blood pressure, Body weight, Cardiovascular disease, Hypertension, Hypotension, Pulse.

Introduction

Cardiovascular disease (CVD) is the leading cause of death not only in industrialized and developed countries, but also in developing societies. Changes in lifestyle of the population living in developing countries, which is due to the socioeconomic and cultural transition, are vital reasons for increasing the rate of CVD. This observation has led to extensive research on prevention. Diagnosing the risk factors and predictors of CVD can help us detect high risk patients and prevent the disease, effectively. Nowadays, with a rapid progress in medical technology and diagnostic tools, more predictors are being added to the previous list of CVD risk factors. Therefore, there is need for updated risk assessment methods to screen high risk individuals early in their life. Cardiovascular diseases (CVDs) are seen as one of the leading causes of death worldwide, especially in developing countries. Most of which could result from lack of routine medical check-up exhibited by citizens. However, this negligence might be due to economic status of such nations, nature of their work (labour), and most often, when there is no symptom to account for their health status. The prevalence of CVD risk factors in Latin America for instance is estimated to be considerably high, with 23.8% of men and 18.0% of women having high blood pressure, 57.1% of men and 58.3% of women being overweight or obese, 7.5% heavy drinkers, 15.8% reported to be current smokers, and 31.2% of adults characterized by insufficient physical activity (WHO, 2017). The WHO has again reported that about 17.3 million people have died of CVD in 2016 and that this number will reach up to 23.3 million by 2030 (WHO, 2019). Aside increase blood lipid, smoking, and alcohol consumption, other factors which are also known to be associated with cardiovascular diseases includes increase in blood pressure, pulse, and body weight and it is ideal fact that most often, people usually care less when it comes to diagnosing for these parameters.

Pulse is one of the most reliable indicators of body status in terms of health and disease, and the best sign by which the heart can be evaluated. Moreover, the vital concept of "blood production and distribution," cannot be fully assessed without appraising the pulse. There are numerous factors that can influence body weight. The individual has no control over some of these factors, including developmental determinants, genetic makeup, gender, and age. Other factors that influence body weight over which the individual has potential control include level of physical activity, diet, and some environmental and social factors.

Hypertension has been among the most studied topics of the previous century and has been one of the most significant comorbidities contributing to the development of stroke, myocardial infarction, heart failure, and renal failure. The definition and categories of hypertension have been evolving over years, but there is a consensus that persistent BP readings of 140/90 mmHg or more should undergo treatment with the usual therapeutic target of 130/80 mmHg or less (Iqbal & Jamal, 2022). Pressures above this level are associated with an escalating risk for the development of arteriosclerosis, left ventricular hypertrophy, nephrosclerosis, and cerebrovascular disease. Involvement of these target organs in turn leads to risk of decomposition of cardiac and renal function and of thrombotic, embolic, aneurismal, or hemorrhagic vascular disease (MacMahon *et al.*, 1990). The risk increases progressively: the higher the blood pressure and number of concurrent risk factors, the more advanced the degree of target organ involvement (MacMahon *et al.*, 1990). Systolic and diastolic blood pressure are closely correlated and are correlated with risk of cardiovascular disease independently and in combination. However, high systolic pressure may contribute more to the risk of complications than high diastolic pressure (Stamler *et al.*, 1989).

In Nigeria and the world at large, cardiovascular diseases are known to be one among the medical condition responsible for increase in mortality rate of which in most cases, often develop with little or no symptom. Lots of person show less interest in routine medical diagnostic which can help in identifying the condition and making necessary adjustment in other to prevent it. This research however, investigate if cardiovascular diseases are among the conditions suffered by the staff and students of Federal University Wukari, and to highlight the need for routine checkups.

Materials and Methods

Study Period
This project research was conducted in August, 2022.

Study Population and Design
A total of eighty-six people were used for the purpose of this research. They comprised of forty-three members of staff and forty-three students of Federal University Wukari, Taraba State, Nigeria. The members of staff and students' blood pressures, pulse and body weights were checked and recorded. The age range of the staff used in this study is 28 – 62 years, while the age range of the students is 18 – 32 years.

Equipment used
The equipment used for this research are Wrist Digital cs70 Sphygmomanometer and a digital personal weighing scale (PH-2015A).

Determination of Blood Pressure and Pulse
Each member of staff and student was requested to relax for few minutes for the measurement of his/her blood pressure and pulse. The cuff of the Wrist Digital Sphygmomanometer was wrapped around the left wrist. The display was placed on the palm side of the wrist. The staff/student was asked to sit upright and ensure the blood pressure monitor was at the same height as his/her heart. The on/off key was clicked and the device measured the blood pressure and pulse automatically. The results were recorded.

Determination of Body Weight
The control switch of the digital weighing scale was turned on. Each member of staff/student climbed on the weight scale and waited for about three seconds for the body weight reading to display automatically. The result was recorded.

Statistical Analysis
Statistical analysis was carried out on the results with the use of Students-T-Distribution test using Statistical Package for Social Sciences (SPSS) version 23. The group means were compared for significance at $p<0.05$ and the group results presented as mean ± standard deviation.

Results
The results are presented below:

Table 1: Mean body weight, pulse and blood pressure of staff and students of Federal university Wukari, Nigeria

Parameters	Members of staff	Students
Body weight (kg)	**78.23 ± 13.19[a]**	**60.05 ± 8.70[b]**
Pulse (BPM)	76.56 ± 11.43[a]	77.56 ± 13.51[a]
Systolic (mmHg)	131.07 ± 17.41[a]	107.09 ± 13.84[b]
Diastolic (mmHg)	78.30 ± 12.49[a]	61.47 ± 8.48[b]
Average blood pressure (mmHg)	131/78	107/61

Result for body weight, pulse, systolic and diastolic represent mean ± standard deviation of result obtained (n=43).

Mean in the same row, having different letters of the alphabet are statistically significant ($P<0.05$).

There is a significant difference ($p<0.05$) between the mean body weight, systolic and diastolic readings of the staff and students. There is no significant difference ($p>0.05$) between the mean pulse of the staff and students. The mean body weight, systolic, diastolic and average blood pressure of the staff are higher than that of the students, while the average pulse of the students is higher than the pulse of the staff.

Table 2: Boby weight, pulse and blood pressure of some staff of Federal University Wukari

S/N	Body weight (kg)	Pulse (BPM)	Systolic (mmHg)	Diastolic (mmHg)	Blood pressure (mmHg)	Remark on blood pressure
1	95	79	110	70	110/70	Normal
2	102	96	118	75	118/75	Normal
3	65	73	105	55	105/55	Normal
4	68	55	162	71	162/71	Slightly high
5	82	57	122	64	122/64	Normal
6	91	71	125	72	125/72	Normal
7	76	64	129	75	129/75	Normal
8	74	70	118	79	118/79	Normal
9	77	76	120	68	120/68	Normal
10	70	63	134	69	134/69	Normal
11	69	72	140	87	140/87	Normal
12	84	74	135	79	135/79	Normal
13	87	69	155	82	155/82	Slightly high
14	79	70	131	79	131/79	Normal
15	68	82	119	80	119/ 80	Normal
16	81	61	113	88	113/88	Normal
17	77	70	144	89	144/89	Slightly high
18	65	72	110	64	110/64	Normal
19	86	66	147	89	147/89	Slightly high
20	55	84	112	71	112/71	Normal
21	69	74	149	98	149/98	Slightly high
22	90	83	131	99	131/99	Normal
23	69	75	158	97	158/97	High
24	88	70	160	106	160/106	High
25	75	71	130	79	130/79	Normal
26	62	63	118	71	118/71	Normal
27	80	83	133	75	133/75	Normal
28	84	79	159	92	159/92	High
29	94	69	133	92	133/92	Normal
30	98	89	132	83	132/83	Normal
31	58	61	102	58	102/58	Normal
32	95	86	126	66	126/66	Normal
33	84	87	125	81	125/81	Normal
34	87	93	161	102	161/102	High
35	64	75	112	65	112/65	Normal
36	90	104	156	83	156/ 83	Slightly high
37	79	96	104	58	104/58	Normal
38	68	79	127	70	127/70	Normal
39	79	78	133	87	133/87	Normal

40	48	82	125	69	125/69	Normal
41	112	104	157	86	157/86	Slightly high
42	74	80	101	61	101/61	Normal
43	66	79	135	83	135/83	Normal

The blood pressure of thirty-two (32) staff is within the normal range. The blood pressure of seven (7) staff is slightly high, while the blood pressure of four (4) staff is high.

Table 3: Boby weight, pulse and blood pressure of some students of Federal University Wukari

S/N	Body weight (kg)	Pulse (BPM)	Systolic (mmHg)	Diastolic (mmHg)	Blood pressure (mmHg)	Remark on blood pressure
1	66	66	96	58	96/58	Normal
2	56	81	100	62	100/62	Normal
3	69	65	118	75	118/75	Normal
4	59	85	107	55	107/55	Normal
5	61	68	105	68	105/68	Normal
6	61	102	109	56	109/56	Normal
7	59	73	97	55	97/56	Normal
8	64	80	102	55	102/55	Normal
9	74	77	126	61	126/61	Normal
10	51	81	112	62	112/62	Normal
11	49	81	112	60	112/60	Normal
12	83	81	106	78	106/78	Normal
13	58	48	117	67	117/67	Normal
14	65	74	126	75	126/75	Normal
15	60	92	108	60	108/60	Normal
16	78	76	102	56	102/56	Normal
17	60	92	113	76	113/76	Normal
18	40	96	95	56	95/56	Normal
19	65	75	120	59	120/59	Normal
20	65	64	112	63	112/63	Normal
21	53	53	95	50	95/50	Normal
22	66	67	93	45	93/45	Normal
23	62	73	116	59	116/59	High
24	66	56	93	54	93/54	High
25	72	70	96	75	96/75	Normal
26	57	78	150	71	150/71	Slightly high
27	68	87	100	53	100/53	Normal
28	57	71	105	60	105/60	High
29	58	82	91	57	91/57	Normal
30	54	78	89	50	89/50	Slightly low
31	45	103	103	57	103/57	Normal
32	50	94	92	53	92/53	Normal
33	49	55	109	67	109/67	Normal
34	60	58	110	68	110/68	High

35	56	84	121	68	121/68	Normal
36	53	90	103	56	103/56	Normal
37	48	82	95	48	95/48	Normal
38	69	95	115	82	155/82	Slightly high
39	64	81	98	66	98/66	Normal
40	63	94	105	66	105/66	Normal
41	55	63	100	60	100/60	Normal
42	50	97	105	63	105/63	Normal
43	64	67	98	57	98/57	Normal

The blood pressure of forty (40) students is within the normal range. The blood pressure of two (2) students is slightly high, while the blood pressure of one (1) student is slightly low.

Discussion

The mean body weight of the members of staff is significantly higher than that of the students (table 1). It is possible that age and other factors that may contribute to weight-gain may be responsible for the weight difference recorded. The highest weight recorded among the staff is 112 kg, while the lowest weight recorded among the staff is 48 kg (table 2). Among the students, the highest weight recorded is 83 kg, while the lowest weight recorded is 40 kg (table 3). The results showed that based on the ages of the staff and students used in this study, the higher the age, the higher the weight of some individuals. This also implies that more body mass and/or bone mass may be building up as age progresses during adulthood. It is also possible that the lower weight recorded among some students when compared with the weight of the staff may have been influenced by regular physical activities which the students often engage in. Physical exercise or activities is believed to aid weight regulation in human.

In healthy adults, the pulse rate at rest should be between 60 bpm to 100 bpm or slightly higher. It is known that both the staff and students usually engage in several activities during the academic periods. Hence, they may be involved in certain levels of stress or physical activities. It has been reported that both surprise and stress induce physiological response: elevate heart rate substantially (Mustonen & Pantzar, 2013). Exercise may be regarded as stress to the body. The mean pulse of both the staff and students are within the normal range (table 1). The mean pulse of the students was observed to be mildly higher than that of the staff. This may be due to the fact that most of the students may be engaged in physical activities more than most of the staff. Different research suggests that heart rate variability can be used as an accurate measure of psychological stress and may be used for an objective measurement of psychological stress (Kim *et al*., 2018). The pulse of most of the staff (table 2) and that of most of the students (table 3) are normal. This showed that the hearts of the staff and students are functioning properly. Individuals with low pulse rate may be advised to engaged in exercise to modulate their pulse rate. Another available evidence in research indicates that the normal range for resting heart rate is 50-90 beats per minute (Aladin *et al.,* 2014).

The average blood pressure of both the staff and students are within the normal range. This is because a systolic blood pressure of less than 90 millimeters of mercury (mmHg) or diastolic blood pressure of less than 60 mmHg has been reported to be generally considered as hypotension (Flynn *et al.*, 2017). The average blood pressure of the staff was higher than that of the students. The differences in systolic and diastolic pressure of the staff compared to that of the students are statistically significant ($p<0.05$).

Following the measurement of blood pressure of the forty-three (43) staff, it was observed that the blood pressure of thirty-two (32) staff was within the normal range. The blood pressure of seven (7) staff was slightly high, while the blood pressure of four (4) staff was high (table 2). It is encouraged that people, especially the aged should frequently check their blood pressures to detect early if they have any challenge associated with blood pressure or cardiovascular disease. The measurement of blood pressure of the forty-three (43) students showed that the blood pressure of forty (40) students was within the normal range. The blood pressure of two (2) students was slightly high, while the blood pressure of one (1) student was slightly low. The result of this study showed that most of the staff and students are maintaining normal heathy leaving and may be probably engaging in moderate physical exercise. Previous research reported finding which stated that in mildly hypertensive men, short-term physical activity decreased blood pressure for 8 to 12 hours after exercise, and average blood pressure was lower on exercise days than on non-exercise days (Pescatello *et al*., 1991). The daily academic activities of most of the staff and students is believed to play a key role since exercise which in regulating blood pressure.

The blood pressure of the four staff that was high and the seven staff and two students that was slightly high could be regulated by applying certain appropriate management measures. Although their blood pressures will be required to be checked again to ascertain if the result will be consistent before any treatment or modulation measure will be applied. Some researchers have reported that along with appropriate pharmacological therapy, there is now established evidence and overall consensus in current guidelines on the effectiveness

of regular physical activity in the treatment of hypertension, in combination with drug(s) therapy or even alone (Whelton *et al.*, 2002; Elley & Arrol, 2005).

Conclusion

The results of this study showed that the mean body weight of the members of staff is significantly higher than that of the students. This also implies that more body mass and/or bone mass may be building up as age progresses during adulthood. The pulse of most of the staff and that of most of the students are normal. This showed that the hearts of the staff and students are functioning properly. The average blood pressure of both the staff and students are within the normal range, showing that most of the staff and students may not be facing any cardiovascular disease challenge which may arise as a result of hypertension or hypotension. The average blood pressure of the staff was higher than that of the students.

Recommendations

People are advised to frequently check their blood pressure and pulse to detect early any challenge relating to hypertension and hypotension.

People are advised to frequently check their body weight.

There is need to further this study using a larger population in this research study to effectively compare the results.

References

1. World Health Organization (2017). Health Situation in the Americas: Core indicators Washington, D.C. United States of America. Retrieved from https://iris.paho.org/handle/10665.2/34329?show=full
2. World Health Organization (2019). The top 10 causes of death. Geneva: World Health Organisation. Retrieved from https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death
3. Iqbal, A. M., & Jamal, S. F. (2022). Essential Hypertension. In StatPearls. StatPearls Publishing. Pp. 34. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK539859/
4. MacMahon, S., Peto, R., Cutler, J., Collins, R., Sorlie, P., Neaton, J., Abbott, R., Godwin, J., Dyer, A., & Stamler, J. (1990). Blood Pressure, Stroke, and Coronary Heart Disease: Part I. Prolonged Differences in Blood Pressure: Prospective Observational Studies Corrected for the Regression Dilution Bias. *Lancet. 335*(8692), 765-774. DOI: 10.1016/0140-6736(90)90878-9
5. Stamler, J., Neaton, J. D., & Wentworth, D. N. (1989). Blood Pressure (Systolic and Diastolic) and Risk of Fatal Coronary Heart Disease. *Hypertension, 13*(5 Suppl), I-12. DOI: 10.1161/01.hyp.13.5_suppl.i2
6. Mustonen, V., & Pantzar, M. (2013). Tracking Social Rhythms of the Heart. *Approaching Religion, 3*(2), 16–21. DOI:10.30664/ar.67512
7. Kim, H., Cheon, E., Bai, D., Lee, Y. H., & Koo, B. (2018). Stress and Heart Rate Variability: A Meta-Analysis and Review of the Literature. *Psychiatry Investigation, 15*(3), 235–245. DOI: 10.30773/pi.2017.08.17
8. Aladin, A. I., Whelton, S. P., Al-Mallah, M. H., Blaha, M. J., Keteyian, S. J., Juraschek, S. P., Rubin, J., Brawner, C. A., & Michos, E. D. (2014). Relation of Resting Heart Rate to Risk for all-cause Mortality by Gender after Considering Exercise Capacity (the Henry Ford Exercise Testing Project). *The American Journal of Cardiology, 114*(11), 1701–1706. DOI: 10.1016/j.amjcard.2014.08.042
9. Flynn, J. T., Kaelber, D. C., Baker-Smith, C. M., Blowey, D., Carroll, A. E., Daniels, S. R., Ferranti, S. D., Dionne, J. M., Falkner, B., Flinn, S. K., Gidding, S. S., Goodwin, C., Leu, M. G., Powers, M. E., Rea, C., Samuels, J., Simasek, M., & Thaker, V. V. (2017). Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents. *Pediatrics, 140*(3), 1904. DOI: 10.1542/peds.2017-1904
10. Pescatello, L. S., Fargo, A. E., & Leach, C. N. (1991). Short-term Effect of Dynamic Exercise on Arterial Blood Pressure. *Circulation, 83*(5), 1557-1561. DOI: 10.1161/01.cir.83.5.1557
11. Whelton, S. P, Chin, A., Xin, X., & He, J. (2002). Effect of Aerobic Exercise on Blood Pressure: a Metaanalysis of Randomized, Controlled Trials. *Annual Internal Medicine, 136*(7), 493-503. DOI: 10.7326/0003-4819-136-7-200204020-00006
12. Elley, C. R., & Arrol, B. (2005). Refining the Exercise Prescription for Hypertension. *Lancet, 366*(9493), 1248-1249. DOI: 10.1016/S0140-6736(05)67507-1