

**ANALYSIS OF THE GENDER DIFFERENCE IN THE MEANS OF STANDING
HEIGHT (SHT) AND BODY WEIGHT (BWT): INVESTIGATING THEIR INDIVIDUAL
INFLUENCE ON THE RELATED HEALTH CHALLENGES OF THE STAFF
MEMBERS OF THE FACULTY OF EDUCATION IN UNIVERSITY OF UYO.**

By

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ABSTRACT

The study analyzed the gender difference in the means of standing height (SHT) and body weight (BWT): investigating their individual influence on the related health challenges of the staff members of the faculty of education in university of uyo. Ex post facto survey design was used for the study. The study was conducted in the University of Uyo community in Akwa Ibom State. The population of the study comprised the males and females of the Faculty of Education of the University. A sample size of 82 staff members of the Faculty of Education, comprising 42 males and 40 females were used for the study. Standard-constructed instruments were adapted and used to measure the body weight, standing height, heart rate and blood pressure as done by some notable authors. The instruments for the study are standardized questionnaire titled: Gender Difference in Standing Height and Body Weight Questionnaire (GDSHBWQ). The consistency of the instruments was certified reliable at 0.9. The data collected on the subjects were treated with the descriptive statistics to obtain the answers the research questions. The Z-test statistics was used to treat the hypotheses, set at probability significant level of .05. on this basis the study concluded that there is no significant gender difference in the Standing height (SHT) among the Education Faculty staff members. On the average, the males are significantly not taller than their female counterparts. And also that there is a significant gender difference in the Body weight (BWT) among the Education Faculty staff members. On the average, the females are significantly heavier than their male counterparts. It was recommended that the staff members of the Education Faculty should be informed of these findings about the potentiality of the related health challenges and the risk factors facing them.

Keywords: Gender Difference, Standing Height (sht), Body Weight (bwt), Health Challenges and University of Uyo.

Introduction

Health challenges are among the most serious human problems facing human beings today. They would hinder an individual from achieving a healthy lifestyle and carrying out effective

physical and mental tasks. Health problems come in different types and from different sources. Some are endemic if in a specific place or pandemic to a global dimension. Some are gender-specific and age-specific, while others can be common to both genders and all age groups.

One of the health challenges noted among the populace that had attracted the attention of the researcher, is the sedentary lifestyle of many office workers resulting in hypokinetic diseases. According to NHCE (2015) and WHO (2015), hypokinetic diseases affect the human body generally, from being overweight, to being with obese weight, to becoming diabetic patients, and developing other metabolic syndromes. Quite a number of researches have been done to help create awareness on hypokinetic health challenges (Subramanian, Sharma, and Rajendran, 2018; Goonet al., 2011).

The human body has been a focus of many studies that began as early as 1966 by Benjamin Heath and Joel Carter (Heath and Carter, 1966) to promote good health care. Various tests and measurements have been done to classify the body into body structural types by somatotypes or from the body typology. It is also shown in other studies (Hassanein, 2015; Pizzorno and Joiner-Bey, 2016) that there is a suitable body type, an ideal body mass and a suitable fitness level that every individual should seek to have so as to avoid health challenges that do occur in the negative variations in body types, body mass and in poor fitness. The appraisal and classification of body types is referred to as “somatotyping”; and previous researches (Hassanein, 2015; Pizzorno and Joiner-Bey, 2016), had disclosed considerable evidence that physique patterns are significantly and definitely related to some human problems. Therefore interest in health care programmes to ensure suitable body structure in body weight, body height, body mass and body types have become necessary for maintaining good health.

Studies from Stewart *et al.* (2014); Willgoose and Rogers (2014) have shown that endomorphous sedentary persons are at greatest risk for obesity and overweight thereby carrying unnecessary adiposity that can lead to diabetes and postural deformities. The obese and overweight staffers may not be aware of these risk factors in such an excessive body mass. The native and cultural belief that an obese looking body denotes a sign of wealth and beauty had been debunked by many scientific researches that showed that health complications of high body mass index is detrimental to good health (Oladapo *et al.*, 2010; Quinn, 2017;; Wolf, 2017).

Obesity and overweight do attract public stigma to the fat individual, and also adds on unnecessary burden (unnecessary extra weight) on the bones, ligaments and joints. The same studies also show that sedentary mesomorphous persons are at moderate risk for obesity and overweight while the ectomorphous persons are extremely unlikely to develop obesity. Studies have showed that certain somatotypes are more prone to develop particular diseases (Wang and Beydoun, 2017; Wolf, 2017). There is therefore some link between body types and body mass and some health challenges.

The University of Uyo is an academic community to which staff members’ body dispositions and health statuses should be of great concern to the authorities. There are a number of researchers on gender differences in many aspects of health challenges (Rosenberg, 2010; Sandberg, 2012). Though some specific health challenges are respectively for men and for women, there are those health challenges common to both genders that need to be investigated among the members of the University environment.

Statement of Problem

The staff members of the University of Uyo, Uyo, are subject to health challenges as all other humans, including those arising from poor body structure and vital organic malfunctioning.

The Faculty of Education as a whole and the Department of Physical and Health Education in particular is among Faculties and Departments respectively, where researches on health issues are also studied. It is assumed that some health issues arising from poor body types, excessive body mass and poor body fitness may not be known to the Faculty of Education staff members and those who might know may not understand the risk factors inherent in their health conditions.

Objectives of the Study

1. The gender difference in the standing height (SHT) and the related health challenges among the staff members of the Faculty of Education.
2. The gender difference in the body weight (BWT) and the related health challenges among the staff members of the Faculty of Education.

Research Question

1. What is the gender difference in the mean of standing height (SHT) and the related health challenges among the staff members of the Faculty of Education?
2. What is the gender difference in the mean of body weight (BWT) and the related health challenges among the staff members of the Faculty of Education?

Research Hypothesis

- There is no significant gender difference in the mean of standing height (SHT) and the related health challenges among the staff members of the Faculty of Education.
- There is no significant gender difference in the mean of body weight (BWT) and the related health challenges among the staff members of the Faculty of Education.

Conceptual review

Standing Height and health challenges

In a study by Florence *et al.* (2018) on adults' height and risk of diseases in a combined epidemiological and genetic analysis in England on 417,434 subjects. The study examined the associations for adults' height and genetically determined height (using a two-sample Mendelian randomisation approach with height-associated genetic variants as instrumental variables) in 417,434 individuals of white ethnic background participating in the UK Biobank, England. The researchers undertook pathway analysis of height-associated genes to identify biological processes that could link height and specific diseases.

The result showed that normal height was associated with 32 (thirty-two) diseases while the genetically determined height was associated with 12 diseases. Of these, 11 diseases showed a concordant association in both analyses, with taller height associated with reduced risks of coronary artery disease. The diseases included hypertension, gastro-oesophageal reflux disease, diaphragmatic hernia, atrial fibrillation, venous thromboembolism, intervertebral disc disorder, hip fracture, vasculitis, cancer overall and breast cancer.

The study concluded that adult height is associated with risk of a range of diseases. The study confirmed previously reported height associations for coronary artery disease, atrial fibrillation, venous thromboembolism, intervertebral disc disorder, hip fracture and cancer and identified potential novel associations for gastro-oesophageal reflux disease, diaphragmatic hernia and vasculitis.

Body Weight and Health Challenges

Akarolo-Anthony *et al.* (2014) in a study titled "obesity epidemic has emerged among Nigerians"; by using the data from the WHO showed that the conditions of body weight resulting in overweight and obesity increased by 20% between 2002 and 2010 in Nigeria. The study examined the correlates of this fast growing epidemic. However, body weight cannot be isolated

from the standing height of an individual and the body mass index derived from the relationship of both parameters. They conducted a cross-sectional study among a random sample of 1058 adults, who were visitors and staff of a government worksite in Abuja, an urban city in Nigeria. The study participants had varying socio-economic status and a wide range of occupations, including skilled labor and professionals. The result was that mean age and body-mass index of the study population were 42 years, $\pm(9.3)$ and $27 \text{ kg/m}^2 \pm(4.8)$. The overall prevalence of overweight or obesity (Body-Mass Index $\geq 25 \text{ kg/m}^2$) was 64% (74% of the women and 57% of the men). Individuals aged 40 – 49 years were more likely to be overweight or obese. Compared with the individuals in the lower socio-economic status, the PR for obesity among those in the middle and high socio-economic statuses, were higher. They concluded that about two-thirds of urban, professional, high socio-economic status Nigerian adults are either overweight or obese. The prevalence of overweight and obesity among this population of adult Nigerians is as high as it is in the United Kingdom. Female gender and older age were independent predictors of overweight and obesity; while middle or high socio-economic status were independently associated with obesity.

Gender difference in Somatotypes and Health challenges

Urrutia-García *et al.* (2015, had examined Somatotype of patients with type 2 diabetes in a University hospital in Mexico. The aim of the study was to determine the somatotype of Mexican type 2 diabetes patients, using the Heath and Carter somatotype method. The study was conducted on 180 subjects, who underwent an anthropometry following the restricted format established by the International Society for the Advancement of Kinanthropometry (ISAK). A database was elaborated and they obtained descriptive measures such as age, weight, height and the 3 somatotype components. The results showed that the average age was 58 years (± 11 SD); 58.6 years (± 10.9 SD) for males and 56.8 years (± 11 SD) for females. The average weight was 77.5 kg (± 16.7); 80.7 kg (± 14.6 SD) for males and 75 kg (± 17.8 SD) for females. The results indicated that the mean somatotype for Mexican type 2 diabetes patients was 6.3, 6.4, 0.6. Diabetic females have higher mean values for endomorphy (7.3) and mesomorphy (6.7) and lower mean values for ectomorphy (0.4) than their male counterparts (5.0, 6.0 and 0.8, respectively). It is evident that endomorphy is predominantly in females, in contrast to males, since there are known differences in fat and muscular mass between both genders. The study concluded that the results are similar to previous studies presented for other diabetic populations. Sex differences are significant and especially higher for the endomorphic somatotype, with generally higher values in females. Physically inactive staff members may be prone to obesity and these findings need be taken seriously.

Cappiello (2020) carried out a study at the University of California reviewed results of researches correlating somatotypes to diseases and showed that there are a lot of benefits to being tall on the other hand, but there is also a huge drawback; tall people may be more likely to develop cancer. He concluded that tall people have more cells in the body that can undergo mutation later thereby leading to cancer. He showed fat and obese people do not have more body cells as commonly believed but have more adipocytes (fat containing cells). He found from 10,000 cases of cancer patients that cancer risk rose by 10 percent for every four inches above average height a person is - average being 5'4" (160cm) for women and 5'9" (183cm) for men. By this the ectomorphy therefore tends to be affected more than the endomorphy and least affected is the mesomorphy.

Pizzorno and Joiner-Bey (2016) studied the prevalence of obesity and somatotypes, and asserted that the obese persons have a 5- to 7-year shorter life expectancy, with greater relative

risk for mortality associated with greater degree of obesity. Most of the risk is from cardiovascular causes which include type 2 diabetes mellitus (T2DM), elevated cholesterol, hypertension, and atherosclerosis. In the determination of body composition, obesity is defined as body fat percentage above 30% for women and above 25% for men. Indirect methods of measurement were used with visual observation of the qualitative analysis of obesity. Classification by body types (somatotyping) was by the physical anthropologic classification of physique based on body size and proportion. Observations were that the Endomorphs were relatively with large body, short arms and legs. The Mesomorphs were with large muscular chest that dominates abdomen and prominent bony joints, while the Ectomorphs were with relatively small frame (slender, delicate bone structure), long arms and legs. It was concluded that Endomorphs are at greatest risk for obesity; Mesomorphs are at moderate risk, and Ectomorphs are extremely unlikely to develop obesity.

Almeida, *et al* (2013), in their study on the analysis of the somatotype of the physically inactive individuals aimed at comparing demographic variables, physical activity level, and health-related anthropometric indicators according to somatotype among physically active individuals. The study is a descriptive cross-sectional survey in which the sample consisted of 304 individuals who were users of the jogging track at the Federal University of Pernambuco (UFPE) in Recife, Brazil. Somatotypes were analyzed using the anthropometric technique proposed by Heath & Carter. To assess physical activity level, they used the short version of the International Physical Activity Questionnaire (IPAQ). They used as health-related anthropometric indicators: body mass index (BMI), waist circumference (WC), waist-hip ratio (WHR), and iconicity index (CI). Descriptive statistics was used to characterize the sample, and then a multivariate analysis of variance (at 0.05) to test for differences. In the somatotype analysis, it was observed among women significant predominance of the endomorphy and lower predominance of the ectomorphy in comparison to men. In the age group under 29 years, significantly lower values were found for endomorphy than in other age groups. Irregularly active individuals had significantly lower values of endomorphy. It was also observed that individuals with obesity and risk in WHR, WC and CI had higher scores of endomorphy and mesomorphy and lower scores of ectomorphy. The somatotype of physically active individuals in the study raised health concern, mainly related to high relative adiposity represented by endomorphy.

Methodology

Ex post facto survey design was used for the study. The study was conducted in the University of Uyo community in Akwa Ibom State. The population of the study comprised the males and females of the Faculty of Education of the University. A sample size of 82 staff members of the Faculty of Education, comprising 42 males and 40 females were used for the study. Standard-constructed instruments were adapted and used to measure the body weight, standing height, heart rate and blood pressure as done by some notable authors. The instruments for the study are standardized questionnaire titled: Gender Difference in Standing Height and Body Weight Questionnaire (GDSHBWQ). The consistency of the instruments was certified reliable at 0.9. The data collected on the subjects were treated with the descriptive statistics to obtain the answers the research questions. The Z-test statistics was used to treat the hypotheses, set at probability significant level of .05.

Results and Discussion

Results

Research Question 1: What is the gender difference in the mean of Standing Height (SHT) and the related health challenges among the staff members of the Faculty of Education?

Table 1: Descriptive Statistical Analysis of Gender Difference in the Means of SHT.

Gender	N		SD	Results
Males	42	1.68 cm	0.6 cm	Males are on the average taller than their female counterparts.
Females	40	1.63 cm	0.05 cm	

Source: Appendix IV

Result: in Table 1., the descriptive statistical analysis showed that the males have a mean standing height value of 1.68m while the females have a mean standing height value of 1.63m. The result is that the males are taller than their female counterparts by the difference of 0.05m.

Research Question 2: What is the gender difference in the mean of Body Weight (BWT) and the related health challenges among the staff members of the Faculty of Education?

Table 2: Descriptive Statistical Analysis of Gender Difference in the Means of BWT.

Gender	N		SD	Results
Males	42	73.1 kg.	5.9 kg.	Females on the average are heavier than their male counterparts.
Females	40	80 kg.	3 kg.	

Source: Appendix IV

Result: Descriptively, in Table 2., the females have a mean body weight of 80kg, while the males have a mean body weight of 73.1 kg. The finding was that the females are heavier than the males by the mean difference of 6.9 kg.

Testing the Hypotheses

Hypothesis 1: There is no significant gender difference in the means of Standing Height (SHT) and the related health challenges among the staff members of the Faculty of Education.

Table 3: Summary of Z-test statistical analysis of no significant gender difference in SHT.

Gender	N		SD	Df	SE	Z-cal	Decision
Males	42	1.68 m	0.6 m	80	0.1	0.5	H ₀ accepted
Females	40	1.63 m	0.05 m				

Significant at $P \leq .05$, df. 80 = 2.000 Z-critical value.

Source: Appendix IV

Result: In Table 3., the Z-calculated value of 0.5 is less than the Z-critical value of 2.000. Therefore the hypothesis that there is no significant gender difference in the means of SHT among the staff members of Education Faculty is accepted. The finding is there is no significant gender difference in the SHT among the Education Faculty staff members. On the average, the males are significantly not taller than their female counterparts.

Hypothesis 2: There is no significant gender difference in the means of Body Weight (BWT) and the related health challenges among the staff members of the Faculty of Education.

Table 4: Summary of Z-test statistical analysis of no significant gender difference in BWT.

Gender	N		SD	Df	SE	Z-cal	Decision
Males	42	80 kg	5.9 kg	80	1.03	6.7	H ₀ Rejected
Females	40	73.1 kg	3 kg				

*Significant at $P \leq .05$, df. 80 = 2.000 Z-critical value.

Source: Appendix IV

Result: In Table 4, the Z-calculated value of 6.7 is greater than the Z-critical value of 2.000. Therefore the hypothesis that there is no significant gender difference in the means of BWT among the staff members of Education Faculty is rejected. The finding is that there is a significant gender difference in the BWT among the Education Faculty staff members. On the average, the females are significantly heavier than their male counterparts.

Discussions

The study's finding is that the male staff members in the Faculty of Education were descriptively taller than their female counterparts; however, the finding has no statistical significance. The male members had a mean standing height of 1.68m while the female members had a mean standing height of 1.63m with a mean difference of 0.05m. There is however lack of published information as to comparison from other Universities with the study in terms of height differences between genders in a University Faculty setting. This study has now set a trend for future studies. Generally males have often been found to be taller than females in larger populations (Cappiello, 2020; Deswal, and Bozkur, 2016). The study on a century of trends in adult human height by NHCE (2016), showed that Nigerian males have an average height of 1.65m and the females have an average height of 1.57m; meaning that the mean heights of the genders of the Education Faculty were within the national standard of acceptable height devoid of health challenges due to over-height or under-height status. Excessive height is a problem that can lead to health challenges equally as short height would (Paajanen, Oksala, Kuukasjärvi, and Karhunen, 2010). Furthermore Cappiello (2020), had reviewed results of somatotype and disease correlates and found that there are lots of benefits to being tall, but there is also draw back as tall people may be more likely to develop cancer due to cell mutation later in life. However, for this study, there appeared there is no related health challenge from the standing heights on the average, among the staff members in Education Faculty of the University of Uyo, Uyo.

The study's finding showed that female members were significantly heavier than their male counterparts by an average body weight of 6.9 kg. The females had a mean body weight of 80kg. while the males had a mean body weight of 73.1kg. Normally in a biological sense, increase of height would attract increase in bone growth which is the third provider to extra weight in the human body after tissues and organs as asserted by Flegalet *al.* (2017). Therefore, males are generally found to be heavier because of their superior muscular girth and longer and heavier bones. The reason for females' superior body weight in this study is from the smaller sample size used as compared to the global results from larger populations in other studies. But females on the other hand have been noted for more accumulation of body fats than males (Gillis and Sullivan, 2016). Body weight and its related health challenges are often from the levels of overweight and obese weight and being underweight. According to Alrashidi (2016), there are common related health challenges that could affect those who are with excessive body weight and those who are underweight. Other health problems from excessive body weight are when the body weight is more of accumulation of fats than muscles cells. Excessive body weight would bring about overweight and obesity from fats; and that can lead to stroke as fat deposits may accumulate in the arteries that supply the heart with blood; and, or when the blood supply to the brain is cut off. High blood pressure is also associated with obesity from overweight when blood vessels are restricted by the hardening of the walls of the blood vessels, thereby increasing blood pressure due to inelasticity of the walls of the arteries. The body weight statuses of the staff members alone cannot be used here to infer any adverse health challenge yet not until they are subjected to BMI analysis.

Conclusion

The study findings justified the conclusion that there is no significant gender difference in the Standing height (SHT) among the Education Faculty staff members. On the average, the males are significantly not taller than their female counterparts. And also that there is a significant gender difference in the Body weight (BWT) among the Education Faculty staff members. On the average, the females are significantly heavier than their male counterparts.

Recommendations

1. The staff members of the Education Faculty should be informed of these findings about the potentiality of the related health challenges and the risk factors facing them.
2. The staff, by these findings, should be enlightened to undertake minimal of sugary foods; increase the intake of dietary fibres, and commit themselves to participating in well-organized physical exercise programmes that would burn down excessive fats and drain off cholesterol.

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