

USE OF BODY MASS INDEX (BMI) TO DETERMINE CARDIOVASCULAR RISK FACTORS OF PHYSICAL EDUCATION TEACHERS IN TAMALE METROPOLIS

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Abstract

Body Mass Index (BMI) is sometimes used for defining Anthropometric in adults. The common interpretation is that it represents an index of an individual's fatness characterized by height/weight in adults and for classifying them into groups. It is widely used as a risk factor for the prevalence of several health issues among adults. Body fatness has been an important psychosocial issue among humans for decades. Evidence indicates that there is a wide range of BMI over which mortality risk is modest among Physical Education Teachers in the Tamale metropolis and this is age-related. The data collected were analyzed using simple frequency counts, percentage spread, mean, mode, and the findings included the fact that most of the Physical Education Teachers in the Tamale Metropolis have low risk health factors. The results also show a mean score of 1.75554 for the entire height with 73.3482 score for weight and 23.5500 for BMI respectively. Seventeen (17) out of the 28 respondents have Normal Weight, and are therefore healthy, representing 60.71% of the total number of respondents. Eleven (11) out of 28 of the respondents representing 39.28% are overweight therefore not Healthy as agreed by the American College of sports medicine classification (2010). Development of positive relationship towards regular exercises to reduce weight and stress in their classroom activities is recommended.

Keywords: anthropometric, body mass index (bmi), fatness, health, height.

Introduction

The body mass index (BMI) is the metric currently in use for defining anthropometric height/weight characteristics in adults (Stefan, et al 2008). It is also used to categorize body types into groups. (American College of Sports Medicine Classification 2010) Research has shown that body fatness has become an important psychosocial issue among humans in recent years. More recently, the degree of rotundity considered ideal also has varied considerably in the general population, but particularly for male and females (Nestle, 2000). Traditionally, a person's fatness has been defined at personal level as well as at a societal level (Nestle, 2000) However, this is difficult to quantify as indicated by Malis, et. al (2005). The social consequences of being "too fat" are sometimes severe. This can lead to discrimination and result in social and emotional issues (Must, et. al 2001). Not only the societal but also the functional, and indirectly, the medical consequences of an excessive accumulation of fat also have been observed among Physical Education teachers in Tamale Metropolis. Nevertheless, the concept that fatness is a major population-based medical issue has gained popularity among Physical Education teachers

Background

Traditionally, a person's fatness has been defined at a personal level and societal level (Must, et. al 2001). However, this is difficult to quantify. That is, each individual has his/her own perception of how fat he/she should be. As indicated above, this often depends on a general concept of societal norms. Earlier on, it was recognized that tall people had a lower death rate than short people with the same height and weight (Wt/Ht) ratio (Singh 2001). It was recognized that a person's height in general and leg length in particular could affect the calculated body mass adjusted for height. (Singh 2001) Some people view the secular trend within the Physical Education Teachers in Tamale Metropolis over the past years as being one in which the

Teachers in general are “more obese”. The net effect of the above is that chronic diseases of aging have become more of a public health concern. Therefore, the function of the Physical Education teacher is to persuade and use his skills and knowledge to coordinate all activities of the school which will lead to a healthy life for his / her students in accordance with Ghana Education Service Rules.

Education Service rules. From observation, there are some physical changes regarding body weights and the prevalence of obesity amongst the physical education teachers in Tamale Metropolis. In observing Teachers of Physical Education extraction, they are averagely heavier and are more likely to be “overweight” or “obese”, as defined by current BMI standards, than those in other teaching disciplines in Tamale metropolis. However, their lookout may be pointing to a healthier figure that can live longer than any person.

Problem Statement

A critical observation of students and residents of Tamale Metropolis expect their Physical Education teachers to behave, look and live in a particular way because of the roles they play in their schools. Physical Education teachers see themselves as inculcating skills, knowledge and shaping the future of the young ones in their respective schools. However, students and the entire residents of Tamale Metropolis expect that Physical Education teachers to live by what they preach in the schools, so that they can properly shape the future of others whose future, in one way or the other, depends on them. Therefore, the problem that this study seeks to investigate is how to use height/weight ratio and body mass index (BMI) to determine Physical Education teachers’ health status in Tamale Metropolis.

Purpose of the Study

Physical Education teachers occupy a key position in the Basic and Senior High Schools in Tamale Metropolis. However, they rely on both situational and environmental variables of which the supply of

some inputs such as good health, sound mind and good healthy environment are crucial for their work. The purpose of the study is how Physical Education teachers will use Body Mass Index, Weight and Height to determine their health status. To determine the relationship between body mass index and weight/height as an effective health tool to determine health status of Physical Education teachers in Tamale Metropolis.

Research Objectives

1. To identify the height and weight of Physical Education teachers in Tamale Metropolis.
2. To find out the body mass indexes (BMI) of these teachers.
3. To use weight and height to determine the health status of these teachers.

Research Questions

1. What are the Heights and Weights ratios of Physical Education teachers in Tamale Metropolis?
2. What are the body mass indexes (BMI) of these teachers?
3. How can these be used to determine their health status?

Significance of the Study

The study examined the influence of body mass index, waist to hip ratio and the relationship on how it can affect the health status of the Physical Education teachers in Tamale Metropolis. It will enable us to critically examine factors leading to obesity. Parents usually hold Physical Education teachers responsible for success and failure of school games and sports activities. In the light of this, the study sets out to find the extent to which Physical Education teachers' life style or behaviour contributes to obesity. This study will be significant and relevant to:

- practising educational administrators and headteachers/ Headmasters/Headmistresses
- Physical Education administrators/practitioners

- Local, Metropolitan/ Municipal/District school board and Ministry of Education officials
- Teachers and students/pupils
- Ministry of Education and Ghana Education Service

Instrument

Instrument used in collecting data for this study was the questionnaire which was entitled 'Determination of cardiovascular risk factors of Physical Education Teachers in Tamale metropolis. It was developed by the researchers based on the literature review. The questionnaire was in parts; part 'A' sought for bio-data of respondents and part 'B' was to measure height and weight of the respondents. The questionnaire was piloted to determine its usability. According to Bamidele et'al (2002) validity involves an essential and systematic examination of test content to determine whether it covers a sample of the behaviour domains to be measured. Validity of the instrument was determined by a panel of tutors from the Science Department of Bagabaga College of Education-Tamale. Abiri (2006) agrees that reliability is the extent to which an instrument is free from random error, thus measuring over time the variables of interest. The instrument was administered to 28 physical education teachers in the metropolis to elicit responses from respondents from the schools. A clear instruction on how to complete the questionnaire was provided to the respondents by the researcher.

Review of Related Literature

Cardiovascular-Diseases and Risk Factors

Urban populations in the developing world are growing rapidly and at an accelerating rate (Kruger et. al 2008). Rural-to-urban transitions are often associated with marked changes in behaviour and lifestyle, such as diminished physical activity, sedentary employment, poorer dietary habits, and increased psychosocial stress (Ogeng, et. al 2011). In fact,

because of these emerging risk factors, over 80% of the global burden of cardiovascular disease has now shifted to low- and middle-income countries. (Koorts, et. al 2011). According to Kruger et. al (2008), the fastest rate of urbanization worldwide is occurring in sub-Saharan Africa, driven by high fertility rates and rapid industrialization. The transition from pre-industrial to industrialized economies has initiated an epidemiological transition from illnesses related to malnutrition, childbirth, and infection, towards chronic, non-communicable diseases, such as cardiovascular diseases. However, the epidemiological transition in sub-Saharan Africa is still in its early stages. As a consequence, diseases such as HIV and malaria continue to strain limited resources and dominate the public consciousness, while CVD and its often-subclinical symptoms are overlooked. Thus, populations are becoming older and more vulnerable to CVD at a time when surveillance capacities remain poor and skilled health workers scarce.

However, given these heterogeneities of cardiovascular disease risk profiles, a multi-factorial approach to cardiovascular disease risk assessment and intervention is essential. Here, are some major risk factors: dyslipidemia, hypertension, obesity, over weight and diabetes, are common among urban and rural Ghanaian men and women. Stedman (2006) contends that cardiovascular relates to the circulatory system, which comprises the heart and blood vessels and carries nutrients and oxygen to the tissues of the body and removes carbon dioxide and other wastes from them. Risk factors are conditions or habits that make a person more likely to develop a disease. (Stefan, et. al 2008). These factors can increase the chances that an existing disease will get worse. Stefan et al (2008) also points out some important risk factors for the heart that one can do something about. They include high blood pressure, high blood cholesterol, diabetes, overweight or obesity and being physically inactive. According to WHO report (1997), the heart is a muscular organ in most animals, which pumps blood through the blood vessels of the circulatory

system. Blood provides the body with oxygen and nutrients, as well as assists in the removal of metabolic wastes. In humans, the heart is located between the lungs, in the middle compartment of the chest.

Hillsdon et. al. (2005) agree that the ability of the heart, blood cells and lungs to supply oxygen-rich blood to the working muscles and the ability of the muscles to use oxygen to produce energy for movement is as vital and important. This type of fitness is a health-related component of physical fitness that is brought about by sustained physical activity, A person's ability to deliver oxygen to the working muscles is affected by many physiological issues, including heart rate, cardiac output, and maximal oxygen consumption. Understanding the relationship between cardio-respiratory endurance training and other categories of conditioning requires a review of changes that occur with increased aerobic or anaerobic capacity. (Frank 2010). As aerobic/anaerobic capacity increases, general metabolism rises, muscle metabolism is enhanced, hemoglobin rises, buffers in the bloodstream increase, venous return is improved and the blood bed becomes more able to adapt readily to varying demands as agreed by Frank (2010. Inferring from each of these results of cardiovascular fitness conditioning will have a direct positive effect on muscular endurance, and an indirect effect on strength and flexibility. To facilitate optimal delivery of oxygen to the working muscles, the person needs to train or participate in activities that will build up the energy stores needed for sport. A 2005 Cochrane review demonstrated that physical activity interventions are effective for increasing cardiovascular fitness.

Fatness as a Personal or Societal Issue

A person's fatness has been defined at a personal level as well as at a Societal level (Nestle, 2000). However, this is difficult to quantify. That is, each individual has his/her own perception of how fat he/she should be. As indicated above, this often depends on a general concept of societal norms or is due to peer pressure. For example, currently in

Western societies, young women are often concerned about their body image, and most consider themselves to be too fat, even though they are well within population-based references. This is not only due to societal concepts of an ideal degree of fatness, but also due to thinness being a goal promulgated by the fashion industry and reinforced by commercial advertising. At the societal level, although poorly described or quantified, there also is a degree of fatness beyond which a person generally is considered to be unacceptably fat; that is, there is an ill-defined threshold at which a person is labelled as being “fat” or “obese children.” (Stefan, et al 2008).

Oduro et. al (2012) contends that, the social consequences of being “too fat” are severe. Discrimination begins in childhood and results in serious emotional scars. Societal discrimination limits career choices, and indeed many career paths are closed to those considered to be too fat. Also, societal stigmatization often impairs a person’s ability to express his/her intellectual and other talents; that is, they become underachievers. In addition, the potential pool of mates is limited because of their perceived unattractiveness. Thus, obese people tend to marry other obese people and genetically may produce “obese”

Fatness as a Medical Issue

Consequences of an excessive accumulation of fat also have been recognized over the years. Nevertheless, the concept that “body build” (fatness) is a major population-based medical issue gained popularity in the medical field only shortly before 1900 (Agyemang et. al, 2012) Life insurance data accumulated at that time and subsequently indicated that body weight, adjusted for height (Wt/Ht), was an independent determinant of life expectancy, and in 1910, the effects of being overweight were noted to be greater for younger people than for the elderly. Subsequently, the Metropolitan Life Insurance Company in 1959 published tables of average body weights for heights (Wt/Ht) by gender and at different ages. This was based on data from 1935 to 1953 from more than 4 million adults, mostly men,

insured by 26 different insurance companies. The risk for development of certain diseases as well as mortality data related to Wt/Ht differences also were analyzed and reported in the 1960 Statistical Bulletin of the Metropolitan Life Insurance Co. (Flegal, et. al, 2001)

The Wt/Ht tables were used for many years as a reference for population-based studies. If a person's Wt/Ht was 20% above or below the mean for that height category, he/she was considered to be overweight or underweight, respectively. (Must, et. al 2001). The insurance data also indicated the ratios of weights for heights (the term used was "body building") at which mortality was lowest in adults. (Must, et. al 2001). The latter was referred to as the "ideal" or later the "desirable" weight. All of these data were periodically updated. Interestingly, from 1909 to 2003, the desirable weight, that is, the weight/height representing the lowest mortality had increased. However, a "desirable body" weight for height was invariably lower than the average weight for height in the insured population. (Must, et. al 2001).

Adoption of the BMI as an Index of Obesity

Keys et. al (2002) severely criticized the validity of Metropolitan Life Insurance data in 1998 but published tables of desirable weight for height, as well as the tables used to define people who were underweight or overweight. That era "obesity" as a word was not common. Instead, Keys et. al (2002) used better documented weight for height data, referred to as the body mass index (BMI). Thus, = $\text{body weight (kilograms) divided by height squared (meters)} = \text{BMI}$. Keys et. al (2002) agreed that by squaring the height, it reduces the contribution of leg length in the equation and tends to normalize the body mass distribution at each level of height; that is, it reduces the effect of a variance in height in the relationship of weight to height. This was considered to be important because most of body fat is in the

trunk. Nevertheless, as also pointed out by Keys et. al (2002) even the BMI rather poorly represents a person's per centage of body fat.

Keys et. al (2002) and American college of sports medicine (2010) used a better documented weight for height data, referred to as the body mass index (BMI). Thus, = body weight (kilograms) divided by height squared (meters) = BMI to measure the Health status of an individual. Table 1 and Table 2 shows how the various health status are classified based on gender.

Table 1: Body Mass Index Classification (Men) Based on Gender

Measurement	Health Status		
Height cm	18 to 24.9kg/m ² weight	Normal	Healthy
Weightkg	25 to 29.5kg/m ² weight	Over	Not Healthy
BMIkg/m ²	30 to 35kg/m ² Above Extremely obese	Obese 35kg/m ²	Cardiovascular Risk Serious Cardiovascular Risk/Disease

Source: American College of Sports Medicine (2010)

Table 2: Body Mass Index Classification (Women) Based on Gender

Measurement	Health Status		
Height cm	< 27kg/m ² weight	Normal	Healthy
Weightkg	27 to 29.5kg/m ² weight	Over	Not Healthy
BMIkg/m ²	30 to 35kg/m ² Obese Above Extremely obese	35kg/m ²	Cardiovascular Risk Serious Cardiovascular Risk/Disease

Source: American College of Sports Medicine (2010)

Despite all the criticisms, the Metropolitan Life Tables criteria for defining obesity were widely used in the United States until the early 1990s. The World Health Organization (WHO) classification of body weight for height, based on the BMI, was published, and later it was widely adopted and used.

World Health Organization (WHO) and the Categorization of BMIs

World Health Organization (WHO) brought Experts to Consult and develop a uniformed categorization of the BMI in 1993 (World Health Organization Report 2010). The results were published as a technical report in 1995. Four categories were established: underweight, normal, overweight, and obese. An individual would be considered to be underweight if his/her BMI was in the range of 15 to 19.9, normal weight if the BMI was 20 to 24.9, overweight if the BMI was 25 to 29.9, and obese if it was 30 to 35 or greater. Using linear regression, a BMI of 16.9 in men and 13.7 in women represents a complete absence of body fat stores.

The above categories are similar to those suggested by Garrow in 1981, but the terminology used were different “desirable” for a BMI up to 25, “grade I obesity” between 25 and 29.9, “grade II obesity,” between 30 and 40, and “grade III obesity” for BMI greater than 40. The latter classification was based on Rosenbaum and colleagues’ own data obtained in a survey of an adult population, aged 16 to 64 years, in Great Britain and published in 1985. The population based data indicated that the majority of people were in the “desirable” range of the BMI. Unfortunately, this distribution is not and has not been similar to those found in other surveys. The BMIs have been higher.

BMI as a Determinant of Body Fat Mass

Burton et. al (2005) critique a particular problem with the use of BMI as an index of obesity. He said that it does not differentiate between body lean mass and body fat mass; that is, a person can have a high

BMI but still have a very low fat mass and vice versa. Anatomical and metabolic perspective, obesity should be referred to an excessive accumulation of body fat (triacylglycerols), and upon these grounds, the accuracy of the BMI as a determinant of body fat mass has been repeatedly questioned by some scholars. This is because it clearly has limitations in this regard. In addition, in a recent study in individuals with or without diabetes in which the loss of lean body mass with aging was reported, the mean BMI in those without diabetes was 26.8. In those with diabetes, the BMI was 29.1; that is, it was higher as generally expected. However, the percentage of lean body mass was the same; that is, the increased BMI in those with diabetes was not due only to an excessive accumulation of fat.

Trends in Body Weight and Height

Over the years, there has been an increase in BMI in the general population (Blackburn, 1999). This has resulted in prediction of a public health disaster or a problem in the society as well. It should be recognized that in the United States during the period from 1960 to 2002 not only has the mean weight increased by 24 lb among men aged 20 to 74 years, but also the height has increased by about 1 inch. We can then calculate that the weight increase per year has only been 0.57 lb, and as indicated above. The results can be due to an increase in lean mass rather than fat mass, or it may be a combination of the two.

According to Wildman et. al (2008) there was an earlier report on life-insured men up to age 40 years, reported to be 0.5 to 1.5 inches taller and 2 to 9 lb heavier for the same height in 1959 than those studied 50 to 60 years prior to 1959. Also, in the earlier study, the mortality rate was lowest in those with higher weight-to-height ratios. This was attributed to the presence in the population of diseases such as tuberculosis that resulted in an increase in death rate (Stefan, 2008). Previously, a secular upward trend in height in adults in the United Kingdom also was reported. In addition, in a twin study in the United

Kingdom, children in 2005 were not only heavier but also taller than 1990 children, whereas their BMIs were essentially the same. Toth et. al (2000) agrees that the overall history of changes in height and weight in Western European men and probably women has been that of an increase in both weight and height. In the 17th century, the average height of men in Northern Europe was 5 ft 3 inch. It now approaches 6 ft. These data suggest that the BMI categories should be adjusted upward periodically to accommodate population-based changes.

The “Obesity Epidemic”

Recently, there has been concern that an epidemic of obesity is occurring in most countries. This is based on a worldwide data on BMI. (McPherson, 2010). There has been a change in the mean but to a greater extent in the distribution of BMI for adults aged 20 to 74 years in the United States (Flegal et. al, 1998). That is, the mean BMI has increased, but there has been a greater increase in skewing toward the right and very large BMI. This results in more individuals being categorized as “obese.” The reason for the recent increase in mean BMI, but particularly in those in the obese category, is unknown, although there are many speculations. The dramatic decrease in smoking is likely to have been a contributor (Pisinger et’al 2007) Smoking contributes to population-based BMI by at least 2% (Pisinger et’al 2007). Smoking impairs appetite per se. It is pathogenetically important in the development of chronic obstructive pulmonary disease which results in a lower body mass.

Methodology

The Research Approach

The study used a survey research design, aimed at determining cardiovascular risk factors of Physical Education teachers in Tamale Metropolis. Survey deals with “what is”? Its scope is very vast. It describes and interprets what exists at present. In surveys, we are

concerned with conditions or relationships that exist, practices that prevail, beliefs, points of view or attitudes that are held, processes that are going on, influences that are being felt, and trends that are developing. Although the major purpose of survey method in research is to tell “what is”? i.e., to describe the problem or phenomenon, many surveys go beyond a mere description of the existing situation. For example, the survey dealing with curriculum courses help us in obtaining information not only on the strength and weaknesses of the current curriculum but also can elicit recommendations for change. Surveys or studies also serve as direct sources of valuable knowledge concerning human behaviour (Babbie, 1990).

The survey method or approach was used to collect the following three types of information (i) what exists, (ii) what we want, (iii) how to get there. The information of what exists will be gathered by studying and analyzing important aspects of present situation. The information on what we want was obtained by clarifying goods, goals, and objectives possibly through a study of the conditions existing elsewhere or what experts consider to be desirable. The Information of how to get these is collected through discovering the possible means of achieving the goals on the basis of the experiences of others or of opinions of experts. Kothari (2004) views this approach as conditions or relationship that exists, opinions that are held, processes that are going on, effects that are evident or trends that are developing.

Population, Sample Selection and Sample Size

All items in any field of inquiry constitute a ‘Universe’ or ‘Population’ (Kothari 2004). Kothari also agrees that a complete enumeration of all items in the ‘population’ is known as a census inquiry. Millar (1991) agrees that there is the need to select few items from a large population for study purposes. This is to enable one to make inferences and to be able to generalize. The Representation sampling approach will be used for the sampling and sample size as agreed by Millar. He also agrees that representation sampling is better

than large sample size or a whole population. The size of a sample should not be too large or too small (Karma, 1999).

Sample Size

The Northern Region has about hundred (100) Physical Education personnel scattered all over the region (Regional Education Office 2016/ PE unit). The study area is the Tamale Metropolis which is one of the Assemblies in Ghana and the capital of Northern Region. The Metropolis has 244 schools consisting of both Basic Schools and Senior High Schools (Public and Private) (Metro Education Office 2016/ PE unit). Not all the 244 were selected for the study, but all the Senior High Schools Physical Education teachers, Metro Education Physical Education personnel and Regional Education Physical personnel were purposively sampled and used for the study. This sampling technique was used for the simple reason that these Physical Education teachers and personnel possess at least a first degree in Physical Education and have either taught Physical Education in both theory and practical and therefore possessed the requisite knowledge that were elicited from them (*'Preach what you teach'*). In all a sample of twenty-eight (28) Physical Education teachers were selected and used as the sample size for the study. However, there are a few things that inform the sample size:

- Time
- Population size
- The interest of the population
- Consanguinity of the population

Data Collection Approach

Data collection is an important aspect of any type of research study. Inaccurate data collection can impact the results. Data were collected by taking each of the respondent's weight and height by using a scale and a tape measure to determine each of the height and weight. Information were recorded in a field record note book and codes assigned to each of them. This is for the purpose of reference in an event that there is an error.

Data Analysis

Data collected were analyzed using descriptive statistics (mean, mode and median). The mean weight of the respondents was determined by using the SPSS to analyze. The BMI was calculated manually by taking the weight and dividing it by height².

Findings and Discussions

From table 3, the results indicate that a total of 28 Physical Education teachers were contacted. This was made up of seventeen (17) males, eleven (11) females who took active part in responding to the questionnaire administered by the researchers. All the 28 questionnaires sent out were retrieved. The results show a mean score of 1.75554 for the entire height with 73.3482 score for weight and 23.5500 for BMI respectively. The results also indicate that the standard deviation for the distribution for height, weight and BMI are .09747, 15.11634 and 2.74337 respectively. An indication of its closeness to the mean score of the various variables. The results support the accession by WHO (1997) report that was published as a technical report in 1995 that establishes four categories: underweight, normal, overweight, and obese. An individual would be considered to be underweight if his/her BMI was in the range of 15 to 19.9, normal weight if the BMI was 20 to 24.9, overweight if the BMI was 25 to 29.9, and obese if it was 30 to 35 or greater. Using linear regression, a BMI of 16.9 in men and 13.7 in women represents a complete absence of body fat stores. Multiple modes also exist within the various variables but the smallest value is shown. This is also an indication that some of the respondents have the same height and weight in the distribution.

Table 3: Statistics of Height and Weight of Physical education Teachers in Tamale Metropolis.

	What is Height	What is Weight	What is Height ²	What is BMI
	28	28	28	28
	0	0	0	0
Mean	1.7554	73.3482	3.0854	23.5500
Median	1.8000	71.7000	3.2400	22.4050
Mode	1.83 ^a	48.50 ^a	3.34 ^a	21.71
Std. Deviation	.09747	15.11634	.33260	2.74337
Variance	.009	228.504	.111	7.526
Range	.35	49.60	1.17	8.59
Sum	49.15	2053.75	86.39	659.40

a. Multiple modes exist. The smallest value is shown

Table 4 also indicates that seventeen (17) out of the twenty-eight (28) respondents have Normal Weight, and are therefore healthy, representing 60.71% of the total number of respondents. 11 out 28 of the respondents representing 39.28% are overweight therefore not Healthy per the American College of Sports Medicine Classification (2010) as indicated in the literature. The results also confirm Flegal et al. (2001) assertion that the Weight/Height tables were used for many years as a reference for population-based studies. If a person's Weight/Height was 20% above or below the mean for that height category, he/she was considered overweight or underweight, respectively. Among the 28 respondents 7 of them are females and out of the 7, 5 of them have Normal Weight representing 71.42% and 2 are overweight representing 28.58% of the female respondents.

Table 4: Heights and Weights of Physical Education Teachers in Tamale Metropolis

Height m	Height ² m ²	Weight kg	BMI=W÷H ² Kg/m ²	Gender
1.50	2.25	48.50	21.55	M
1.58	2.49	51.10	20.10	M
1.59	2.52	56.80	22.53	M
1.62	2.62	56.90	21.71	M
1.64	2.68	58.20	21.71	F
1.67	2.78	59.70	21.47	M
1.69	2.85	59.80	20.98	M
1.70	2.89	59.85	20.70	M
1.71	2.92	60.20	20.61	F
1.73	2.99	61.20	20.46	F
1.75	3.06	63.60	20.78	M
1.76	3.09	66.00	21.35	M
1.79	3.20	67.90	21.21	M
1.80	3.24	71.20	21.97	M
1.80	3.24	72.20	22.28	M
1.81	3.27	76.20	23.30	M
1.81	3.27	77.70	23.76	M
1.82	3.31	83.10	25.10	F
1.83	3.34	84.10	25.17	M
1.83	3.34	84.30	25.23	M
1.83	3.34	84.50	25.29	F
1.83	3.34	90.30	27.03	M
1.84	3.38	91.10	26.95	M
1.84	3.38	91.20	26.98	M
1.84	3.38	91.40	27.04	F
1.84	3.38	92.50	27.36	M
1.85	3.42	96.10	28.09	F
1.85	3.42	98.10	28.69	M

Conclusion

The results obtained in this study support the three research questions, although other studies are certainly needed in other contexts and from other perspectives. Generally, the study reveals that Tamale Metropolitan Physical Education teachers are healthy based on the Anthropometric classification, though a few of them are overweight. This means that they have what it takes to demonstrate their commitment in the teaching learning process in their respective schools. Interestingly, the study also brought out the various weights to heights and BMI of the Physical Education teachers. BMI, it is tended to be used in associating with risk factors with regards to health, and obesity. Physical Education teachers of Tamale Metropolis should check their weight and also frequently exercise their bodies.

Recommendations

It is recommended that Physical Education Teachers of Tamale Metropolis should develop positive relationship towards regular exercises to reduce weight and stress in their classroom activities. This will go a long way to promote active teaching and learning process, and students' participation in the class.

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