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Assessment of body mass index, body fat mass and percentage body fat of physical education trainees

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Abstract

The objective of the study was to assess the body mass index, fat mass and fat free mass of physical education trainees. For the purpose of the study, 60 Physical Education Students of age 20-24 years were chosen from Department of Physical Education and Sports and Department Mangalore University. To achieve the study's goals, simple random sampling technique was used, Body Composition Analyser was used for measuring parameters named Body Mass Index (BMI), Body Fat Mass (BFM) & Percent Body Fat (PBF), of students of Physical Education. The findings of this study underscore the importance of physical activity in maintaining healthy body composition among university students. Study highlight the potential impact of lifestyle factors such as physical activity on overall health.

Keywords: Body mass index, physical education, body composition

Introduction

Body mass index (BMI) is a simple tool for estimating the total amount of fat stored in body based on the weight and height of an individual. Identifying body weight status using BMI is related to the five categories of body weight: underweight, normal weight, overweight, and obese individuals.

The human body is composed of many major components at the cellular and tissue levels. These include water, minerals, protein and fat. Increases in the levels of fat component is highly influence on to health and also sports performance. In fact, fat plays a crucial role in human physiology. Fat stores energy, regulates body temperature, insulates organs and builds cell membranes.

The ideal percentage of body fat varies between each individual depending on various factors such as gender, body type, hereditary, age, activity levels and eating habits. People who are overweight and obesity, generally develop a higher body fat percentage due to either a sedentary lifestyle or a regular consumption of more energy than the body requires.

The term body fat percentage indicates the amount of body fat mass calculated as the total body weight percentage. Body fat percentage in the proportion of fat in body compared to total body composition.

Gallagher in his study classified the body fat percentage for adolescents. The body fat ranged below 8% is under fat, 8% to 19% is ideal fat, ranged 19% to 25% is over fat and above 25% body fat is obese.

It is widely presumed that young people who study physical education at professional physical education colleges could be characterised with proper physique and body composition. A physical education program involves routine, rigorous physical activities. Bachelor degree and master degree in physical education programs are run by the university, which involves practical classes in the morning and evening sessions. Every physical education taught different kinds of exercises, sports, and games practically. In which each student undergoes very difficult physical activities, competitions, and recreational activities. So, it is believed that the students of the physical education program are stronger and fit than other postgraduate students.

Procedure

To achieve the purpose of the study necessary data was collected from total 60 subjects age ranged between 22 to 25 years from Physical education department of Mangalore University. The Subjects were consulted personally by the investigator. Willingness of subjects were considered before the administration of test. Necessary instruction was given to the physical education students before the administration of the test which include the purpose of the study and the procedure of test.

Turn on the Karada Scan device and ensure it is properly calibrated according to the manufacturer's instructions. Enter the participant's information into the device, including age, sex, height, and activity level. This information is critical for accurate analysis.

Ask the participant to stand on the device's footplate with bare feet, ensuring proper contact with the electrodes. Instruct the participant to hold hand grips which is provided with the Karada Scan If the device includes, them firmly with both hands, ensuring contact with the sensors. Ensure the participant stands still with arms straight down and legs slightly apart for accurate measurement. Initiate the measurement process by pressing the start button on the device. The device will take a few seconds to complete the measurement. Instruct the participant to remain still during this period.

Once the measurement is complete, the device will display various body composition parameters such as body fat percentage, muscle mass, visceral fat level, BMI, metabolic age, resting metabolism, and subcutaneous fat. Carefully recorded the displayed results on the data recording sheet or input them into an electronic data management system.

Results

The collected data from the study of physical education trainees were analysed.

Table 1: Physical characteristics and body composition of physical education trainees

Variables	Mean	Standard deviation
Age	23.83	3.47
Height	170.85	22.62
Weight	63.79	12.08
BMI	21.83	3.85
Fat% (PBF)	16.79	5.13
Fat mas (BFM)	11.03	4.66

The above table shows the mean value and standard deviation of physical characteristics and body composition variables of physical education students. Mean value of body mass composition is 21.83 ± 3.85 , body fat percentage 16.79 ± 5.13 , fat mass (BFM) 11.03 ± 4.66 .

Table 2: Body fat percentage (PBF) in physical education students

Age	Under Fat	Ideal Fat	Over Fat	Obese
20-25	Below 8%	8 To 19%	19 To 25%	Above 25%
	Nil	94%	06%	Nil

Percentage of body fat measured and recorded in the above table. The physical education trainees were classified according to body fat ranges (Gallagher, 2000) [3]. In this study, no students reported in under fat range, 94% students with ideal fat percentage and the over fat reported 06%. No students found with more percentage of body fat.

Table 3: Classification of physical education trainees according to their BMI

Body Mass Index	Classifications	Trainees	Percentage
< 18.5	Under weight	5	8.33%
18.5 to 25	Normal weight	48	80.00%
25 to 30	Over weight	7	11.67%
> 30	Obese	0	0.00%

The above table shows that the classification of physical education trainees according to their body mass index. The underweight students 8.33%, Normal weight students 80% over weight 11.67% and no students are recorded as obese.

Discussions

Body mass index (BMI) is universally considered a marker of health and is widely used to measure malnutrition, overweight, and obesity. Also, some studies have shown that BMI can effectively reflect the physical fitness of the subjects. Physical activity is one of the indicators of a healthy lifestyle and healthy habits among students. In this study, it is observed that the maximum number of physical education student's body mass index is good and normal.

Body fat is necessary from which the body creates energy. Total body fat consists of two kinds of fats: a) essential body fat and b) storage body fat, and both of them are important to keep good health. Accurate estimation of lean body mass and fat mass is necessary for maintaining the total health and well-being of individuals.

For normal physiological functions, such as regulation of body temperature, production of sexual hormones, good neurological function, vitamin absorption, healthy metabolism, balance of blood sugar, and oxygen absorption, the essential body fat (EBF) is required. It is also necessary for the regulation of glucose, cholesterol, energy release, and storage to maintain life (Rani, 201) [4]. EBF is found in the heart, brain, lungs, nerves, liver, spleen, kidneys, intestines, muscles, and bone marrow. It is not visible, as it is located deep inside the body.

Storage body fat consists of fat accumulation in adipose tissue in the form of subcutaneous fat that is found around the liver, pancreas, heart, intestines, and kidneys.

Regular exercise can reduce abdominal visceral and subcutaneous fat mass. Physical fitness has a direct negative effect on body fat. An increase in physical fitness will result in a decrease in body fat, and many athletes reduce their body fat through physical exercise in order to improve their physical fitness.

In this study, the physical education students are regularly involved in rigorous physical activities such as exercise, sports training, sports skill practice, and competitions. Hence, their body mass index is normal or ideal. It indicates regular physical activity is a major factor in maintaining the body mass index of the individual.

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