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Comparative study of fat percentage and muscle mass of college students of hilly and plain area of Kashmir division

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Abstract
The study aimed to Compare Study of Fat Percentage And Muscle Mass of College Students of hilly and Plain Area of Kashmir division A total of Sixty (60) subjects, out of which thirty (30) were selected from plain and thirty (30) from hilly areas of Kashmir division and all of them were randomly selected for the study through a special sampling technique called as Simple random Sampling. The age of the subjects ranged between 18-21 years. To analyze the Fat Percentage And Muscle Mass of College Students of both the groups the following tests or equipments were used. Skin fold caliper for measuring Fat Percentage. Weighing machine for measuring weight and then fat percentage of each individual subject was subtracted from their actual weight to get the muscle mass of the subjects. The analysis of data was done by using statistical technique 't'- test for finding the significance difference of Fat Percentage And Muscle Mass of College Students of hilly and Plain Area of Kashmir division and the level of significance was set at 0.05 levels (p<0.05). The findings means and standard deviation of selected physical variables of college students from plain areas viz. Fat Percentage is (9.96 ± 2.28) and Muscle Mass is(57.0 ± 1.51) and The findings means and standard deviation of selected physical variables of college students from plain areas viz. Fat Percentage is (7.23 ± 3.19) and Muscle Mass is(59.87 ± 3.76). Hence it is clear that the students from plain areas are fatty and with least muscle mass as compared to that of living in hilly areas the reason behind all this might be the tracking habit of people living in hilly areas as these areas have good facilities of transport so people in hilly areas consume extra energy as compared to plain areas.

Keywords: Muscle Mass, Fat Percentage, Skin fold caliper Weighing machine, College Students of hilly and Plain Area

Introduction

In physical fitness, body composition is used to describe the percentages of fat, bone and muscle in human bodies. Because muscular tissue takes up less space in our body than fat tissue, our body composition, as well as our weight, determines leanness. Two people of equal height and body weight may look completely different from each other because they have a different body composition. The human body is composed from many major components at the cellular and tissue levels. These include water, minerals, protein and fat. Increases in the levels of fat components are detrimental to health and also sports performance. On the other hand, increases the protein component result from more muscle mass and hence are beneficial to athletes. The mineral components is mainly associated with bone. The density of bone can be problematic in the elderly where osteoporosis arises. The assessment of body composition is not only common in sport and exercise sciences but also in medicine. Most of the interest is in quantifying body fat in relation to health and to sports performance.

Skin fold method

The skin fold estimation methods are based on a skin fold test, also known as a pinch test, whereby a pinch of skin is precisely measured by calipers at several standardized points on the body to determine the subcutaneous fat layer thickness. These measurements are converted to an estimated body fat percentage by an equation. Some formulas require as few as three measurements, others as many as seven.

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The accuracy of these estimates is more dependent on a person's unique body fat distribution than on the number of sites measured. As well, it is of utmost importance to test in a precise location with a fixed pressure. Although it may not give an accurate reading of real body fat percentage, it is a reliable measure of body composition change over a period of time, provided the test is carried out by the same person with the same technique. Skin fold-based body fat estimation is sensitive to the type of calliper used, and technique. This method also only measures one type of fat: subcutaneous adipose tissue (fat under the skin).

Procedure and Methodology:
Sixty (60) subjects were selected for the collection of data which include 30 subjects from plain areas and 30 from hilly areas of Kashmir Division. The subjects were selected by simple random sampling method. The age of the subjects ranged between 18-21 years. For the data of fat percentage the skin fold was picked up and the reading was taken from three major areas of the body where mostly the fat gets accumulated. These areas are chest, abdomen and thigh. After taking the measurement of these areas the values were added and then compared with Nomo-graph to know the percentage of fat in the body. This is measured to the nearest millimeter. This Nomo-graph consists of two scales. One scale indicates level of age of males and females; second one indicates percentage of fat. The scores or values from the three areas after adding are compared with the scale of fat percentage to know the fat percentage in the body and the data related to Muscle Mass was obtained by following steps given below:

Step 1: Weigh yourself with a body fat scale. The scale will automatically calculate your percentage of body fat.

Step 2: Subtract your body fat percentage from 100 to get your lean mass percentage. Here is an example: 100 - 25 percent body fat = 75 percent lean mass.

Step 3: Divide your lean mass percent by 100 to calculate the decimal for your lean mass percent. Here is an example: 100 / 75 = .75

Step 4: Multiply your lean mass decimal by your total body weight to calculate your lean mass weight. If you weigh 175 lbs., multiply 175 by .75 for 131.25 lbs. of lean mass.

Equipments Used For Collection of Data
The various equipments that were used for the collection of data were Haemometer for measuring haemoglobin percentage. Peak flow meter for measuring exhale capacity. A digital Stop watch for recording time during pulse rate count.$Vo2_{max}$. Bench for cardiovascular endurance.

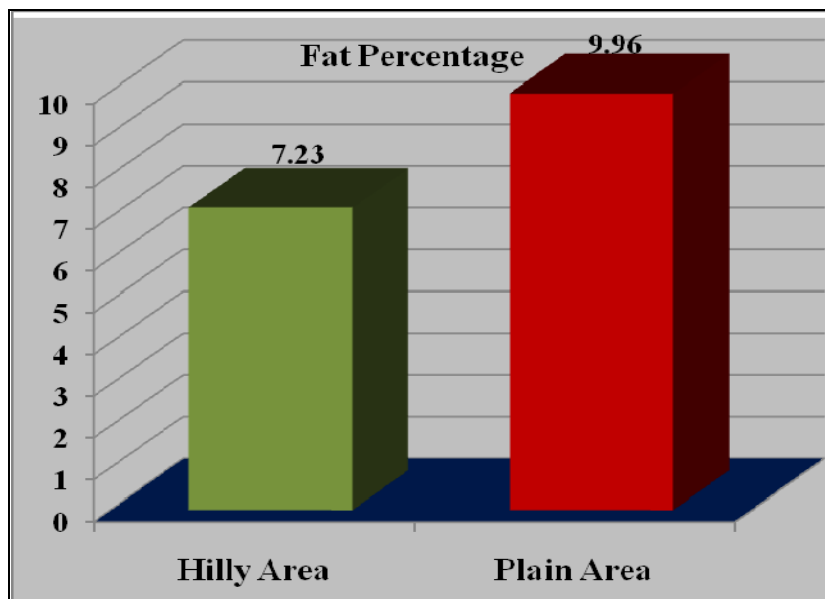**Table 1:** Comparison of Fat Percentage of College Students of Hilly and Plain Areas.

Group	Mean	S.D.	Mean Difference	Degree of Freedom	O.T	Tabulated 't'
Hilly Area	7.23	3.19	2.73	58	3.81	2.00
Plain Area	9.96	2.28				

Level of significance =0.05
Tabulated 't' 0.05 (58) =2.00

Table No 1 reveals that there is difference between means of Hilly Area group and Plain Area group because mean of Hilly Area group is 7.23 which is less than the mean of Plain Area group 9.96 so this mean difference is found as 2.73.To check the significant difference between Hilly Area and Plain Area groups the data is again analyzed by applying 't' test. Before applying 't' test, standard deviation is calculated between Hilly Area and Plain Area group which is 3.19 and 2.28 respectively and the calculated value of 't' is found as 3.81, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows that Plain Area college students are having more fat percentage than Hilly Area college students. Hence the hypothesis which was given by the researcher is accepted. This is presented graphically in figure No.1.
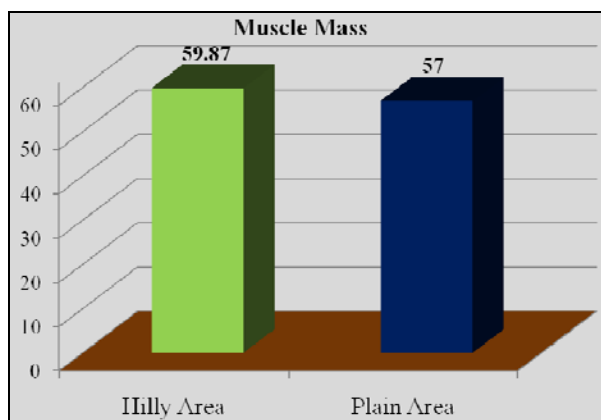

Fig 1: Graphical representation of mean difference between hilly and plain area group.

Table 2: Comparison of Muscle Mass of college Students Hilly and Plain Area

Group	Mean	S.D.	Mean Difference	Degree of Freedom	O.T.	Tabulated 't'.
Hilly Area	59.87	3.76	2.86	58	3.86	2.00
Plain Area	57.00	1.51	2.86			

Table No.2 reveals that there is difference between means of Hilly Area group and Plain Area group because mean of Hilly Area group is 59.87 which is greater than the mean of Plain Area group which is 57.00 and therefore mean difference is 2.86 to check the significant difference between Hilly Area and Plain Area group data is again analyzed by applying 't' test. Before applying' test, standard deviation is calculated between Hilly Area and Plain Area group which is 3.76 and 1.51 respectively and then the calculated value of 't' is found as 3.86, is greater than tabulated 't' which is 2.00 at 0.05 level of significance. This shows that Hilly Area college students are having more muscle mass than Plain Area college students. Hence the hypothesis which was giving by the researcher is accepted. This is presented graphically in figure No.2.

Fig 2: Graphical Representation of Mean difference Between Hilly and Plain Area group.

Conclusion
Within the limitations of the study and from statistical analysis the following conclusion was drawn.
There was found significant difference in Fat Percentage And Muscle Mass of College Students of hilly and Plain Area of Kashmir division. From result of this survey type of study we come to this conclusion that students living in plain areas of Kashmir division gain more fat and have less muscle mass as compared to students from hilly areas. the reason behind all this might be inactiveness or comfortable life in plain areas as compared to students living in Hilly areas and All this is not good sign for the students of hilly areas of Kashmir Division so the students of plain areas are recommended through this study to take initiatives to get rid of this problem by taking active part in running, walking and other physical activities to burn this accumulated fat otherwise it may prove fatal to them.

References
1. Maclaren D *et al.* Sports and Exercise Physiology, (New York: Bios Scientific Publishers, 2007.
2. Sharma JP. Exercise Physiology, (New Delhi: Vivek Thani Khel Sahitya Kendra, 2010.
3. Vijay Lakshmi. Physical Fitness, (Delhi: Vivek Thani Khel Sahitya Kendra, 2009.