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Relationship of body mass index, fat and visceral fat among adolescents

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Abstract

In the present study the researcher studied out the correlation of Body mass index, Fat and visceral fat among adolescents. Data was statically analyzed using descriptive statistics and Pearson Product Multi Correlation Coefficient was used (PPMCC). It was find out that body mass index was significantly correlated with fat and visceral fat and on the other hand fat was also significantly correlated with visceral fat among adolescents.

Keywords: Body mass index, fat, visceral fat and adolescents

Introduction

Human body is composed of fat mass and fat free mass which consists of muscle, water, bone and organ. Fat are also known as lipids, fats are essential for proper body functioning. They are important for controlling inflammation, blood clotting, and brain development (Ifeoma, F. O. 2015)^[1]. Fats are also an important energy source. When the body has used up the calories from carbohydrates, which occurs after the first 20 minutes of exercise, it begins to depend on the calories from fat. Healthy skin and hair are maintained by fat. It helps the body absorb and move the vitamins A, D, E, and K through the bloodstream. There are different types of fats including saturated and unsaturated (monounsaturated and polyunsaturated), which all have specific functions within the body. The ideal weight and fat-lean ratio varies considerably for men and women by age. The average healthy adult body fat range regardless of age is 15 to 20% for men and 20 to 25% for women. A woman with more than 32% body fat and males with more than 25% body fat are considered to be at increased risk for disease. Trained athletes tend to be at the low end of this scale due to their increased lean weight (muscle mass) compared to untrained individuals. While low levels of body fat seem to be related to improved performance, body composition alone is not a great predictor of sports success. The body of human being retains fat in our body in two forms. Storage Fat - This consists mainly of fat deposited just under the skin or subcutaneous fat. Storage fat for men and women is fairly similar. For the average man 12% of bodyweight is storage fat and for the average woman 15% of bodyweight is storage fat. Essential Body Fat - Essential fat is the amount of fat necessary for maintenance of life and reproductive functions. For women the average amount of essential fat is 13% of bodyweight and for men it is 3%. As per world health organization (WHO) Obesity and overweight are the problem of pinnacle level regarding health and presently it is a global epidemic (Popkin 2001)^[2].

The problem of overweight and obesity is escalating among adults and adolescents in developed and developing countries also. The adolescents pass through a period of transition from adolescents to adulthood. The body having overweight and obesity at early stage of life will lead to serious problematic issues related to health in the upcoming future (Tanner 1978)^[3]. A high prevalence among adolescents related to obesity had been observed in metro Politian cities in India (Sundaram *et al.* 1988)^[4]. About 50-80% of children that are obese will row up to become in future obese adults (Styne 2001)^[3]. Visceral fat is stored in the abdominal cavity, thus covering a number of vital internal organs of our body such as pancreas, liver, intestine, stomach. A increase in the % of visceral fat in our body leads to increased risks of a number of health problem including type 2 diabetes. Visceral fat can be diagnosed by undergoing an MRI Scan (Magnetic Resonance Imaging Scan).

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Around 10% of around 10% of our total fat is likely to be stored as visceral fat, thus carrying large % of body fat will also lead to the increased level in the storage of visceral fat.

Classifications of body composition in relative age groups

Men – % Bodyfat / Age	20-29	30-39	40-49	50-59	60-69
Low (Increased Health Risk)	<8	<8	<8	<8	<8
Excellent/Fit (Healthy)	<=10.5	<=14.5	<=17.4	<=19.1	<=19.7
Good/Normal (Healthy)	10.6-14.8	14.6-18.2	17.5-20.6	19.2-22.1	19.8-22.6
Fair/Average (Healthy)	14.9-18.6	18.3-21.3	20.7-23.4	22.2-24.6	22.7-25.2
Poor (Increased Health Risk)	18.7-23.1	21.4-24.9	23.5-26.6	24.7-27.8	25.3-28.4
High (Increased Health Risk)	>=23.2	>=25	>=26.7	>=27.9	>=28.5

Objectives

1. To find out the relationship of Body mass index with fat.
2. To find out the relationship of Body mass index with visceral fat.
3. To find out the relationship of Fat with visceral fat.

Delimitations

- The study was delimited to the subjects between age group of 15 to 19 years.
- The study was delimited to adolescents from district Doda (J&K)
- The study was delimited to 50 samples.

Limitations

- Life style pattern, socio-economic background, nature of activity will be considered as a limitation of the study.

Material and Methods

- The study was collected on 50 samples of drug adolescents. To measure among the subjects was measured by using OMRON Body composition monitor with scale Model HBF-362 was used.

Statistical Technique Data was statically analyzed using descriptive statistics and Pearson Product Multi Correlation Coefficient was used (PPMCC).

Table 1.1: Mean and standard deviation of adolescents

Descriptive Statistics			
	Mean	Std. Deviation	N
Body Mass Index	23.4680	2.87398	50
Fat	18.6920	4.59089	50
Visceral Fat	7.3200	2.28071	50

Table 1.2: **. Correlation is significant at the 0.01 level (2-tailed).

Correlations				
		Body Mass Index	Fat	Visceral Fat
Body Mass Index	Pearson Correlation	1	.565**	.821**
	Sig. (2-tailed)		.000	.000
	N	50	50	50
Fat	Pearson Correlation	.565**	1	.535**
	Sig. (2-tailed)	.000		.000
	N	50	50	50
Visceral Fat	Pearson Correlation	.821**	.535**	1
	Sig. (2-tailed)	.000	.000	
	N	50	50	50

The table 1.1 shows the correlation coefficients along with their P-values and sample size of adolescents. The product movement correlation coefficient is also known as Pearson correlation because it was developed by the British Mathematician Karl Pearson. The Correlation coefficient with one asterisk mark is significant at 5% whereas with two asterisks mark is significant at 1% level (JP Verma 2011). All those correlation coefficients having P-value less than 0.05 are significant at 5% level. As the research hypothesis is two – tailed that defines a significant correlation between the variables. Following conclusion can be drawn from the table 1.2. The Body mass index was significantly correlated with the fat and visceral fat as the p- value was less than 0.05 level of significance respectively. The level of fat was also significantly correlated with visceral fat. Thus all the mentioned variables i.e. Body mass index, fat and visceral fat are significantly correlated with each other. The p-value of all the three variables is less than 0.05 level of significance.

Conclusion

The data was collected from adolescents on three parameters i.e. Body mass index. Fat and visceral fat to find out relationship among each other among the mentioned parameters. It was found out Body mass index, fat and visceral fat was significantly correlated among each other.

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