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An analytical study of obesity and strength and endurance among citizens of Bilaspur city

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Abstract
The main purpose of the study was to find out and the comparison of agility and flexibility of obese citizen of the bislaspur city. A total of Fourty Five (45) subjects, comprising 15 Obesity Grade-1, 15 Obesity Grade-2 and 15 Obesity Grade-3, of bislaspur city. The Subjects were selected by using simple random sampling. The age of the subjects ranged between 25-40years. To analyze the strength and endurance of the subjects of all the groups I.e. Obesity Grade-1, Obesity Grade-2 and Obesity Grade-3 of bislaspu city. The following tests or equipments were used. Strength (Leg lift dynamometer), it is measure the strength of the leg. To measure the Cardio-Vascular Endurance, (Metronome, Stop watches, 20 inch Bench). The analysis of data was done by using statistical technique 'f'- test for finding the significance difference of strength and endurance of bilaspur city and the level of significance was set at 0.05 levels ($p<0.05$).

Keywords: strength and endurance, citizens

Introduction
Obesity is perhaps the most prevalent form of malnutrition in developed countries both amount adults and children. It is extremely difficult to access the size of the problem and compare the prevalence rates in different countries as no exert figures are available and also because the definitions of obese in standardized. Further, there has been an increased awareness the problem in recent years. However, it has been estimated to affect 20 to 40 percent of the adults and 10 to 20 percent of children and adolescents in developed countries it is found in all countries in varying degrees. The history of human being is witness to fact that long as man was busy in his day to day routine work in absence of modern means of life, he did not have the problems being graced by today's man. The development in the field of technology has provided numerous comforts to the modern man compared to the ancient one. There is an increased efficiency in the work and also increase in the leisure hours, remarkable increase in the production, in the industrial as well as forming output, drastic changes in the communication system is available, unbelievable progress and developments in the war gadgets, much improved transports system is available. The problem of obesity alone is the root cause of many physical problems of humans beings. However, the problem of obesity overweight is not products/results of only one specific factor, there are many contributing factors, for examples physical inactivity comfortable life style, dietary habits, genetics, social and physically weak and responsible to diseases. Alias, Indian have become less and less active, and they have become more reliant on machines especially the automobile to do the work, their ancestors had to do with their own muscles. As the profusion of convinces were not enough problems, Indians now eat foods high in fat and refined starches and sugar, all of which are high in calories. They are eating fewer of the foods called complex carbohydrates whole grains, fruits and vegetables that have fewer of calories and greater national valve. This combination of less physical exertion and more empty calories has left many Indians overweight and out of shape. The convenience culture also is the cause of obesity. In office buildings we ride elevators rather than walk up one or two flights of stairs, parents drive their kids to the neighbor's instead of telling them to ride bikes walk; home gardeners use power mowers rather than old fashion blade movers.
Obesity can defined as excessive enlargements of the body's total quantity of fat. There is no biological reason for man and woman to get fatter as they grow older but now days; obesity has been called the main health problems of modern society. The seriousness of this situation is underlined by a similar rise in obesity related diseases. Obesity my defined as an abnormal growth of adipose tissue due to enlargement of fat cell size (hypertrophy obesity)or an increase in fat cell number (hyperplasic obesity) or combination of both.

Strength
Strength is conditional ability i.e. it depends largely on the energy liberation processes in the muscles. Strength is also perhaps the most important motor ability` in sports as it is a direct product of muscle contractions. All movements in sports are caused by muscle contractions and, therefore, strength and strength training, therefore, assume high importance for achieving good performance in all sports, The role of strength training for general health, good posture and for prevention of injures is usually overlooked which in the long run can prove harmful. Zimmermann (1989) has very rightly pointed out the positive effects of strength training on muscles, bones, joint heart, circulatory system, metabolic and nervous system.
The strength ability can be divided into three types described

below.

Endurance

Today there is a growing emphasis on looking good, feeling good, and living longer, increasingly scientific evidence tells us that one of the keys achieving these is to the human body what fine tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that helps us for better look, pleasant and do our best. Endurance is the ability to do spots movements with the desired quality and speed under condition of fatigue. Endurance is directly or indirectly of high importance in all sports. Endurance is the basic component of physical fitness. Endurance like strength is a conditional ability. It is primarily determined by energy liberation process.

Methodology

Source of Data

For the present study the subjects were selected from Bilaspur city.

Selection of Subjects

For the present study total 45 female subjects were selected as the subjects for the study.

Sampling Method

The subjects were selected by Sample Random Sampling method.

Hypothesis

It was hypothesized that there was significant difference in physical fitness components of various obesity grades citizens of Bilaspur city.

Collection of Data

The data pertaining to the study was collected by administering the tests which are meant for the selected variables.

Analysis and interpretation of Data

In the chapter the gathered data from the citizens of bilaspur city are presented in tables, graphs, figures and discussion and findings are also presented in this chapter.

Findings

The finding of this study showed insignificant difference of strength and endurance, so for this component there was found significant difference of strength and endurance between obesity grade one, grade two and grade three.

Level of Significance

To test the hypothesis the level of significance was set at 0.05 level of confidence which was considered adequate and reliable for the purpose of this study.

Table 1: Mean of Strength of various obesity grades

Name of Group	Mean of Strength
Obesity Grade-1	173.52
Obesity Grade-2	155.55
Obesity Grade-3	142.00

From the above given table it is being said that the Mean of the strength of I group (Obesity Grade-1) is 173.52, Mean of the II group (Obesity Grade-2) is 155.55, Mean of the III group (Obesity Grade-3) is 142.00,

There is Mean difference between all three obesity grades. Whether it is significant or not it can be shown by using special statistical technique 'F' test (ANOVA).

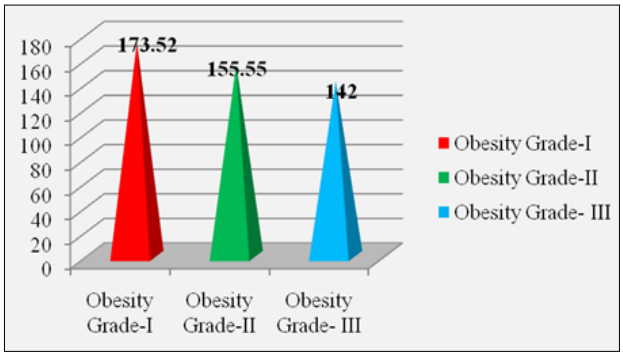

Fig 1: Graphical representation of mean difference between of Strength between Obesity grade- 1 grade- 2 and obesity grade -3

Table 2: Showing one way Analysis of Variance (ANOVA) of Strength Scores

Source of variance	df	Sum of squares	Mean Variance	F Calculated	F Tabulated
Between Groups	K-1 3-1=2	31686	3343.65	5.61	3.23
Within Groups	N-K 45-3=42	24998.7	595.20		

'F' at degree of freedom between groups (df_b) is shown by the formula K-1 where 'K' is number of groups which are 4 so it becomes 3-1=2.

'F' at degree of freedom within groups (df_w) is shown by the formula 'N-K' where 'N' is total number of subjects in all groups and 'K' is number of groups which becomes 45 - 3 = 42.So 'F' test at 2 and 42 is 3.23 which is called tabulated 'F'.

In the given table the value of Tabulated 'F' is 3.23 and the value of Calculated 'F' is 5.61 which is greater than tabulated 'F' at 0.05 level of confidence so it is said that there is significant difference in physical fitness component (strength) between of various obesity grade citizens of bilaspur, hence the researchers hypothesis is accepted.

Table 2: Mean of Endurance of various obesity grades

Name of Group	Mean of Endurance
Obesity Grade-1	63.09
Obesity Grade-2	60.62
Obesity Grade-3	58.43

From the above given table it is being said that the Mean of the Endurance of I group (Obesity Grade-1) is 63.09. Mean of the II group (Obesity Grade-2) is 60.62, Mean of the III group (Obesity Grade-3) is 58.43

There is Mean difference between all three obesity grades. Whether it is significant or not it can be shown by using special statistical technique 'F' test (ANOVA).

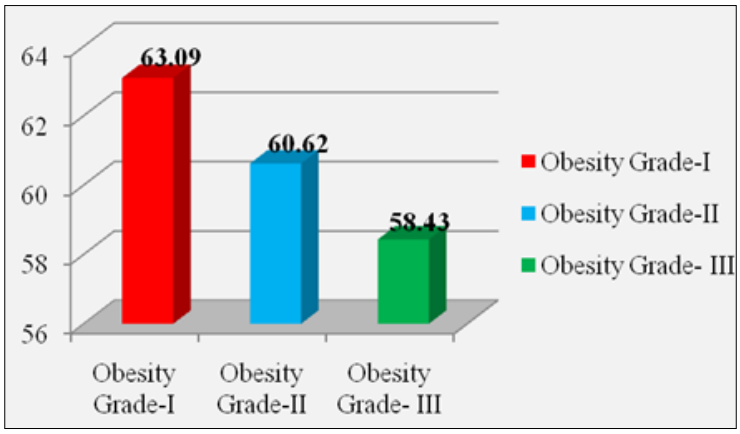

Fig 2: Graphical representation of mean difference between of Endurance between Obesity grade- 1 grade- 2 and Obesity grade -3

Table 3: Showing one way Analysis of Variance (ANOVA) of Endurance Scores

Source of variance	Df	Sum of squares	Mean Variance	F Calculated	F Tabulated
Between Groups	K-13-1=2	2341.14	102.54	2.01	3.23
Within Groups	N-K 45-3=42	2136.06	50.85		

'F' at degree of freedom between groups (df_b) is shown by the formula K-1 where 'K' is number of groups which are 4 so it becomes 3-1=2.

'F' at degree of freedom within groups (df_w) is shown by the formula 'N-K' where 'N' is total number of subjects in all groups and 'K' is number of groups which becomes 45 - 3 = 42.So 'F' test at 2 and 42 is 3.23 which is called tabulated 'F'.

In the given table the value of Tabulated 'F' is 3.23 and the value of Calculated 'F' is 2.01 which is greater than tabulated 'F' at 0.05 level of confidence so it is said that there is significant difference in physical fitness component (Endurance) between of various obesity grade citizens of bilaspur, hence the researchers hypothesis is accepted.

Conclusion

Within the limitations of the study and from statistical analysis the following conclusion was drawn.

There has been found insignificant difference in Strength and Endurance of obese persons belongs to Kashmir city. Because the tabulated 'f' exceeds than the calculated 'f' for both the variables. Hence the given hypothesis has been accepted.

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