



A STUDY ON OBESITY AND CARDIOVASCULAR ENDURANCE ON COLLEGIATE STUDENTS

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ABSTRACT

Over the past four decades, there has been an increase in the prevalence of overweight and obesity in adults across all genders, ages and racial/ethnic groups. The negative effects of obesity on both the individual and society are serious and multidimensional. Obesity is the risk factor for many health problems, including coronary heart disease, certain forms of cancer, type 2 diabetes, hypertension, stroke, osteoarthritis, sleep apnea, and respiratory problems is associated with increase in all cause mortality.



KEY WORDS : Obesity and cardiovascular Endurance.

INTRODUCTION

In adults relationships among physical activity health related fitness and health are fairly well established. Low level of physical activity and cardio respiratory fitness are both associated with higher risk of all causes and disease specific mortality. Obesity is caused by a combination increased caloric expenditure resulting in a step of positive energy balance (Miller, 1999).

A sedentary life style is among the risk factors for significant diseased. Physical fitness is the ability to perform daily actively and willingly. Physical fitness includes not only components of sports but those of health as well. Health-related physical fitness involves cardiopulmonary fitness muscle endurance, strength, flexibility and body composition.

Genetic : The fat in a person's body is stored in fat cells distributed throughout the body. A normal person has between 25 and 35 billion fat cells, but this number can increase in times of excessive weight gain, to as many as 100 to 150 billion cells. The number of fat cells in the body remains constant after their formation; the cells just expand and shrink in size during weight gain and loss. This has been suggested as one reason weight loss is so hard to maintain for many people, and research is under way to determine methods or medications that will reduce the actual number of cells.

STATEMENT OF THE PROBLEM

For the present study following statement of the problem to be stated:

- 1) Is there any difference on cardiovascular endurance among active group and non active group?
- 2) Is there any difference on obesity among active group and non active group?
- 3) Is there any relationship between obesity and cardio vascular endurance ?

DELIMITATIONS

The study was delimited to 40 active students and 40 non active students.

The study was delimited only college going male students.

The age group was delimited between 18 to 25 years.

The study was again delimited on following variables.

- (a) Fat mass (b) Fat free mass (c) Body mass index
(d) cardio vascular endurance.

METHODOLOGY

Selection of Subject

To conduct the study 80 collegiate students selected. Forty active students (Students who are doing regular physical activities).

The average age of active group was 22.32 years and non active group was 22.86 years. The sample selected by the random basis.

CRITERION MEASURES

To measure fat% free mass and fat mass (adipose cells) of all the sample body fat analyzer instrument will be used. This instrument is highly reliable to evaluate body composition. BMI was calculated from Quetelet index i.e. $BMI = WT (Kg) / HT (m^2)$

For measuring the cardiovascular endurance “Harvard step test” 1943 has been administered on each sample. The test is highly valid and reliable.

BODY FAT ANALYZER:

To measure fat % fat free mass and fat mass body fat analyzer was used according to procedure mention in the booklet and scoring was done according to instruction given by the manufacturer.

Harvard Step Test:

Brouha (1943) constructed a very simple and promising field test for measuring cardiovascular endurance of human beings by using easily available and inexpensive equipment. Originally, the test was developed on 220 college men by administering it simultaneously on small groups of students. This is probably the most common test of cardiovascular endurance used in India and also all over the world.

Equipment;

A stopwatch, 20-inch high bench, metronome (optional), stethoscope (optional).

Scoring:

The pulse of 1 to 1.5 minute recorded and fitness index is calculated by the following formula:

$$\text{Fitness index} = \frac{\text{Duration of exercise period in second}}{5.5 \times \text{pulse count after exercise}} \times 100$$

Body Mass Index:

To calculate body mass index subject's height and weight was measured according to method given by the expert. After that body mass index was calculated using following formulas- $BMI = Wt(kg)/ht(m^2)$.

Collection of Data

For measuring cardio vascular endurance “Harvard step test” was administered to entire subject at laboratory of college. To measure fat %, fat mass and fat free mass, body fat analyzer machine has been used according to suggestion given by the manufacturer of the machine. This machine is valid and reliable to measure fat mass, fat % and fat free mass of individual's body. To calculate BMI height and weight was taken from all the students at college laboratory.

Table No.1**Physical, Body composition and Physiological characteristics of subjects in the active and non active groups.**

Variables	Active Group(N=40) (mean + SD)	Non Active Group (N=40) (mean + SD)
Age (Years)	24.89 +2.25	24.07 + 2.37
Height (cm)	1.68 +6.55	1.68 + 5.66
Weight (kg)	61.10 + 8.90	61.40 + 8.90
Body mass index (kg/m ²)	21.57 + 2.81	21.59 + 2.92
Fat %	16.40 + 5.29	20.46 + 5.28
Fat mass	10.00 + 3.41	12.58 + 3.78
Fat Free Mass	51.09 + 8.29	48.81 + 7.72
Cardiovascular endurance	55.89 + 6.06	48.07 + 3.37
Pulse rate	59.10 + 5.21	68.40 + 4.67

Table No.2**Comparison on Height, weight and BMI among active and non active group**

	Active-Group (N=40)	Non-Active Group (N=40)	t	Significance Level
Height	1.68 + 6.55	1.68 + 5.66	.21	NS
Weight	61.10 + 8.90	61.40 + 8.90	.15	NS
BMI	21.57 + 2.81	21.59 + 2.92	.03	NS

T value at .05=1.98 and .01=2.61

Table No. 3**Comparison on fat % fat mass and fat free mass among active and non active group**

	Active Group (N=40)	Non-Active Group (N=40)	t	Significance Level
Fat %	16.40 + 5.29	20.46 + 5.28	4.06	.01
Fat Mass	10.00 + 3.41	12.58 + 3.78	3.19	.01
Fat Free Mass	51.09 + 8.29	48.81 + 7.72	1.27	NS

T value at .05=1.98 and .01 = 2.61

Table No. 4**Comparison on pulse rate and cardiovascular endurance among active and non active group**

	Active Group (N=40)	Non-Active Group (N=40)	t	Significance Level
Pulse Rate	59.10 + 5.21	68.40 + 4.67	8.40	.01
cardiovascular endurance	55.89 + 6.06	48.07 + 3.37	7.12	.01

T value at .05 = 1.98 and .01=2.61

CONCLUSIONS

1. Active group and non active group are having no difference on height, weight and body mass index.
2. Non active group are having more fat % and fat mass compared to active group. But both the groups are having equal fat free mass.
3. Active group showing their superiority on pulse rate and cardiovascular endurance compared to non active group.

4. Obese group are having low cardio vascular endurance compared to obese group.
5. Low fat group are superior on cardiovascular endurance compared to obese group.
6. Average fat group are having low cardiovascular endurance compared to low fat group.
7. Fat % fat mass and fat free mass shows their negative co relationship with cardiovascular endurance.

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