



A COMPARATIVE STUDY OF CARDIO ENDURANCE BETWEEN OBESE AND NON-OBESE ADOLESCENT BOYS

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Abstract: The aim of the present study is compare cardio endurance between obese and non obese adolescent Indian boys. For present study, 200 obese adolescent boys (Av. age 16.25 yrs.) and 200 normal weight adolescent boys (Av. age 16.12 yrs.) from various govt. and private schools of Chhattisgarh were selected to serve as sample for the present study. The criteria for selection of subjects was based on WHO (2000) classification of body mass index (BMI) which BMI between 18.0-24.99 is considered to be normal weight while BMI >30 is considered to be obese. To assess cardio endurance of the selected subjects, 600 yard run/walk test was used. Results reveal that cardio endurance of obese adolescent boys was significantly superior as compared to non-obese boys. It can be concluded that cardio endurance or cardio respiratory endurance is severely impaired due to obesity in adolescent boys.

Keywords : Cardio Endurance, adolescence, obesity, BMI

Introduction:

Adolescent has been defined by WHO (2000)¹ as the period of life spanning between 10-19 years and the youth as between 15-24 years. They are no longer children, but not yet adults. Childhood and adolescence are complex stages with profound changes due to growth and maturation. The behavioural and physiological pattern obtained throughout this stage can be

crucial to a healthier future and greater quality of life

Health is related to fitness; that is one thing that can be easily overlooked. This is a basic fact, but with what the technology and other people have brought us, a lot of people forget to see this.

One of the important dimension of health related fitness is cardio-respiratory fitness or cardio endurance. It can be defined as the ability of the cardio respiratory system to respond adequately and safely to the blood, oxygen and other nutritional requirements of the body's organs and tissues, particularly the working muscles during physical activity.

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In modern society obesity became a serious problem. Studies in the past have shown the adverse effect of obesity upon psychological well-being. In numerous studies by researchers such as Duche et al. (2002)², Deforche B, et al. (2003)³, Weiss, R. et al. (2004)⁴, Savvas, P. et al. (2006)⁵, NoppawanCharususin (2007)⁶, Manu (2007)⁷, Kwok-Kei Mak et al. (2010)⁸, Riddiford-Harland (2011)⁹ have explored the relationship of obesity with variables such as hypertension, physical fitness, upper and lower limb functionality, peak power, metabolic syndrome etc. But no study has yet been conducted in India where cardio endurance of adolescent obese and non obese boys was compared. Hence the present study was planned.

Hypothesis

It was hypothesized that obese adolescent boys will exhibit superior cardio endurance as compared to non-obese adolescent boys.

Methodology :-

The following methodological steps were taken while conducting the present research work.

Sample :-

For present study, 200 obese adolescent boys and 200 normal weight adolescent boys from various govt. and private schools of Chhattisgarh were selected to serve as sample for the present study. The criterion for selection of subjects was based on WHO (1995) classification of body mass index (BMI) in which BMI between 18.0-24.99 is considered to be normal weight while BMI >30 is considered to be obese. To select the desired number of subjects for the present study, in all 1200 school children between age ranges 11-18 years was screened and from this population 200 obese and 200 normal weight adolescent subjects were selected.

Tools:

Following tools were used to fulfil the objectives of the study -

(a) Anthropometric Measurements

Height and weight of 1200 subjects were recorded as per the standard procedure and equipments.

(b) Body Mass Index

In order to classify subjects into normal and obese categories, WHO classification for Body Mass Index was preferred in the present study. According to this classification, a BMI <18.5 kg/m² is defined as underweight, 18.5-24.9 kg/m² as normal weight, 25.0-29.9 kg/m² as overweight, and >30.0 kg/m² as obesity. Obesity can be further stratified into moderate obesity (BMI 30-34.9 kg/m²), severe obesity (35-39.9 kg/m²), and very severe obesity (>40 kg/m²). BMI was calculated by the formula $\text{wt (kg)} / \text{Ht (m)}^2$

(c) Cardio Respiratory :

To assess cardio endurance of selected subjects, 600 yard run/walk was used. The time taken to run 600 yards recorded in minutes and seconds is the score of this test item.

Procedure:

First of all height and weight of the selected samples were recorded as per the method described under the caption tools. BMI was calculated by the formula $\text{wt (kg)} / \text{Ht (m)}^2$. Afterwards subjects were classified into two categories i.e. normal weight and obese. 200 normal and 200 obese adolescent boys were selected afterwards on the basis of their BMI. 600 yard run walk/test was administered to all the subjects according to their convenience and availability. The obtained data was tabulated according to their respective groups. 't' test was used to compare the data between two study groups. The results are presented in table 1.

Analysis, Results and Conclusion

Table No. 1: Comparison of 600 hundred yard run/walk timing among obese and normal weight adolescent boys

| Variable | Obese Adolescent Boys (N=200) | | Normal Weight Adolescent Boys (N=200) | | Mean Diff. | 't' |
|-------------------|-------------------------------|------|---------------------------------------|------|------------|---------|
| | M | S.D. | M | S.D. | | |
| 600 yard run/walk | 3.75 | 0.92 | 1.65 | 0.64 | 2.09 | 26.36** |

** Significant at .01 level

From the analysis of entries reported in table 1, it is observed normal adolescent boys have (M=1.65) completed the 600 yard run/walk in significantly less time as compared to obese adolescent boys (M=3.75). The reported t=26.36, which is statistically significant at .01 level, confirms the above findings

The results clearly indicate a detrimental effect of obesity upon cardio endurance. It ones again shows that excessive fat mass in obese as adipose tissue utilises reduced oxygen during physical exercise or activity which in turn reduces the oxygen uptake of working muscle. This is the reason behind reduced cardiac endurance in obese adolescent boys as compared to non obese adolescent boys.

Conclusion

On the basis of findings it may be concluded that cardiac endurance is significantly lower in obese adolescent boys as compared to non-obese adolescent boys.

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