

## ASSESSMENT OF MUSCULAR STRENGTH AND CARDIO- RESPIRATORY ENDURANCE BETWEEN SPORTSMEN AND NON- SPORTSMEN

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### ABSTRACT

*The aim of present study was to assess the Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen. The thirty (30) volunteer subjects were selected for the present study. They were 19-23 years old they were divided into two groups as Sportsmen (n=15) and Non- Sportsmen (n=15) groups. Subjects of the Sportsmen group participated continuously in ten sessions of sporting activity per week from LNIPE, Guwahati, while subjects of Non- Sportsmen group had no sporting exercises from Guwahati. The Muscular Strength and Cardio Respiratory Endurance selected as variable from the present study and were measured. Muscular Strength was measured by 1RM test Bench Press (in Kg) and Cardio Respiratory Endurance was measured by Cooper Vo2 max test (nearest 25 meters).*

*To assess Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen level between Sportsmen and Non- Sportsmen t-test was used. The Level of Significance was set at .05 level. The results of the present study showed significant differences in Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen where Sportsmen were found better than Non- Sportsmen. The result of Muscular strength component of Sportsmen and Non- Sportsmen was insignificant.*

**Keywords:** Muscular Strength, Cardio Respiratory Endurance.

### INTRODUCTION

The state of being fit or “in condition” is of primary concern to any nation or people. The vigour of the individual depends upon his fitness for the task at hand and basic to any task is fitness for living itself. To the athlete the concept of training and fitness is a familiar one. Any athlete knows that in order to be good at his sport, he must undertake training in skills, attitudes and physical well-being. For those who have few athletic aspirations, fitness is just essential although the ways it is acquired are not clearly marked out the physical fitness programme (Nyak,

**K.,A.**). Many people are currently involved in cardiorespiratory fitness and resistance training programs and efforts to promote participation in all forms of physical activity are being developed and implemented (**Pollock, L., Michael.,et.al**).

Skeletal muscle strength has been defined as “the maximal force a muscle or muscle group can generate at a specified velocity” (**Knuttgen and Kraemer, 1987**).

Health is a condition with physical, social and psychological dimensions. Health related fitness can therefore be seen as a set of capabilities conducive to good health in its broadest sense (**Oja, P. & Tuxworth, B**).

Aerobic Fitness is a key component of Health related Fitness. Maximum oxygen uptake (Vo<sub>2</sub> max) is the objective to measure the aerobic chain consisting of respiratory, cardiovascular and metabolic functions. It reflects training status and the level of habitual physical activity of an individual within genetically determined limits. Aerobic fitness is the single most important dimension of overall functional fitness needed for everyday physical demands (**Oja P. & Tuxworth, B**).

## **PURPOSE OF THE STUDY**

The aim of the present study was to assess the Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen to find out which of these two categories is fit in response to tests administered so as one can improve the standard and level of physical fitness in Sportsmen and Non- Sportsmen.

## **MATERIALS AND METHODS**

The thirty (30) volunteer subjects were selected for the present study. They were 19-23 years old they were divided into two groups as Sportsmen (n=15) and Non- Sportsmen (n=15) groups. Subjects of the Sportsmen group participated continuously in ten sessions of sporting activity per week from LNIPE, Guwahati, while subjects of Non- Sportsmen group had no sporting exercises from Guwahati. After selection, purpose and methodology as well as the research applications were explained to the subjects.

## **SELECTION OF VARIABLE AND THEIR CRITERION MEASURES**

The Muscular Strength and Cardio Respiratory Endurance selected as variable from the present study and were measured. Muscular Strength was measured by 1RM test Bench Press (in Kg) and Cardio Respiratory Endurance was measured by Cooper Vo<sub>2</sub> max test (nearest 25 meters).

## **STATISTICAL ANALYSIS**

To Compare Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen level between Sportsmen and Non- Sportsmen t-test was used. The Level of Significance was set at .05 level.

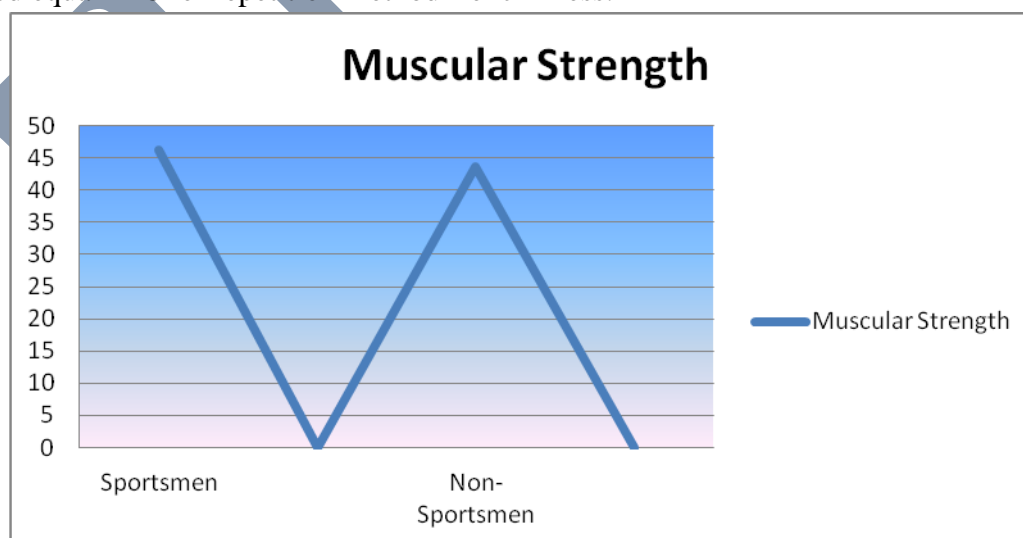
## FINDINGS AND CONCLUSIONS

The Assessment of Muscular Strength and Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen were computed by t- test and its results have been showed in table 1 and table 2.

**Table 1- Assessment of Muscular Strength of Sportsmen and Non- Sportsmen**

	<i>Sportsmen</i>	<i>Non- Sportsmen</i>
Mean	46.33333333	43.66666667
Variance	40.95238095	30.23809524
Observations	15	15
Pooled Variance	35.5952381	
Hypothesized Mean Difference	0	
Df	28	
t Stat	1.224061992	
P(T<=t) one-tail	0.115564568	
t Critical one-tail	1.701130908	
P(T<=t) two-tail	0.231129136	
t Critical two-tail	2.048407115	

Table 1 showed that insignificant difference was found between the means of Sportsmen and Non-Sportsmen in Muscular Strength, Since the calculated value of t (= 1.2240) is less than tabulated t .05 (1.701), it may be concluded that the mean of Muscular Strength of Sportsmen was significantly lower than of the Non- Sportsmen at the significance level 0.05. Sportsmen and Non- Sportsmen performed equal in One Repetition method Bench Press.

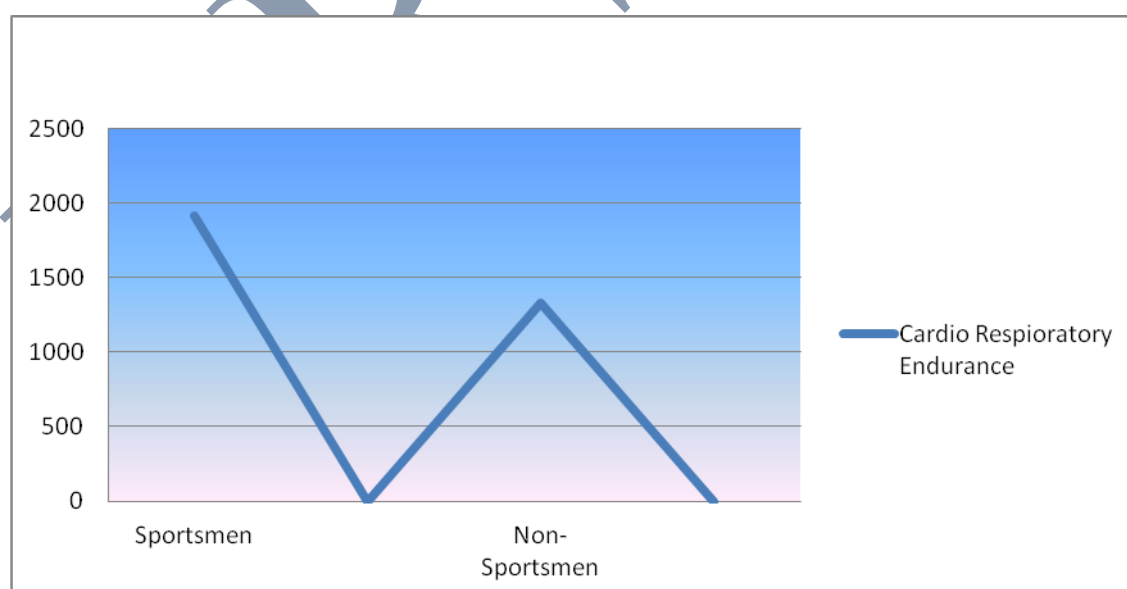


**Figure 1: Graphical demonstration of Muscular Strength of Sportsmen and Non-Sportsmen.**

**Table 2- Assessment of Cardio respiratory Endurance of Sportsmen and Non- Sportsmen**

	<i>Sportsmen</i>	<i>Non- Sportsmen</i>
Mean	1913.333333	1326.666667
Variance	41238.09524	49238.09524
Observations	15	15
Pooled Variance	45238.09524	
Hypothesized Mean Difference	0	
Df	28	
t Stat	7.553876662	
P(T<=t) one-tail	1.575E-08	
t Critical one-tail	1.701130908	
P(T<=t) two-tail	3.14999E-08	
t Critical two-tail	2.048407115	

Table 2 showed that significant difference was found between the means of Sportsmen and Non- Sportsmen in Cardio Respiratory Endurance, Since the calculated value of  $t (=7.5538)$  which was higher than tabulated  $t .05 (1.701)$ , it may be concluded that the mean of Cardio Respiratory Endurance of Sportsmen was significantly higher than the Non- Sportsmen at the significance level 0.05.

**Figure 6: Graphical demonstration of Cardio Respiratory Endurance of Sportsmen and Non- Sportsmen.**

## DISCUSSION

The results of the present study showed significant differences in Cardio Respiratory Endurance between Sportsmen and Non- Sportsmen where Sportsmen were found better than Non- Sportsmen. This might be due to the reason that Sportsmen group perform more sporting activities related to endurance. Difference of Cardio Respiratory Endurance might be due to over all fitness and regular sports activities. The study is also supported by study conducted by **Shin K, et.al** in 1997 where the result was found that the resting HR in athletes was significantly lower than that in non athletes.

With reference to Muscular strength component of Sportsmen and Non- Sportsmen performed almost equal. This might be due to the reason that in both the selected groups, perform the similar type of activities related to shoulder.

## REFERENCES

1. Nyak, K., A. (2004). Sports Education. New Delhi: APH Publishing.
2. Pollock, L., Michael.,et.al. (1998).The Recommended Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory and Muscular Fitness, and Flexibility in Adults. Med. Sci. Sports Exercise. pp. 975–991.Vol. 30, No. 6.
3. Oja, P. & Tuxworth, B. (1995). Eurofit for Adults: Assessment of Health- related Fitness. (pp. 7). Council of Europe.
4. Oja P. & Tuxworth, B. (1995). Eurofit for Adults: Assessment of Health- related Fitness. (pp. 23). Council of Europe.
5. Shin, K . et.al. (1997).Autonomic differences between athletes and nonathletes: spectral analysis approach. Medicine and Science in Sports and Exercise, 29(11):1482-1490.