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## Comparison of the relative strength among the different weight categories of 12<sup>th</sup> South Asian games

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### Abstract

To achieve the purpose of this study were purposive selected from the “12<sup>th</sup> SOUTH ASIAN GAMES” for the year 2016. Only male weightlifters participated in various weight categories, acted as the subjects. The age of the subjects ranged from 18-30 years. The total subjects were 30, which were divided into three (3) groups of ten (10) subjects for each group. The first groups were low weight categories (62 kg. & 69 kg.), Second groups were middle weight categories (77 kg. & 85 kg.) and third groups was high weight categories (94 kg. & 105 kg.). In order to measure the relative strength of various lifters of different groups, the data was collected from the results of “12<sup>th</sup> SOUTH ASIAN GAMES” for the year 2016, which was held at Assam, Guwahati. Descriptive Statistic (Mean, Standard Deviation), One-way ANOVA, (Analysis of variance) with post hoc test (LSD) was applied to analyze and compare the relative strength among the different body weight categories of 12<sup>th</sup> south Asian games. The level of significance was set at 0.05. 3 indicate that there were significant differences in the entire three groups. However group Lower had higher relative strength. After applying the post Hoc Test (LSD test) it was found that there was significant difference in all the three groups in their relative strength.

**Keywords:** South Asian games, weight categories, relative strength

### Introduction

Doncash Seaton *et al* (1956) by environment human beings are competitive and aspires from excellence in every field. Sport is not an exception, changes are the order of the day. Changes are taking place each day in every walk of life. Life of people, their philosophy, ways of living etc. are undergoing changes due to basic and applied research in various fields. Man has reached the space age from the primitive “Stone Age” because of continuous changes. Records have been sprucing as a result of combined improvement in the technique of training and coaching. New techniques are established in laboratories and scientific methods are applied to obtain the level of performance. Sports by their very nature are enjoyable, challenging, absorbing and require a certain amount of skill and physical condition.

Bucher Today we all know that now a day is an area of smallest input and extreme output and for this, every possible work is being done to increase efficiency. Every perception angle is being thoroughly scrutinized by researchers and scientists together, so that sportsmen can get maximum mechanical advantages to improve their performance, clear insight of sports during Greek period was reflected in the Epic poems of Homer. Games were the part of the daily life of the people, or any important event.

C.N. Gardiner (1955) [2] Games and sports are a popular pastime activity for the young and the old, for boys and girls and for men and women. They offer an opportunity for all to obtain exercise, fun and relaxation. They can play an important role in developing physical fitness and skills for use in leisure time, now and perhaps more important, in later years. Many of the skill developed thought games and sports may be used in years to come to help keep physically fit.

Strength training has made the single, most positive contribution to this type of improvement. Witness the performance this year of tennis ace Serena Williams and Giants Slugger Barry Bonds.

Maximum strength is the backbone upon which all other strength qualities depend. You’ll hear me talk a lot about being fast and the importance of speed, power, reactive ability etc.

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All of these qualities of strength are very important, but truthfully, unless you have enough raw horsepower in your engine you won't be going anywhere or doing anything in a hurry! In the case you can think of horsepower and maximum strength as being synonymous.

While only power lifters need to maximize and demonstrate maximum strength in competition, all athletes need to develop maximum strength as a foundation for other such as explosive strength, reactive strength, strength endurance, agility and others.

For this reason, absolute muscular strength must first be brought to optimal levels and simultaneously blended into strength that you can use for your sport, or "functional" strength. Maximum strength can be displayed through 2 types of muscular actions:

1. **Concentric Strength:** The ability to overcome a resistance through muscular contraction, i.e. the muscle shortens as it develops tension. Lifting a weight is an example of concentric strength.
2. **Eccentric Strength:** Displayed when a muscle lengthens as it yields to a resistance. Eccentric strength is normally 30-50% greater than concentric strength, meaning that you can lower significantly more weight in good control than you can actually lift.

Athletes who compete in weight-class events depend heavily on relative strength, as do athletes who must overcome their bodyweight to accomplish a motor task (i.e. long jump, sprinting etc.). Further, sports which have aesthetic requirements (figure skating, gymnastics etc.) demand the development of strength without a commensurate gain in bodyweight.

So how do you know if your strength to weight ratio is optimal? Simple, if your strength is going up faster than your bodyweight and your performance is improving as well then you're on the right track. You definitely don't need to be afraid of an increase in bodyweight so long as the strength gained from that bodyweight is functional.

If one weighs 150 pounds and squats 200 lbs and increases his bodyweight to 175 lbs and improves his squat to 300 lbs, his strength: bodyweight ratio has improved considerably!

Oftentimes a 10% increase in body-mass will lead to as much of a 30% increase in strength or more!

So how do you know when you've reached a point when you're becoming too strong? Simple. The thing to note is "eventually", but not "immediately", increasing strength and body-mass could result in negative effects on speed, size, and relative strength

**Objectives of the study**

To compare the relative strength among the different weight categories of weight lifters of 12<sup>th</sup> South Asian Games.

**Material and Methods**

**Subjects:** To achieve the purpose of this study were purposive selected from the "12<sup>th</sup> SOUTH ASIAN GAMES" for the year 2016. Only male weightlifters participated in

various weight categories, acted as the subjects. The age of the subjects ranged from 18-30 years. The total subjects were 30, which were divided into three (3) groups of ten (10) subject for each group. The first groups were low weight categories (62 kg. & 69 kg.), Second groups were middle weight categories (77 kg. & 85 kg.) and third groups was high weight categories (94 kg. & 105 kg.)

**Reliability of Data:** The reliability of data was ensured by establishing the instrument reliability and tester reliability.

**Instrument Reliability:** All the instruments and equipments like weighing machine, Bar, Weight plates, collars, platform and outfits were taken.

**Testers Reliability:** Since the data's for the study is taken from the performance of "12<sup>th</sup> SOUTH ASIAN GAMES" for the year 2016, which was held at Assam, Guwahati and was conducted by the qualified International referees, these scores were assumed to have higher level of reliability.

**Collection of Data:** In order to measure the relative strength of various lifters of different groups, the data was collected from the results of "12<sup>th</sup> SOUTH ASIAN GAMES" for the year 2016, which was held at Assam, Guwahati. The sum of the best 2 lifts of respective events was considered as the scores of the lifters.

**Statistical Analysis**

- According to objectives of the study to gathering the data Analysis of descriptive statistics were used. (Mean, Standard Deviation)
- One-way Analysis of variance (ANOVA) was applied to analyze and compare of the relative strength among the different weight categories of weight lifters of 12<sup>th</sup> South Asian Games. The level of significant was set at 0.05

**Results and Findings**

The total subjects were 30, which were divided into three groups of 10 each. The sum of the best 2 lifts of respective events was considered as the scores of the lifters. The mean and standard deviation values of all the three groups lower, middle and high.

The results pertaining to the study are present with the help of following tables and Graphs.

**Table 1:** Mean and Standard Deviation of Scores Of The Relative Strength Of Lifters From Different Body Weight Groups)

Groups	N	Relative Strength	
1-Lover	10	Mean	3.7690
		Sd	.41959
2-Middle	10	Mean	3.2950
		Sd	.62352
3- High	10	Mean	2.9460
		Sd	.42375
Total	30	Mean	3.3367
		Sd	.59051

Mean and Standard Deviation value of relative strength in kilograms.

**Table 2:** Analysis Of Variance (Anova) For the Data of Relative Strength of Various Different Body Weight Categories

S.NO	Source of variance	Sum of Squares	Df	Mean Square	F	Sig.
1	Between Groups	3.413	2	1.706		
2	Within Groups	6.700	27	.248	6.877	.004
3	Total	10.112	29			

Tab. F.05 (2, 27) = 3.35

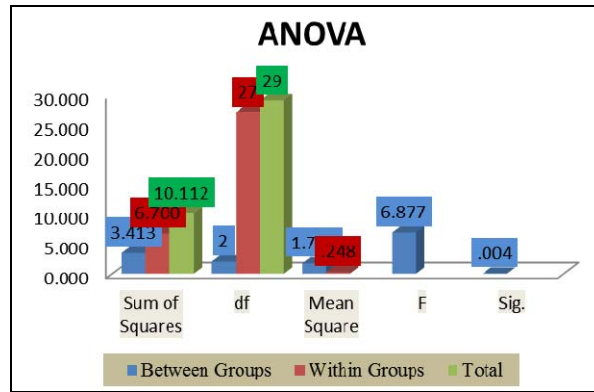


Fig 1: Graphical Representation of f ratio with regard to Comparison of relative strength among the different body weight groups

As shown in table – 2 that the obtained value of ‘f’ ratio that is 6.877 was greater than the tabulated value of 3.35 for the selected degree of freedom and level of significance which indicates that the subjects of all the groups differ significantly

in relative strength. To further analysis which group is better pair wise mean comparison analysis was done by using post Hoc Test (LSD test).

Table 3: Post HOC Test for the Multiple Comparison of relative strength

Groups		Mean Difference Of Groups	SStd. Error	SSig.	95% Confidence Interval	
					Lower Bound	Upper Bound
L 1-Lower	Mmiddle	.47400*	.22	.043	.016	.931
	Hhigh	.82300*	.22	.001	.365	1.28
M2-Middle	Llower	-.47400*	.22	.043	-.931	-.016
	Hhigh	.34900	.22	.129	-.108	.806
H3-High	Llower	-.82300*	.22	.001	-1.28	-.365
	Mmiddle	-.34900	.22	.129	-.806	.108

\*. The mean difference is significant at the 0.05 level.

Above Table-3 indicate that there were significant differences in the entire three groups. However group Lower (first) had higher relative strength.

Multiple comparison

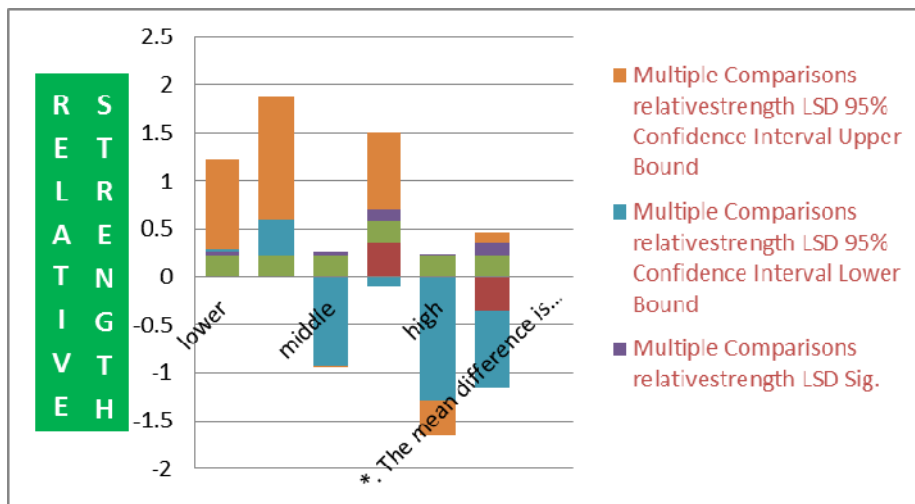


Fig 2: Graphical Representation of mean scores with regard to Comparison of relative strength among different body weight groups

Discussion of Findings

The analysis of data reveals that there is a significant difference in relative strength of various categories of lifters was found at the selected level of significance which established that various categories of lifters possesses different level of relative strength. After applying the post Hoc Test (LSD test) it was found that there was significant difference in all the 3 group in their relative strength. This may be probably due to the different nature of training and pre-requisite components for lifters. Such results may be due

to small size of sample and other factors such as different body types, difference in the body compositions etc.

Summary

The purpose of the study was to compare the relative strength of the weight lifters belonging to various categories. Thirty male lifters who have participated in various categories in “12<sup>th</sup> South Asian Games” held at Assam, Guwahati for the year 2016 were selected as subjects. Their relative strengths were recorded in Kilograms.

The scores or performances of the Male weightlifters were analyzed by calculating the means and the data were subjected to one way analysis of variance in order to find out the significance in the means. The results have shown that the lifters participated in various categories differ significantly in their relative strength. The selected level of significance was 0.05. After applying the Post hoc test it was observed that there was significant difference in relative strength. However group-I had highest relative strength as its mean value is highest among all the groups.

### Conclusions

Within the limitations of the study the following conclusions were drawn:

1. The lifters participated in various categories showed a significant difference in their relative strength.
2. Group-I had the highest relative strength as its mean value is highest among all the groups.

### Recommendations

1. Similar types of study may be conducted on female weightlifters.
2. Similar types of study may be conducted for different games and sports, where the relative strength plays an important role such as weight lifting, body building, judo, wrestling, boxing, throwing events etc.
3. The study may be conducted utilizing the lifters of different levels.
4. The study may be conducted on large sample.

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