



COMPARISON OF LEG STRENGTH GRIPSTRENGTH AND BACK STRENGTH AMONG THE WRESTLERS WEIGHTLIFTERS AND JODOKAS OF COLLEGE STUDENTS

Meenakshi Saini^{a,*} and Ankan Sinha^b

^akendriya Vidyalaya Panisagar, Dharmanagar, North Tripura - 799253, India

^bDepartment of Physical Education, GD College, Dharmanagar, North Tripura – 799253, India

*Corresponding Author Ph: 03822-261259; Email: kakku303@yahoo.co.in

DOI: 10.26524/14118

ABSTRACT

The purpose of the study was to compare the leg strength, grip strength and back strength among the Wrestlers, Weightlifters and judokas of college students. The subjects were selected from the Wrestlers, Weightlifters and Judokas of different degree colleges in Jharkhand for this study. Ten (10) male athletes from each group namely Wrestling, Weightlifting and Judo were selected as the subject for the study. Variables such as leg strength, grip strength and back strength were presented to compare the student athlete belonging to Wrestling, Weightlifting and Judo. To see the significant difference of leg strength, grip strength and back strength among the student athletes belonging to Wrestling, Weightlifting and Judo the analysis of variance “F-ratio” was applied at 0.05 level of significance. For further analysis “Post-Hoc Test” (LSD Test) was applied. There is a significant difference in leg strength among Wrestlers, Weightlifters and Judokas as calculated F (4.04) is greater than Tabulated F (3.35). The Weightlifters shown significantly different level of leg strength (192.5) in comparison to Wrestlers (165.8) and Judokas (163.5). However, the Wrestlers and Judokas had shown more or less same level of leg strength. In case of back and grip strength there was no significant differences among Wrestlers, Weightlifters and Judokas as their calculated F (1.89) and (1.73) is lower than tabulated F (3.35) respectively. However, there were small ranges of variations as Weightlifters had the greater mean value (141.5) than Wrestlers (128.3) and Judokas (132.9) and Judokas had the greater mean value (52.7) than the Wrestlers (51.1) and Weightlifters (49.3) in relation to back strength and grip strength respectively.

Keywords: Wrestlers; Weightlifters; Judokas; leg strength; back strength; grip strength.

1. INTRODUCTION

Doing sports is the far most accepted way to keep people healthy directly. Sports include the physical/psychological benefits, ways to get fitter and a brief explanation of our muscle structure [1,2]. Sports can improve the 5

components of fitness, namely: Strength, speed, skill, stamina, and suppleness.

Our first resource in solving problems lies in our strengths, the skills that you already have sharpened until they are ready to work for you. That's why we call them strengths. Strength is the quality or state of



being physically strong and the ability to resist being moved or broken by a force.

Lower body strength helps us in many ways, from walking, to running, to building endurance. The primary muscle in the lower body that you should focus on to build your lower body strength are the abductors, or the outer thigh muscles; adductors, or the inner thigh muscles, gastrocnemius, gluteus maximus, hamstrings, or the muscles in the back, top part of your legs; and the quadriceps, or the thigh muscles [3].

In execution of any skills of games and sports and even in the movement of daily life we need stability. Generally during any movement we derive stability through the back muscles like spinus erectus.

1.1 Study aim

To compare the leg strength, back strength and grip strength among the Wrestlers' Weightlifters and Judokas of college students.

2. METHODS

2.1 Subjects

The subjects were selected from the Wrestlers' Weightlifters and Judokas between 60 to 70 kilograms body weight of different degree colleges in Jharkhand for this study. Ten (10) male athletes from each groups namely wrestling, weightlifting and judo were selected as the subject for the study.

2.2 Criterion measure and reliability of data

Criterion measure for this study was to compare the leg strength, back strength and grip strength among the Wrestlers'

The human hand can be used to grip different things in several different positions like holding the opponent in various games and sports [4,5]. These different positions require different types of grip strength which are typically quantified based on the way the hand is being used.

There are few games and sports such as Weightlifting, Wrestling, Judo, Shot-put etc which largely depends upon the different forms of strength like, absolute strength, relative strength, leg strength, core strength, back strength, grip strength and so on. For better performances in these respective games and sports one should know the status of particular strength and the way to enhance it.

Weightlifters and Judokas of college students. The reliability of data was ensured by establishing the instrument reliability and testers competence. Ten male from each groups namely, Wrestlers' Weightlifters and Judokas were selected by random method throughout Degree colleges of Jharkhand. All the instruments and equipments like leg, back and grip dynamometer were taken from Dhanbad sports club which has been supplied by well know standard agencies and companies. Before the use of these instruments and equipments, they were calibrated for the accurate result. To ensure that the investigator was well acquainted with technique of conducting the tests, the investigator had a number of practice session in the testing procedure under the guidance of the expert.

2.3 Procedure for collection of data

The measurements of leg strength, back strength and grip strength were taken two times with sufficient rest and the best out of



two considered as the score. The maximum reading is recorded in Kilograms.

2.3.1 Procedure for administration of test

The procedure for administration of the test for grip strength is such where the athlete using their dominant hand applies as much grip pressure as possible on the dynamometer. The investigator records the maximum reading in kilograms. The athlete repeats the test 2 times. The investigator uses the highest recorded value to assess the athlete's performance.

For the administration of leg strength the bar should be held in the center, with both the hands together and with the palms facing towards the body. It should be at a level where the thighs and the trunk meet. The back must be kept straight as the athlete pull as hard as possible on the chain and try to straighten the legs. Maximum performance will result when the legs are almost straight at the end of the lift. This is usually occurring if the bar is attached to the dynamometer when the knees are bent at about 120 degrees. The athlete repeats the test 2 times with sufficient rest in between.

For administering the back strength test the athletes stands upright on the base of the dynamometer with the feet shoulder width apart, arm straight and the fingers extended downward as far as possible on the fronts of the thighs. The bar is then attached to the chain so that it is 1 to 2 inches below the

fingertips. Then bend forward slightly and grasp the bar. The correct position to lift is with the back bent forward slightly at the hips and keeping the legs straight. The head should be held upright, and athlete should look straight ahead. Lift steadily, keeping legs straight and feet flat on the base of the dynamometer. At the completion of the test, the back should be almost straight. If it is perfectly straight, the test should be repeated with the bar slightly lower.

3. STATISTICAL TECHNIQUE EMPLOYED FOR ANALYSIS

To see the significant difference of selected variables namely leg strength, back strength and grip strength among the athletes belonging to various groups such as Wrestlers, Weightlifters and Judokas the analysis of variance "F-ratio" was applied at 0.05 level of significance. For further analysis "Post-Hoc Test" (LSD Test) was applied.

4. FINDING

Findings pertaining to leg strength of players belonging to various groups such as Wrestlers, Weightlifters and Judokas which were subjected to one way analysis of variance and mean difference method have been presented in the following tables:



Table1.Comparison of leg strength of players belonging to wrestling, weightlifting and judo

Sources of variance	D.f	S.S	M.S	F-value
(SS)b	r-1=2	5197.27	2598.63	4.04
(SS)w	N-r=27	17356.6	642.84	
Total	30			

*Significant at 0.05 level.

Tab .05(2, 27) = 3.35

The above table- 1 indicates that calculated F (4.04) is greater than Tabulated F (3.35). Hence, there were significant differences among various groups such as Wrestlers, Weightlifters and Judokas in

relation to Leg Strength. As F- ratio found to be significant, the data further analyzed with Post-hoc test (LSD test). The results pertaining to this are presented in Table. 2

Table-2 paired mean differences of leg strength of players belonging to wrestling, weightlifting and judo

Mean of different groups			Mean difference	Critical difference
I	II	III		23.24
165.8	192.5		26.7	
165.8		163.5	2.3	
	192.5	163.5	29	

Above Table 2 indicates that there were significant differences in leg strength between Wrestlers (165.8) and Weightlifters (192.5) as well as Judokas (163.5) and

Weightlifters (192.5). However, there was no significant difference between Wrestlers (165.8) and Judokas (163.5).

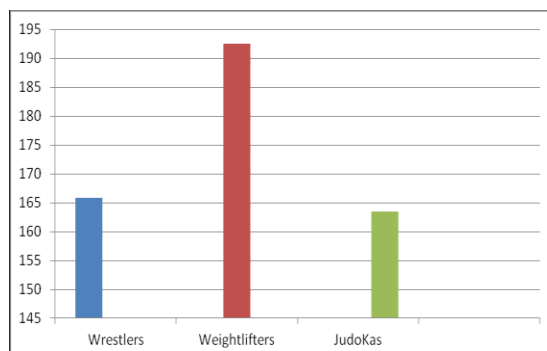


Figure 1. Paired mean differences of leg strength of players belonging to wrestling, weightlifting and judo

Findings pertaining to back strength of players belonging to various groups such as Wrestlers, Weightlifters and Judokas

which were subjected to one way analysis of variance which have been presented in the following table:

Table- 3 comparison of back strength of players belonging to wrestling, weightlifting and judo

Sources of variance	D.f	S.S	M.S	F-value
(SS)b	r-1=2	897.87	448.93	1.89
(SS)w	N-r=27	6387.5	236.57	
Total	30			

*Significant at 0.05 level.

Tab .05(2, 27) = 3.35

The above table 3 indicates that calculated F (1.89) is less than the tabulated F (3.35). F-ratio found to be insignificant. Hence there were no significant differences among various groups such as Wrestlers,

Weightlifters and Judokas in relation to Back Strength. However, there were small ranges of variations as Weightlifters had the greater mean value (141.5) than Wrestlers (128.3) and Judokas (132.9).

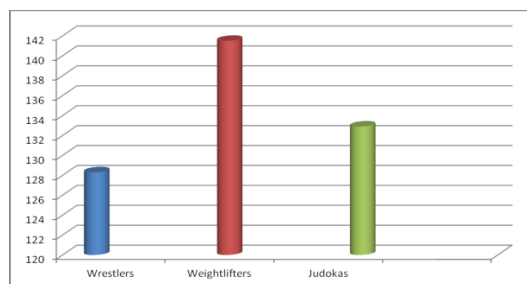


Figure. 2 Mean values of wrestlers, weightlifters and judokas

Findings pertaining to grip strength of players belonging to various groups such as Wrestlers, Weightlifters and Judokas

which were subjected to one way analysis of variance which have been presented in the following table:

Table- 4 Comparison of grip strength of players belonging to wrestling, weightlifting and judo

Sources of variance	D.f	S.S	M.S	F-value
(SS)b	r-1=2	57.87	28.93	1.73
(SS)w	N-r=27	451.1	16.71	
Total	30			

*Significant at 0.05 level.

Tab .05(2, 27) = 3.35

The above table 4 indicates that calculated F (1.73) is less than the tabulated F (3.35).F-ratio found to be insignificant. Hence there were no significant differences among various groups such as Wrestlers, Weightlifters and Judokas in relation to Grip Strength. However, there were small ranges of variation as Judokas had the greater mean value (52.7) than the Wrestlers (51.1) and Weightlifters (49.3).

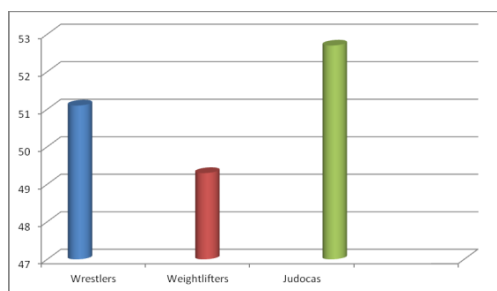


Figure.3 Mean values of wrestlers, weightlifters and judokas



4. 1 Discussion of finding

The analysis of data reveals that there is a significant difference in leg strength among Wrestlers, Weightlifters and Judokas were found at the selected level of significance which establishes that various variables such as Wrestlers, Weightlifters and Judokas possesses different level of leg strength. But in case of back strength and grip strength it was noted that there were no significant differences among the various groups such as Wrestlers, Weightlifters and Judokas. After applying Post-hoc test in table – 2 it was found that there were significant differences in leg strength between Wrestlers (165.8) and Weightlifters (192.5) as well as Judokas (163.5) and Weightlifters (192.5). However, there was no significant difference between Wrestlers (165.8) and Judokas (163.5). As the Weightlifters had the highest mean value (192.5) in relation to leg strength, had the greater leg strength as compare to Wrestlers and Judokas. There were no significant differences among Wrestlers, Weightlifters and Judokas in relation to back strength and grip strength as their calculated F (1.89) and (1.73) is lower than tabulated F (3.35) respectively. All the groups had almost same level of back and grip strength with small range of variations.

The significant difference in leg strength was probably due to the different nature of training and pre-requisite components for athletes. Such results may be due to small size of sample and other factors such as different body type, difference in the body composition etc.

5. SUMMARY AND CONCLUSION

The purpose of the study was to

compare the leg strength, grip strength and back strength among the wrestlers' weightlifters and judokas of college students. The subjects were selected from the Wrestlers' Weightlifters and Judokas of different degree colleges in Jharkhand for this study. Ten (10) male athletes from each group namely Wrestling, Weightlifting and Judo were selected as the subject for the study. Variables such as leg strength, grip strength and back strength were presented to compare the student athlete belonging to Wrestling, Weightlifting and Judo. To see the significant difference of leg strength, grip strength and back strength among the student athletes belonging to Wrestling, Weightlifting and Judo the analysis of variance "F-ratio" was applied at .05 level of significance. For further analysis "Post-Hoc Test" (LSD Test) was applied. There is a significant difference in leg strength among Wrestlers, Weightlifters and Judokas calculated F (4.04) is greater than Tabulated F (3.35). The Weightlifters shown significantly different level of leg strength (192.5) in comparison to Wrestlers (165.8) and Judokas (163.5). However, the Wrestlers and Judokas had shown more or less same level of leg strength. In case of back and grip strength there was no significant differences among Wrestlers, Weightlifters and Judokas as their calculated F (1.89) and (1.73) is lower than tabulated F (3.35) respectively. However, there were small ranges of variations as Weightlifters had the greater mean value (141.5) than Wrestlers (128.3) and Judokas (132.9) and Judokas had the greater mean value (52.7) than the Wrestlers (51.1) and Weightlifters (49.3) in relation to back strength and grip strength respectively.



6. REFERENCES

1. G. Feuerstein (2012) *The Yoga Tradition: Its History, Literature, Philosophy and Practice*, New Delhi: Motilal Banarsidass Publications.
2. R.W. Bohannon, Grip strength: a summary of studies comparing dominant and nondominant limb measurements, *Perceptual and Motor Skills*, 96 (2003) 728-730.
3. S. V. Devananda (2000) *The Sivananda Companion to Yoga*, New York: Fireside Book, Simon and Schuster.
4. S. Koley, A. Khajuria, S. Melton, The correlation between back strength and leg strength among Indian inter-university male cricketers, *Journal of Physical Education and Sport*, 8 (2010) 125 – 132.
5. A. A. Daniel (1985) *Modern Principles of Athletic Training* 6th Ed, Santa Clara: Mosby college publishing.