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THE STUDY ON HAND GRIP STRENGTH BETWEEN WRESTLERS AND WEIGHT LIFTERS: A COMPARATIVE INVESTIGATION

[1]Miss. Sowmyashree, [2]Mr. Madhu G. R., [3]Dr.Radhakrishna H. B.
[1]Master degree student, [2]Assistant Professor, [3]Physical Education Director
[1,2]Alva's college of Physical Education, Moodbidri, Karnataka,
[3]GFGC Vamadapadavu, Bantwal, Karnataka
Email: [1]sowmyashri@gmail.com, [2]madhugr19@gmail.com, [3]radhakrishnavarun@gmail.com

Abstract: *Hand grip strength (HGS) is described as the force applied by the hand to hold on, to pull on, or to suspend objects in the hand. It is a reliable measurement which can be easily used to evaluate the functional integrity of the hand. The present study aimed at compare the hand grip strength of between Mangalore University inter collegiate wrestlers and weight lifters. To achieve the purpose of the study necessary data was collected from total 78 subjects of which 39 were from wrestling and 39 from weight lifting. The selected subjects are participated Mangalore University intercollegiate championships since last 3 years, their age ranged between 18 to 25 years. To assess the hand grip strength of the subject. The test selected to measure hand grip strength test by use dynamometer. The mean, standard deviation and z-test was used for testing the hypothesis for significance of mean difference in the hand grip strength. All the statistical calculation was carried out with significance level of 0.5. After analysis researcher conclude that, there is a no significance difference in hand grip strength level between wrestlers and weightlifters of Mangalore University and there is positive relationship between body weight and handgrip strength.*

Key Words: *Handgrip, strength, Mangalore University, Wrestlers and Weight lifters etc...*

1. INTRODUCTION:

Hand grip strength (HGS) is described as the force applied by the hand to hold on, to pull on, or to suspend objects in the hand. It is a reliable measurement which can be easily used to evaluate the functional integrity of the hand. HGS values have been influenced by many factors such as age, gender BMI, hand and forearm anthropometries, and hand dominance.

Strength of the skeletal muscles depends on multiple factors such as body build and composition, physical activity, hormonal influence, etc. HGS reflects total muscle strength and physical fitness. Therefore, it can be used as a powerful indicator of the overall strength of the body. Sedentary people who were not actively participating in sports have demonstrated significantly lower HGS compared to physically active people that involved in regular sports activities such as cricket, hockey, tennis, basketball, handball, etc. Therefore, HGS can be used to indicate the sedentary nature of a population, and it would help to predict their potential risk of developing non communicable diseases such as myocardial infarction and stroke. Further, it is important to consider the other factors that are influencing the HGS in order to have a better understanding.

A significant difference has been reported between males and females where males have had higher HGS than the females. Moreover, statistically higher HGS had been found in dominant hand than the non-dominant hand in previous studies. Further, many studies have shown a conflicting association of anthropometry with HGS. Hand breadth had found to be the most highly correlating parameter with the HGS. Furthermore, forearm girth, wrist girth, hand length, hand span and forearm length were known to have a significant correlation with the HGS.

Dr. P. Sathya, et al., (2016) finds that there is positive correlation (moderate to strong) between grip strength and shoulder power. According to Pizzigalli, et al., (2015) proper training and years of practice results in increased handgrip strength.

Charushila A Rukadikar, et al., (2018) observed positive correlation between hand grip strength with height and weight in cricket players Conclusion Proper training for maintaining height and weight will increase in hand grip strength. It will further lead to better strength and performance in cricket activities like batting, bowling, throwing, fielding.

1.1. Significance of the study:

The findings of the study will be significance in the following ways;

- The study may provide guidelines to the physical education teachers and coaches in preparing the training programme for the wrestlers and weight lifters.
- The study may help the coaches and physical education teachers to identify the individual efficiency in hand grip strength.

- The study may reveal vital information regarding the selection of talents in wrestlers and weightlifters, keeping in mind the level of hand grip strength performance

1.2. Delimitation of the study:

The delimitation for the present study is given as below:

1. The study was delimited to the subjects who have participated in Mangalore intercollegiate tournament.
2. The study was delimited those who have participated in tournament from the last 5 years.
3. The study was delimited to age range of 18 to 25 years.
4. The study was delimited of 39 wrestlers and weightlifters respectively.

1.3. Limitation of the study:

The present investigation was carried out under following limitation.

1. Daily routine, diet of subject, and life style of players cannot be controlled by researcher and hence was a limitation to the study.
2. The response obtained from the subjects are treated as correct and genuine.
3. The dynamometer must be adjusted for hand size, how successfully this is done will affect the accuracy of the measurement itself limitation of the study.

1.4. Hypotheses:

The study has been designed to the test following hypothesis.

H_0 It was hypothesized there is a no significance deference in hand grip strength between wrestlers and weightlifters.

H_1It was hypothesized there is a significance deference in hand grip strength between wrestlers and weightlifters.

2. METHODOLOGY:

2.1. Selection of the subject:

To achieve the purpose of the study necessary data was collected from total 78 subjects of which 39 were from wrestling and 39 from weight lifting. The selected subjects are participated Mangalore University intercollegiate championships since last 3 years, their age ranged between 18 to 25 years.

2.2. Selection of the test items:

To assess the hand grip strength of the subject. The test selected to measure hand grip strength test by use dynamometer.

2.3. Procedure for administration and collection of data:

The subjects will be consulted personally by the investigator. Willingness of subjects were considered before the administration of test. The scholar visited different college of under Mangalore University. Necessary instruction was given to the subjects before the administration of the test which include the purpose of the study and the procedure for test will explain to the subject.

- The subject should be in a standing position, arms at their side, not touching their body. Keep elbow bent slightly. Administer the test on the non-dominant hand.
- Ask the subject to squeeze the dynamometer with as much force as possible, being careful to squeeze only once for each measurement.
- Three trials should be made with a pause of about 10-20 seconds between each trial to avoid the effects of muscle fatigue.
- Record the result of each trial to the nearest to kilogram. If the difference in scores is within 3 kg, the test is complete. If the difference between any two measures is more than 3 kg, then repeat the test once more after a rest period. Use the best 3 measurements.
- When a 4^{th} measurement is taken with the hand grip (when any of the 3 measurements are 3 kg apart) be sure the outlier (the lowest value) is crossed off with initials so that the 3 highest measurements are clearly indicated for data entry.

2.4. Statistical analysis:

The collected data were tabulated for the purpose of analysis. The mean, standard deviation and z-test was used for testing the hypothesis for significance of mean difference in the hand grip strength. All the statistical calculation was carried out with significance level of 0.5.

3. ANALYSIS AND INTERPRETATION OF THE DATA:

After statistical analysis of data on hand grip strength of wrestlers and weightlifters shown in following tables and figures.

Table No 1

The below table showing the hand grip strength of wrestler's according to their weight category

Hand grip strength on wrestlers			
Sl.no	Weight	Mean	S. D
1	51-60 kg	20.54	2.37
2	61- 70 kg	29.46	4.12
3	71-80 kg	35.31	3.3

Above table shows that hand grip strength of wrestlers. Wrestlers has categorized as per their body weight, the groups are 51-60 kg, 61-70 kg and 71-80 kg. The mean and standard deviation value is 20.54 and 29.46, 35.31 and 2.37, 4.12 and 3.3 respectively. According to that, the hand grip strength wrestler's increases respect to their body weight. It indicates,

Table No 1. 2

The below table showing the hand grip strength of weightlifters according to their weight category

Sl.no	**Weight**	**Mean**	**S. D**
1	41-50 kg	20.88	1.73
2	51-60 kg	24.38	1.3
3	61-70 kg	26.63	1.6
4	71-80 kg	30.88	2.53
5	81-90 kg	36.71	2.14

Above table shows that hand grip strength of weightlifters. Weightlifters has categorized as per their body weight, the groups are 41-50kg, 51-60kg, 61-70kg, 71-80kg, 81-90kg. The mean and standard deviation value is 20.88, 24.38, 26.63, 30.88, 36.71 and 1.73, 1.3, 1.6, 2.53, 2.14 respectively. It shows the low body weight category weightlifters have low hand grip strength. Research found that hand grip strength will increase with their body weight, it shows 81-90kg body weight category have high hand grip strength compare to other groups.

Table No 2

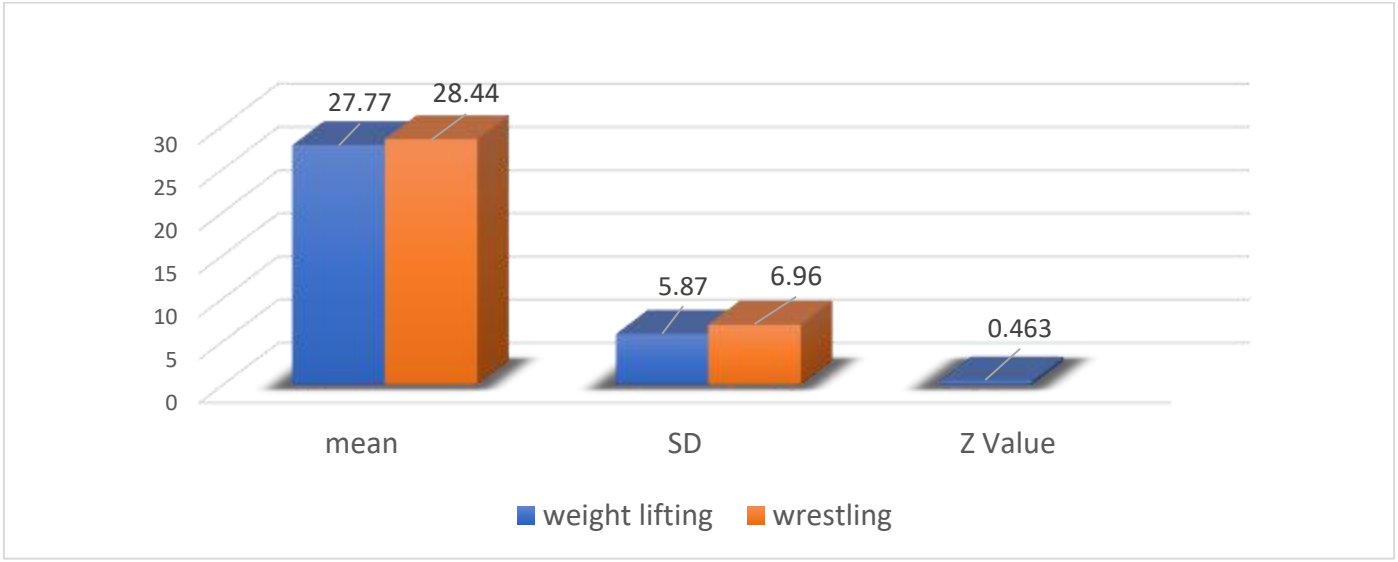
Compare the hand grip strength wrestlers and weightlifters of mean, standard deviation and Z-test value

No. subject	**Variance**	**Mean**	**S. D**	**Z-value**
39	Wrestling	28.44	6.96	0.463
39	weightlifting	27.77	5.87	

Above the table 3 show the hand grip strength wrestlers and weightlifters have deferent mean value and standard deviation value. Mean value of wrestlers 28.44 and weightlifters 27.77, standard deviation value of wrestlers is 6.96 and weightlifters have 5.87. Z-value of this table 0.63, table value is less than the critical value.

Figure No 1

Graphical Illustration of hand grip strength between wrestlers and weightlifters.



Above figure shows that a hand grip strength of wrestlers and weightlifters, the table value is less than the critical value. Hence, there is a no significance difference in hand grip strength between wrestlers and weightlifters.

4. DISCUSSION ON HYPOTHESIS

The purpose of the study was to compare the hand grip strength level among wrestlers and weightlifters of Mangalore University. After statistical analysis researcher found that z-calculated value is less than the table value, so we accept the null hypothesis (H_O). Hence researcher conclude that, there is a no significance difference in hand grip strength level between wrestlers and weightlifters of Mangalore University.

5. SUMMARY, CONCLUSION AND RECOMMENDATION:

The human hand is capable of complex and precise functions which can be divided into grasping abilities measured by the strength and manual dexterity. As a child grows up, the hand function develops with contribution of the increased hand anthropometry. Handgrip strength can be quantified by measuring the amount of static force that the hand can squeeze around an instrument called as handgrip dynamometer. While gripping, the muscles of the flexor mechanism in the hand and forearm create grip strength while the extensors of the forearm stabilize the wrist. Aswathy V, (2019) finds the grip strength of softball players showed the closest relationship with the arm measurements compared to hockey players. It may be concluded that the grip strength of University level women softball players had significant relationship with most of their arm measurements.

Handgrip strength is widely used in adults as an indication of muscle strength in fitness testing and is seen as the single item most reasonably representative of total body strength. Grip strength has been used as an indicator of overall muscle strength. Handgrip strength is influenced by a number of factors including age, gender, handedness, motivation and position of extremity during test.

6. CONCLUSION:

- Z-calculated value is less than the table value, so we accept the null hypothesis (H_O).
- Researcher conclude that, there is a no significance difference in hand grip strength level between wrestlers and weightlifters of Mangalore University.
- The study found there is positive relationship between body weight and handgrip strength.

7. Recommendations:

Some of the suggestions are made for future findings

1. A similar study could be done in different sports and games.
2. A similar study could be done among the players of two are more games.
3. A similar study could be done with subject belonging to different age groups.

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