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## Comparative study of minimal muscular fitness between handball and basketball players

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### Abstract

The objective of the present study was to compare the minimal muscular fitness between handball and basketball players. The data pertaining to this study was collected by administering the appropriate tests described below on the inter-university players of Amravati University, who were participated at least inter-university tournaments where held in Amravati University, Amravati. 25 male Handball players and 25 male Basketball players, who had participated in inter-university tournaments, were preferred as area under discussion for this study. The age of the subject matter was ranging from 18 years to 25 years. To measure the minimal muscular fitness, Kraus-Weber Strength Test was conducted with its six test items as follow: 1) strength of abdominal plus psoas muscles; 2) strength of abdominal minus psoas muscles; 3) strength of psoas and lower abdominal muscles; 4) strength of upper back muscles; 5) strength of lower back muscles; 6) floor-touch test. To compare minimal muscular fitness between Handball and Basketball male players the independent 't' test was used at 0.05 level of significance. Result: There was no significant difference in minimal muscular fitness between handball and Basketball players.

**Keywords:** Minimal Muscular Fitness, Handball, Basketball Players

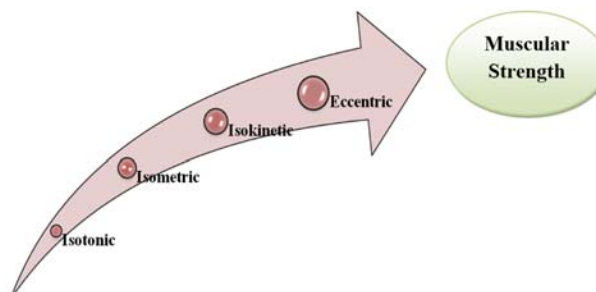
### Introduction

Actually, it is the strength testing which gave birth to the systematic study of measurement and evaluation in 1861 at Amherst College in United States of America. This also resulted in raising the status of the discipline of physical education when Edward Hitchcock became the first professor of physical education in the USA. Sargent 1897 published the first strength test battery based on his study which included a combination of strength, muscular endurance and even pulse rate.

In other words, in the beginning testing in physical education has been synonymous with physical fitness testing. However, with the advancement in knowledge, body composition (freedom from obesity), flexibility and overall organic soundness have been included in fitness testing so that the test could evaluate one's ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits as well as to meet unforeseen emergencies. But in sports, majority of trainees generally aim to improve muscular endurance, muscular strength and at the most circulatory endurance.

Muscular strength may be defined as the maximal muscular force or tension used in the creation or prevention of the movement in one maximal effort of a muscle group. Muscular strength is produced by four basic types of muscular contraction.

Hence muscular strength may be subdivided into four categories listed below:



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All the above types of muscular strengths are highly correlated with muscular endurance. Muscular endurance is the duration for which an individual can apply muscular strength until exhaustion. In other words, local muscular endurance is usually defined as the ability or a capacity of a muscular group to perform repeated contraction (isotonic, isokinetic or eccentric) against a load or to sustain a contraction (isometric) for an extended period of time. Muscular strength (force), is created by the summation of forces produced by the contraction of individual muscle fibers. It is highly graded strength within a given muscle as per the requirement of the quality of the movement whether a fine graded movement (delicate work) is to be performed as that of eye muscles; or heavy work is to be performed as in the case of hitting heavy weight. [3]

Physical Fitness gives us better look, pleasant feel and productive performance. Fitness is an individual's quality that differs from individual to individual. Physical fitness involves the performance of our body systems like circulatory system, Muscular system etc. but the intellectual abilities, alertness, emotional stability, etc. also shown its affect on physical fitness. [5]

**Methodology**

**Sources of data**

The data pertaining to this study was collected by administering the appropriate tests described below on the inter-university players of Amravati University, who were participated at least inter-university tournaments where held in Amravati University, Amravati.

**Selection of the subject**

25 male Handball players and 25 male Basketball players, who had participated in inter-university tournaments, were preferred as area under discussion for this study. The age of the subject matter was ranging from 18 years to 25 years.

**Criterion measures**

The criterion measures to test the hypothesis of the study were below:

**Minimal Muscular Fitness**

To measure the minimal muscular fitness, Kraus-Weber Strength Test was conducted with its six test items as follow: 1) strength of abdominal plus psoas muscles; 2) strength of abdominal minus psoas muscles; 3) strength of psoas and lower abdominal muscles; 4) strength of upper back muscles; 5) strength of lower back muscles; 6) floor-touch test.

**Administration of Test**

**Kraus Weber Test No. 1:** With his feet held on the ground by the examiner, the subject lies flat on his back with his hands behind the neck. Perform one sit-up.

**Kraus Weber Test No. 2:** The subject is in the same position except that his knees are bent with his ankles close to the buttocks. Perform one sit-up.

**Kraus Weber Test No. 3:** The subject lies flat on his back with his hands behind his neck. The legs straight are lifted 10 inches off the floor. Hold this position for 10 seconds.

**Kraus Weber Test No. 4:** The subject lies on his stomach with a pillow under his lower abdomen and groin. The examiner holds his feet down. Lift head, shoulders, and chest off the floor and hold for 10 seconds.

**Kraus Weber Test No. 5:** The subject's position is the same, but the examiner holds the chest down. With knees straight, lift legs off floor and hold for 10 seconds.

**Kraus Weber Test No. 6:** The subject stands erect, barefooted, and with feet together. The examiner holds the knees straight. Bend over slowly and touch the floor with the fingertips. Hold this position for 3 seconds. [6]

**Statistical Analysis**

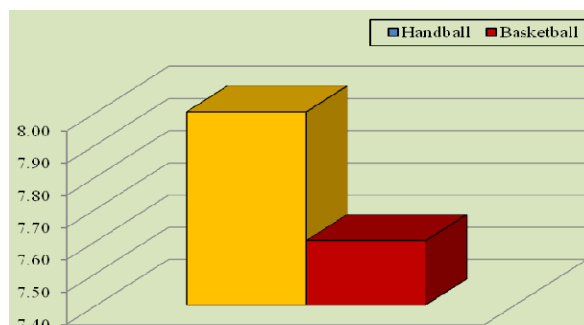
To compare minimal muscular fitness between Handball and Basketball male players the independent 't' test was used at 0.05 level of significance.

**Table 1:** Mean and t-ratio of minimal muscular fitness for Handball and Basketball male players

Variables	Group	Mean	SD	SE	MD	't' ratio
Strength of abdominal plus psoas muscles	Handball	8.00	4.08	1.19	0.40	0.34
	Basketball	7.60	4.36			
Strength of abdominal minus psoas muscles	Handball	8.80	3.32	0.86	0.40	0.46
	Basketball	9.20	2.77			
Strength of psoas and lower abdominal muscles	Handball	4.84	1.70	0.49	0.40	0.82
	Basketball	5.24	1.74			
Strength of upper back muscles	Handball	5.24	2.03	0.57	0.08	0.14
	Basketball	5.16	2.01			
Strength of lower back muscles	Handball	5.92	1.80	0.52	0.48	0.93
	Basketball	5.44	1.85			
Floor-touch test	Handball	4.52	1.64	0.46	0.04	0.09
	Basketball	4.56	1.64			

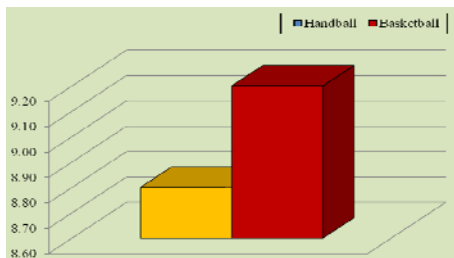
\*Significant at 0.05 level.

Table-1 indicates that that the obtained 't' value of 0.34 between Handball and Basketball players in Strength of abdominal plus psoas muscles was found to be insignificant at 0.05 level of confidence as we obtained value of 2.02 with 48 degree of freedom.



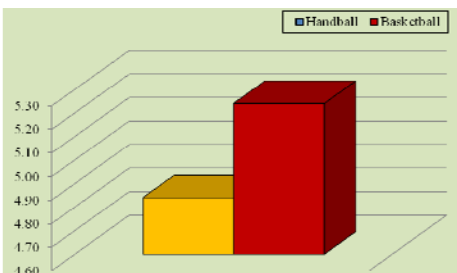
**Fig 1:** Graphical representation of mean of strength of abdominal plus psoas muscles between Handball and Basketball players

Table-1 indicates that that the obtained 't' value of 0.46 between Handball and Basketball players in Strength of abdominal minus psoas muscles was found to be insignificant at 0.05 level of confidence as we obtained value of 2.02 with 48 degree of freedom.



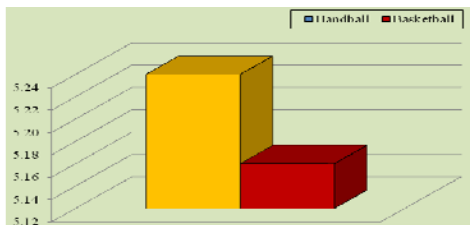
**Fig 2:** Graphical representation of mean of Strength of abdominal minus psoas muscles between Handball and Basketball players

Table-1 indicates that that the obtained ‘t’ value of 0.82 between Handball and Basketball players in Strength of psoas and lower abdominal muscles was found to be insignificant at 0.05 level of confidence as we obtained value of 2.02 with 48 degree of freedom.



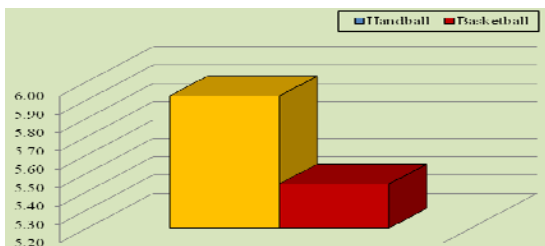
**Fig 3:** Graphical representation of mean of Strength of psoas and lower abdominal muscles between Handball and Basketball players

Table-1 indicates that that the obtained ‘t’ value of 0.14 between Handball and Basketball players in Strength of upper back muscles was found to be insignificant at 0.05 level of confidence as we obtained value of 2.02 with 48 degree of freedom.



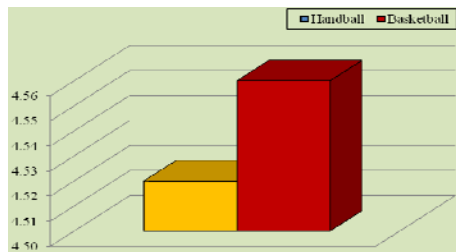
**Fig 4:** Graphical representation of mean of Strength of upper back muscles between Handball and Basketball players

Table-1 indicates that that the obtained ‘t’ value of 0.93 between Handball and Basketball players in Strength of lower back muscles was found to be insignificant at 0.05 level of confidence as we obtained value of 2.02 with 48 degree of freedom.



**Fig 5:** Graphical representation of mean of Strength of lower back muscles between Handball and Basketball players

Table-1 indicates that that the obtained ‘t’ value of 0.09 between Handball and Basketball players in Floor-touch test was found to be insignificant at 0.05 level of confidence as we obtained value of 2.02 with 48 degree of freedom.



**Fig 6:** Graphical representation of mean of Floor-touch test between Handball and Basketball players

**Conclusion**

Within the limitations of the present study and on the basis of the findings the following conclusions were drawn.

In this research it is observed that there has been insignificance difference between the handball and basketball players in strength of abdominal plus psoas muscles; strength of abdominal minus psoas muscles; strength of psoas and lower abdominal muscles; strength of upper back muscles; strength of lower back muscles and floor-touch test.

There was no significant difference in minimal muscular fitness between handball and Basketball players. But graph shows the difference in mean of minimal muscular fitness between handball and Basketball players.

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