



## COMPARATIVE STUDY OF LEG AND BACK STRENGTH AMONG MALE HANDBALL PLAYERS OF DIFFERENT POSITIONS

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### Abstract

Strength is a conditional ability i.e., it depends largely on the energy liberation processes in the muscles. Strength is direct product of muscle contraction and is considered the most important motor ability. The strength of legs and Back are the most integral component of the handball player. The legs are responsible for constant running, dodging, jumping and diving and needs high explosive power. Whereas back is involved in shooting and throwing the ball. Therefore the purpose of the study was to compare the Leg and Back strength among male Handball players at different positions. 30 Male handball players were selected randomly from Lakshmi Bai National Institute of physical education, Gwalior who were part of the West Zone Intervarsity team 2016-17. Players were selected from three positions i.e. Centre Forward (CF), Right Back (RB), Goalkeeper (GK). All the subjects belonged to the age group of 17 to 24 years. considering the primary purpose of the study and appropriateness of variables to be assessed with respect to Leg strength and back strength the dynamometer was used. Descriptive statistics like mean and standard deviation (SD) were computed. Analysis of variance (ANOVA) statistical technique was used to find out significant difference in mean among three positioned groups. Further in the case of significant difference the LSD post hoc test was applied. All the statistical analyses were performed using SPSS 12.0. The results of the study showed that the mean and standard deviation of criterion test scores for Centre

Forward (CF) Leg Strength ( 98.2 +\_ 8.81), back strength (97.2 +\_ 6.98) , Right Back(RB) Leg Strength(104.1+\_11.9) back strength(105.2 +\_ 6.57) and Goalkeeper (GK) leg strength (111.2 +\_ 6.06 ),back strength (103.5 +\_ 8.46). It was evident that there was no significant differences found between Centre forward and right back players group whereas the leg strength of the goalkeepers was found significantly higher than the CF and RB players group. The finding of the study indicated that the goalkeepers in handball had higher leg strength than the players of other two groups. This finding is in agreement with the results of Cassel (Feb1979) who compared motor ability and physical characteristics of college soccer players by position of play.

**Keywords:** Leg Strength, Back Strength, Centre Forward (CF), Right Back (RB) and Goalkeeper.

### Introduction

Among various sports Handball and Basketball is an Olympic sports, in the ball games fast pace of offensive and defensive action is considered. To play team-handball, especially to control factors that influence performance is challenging, because playing handball is complex and multi-factorial. Handball players have to match up their movements with jumping, running, change of direction and specific movements of throwing, catching, checking, passing and blocking. Handball has extended global popularity and charmed players and viewers with its dynamic appearances as a team game players



approximately run about 5-8 km with a variety of movements such as dribbling, passing, throwing, feinting at variable velocities and jumping .There are many tools and devices to test, measure and evaluate one's abilities and performances. The factors of performance can be basic performance traits, personality, socio – economic conditions, emotion make up, body build, structure, hereditary endowments and, so on. On general opinion of majority researchers, authors will not included the components such as Power, Balance, Speed and Agility (which are more significant for achieve in specified sports) as necessary modules of elementary physical fitness. On the other hand, in this study author has undertaken Leg and back Strength comparison between Handball players of different positions. Male subjects participated at the West –Zone Intersivity Handball Tournament, 2016-17 of LNIPE Gwalior were considered in this study.

### Methodology

For this cross sectional study 30 male Handball players were selected randomly from the intersivity Handball trials of the LNIPE Gwalior who participated in West-Zone Intersivity Handball competition in 2016-17. These 30 Players were selected from three positions i.e. Centre Forward (CF)- 10 ,Right Back(RB)- 10 , Goalkeeper (GK)- 10 . All subjects belonged to the age group of 18 to 24 years.

#### Variables and Instrument

Considering the primary purpose of the present study and appropriateness of variables to be assessed with respect to Leg strength and Back strength the Dynamometer was used.

### Procedure

The data was collected under natural environmental conditions in the morning between 6.30 am to 8.30 am. Each participant was briefed about the test and was familiarized with the

performance of the leg and back strength prior to the data collection. All testing was completed at the handball court by the same tester. The subjects for the test were asked to wear the same kit for data collection. Each subject performed both test for total of three trials and best efforts among the trials was counted as score. Verbal encouragement was given throughout the test.

#### Statistical Analysis

Descriptive statistics like mean and standard deviation (SD) were computed. Analysis of variance (ANOVA) statistical technique was used to find out significant difference in mean among three positioned groups i.e. Centre Forward (CF), Right Back (RB), and Goalkeeper (GK) with respect to leg and back strength .Further in the case of significant difference the LSD Post hoc test was applied .All the statistical analyses were performed using SPSS 12.0.

### Results and Discussion of Findings

In order to compare the leg and back strength among male handball players at different positions Analysis of Variance was used and for significant F-Value the LSD test was applied.

TABLE 1  
DESCRIPTIVE STATISTICS OF LEG AND BACK STRENGTH  
AMONG THREE POSITIONS OF SOCCER

Group	Variables			
	Leg Strength		Back Strength	
	Mean	S.D	Mean	S.D
Centre Forward	98.2	8.81	94.2	6.98
Right Back	104.2	11.9	103.2	6.57
Goalkeeper	111.2	6.06	103.5	8.46

Table-1 reveals that the mean and standard deviation of criterion test scores of leg strength and back strength of Centre Forward (CF) Right Back (RB) , Goalkeeper (GK) are as follows :



Centre Forward , leg strength ( $98.2 \pm 8.81$ ), back strength ( $94.2 \pm 6.98$ ) , Right back Leg strength ( $104.2 \pm 11.9$ ) ,back strength ( $103.2 \pm 6.57$ ) and Goal keeper ,leg strength( $111.2 \pm 6.06$ ) ,back strength ( $103.5 \pm 8.46$ ).

TABLE 2  
ANALYSIS OF VARIANCE OF THE MEAN OF DIFFERENT POSITION OF HANDBALL PLAYERS ON LEG STRENGTH

Source of Variance	df	SS	M.S.S	F-Ratio
Between Group	2	854.4	429.7	5.95
Within Group	27	2316.2	85.63	

\*Significant at 0.05 level tab  $F_{0.05(2,27)} = 4.45$

Table-2 reveals that there was significant difference found in the leg strength among Center Forward, right back and Goalkeepers because obtained F-ratio value (5.95) was greater than tabulated F- ratio value (4.45) at 0.05 level of significance .To further analysis for the pair wise mean comparison the LSD test was applied.

TABLE 3  
LSD TEST MEAN DIFFERENCE OF LEG STRENGTH BETWEEN THREE GROUPS

Group	Centre Forward	Right Back	Goalkeeper	M.D	Critical Difference at 5% level
Centre Forward	98.2	104.1	-	6.1	8.51
Right Back	98.2	-	111.2	14*	8.51
Goalkeeper	-	104.2	111.2	7.3	8.51

It is clearly evident from table-3 when compared the pair wise difference of mean with critical difference , it was evident that there was no significant difference found between centre forward, Right back and Goalkeeper in leg strength , whereas the mean of the Right back group was significantly higher than that of the Centre forward players. The findings imply that the Right back players group was better in leg strength in comparison to Centre forward players group.

TABLE 4  
ANALYSIS OF VARIANCE OF THE MEAN OF DIFFERENT POSITION GROUPS OF HANDBALL PLAYER ON BACK STRENGTH

Source of Variance	df	SS	M.S.S	F-Ratio
Between Group	2	355.27	177.63	3.25
Within Group	27	1473.7	54.58	

\*Significant at 0.05 level tab  $F_{0.05(2,27)} = 4.45$

Table 5 reveals that there was no significant difference found in back strength among Centre forward, Right back and goalkeeper because the obtained F-ratio (3.25) was lesser than the tabulated f-ratio value (3.35) at 0.05 level of significance.

### Discussion

The purpose of the present study was to compare the Leg and Back strength among male handball players at different positions. The finding of the study indicated that the right back players group showed higher leg strength than players in the other positions i.e., Centre forward and goalkeeper. The finding is in agreement with Vishwanatha (2016) who compared leg and shoulder strength amongst basketball and handball players of intercollegiate level of University of Mysore. Cassel (Feb.1979) who compared the motor ability and physical characteristics of college soccer players by position of play. In motor ability differences (P.05) were found in leg power and in this respect the full back were found to be more powerful than forward. In respect of soccer ability ,the half were found to be more skill full than goal keepers and in speed forwards and back were much faster than goal keeper. Muratovic et. al., (2014) compared anthropometric characteristics and body composition of elite handball and basketball players .The results showed there was no significant difference in body mass index among the groups, while a significant difference was found for body height and body weight as well as for all three of the body contents



measured (muscle, bone and fat) among the groups. These findings may give coaches from the region better working knowledge and suggest to them to follow recent selection process methods and to be more careful during the recruitment.

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### Conclusions

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

1. There was significant difference found in Leg strength among Centre forward, Right back and Goalkeepers .The findings imply that the Right Back players group was better in leg strength in comparison to Centre forward players group may be due to better ability to jump and shoot from long range distance. It means that the Right back position players needs more Muscular strength of leg as compared to other two groups.
2. There was significant difference in back strength at different handball positions i.e., Centre Forward, Right Back and Goalkeeper.

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