

# Effects of Football and Swimming Practice on Muscular Strength Of Different Muscle Groups of the Body

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## Abstract

**Purpose:** Purpose of the present study was to find out the effects of foot ball practice and swimming practice on muscular strength of different muscles of the body.

**Methodology:** For conducting this study total sixty boys [30 state level footballer and 30 state level swimmer boys] of 18 to 22 years were selected from different area of west Bengal, India. Selected criteria were leg explosive strength, abdominal muscular strength endurance, right hand and left hand muscular strength. Leg explosive strength, abdominal muscular strength endurance hand muscular strength were judged by standing broad jump, modified bend knee sit up test, and hand grip dynamometer respectively.

**Results:** Significant improved scores ( $p < 0.05$ ) were noted in leg explosive strength and footballer were better performer than swimmer. There were no significant differences on abdominal muscular strength endurance and muscular strength for both hand at 0.05 level of confidence between the selected groups, though, the swimmers acquired more abdominal muscular strength endurance and muscular hand strength than footballer.

**Conclusion:** Foot ball playing have most positive impact to improve the leg explosive strength than swimming practice.

**Key-words:** Swimmer, footballer, muscular strength.

**Introduction:** Foot ball is an amazing game of skillful leg. It is a beauty of kicking, trapping, pushing, dribbling etc. [1]. On the other hand swimming is a wonderful game of bouncing, pulling and pushing of water by leg and hands both [1]. Both the games required combination of many fitness components [1]. Among them, muscular strength is significantly related to sport performance very much. It is too much related to sprint performance, American foot ball performance, soccer performance, rugby league performance etc. [2]. Muscular strength normally refers to the force developed by a certain muscle group during the maximal voluntary contractions under certain conditions [3], so that one can overcome resistance or acts against resistance [4], while explosive strength is the ability to manifest the maximal strength in the shortest period of time [5]. Maximum muscular strength is the ability to overcome or to act against maximal resistance where the muscular strength endurance is the ability to overcome resistance or to act against resistance under conditions of fatigue [4]. The basic characteristic of muscular strength is that it is a highly trainable fitness component [4] and it also follows the principle of overload and specificity [4] i.e. strength of the particular muscle is increased which is involved in strength training or practicing [4]. Swimmers use their hands and legs equally to achieve their best performance and footballers use strongly their leg than hands and with this view the researchers want to investigate that practicing of which game foot ball or swimming should be best to improve varied types of muscular strength and have any differences between the footballer and swimmer on the muscular strength of various muscle groups of their body?

**Materials and methods:** Total 60 boys [30 state level foot ball players and 30 state level swimmers] of 18 to 22 years old were randomly selected, from West Bengal, India. The criteria measured for the study were leg explosive strength, abdominal strength endurance and maximum strength of both right and left hands. Leg explosive strength

was measured by using vertical jump [6]. Abdominal muscular strength endurance was judged by modified bend knee sit up test [6]. Hands' maximum strength was tested by using hand grip dynamometer [7]. Mean and standard deviation were used as descriptive statistics. Statistical calculations were done by using software prism 3.0 version. Level of significant was set at 0.05 level of confidence.

### **Result and discussion:**

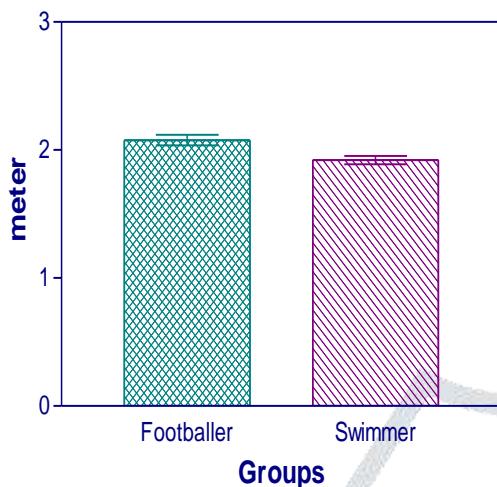
Table-1: Mean and standard deviation of personal data of swimmers and foot ball players

Variables	Swimmer		Footballer		"t"
	Mean	SD	Mean	SD	
Age (year)	18.97	$\pm 1.016$	19.40	$\pm 2.588$	t=1.79
Height (cm)	166.8	$\pm 4.354$	165.3	$\pm 6.144$	t=1.08
Weight (kg)	60.81	$\pm 4.468$	61.33	$\pm 7.875$	t=0.32

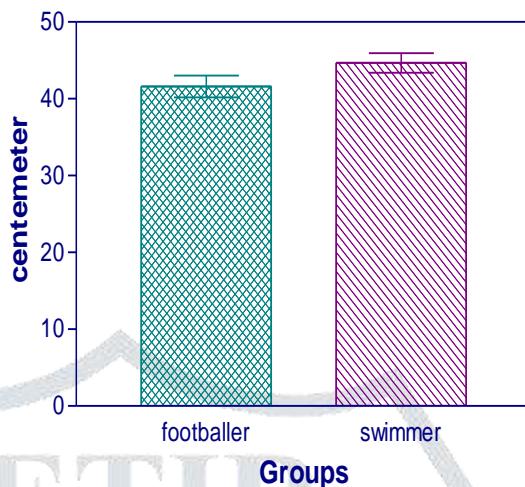
Table-2: Mean and standard deviation of muscular strength of different body parts of swimmers and foot ball players [8]

Variables	Swimmer		Footballer		't'
	Mean	SD	Mean	SD	
Leg explosive strength (meter)	1.922	$\pm 0.1758$	2.077	$\pm 0.2279$	2.94**
Abdominal muscular strength endurance	44.55	$\pm 6.908$	41.60	$\pm 7.784$	1.61ns
Right hand muscular strength (kg)	52.43	$\pm 8.540$	51.80	$\pm 7.162$	0.31ns
Left hand muscular strength (kg)	50.57	$\pm 10.12$	49.93	$\pm 10.42$	0.24 ns

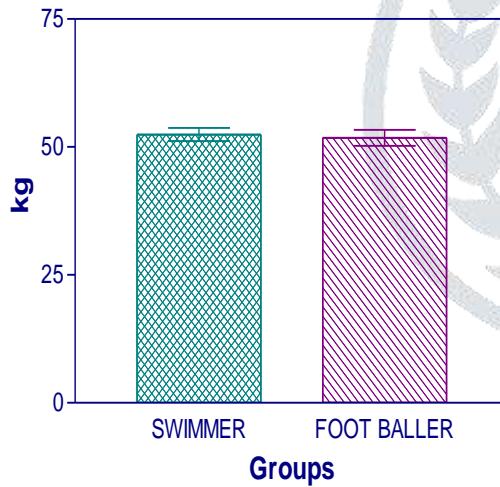
**Fig-1: Graphical representation of mean and standard error of leg explosive strength of state level foot baller and swimmer**



**Fig: Graphical representation of mean and standard error of abdominal strength endurance of footballer and swimmer**



**Fig2: Graphical representation of mean and standard error of right hand muscular strength**



**Fig-3: Mean and standard error of left hand muscular strength of both groups**

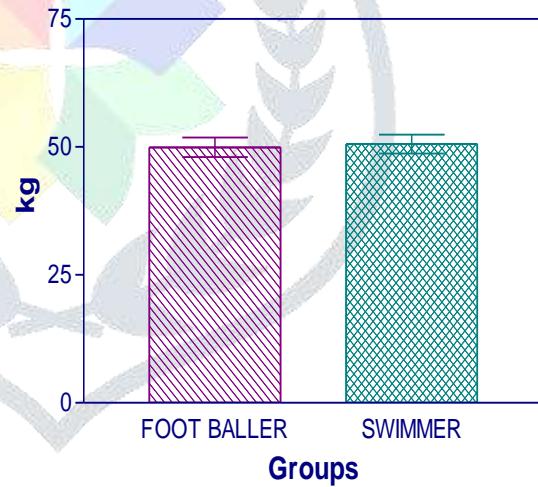


Table -1 showed the means and standard deviations of personal data of swimmer and footballer. From table-1 it was found that there were no significant differences between swimmers and footballers on their age, height and weight at 0.05 level of confidence.

Table-2 showed the mean and standard deviations of leg explosive strength (swimmer- 1.92,  $\pm 0.18$ ; Footballer- 2.08, 0.23); abdominal muscular strength endurance (swimmer- 44.55,  $\pm 6.908$ ; Footballer- 41.60,  $\pm 7.784$ ); right hand muscular strength (swimmer- 51.80,  $\pm 8.54$ ; Footballer- 52.43,  $\pm 7.16$ ); and left hand muscular strength (swimmer- 50.57,  $\pm 10.12$ ; Footballer- 49.93,  $\pm 10.42$ ). From table 2 it was found that there was significant difference on muscular strength at 0.05 level of confidence between footballer and swimmer but only for leg muscles. From table 2 it was also

found that footballers have better leg-explosive strength than swimmers. On other hand swimmers exhibited better abdominal muscular strength and muscular strength for both right and left hand than footballers, though there were no significant differences between the selected groups.

Ramzan Sumia (2016), studied on leg explosive strength of swimmer and footballer and she found that there was significant difference on leg explosive strength between the swimmers ( $2.24, \pm 0.07$ ) and footballer ( $2.36, \pm 0.11$ ) and foot ball players were better performer on leg explosive strength than swimmers [9]. Present study also revealed the same scenario of the previous study.

G.D. Ghai, and S.C. Negi (2007), studied on Motor Development Patterns of Trained and Untrained Indian Girls. They found that trained girls were superior to untrained girls on selected motor performance namely Explosive Leg Strength, Abdominal Strength, at every age level [10]. So, training has a positive impact on the development of motor components.

Bo-Ae Lee and Deuk-Ja Oh (2015), studied on effect of regular swimming exercise on the physical composition, strength, and blood lipid of middle-aged women. They found that the maximum muscular strength of women swimmer was improved by practicing swimming ( $40.15 \pm 5.63$  and  $41.93 \pm 4.80$ ) [11]. Present study revealed the muscular strength for left hand it was  $50.57 \pm 10.12$  and for right hand it was  $52.43 \pm 8.540$ . This too much mean of muscular strength may be due to the age and sex difference of the swimmers. Bo-Ae Lee and Deuk-Ja Oh (2015), also studied on abdominal muscular strength endurance and they found a significant improvement of muscular strength endurance (pre test  $17.05 \pm 7.85$  post test  $18.87 \pm 6.01$ ). Present study showed the mean and standard deviation of abdominal muscular strength endurance of swimmer was  $44.55 \pm 6.908$ . This too much better performance of the swimmers of present study may be due to the younger age and sex of the swimmers.

Foot ball is an amazing power game of kicking, trapping, pushing, dribbling of football mainly by the leg. Foot ball players perform a large variety of ballistic exercises distinguished from a kinematic point of view by high velocities and accelerations throughout the entire movement [12] where hands are strictly prohibited to take part in this game except for goal-keeper and during the time of throw-in. On the other hand swimming is a wonderful game of bouncing, pulling and pushing of water by leg and hands both. Another memorable thing is that strength is highly trainable factor among fitness components. In foot ball playing, leg is the most useable body part for foot ball players where, for swimming, both hands and legs have equal importance for better performance and that may be the reason which helps to acquired much leg explosive strength by footballer than swimmer and swimmer acquired much maximum hand muscular strength and abdominal muscular strength for bouncing on water than footballer.

#### Conclusions:

1. Foot ball playing has positive impact to improve leg explosive strength than swimming practicing.
2. Though, swimming practice has better impact to the improvement of abdominal muscular strength endurance and hand's maximum strength but, both the swimming practice and football playing have nearest positive impact to improve abdominal muscular strength endurance and hand's maximum strength.

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