

# COMPARISON OF LUNG CAPACITIES OF FOOTBALLERS AND SWIMMERS

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**Abstract:** The primary objective of the study was to compare the lung capacities between Swimmers and football players. The data was collected through respondents in the form of different descriptive tests. Total 200 players ( 100 Swimmers and 100 football players) selected for present study and their age ranged from 18 to 25 years. vital capacity, Respiratory rate, Maximum expiratory pressure, Maximum inspiratory pressure, Breath Holding Capacity were considered as a lung capacity and compared with Swimmers and football players. The results of the study show that insignificant differences were found in Vital Capacity and respiratory rate between footballers and swimmers. The results of the study show that significant differences were found in Maximum expiratory pressure between footballers and swimmers. The finding of the study indicates that footballers were found to have lower Maximum inspiratory pressure as compared to swimmers. The results of the study show that insignificant differences were found in Breath holding capacity (After Exhalation) between footballers and swimmers.

**Keywords:** Vital capacity, Respiratory rate, Maximum expiratory pressure , Maximum inspiratory pressure

## I. INTRODUCTION

Swimming and Football are the most popular sports in the world. Both requires a variety of physiological efficiency but both game differ from their skills and technique. Football is one of the popular sports in the world and 203 national associations affiliated to FIFA and represents about 200 million football players, of which approximately 40 million are women (FIFA, Singh 2021, Singh 2012) . Football has been considered the most dangerous of collision team sports of eleven players . Football requires a variety of physiological and physical characteristics and variety of skills (Singh 2013). Swimming is an individual aquatic sport that requires using a person's entire body to move through water (Singh 2011). swimming is popular competitive as well as recreational sports, featuring events over a variety of distances including breaststroke, freestyle, butterfly and backstroke (Singh 2011) . Most studies in swimming assessing oxygen consumption dynamics are conducted at moderate and heavy intensity domains; At high speed, VO<sub>2</sub> dynamics assessment is still rare and a challenging task (Guyton and Hall , 2011 ; Bruinings,2007). During sporting activity, the heart and the lungs are two main organs of the body come into action. The lungs bring oxygen into the body to provide energy and remove carbon dioxide, a waste product formed during energy production. The heart pumps oxygen to the exercising muscles (Widmaier, Raff, and Strang, 2008; Guyton and Hall , 2011 ; Fringer and Stull , 1974). Lung capacity is also important for athletes to increase stamina, improve strength, regulate heart rate, and sports enhance performance ( (Widmaier, Raff, and Strang, 2008; Guyton and Hall , 2011 Singh 2012;Berggren,2005). In swimming, athletes are supported individually through communication, attention and paperwork. In football, the atmosphere is like a fight, with players, parents and athletes yelling in support of their respective teams. Football involves a series of sprints, running in different direction, quick change of Direction, tackling the ball and jumping , a high-intensity interval training that improves cardiovascular health and builds muscle strength. Swimming is a moderate to severe -impact, full-body workout in the water (Singh 2011, Singh 2004)

## II. METHODS

### Sampling method and Sample Size:

The method of sample was purposive –A non-random method of sampling design for swimmers and footballers with a specific purpose. Total 100 football players and 100 Swimmers from different states and national level affiliated unites of federation was selected as sample size of the study.

### Source and tools of Data collection:

The study depends mainly on primary source of data. The data was collected through respondents in the form of test of vital capacity, Respiratory rate, Maximum expiratory pressure , Maximum inspiratory pressure, Breath Holding Capacity from different Academies, Clubs, States and Universities at the venue of Inter-varsity, State tournaments.

### Sample Size

Total 200 players ( 100 Swimmers and 100 football players) selected for present study and their age ranged from 18 to 25 years. The vital capacity, Respiratory rate , Maximum expiratory pressure , Maximum inspiratory pressure , Breath Holding Capacity were immediately recorded from 100 Swimmers and 100 football players **by the instruments**

Table- 1shows the mean scores, standard deviation (SDs) and t-test of Vital capacity (VC) between footballers and swimmers

Sr.No	Components	Players	No.	Mean Scores (Liters)	SDs	T-Value
1.	Vital Capacity	Football	100	2807.67	123.58	1.45 NS
		Swimming	100	2789.06	118.39	

Table-1 shows the descriptive statistics and t-test for comparison of Vital capacity (VC) between footballers and swimmers.

FIGURE-1

SHOWS THE MEAN SCORES AND STANDARD DEVIATION (SDS) OF VITAL CAPACITY (VC) BETWEEN FOOTBALLERS AND SWIMMERS

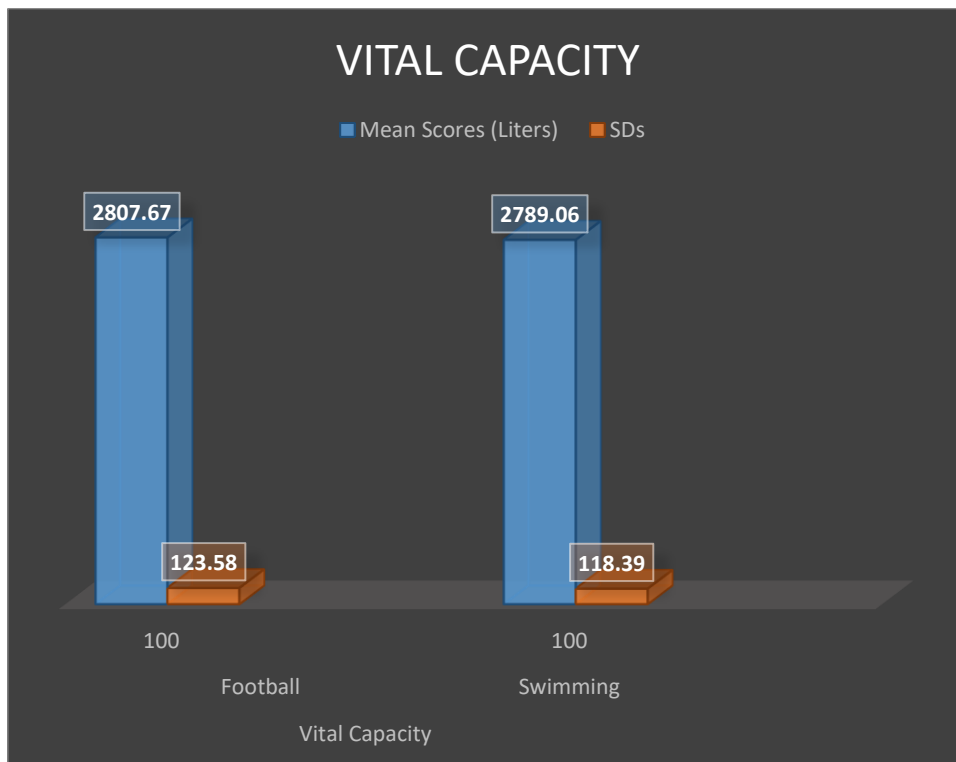


TABLE-2

Shows the mean scores, standard deviation and T-Value of Respiratory rate between Footballers and Swimmers

Sr.No	Components	Players	No.	Mean Scores	SDs	T-Value
1.	Respiratory Rate	Football	100	20.50	4.34	1.79NS
		Swimming	100	19.00	4.10	

Table-2 shows the descriptive statistics and t-test for comparison of Respiratory Rate between footballers and swimmers

FIGURE-2  
SHOWS THE MEAN SCORES AND STANDARD DEVIATION (SDS) OF RESPIRATORY RATE BETWEEN FOOTBALLERS AND SWIMMERS

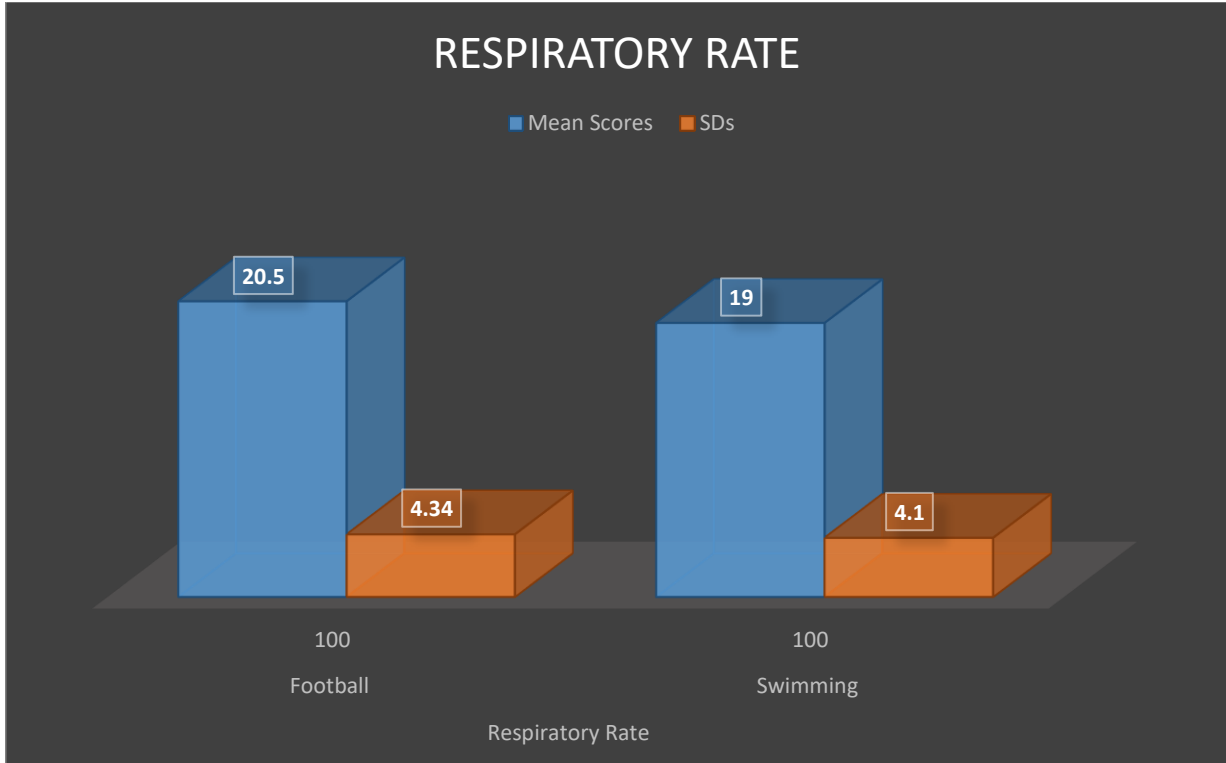


TABLE-3

Shows the Mean Scores, Standard Deviation of Maximum Expiratory Pressure Between Footballers And Swimmers

Sr.No	Components	Players	No.	Mean Scores	SDs	T-Value
1.	Maximum expiratory pressure	Football	100	55.67	8.10	P<.05
		Swimming	100	63.79	9.12	

Table-3 shows the descriptive statistics and t-test for comparison of Maximum expiratory pressure between footballers and swimmers

FIGURE-3  
SHOWS THE MEAN SCORES, STANDARD DEVIATION (SDS) OF MAXIMUM EXPIRATORY PREASURE BETWEEN FOOTBALLERS AND SWIMMERS

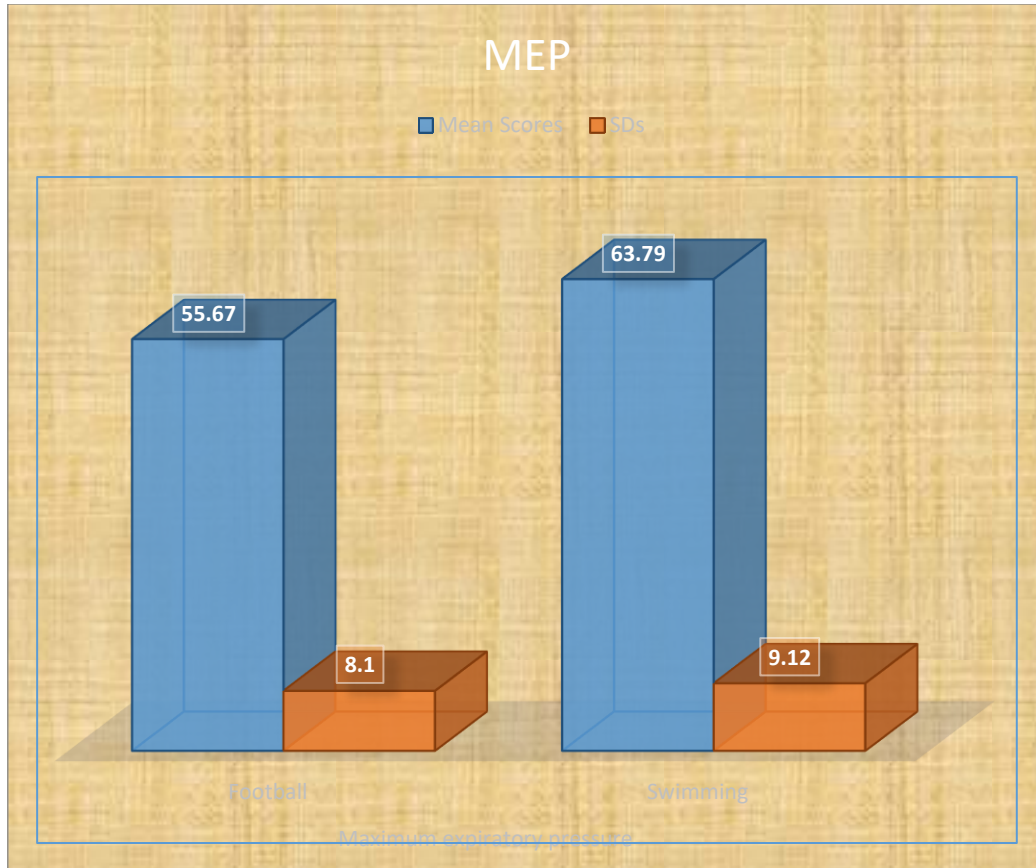


TABLE-4

Shows the mean scores, standard deviation of maximum inspiratory pressure between footballers and swimmers

Sr.No	Components	Players	No.	Mean Scores	SDs	T-Value
1.	Maximum inspiratory pressure	Football	100	75.50	8.79	P<.05
		Swimming	100	81.20	9.61	

Table-4 shows the descriptive statistics and t-test for comparison of Maximum inspiratory pressure between footballers and swimmers

FIGURE-4  
SHOWS THE MEAN SCORES, STANDARD DEVIATION (SDS) OF MAXIMUM INSIRATORY PREASURE BETWEEN FOOTBALLERS AND SWIMMERS

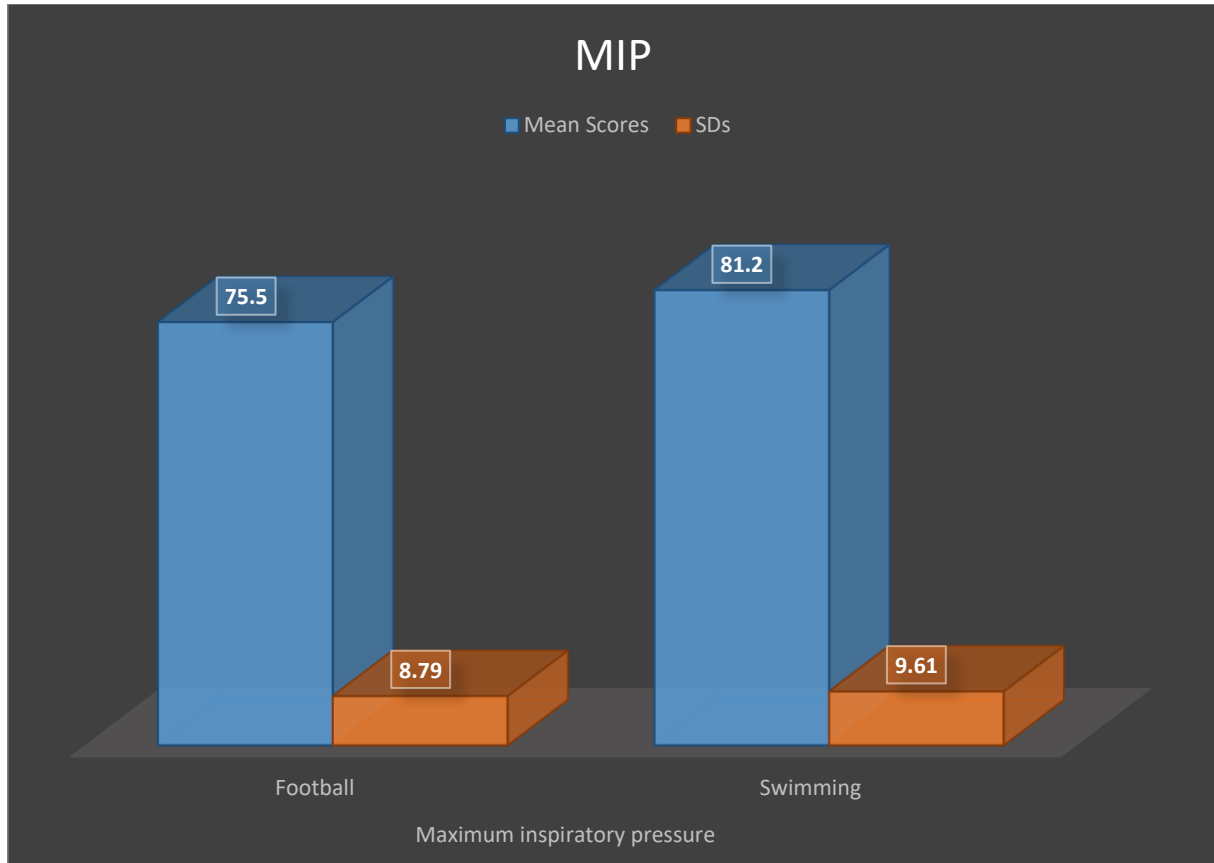


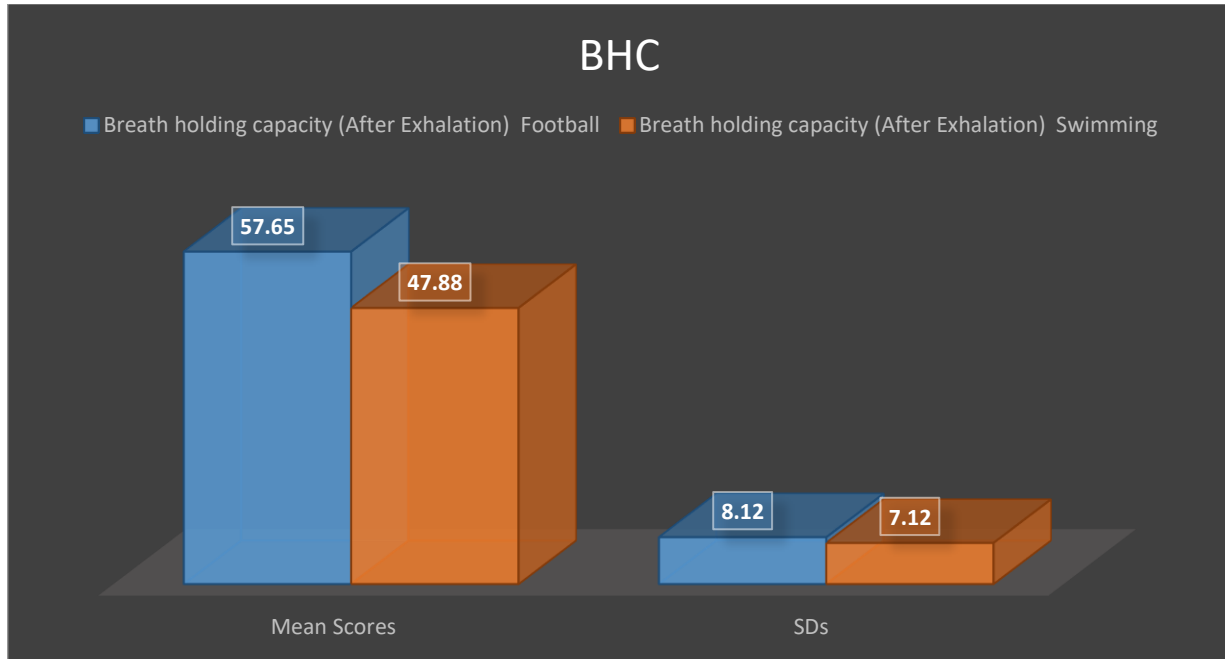
TABLE-05  
SHOWS THE MEAN SCORES, STANDARD DEVIATION (SDS) OF BREATH HOLDING CAPACITY(AFTER EXHALATION) BETWEEN FOOTBALLERS AND SWIMMERS

Sr.No	Components	Players	No.	Mean Scores	SDs	T-Value
1.	Breath holding capacity (After Exhalation)	Football	100	57.65	8.12	P<.05
		Swimming	100	47.88	7.12	

Table-4 shows the descriptive statistics and t-test for comparison of Breath holding capacity (After Exhalation) between footballers and swimmers

FIGURE -05

SHOWS THE MEAN SCORES, STANDARD DEVIATION (SDS) OF BREATH HOLDING CAPACITY (AFTER EXHALATION) BETWEEN FOOTBALLERS AND SWIMMERS



### III. DISCUSSION

Lung capacity helps athletes use oxygen more effectively to improve their performance. Participating in sports activities can help improve lung capacity by strengthening the cardiovascular system and increasing respiratory muscle function. Improved lung function means the body is able to exercise more efficiently. The main result is that the body more effectively captures oxygen in the bloodstream and delivers it to working muscles, where it is needed for metabolic processing of energy. The mean scores obtained from Table 1, the mean score of footballers was **2807.67** and the swimmers was **123.58** recorded respectively of selected physiological variables with respect to Vital capacity. Whereas, the standard deviation of footballers was **123.58** and footballers was **118.39** respectively of selected physiological variable with respect to Vital capacity. The results of the study show that insignificant differences were found in Vital Capacity between footballers and swimmers.

In addition, the, mean scores obtained from Table 2, the mean score of footballers was **20.50** and the swimmers was **19.00** recorded respectively of selected physiological variables with respect to Respiratory Rate. Whereas, the standard deviation of footballers was **4.34** and footballers was **4.10** respectively of selected physiological variable with respect to Respiratory Rate. The results of the study show that insignificant differences were found in Respiratory Rate between footballers and swimmers. The mean scores obtained from Table 3, the mean score of footballers was **55.67** and the swimmers was **63.79** recorded respectively of selected physiological variables with respect to Maximum expiratory pressure. Whereas, the standard deviation of footballers was **8.10** and footballers was **9.12** respectively of selected physiological variable with respect to Maximum expiratory pressure. The finding of the study indicates that footballers were to found have lower Maximum expiratory pressure as compared to swimmers.

The mean scores obtained from Table-4, the mean score of footballers was **75.50** and the swimmers was **81.20** recorded respectively of selected physiological variables with respect to Maximum inspiratory pressure. Whereas, the standard deviation of footballers was **8.79** and footballers was **9.61** respectively of selected physiological variable with respect to Maximum inspiratory pressure. The results of the study show that significant differences were found in Maximum inspiratory pressure between footballers and swimmers. The finding of the study indicates that footballers were to found have lower Maximum inspiratory pressure as compared to swimmers.

The mean scores obtained from Table 05, the mean score of footballers was **57.65** and the swimmers was **47.88** recorded respectively of selected physiological variables with respect to Breath holding capacity (After Exhalation).

Whereas, the standard deviation of footballers was **8.12** and swimmers was **7.12** respectively of selected physiological variable with respect to Breath holding capacity (After Exhalation). The results of the study shows that insignificant differences was found in Breath holding capacity (After Exhalation) between footballers and swimmers. The finding of the study indicates that footballers were found to have lower Breath holding capacity (After Exhalation) as compared to swimmers.

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