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A comparative study of selected physical fitness components between state level swimmers and footballers

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Abstract

Purpose of the present study was to find out the differences between footballer and swimmer on selected physical fitness components. For conducting this study total 60 boys [30 state level football players and 30 state level swimmers] of 18 to 22 years were selected from different area of west Bengal, India. Selected criteria were agility, flexibility, coordination and cardio-vascular endurance. All the physical fitness components were measured by using standard test. Mean and standard deviation were used as descriptive statistics and 't' test was used to compare the means of selected fitness components of the groups. Level of confidence was set at 0.05 level of confidence. Significant differences ($p < 0.05$) were noted in agility, flexibility and hand-eye co-ordination. From this study it was also found that footballers have a better agility than swimmer where swimmers have better flexibility and hand-eye co-ordination. There was no significant difference on cardio-vascular efficiency between footballer and swimmer at 0.05 level of confidence. Football practice helps to improve agility in better way than swimming practice. Swimming practice helps to acquire greater flexibility and hand-eye co-ordination than football playing. Both swimming and football playing have near about similar effect to improvement the cardio-vascular endurance.

Keywords: Swimmer, footballer, agility, flexibility, hand-eye coordination

Introduction

It is well established that physical activity can improve the cardio respiratory fitness and health profile ^[1] and football (soccer) is one of the most popular sports in the world ^[2]. With regards to performance determinants, soccer is an intermittent high-intensity ball game that involves linear sprints, rapid changes-of-directions, jumps and kicks ^[3, 4]. Soccer is a complex sport which demands high performance levels in various components of physical fitness (e.g., muscle power, speed, agility) to increase the likelihood for success in competition ^[5]. On the other hand swimming is a wonderful game of bouncing, pulling and pushing of water by leg and hands both ^[6]. Swimming is a great workout of whole body against the resistance of the water. Swimming is a good all-round activity ^[7]. Both the games required too much endurance ^[6]. Like football for better performance in swimming athletes required a high quality of fitness. From previous study it was found that football helps to develop agility, strength, endurance etc ^[5, 8] and swimming also helps to improve strength, agility, flexibility, endurance, etc. ^[9, 10, 7] With this view investigators want to observed that both football playing and swimming practicing have equal efficiency to improve the selected physical fitness components?.

Materials and methods

Total 60 boys [30 state level football players and 30 state level swimmers] of 18 to 22 years old were randomly selected, from West Bengal, India. Selected criteria were agility, flexibility, coordination and cardio-vascular endurance. All the physical fitness components were measured by using standard test. Agility was determined by time taken in 4x10 meter shuttle run ^[11], flexibility was measured by sit and reach test in centimeter ^[11], hand-eye co-ordination was measured by ball transfer test ^[12] and cardio-vascular endurance was considered by time taken for completing 600 yard ^[11]. Mean and standard deviation were used as descriptive statistics and 't' test was used to compare the selected groups.

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Level of confidence was set at 0.05 level of confidence. Statistical calculations were done by using software prism 3.0 version.

Result and discussion

Table 1: Mean and standard deviation of personal data of swimmers and football players

Variables	Swimmer		Footballer		“t”
	Mean	SD	Mean	SD	
Age (year)	18.97	±1.016	19.40	±2.588	1.79ns
Height (cm)	166.8	±4.354	165.3	±6.144	1.08ns
Weight (kg)	60.81	±4.468	61.33	±7.875	0.32ns

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: Mean and standard deviation of muscular strength of different body parts of swimmers and football players [13 Garrett 2007]

Variables	Swimmer		Footballer		“t”
	Mean	SD	Mean	SD	
Agility (Second)	10.38	±0.85	9.35	±0.55	5.59**
Back and hamstring flexibility (Centimeter)	18.66	±4.498	15.07	±4.417	3.122**
Hand eye co-ordination (Second)	13.10 B	±1.897	15.38	±1.147	5.63**
Cardio-vascular endurance (Second)	114.5	±27.52	123.3	±10.45	1.62 ns

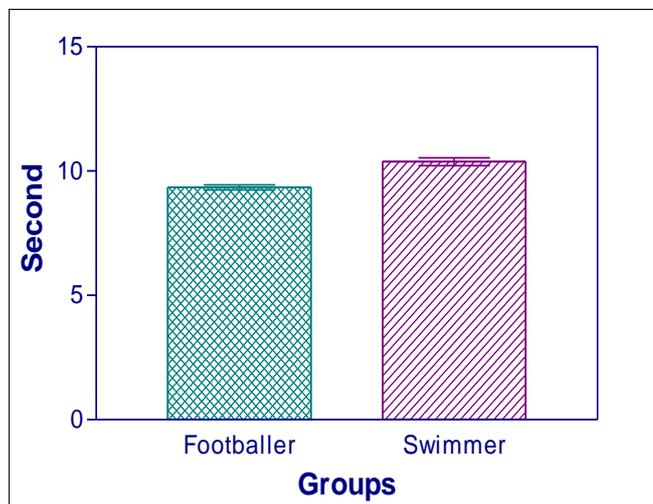


Fig 1: graphical representation of mean and standard error of agility of state level footballer and swimmer

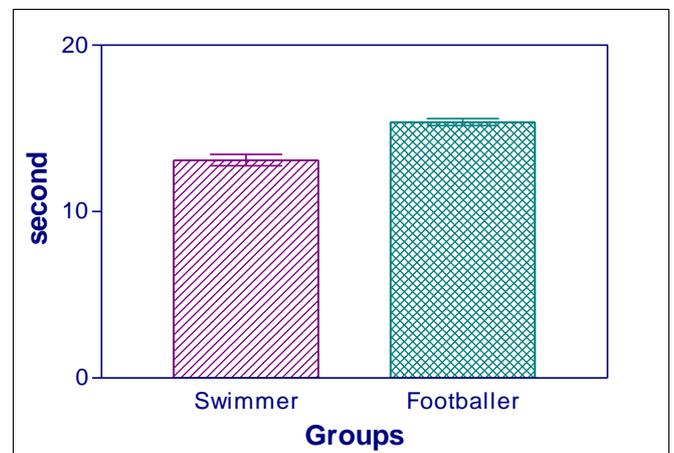


Fig 3: graphical representation of mean and standard error of co-ordination of state level swimmer and footballer

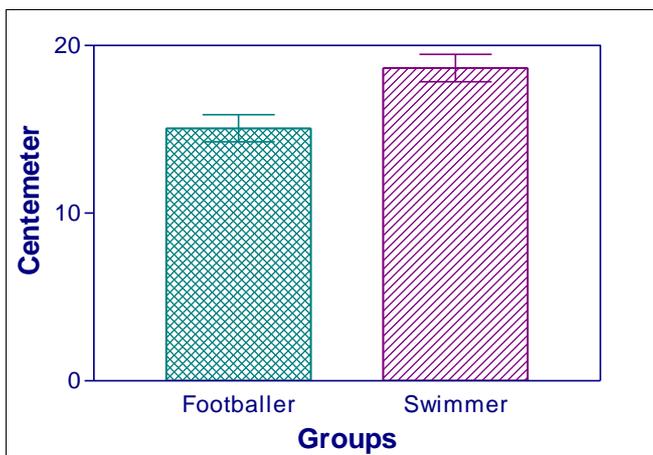


Fig 2: graphical representation of mean and standard error of flexibility of state level footballer and swimmer

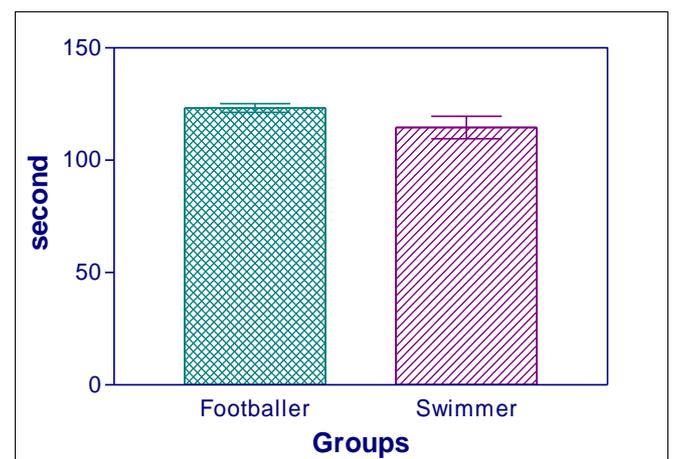


Fig 4: graphical representation of mean and standard error of cardio vascular endurance of state level footballer and swimmer

Table-2 showed the mean and standard deviations of agility (swimmer- 10.38 ±0.85; Footballer-9.35 ±0.55), flexibility (swimmer-18.66±4.498; Footballer- 15.07±4.417) hand-eye co-ordination (Swimmer- 13.10±1.897; Footballer-15.38±1.147) and cardio-vascular endurance (swimmer-114.5±27.52; Footballer- 123.3±10.45). From table 2 it was

found that there were significant differences on agility, flexibility and hand eye co-ordination between swimmer and footballer. From table 2 it was also found that footballers have better agility than swimmers. On other hand swimmers exhibited better flexibility and hand-eye co-ordination than footballers. There was no significant difference between the selected groups on cardio-vascular endurance.

Ramzan Sumia (2016), studied on selected motor fitness components among swimmers and football players and she found that there was significant difference (4.82) on agility between the swimmers (10.18, ± 0.72) and footballer (9.31, ± 0.37) and football players were better performer in agility than swimmers ^[14]. Present study also revealed the same scenario for having agility. Football is an intermittent high-intensity ball game that involves linear sprints, rapid changes-of-directions, and jumps and kicks ^[3] and that may be the reason for acquiring greater agility than swimmers.

In case of back and hamstring flexibility, Bo-Ae Lee and Deuk-Ja Oh (2015), found significant improvement of flexibility by swimming practice (pretest-13.43 \pm 3.93; posttest- 15.66 \pm 5.97) ^[9]. Present study also revealed a significant difference in flexibility between footballers and swimmers, and swimmers exhibited better flexibility than footballers. This is may be due to the continuous body bending in a specific medium so that they can easily perform swimming in a better way and that may help to improve and maintain back and hamstring flexibility.

From table 2 it was also found that there was significant difference in hand –eye co-ordination between the swimmers and footballers and the swimmers acquired better hand-eye co-ordination than footballer. Football is an amazing power game of kicking, trapping, pushing, dribbling of football mainly by the leg, 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. In swimming proper use of hands play a vital role in the way of greater achievement, and this may be the reason of improving better hand –eye co-ordination than footballer.

Ramzan Sumia (2016), also observed significant difference (2.16) on cardio-vascular endurance between the groups (swimmer- 75.85 \pm 3.88; footballer- 78.28 \pm 3.20) ^[14].

Bo-Ae Lee and Deuk-Ja Oh (2015), found significant improvement of cardio-vascular endurance by swimming training (pretest-13.41 \pm 5.12 posttest-16.07 \pm 6.81) ^[9].

B. Lazovic-Popovic a,g *et al.* (2016) found Elite swimmers had larger lung volumes when compared to football players and the control group ^[10]. Present study revealed no significant difference in cardio-vascular endurance between swimmers and footballers though swimmers have better cardio-vascular endurance efficiency than footballer that revealed the previous study. This may be due to the specific training on specific way of breathing, specific training position or the specific surrounding medium.

Conclusion

Football practice helps to improve agility in better way than swimming practice.

Swimming practice helps to acquire greater flexibility and hand-eye co-ordination than football playing.

Both swimming and football playing have near about similar effect to the improvement of cardio-vascular endurance.

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