



## PHYSICAL STATUS AND COORDINATIVE ABILITIES AMONG FEMALE FOOTBALL PLAYERS IN RELATION TO DIFFERENT PLAYING POSITIONS

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**ABSTRACT:** The purpose of this study was to examine physical status and coordinative abilities among university level female football players in relation to different playing positions i.e. goalkeepers, defenders, midfielders and attackers. A sample of forty (N = 40) female football players (mean  $\pm$  SD: age  $22.17 \pm 1.41$  years, height  $1.61 \pm 0.02$  m, weight  $56.00 \pm 1.43$  kg, BMI  $21.39 \pm 0.70$ ), which includes ten each goalkeepers, defenders, midfielders and attackers, who participated in inter-college competitions of Guru Nanak Dev University, Amritsar, India, was selected. All the participants were informed about aim and methodology of the study and they volunteered to participate in this study. The study was conducted on selected coordinative abilities i.e. orientation ability, differentiation ability, reaction ability and balance ability. One way Analysis of Variance (ANOVA) was applied to find out the significance of differences with regard to coordinative abilities among female goalkeepers, defenders, midfielders and attackers in football. Scheffé's post-hoc test (SPHT) was applied to see the direction and significance of differences where 'F' value found statistically significant. The level of significance was set at 0.05. While comparing the means, it is revealed that goalkeepers had better orientation ability, reaction ability and balance ability than their counterparts; defenders, midfielders and attackers. It is also observed that attackers had better orientation ability, reaction ability and balance ability than their counterparts; defenders and midfielders. However, defenders showed better differentiation ability than goalkeepers, midfielders and attackers. Further, significant differences were found between football players of different playing positions with regard to orientation ability ( $p < 0.05$ ) and balance ability ( $p < 0.05$ ) but insignificant differences were found with regard to differentiation ability ( $p > 0.05$ ) and reaction ability ( $p > 0.05$ ).

**Keywords:** Coordinative abilities, football, goalkeepers, defenders, midfielders, attackers.

### INTRODUCTION

Football is probably the most popular game of the world but there is still limited scientific information available concerning the coordinative abilities and physical fitness qualities of Indian female football player. Football is a highly structured analytical game in which players constantly have to deal with a complex and frequently and rapidly changing environment. In competitive sports, beautiful and graceful movements are a product of well developed technical



skills and coordinative abilities. The speed of learning of skill and its stability is directly dependent on the level of various coordinative abilities. Coordinative abilities are needed for maximal utilization of conditional abilities, technical and tactical skills [1]. The coordinative abilities to a great extent determines the maximum limits to which sport performance can be improved in several sports which depend largely on technical and tactical factors [2]. Motor learning process, continuous refinement and modification of sport skills to large extent depends on the level of coordinative abilities. Amateur players in particular still have to invest most of their training time in technical and tactical training as well as in endurance and strength training, whereas coordinative training is not encouraged so much [3]. A player's coordinative mastery over a sport technique can make him compete efficiently and effectively. Coordinative abilities become effective in movements only through the motor abilities and actively determined drives and cognitive processes [4]. Speed ability is the performance pre-requisite to perform motor actions under given conditions in minimum of time [5-6]. Balance ability is thought to be of great significance as it is an integral part of all movements [7-6]. It can be defined as the ability to maintain or recover the body's centre of mass within the body's base of support to prevent falling and complete therequired movements [8-6]. Hockey (1983) refers that the development of the coordination abilities, also associated with motor abilities of individuals [9]. Freiwald emphasized the importance of coordinative balance training in science-based training programs to prevent injuries and improve performance [10]. Without the adequately developed coordinative abilities, a sportsman cannot make maximum use of his psycho-biological capacities and reserves. Better developed coordinative ability provides an essential base for faster and effective learning, stabilization and variation in technique and their successful execution in game situation [1]. Therefore the aim of this study was to examine the differences in physical status and coordinative abilities among university level female football players in relation to different playing positions i.e. goalkeepers, defenders, midfielders and attackers.

## **MATERIALS AND METHODS**

**Subjects:** A sample of forty (N = 40) female football players (mean  $\pm$  SD: age  $22.17 \pm 1.41$  years, height  $1.61 \pm 0.02$  m, weight  $56.00 \pm 1.43$  kg, BMI  $21.39 \pm 0.70$ ), which includes ten each goalkeepers, defenders, midfielders and attackers, who participated in inter-college competitions of Guru Nanak Dev University, Amritsar, India, was selected. All the participants were informed about aim and methodology of the study and they volunteered to participate in this study.

**Selection of Variables and Tests:** The study was conducted on selected coordinative abilities i.e. orientation ability, differentiation ability, reaction ability and balance ability. The necessary data was collected by administering various coordinative ability tests as suggested by Peter Hirtz, 1985.

**Numbered Medicine Ball Run Test:** This test was used to determine orientation ability. Five medicine balls weighing 3Kg each were placed on an even surface in a semi circle with a distance of 1.5 meters between them and metallic numbered 1 – 5 plates of 1 sq. ft. size were fixed behind the balls. The sixth ball weighing 4Kg was kept in such a way that it was 3 meters



from each of the 1 – 5 numbered balls. Before the start of the test the subject/s were asked to stand behind sixth ball facing opposite direction. On signal the subject turned and run towards the number called by the tester and touched the medicine ball and run back to sixth ball, immediately another number was called. Similarly, a total of three times the number was called by the tester and subject performed accordingly. The time taken to complete the course was noted in seconds and better one from given two trials was recorded as score.

**Backward Medicine Ball Throw Test:** This test was administered to assess the differentiation ability. A gymnastic mat was kept 2 meters away from the starting line. A circle of 40 cm. radius was drawn in the middle of the mat and a medicine ball of 2Kg was kept at the centre of the circle. The subject/s were asked to stand behind the starting line facing opposite direction and asked to throw five medicine balls of 1Kg each over the head by targeting 2Kg ball placed on the mat, one after another by using both the hands. The total of points scored in all five throws (medicine ball touching the mat – 1 point, touching the circle line -2 points, inside the circle – 3 points and touching the 2Kg medicine ball -4 points) was recorded as score.

**Ball Reaction Exercise Test:** This test was used to measure the reaction ability. Two wooden planks of 4 meters each were kept inclined by a supporting stand of 1.20 meter height so that it could enable volleyball to roll freely downwards. The lower ends of the planks were graduated in centimetres. Volleyball was held by the tester at the top of the planks. The subjects were stand facing opposite to planks, behind the starting line which is 1.50 meters from lower end of plank. On signal and simultaneous drop of volleyball by the tester, the subject took a turn and run towards the planks to stop the dropping ball with both hands and not push it upward while stopping. The score was the distance measured in centimetres from the top of the planks to a point where the volleyball was stopped. Best one from given two trials was recorded as score.

**Long Nose Test:** This test was administered to assess the balance ability. A standard sized balancing beam was kept at the floor, 1.50 meters away from starting line. The subject was asked to stand behind the starting line with 1Kg medicine ball on his strong hand fully stretched forward and the other hand holding the opposite ear lobe. On signal the subject moved over the balancing beam towards the 2Kg medicine ball which was kept at the other end of the beam and pushed down it with any of the foot and come back to the starting line without losing the balance. The time taken in seconds to complete the course was taken as the score and if someone failed to successfully complete the task no score as well as subsequent trial was awarded.

**Statistical Analysis:** The Statistical Package for the Social Sciences (SPSS) version 16.0 was used for all the analyses. One way Analysis of Variance (ANOVA) was applied to find out the significance of differences with regard to Coordinative Abilities among goalkeepers, defenders, midfielders and attackers in football. Scheffe's post-hoc test (SPHT) was applied to see the direction and significance of differences where 'F' value found statistically significant. The level of significance was set at 0.05.



## RESULTS

Table -1 depicts the physical status of female football players of different playing positions. Table - 2 shows the mean values and standard deviations of female football players of different playing positions i.e. goalkeepers, defenders, midfielders and attackers, with regard to the selected coordinative abilities. While comparing the means, it is revealed that goalkeepers had better orientation ability, reaction ability and balance ability than their counterparts; defenders, midfielders and attackers. It is also revealed that attackers had better orientation ability, reaction ability and balance ability than their counterparts; defenders and midfielders. However, defenders showed better differentiation ability than goalkeepers, midfielders and attackers. Further it is evident from tables -3,4,5 & 6 that significant differences were found between football players of different playing positions with regard to orientation ability ( $p < 0.05$ ) and balance ability ( $p < 0.05$ ) but insignificant differences were found with regard to differentiation ability ( $p > 0.05$ ) and reaction ability ( $p > 0.05$ ). Table -7 showed paired means of different playing positions; it revealed statistically significant differences ( $p < 0.05$ ) of midfielders with goalkeepers, defenders & attackers and of goalkeepers with defenders respectively but attackers have shown insignificant differences ( $p > 0.05$ ) with goalkeepers & defenders, with regard to orientation ability. Further, it revealed statistically significant differences ( $p < 0.05$ ) of goalkeepers with midfielders but insignificant differences with defenders & attackers and insignificant differences ( $p > 0.05$ ) have also been found in between defenders, midfielders & attackers with regard to balance ability.

**Table 1.** Physical Status of Female Football Players of different Playing Positions.

Playing Positions	Age (yrs)		Height (m)		Weight (Kg)		BMI	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Goalkeepers	21.60	1.35	1.62	0.02	56.41	1.43	21.52	0.84
Defenders	23.00	1.33	1.62	0.02	56.41	1.74	21.50	0.70
Midfielders	21.30	1.06	1.61	0.02	55.63	1.34	21.34	0.79
Attackers	22.80	1.23	1.62	0.03	55.58	1.12	21.21	0.51
<b>Total</b>	<b>22.17</b>	<b>1.41</b>	<b>1.61</b>	<b>0.02</b>	<b>56.00</b>	<b>1.43</b>	<b>21.39</b>	<b>0.70</b>



**Table 2.** Mean and Standard Deviation of Football Players of different Playing Positions with regard to the variable Coordinative Abilities.

Variables	Playing Positions							
	Goalkeepers		Defenders		Midfielders		Attackers	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Orientation Ability	8.32	0.14	8.90	0.52	9.88	0.54	8.58	0.33
Differentiation Ability	14.40	1.57	14.60	1.95	14.40	1.95	13.80	1.47
Reaction Ability	1.30	0.07	1.46	0.22	1.49	0.20	1.44	0.22
Balance Ability	5.75	0.42	5.91	0.64	6.62	0.73	6.05	0.62

**Table 3.** Analysis of Variance (ANOVA) among Football Players of different Playing Positions with regard to Orientation Ability.

Source of variance	Sum of Squares	df	Mean Square	F-value	Sig.
Between Groups	13.976	3	4.659	26.587*	0.00
Within Groups	6.308	36	0.175		
Total	20.284	39			

\*Significant at .05 level of Confidence

$$F_{.05} (3, 36) = 2.86$$

**Table 4.** Analysis of Variance (ANOVA) among Football Players of different Playing Positions with regard to Differentiation Ability.

Source of variance	Sum of Squares	df	Mean Square	F-value	Sig.
Between Groups	3.600	3	1.200	0.390	0.76
Within Groups	110.800	36	3.078		
Total	114.400	39			

\*Significant at .05 level of Confidence

$$F_{.05} (3, 36) = 2.86$$

**Table 5.** Analysis of Variance (ANOVA) among Football Players of different Playing Positions with regard to Reaction Ability.

Source of variance	Sum of Squares	df	Mean Square	F-value	Sig.
Between Groups	0.214	3	0.071	1.976	0.13
Within Groups	1.300	36	0.036		
Total	1.514	39			

\*Significant at .05 level of Confidence

$$F_{.05} (3, 36) = 2.86$$



**Table 6.** Analysis of Variance (ANOVA) among Football Players of different Playing Positions with regard to Balance Ability.

Source of variance	Sum of Squares	df	Mean Square	F-value	Sig.
Between Groups	4.303	3	1.434	3.787*	0.02
Within Groups	13.635	36	0.379		
Total	17.938	39			

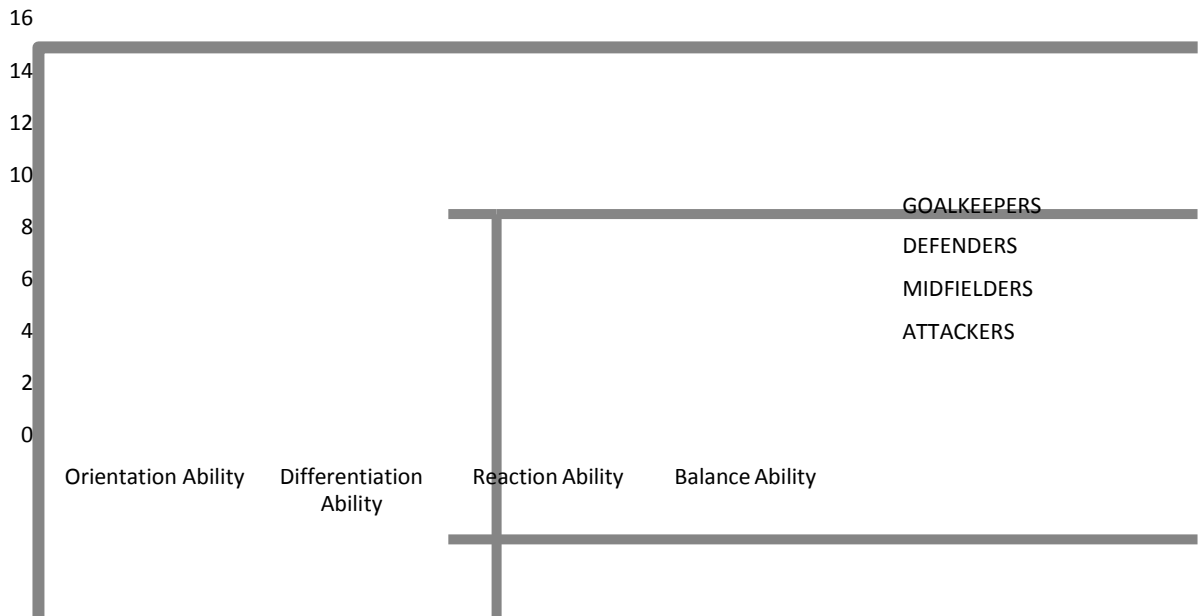
\*Significant at .05 level of Confidence

$F_{.05} (3, 36) = 2.86$

**Table 7.** Comparison of Mean Values of Post-hoc Test (Scheffe's) among Football Players of different Playing Positions with regard to Orientation Ability and Balance Ability.

Variables	Playing Positions				Mean Difference	Sig
	Goalkeepers	Defenders	Midfielders	Attackers		
<b>Orientation Ability</b>	8.32	8.90			<b>0.58*</b>	0.03
	8.32		9.88		<b>1.56*</b>	0.00
	8.32			8.58	0.26	0.59
		8.90	9.88		<b>0.98*</b>	0.00
		8.90		8.58	0.32	0.42
			9.88	8.58	<b>1.30*</b>	0.00
<b>Balance Ability</b>	5.75	5.91			0.16	0.95
	5.75		6.62		<b>0.87*</b>	0.03
	5.75			6.05	0.30	0.76
		5.91	6.62		0.71	0.10
		5.91		6.05	0.14	0.97
			6.62	6.05	0.57	0.25

\*Significant at .05 level of Confidence



**Figure 1.** Mean Values of Football Players of different Playing Positions with regard to the variable Coordinative Abilities.

## DISCUSSION

The results of study provided physical status and coordinative abilities among university level female football players in relation to different playing positions. In present study the mean height and weight of female football players is  $1.61 \pm 0.02$  m and  $56.00 \pm 1.43$  kg. The result indicated that female football players of this study were taller and heavier than the Indian National women football team (height (cm)  $154.72 \pm 4.72$ , body weight (kg)  $52.93 \pm 5.29$ ) studied by Pawar (2012) [11]. Coordination abilities enable an athlete to do a group of movements with better quality and effect. The findings of present study revealed that insignificant differences were found between female football players of different playing positions (i.e. goalkeepers, defenders, midfielders and attackers) with regard to differentiation ability and reaction ability which are in accordance with the findings of Ruhul et al., 2010 [12]. This might probably account for vast differences of technical and tactical moves between different playing positions in football. However, significant differences were found with regard to orientation ability and balance ability. As supported by Kapri and Choudhary, (2010) attackers had better orientation ability, reaction ability and balance ability than their counterparts; defenders and midfielders [13]. Goalkeepers had better orientation ability, reaction ability and balance ability than their counterparts; defenders, midfielders and attackers. However, defenders showed better differentiation ability than goalkeepers, midfielders and attackers. The systemic approach stated by Schoellhorn (1999) allows using the concept of differential training in proprioceptive and coordination training [14].



## CONCLUSION

It is concluded that goalkeepers had better orientation ability, reaction ability and balance ability than their counterparts; defenders, midfielders and attackers. Attackers had better orientation ability, reaction ability and balance ability than midfielders and defenders. However, defenders showed better differentiation ability than midfielders and attackers. Significant differences were found with regard to orientation ability and balance ability but insignificant differences were found with regard to differentiation ability and reaction ability.

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