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## Assessment of soccer playing ability and co-ordinative abilities of soccer players on circadian variations

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### Abstract

The purpose of the study was to examine the circadian variations in coordinative abilities and soccer playing abilities of male soccer players. In this study statistical population included 30 college soccer players of MG University (Kottayam) colleges belong to south zone. For collecting the data Coordinative abilities (Orientation ability, Differentiation ability, Reaction ability, Balance, and Rhythm ability) were selected as independent variable and soccer playing ability as dependent variable. Data were collected by the administration of standard tests for selected Coordinative abilities and Soccer playing ability. In order to find out the effect of circadian variations on Coordinative abilities and Soccer performance of Soccer players, the student t test was employed. The level of significance chosen to test the hypothesis will be 0.05,  $P < 0.05$ . Accordingly, a statistical software package was used. In order to analyze the scores of the selected dimensions of morning and evening performance of soccer players, the described analysis technique was used. On the basis of findings of present study, the following conclusions were drawn. The results strongly confirm that, insignificant differences were observed between morning and evening performance of Differentiation ability, Rhythm ability and Orientation ability in soccer players. The results powerfully prove that, significant differences were observed between morning and evening performance of balance ability and Reaction ability in Soccer players, and also the results strongly confirm that, insignificant differences were observed between morning and evening performance of soccer playing ability in soccer players.

**Keywords:** Soccer playing, co-ordinative abilities, circadian variations

### Introduction

Football is the world's most popular ball game in numbers of participants and spectators. Simple in its principal rules and essential equipment, the sport can be played almost anywhere, from official football playing fields (pitches) to gymnasiums, streets, school playgrounds, parks, or beaches. School-age athletes typically practice between the final bell and their dinner time (Beck and Gobatto, 2013) [4]. Meanwhile, competitions for spectator sports-such as basketball games, baseball games, and football games-are frequently scheduled in prime-time slots beginning as late as 8 pm. Within this broad range, is there a particular time of day that's optimal for training and performance? Football games may take place at various times throughout the day whilst training may be held in the morning or afternoon. Despite its popularity as a sport, few scientific studies have focused on the circadian variation in soccer players' performance. For instance, some investigators, who are interested in soccer performance, reported that aerobic, anaerobic performance and repeated sprint ability fluctuate with time of day. Most of studies showed that peak soccer performances have been found to occur in the early evening corresponding to the peak of the body temperature rhythm. Furthermore, worst performance has been found in the morning. Circadian rhythm in exercise performance for soccer players with morning lows and evening peaks are common findings in many laboratory tests performed on cycle ergo-meter (Bernard *et al.* 1998) [5]. Diurnal variation was also described in some football-specific tests, including dribbling time and chip test performance, being more accurate in the evening indicated that adult football players perform at an optimum between 16:00 and 20:00 h not only for football-specific skills but also for some physical performances (Di-Cagno *et al.* 2013) [7]. In this context, various chronobiological studies suggest that the temporal order of children differs from that of adults. For a good soccer player, it is essential to kick the ball well with both legs.

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But even top-level players show bilateral differences and fail to score when it is not possible to play the ball with their preferred leg (Atkinson and Spiers 1998) [3].

Generally, peak performance measures, including strength, anaerobic power output and joint-flexibility, have been found in late afternoon, approximately corresponding to the peak of the body temperature. When the diurnal rhythms of performance tasks are considered, those of “simple” tasks, with a small cognitive component, tend to parallel the rhythm of core temperature and peak in the late afternoon and evening (Chtourou *et al.* 2012) [6]. Coordination skills are determined by the process of guiding and controlling motor acts. A review of the literature showed that there is still a lack of knowledge when considering the association of circadian rhythms and coordination skills. Moreover, the diurnal variation in children and adolescent performance is still poorly investigated. The dream of becoming a top-level soccer player and the chance to represent one's country is a dream for many young footballers (Aloui *et al.* 2012) [2]. However, only a small percentage do actually go on to make the grade. So what do these player have in common, is it a greater athletic ability, a strong mental attitude or refined technique or perhaps a combination of the these factors? Some coaches feel that soccer players are born not made whilst others believe that any player can be successful as long as they have the capacity and willingness to learn. Many players with lesser ability have succeeded thanks to sheer hard work whilst those with natural fantastic physical and technical ability have failed due to a lack of motivation. This article will briefly look at factors suggesting what may be required to become a professional soccer player. Physical ability: Genetic factors do play an important part in defining the physical abilities of players. However, anybody can develop this part of their game through undertaking fitness programs that meet the requirements of the game and that match the needs of the individual (Adnene *et al.* 2013) [3]. In the case of younger players, fitness can also initially be developed by simply playing the game. Technical ability: According to different observers, the technical side of the modern game has seemingly suffered whilst the physical element has grown in importance. The aimed of this study is soccer playing ability and co-coordinative abilities of soccer players on circadian variations

### Selection of subjects and methodology

The study was conducted on college level male soccer players of colleges under south zone of MG University, Kerala. A total thirty (N=30) soccer players were selected as subject. All players were the members of the college soccer team. In the light of the expert's opinion, administrative feasibility, availability of subjects, availability of testing equipment's and materials, the following variables are selected for the purpose of this investigation.

#### a) Coordinative abilities

Orientation Ability, Differential Ability, Reaction Ability, Balance and Rhythm Ability are selected as independent variables and Playing ability as dependent variable. Numbered Medicine Ball Run Test, Backward Medicine Ball Throw Test, Ball Reaction Exercise Test, Long Nose Balance Test and Sprint at the given Rhythm Test are respectively used to measure the independent variables and Mc Donald Soccer Test was used to measure the dependent variable playing ability

### Collection of data

Data was collected by administration of standard tests for selected Coordinative abilities and Soccer playing ability. The tests were administered after giving them a good warm up of same duration and of same sequence every time. The subjects were tested two times (one time in morning and one time in evening) in the following way. The timings are as given below: Between 7.00 AM to 9.00 AM, Between 5.00 PM to 7.0

### Result

In order to determine the significance of difference between means of Morning and Evening in each of the Coordinative Abilities and Soccer Playing Ability, the level of significance was set at 0.05. The significance of difference between the means of different Coordinative abilities and soccer playing ability at different time of day (Morning and Evening) worked out by following formula:  $t = \frac{DM}{\sigma DM}$ , Where DM is Difference between both the mean,  $\sigma DM$  is standard error of the difference between the means.

### Significant difference in coordinative abilities and Soccer Playing ability at different time of day

Variables	Group	Mean	SD	SEM	N	T ratio
Differentiation Ability	Morning	11.13	3.18	0.64	30	0.31
	Evening	10.09	3.13	0.57	30	
Orientation Ability	Morning	8.0673	1.2167	0.2221	30	0.4004
	Evening	7.9890	0.6533	0.1193	30	
Balance Ability	Morning	4.3210	0.3434	0.0627	30	6.2137*
	Evening	4.7213	0.4438	0.0810	30	
Reaction Ability	Morning	114.07	30.32	5.54	30	3.0431*
	Evening	100.50	17.78	3.25	30	
Rhythm Ability	Morning	0.6910	0.3438	0.0628	30	0.3209
	Evening	0.6603	0.4076	0.0744	30	
Soccer Playing Ability	Morning	22.97	1.83	0.33	30	0.8932
	Evening	23.20	1.45	0.26	30	

\* $t^*$  0.05 (29) = 2.05

It is evident from the above table that there was no significant difference exists between mean of differentiation ability of soccer players at different time of day (Morning and Evening), since the calculated 't' value 0.31 which was found to be less than tabulated 't' value 2.05. Differentiation ability mean in the Evening was less (10.09 seconds) in comparison to mean of differentiation ability in the Morning (11.13). There was no significant difference exists between mean of Orientation ability of soccer players at different time of day (Morning and Evening), since the calculated 't' value 0.40 which was found to be less than tabulated 't' value 2.05. Orientation ability mean in the Evening was less (7.98 seconds) in comparison to mean of Orientation ability in the Morning (8.06).

It is evident from the table that there was a significant difference exists between mean of Balance ability of soccer players at different time of day (Morning and Evening), since the calculated 't' value 6.21\* which was found to be higher than tabulated 't' value 2.05. Balance ability mean in the Evening was higher (4.72 seconds) in comparison to mean of Balance ability in the Morning (4.32). It is evident from the table that there was a significant difference exists between mean of Reaction ability of soccer players at different time of day (Morning and Evening), since the calculated 't' value 3.04\* which was found to be higher than tabulated 't' value 2.05. Reaction ability mean in the Evening was less (100.50

cm) in comparison to mean of Reaction ability in the Morning (114.07). It is evident from the table that there was no significant difference exists between mean of Rhythm ability of soccer players at different time of day (Morning and Evening), since the calculated 't' value 0.32 which was found to be less than tabulated 't' value 2.05. Rhythm ability mean in the Evening was less (0.69 seconds) in comparison to mean of Rhythm ability in the Morning (0.66). It is evident from the table that there was no significant difference exists between mean of Soccer playing ability of soccer players at different time of day (Morning and Evening), since the calculated 't' value 0.89 which was found to be less than tabulated 't' value 2.05. Soccer playing ability mean in the Evening was higher (23.20) in comparison to mean of Soccer playing ability in the Morning (22.97).

### Conclusion

On the basis of findings of present study, the following conclusions were drawn.

1. The results strongly confirm that, insignificant differences were observed between morning and evening performance of Differentiation ability and Rhythm ability in soccer players.
2. The results strongly confirm that, insignificant differences between morning and evening performance of Orientation ability in soccer players.
3. The results powerfully prove that, significant differences were observed between morning and evening performance of Balance ability and Reaction ability in soccer players.
4. The results strongly confirm that, insignificant differences were observed between morning and evening performance of soccer playing ability in soccer players.

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