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## Effect of menstrual cycle on soccer playing ability of national players

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### Abstract

The present study with a prime focus on female soccer players was conducted to find out the effect of menstrual cycle on soccer playing ability. To conduct the study, 50 female soccer players (Ave. age 24.22 yrs) who took part in inter-university/national level soccer tournaments were selected as sample. Warner's soccer skill test (1950) was used to assess soccer playing ability of selected subjects. To assess soccer playing ability of female soccer players on the basis of their menstrual cycle, the data was collected before, during and after the menstruation period. Results indicate that soccer playing ability was at its best in post menstruation period as compared to pre menstruation and menstruation period. It was concluded that menstrual cycle is an important marker as far as soccer playing ability is concerned.

**Keywords:** Menstruation cycle, soccer playing ability

### Introduction

Effect of menstrual cycle on athletic performance is an issue which has generated quite a lot of debate. The studies in this regard have shown that menstrual cycle affect physical, physiological, psychological and biological functioning of women taking part in competitive sports but the results in this regard are not consistent. Sports scientist also opined that the sports performance during menstruation depends on other factors also.

Women's hormone levels do fluctuate during menstruation, and because of these fluctuations their autonomic nervous system and metabolic functions also gets affected. Therefore it is possible that due to physiological changes athletic performance may also be compromised.

Greeves *et al.* (1999) [3] reported that lowest strength in women was during late follicular stage because of higher estrogen levels. Female with normal menstrual cycle are at stronger during mid luteal period because of higher progesterone level during this phase as compared to menstrual phase. Contradictory theories have been proposed by various researchers in explaining the role of fluctuating sexual hormones in relation to muscle strength or fatigue (Janse de Jonge *et al.* (2001) [4]. Effect of menstruation on sports performance has been studied by many researchers, viz., Brooks-Gunn, Gargiulo and Warren (1986) [1], Quadagno, Faquin, Lim, Kuminka, & Moffet (1991) [5], Wojtys *et al.* (1998) [9], Tasmektepligil *et al.* (2010) [7], Tasgin (2011) [6].

Just like any other sport, participation of women in soccer has age old history. To perform at highest level female soccer players needs to possess basis soccer skills. The execution of these soccer skills are dependent upon many physical, physiological and psychological factors. But as far as women soccer is concerned, menstrual cycle may be the most challenging factor for execution of soccer skills. Surprisingly soccer playing ability of female soccer players has not been studied in the light of menstrual cycle, hence present study was planned.

### Objectives

The objective of the present study is to assess the effect of menstrual cycle on soccer playing ability of interuniversity/national players.

### Hypothesis

It was hypothesized that soccer playing ability of selected female soccer players will show significant variation during different phases of menstrual cycle.

### Methodology

The following methodological steps were taken in order to conduct the present study.

### Sample

To conduct the study, 50 female soccer players (Ave. age 24.22 yrs) who took part in inter-university/national level soccer tournaments were selected as sample. Purposive sampling method was used for selection of subjects. Only those subjects with normal menstrual cycle were considered for selection in the present study.

### Tools

Warner's soccer skill test (1950) was used to assess fundamental soccer skills i.e. kicking for distance, left and right foot; throw in for distance, dribbling the ball and kicking for accuracy respectively. This test is highly reliable and valid

### Procedure

First of all, female soccer players between age range 18-28 years who took part in university / national level tournament was identified through purposive sampling method. Out of these identified subjects medical history of subjects was ascertained regarding their menstrual cycle. Help of gynecologist was also taken to ascertain the regularity of menstrual cycle. In all, 50 subjects with regular menstrual

cycle were selected for the present study. Soccer playing ability of these selected subjects was ascertained 2 days before, during and 2 days after the menstruation with the administration of Warner's Soccer Skill Test Items. Soccer skill performance has been observed by five items namely; kicking (left & right), throwing, dribbling, and kicking for accuracy. To assess soccer playing ability, linear transformation method was adopted. In this method highest and lowest limit of all the soccer skill test items was traced out and numerical weightage was given in the ranking system. In the dribbling the ball test item, first ranking was awarded to lowest timing given by the subjects and next ranks has been awarded to those who took more time to complete given task. When the data were tabulated according to pre-defined groups, repeated measure ANOVA was used. The results are presented in table no. 1, 1(a) and 1(b).

### Analysis and interpretation of data

**Table 1:** Descriptive Statistics of Scores on Soccer Playing Ability Before, During and After Menstruation

| Conditions          | N  | Soccer Playing Ability |       |
|---------------------|----|------------------------|-------|
|                     |    | Mean                   | S.D.  |
| Before Menstruation | 50 | 65.66                  | 24.59 |
| During Menstruation | 50 | 66.10                  | 23.96 |
| After Menstruation  | 50 | 62.68                  | 21.17 |

**Table 1(a):** Repeated Measures ANOVA – Test of Within Subject Effects

| Source          | df | Sum of Squares | Mean Square | F    | Sig. |
|-----------------|----|----------------|-------------|------|------|
| Within subjects | 02 | 346.173        | 173.087     | 2.91 | .05  |
| Error           | 98 | 5813.827       | 59.325      |      |      |

Results obtained through Repeated Measures ANOVA indicate that soccer playing ability of female soccer players prior to menstruation (M=65.66), during menstruation (M=66.10) and after menstruation (M=62.68) differ significantly. The interpretation of scores as per linear transformation is lower the score, better the soccer playing

ability. The F ratio of 2.91, which is statistically significant at .05 level, confirms this finding.

The obtained results shown in table 1 and 1(a) were also confirmed by Least Significant Difference Test presented in table no. 2.

**Table 2:** Pairwise Comparisons of Mean Scores on Soccer Playing Ability in three experimental conditions i.e. before, during and after menstruation Least Significant Difference Test with Significance Level .05

| Mean (I)            | Mean (J)            | Mean Difference (I-J) |
|---------------------|---------------------|-----------------------|
| Before Menstruation | During Menstruation | -.44                  |
|                     | After Menstruation  | 2.98*                 |
| During Menstruation | Before Menstruation | .44                   |
|                     | After Menstruation  | 3.42*                 |
| After Menstruation  | Before Menstruation | -2.98*                |
|                     | During Menstruation | -3.42*                |

\* Significant at .05 level

Statistical figures presented in table 1 draws following inferences:

- The soccer playing ability was not found to differ significantly during menstruation period (M=66.10) and prior to menstruation (M=65.66). The mean difference of .440 was not found to be statistically significant.
- The soccer playing ability was found to be significantly superior after menstruation (M=62.68) as compared to performance prior to the start of menstruation (M=65.66). The mean difference of 2.980 was found to be statistically significant at .05 level.
- The soccer playing ability was found to be significantly superior after menstruation (M=62.68) as compared to performance during menstruation (M=66.10). The mean difference of 3.420 was found to be statistically significant at .05 level.

### Result and discussion

Results of the present study showed the significant impact of menstrual cycle on soccer playing ability of female soccer players. Previously Brooks-Gunn, Gargiulo and Warren (1986)<sup>[1]</sup> have also reported the impact of menstrual cycle of swimming performance. Scientific investigation by Constantini (2005)<sup>[2]</sup> reveals that sex hormones estrogen and progesterone significantly affect exercise performance. Hence the result of the present study is consistent with previous findings.

### Conclusion

On the basis of results, it may be concluded that soccer playing ability of national players vary during their menstrual cycle.

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