

## **Effect of Menstruation Cycle on Cardio Vascular Fitness, Flexibility and Mood State of Selected Female Players**

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### **Abstract**

Athletic Competition for a woman at a higher level is fairly a recent development. Women's athletic worthy of the name did not exist prior to the world war-I and women began Olympic Competition only in 1928. The objective of the research was to assess the effect of Menstruation cycle on Cardiovascular Fitness, flexibility and mood state of selected female players of Indira Gandhi Institute of Physical Education and Sports Sciences. For the said purpose, 20 female athletes were selected. Variables were taken for Cardiovascular Fitness test – 9 minute run and walk, for Flexibility – sit and reach test and for Mood State- a questionnaire of POMS was taken. All the above tests were conducted pre menstrual phase, during menstruation and post menstruation. ANOVA (F- Test) was applied for the statistical procedure. Data pertaining to Cardiovascular Fitness, Flexibility and Mood State of female players revealed statistically insignificant differences in female players during different phases of Menstruation cycle.

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### **INTRODUCTION**

Athletic competition for a woman at a higher level is fairly a recent development. It awaited the emancipation of women from antiquated social concepts from clothes that were unsuited for comfortable movement, let alone athletic performance. It is indeed assuming to attempt to visualize present day swimming and running performance in the athletic costumes of the 19<sup>th</sup> century. Women's athletic worthy of the name did not exist prior to World War-I and women began Olympic competition only in 1928.

As a consequences we are only beginning to learn the specialized physiological involved in the reaction of females of different ages to the various stressors in athletic competition. Furthermore, women's athletic have developed around modification of existing men's sports and whether these activities are best suited to the unique interest and the physiological, psychological and sociological needs of girls and women has not really been investigated.

Women are outperformed by men in all athletic activities in which performance can be precisely and objectively measured by distance or time. The difference is most pronounced in activities such as the shot put, where high level of upper body strength are crucial to successful performance. In the 400m free style swim, however, the winning time for women in the 1924 Olympic games was 16% slower than that for the men, but the difference decreased to 11.6% in 1948 Olympics and to only 6.9% in 1984 Olympics. The fastest women's 800m freestyle swimmers in 1978 swam faster than the world record – holding man for the same distance in 1972. In this event, as in many others, the gap between the sexes is narrowing. Unfortunately, making valid comparison through the years have been difficult because the degree to which an activity has been emphasized and its popularity are not constant and other factors-such as

opportunities to participate, coaching facilities and training techniques-have been considerably between the sexes over the years. Once girls and women started training as hard as boys and men, their performance improved dramatically. The effect that participation in athletics has upon female reproductive system has been a primary concern. Science the beginning of the owmen's participation in athletic events.

Normally a woman will menstruate four to six days at 20-30 days interval, but this varies with the individuals. Should female athlete avoid exercise and completion during this period of cycle? Probably not. All females are not the same, even though normal biochemical changes do occur in the body preceding and during actual breeding. Symptoms than can appear at this time are pain (Cramps, Headache, Joint Pain, Muscle Pain, Low Back Pain) Nausea, enlarged and tender breasts, acne increased, congestion in the pelvic area, decrease flexibility in the lower back, weight gain and lower threshold for pain. The shortage of progesterone also results in a drop in blood sugar, and imbalance of sodium and potassium in and around the cells and excessive water retention.

One change has been noted to be a result long distance running many females who run 10-15 miles per day, 70-100 miles per week, experience cessation of the menstrual flow (Secondary amenorrhea) usually when they stop intensive training the menses returns. There is no evidence that participation in sports by itself invokes any significant changes in the menstrual cycle, either favourable or unfavourable for the majority of females. Physical performance by women seem to be best in the immediate post menstrual period and upto the 15<sup>th</sup> day of the menstrual cycle. Women performing during the menstruation have also achieved record breaking performance. Top class athlete will almost invariably compete during the Menstrual Cycle although some of them are not Psychologically prepared for it. The menstrual function has insignificant effect on practically all phenomena so far studied all over world. The body as fit for exercise at this time, as at other times in the cycles. Girls or women should not look on menses as sickness. Full participation should be allowed at all times for those who desire to be active during menses.

## **METHODOLOGY**

**Sample:** For the purpose of study 20 female athletes from I.G.I.P.E.S.S. were selected to collect the data for selected variables.

**Variables:** After reviewing the literature, consultation with the experts and researchers following variables were selected for the purpose of this study.

- a) Cardiovascular fitness (pre, during and post)
- b) Flexibility (pre, during and post)
- c) Mood State (pre, during and post)

### **Tools:**

- a) For cardiovascular fitness test : 9 minutes run and walk test and distance was measured in kilometers.
- b) For flexibility: sit and reach test and measurement was recorded in inches.
- c) For mood state: POMS questionnaires were filled by the athlete and points were given.

**Test Administration:**

All the tests were administered in the laboratory and in the field of I.G.I.P.E.S.S., prior to the administration of the test the subjects were briefed about the test conducted on the selected variables. A 200 mtrs track was used to administered the cardiovascular fitness test and track was marked in the intervals of 10mts. For pretest all selected females athletics were called on the track, at the signal ready, subjects were standing on the starting line and on go they started running, the researcher counted the lap and additional in complete laps distance covered in 9 minutes, distance covered exactly in 9 minutes was recorded correct.

For flexibility a sit and reach test was administered to measure the flexibility of back and leg (hamstring) muscles for pre test, subject was asked to remove shoes and place her feet against the testing box while sitting on the floor with straight knees. Now the subject was asked to place one hand on the top of the other so that the middle fingers of both hands are together at the same length. The subject was instructed to lean forward and place her hand over measuring scale lying on the top of the box with its 10 inches mark coinciding with the front edge of the testing box. Then, the subject was asked to slide her hand along the measuring scale as far as possible and to hold the farthest position for at least one second. The above 9 minute run and walk test and sit and reach test were administered during the menstruation and after menstruation.

For Mood State POMS questionnaire were given to the selected female athletes in the Psychology lab and female athletes were asked to filled the questionnaire on their truthfulness.

**Statistical Technique:**

For statistical analysis on the effect of menstruation cycle on cardiovascular fitness, flexibility and mood state of selected 20 female players. ANOVA (F-Test) was used. The analysis of variance of different phases of menstruation cycle of female athletes on cardiovascular fitness, flexibility and Mood State is presented in Table 1,2 & 3 respectively.

**RESULT AND DISCUSSION**

**Table No.1: Analysis of Variance of Mean Difference on Cardiovascular Fitness (9 Minutes Run and Walk) among Female Players**

Source of variation	DF	Sum of squares	Mean square	F
Between Group	2	1.19	.020	
Within group	57	1.26	.630	31.5*

\* Significant at .05 level, Tab .05 (2,57) = 3.17

**Table No.2: Analysis of Variance of Mean Difference on Flexibility (Sit and Reach Test) among Female Players**

Source of variation	DF	Sum of squares	Mean square	F
Between Group	2	1134.51	567.25	
Within group	57	1127.63	19.78	28.67*

\* Significant at .05 level, Tab .05 (2,57) = 2.74

**Table No.3: Analysis of Variance of Mean Difference of Mood State among Female Players**

Source of variation	DF	Sum of squares	Mean square	F
Between Group	2	19576.19	9788.09	
Within group	57	19502.75	342.15	28.60*

\* Significant at .05 level, Tab .05 (2,57) = 3.17

Table 1,2,3 clearly indicate that there were significant difference found out at different phases of Menstruation Cycle on Cardiovascular fitness, flexibility and mood state respectively. Since the value of F obtained at .05 level was 31.5, 28.67, 28.60 respectively whereas the value needed for significance was 3.17, 2.74, 3.17 respectively for 2 and 57 degree of freedom at .05 level.

To find out the paired mean differences where F-Test is significant, the Scheffe's Post Hoc Test was employed.

**Table No.4: Significant Difference between the Paired Mean on Cardiovascular Fitness at different Phases of Menstruation Cycle in Female Players**

Before	During	After	Mean difference
1.41	1.48		.07
1.41		1.49	.08
	1.48	1.49	.01

\* Significant at .05 level, CD .05 (2,57) = 0.110

**Table No.5: Significant Difference between the Paired Mean on Flexibility at Different Phases of Menstruation Cycle in Female Players**

Before	During	After	Mean difference
2.83	3.65		.82
2.83		3.1	.27
	3.65	3.1	.55

\* Significant at .05 level, CD .05 (2,57) = 3.53

**Table No.6: Significant Difference between the Paired Mean of Mood State at Different Phases of Menstruation Cycle in Female Players**

Before	During	After	Mean difference
98.3	99.85		1.55
98.3		101	2.7
	99.85	101	1.15

\* Significant at .05 level, CD .05 (2,57) = 14.65

It is evident from table 4,5,6 that there were no significant difference found at different phases of Menstruation cycle among female players for cardiovascular fitness, flexibility and mood state respectively. Since the value was .07, .08, .01- .82, .27, .55-1.55, 2.7, 1.15 respectively where as the value of CD needed to be significant was .110, 3.53, 14.65 respectively for 2 and 57 degree at .05 level.

## RESULT & DISCUSSION

The data pertaining to cardiovascular fitness, flexibility and mood state of selected female players showed state of selected female players showed statistically insignificant difference in female players during the different phases of Menstrual Cycle. The changes are less evident but clear cut when sedentary subject undergo training programme. The probable reason for insignificant difference would have been dependent on certain factors like trained state, level of fitness and mental toughness among female players. Moreover the three phases of Menstruation cycle would not have much impact on their performance as per their cardiovascular fitness, flexibility and mood state. So the body is fit for exercise during the menstrual cycle, as at other time.

## CONCLUSION AND RECOMMENDATION:

**Conclusion:** The result revealed statistically insignificant difference in Cardiovascular Fitness, Flexibility, Mood State before, during and after menstruation cycle.

### Recommendation:

1. Similar study may be taken to other age group.
2. Similar study may be taken to sedentary college female.
3. Several studies have suggested that the menstrual cycle may affect performance differently as a function of the sport's studied. Therefore, studies could compare athlete in different sports; sports should be chosen that vary on dimensions involving energy expended, endurance, muscle required and so on.

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