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**Dr. Vikrant Ramchandra Wankhade**  
Director, Department of  
Physical Education & Sports,  
Bharatiya Mahavidyalaya,  
Amravati. (M.S.), India

## Comparative study of diurnal variation in selected physical fitness components of baseball player's

**Dr. Vikrant Ramchandra Wankhade**

### Abstract

The purpose of the study was to investigate the fact of diurnal variation on selected physical fitness component i.e. standing broad jump, shuttle run, sit & reach test and 50 yard dash of Baseball players. 30 male Baseball players of Bharatiya Mahavidyalaya, Amravati represent in intercollegiate Baseball tournament under S.G.B. Amravati University, Amravati They were randomly selected for this study. To analyze the collected data the one-way Analysis of variance and L.S.D. Post Hoc test statistic techniques were employed, finding revealed significant differences in diurnal variation on Standing broad jump, shuttle run and 50 yard dash of Baseball players but there was no significant difference on flexibility of Baseball players. As the calculated 'F' value of standing broad jump (13.422), Shuttle run (7.926) & 50 yard dash (10.734) was higher than tabulated 'F' at 0.05 level (3, 116) = 2.68. The analysis further shown significant difference of paired means in diurnal variation on standing broad jump, shuttle run & 50 yard dash.

**Keywords:** Diurnal Variation in Selected Physical Fitness Components

### Introduction

The field of game and sports is no exception to this. In advance countries the rapid progress on the field of game and sports has been possible only due to research, experimentation and application of scientific knowledge.

Men performance in sports or any other field depends on his movement oriented behavior, all three actions which can be noted by others with or without the aid of instruments and which have their roots in the biological phenomena. In other words, the performance of an individual is the result of the integrated and harmonious functioning of the several dynamics process of the body which are physiological, psychological, and psycho-physiological and biochemical in nature.

This is probably the most popular and frequently used term in physical education and to develop physical fitness is the most important objective of physical educators. According to Nixon and Cozens (1964), it was the desire to establish a scientific approach to the development of physical fitness which formed the basis of the first meeting of physical educators in 1885 when the profession of physical education originated.

The United States President's Council on Physical Fitness and Sports defined the terms physical fitness as "the ability to carry out daily tasks with vigor and alertness without undue fatigue, with energy to enjoy leisure time pursuits, and to meet unforeseen emergencies" (Clarke, 1971). However, later on the president council also included some other motor performance components namely agility, speed, flexibility and balance in physical fitness. But keeping in view the general opinion of the majority of the researchers. The author has not included the components such as speed, agility, power and balance (which are more important for success in specified sports) as essential components of basic physical fitness. Clarke and Clarke, 1987, AAHPERD, 1980, 1984) call such fitness tests which include the measurement of percentage body fat, as health-related physical fitness tests. The physicians Kraus and Weber (1961) demonstrated that certain diseases like low back pain, obesity, hypertension, degenerative cardiovascular diseases, abdominal poses, foot problems etc. are the conditions produced by sedentary life style of the affluent and tension producing society. Through the process of factor analysis, Fleishman (1964) and Falls *et al.* (1965) has prescribed specific physical fitness test batteries.

The ability to meet the demands of daily living with energy to spare, possessing.

**Correspondence:**  
**Dr. Vikrant Ramchandra Wankhade**  
Director, Department of  
Physical Education & Sports,  
Bharatiya Mahavidyalaya,  
Amravati. (M.S.), India

The functional capacities to do not only task that are required, but also those activities that one enjoys.

Fitness is sometimes also described in quantitative terms using measures such as heart rate, endurance, blood pressure or blood cholesterol level. This valuable measure may be indicative of one's general state of health and thus are certainly related to fitness.

We have become a nation of observers with more people (including children) spending their leisure time pursuing just that – leisure. Consequently, statistics show that obesity and overweight, the problems that come with high blood pressure, diabetes, cardiac arrest, etc. are on the rise. But statistics also show that preventive medicine pays off, so one should not wait until his/her doctor gives an ultimatum. Everyone must take the initiative to get active now.

The decision to carry out a physical fitness program cannot be taken lightly. It requires a lifelong commitment of time and effort. Exercise must become one of those things that you do without question, like bathing and brushing your teeth. Unless you are convinced of the benefits of fitness and the risks of unfitness, you will not succeed. It has been realized that fitness adds not only years to one's life, but life to one's years.

### Statement of the problems

Biological adaptation is an indispensable aspect in the International area of competition. Hence the present study was state as "Comparative study of diurnal variation in selected physical fitness components of Baseball Player's"

### Purpose of the study

The purpose of the study was to investigate the effect of diurnal variation on selected physical fitness components of Baseball players.

### Significance of the study

- 1) The result of this study would provide a guideline to the physical education teacher, coaches and trainers in preparing the training schedule to get the maximum performance for a specific time.
- 2) The Finding of the study would add exit level of knowledge with regard to effect of diurnal variation in selected physical fitness components of Baseball players.

### Hypothesis

On the basis of literature reviewed, available research findings and on my personal experience It was hypothesized that there would be a significant difference in diurnal variation on selected physical fitness components of Baseball players.

### Methodology

#### Sources of data

For this study, the male Baseball team of Bharatiya Mahavidyalaya, Amravati was the sources of data.

### Selection of Subjects

30 male Baseball inter collegiate player of Bharatiya Mahavidyalaya, Amravati were selected as subject for the purpose of the study. The age of the subjects were ranged between 18 to 28 years.

### Criterion Measures

The criterion measures of selected physical fitness components adopted in this study are as below:

- a. Standing broad jump: To measure explosive leg strength and the measurement was taken in centimeter.
- b. 50 yard dash: To assess the speed and the score was recorded in seconds.
- c. Modified sit and reach test: To measure trunk flexibility, the measurement was recorded in centimeter.
- d. Shuttle Run: To measure agility, Speed and Co-ordination, and the Score was recorded in seconds.

### Collection of Data

The necessary data on the selected physical fitness components were collected at different time of days by administering the specific test on same days at following timings.

1. Between 6:00 am to 7:00 am
2. Between 8:30 am to 9:30 am
3. Between 2:30 pm to 3:30 pm
4. Between 6:00 pm to 7:00 pm

The data were collected at the Baseball ground of Bharatiya Mahavidyalaya, Amravati.

### Statistical Analysis and interpretation of Data

The analysis of data collected on selected physical fitness components namely strength, Speed, Flexibility and agility of Baseball players during different time of day.

The data pertaining to each of the selected physical fitness components strength, Speed, Flexibility and agility were examined by One Way Analysis of Variance in order to determine the difference if any, during different time of a day. When the difference was found significance the LSD Post-Hoc test was applied to assess the paired mean difference among the groups.

### Level of significance

To find out the effect of diurnal variation of the selected physical fitness components of Baseball players the level of significance was set at 0.05 level of confidence.

Findings pertaining to the diurnal variation on selected physical fitness test i.e. standing broad jump, 50 yard dash, sit & reach test and shuttle run.

## 2. Discussion of finding

**Table 1:** One Way ANOVA table showing mean difference of diurnal variation in selected physical fitness components of Baseball Player's

Components	Source of Variation	SS	df	MS	F
Standing Broad Jump (In Centimeter)	Between Groups	1.229	3	0.410	13.422*
	Within Groups	3.539	116	0.031	
Shuttle Run (In Seconds)	Between Groups	3.091	3	1.030	7.926*
	Within Groups	15.077	116	0.130	
Sit And Reach Test (In Centimeter)	Between Groups	117.092	3	39.031	2.359
	Within Groups	1919.233	116	16.545	
50 Yard Dash (In Seconds)	Between Groups	6.120	3	2.040	10.734*
	Within Groups	22.047	116	0.190	

\*Significant at 0.05 level  $F_{0.05}(3, 116) = 2.68$

To find the mean difference F test was applied. Table 1 shows the mean difference obtained by applying F test.

Table-1 reveals that there was significant difference between the means of 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of Standing Broad Jump. The calculated 'F' was 13.422 where as tabulated 'F' was 2.68. Calculated 'F' greater than the tabulated 'F', which shows significance in 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of standing broad jump. Therefore, there is need of post hoc test.

Table-1 reveals that there was significant difference between the means of 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of shuttle run. The calculated 'F' was 7.926 where as tabulated F was 2.68. Calculated 'F' greater than the tabulated 'F', which shows significance in 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of shuttle run.

Therefore, there is need of post hoc test.

Table-1 reveals that there was significant difference between the means of 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of sit and reach test. The 'F' 2.359 was as tabulated value. Calculated 'F' was less than the tabulated 'F', which shows the not significance in 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of sit and reach test. Therefore, there is no need of post hoc test.

Table-1 reveals that there was significant difference between the means of 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of 50 Yard Dash. The calculated 'F' was 10.734 where as tabulated F was 2.68. Calculated 'F' greater than the tabulated 'F', which shows significance in 6:00 to 7:00 am, 8:30 to 9:30 am, 2:30 to 3:30 pm and 6:00 to 7:00 pm diurnal variation of 50 Yard Dash. Therefore, there is need of post hoc test.

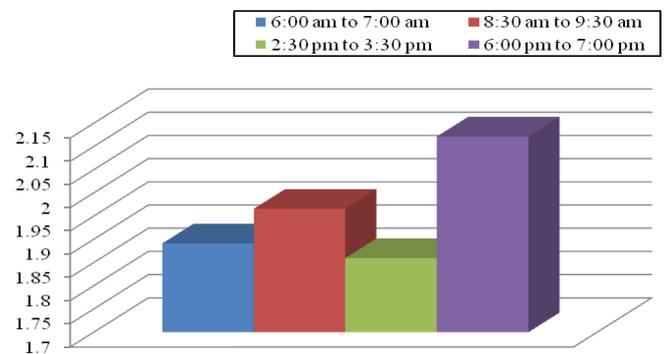
Table 2: Post hoc test table showing mean difference of diurnal variation in Standing Broad Jump of Baseball Player's

6:00 to 7:00 am	8:30 to 9:30 am	2:30 to 3:30 pm	6:00 to 7:00 pm	M.D.	C.D.
1.891	1.966			0.075	0.109
1.891		1.860		0.032	0.109
1.891			2.122	0.230*	0.109
	1.966	1.860		0.106	0.109
	1.966		2.122	0.156*	0.109
		1.860	2.122	0.262*	0.109

Table-2 clearly revealed that significant difference was found between the means of 6:00 to 7:00 am and 6:00 to 7:00 pm, 8:30 to 9:30 am and 6:00 to 7:00 pm, 2:30 to 3:30 pm and 6:00 to 7:00 pm as the mean difference of above three was greater than the critical differences.

Insignificant difference was found between the means of 6:00 to 7:00 am and 6:00 to 7:00 pm, 6:00 to 7:00 am and 2:30 to 3:30 pm, 8:30 to 9:30 am and 2:30 to 3:30 pm as the mean difference was less than the critical difference.

The sequence of standing broad jump performance in all four groups was (2.122) 6:00 to 7:00 pm > (1.966) 8:30 to 9:30 am > (1.891) 6:00 to 7:00 am > (1.860) 2:30 to 3:30.



Graph 1: showing mean difference of diurnal variation in Standing Broad Jump of Baseball Player's

Table 3: Post hoc test table showing mean difference of diurnal variation in Shuttle Run of Baseball Player's

6:00 to 7:00 am	8:30 to 9:30 am	2:30 to 3:30 pm	6:00 to 7:00 pm	M.D.	C.D.
9.931	9.884			0.047	0.226
9.931		10.227		0.296*	0.226
9.931			9.802	0.129	0.226
	9.884	10.227		0.343*	0.226
	9.884		9.802	0.082	0.226
		10.227	9.802	0.425*	0.226

Table-3 clearly revealed that significant difference was found between the means of 6:00 to 7:00 am and 2:30 to 3:30 pm, 8:30 to 9:30 am and 2:30 to 3:30 pm, 2:30 to 3:30 pm and 6:00 to 7:00 pm as the mean difference of above three was greater than the critical differences.

Insignificant difference was found between the means of 6:00 to 7:00 am and 8:30 to 9:30 am, 6:00 to 7:00 am and 6:00 to 7:00 pm, 8:30 to 9:30 am and 6:00 to 7:00 pm as the mean difference was less than the critical difference.

The sequence of shuttle run performance in all four groups was (10.227) 2:30 to 3:30 pm > (9.931) 6:00 to 7:00 am > (9.884) 8:30 to 9:30 am > (9.802) 6:00 to 7:00 pm

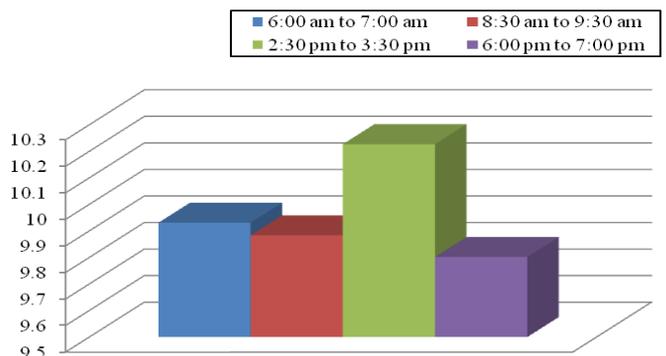


Table 2: showing mean difference of diurnal variation in Shuttle Run of Baseball Player's

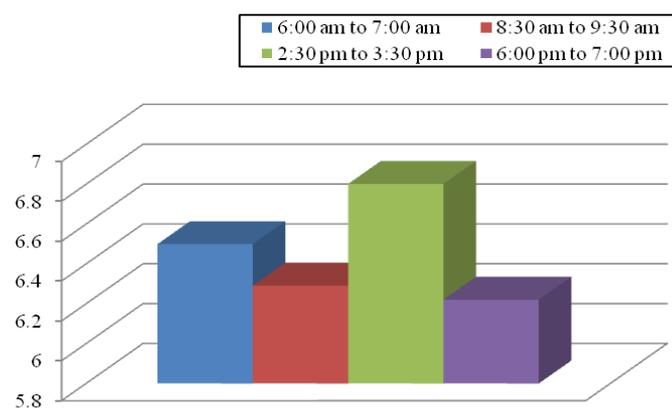
**Table 4:** Post hoc test table showing mean difference of diurnal variation in 50 Yard Dash of Baseball Player's

6:00 to 7:00 am	8:30 to 9:30 am	2:30 to 3:30 pm	6:00 to 7:00 pm	M.D.	C.D.
6.500	6.291			0.208	0.273
6.500		6.802		0.302*	0.273
6.500			6.220	0.279*	0.273
	6.291	6.802		0.510*	0.273
	6.291		6.220	0.071	0.273
		6.802	6.220	0.581*	0.273

**Table-4** clearly revealed that significant difference was found between the means of 6:00 to 7:00 am and 2:30 to 3:30 pm, 6:00 to 7:00 am and 6:00 to 7:00 pm, 8:30 to 9:30 am and 2:30 to 3:30 pm, 2:30 to 3:30 pm and 6:00 to 7:00 pm as the mean difference of above four was greater than the critical differences.

Insignificant difference was found between the means of 6:00 to 7:00 am and 8:30 to 9:30 am, 8:30 to 9:30 am and 6:00 to 7:00 pm as the mean difference was less than the critical difference.

The sequence of 50 yard dash performance in all four groups was (6.802) 2:30 to 3:30 pm > (6.500) 6:00 to 7:00 am > (6.291) 8:30 to 9:30 am > (6.220) 6:00 to 7:00 pm



**Table 4:** showing mean difference of diurnal variation in 50 Yard Dash of Baseball Player's

#### 4. Discussion of Hypothesis

In the beginning it was hypothesized that there will be a significant difference of diurnal variation on the selected physical fitness components.

The result of the study also shows that in standing broad jump, Shuttle run and 50 yard dash, performance there were significant difference among the four selected timing of the day, so the hypothesis is accepted in the above three components of physical fitness. Whereas in Sit and Reach test performance no significant difference was found among the four selected timing of the day, so the hypothesis is rejected in the case of above components of physical fitness.

**5. Conclusion:** Within the limitation of the present study & on the basis of the findings, the following conclusions are drawn:

1. It was seen that there was significant difference in diurnal variation on standing broad jump.
2. It is also shown that there was significant difference between diurnal variation on shuttle run,
3. It is also revealed from the study that there was significant difference between diurnal variation in 50 yard dash of Baseball players,
4. No significant difference was found in diurnal variation on flexibility which was measured by sit & Reach box.

There was significant difference between paired mean of diurnal variation in standing broad jump, shuttle run & 50 yard

dash of Baseball players.

Finding it is concluded that the changes and fluctuations that take place in the physiological parameters of the body within twenty four hours affects a lot the performance.

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