

# Comparative study of different duration of warming-up on the selected physical fitness components of volleyball players

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■ ABSTRACT

The purpose of the study was to determine the effect of warm-up of different duration on selected physical fitness components of volleyball players. The subjects were 20 male volleyball players of Inter collegiate volleyball tournament of Sant Gadge Baba, Amravati University, Amravati. The age of the subjects were ranged between 18 to 28 years. The data on selected criterion based on the test the research Scholar were the criterion measures selected for the purpose of the study were vertical jump in cms. Sit and Reach test in inches. Shuttle Run in seconds. Eye hand co-ordination in seconds and eye foot co-ordination in seconds. The test was administered consecutively for four days preceded by after no warm-ups on the first day, 5 min. warm-up on the fourth day, respectively. The data pertaining to each of the selected physical components of volleyball players were examined by one way analysis of variance in order to determine the differences if any. The level of significance was set at 0.05 level of confidence. Significant difference found among the paired means in vertical jump (3.725) and sit and Reach test (3.921), but insignificance difference found in shuttle run (0.847), eye-hand co-ordination (0.512) and eye-foot co-ordination (1.046) selected different duration of warm-up *i.e.*, without warm-up, 5 min warm-up, 10 min warm-up, 15 min warm-up. Hence, it is concluded that warm-up significantly affect on leg strength and flexibility.

■ KEY WORDS : Warm-up, Physical fitness components, Volleyball

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Warm-up plays an important role in enhancing performance of sportsmen to various games and sports. Warm-up is more vital for those activities in which quick movements and fast running are involved. It improves performance by increasing the rate and strength of muscle contractions, increases muscle coordination and helps to prevent injuries. Game and sports are the area of social life which is rich in

opportunities for sociological research. We must view the term physical on a broader, more abstract plane-as a condition of mind as well as body. Indeed, this physical education should bring about improvements in mind and body, that affect all respect of the person's daily living and the whole person should be benefited by the experience (Bucher, 1983; Clarke, 1976 ; Freeman, 1987; Getchell, 1976 and Mathews, 1982).

Game and sports hold as a prominent place in modern life, millions of people participate in sporting activities (Phillips, 1979; Kansal, 2008; Best, 1983; Racy and Jerk, 1969 and Singh, 2006). Watch and read about them, and spend money and time on sports related activities and equipments. The impacts of sports in modern society made it clear that sports is very legitimate field of academic study. Thompsons (1971), studied to determine the effects to warm-up, specific warm-up, general warm-up, general warm-up consisting of stretching type of exercise and general warm-up in form of hot shower upon the performance of speed. Endurance, Agility and power under different warm-up conditions. As well as Steacy (1961) studied nineteen college women having relatively high basketball playing agility who participated in a nine weeks testing programme involving 27 test days. The unrelated warm-up and related warm-up involving skills similar to the tests. The warm-up directly preceded the tests and the orders were systematically rotated. The test were scoltis passing test. The unrelated warming-up and the related warm-up were significantly superior to no warm-up and Skubic and Hoolgkins (1995), studied the effect of warm-up activities on speed, strength and accuracy. Test were used for speed, strength and accuracy each were performed when preceded by no warming-up by a general warm-up and by a warm-up related to the three types of warm-up procedures.

A major discussion concerns the use of some type of warm procedure before engaging in physical activity. The physical educator and coach should be familiar with the available evidence before determining whether or not to use the warm-up or how to use it most effective.

#### **Statement of the problems :**

It is universally accepted that warming-up is essential for any vigorous sports activity to exhibit optimum performance and prevent from injuries. But question arises that what should be the actual duration of warming-up hence, the present study was conducted on comparative study of different duration of warming – up on the selected physical fitness components of volleyball players (Andrews, 1976; Edward and Richard, 1993 and Singh, 1991).

#### **Purpose of the study :**

The main purpose of the present study was to find

out the effect of different duration of warming-up on the selected physical fitness components of volleyball players.

#### **Objective of the study :**

- Some findings of the study may assist the physical education teachers and coaches to proved proper warming-up schedule in terms of duration for the specific intensity of work.
- The method may of warming-up may enable the volleyball players to execute the skill more efficiently.
- The study may be of immense help to the physical education teachers and coaches to determine the effectiveness of stipulated duration of warming-up. So, that their sportsman would be able to put up better performance.

#### **Significance of the study :**

- The result of this study may help the coaches or players to know the effects of different duration of warming-up and its contribution to the skills performance.
- To device specific warm-up programme.
- The finding of the present study will be of special significance to the sports trainers specially dealing with the game of volleyball is that it will be possible for them to structure the specific warm-up of stipulated duration in relation to enhance desired physical fitness component for better performance.

#### **Hypothesis :**

It was hypothesized the there would be differential effects by different duration of warming-up on the selected physical fitness components of volleyball players.

#### **■ METHODOLOGY**

The required data were collected on selected volleyball players of Inter collegiate volleyball tournament of Sant Gadge Baba Amravati University, Amravati. So the selected subjects were served as the sources of data and for the present study 20 male volleyball players were selected randomly from Inter collegiate volleyball tournament of Sant Gadge Baba Amravati University, Amravati. Their age ranged between 18 to 25 years



according to the college records. To collect data for this study appropriate test on selected physical fitness components were administered on the selected volleyball players. Selected tests were as vertical jump to measurement the explosive strength of legs, sit and reach test to measurement the trunk flexion, shuttle run to measurement the speed and agility, eye hand co-ordination to measurement the co-ordination between eye and hand, eye foot co-ordination to measurement the co-ordination between eye and foot as well as criterion measures for this study to measure the explosive strength of legs vertical jump was administered and score was recorded in cms. The trunk flexion sit and reach test was employed and the score was recorded in cms. The agility and speed shuttle run test was applied and the score was recorded in seconds. The co-ordination in between eye and hand and eye and foot, eye-hand and eye and foot co-ordination test was used and the score was recorded in seconds. The selected test items were administered consecutively on four days preceded after no warm-up on the first day, after 5 minutes warm-up on the second day, after 10 minutes warm-up on the third day and after 15 minutes warm-up on the fourth day. The test was administered at the volleyball arena of Shri Shivaji College of Physical Education, Amravati.

**■ OBSERVATIONS AND DISCUSSION**

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

**Statistical procedure :**

The data pertaining to each of the selected physical components of volleyball players were examined by one way analysis of variance in order to determine the differences if any when the difference was found significant the Scheffe’s Post Hoc test was applied to assess the significant difference among the paired means. By using one way analysis of variance it was found that there are not significance difference among the selected different duration of warm-up *i.e.*, without warm-up, 5 min warm-up, 10 min warm-up, 15 min warm-up. The level of significance was set up at 0.05 for testing the significance of difference between means are given in Table 1.

From Table 1 it is observed that vertical jump for the time after no warm-up, after 5 min. warm-up, after 10 min. warm-up and after 15 min. warm-up, differs significantly, as the obtained F-value 3.725 is greater than the required F-value 2.699 at 0.05 level of confidence.

As the difference was found to be significant the Post Hoc Test was applied to asses the significant difference between the paired means, which was shown in Table 2.

From Table 2 it was observed that mean difference between no warm up and 10 min. warm up is 4.960, no warm up and 15 min. warm up is 5.960 which are greater than the critical difference 3.974 shows significant difference. And other mean difference do not show the significant difference (Fig. 1).

From Table 3 it is observed that shuttle run for the time after no warm-up, after 5 min. warm-up, after 10

**Table 1 : One way analysis of variance for vertical jump of volleyball players**

Source of variance	Degree of freedom	Sum of square	Mean sum of square	F-ratio
Between the groups	K-1 4-1 = 3	559.790	186.597	3.725*
Within the groups	N-K 100-4 = 96	4808.960	50.093	

\* indicate significance of value at P=0.05

$F_{0.05(3, 96)} = 2.699$

**Table 2 : Paired mean difference for vertical jump performance**

No warm up	5 Min. warm up	10 Min. warm up	15 Min. warm up	Mean difference	Critical difference
47.720	49.720			2.000	3.974
47.720		52.680		4.960*	3.974
47.720			53.680	5.960*	3.974
	49.720	52.680		2.960	3.974
	49.720		53.680	3.960	3.974
		52.680	53.680	1.000	3.974

\* indicate significance of value at P=0.05

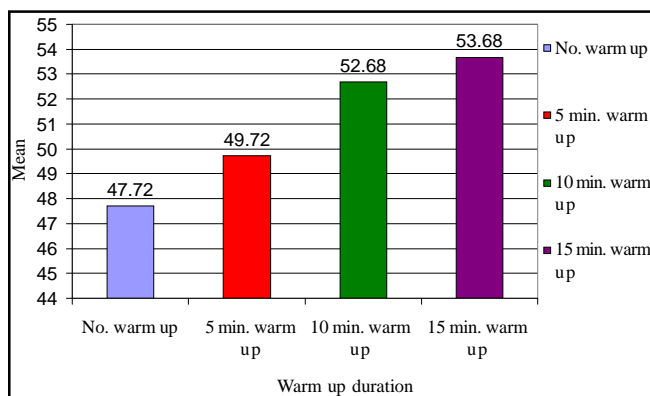


Fig. 1 : Shows that mean difference for vertical jump performance

min. warm-up and after 15 min. warm-up, differs insignificantly, as the obtained F-value 0.847 is less than the required F-value 2.699 at 0.05 level of confidence.

As the difference was found to be insignificant the post hoc test was not applied to assess the significant difference between the paired means.

From Table 4 it is observed that sit and reach for the time after no warm-up, after 5 min. warm-up, after 10 min. warm-up and after 15 min. warm-up, differs significantly, as the obtained F-value 3.921 is greater than the required F-value 2.699 at 0.05 level of confidence.

As the difference was found to be significant the

post hoc test was applied to assess the significant difference between the paired means, which was shown in Table 5.

From Table 5 it was observed that mean difference of sit and reach test between no warm up and 10 min. warm up is 2.440, no warm up and 15 min. warm up is 3.880, 4 min. warm up and 15 min. warm up is 2.960 which are greater than the critical difference 2.421 shows significant difference. And other mean difference do not show the significant difference (Fig. 2).

From Table 6 it is observed that eye-hand co-ordination for the time after no warm-up, after 5 min.

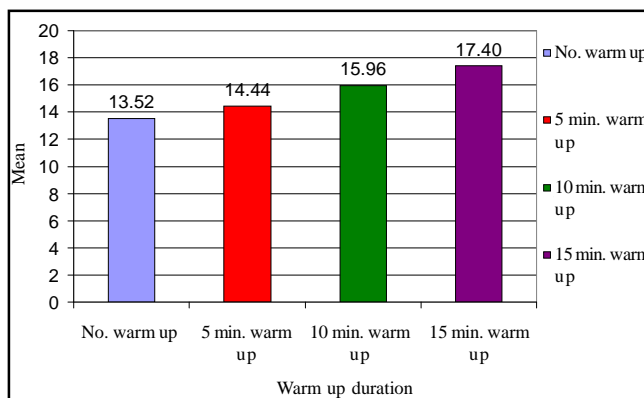


Fig. 2 : Shows that mean difference for sit and reach test performance

Source of variance	Degree of freedom	Sum of square	Mean sum of square	F-ratio
Between the groups	K - 1 4-1 = 3	1.007	0.336	0.847 <sup>NS</sup>
Within the groups	N - K 100 - 4 = 96	38.049	0.396	

F<sub>0.05(3, 96)</sub> = 2.699

Source of variance	Degree of freedom	Sum of square	Mean sum of square	F-ratio
Between the groups	K - 1 4-1 = 3	218.75	72.917	3.921*
Within the groups	N-K 100 - 4 = 96	1785.36	18.598	

\* indicate significance of value at P=0.05

F<sub>0.05(3, 96)</sub> = 2.699

No. warm up	5 Min. warm up	10 Min. warm up	15 Min. warm up	Mean difference	Critical difference
13.520	14.440			0.920	2.421
13.520		15.960		2.440*	2.421
13.520			17.400	3.880*	2.421
	14.440	15.960		1.520	2.421
	14.440		17.400	2.960*	2.421
		15.960	17.400	1.440	2.421

\* indicate significance of value at P=0.05

warm-up, after 10 min. warm-up and after 15 min. warm-up, differs insignificantly, as the obtained F-value 0.512 is less than the required F-value 2.699 at 0.05 level of confidence.

As the difference was found to be insignificant the post hoc test was not applied to assess the significant difference between the paired means.

From Table 7 it is observed that eye-foot co-ordination for the time after no warm-up, after 5 min. warm-up, after 10 min. warm-up and after 15 min. warm-up, differs insignificantly, as the obtained F-value 1.046 is less than the required F-value 2.699 at 0.05 level of confidence.

As the difference was found to be insignificant the post hoc test was not applied to assess the significant difference between the paired means.

The findings of the present study are :

Significant in vertical jump ( $F = 3.725 > \text{Tab } F = 2.699$ ) at 0.05 level of confidence in 3, 96 degree of freedom. Hence, post hoc test was applied to assess the significant mean difference no warm up and 10 min. warm up ( $MD = 4.960$ ), no warm up and 15 min. warm up ( $MD = 5.960$ ) which are greater than the critical difference 3.974 shows significant difference.

Sit and reach test ( $F = 3.921 > \text{Tab } F = 2.699$ ) at 0.05 level of confidence in 3, 96 degree of freedom. Hence, post hoc test was applied to assess the significant mean difference no warm up and 10 min. warm up ( $MD = 2.440$ ), no warm up and 10 min. warm up ( $MD = 3.880$ ) and no warm up and 15 min. warm up ( $MD = 2.421$ ) which are greater than the critical difference 3.974 shows significant difference.

Insignificant in shuttle run ( $F = 0.847 < \text{Tab } F = 2.699$ ) at 0.05 level of confidence in 3, 96 degree of freedom.

Insignificant in eye-hand co-ordination ( $F = 0.512 < \text{Tab } F = 2.699$ ) at 0.05 level of confidence in 3, 96 degree of freedom.

Insignificant in eye-hand coordination ( $F = 1.046 < \text{Tab } F = 2.699$ ) at 0.05 level of confidence in 3, 96 degree of freedom Charles and Frank, 1956 also worked on the related topic.

**Conclusion :**

Warm up plays an important role in enhancing performance of players in various games also it helps to prevent the injuries.

It was concluded that in case of vertical jump and sit and reach test performance of the players have shown better performance after 15 minutes warm-up, followed by 10 minutes warm-up then 5 minutes warm-up whereas least performance was shown by the subjects who performed without any warm-up. It may be because as a result of warm-up the local temperature in the muscles increases which in turn increases the muscle reaction time, muscle speed and muscle excitability and also decreased the duration of action patented in the muscle and also supplies oxygenated blood to muscle fibres by which they activate the muscle fibres which helps them to execute explosive strength of legs. The flexibility of the trunk improves with the warm up may be because the development of muscle tone, excitability and joint mobility due to the appropriate secretion of synovial fluid in the joints as well as ligament surrounding the joint

**Table 6 : One way analysis of variance for eye-hand co-ordination of volleyball players**

Source of variance	Degree of freedom	Sum of square	Mean sum of square	F-ratio
Between the groups	K - 1 4-1 = 3	2.772	0.924	0.512 <sup>NS</sup>
Within the groups	N-K 100 - 4 = 96	173.274	1.805	

$F_{0.05(3, 96)} = 2.699$

**Table 7 : One way analysis of variance for eye-foot co-ordination of volleyball players**

Source of variance	Degree of freedom	Sum of square	Mean sum of square	F-ratio
Between the groups	K - 1 4-1 = 3	0.817	0.272	1.046 <sup>NS</sup>
Within the groups	N - K 100 - 4 = 96	24.989	0.260	

$F_{0.05(3, 96)} = 2.699$

flexibility. Hence, the results shown in the improvement of flexibility due to warm up.

Also it was concluded that in case of shuttle run eye-hand co-ordination and eye-foot co-ordination performance of the players haven't shown any significant difference in the performance after 15 minutes warm-up followed by 10 minutes warm-up and 5 minutes warm-up and without warm-up. It may be attributed to the fact that the intensity of warm up may not sufficient to improve the shuttle run, eye-hand and eye-foot co-ordination performance.

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