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Comparative study of active, passive and no warm-up on selected physical fitness performance of inter-university players

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Abstract

The purpose of the study was to find out the effect of Active and Passive warming up as well as no warm-up on the selected fitness performance of inter-university players. Fifty male inter-university players of different games such as Basketball, Football, Volleyball, Handball and Hockey were selected for the study from Visva-Bharati, Santiniketan. The data were collected by administering Sit & Reach Test for Flexibility, 50 yard Dash for Speed, Standing Broad Jump for Explosive leg strength, Semo-Agility Test for Agility and Bent Knee Sit-ups test for endurance of abdominal muscle. To find out the significant difference F-test was employed for the selected components. The result showed that there was significant difference inflexibility (13.0), Speed (25.15), Explosive strength (3.7) and Agility (78.1) at 0.05 level of confidence. But in case of Endurance (.78) result had not shown any significance difference at 0.05 level of confidence.

Keywords: Active warm up, passive warm up & No Warm-up

Introduction

Warm-up has been found to be important in preventing injury and muscle soreness. When vigorous physical effort is not preceded by a sufficient warm-up injuries take place. An effective quick warm-up can also be a good motivator. Students who get satisfaction from an effective warm-up have a stronger desire to participate in an activity. By contrast a poor warm-up can lead to fatigue and boredom limiting the student's attention and ultimately results in a poor performance. There are number of controversies about warm-up as to whether warm-up really helps in higher levels of performance or it is only psychological factor. Number of research studies indicates the usefulness of passive warm-up like sauna bath, steam bath and the like before the start of an activity. A warm up is usually performed before participating in technical sports. A warm up generally consist of a gradual increase in intensity in physical activity. For example, before running or playing an intense sport one might slowly jog to warm muscles and increase heart rate. It is important that warm ups should be specific to the exercise that will follow, which means that exercises should prepare he muscles to be used and to activate the energy systems that are required for that particular activity.

Objective of the Study: The study stated as "Comparative study of Active, Passive and No warm-up on selected physical fitness Performance of Inter-university Players".

Hypothesis: It was hypothesized that there may be differential effect of active, passive, and no warm up on the selected physical fitness performance of inter-university players. It was further hypothesized that active warm up would show significantly higher performance compared to passive and no warm up.

Delimitations

Only 50 male inter-university players' belonged five games namely Football, Basketball, Volleyball, Hockey and Handball were selected as subjects for the study.

The age of the subjects was ranging in between 18-25 years.

The selected physical fitness components were taken up for the present study as muscular strength, endurance, agility, speed and flexibility.

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For passive warm-up only ointment (move & fast relief) was used.

Limitations

Interest of the students towards this test was not known. No specific motivation technique was used during the test. The physical fitness level of the subjects was unknown to the scholar.

Significance of the Study: The result of this study may help the coaches or players to know the effect of active as well as passive warming up on physical fitness performance. The finding of the present study would be of special significance to the sports trainer.

Design of the Study

50 male inter-university players were selected from game of football, basketball, volleyball, handball and hockey of Visva-Bharati, Santiniketan. Standing Broad Jump was applied to measure the explosive strength of the legs. The score was recorded in centimeter. Bent knee sit up was used to measure the dynamic (isotonic) endurance of abdominal muscle and the score will be recorded in number. 50 yard Dash test was administrated to measure the speed of the player and the score was recorded in sec. Sit and Reach test was used to measure the flexibility of the back and hamstring muscle. The score was noted in centimeter. SEMO test was applied to measure agility of the subject and the score was recorded in second.

Findings: The findings of each of the selected test performance such as Standing broad jump, Bent knee sit up, Semo test, 50 yard dash and Bent knee sit up are separately presented in table.

Table 1: Significance of Mean Difference in Standing Broad Jump Performance after Active Warm-up, Passive Warm-up and No Warm-up.

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum Of Square	F - Ratio
Between Groups	K - 1 3 - 1 = 2	0.37	0.18	3.7*
With - in Groups	N - K 150 - 3 = 147	7.51	0.05	

*Significant at 0.05 level of confidence Tabulated $F_{0.05(2, 147)} = 3.06$

An examination of Table -1 reveals that the Standing Broad Jump after Active Warm-up, Passive Warm-up and No Warm-up performance differs significantly as the obtained F-value of 3.7 is greater than the required F- value of 3.06 at 0.05 level of confidence.

As the difference was found significant by One Way Analysis of Variance, the LSD POST HOC test was applied to assess the significance of difference between the paired means.

Table 2: Paired Mean Difference for Standing Broad Jump Performance

Mean of			Mean Difference (MD)	Critical Difference (CD)
Active Warm-up	Passive Warm-up	No Warm-up		
2.27	2.22		0.05	0.09
2.27		2.15	0.12*	0.09
	2.22	2.15	0.07	0.09

*Significant at 0.05 level of confidence

It is learnt from Table -2 that there are significant mean difference in between Active warm-up and No Warm-up as the obtained mean difference value 0.12 is greater than the critical difference value of 0.09. It is also observed from Table - 2 that there are no significant mean difference in Active warm-up v/s Passive warm-up and Passive warm-up v/s No Warm-up because the obtained mean difference values are 0.05 and 0.07 respectively are less than the critical difference value of 0.09.

The different mean values are depicted on Fig.1

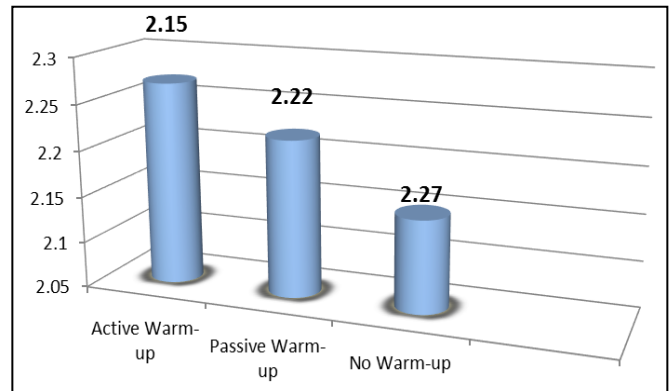


Fig 1: Means of Standing Broad Jump Performance after Active, Passive and No Warm-up.

Table 3: Significance of Mean Difference in Semo-Agility Performance after Active Warm-up, Passive Warm-up and No Warm-up.

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum Of Square	F - Ratio
Between Groups	K - 1 3 - 1 = 2	14.06	7.03	78.1
With - in Groups	N - K 150 - 3 = 147	124.45	.085	

*Significant at 0.05 level of confidence Tabulated $F_{0.05(2, 147)} = 3.06$

An examination of Table -3 reveals that the Semo-Agility for the Active Warm-up, Passive Warm-up and No Warm-up differs significantly, as the obtained F- value of 78.1 is greater than the required F- value of 3.06 at 0.05 level of confidence. As the difference was found significant by One Way Analysis of Variance, the LSD POST HOC test was applied to assess the significance of difference between the paired means.

Table 4: Paired Mean Difference for Semo-Agility Test Performance

Mean of			Mean Difference (MD)	Critical Difference (CD)
Active Warm-up	Passive Warm-up	No Warm-up		
12.66	12.96		0.30*	0.11
12.66		13.40	0.74*	0.11
	12.96	13.40	0.44*	0.11

*Significant at 0.05 level of confidence

It is learnt from Table -4 that there are significant mean difference's between Active warm-up and Passive warm-up, Active warm-up and No Warm-up and Passive warm-up and No warm-up as the obtained mean difference values 12.66, 12.96 and 13.40 respectively are greater than the critical difference value of 0.09.

The different mean values are depicted on Fig.2

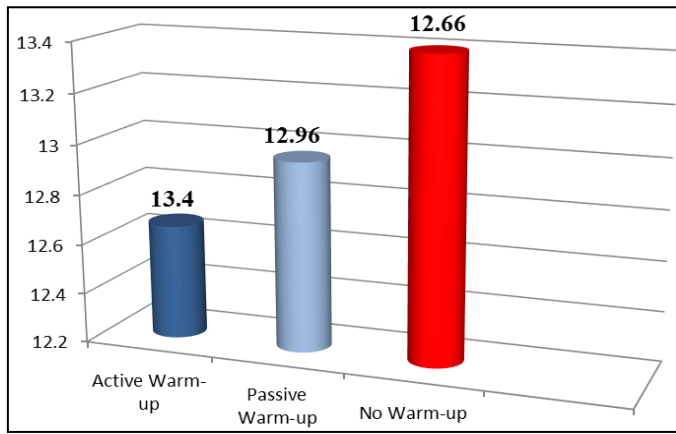


Fig 2: Means of Performance after Semo-agility test performance Active, Passive and No Warm-up

Table 5: Significance of Mean Difference in Sit and Reach Test Performance After Active Warm-up, Passive Warm-up and No Warm-up.

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum of Square	F - Ratio
Between Groups	K - 1 3 - 1 = 2	524.57	262.28	13.0
With - in Groups	N - K 150 - 3 = 147	2964.26	20.16	

*Significant at 0.05 level of confidence Tabulated $F_{0.05}(2, 147) = 3.06$

An examination of Table - 5 reveals that the Sit and Reach test performance's after Active Warm-up, Passive Warm-up and No Warm-up differs significantly, as the obtained F-value of 13.0 is greater than the required F- value of 3.06 at 0.05 level of confidence.

Since the difference was found to be significant by One Way Analysis of Variance, the LSD POST HOC test was applied to assess the significance of difference between the paired means.

Table 6: Paired Mean Difference for Sit and Reach Test Performance

Mean of			Mean Difference (MD)	Critical Difference (CD)
Active Warm-up	Passive Warm-up	No Warm-up		
28.48	26.00		2.48*	1.77
28.48		23.9	4.58*	1.77
	26.00	23.9	2.1*	1.77

*Significant at 0.05 level of confidence

Table - 6 shows that the mean difference values of Active Warm-up and Passive Warm-up (MD = 2.48), Active Warm-up and No Warm-up (MD = 4.58) and Passive Warm-up and No Warm-up (MD = 2.1) differs significantly as the obtained mean different values are higher the that of critical difference value of 1.77.

The different mean values are depicted on Fig.3

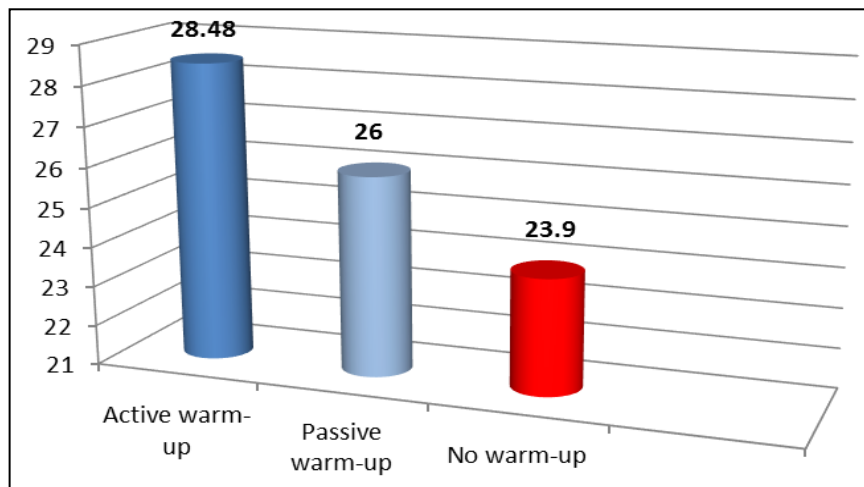


Fig 3: Means of Performance after sit and reach test performance Active, Passive and No Warm-up.

Table 7: Significance of Mean Difference in 50 yard Dash Performance After Active Warm-up, Passive Warm-up and No Warm-up.

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum Of Square	F - Ratio
Between Groups	K - 1 3 - 1 = 2	5.03	2.51	25.15
With - in Groups	N - K 150 - 3 = 147	15.39	0.10	

*Significant at 0.05 level of confidence Tabulated $F_{0.05}(2, 147) = 3.06$

Table 8: Paired Mean Difference for 50 Yard Dash

Mean of Active Warm-up	Mean of Passive Warm-up	Mean of No Warm-up	Mean Difference (CD)	Critical Difference (CD)
6.44	6.57		0.13*	0.125
6.44		6.88	0.44*	0.125
	6.57	6.88	0.31*	0.125

*Significant at 0.05 level of confidence

It is learnt from Table - 8 that there are significant mean difference in between Active warm-up v/s Passive warm-up, Active warm-up v/s No Warm-up and Passive warm-up v/s No warm-up as the obtained mean difference value 0.13, 0.44 and 0.31 respectively is greater than the critical difference value of 0.125.

An examination of Table - 7 reveals that the Sit and Reach after Active Warm-up, Passive Warm-up and No Warm-up differs significantly, as the obtained F- value of 13.0 is greater than the required F- value of 3.06 at 0.05 level of confidence. As the difference was found significant by One Way Analysis of Variance, the LSD POST HOC test was applied to assess the significance of difference between the paired means.

The different mean values are depicted on Fig.4

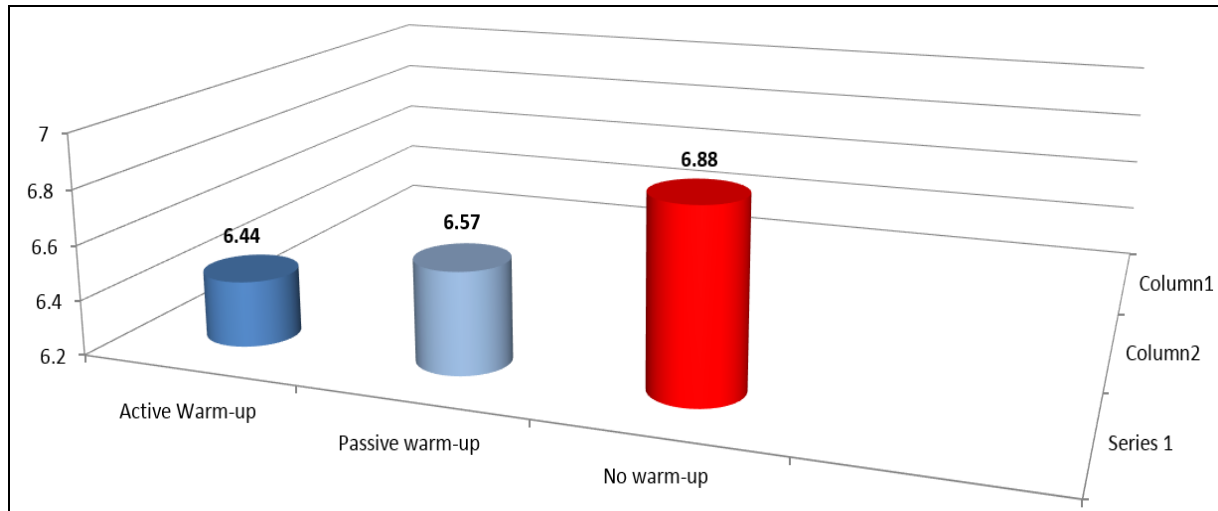


Fig 4: Means of Performance after 50 yard dash performance Active, Passive and No Warm-up

Table 8: Significance of Mean Difference in Sit-Ups Performance After Active Warm-up, Passive Warm-up and No Warm-up.

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum Of Square	F - Ratio
Between Groups	K - 1 3 - 1 = 2	145.69	72.84	0.78 [@]
With - in Groups	N - K 150-3=147	13672.58	93.01	

@ Not Significant at 0.05 level of confidence Tabulated $F_{0.05}(2, 147) = 3.06$

An examination of Table – 8 reveals that the there is No Significant mean difference in Sit-ups after Active Warm-up, Passive warm-up and No warm-up as the obtained F – value of 0.78 is less than the required F value of 3.06 at .05 level of confidence.

Discussion of Findings

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 contraction, increase muscle coordination and helps to prevent injuries. The finding’s of present study revealed that in case of Standing Broad Jump, Sit and Reach, Semo-Agility and 50 yard dash, performance of the players have shown better performance after Active warm-up followed by the Passive warm-up where as least performance was shown by the subjects after no warm-up it may be because as a result in Active warm-up and Passive Warm-up the local temperature of the muscle increases which in turn increases the muscle reaction time, muscle speed and muscle excitability and also decreases the duration of action patented in the muscle and also supplies oxygenated blood to muscle fibers by which they active the muscle fibers 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 ligaments surroundings the joint flexibility. Hence, the results have shown in the improvement of flexibility due to warm-up. The findings of study also reveals that in case of Sit-ups performance of the players did

not show any significant difference after Active warm-up, Passive warm-up and No warm-up. It may be attributed to the fact that the intensity of warm-up may not be sufficient to improve the Sit-ups performance. Hence such result occurred. The reasons may be attributed to the fact that active warming-up increase cardiac output and thus, blood flow to the areas of the body involved in the activity. Similarly warming-up praises the body and muscle temperature facilitating enzyme activity which in turn increases the metabolism of skeletal muscle. Raised temperature also promotes increases in the amount of blood and oxygen reaching the skeletal muscles as well as an improvement takes place in the contraction and reflex times of the skeletal muscles. Therefore, a significant improvement in the physical fitness performance like speed, agility, flexibility and explosive strength were occurred.

Conclusions

- In the explosive strength the subjects have shown better performance after Active and Passive Warm-up, and least performance was shown by the subjects when they performed after No warm-up.
- Similarly in case of flexibility test the subjects have shown their better performance after Active and Passive Warm-up and shown least performance without warm-up.
- In Agility also subjects have shown better performance after Active and Passive warm-up and shown least performance after No warm-up.
- In case of speed the subjects have shown better performance after Active warm-up followed by Passive warm-up, and shown least performance after No warm-up.
- In case of Sit-Ups the subjects have not shown mean significant difference after Active warm-up, Passive warm-up and No warm-up.

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