



Effects of Calisthenic Exercises on Physical Fitness Component of Speed among Players of Racket Game

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Abstract: The purpose of conducting this study is to investigate the effect of calisthenics exercises on the physical fitness component of speed among various racket game players. For this study, randomly 30 male players were selected as participants from Lakshmibai National Institute of Physical Education, North East Regional Centre, Guwahati, Assam, with their age ranging between 18 to 22 years from the racket sports specialization groups of badminton, tennis, table tennis. The total number of subjects were further divided into two groups with 15 subjects in each group i.e., experimental control group. The experimental group was given calisthenic training program for six weeks whereas the control group not given any calisthenic training. Pre-test was conducted for all 30 subjects selected prior to the implementation of the training, then the calisthenic exercises training was imparted for 6 weeks for thrice a week with a session duration of 45 minutes. The training period was concluded by conducting Posttest for both the groups, i.e., experimental group (N=15) and control group (N=15). The data collected were put to statistical analysis, two-way ANOVA was employed as a measure for present data and tested at 0.05 level of significance along with descriptive statistics of Mean and Standard Deviation. The results revealed that in the variable of speed there was significant differences seen in the test scores, whereas, no significant difference was seen between the experimental and control group.

Keywords: calisthenic exercises, physical fitness, speed, racket game players, badminton, tennis, table tennis, experimental group, control group, ANOVA

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INTRODUCTION

Racket sports or any modified variations of racket sports are considered as ideal form of exercises for grown-up adults of various age groups. Involving oneself into playing racket sports assists in providing extraordinary level of cardiovascular fitness as well as providing strength to the upper and lower body parts from time to time. Individuals can expose themselves to playing and training for racket sports at any age, it does not require too many equipment and can be modified to fit any level of fitness (Solana, 2017).

Racket games exhibit high level of technical and mental skills, physical fitness, power and accuracy. The racket games are exciting in nature thus hugely popular in form of badminton, table tennis, tennis, squash rackets, etc. Racket games require an innumerable of skills, majorly accuracy, footwork, agility, mental attitude, power and mental toughness.

Since racket sports are physically demanding at times especially when the players are involved at an advanced or elite level of playing, the most neglected side of the racket sports for that matter any sports are the mental side of the game. To maintain proper harmony between the physical and the mental components proper exposure of training is required. The players often seem to lose the match even if being physically fit because of the weaker mental attitude and toughness. Racket games players should have the ability to stay calm, composed, focused and mentally tough to sustain any challenging situation. Imparting physical training should lead to performance enhancement and not to overtraining. Various kinds of physical training as per the level of players should be selected by the coaches and trainers so that players can remain physically as well as mentally fit (Hamilton, 2010).

Keeping this view in mind, the present experiment was designed to explore the effects of calisthenic exercises on speed among the major racket games players.

METHODOLOGY

Selection of Subjects

For this study, 30 male players were selected as subjects from Lakshmibai National Institute of Physical Education, North East Regional Centre, Guwahati, Assam, with their age ranging between 18 to 22 years. The total number of subjects were further divided into two groups with 15 subjects in each group i.e., experimental & control group. The selection of subjects was done randomly from three racket sports specialization groups i.e., badminton, tennis, table tennis. The experimental group was exposed to calisthenic training program for six weeks whereas the control group continued with their daily routine activities but was not given any calisthenic training.

Selection of Variables

Based on the literature reviewed and understanding, and also keeping in mind the purpose of the study fitness component of speed was selected as the variable for this study.

Criterion Measures

The description of the test items for testing and collecting the pre and post data on the selected physical fitness variables of Speed is as follows:

- **Speed – 50 Meter Dash**

As a part of International Physical Fitness Test, 50 Meter Dash aims to test the speed and acceleration by making an individual run single maximum sprint of 50 meters in a time recorded to conclude the sprint. Prior to run the actual sprint, the participants should do a proper warm up. The 50Meter dash is to be started being in a stationary position keeping the dominating foot in front of the other and should be placed behind the starting line, it is to be kept in mind that the hands should not come in contact of the ground in the stationary position.

On the starter's instruction of 'set' the participants should be ready and remain motionless, followed by another instruction of the starter as 'go'. The instruction of 'go' indicates the beginning of the sprint to be run in maximum speed by the participant towards the finish line. The sprint concludes once the participants

cross the finish line. The best time is recorded as score of the test out of two trials given to each participant.

Administration of Test and Collection of Data

Prior to the administration of the test, the researcher contacted the subjects of three racket sports specialization groups, viz., badminton, table tennis and tennis. The purpose of the research and the tests were made clear to the subjects so that they were aware of what they are expected to do. After that the subjects were randomly assigned to two groups i.e., experimental and control (N=15 each). A pretest was conducted on the subjects of both the designated groups for collecting data and testing the variable of speed. After the pretest the groups were separately exposed to assigned training and no training conditions for the period of 6 weeks calisthenic exercises training for thrice a week with a session duration of 45 minutes. Posttest was conducted using same parameters as was done in the pretest for both the groups, i.e., experimental group (N=15) and control group (N=15).

Statistical Procedures

The data thus collected were put to statistical computerization for analysis, two-way ANOVA was employed as a measure for present data and tested at 0.05 level of significance along with descriptive statistics of Mean and Standard Deviation.

RESULTS

To start with, the result of the total sample (N = 30) in experimental (N=15) and control group (N=15) investigated on the basis of pre-test and post-test scores, their descriptive statistics and the univariate analysis on their physical fitness variable of speed has been presented in the following tables.

Table 1: Descriptive Statistics of Speed in Pretest and Posttest of the Experimental and Control Group

Test	Treatment groups	Mean	Std. Deviation	N
pretest	experimental	7.29	0.34	15
	control	7.28	0.52	15
	Total	7.28	0.43	30
posttest	experimental	6.97	0.38	15
	control	7.09	0.57	15

	Total	7.03	0.48	30
Total	experimental	7.13	0.39	30
	control	7.18	0.54	30
	Total	7.16	0.47	60

Descriptive statistics of speed on table 1 shows that the total mean score of speed is 7.16 ± 0.47 . The total mean and SD of the pretest is 7.28 ± 0.43 . In pre test of experimental and control group, the mean and SD of speed is 7.29 ± 0.34 & 7.28 ± 0.52 respectively.

The total mean score and SD of speed in post test is 7.03 ± 0.48 where, the mean and SD of post test of experimental group is 6.97 ± 0.38 and of control group is 7.09 ± 0.57 . The mean scores of speed for both the groups and tests are illustrated graphically in figure 1.

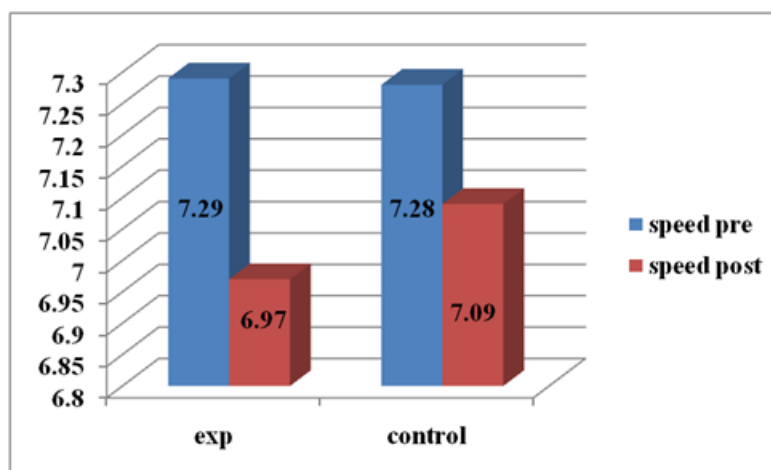


Figure 1: Means Scores of Tests and Treatments in the Variable of Speed

Table 2: Univariate Analysis of Pretest and Posttest in the Variable of Speed

	Sum of Squares	Df	Mean Square	F	Sig.
Contrast	.988	1	.988	4.52*	.038
Error	12.237	56	.219		
*Significant at .05 level				F.05 (1, 56) = 4.01	

The 'f' value tested for significance for the present findings was at 0.05 level with 1,56 df. The required

value is 4.01.

Table 2, shows that the obtained 'f' value of pretest and posttest scores in speed is 4.52 which is greater than the tabulated value. This indicates there was significant difference between the pre and post tests in the factor of speed.

As there was significant difference, pair-wise comparison was done that has been presented in table 3.

Table 3: Pairwise Comparison of Speed between the Pre and Post test of the Groups

(I) Test	(J) Test	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
pretest	posttest	.257	.121	.038	.015	.498
Based on estimated marginal means						
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).						

Pairwise comparison of speed in the pre and post test are shown in table 3, indicates statistically significant difference between the pre & post test speed (MD = 0.257; p = .038).

Table 4: Univariate Analysis of Experimental and Control Groups in the Variable of Speed

	Sum of Squares	df	Mean Square	F	Sig.
Contrast	.046	1	.046	.21	.648
Error	12.237	56	.219		

*Significant at .05 level

F.05 (1, 56) = 4.01

The 'f' value tested for significance for the present findings was at 0.05 level with 1,56 df. The required value is 4.01. Table 4, shows that the obtained 'f' value of experimental and control group in speed is 0.21 which is less than the tabulated value. This indicates that there was no significant difference between the groups in the factor of speed. As there was no significant differences seen further calculations are not done for the groups. The interactions between the dependent variables are shown in table 5.

Table 5, shows the interaction of test and treatment groups where in pretest the experimental group in speed

(Mean = 7.29) and control group (Mean = 7.28) reveals that the mean score of experimental group is higher than the control group. Whereas, in post test the mean score of experimental group (Mean = 6.97) and the control group (Mean = 7.09) is lower than the control group. In overall context of interaction among the tests and treatment groups in the dependent variable of speed it can be said that there was improvement in pre & post test among both the groups.

Table 5: Interaction of Test and Treatment Groups in the Variable of Speed

Test	Treatment groups	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
pretest	experimental	7.29	.121	7.052	7.535
	control	7.28	.121	7.044	7.528
posttest	experimental	6.97	.121	6.732	7.216
	control	7.09	.121	6.850	7.334

DISCUSSION

It was hypothesized that there would be significant effect of six weeks calisthenic exercises on the physical fitness component of speed of the racket game players. From the analysis, it can be said that the hypothesis of the study stands partially accepted, as because in the variable of speed there was significant differences seen in the test scores, whereas, no significant differences was seen between the experimental and control group.

The purpose of this research was to find out the effects of calisthenic exercises on the selected physical fitness components among players of racket game. The variable tested in this study showed scientific result by getting enhanced after the subjects were exposed to six week calisthenic exercises training when compared between tests and treatments.

The results of this study are in consonance to the research of Barik and Banerjee (1990) studied the effect of six week conditioning programme on some performance variables among tribal students by random sampling where 17 tribal school boys of 14-16 years were selected. All the subjects had undergone a six-week conditioning programme. The standard fitness test comprised of 50 meters dash for speed, vertical

jump for strength, squat thrust for agility and Cooper's 12-minute run and walk for endurance, T' ratio was computed and analysis of data revealed that speed, endurance and strength increased significantly after training.

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