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The Effect Of Callisthenic And Dumbbell Exercise On Muscular Strength Endurance And Flexibility Of Rural School Boys

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Abstract:

The purpose of the present research was to determine and compare the effects of two tamilnadu physical education sports programme of calisthenics and Dumbbell exercise on muscular strength and endurance and flexibility of 14-17 Years male rural school boys. The research was quasi-experimental and the population consisted of all the 14-17 Years male rural school boys. Forty five rural school boys invited to a local team's camp in erode district rural area were selected as sample. The subjects were randomly divided into three groups—two experimental groups and a control group Experimental I group: 15.50 ± 1.50 years,45 ± 5.40 kg, 160.50 ±5.30 cm; Experimental II group: 15.50 ± 1.50 years,45 ± 5.40 kg, 160.50 ±5.30 cm ; and the control group: 15.50 ± 1.50 years,45 ± 5.40 kg, 160.50 ±5.30 cm. The independent variables of the research were two types of trainings were callisthenic and dumbbell exercise group and the dependent variables were muscular strength endurance was measured by standing board jump , flexibility was measured by sit and reach test,. First, the subjects took the pretest, and then the two experimental groups performed the selected exercises while the control group did not practiced any specific training. Finally, all the subjects took the posttest. The obtained data were analyzed using descriptive and inferential (ANOVA) statistics. The results showed that except for calisthenics and dumbbell both training types led to change in muscular strength and endurance ,flexibility. The results of Thus, considering the results of the research, tumbles exercise is probably effective for improving muscular strength endurance and flexibility in 14-17 Years of Rural school boys.

Keywords*: callisthenic exercise, dumbbell exercise, muscular strength and endurance, flexibility.*

1.Introduction

Performance in sports and games depends on both physical and mental abilities. Body and mind have an equal contribution in human success. Aristotle and John Locke the world‘s greatest thinkers have said that “the body is the temple of the soul, to reach harmony of body, mind and spirit, the body must be physically fit” and also “ a sound mind in a sound body” he who has these two has little more to wish. The physical work done by an individual depends upon the duration, nature and the purpose of activity. If the activity is aerobic, there will be constant supply of oxygen and the energy for the working muscles will be supplied by the lactic acid system, the ‘ Kreb’s cycle’ and ultimately fat will also be used as energy. Physical education and sport, as one of the branches of human knowledge, has evolved tremendously and each day we witness dramatic changes in theories and advent of new methods, and the outcome of these advances is achieving unbelievable records and performances . Conditioning and preparing a team to enter the playing field requires different factors. Technique, tactic, metal readiness, and physical fitness are important elements and negligence toward any of these can burden sport teams with considerable costs. Although technical and tactical aspects can be trained using the athletic and coaching experiences of trainers, successful physical fitness training certainly requires the scientific background of the trainer. The main focus of the training process is improving physical fitness. The level of adaptation depends on the type of the training program.

2.Materials And Methods

The present research is quasi-experimental carried out as pretest-posttest with two experimental groups and a control group. The population of the research consists of 14-17 years old male high school boys who are the local rural people in erode district. This population is selected by random method is used to determine their health, medical, nutritional, and medicinal condition and record. 45 (rural boys) population voluntarily participated in the research and were randomly divided into three equal groups of 15 subjects in each. Two experimental groups and a control group. The sampling method was convenience sampling. The Group II performed selected dumbbell exercise with an intensity of 50-60% of one repetition maximum or 1RM and with 8-12 repetitions and the Group I performed the calisthenics exercises with an 8-12 repetitions. Independent variables: group I underwent calisthenics exercise, Group II underwent dumbbell exercise. Control group did not practice any specific training.

Dependent variables: muscular strength endurance is measured by modified sit ups test and flexibility is measured by sit and reach test. After collecting the pre and post data related to subjects the data were analyzed using SPSS 10. Second, data analysis and hypothesis testing is carried out using inferential statistics, to examine the normal distribution of the subjects of the three groups, correlated t-test is used to compare the records in the pre test and post test, and one-way analysis of variance and Scheffe's test were applied for hypothesis testing and examining the difference in the means of the three groups.

3.Results Of The Study

	Experimental group 1	**Experimental group2**	**Control group**
Pre test mean	22.20	23.03	22.47
Post test mean	23.83	26.97	23

Table 1: Pre and post test mean value of experimental groups and control group on Flexibility

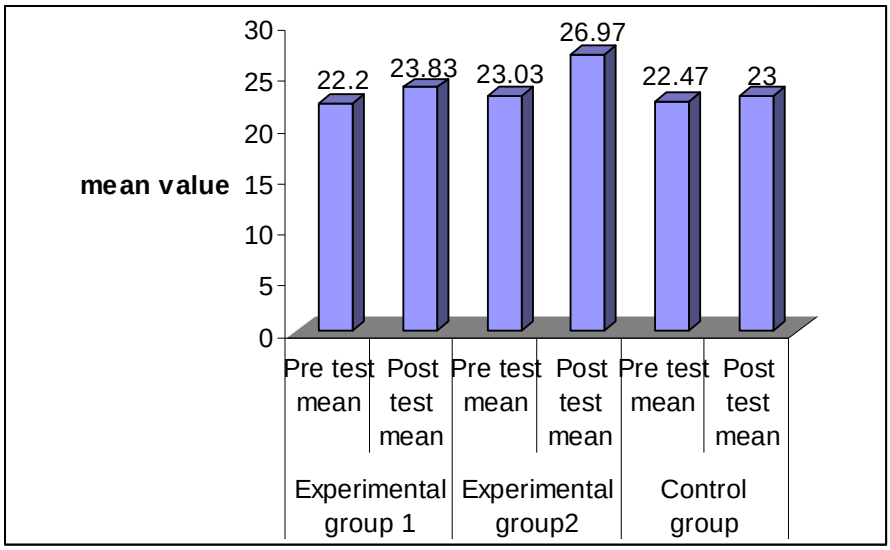

Figure 1

	Experimental group 1	**Experimental group2**	**Control group**
Pre test mean	24.00	24.13	23.87
Post test mean	30.40	34.60	24.33

Table 2: Pre and post test mean value of experimental groups and control group on muscular strength endurance

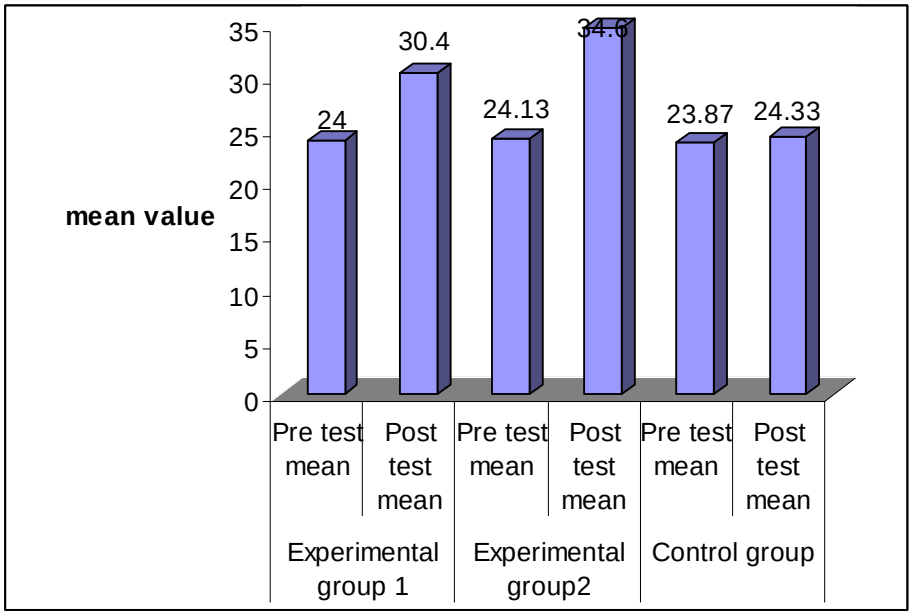

Figure 2

	Experimental Group-I	**Experimental Group –II**	**Control Group**	**Source of Variance**	**df**	**Sum of squares**	**Mean Square**	**F-Ratio**
Pre Test Mean	22.20	23.03	22.47	B	2	5.43	2.717	. 107
				W	42	1066.37	25.390	
Post Test Mean	23.83	26.97	23.00	B	2	131.233	65.617	2.485
				W	42	1109.067	26.406	
Adjusted post Test Mean	24.18	26.53	23.09	B	2	91.803	45.902	12.744*
				W	41	147.681	3.602	

Table 3: Analysis of covariance for the data on flexibility between pre test and post test of calisthenics exercise and dumbbell and control group

** Significant at 0.05 level*

Table 3 shows that the pre test means on flexibility of calisthenics exercise group, Dumbbell exercise group and control group were 22.20, 23.03 and 22.47 respectively and the obtained F ratio of .107 was lesser than the required table value of 3.22 indicates that there was no significant at 0.05 level of confidence for the degrees of freedom 2 and 42. The post test means on flexibility of calisthenics exercise group, Dumbbell exercise group and control group were 23.83, 26.97 and 23 respectively and the obtained F ratio of 2.485 was lower than the required table value of 3.22 which indicates that there was no significant at 0.05 level of confidence for the degree of freedom 2 and 42. The adjusted post test means on flexibility of calisthenics exercise group, Dumbbell exercise group and control group were 24.18, 26.53 and 23.09 respectively and the obtained F ratio of 12.744 was greater than the F ratio of 3.22 which indicates that was significant at 0.05 level of confidence for the degree of freedom 2 and 41. The result of the study indicates that there is statistically significant difference in flexibility after training period. Further, to determine which of the paired means had significant difference scheffe's post hoe test was applied. The results of the follow up test is presented in Table 3.

Experimental Group-1	**Experimental Group-2**	**Control Group**	**Mean Difference**	**Confidential Interval**
24.18	26.52		2.34	1.749*
24.18		23.09	1.09	1.749
	26.52	23.09	3.43	1.749*

Table 4: Scheffe's test for the difference s between the adjusted post test paired means of flexibility

** Significant at 0.05 level*

Table 4 indicates that the mean difference in flexibility between calisthenics exercise group, Dumbbell exercise group is 2.34 it is higher than the confidence interval of 1.74 required for significance at 0.05 level. This indicates that there is significant increase in flexibility for the calisthenics exercise group as the results of 8 weeks of exercise. The mean difference in flexibility between calisthenics exercise group and control group is 1.09 and it is lower than the confidence interval of 1.74 required for significance at .05 level. This clearly indicates that there is no significance increase in flexibility for

calisthenics exercise group as a result of training for 8 weeks . The mean difference in flexibility between dumbbell exercise and control group is 3.43 which is greater than the confidence interval required for significance at .05 level. This clearly indicates that there is significant variation in flexibility.

It may be concluded from the results of the study that 8 weeks of training improved flexibility significantly for dumbbell exercise group than that of other groups.

3.Analysis Of Mascular Strength And Endurance

The data collected before and after the experimental period on muscular strength and endurance of calisthenics exercise group, Dumbbell exercise group and control group were analyzed statistically and presented in Table 5.

	Experimental Group -I	**Experimental Group-II**	**Control Group**	**Source of Variance**	**df**	**Sum of squares**	**Mean Square**	**F-Ratio**
Pre Test Mean	24.00	24.13	23.87	B	2	.533	.267	.005
				W	42	2291.47	54.56	
Post Test Mean	30.40	34.60	24.33	B	2	799.24	399.62	7.277*
				W	42	2306.53	54.917	
Adjusted post Test Mean	30.40	34.47	24.46	B	2	759.654	379.827	110.228*
				W	41	141.279	3.446	

Table 5: Analysis of covariance for the data on muscular strength and endurance between pre test and post test of calisthenics exercise and dumbbell and control group

** Significant at 0.05 level*

Table 5 shows that the pre test means on muscular strength and endurance of calisthenics exercise group, Dumbbell exercise group and control group were 24.00,24. 13 and 23.87respectively and the obtained F ratio of .005 was lesser than the required table value of 3.22 indicates that there was no significant at 0.05 level of confidence for the degrees of freedom2 and 42. The post test means on muscular strength and endurance of

calisthenics exercise group, Dumbbell exercise group and control group were 30.40,34.60 and 24.33 respectively and the obtained F ratio of 7.277 was higher than the required table value of 3.22 which indicates that there was significant at 0.05 level of confidence for the degree of freedom 2 and 42. The adjusted post test means on muscular strength and endurance of calisthenics exercise group, Dumbbell exercise group and control group were 30.40, 34.47 and 24.46 respectively and the obtained F ratio of 110.228 was greater than the F ratio of 3.22 which indicates that was significant at 0.05 level of confidence for the degree of freedom 2 and 41. The result of the study indicates that there is statistically significant difference in muscular strength and endurance after training period. Further, to determine which of the paired means had significant difference scheffe's post hoe test was applied. The results of the follow up test is presented in Table 6.

Experimental Group-I	**Experimental Group - II**	**Control Group**	**Mean Difference**	**Confidential Interval**
30.40	34.47		4.07	1.711*
30.40		24.46	5.94	1.711*
	34.47	24.46	10.01	1.711*

Table 6: Scheffe's test for the difference s between the adjusted post test paired means of muscular strength and endurance
** Significant at 0.05 level*

Table 6 indicates that the mean difference in muscular strength and endurance calisthenics exercise group, Dumbbell exercise group is 4.07it is higher than the confidence interval of 1.711 required for significance at 0.05 level. This indicates that there is significant increase in muscular strength and endurance for the dumbbell exercise group as the results of 8 weeks of exercise . The mean difference in muscular strength and endurance between calisthenics exercise group and control group is 5.94 and it is higher than the confidence interval of 1.71 required for significance at .05 level. This clearly indicates that there is significance increase in muscular strength and endurance for calisthenics exercise group as a result of training for 8 weeks . The mean difference in muscular strength and endurance between dumbbell exercise group and

control group is 10.07 which is greater than the confidence interval required for significance at .05 level. This clearly indicates that there is significant variation in muscular strength and endurance. It may be concluded from the results of the study 8 weeks of training improved the muscular strength and endurance significantly both for calisthenics exercise group and dumbbell exercise group.

Bar diagram showing the adjusted post mean value of experimental and control group on Muscular strength and endurance

4.Conclusion

It is recommended that coaches and physical education teacher can implement this training programme for developing the flexibility and muscular strength and endurance. due to this training method the calisthenics exercise and dumbbell exercise can improve the flexibility and muscular strength and endurance.

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