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Effect of plyometric training on speed, speed endurance and agility of sedentary college men

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Abstract
Sports have a very important role in modern society. It is important for an individual, a group, a nation and indeed the world. Sports performance is the result and expression of the total personality of a sports man. The purpose of the study was to determine the effect of plyometric training on speed, speed endurance and agility of sedentary college men, the subjects were restricted to a minimum number of 30 subjects consisting of 15 Plyometric group and 15control groups. They were randomly selected from Sankar Polytechnic College, Tirunelveli. The subject aged from 18 to 22 years as per the school records. The study was formulated as a random group design. Thirty Sedentary college men students were selected for this study were randomly divided in to two groups i.e Group 'A' Plyometric group Group 'B' control group. The score were compared by using (ANOVA) The level of significant chosen was 0.01level and 0.05 level.

Keywords: Plyometric training, speed endurance, agility, sedentary college men

Introduction
Sports have a very important role in modern society. It is important for an individual, a group, a nation and indeed the world. Sports performance is the result and expression of the total personality of a sports man. The development of a sports man enabling him to achieve high level of performance is usually concerned in four areas namely physical power, social adjustment, psychological development and physiological efficiency. Different activities make different demands on the organism with respect to circulatory, respiratory, metabolic and neurological and temperature regulating functions.

The concept of sports has been changed now a day. Due to the innovations brought by different sports sciences in the field of sports, now there are a number of scientific methods to improve each and every quality, which determines the performance in each games and sports. The same time development is according to the rate of demand of each games and sports. This is the main reason why the performance standards are going higher day by day.

Sports is an institutionalized competitive activity that involves physical exertion or the use of relative complex physical skills by individuals whose participation is motivated by a combination of the intrinsic satisfaction associated with the activity itself and the external rewards earned through participation.

Methodology
The purpose of the study was to find out the effect of plyometric training on speed, speed endurance and agility of sedentary college men. Since the test involved physical fitness test, the subjects were restricted to a minimum number of 30 subjects consisting of 15 Plyometric group and 15control groups. They were randomly selected from The Sankar Polytechnic College, Tirunelveli. The subject aged from 18 to 22 years as per the school records. The subjects assured their voluntary participation during the training period.

The study was formulated as a random group design. Thirty Sedentary college men students were selected for this study were randomly divided in to two groups i.e Group 'A' Plyometric group (N=10) Group 'B' control group (N=10). The Plyometric group underwent the training period of 12 weeks. The control group did not involve in any strenuous physical activity during the course of study. However plyometric group and control group were permitted to

attend their routine curriculum. The subjects were tested at the beginning (pre test) and end of the experiment (post test) in the period of twelve weeks. The programme was scheduled for in evening sessions between 4:30p.m and 5:30 p.m. The training programme consists of Plyometric training.

Analysis of Data and Results of the Study

Table 1: One way analysis of variance (ANOVA) for Pre- Test Scores of 50mts Dash

Source of variance	Sum of squares	DF	Mean square	'F'
Between	.002	1	.002	.015
Within	3.311	28	.118	
Total	3.312	29		

Table Value for DF (1, 28) at 0.05 level = 4.20, DF (1, 28) at 0.01 level = 7.64

Table I, which portrays the result of one way ANOVA for difference in mean 50 meter dash between experimental group and control group before (pre) test, shows that obtained F values are insignificant (F=.015)for pre test. The lack of significant has clearly revealed that there is no difference in group mean values. The calculated F- value is lesser than the table value of 4.20 at 0.05 level and hence it is not significant. Therefore, there is no significant difference among pre-test scores of 50mts dash scores of control and experimental group.

Table 2: One way analysis of variance (ANOVA) for post- Test Scores of 50mts Dash

Source of variance	Sum of squares	DF	Mean square	'F'
Between	1.156	1	1.156	13.678
Within	2.367	28	.085	
Total	3.524	29		

Table Value for DF (1, 28) at 0.05 level = 4.20, DF (1, 28) at 0.01 level = 7.64

Table II shows that the difference in post-test mean between two groups differ significantly at 0.01 level as the obtained ANOVA F value 13.678 is much higher than 7.64 the table value for 1, 28 degrees of freedom at above specified significant level this in turn indicates that there is variance between pre and post test conditions of the subjects. Scheffe's post test is applied for between group comparisons. The result of the post-hoc test is portrayed in Table IV.

Table 3: Scheffe's Test: Test of significance of the Difference between Pairs of Means

Mean values		Mean difference	LS
Control group	Experimental group	0.4	0.01
6.88	6.48		

Scheffe's Confidence Interval at 0.05 level = 0.217
0.01 level = 0.293

It can be observed from table III that the scheffe's confidence interval (CI) values at 0.05 level and 0.01 level for post-test scores are 0.217and 0.293 respectively. The mean difference between Control group and Experimental group (0.4) is above the obtained CI values, 0.217and 0.293 at 0.01 percent significant level respectively. On the whole from overall result for 50 meter dash, it is inferred that plyometreic training has significant effect on increasing the 50meter dash of Experimental group.

Table 4: One way analysis of variance (ANOVA) for pre- Test Scores of 100mts Dash

Source of variance	Sum of squares	DF	Mean square	'F'
Between	2.291	1	2.291	2.260
Within	28.383	28	1.014	
Total	30.674	29		

Table Value for DF (1, 28) at 0.05 level = 4.20, DF (1, 28) at 0.01 level = 7.64

Table IV, which portrays the result of one way ANOVA for difference in mean 100 meter dash between experimental group and control group before (pre) test, shows that obtained F values are insignificant (F=2.260) for pre test. The lack of significant has clearly revealed that there is no difference in group mean values. The calculated F- value is lesser than table value of 4.20 at 0.05 level and hence it is not significant. Therefore, there is no significant difference between pre-test scores of 100mts dash scores of control and experimental group.

Table 5: One way analysis of variance (ANOVA) for post- Test Scores of 100mts Dash

Source of variance	Sum of squares	DF	Mean square	'F'
Between	.510	1	.510	1.180
Within	12.092	28	.432	
Total	12.602	29		

Table Value for DF (1, 28) at 0.05 level = 4.20, DF (1, 28) at 0.01 level = 7.64

Perusal of the table V shows that the difference in post-test mean between two groups differ insignificantly at 0.05 level as the obtained (ANOVA) F value 1.180 is lower than 4.20 the table value for 1, 28 degrees of freedom at above specified significant level this in turn indicates that there is no variance between pre and post test conditions of the subjects. The calculated F- value is lesser than the table value of 4.20 at 0.05 level and hence it is not significant. Therefore, there is no significant difference among post-test scores of 100mts dash scores of control and experimental group.

Table 6: One Way Analysis Of Variance (Anova) For Pre- Test Scores of Shuttle Run

Source of variance	Sum of squares	DF	Mean square	'F'
Between	.137	1	.137	.155
Within	24.846	28	.887	
Total	24.983	29		

Table Value for DF (1, 28) at 0.05 level = 4.20, DF (1, 28) at 0.01 level = 7.64

The difference in pre test mean scores across groups is tested with ANOVA and the results are portrayed in table VI. It is apparent from the examination of result that there is no significant difference in pre test group means of shuttle run. This is because F value obtained from the analysis is insignificant for pre test scores (.155). The lack of significant has clearly revealed that there is no difference in group mean values. The calculated F- value is lesser than table the value of 4.20 at 0.05 level and hence it is not significant. Therefore, there is no significant difference among pre-test scores of Shuttle run scores of control and experimental group.

Table 7: One way analysis of variance (ANOVA) for Post- Test Scores of Shuttle Run

Source of variance	Sum of squares	DF	Mean square	'F'
Between	6.403	1	6.403	7.983
Within	22.459	28	.802	
Total	28.863	29		

Table Value for DF (1, 28) at 0.05 level = 4.20, DF (1, 28) at 0.01 level = 7.64

From the examination of table VII, it is observed that F value from (ANOVA) for post-test scores, 7.983 is above 7.64, the table value for 1, 28 degrees of freedom, revealing that the difference in post-test mean scores (Agility on shuttle run) between two groups dose differ significantly. As the variance F is significant, scheffe's post test is carried to know the significance of the difference in post-scores between two groups.

Table 8: Scheffe's Test: Test of significance of the Difference between Pairs of Means

Mean values		Mean difference	LS
Control group	Experimental group	0.92	0.01
15.05	14.13		

Scheffe's Confidence Interval at 0.05 level = 0.670
0.01 level = 0.904

Table VIII presents the result of scheffe's post hoc test for post test scores of agility on shuttle run of Experimental group. it is apparent from the table that there is remarkable difference between control group and experimental group. However, the mean difference (MD=0.92) is significant at 0.01level of (MD>0.904.CI value at 0.01 level). The above picture clearly envisages that Plyometric training has significant impact has marginal effect on shuttle run of experimental group.

Conclusions

The result of the study seems to be permitting the following conclusions.

1. Participation in 12 weeks plyometric training improves speed, and agility.
2. Participation in 12 weeks plyometric training improves speed endurance but compared to table value it is insignificant.

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