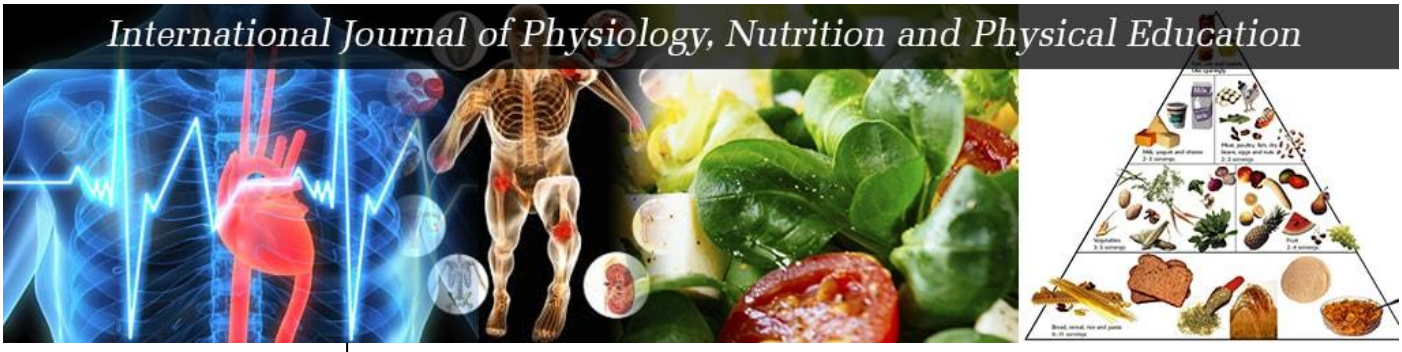

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Effect of squat jump training on leg strength and explosive power among college men

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Abstract
The purpose of the study was to find out the effect of squat jump training on leg strength and explosive power among college men. To achieve the purpose of this study, 20 college men are randomly selected as subjects from the Tamilnadu physical education and Sports University, Chennai, Tamilnadu, India. Their age ranged from 18 to 25 years. The selected participants were randomly divided into two groups such as experimental group underwent squat jump training (n=10) and control group (n=10).Experimental group underwent squat jump training for three alternate days per week and each session lasted for an hour for six week. Control group was not exposed to any specific training but they were participated in regular activities. The data on leg strength and explosive power were collected by administering by wall sit test and standing broad jump. The pre and posttests data were collected on selected criterion variables prior and immediately after the training programme. The pre and post-test scores were statistically examined by the dependent't'-test and Analysis of Co-Variance (ANCOVA) for each and every selected variable separately. It was concluded that the squat jump training group had shown significantly improved in leg strength and explosive power. However the control group had not shown any significant improvement on any of the selected variables such as leg strength and explosive power.

Keywords: Squat jump training and soccer

Introduction
Sports are institutionalized competitive activities that involve vigorous physical exertion or the use of relatively complex physical skills by participants motivated by personal enjoyment and external rewards. Sport is all forms of physical activity which, through casual or organized participation, aim to use, maintain or improve physical fitness and provide entertainment to participants.

The word "training" has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years.

Jump squat is a plyometrics exercise where the squatter engages in a rapid eccentric contraction and jumps forcefully off the floor at the top of the range of motion. This jump squat variation is performed rhythmically with each jump occuring immediately after the next. The performance will be just like the vertical or horizontaljumps. These variationsare most effective for reactive development and to peak the vertical and horizontal jumps. They should quickly descend down into a 1/4 squat position and try to jump as high as and as farther an possible on the ascent-focus on driving the balls of the feet through the floor at toe-off, also these variation the focus is just as much on the negative eccentric contraction as it is on the "jump".

Leg strength is the maximum force that can be generated with the legs (Ted, 1991) [5] and Measuring the distance between a person's standing reach and the height he or she can jump and reach has been proposed as a test of leg explosive power. (Uppal, 2001).

Statement of the Problem
The purpose of the study was to find out the effect of squat jump training on leg strength and explosive power among college men.

Methodology

Selection of Subjects

The purpose of this study was to find out the effect of squat jump training on leg strength and explosive power among college men. To achieve the purpose of the study twenty college men were randomly selected from Tamilnadu physical education and Sports University, Chennai, Tamilnadu and their age ranged from 18 to 25 years. They were divided in to two equal group consists of 10 each and named as experimental group and control group. The investigator did not make any attempt to equate the groups. The control group was not given any special treatment and the experimental group was attented squat jump training for three alternative days per week, for a period of six weeks.

Selection of Variables and Tests

The researcher reviewed the available scientific journals, periodical magazine and research paper, taking into consideration feasibility criteria, availability of the instrument and relevance of the variable of the present study the following variables were selected. The selected dependent variables wereleg strength and explosive power tested by wall sit test and standing broad jump.

Experimental design and Statistical technique

This study was conducted to determine the possibility cause and effects of squat jump training on leg strength and explosive power among college men. This study consisted of two equal groups of ten subjects each. Group-I (n=10) underwent squat jump training and Group II acted as control group. The related group research design was used in this study. The collected data from two groups prior to and after the experimental treatments on selected variables were statistically analyzed by using the statistical technique of dependent‘t’ test and analysis of covariance (ANCOVA). In all the cases 0.05 level of confidence was fixed as a level of confidence to test the hypotheses.

Analysis of the Data

The effects of squat jump training on leg strength and explosive power were analyzed and presented below.

1. Leg strength

The t-test on leg strength of the pre and post test scores of squat jump training group and control group have been analyzed and presented in table I.

Table 1: Computation Of ‘T’-Ratio Between Pre And Post Test Means Of Squat Jump Training Group And Control Group On Leg Strength (Seconds)

Group	Test	Mean	Standard Deviation	t-Ratio
Squat jump Training	Pre-test	44.58	±9.37	8.67*
	Post-test	68.37	±15.24	
Control Group	Pre-test	41.27	±4.58	0.89
	Post-test	40.08	±4.21	

*****Significant at. 05 level. (The table value required for 0.05 level of significance with df 9 is 2.26)

The table I shows that the pre-test mean value of squat jump training group and control group are 44.58 and 41.27 respectively and the posttest means are 68.37 and 40.08 respectively. The obtained dependent t-ratio values between the pre and posttest means of squat jump training group and control group are 8.67 and 0.89 respectively. The table value required for significant difference with Df 9 at 0.05 level is 2.26. Since, the obtained‘t’ ratio value of squat jump training group was greater than the table value, it is understood that squat jump training group had significantly improved the leg strength. However, the control group had not improved significantly. The ‘obtained t’ value is less than the table value, as they were not subjected to any specific training.

Analysis of covariance (ANCOVA) on leg strength of experimental and control groups have been analyzed and presented in table II.

Table 2: Analysis of Covariance (Ancova) On Leg Strength of Squat Jump Training Group and Control Group

Adjusted Post Test Means		Source of variance	Sum of squares	DF	Mean square	F-ratio
Squat jump Training Group	Control Group	Between	127.05	1	127.05	21.57*
65.37	41.12	Within	100.13	17	5.89	

* Significant at 0.05 level. (The table value required for significance at 0.05 level with DF 1 and 17 is 4.45)

Table II shows that the adjusted posttest means values on leg strength. The obtained f- ratio of 21.57 for adjusted posttest mean is greater than the table value 4.45 with Df 1 and 17 required for significance at 0.05 level of confidence. The results of the study indicate that there is a significant mean difference exist between the adjusted posttest means of squat jump training and control groups onleg strength.

The bar diagram shows the mean values of pretest, posttest and adjusted posttest on leg strength of squat jump training group and control group.

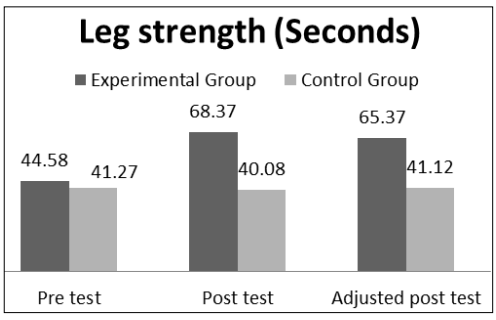

Fig 1: Pre Test, Post Test and adjusted post testmean values of squat jump training experimental and control groups on leg strength.

2. Explosive power

The t-test on explosive power of the pre and post test scores of squat jump training group and control group have been analyzed and presented in table III.

Table 3: Computation Of 'T'-Ratio Between Pre And Post Test Means Of Squat Jump Training Group And Control Group On Explosive Power (Centimeters)

Group	Test	Mean	Standard Deviation	t-Ratio
Squat jump Training	Pre test	157.64	±14.27	11.85*
	Post test	179.38	±13.63	
Control Group	Pre test	151.37	±19.64	1.53
	Post test	150.78	±20.17	

*****Significant at. 05 level. (The table value required for 0.05 level of significance with DF 9 is 2.26)

The table III shows that the pre-test mean value of squat jump training group and control group are 157.64 and 151.37 respectively and the posttest means are 179.38 and 150.78 respectively. The obtained dependent t-ratio values between the pre and posttest means of squat jump training group and control group are 11.85 and 1.53 respectively. The table value required for significant difference with Df 9 at 0.05 level is 2.26. Since, the obtained't' ratio value of squat jump training group was greater than the table value, it is understood that squat jump training group had significantly improved the explosive power. However, the control group had not improved significantly. The 'obtained t' value is less than the table value, as they were not subjected to any specific training.

Analysis of covariance (ANCOVA) on explosive power of experimental and control groups have been analyzed and presented in table IV.

Table 4: Analysis of Covariance (Ancova) On Explosive Power of Squat Jump Training Group and Control Group

Adjusted Post Test Means		Source of variance	Sum of squares	ddf	Mean square	F-ratio
Squat jump Training Group	Control Group	Between	5904.93	1	5904.93	18.34*
178.51	153.78	Within	5473.59	17	321.97	

* Significant at 0.05 level. (The table value required for significance at 0.05 level with Df 1 and 17 is 4.45)

Table IV shows that the adjusted posttest means values on explosive power. The obtained f- ratio of 18.34 for adjusted posttest mean is greater than the table value 4.45 with Df 1 and 17 required for significance at 0.05 level of confidence. The results of the study indicate that there is a significant mean difference exist between the adjusted posttest means of squat jump training and control groups on explosive power.

The bar diagram shows the mean values of pretest, posttest and adjusted posttest on explosive power of squat jump training group and control group.

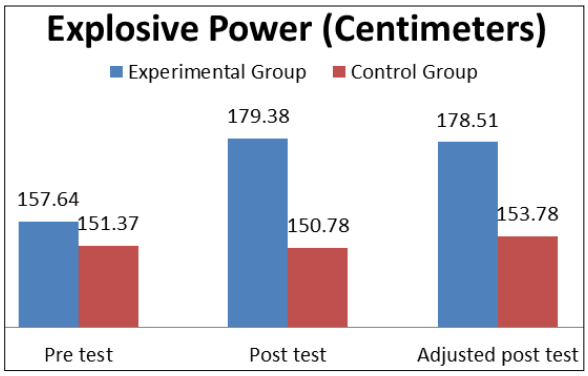

Fig 2: pretest, posttest and adjusted posttest mean values of squat jump training and control groups on explosive power.

Discussion on Findings

The result of the study indicates that there was a significant improvement on leg strength and explosive powerdue to the effect of squat jump training among college menwhen compared to control group**.** The results of this investigation are also supported by the following studies of Adams, *et al*, (1992), Gourgoulis, *et al*. (2003) and Chelly (2009) [1, 3, 4].

Conclusions

1. There was significant improvement on leg strength and explosive power due to the effect of squat jump training among college men.
2. However the control group had not shown any significant improvement on any of the selected variables.
3. There was a significant

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