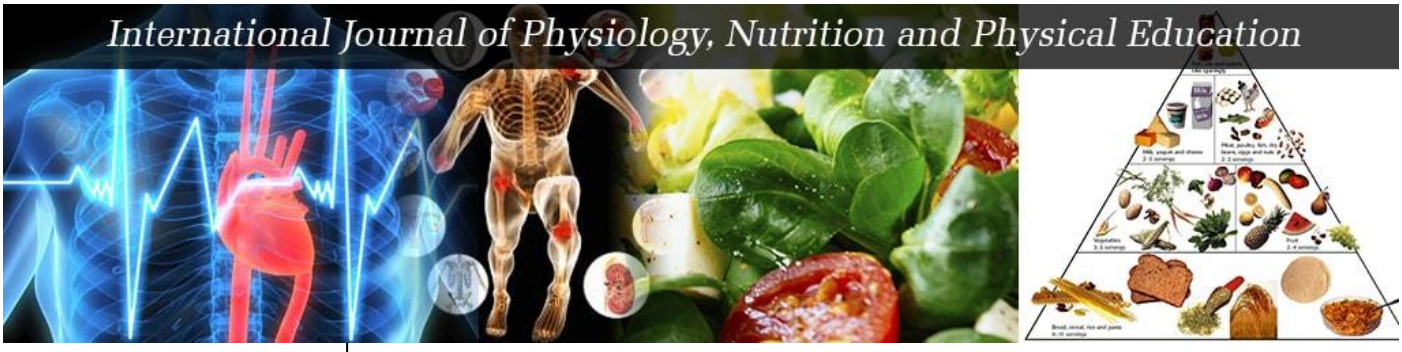

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Effects of plyometric depth jumps on leg strength

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Abstract
The main purpose of the study was to find out the effects of plyometric depth jumps on leg strength. For the purpose of the study college women students were selected at random from Shriram Kala Mahila Mahavidyalaya, Dhamangaon Rly. Dist. Amravati was selected during the session of 2013-2014. The age of the subjects ranged from 18 to 25 years. The 40 subjects were randomly assigned to two groups, experimental group and control group consisting of 20 subjects each. The subjects were involved in regular training. The Subjects were selected by using simple random sampling method. The selected subjects were equated into two equal groups, viz., experimental groups Group-I and Control group (Group II). The experimental treatment was given for a period of 6 weeks. Prior to and at the end of the week training all the subjects were tested at the beginning by pre test and at the six week end post test conducted. To measure the leg strength standing broad jump was use. Result: There was significant difference of experimental group in six week after test values on leg strength, There was insignificant difference of control group in six week after test values on leg strength, There was insignificant difference of experimental and control group in pre test values on leg strength and There was significant difference of experimental and control group in pre test values on leg strength.

Keywords: plyometric depth jumps, leg strength, flexion, ankles.

Introduction
Depth jumps are an intensive plyometric exercise that uses an elevated drop to overload the stretch reflex. When an athlete steps or leaps off of the box, the most common technique is to jump with two legs vertically up, immediately after impact. For 50 years coaches and athlete have purposely used the training to improve power, and Russian lore is still seducing coaches to believing that it's near magic for performance. We know that jumping performance is improved by depth jumps due to the specificity of the exercise, but sprinting is still gray because of the complexity of design requirements in studies [1].

There is a limit to the height at which an in-depth jump can be performed and be effective but not dangerous. A height of 1.2m would provide a great overload on the muscles, but the resistance would be too great for many athletes to overcome while maintaining correct technique. Jumping from such a height increases the possibility of injury; furthermore, the amount of force to be overcome is so great that the amortization phase would be extended and thus the goal of the exercise lost. The recommended height for in-depth jumps ranges from 0.4 to 1.1 m, with 0.75 to 0.8 m being the norm. In-depth jumps for large (>100-kg) athletes should range from 0.5 to 0.75m. Heights greater than this may not allow for the rapid switch from eccentric to concentric activity and may produce injuries. Plyometric training has been criticized because of recommendations to perform in-depth jumps from great heights, such as 3.2 m. Such a height was part of one investigation to determine the most efficient jumping height. Stated simply, jumps from this height should not be performed. Proper landing technique is particularly important for in-depth jumps. If the center of gravity is offset from the base of support, then performance will be hindered and injury may occur. The shoulders should be over the knees during the landing, by flexion of the ankles, knees, and hip [2].

Methodology
Source of Data
For the purpose of the study college women students were selected at random from Shriram Kala Mahila Mahavidyalaya, Dhamangaon Rly. Dist. Amravati was selected during the

session of 2013-2014. The age of the subjects ranged from 18 to 25 years.

Selection of Subjects
The 40 subjects were randomly assigned to two groups, experimental group and control group consisting of 20 subjects each. The subjects were involved in regular training.

Sampling Method
The Subjects were selected by using simple random sampling method.

Experimental Design
The selected subjects were equated into two equal groups, viz., experimental groups Group-I and Control group (Group II). The experimental treatment was given for a period of 6 weeks. Prior to and at the end of the week training all the subjects were tested at the beginning by pre test and at the six week end post test conducted.

Criterion Measures
The following were the criterion measures for testing the hypothesis: Leg Strength: To measure the leg strength standing broad jump was use.

Training Programme
The control group was not exposed to any specific Training However, They were participating in their regular Physical activities. The experimental groups I were subjected to six week of low, medium and high Intensity of Plyometric depth jumps training respectively. Then training was given for five days per week (alternative days). Every training session lasted for 20 to 30 minutes. The training program was scheduled for the morning between 7.00 am. The subjects underwent their respective programme under strict supervision prior to and during every session. Subjects underwent a 10 minutes warm up and warm -down exercises which included jogging, stretching, striding. All the subjects involved in the training were questioned about their stature throughout the training period. None of them reported any injuries. However, muscle soreness was reported in the early weeks, but it subsided later.

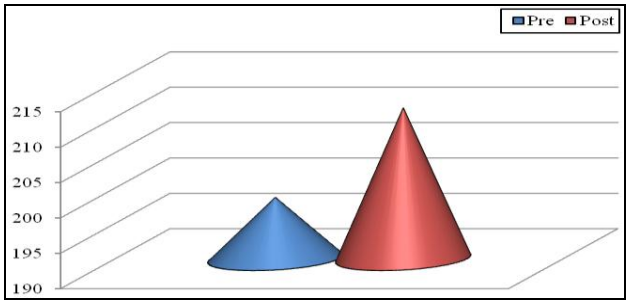
Statistical Analysis
Findings
The data is collected from 40 subjects before and after six week depth jump Training on leg strength and after that the collected data was analyzed by comparing the means of pre and post test of experimental and control groups and was again statistically analyzed by applying t-test to check the significant difference variable. Therefore separate tables and graphs have been presented for variable. Each table gives the mean of pre and post test of experimental group as well as control group. Also the researcher can find the standard deviation of both experimental group as well as control group and also their mean difference is also been given in the table. The level of significance for the present study is kept at 0.05 level of significance and also the degree of freedom is also be kept in mind for the calculation of tabulated 't' which is then compared with the calculated 't'. This is used for testing of hypothesis which was given by the researcher previously.
If the value of the calculated 't' is more than the tabulated 't' then the hypothesis of the researcher would be accepted and if the value of the calculated 't' is less than the tabulated 't' then the hypothesis of the researcher would be rejected. Acceptance or rejection of hypothesis does not matter.
The whole work of the researcher depends upon the collection of the data that is why the collection of data is called the centre point around which the whole research work revolves. So the researcher is asked to collect the data in a very precisely manner as to face less difficulties during the whole researcher work.

Table 1: Showing comparison between pre and post test of leg strength in experimental group

Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Experimental	Pre	198.65	11.46	4.01	12.65	3.151*	38	2.02
	Post	211.30	13.82					

*Significant at 0.05 level of confidence, $t_{.05}$ (38) = 2.02.

Table-1 reveals that there is significant difference in leg strength of experimental group between pre and post test. The obtained t-value of 3.151 is more than the table value of 2.02.



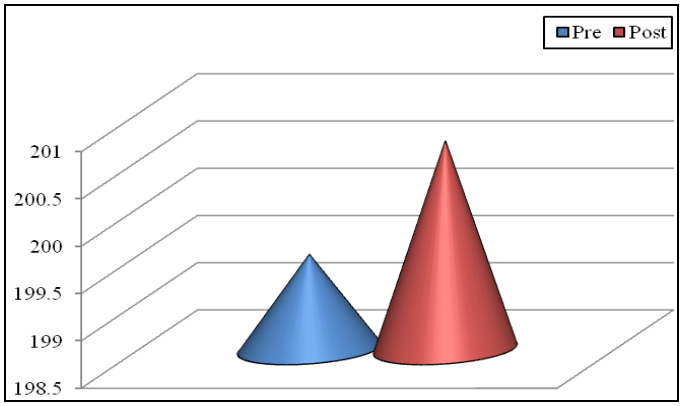
Graph 1: Showing mean difference between pre and post test of leg strength in experimental group

Table 2: Showing comparison between pre and post test of leg strength in control group

Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Control	Pre	199.50	12.11	3.96	1.20	0.303	38	2.02
	Post	200.70	12.91					

*Significant at 0.05 level of confidence, $t_{.05}$ (38) = 2.02.

Table-2 reveals that there is insignificant difference in leg strength of control group between pre and post test. The obtained t-value of 0.303 is less than the table value of 2.02.



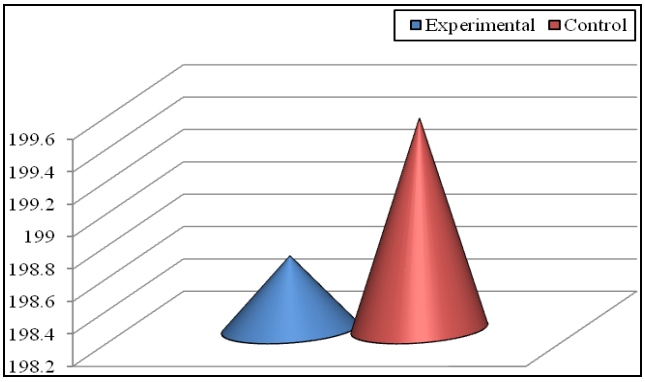
Graph 2: Showing mean difference between pre and post test of leg strength in control group

Table 3: Showing comparison between experimental and control group of leg strength in pre test

Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Experimental and Control	**Pre**	198.65	11.46	3.73	0.85	0.228	38	2.02
	Pre	199.50	12.11					

*Significant at 0.05 level of confidence, $t_{.05}$ (38) = 2.02.

Table-3 reveals that there is insignificant difference in leg strength of pre test between experimental and control group. The obtained t-value of 0.228 is less than the table value of 2.02.



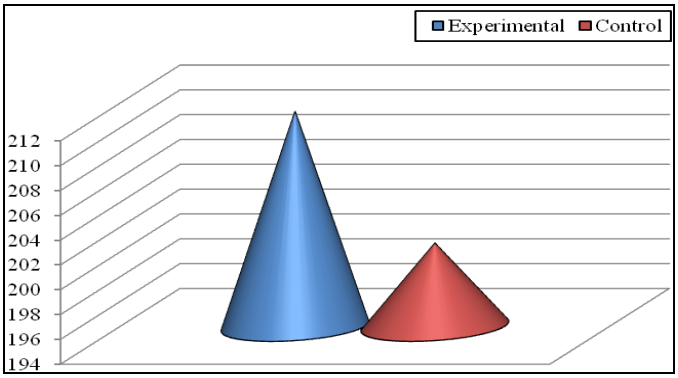
Graph 3: Showing mean difference between experimental and control group of leg strength in pre test

Table 4: Showing comparison between experimental and control group of leg strength in post test

Group	Test	Mean	SD	SE	MD	Ot	df	Tt
Experimental and Control	Post	211.30	13.82	4.23	10.60	2.507	38	2.02
	Post	200.70	12.91					

*Significant at 0.05 level of confidence, $t_{.05}$ (38) = 2.02.

Table-3 reveals that there is significant difference in leg strength of post test between experimental and control group. The obtained t-value of 2.507 is more than the table value of 2.02.



Graph 4: Showing mean difference between experimental and control group of leg strength in post test

Conclusion

Within the limitations of the study and from statistical analysis the following conclusion was drawn.

1) There was significant difference of experimental group in six week after test values on leg strength.
2) There was insignificant difference of control group in six week after test values on leg strength.
3) There was insignificant difference of experimental and control group in pre test values on leg strength.
4) There was significant difference of experimental and control group in pre test values on leg strength.

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