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## A study of effects of skipping and step-up training on leg explosive strength and abdominal strength

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### Abstract

Fitness is the ability to cope mentally, socially and physically with everyday events in the environment. It is the ability to meet the demands of the environment and there are two types: physical and motor. Physical fitness is the ability of your body to cope with the demands of everyday life, and there are several components of physical fitness: cardiovascular endurance, muscular endurance, strength, flexibility, speed, and body composition. To be good at your sport, you need good physical fitness. Skill in our sport also depends on some of these aspects (i.e. motor): agility, balance, power, coordination, reaction time and speed. The several benefits that are derived from the regular physical fitness workouts. Workout chalked out in correspondence to the physical needs of the body, if observed regularly, may help the body get into the desired shape and develop resistance power in the body. The major benefits derived from fitness training programs are bringing down the weight of the bulky body to right proportion, increases the resistance power in the body which results in decreasing the risks of getting attacked by diseases, helps in cutting down the fat from the body and finally gives the body a toned shape. Not only these, but also helps in frequently getting caught in depressions, cures insomnia by helping enhance the sleeping routine, releases positive vibes in the body and thus increases self-esteem and apart from these also gives more energy and stamina to the body.

**Keywords:** Strength, agility, balance, power, coordination, insomnia, self-esteem

### Introduction

#### The Objective of the study

The Objective of this study was to compare the effects of Skipping and Step-up training on leg explosive strength and Abdominal Strength.

### Hypothesis

It will be hypothesized that there will be significant difference between different training groups like Skipping and Step-Up on leg Explosive Strength and abdominal strength.

### Methodology

45 boys studying at D. V. A. Public School, Mithapur, Dist.- Jamnagar were selected randomly and were distributed in Skipping Experimental Group A, Step-Up Experimental Group B and Control Group for the purpose of the study. The age group was between 13 to 16 years. Vertical Jump test was taken to measure Leg Explosive Strength and Step-Up test was taken to measure Stomach Abdominal Strength. For Leg Muscular Strength, standing broad jump test was taken and the nearest mark from the starting line was noted in inches and for Abdominal Strength, (stomach muscles) Step-Up test was taken and rightly done sit ups was counted to collect the relevant data. Pre test and Post test data was collected for the study.

### Planning of the Study

Basketball ground was taken for use for the skipping test.

Monday : - 15 to 20 minutes warm-up  
          : - 15 to 20 minutes general jumps  
          : - 40% work load of total work load  
          : - Frequency of repetitions 90 to 100%

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- : - Frequency of repetitions 90 to 100%
- : - Regular cooling down exercise
- Thursday : - Rest
- Friday : - 15 to 20 minutes warm-up
- : - 15 to 20 minutes general jumps
- : - 40% work load of total work load
- : - Frequency of repetitions 90 to 100%
- : - Regular cooling down exercise

Increase in frequency of the repetitions in the exercise were as below

- a. Training program was started with minimum of 40% work load.
- b. Training program was increased after every 2 weeks.
- c. During training program between every 2 repetitions, subjects were given 2 minutes rest.
- d. Training schedule was fixed in morning from 6 to 8 am.
- e. The training schedule was limited to 8 week only.

**Statistical Procedure**

To find out the effects of Skipping and Step-Up training on

**Table 2:** The Mean Difference and Difference of the Significance of Group A, Group B and Control Group in the Performance of Skipping.

Test	Vertical Jump			Group Total	Individual Difference	Mean Difference	F-Ratio
	Group A	Group B	Control				
Pre Test	27.13	29.53	31.53	327973.56	2	163986.78	4.98*
				1383459.24	42	32939.51	
Post Test	31.07	33.4	31.13	427306.62	2	213653.31	5.67*
				1583352.58	42	37698.88	
Adjusted Mean	14.3	15.96	16.95	527365.87	2	263682.94	7.47*
				1483290.26	42	35316.44	

\*Significant at 0.05% level of confidence t (15) = 2.110

The Pre Test F-ratio of Group A is 4.98, which is significant at 0.05 levels. From above data it is clear that there is significant difference. The Post Test F-ratio of Group B is

Leg Explosive Strength and Abdominal Strength “F” test was applied.

**Table 1:** The Difference of the Significance of the Means of Pre Test and Post Test of the Group A, Group B and Control Group in the Performance of Vertical Jump.

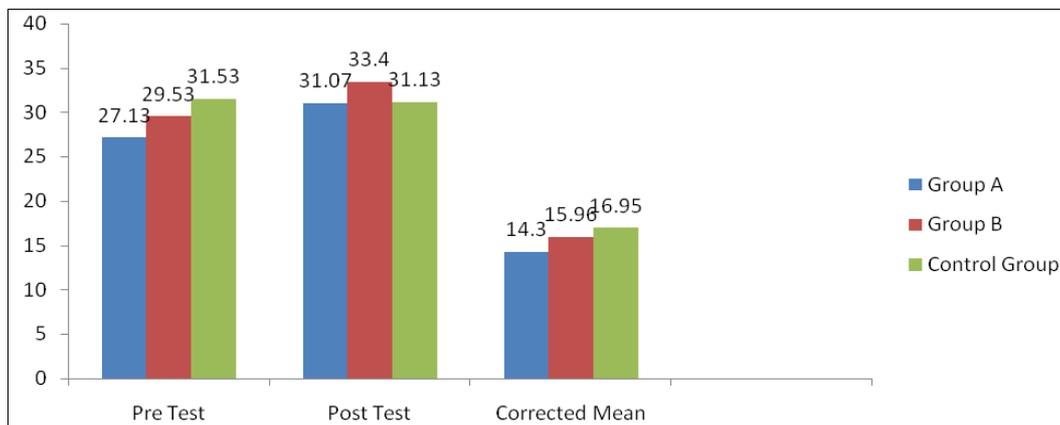
Group	Pre Test	Post Test	Mean Difference	T-Ratio
Group A	27.13	31.07	-3.93	0.13
Group B	29.53	33.4	-3.87	0.12
Control Group	31.53	31.13	0.4	-0.01

\*Significant at 0.05% level of confidence t (15) = 2.110

Table-1 indicates that t ratio of Group A is 0.13, hence is not significant at 0.05 level. T ratio of Group B is 0.12; hence it is not significant at 0.05 levels. Control Group t – ratio is -0.01 which is not significant at 0.05 level.

From above table it is discovered that Pre Test and Post Test after the training given to the Group A and Group B significant difference is not found.

5.67, which is significant at 0.05 levels. Corrected Mean F-ratio is 7.47, which is significant at 0.05 levels.



Y-AXIS 1cm = 10marks.

**Graph 1:** The Graph showing the comparison of the means of Pre Test and Post Test of the Group A, Group B and Control Group in the Performance of Vertical Jump.

**Table 3:** The Difference of the Significance of the Means of Pre Test and Post Test of the Group A, Group B and Control Group in the Performance of Step-Ups.

Group	Pre Test	Post Test	Mean Difference	T-Ratio
Group A	14	15.87	-1.87	0.12
Group B	14.2	16.53	-2.33	0.15
Control Group	15.53	15.27	0.27	0.02

\*Significant at 0.05% level of confidence t (15) = 2.110

Table – 3 indicates that t ratio of Group A is 0.12, hence is not significant at 0.05 level. Group B t – ratio is 0.15; hence it is not significant at 0.05 levels. Control Group t – ratio is 0.02 which is not significant at 0.05 level.

From above table it is discovered that Pre Test and Post Test after the training given to the Group A and Group B significant difference is found.

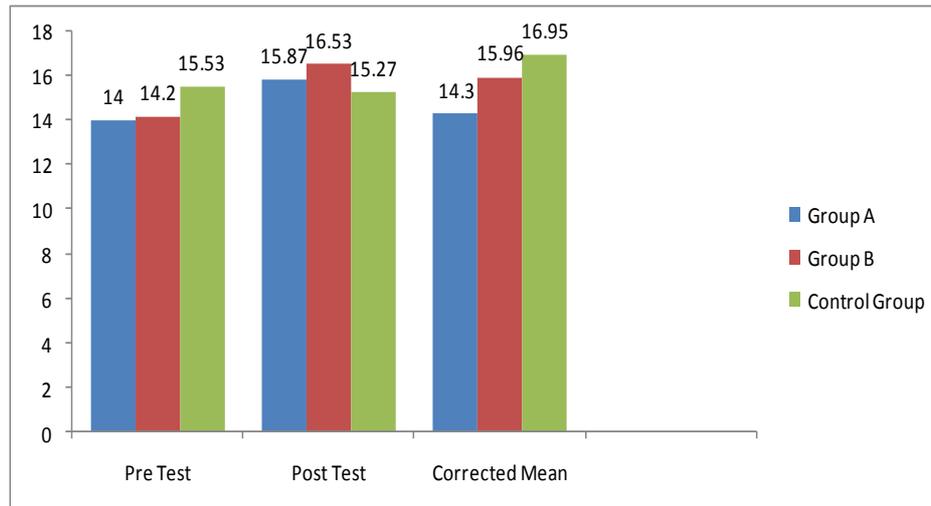
**Table 4:** The Mean Difference and Difference of the Significance of Group A, Group B and Control Group in the Performance of Step-Ups.

Test	Sit-Ups			Group Total	Individual Difference	Mean Difference	F Ratio
	Group A	Group B	Control				
Pre Test	14	14.2	15.53	81112.4	2	40556.2	5.015*
				339660.58	42	8087.16	
Post Test	15.87	16.53	15.27	107952.8	2	53976.4	5.785*
				391911.64	42	9331.23	
Adjusted Mean	14.3	15.96	16.95	133541.03	2	66770.52	7.660*
				366323.14	42	8721.98	

\*Significant at 0.05% level of confidence  $t(15) = 2.110$

The Pre Test F-ratio of Group A is 5.02, which is significant at 0.05 levels. From above data it is clear that there is significant difference. The Post Test F-ratio of Group B is

5.79, which is significant at 0.05 levels. Corrected Mean F-ratio is 7.660, which is significant at 0.05 levels.



**Graph 2:** The Graph showing the comparison of the means of Pre Test and Post Test of the Group A, Group B and Control Group in the Performance of Step-Ups.

### Result of the study

The analysis of the data shows that in eight week's training program in Vertical Jump and Step-Ups the improvement was seen in Leg Explosive Strength and Stomach Abdominal Strength of the Experimental Group A and Group B. There was no improvement in the Controlled Group. Even then little change was seen; the reason of which can be as follows,

- The working mentality seeing others doing the work during the training period. One has the tendency to imitate what others do.
- Since, the actions of the pre-test are repeated in the post-test, one does it without any fear. Hence the possibility is there for improvement.
- During the training period, many physiological changes occur, which help the improvement in the controlled group in the physiological variables.

The "t" ratio of the Experimental Group in Vertical Jump of Group A was 0.13; Group B was 0.12 whereas that of Controlled Group was -0.01. The "t" ratio of the Experimental Group in Step-Ups of Group A was 0.12, Group B was 0.15, and where as in Controlled Group was -0.02.

In Experimental Group of Group A and Group B, "F" ratio of all the variables was significant at 0.05 levels, whereas in Controlled Group "F" ratio of all the variables was significant at 0.05 levels.

Keeping in view the basic limitations, of the research work, the following conclusions were drawn.

1. With training in Skipping the Leg Explosive Strength of the Group A and Group B subjects was seen increased.

2. With training in Step-Up the Stomach Abdominal Strength of the Group A and Group B subjects was seen increased.
3. In the subjects of the Controlled Group, no one noted improvement was seen in the Pre-Test and Post-Test in the Leg Explosive Strength and Stomach Abdominal Strength.

Hence, at this end of the study, having the look at the result, the noted improvement was seen in the Leg Explosive Strength and Stomach Abdominal Strength after the training in Vertical Jump and Step-Ups. Hence the hypothesis of the study becomes significant.

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