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Effect of ladder training on explosive strength of college girls

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Abstract

The purpose of the study was to determine the effect of Ladder training programme on Explosive strength. A ladder workout is a method of strength and sports training where you perform one or more exercises with an ascending and descending repetition pattern. Ladders are muscular endurance and conditioning workouts designed to help you increase your overall training volumes while maintaining proper form and technique. Ladder drills are an excellent way to improve foot speed, agility, coordination and overall quickness. Randomly selected 60 college girls were divided into two equal groups as A and B. After taking the pre-test for Explosive strength using sergeant jump test the ladder training programme was given to experimental groups A whereas the group B was a control group. The experimental group 'A' had undergone the ladder training programme, thrice a week for 16 weeks. Post test was conducted after 16 weeks. The t-test was employed to analyse the significance of difference from the pre-test to post test on selected variable. The result reveals that there was significant improvement in Explosive strength for the experimental group as a result of the ladder training programme conducted for a period of four months.

Keywords: Ladder training, explosive strength, sargent jump test

Introduction

The five components of physical fitness that are most important, directly related to one's health, and can be directly measured are: cardio vascular endurance, strength, muscular endurance, flexibility, and body composition. These 5 components of fitness are typically taught and measured in elementary, secondary/middle, and high school physical education classes all around the world. Fitness centers, gyms, and health clubs use these health-related components of physical fitness to measure clients fitness levels in order to prescribe the appropriate exercise program for each individual. Then there are 6 components of physical fitness that are more skill-related and/or sports-related. These include: agility, balance, coordination, power, reaction time, and speed. These skill-related components of physical fitness are directly related to sports and daily activities. These components can be measured and improved using very specific training techniques.

A ladder workout is a method of strength and sports training where you perform one or more exercises with an ascending and descending repetition pattern. Ladders are muscular endurance and conditioning workouts designed to help you increase your overall training volumes while maintaining proper form and technique. Ladder drills are an excellent way to improve foot speed, agility, coordination and overall quickness. They are an integral part of many SAQ programs and compliment many different sports and events. Speed ladder drills are about quality and form rather than producing overload.

Explosive strength refers to an individual's ability to exert a maximal amount of force in the shortest possible time interval. For conceptual purposes, think of a sprinter forcefully driving into the starting blocks, a high-jumper propelling himself off the ground, a football player exploding off the line, or a weight lifter squatting a near maximal load. While each of these movements are markedly different from one another, both in form and speed of movement, they all require explosive strength. Generally speaking, athletes who need to display large amounts of force in relatively short periods of time would do well to incorporate explosive based strength training. Within their regimen. Clearly this includes most common sports such as baseball, soccer, basketball, football, lacrosse, hockey, tennis, boxing, wrestling, golf, track & field, and weightlifting.

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The rate of force development is at the maximum for any type of muscle action is explosive power. In activities requiring high acceleration and output, explosive power training is necessary for maximum development. The general exerciser doesn't usually need to include explosive power training in a regular workout. Cardiovascular and strength training in a slow, steady manner will give adequate results. In contrast, Athletic movements need to be performed at high speeds. The muscles have to be developed and trained outside of the sport in order to do this. The types of exercises used in explosive power training are determined by the type of sport that is being trained for. For example, for a basketball player trying to improve his jump shot would have a training program that would include weighted vertical jumps.

The Sargent Jump Test also known as the vertical jump test, was developed by Dr. Dudley Allen Sargent. The purpose of the test required for the test are measuring tape or marked wall, chalk for marking wall. The athlete stands side on to a wall and reaches up with the hand closest to the wall. Keeping the feet flat on the ground, the point of the fingertips is marked or recorded. This is called the standing reach height. The athlete then stands away from the wall, and leaps vertically as high as possible using both arms and legs to assist in projecting the body upwards. The jumping technique can or cannot use a countermovement. Attempt to touch the wall at the highest point of the jump. The difference in distance between the standing reach height and the jump height is the score. The best of three attempts is recorded.

Review of Related Literature

KV Robin (2019) ^[9] studied the effects of ladder drills training among football players of Sree Sankaracharya University of Sanskrit. Thirty students of football players of Sree Sankaracharya University of Sanskrit (N = 30) with mean age (M = 21.20 ± 1.16) years, their height (M = 168.13 ± 8.27) cm and weight (M = 61.70 ± 9.55) kg were recruited by using the method of purposive sampling. They were randomly assigned to ladder drills training group (N = 15) and the control group (N = 15). The ladder drills training group underwent 4 weeks of training session (15-50 min/day, 3 days/week). The agility performance was measured with agility t-test where the result were taken and recorded twice. The results had shown that ladder drills training induced significant improvement (t = 15.33, df = 14, p < .05) on agility t-test. There were significant differences of the agility performance between the experimental group and the control group (t = 4.74, df = 28, p < .05) during post-test. The results revealed that the ladder drills training is a feasible method to enhance the agility performance.

Afonso *et al.* (2020) ^[11]. The goal of this systematic review was to evaluate the effects of exercise programs using agility ladders and to assess the quality of available evidence. Search was conducted in October of 2019 using the following databases: Cochrane Library, PEDro, PubMed, Scopus and Web of Science. Study eligibility criteria included randomized trials or randomized controlled trials using agility ladders drills. Participants were healthy humans of any health status. The study appraisal and synthesis methods followed the revised Cochrane risk-of-bias tool for randomized trials (RoB 2) and a qualitative synthesis of the main results of each study were applied.

Only five studies met our criteria, lasting between 4 and 8 weeks. Only two studies evaluated the effects of ladder drills on more than one dimension. Lack of description of the specific exercises that were used limits reproducibility of current studies. With one exception, the articles had low risk of bias for most domains. Despite the widespread popularity of agility ladder drills, research is scarce and problematic, with poorly described protocols and mostly unidimensional performance measures. Claims that agility ladders improve agility and other physical skills is premature, given the nature and quality of existing research.

Objective of the study

The purpose of the study was to determine the effect of ladder training on explosive strength of college girls. The study may help the people to know the effect of ladder Training on Explosive strength. The study may probably make an impact on the public to follow ladder training exercises to maintain good health and fitness. Further, this study may helps to reveal the importance to include ladder exercises in the training schedule to improve Explosive strength.

Hypotheses

There will be significant improvement in Explosive strength as a result of Ladder Training programme.

Design of the study

Randomly selected 60 college girls were divided into two equal groups as A and B. After taking the pre-test for Sargent Test, the ladder training programme was given to experimental groups A, where group B was the control group. The experimental group 'A' had undergone the Ladder training programme thrice a week for 16 weeks. Post test was conducted for all the groups.

Statistical technique for analysis of data

To find out the significance of difference between the pre-test and post-test data on selected variables for the experimental and control groups, the 't'-test was applied. The level of significance chosen was 0.05. The descriptive statistics given in the following tables, reveal the effect of Ladder training programme on Explosive strength.

Table: Significance of Differences between the Initial and Final Means of the Experimental and Control Groups on Explosive Strength

Groups	Initial Mean	Final Mean	MD	SD	't' value
Experimental group (N= 30)	27.53	35.20	5.982	1.236	24.43*
Control group (N= 30)	26.12	25.89	0.132	0.832	0.632

* Significant at 0.05 level

't' value required at 0.05 level = 2.045 (df 29)

The above table indicates that the Experimental group exhibited significant improvement in Agility with initial mean score (27.53) and the final mean score (35.20). Further, it shows that the obtained 't' value (24.43) is much higher than the tabulated 't' value (2.045) at 29 degrees of freedom. Hence the obtained 't' value was found to be highly significant at 0.05 level. On the contrary, the initial mean value (26.12) and final mean value (25.89) of control group showed negligible difference. Further the obtained 't' value (0.632) is less than the required 't' value (2.045) which was insignificant at 0.05 level. The initial and final means of

Experimental and Control groups on Explosive strength are diagrammatically shown below.

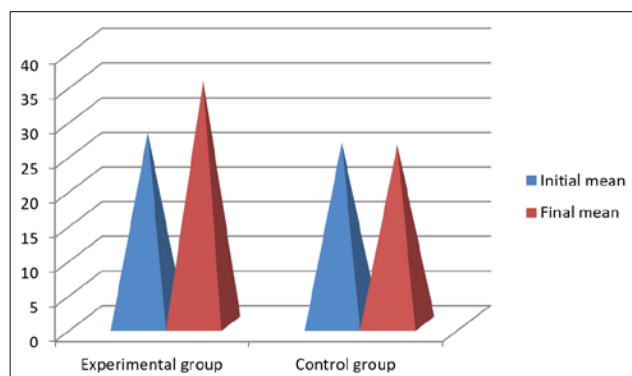


Fig: Graphical representation of mean difference of Experimental and control groups on Explosive strength.

Conclusion

Based on the analysis of statistical results, it was observed that there was significant improvement in Explosive strength for the experimental group as a result of the ladder training programme conducted for a period of four months. There was no significant improvement shown by the control group.

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