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INFLUENCE OF JUMP ROPE TRAINING ON PHYSICAL FITNESS VARIABLES AMONG SCHOOL BOYS

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Abstract:

Jump rope can be incorporated in an athlete's regular training programme as a warm-up, active rest or cool down. The portability of jump rope makes this possible even during competition. Fitness exercise and other types of exercises require access to a gymnasium or fitness centre, while a jump rope requires only sufficient space and adequate surface. This study was designed to investigate influence of jump rope training on physical fitness variables among school boys. To achieve the purpose of the study 30 school boys were selected from Government Boys Higher Secondary School, Anthiyur, Erode. Their age ranged between 15 and 17 years and they were divided into two equal groups consists of 15 each. Group I underwent the jump rope training and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not undergoing any sort of training except their routine work. The data collected from the subjects was statistically analyzed with dependent 't' test to find out significant improvement if any at 0.05 level of confidence. The results speculated that the leg explosive power and leg strength of school boys improved significantly due to the jump rope training with the limitations.

Key Words: Jump Rope, Physical Fitness, Leg Explosive Power, Leg Strength and School Boys.

Introduction:

Most team sports such as the football, hockey, netball and basketball require the development of different physical capacities for optimal performance. For example, the physical capacity of speed is required to 'beat' opponents, strength is needed for body collisions and physical contacts and endurance capacity allows the player to recover and repeat sprint efforts. Jump rope is practiced at a competitive level for young kids and adults. Athletes compete in individual and team events using single rope. Jump rope is a simple, fun activity. Those familiar with its development of a competitive side consider it as a sport. Serious jump rope athletes train rigorously throughout the year. Jumping rope takes immense strength, endurance, focus, patience, and can be much more than a schoolyard game of chanting rhymes.

A jump rope or skipping rope, or skip rope is the primary tool used in the game of skipping played by children and among adults, many participants jump over a rope swung so that it passes under their feet and over their heads. This may consist of one participant turning and jumping the rope, or a minimum of three participants taking turns, two of who turn the rope while one or more jumps. Sometimes the latter is played with two turning ropes; this form of the activity is called Double Dutch and is significantly more difficult. Jump-rope rhymes are often chanted at the beginning when the skipper jumps in and ending when the skipper is tripped up.

In contrast to running, jumping rope is unlikely to lead to knee damage since the impact of each jump or both legs absorb step. Jumping rope also helps to strengthen the arms and shoulders. This combination of an aerobic workout and coordination-building footwork has made jumping rope a popular form of exercise for athletes, especially boxers and wrestlers. Individuals or groups can participate in the exercise, and learning proper jump rope technique is simple compared to many other athletic activities. The exercise is also appropriate for a wide range of ages and fitness levels. Jumping rope is particularly effective in an aerobic routine combined with other activities, such as walking, biking, or running.

Rope jumping can be incorporated in an athlete's regular training programme as a warm-up, active rest, or cool-down. The portability of rope jumping makes this possible even during competition. Exercise bikes and other equipment require access to a gym or fitness center, while a jump rope requires only sufficient space and an adequate surface. Rope jumping can be effective as a part of the active rest phase of resistance training, keeping the muscles warm while also activating fat burning and aerobic energy systems at critical moments of the athlete's anaerobic training session. Some of the techniques that can be used while playing jumping rope are: Basic jump, alternate foot jump (speed step), criss-cross, double under, combination jumps, toad and etc [4].

One of the main objectives of physical education and sport sciences has always been he promotion and improvement of "health and physical fitness" through big muscular activity, such as conditioning for various adaptations. The augmentation of the energy capacity of muscle through an exercise programme is defined as conditioning. Physical conditioning is essential to a desired level for the development of particular motor abilities in view of the requirements of the game concerned and also keeping in view the limitation of the sportsperson concerned. Physical conditioning programme provides opportunity for the development and maintenance of physical fitness. It offers an opportunity for the facilitation of normal growth of a child and prevents the reversal factors of the performance suc as strength, endurance, flexibility, speed and skill. Conditioning of the body through regular exercise enables an individual to meet emergencies more effectively. Training and conditioning are the best known ways, to prepare the players for more efficient performance and healthful living. [10]

Jumping rope use forearm, upper arm and shoulder muscles and also use different muscle of leg and hip muscle. Those who use techniques during rope jumping use more muscles. For example, the technique which involves the opening the legs to the sides works the adductor and abductor muscles in the legs while ropes jumping by making front traversing works the chest and upper back muscles. The jump rope has been a major training tool for many sports such as boxing, wrestling, tennis, and martial arts. Jumping rope requires the coordination of several muscle groups to sustain the precisely timed and rhythmic movements that are integral to the exercise. The coordination of these muscle groups increases an athlete's capacity for dynamic balance. Jumping rope can also be used to develop the coordination of neuromuscular skills, muscle strength, and cardiovascular endurance. It burns calories and builds strength in the upper and lower body. [7]

Hypothesis:

- The first hypothesis of this paper that there would be significant changes over the leg explosive power of school boys due to the influence of jump rope training.
- The second hypothesis of this paper that there would be significant changes over the leg strength of school boys due to the influence of jump rope training.

Materials and Methods:

- **Participants:**

To achieve the purpose of the study 30 school boys were selected from Government Boys Higher Secondary School, Anthiyur, Erode. Their age ranged between 15 and 17 years. The training was given to the experimental group for 3 days per week for the period of 12 weeks. All participants were informed about the nature of the study and their consent was obtained to co-operate till the end of the experiment and testing period.

- **Research Design:**

The purpose of the study was to investigate influence of jump rope training on physical fitness variables among school boys. The study was formulated as consisting of pre test and post test was taken by the all subjects (n=30) were randomly selected from Erode District. The evaluated parameters were leg explosive power (Sergeant vertical jump test) and leg strength (Squat test). They were divided into two equal groups consists of 15 each. Group I underwent the jump rope training and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work.

- **Training Protocol:**

The investigator selected a training that is jump rope training for school boys which improved certain selected physical fitness variable such as leg explosive power and leg strength. During the training period the experimental group underwent the training of selected jump rope training for twelve weeks of period in addition to their daily routine activities as per the curriculum. Experimental group underwent training program on three days per week for twelve weeks period. All the subjects involved in this study were carefully monitored throughout the training program, none of the reported with tear and muscle soreness.

- **Statistical Analysis:**

The data collected from the two groups before and after the experimental period were statistically examined for significant improvement by using 't' test. The collected data on leg explosive power and leg strength due to the influence of jump rope training on selected physical fitness variables was statistically analyzed with paired 't'test to find out the significant improvement between pre and post test. In all cases the criterion for statistical significance was set 0.05 level of confidence.

Results:

All subjects completed the study according to the aforementioned methodology. The jump rope training subjects averaged 96% attendance and no injuries occurred from the jump rope training program. There were no significant differences in height or weight between groups either before or after the training.

Table 1: Analysis of 't' Ratio for the Pre and Post Test of Experimental and Control Group on Leg Explosive Power

Variable	Groups	Mean		Standard Deviation	MD	SEM	't' Ratio
		Pre	Post				
Leg Explosive Power	Experimental	1.59	1.68	0.96	0.09	0.02	3.65*
	Control	1.63	1.66	0.41	0.02	0.04	2.12

* Significant at 0.05 level

Table 1 reveals the computation of 't' ratio between mean of pre and post test on Leg Explosive Power of school boys. The mean values of pre and post test of experimental group were 1.59 and 1.68 respectively. The mean values of pre and post test of control group were 1.63 and 1.66 respectively. The experimental group, the obtained 't' ratio 3.65 was higher than the required table value 2.15, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the leg explosive power of the experimental group improved due to the influence of jump rope training on school boys.

Figure 1: Bar Diagram Shows the Pre and Post Test Mean values of Experimental and Control Group on Leg Explosive Power

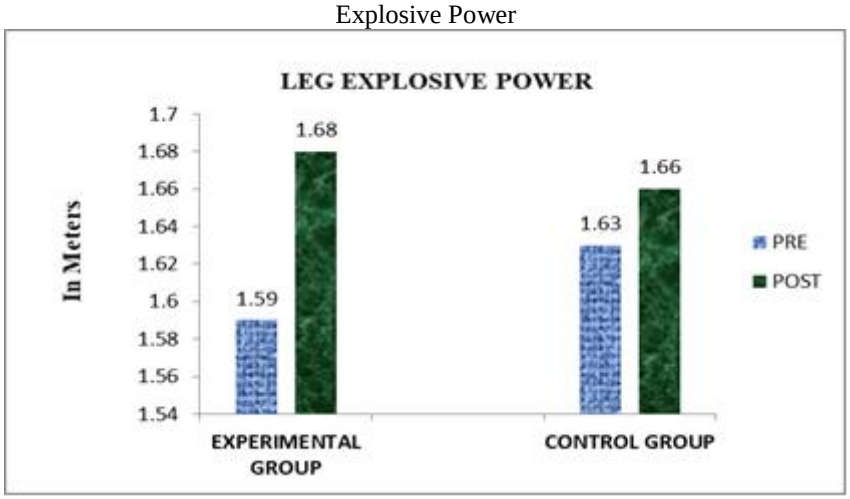


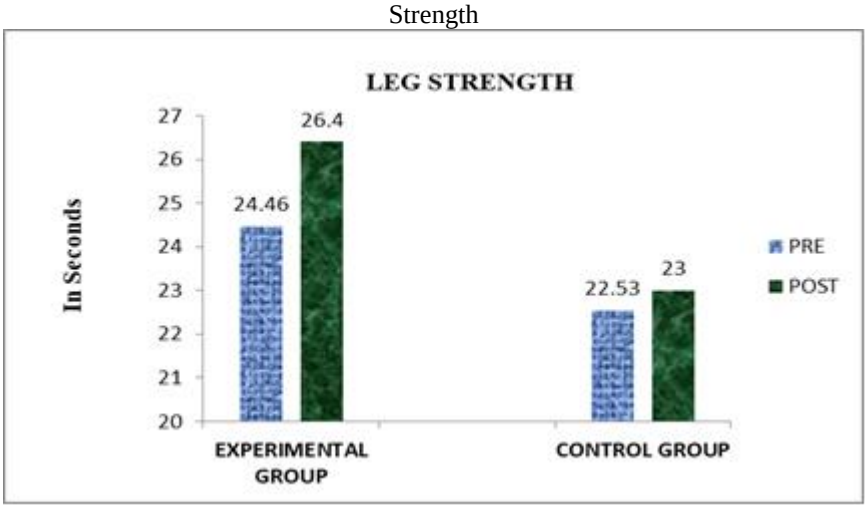
Table 2: Analysis of 'T' Ratio of the Pre and Post Test for Experimental and Control Group on Leg Strength

Variable	Group	Mean		Standard Deviation	MD	SEM	't' Ratio
		Pre	Post				
Leg Strength	Experimental	24.46	26.40	1.09	1.93	0.28	6.80*
	Control	22.53	23.00	0.91	0.46	0.18	1.97

*Significant at 0.05 level

Table 2 reveals the computation of 't' ratio between mean of pre and post test on Leg Strength of school boys. The mean values of pre and post test of experimental group were 24.46 and 26.40 respectively. The mean values of pre and post test of experimental group were 22.53 and 23.00 respectively The experimental group, the obtained 't' ratio 6.80 was higher than the required table value 2.15, it was found to be statistically significant for the degree of freedom 1 and 14 at 0.05 level of confidence. The results clearly indicated that the leg strength of the experimental group improved due to the jump rope training on school boys.

Figure 2: Bar Diagram Shows the Pre and Post Test Mean Values of Experimental and Control Group on Leg Strength



Discussions:

The result of the study indicates that the experimental group namely jump rope training group had significantly improved the selected physical fitness variables namely leg explosive power and leg strength. When compared to the control group. It is also found that the improvement caused by jump rope training when compared to the control group.

The results of the similar studies shows the significant changes over the selected variables of the study such as, the effect of 12-week jumping rope training on the health -related physical fitness in students with intellectual impairment. The jumping rope training demonstrated significant effects on cardiovascular endurance, flexibility, and muscular strength and endurance [1] The aim of this study was to investigate the effect of a 12-week rope jumping and weighted rope jumping exercise programme on body composition and strength performance in 25 female adolescent volleyball players. There was no difference in the body weight of the three groups although there was a considerable decrease of the body fat of WRJ and RJ groups In this study we showed that the muscles in upper extremity, lower extremity and abdominal region of a group doing exercises for 12-week programme with weighted rope would be gained a considerable power [3]. The influence of rope skipping on health related physical fitness of junior high school students [5]. The effects of jump rope training on shoulder isokinetic strength in adolescent volleyball players 24 healthy volleyball players are selected for this study and their age ranged between 13 and 16 years. They are divided into three groups, Group 1 took weighted-rope training, group 2 took unweighted-rope training , and group 3 did not train with any specific program The results indicate that a jump-rope training program is a good conditioning method for overhead athletes because of its potential benefits to shoulder strength[7]. The six weeks of jump rope exercise improved triglyceride and insulin sensitivity and increased adiponectin levels in obese Korean male adolescents [8]. In his book stated that rope jumping is a training tool that enhances quickness and speed without requiring large blocks of training time or numerous sessions a week. Rope jumping is considered to be a total body movement that can be applied to almost any sport. In order to maximize the benefits of a jump rope regimen, one should strive to stimulate one's sport form, intensity, duration, and sport specific movements [10]. The effects of forty-weeks jumping rope exercise intervention on physical fitness of elementary school students [11]. The purpose of this investigation was to determine the efficacy of weighted jump ropes as an alternative to core plyometric exercises in developing explosive-reactive power and anaerobic capacity. Thirty-six university students served as subjects for the study and were divided into three groups. Subjects participated in the exercise program three times a week for 10 weeks. Results indicated that weight jump rope training group made significant improvements between all pre- and post treatment measures. These findings suggest that weighted rope jumping is a viable alternative to high impact plyometric exercises [12]. The purpose of this study was to investigate the effects of a 7-week of rope-jump training on speed, endurance and agility in middle school male students. 7 weeks rope jump training is a feasible and safe training method for improving cardiovascular endurance and agility in middle school student boys. However, rope jump training confers small improvements in sprint performance in middle school student boys [13]. The purpose of this study is to analyze about the influence of ladder drills exercise towards speed, liveliness, and power of limb muscle. The influence of jump rope exercise towards speed, liveliness, and power of limb muscle. The difference between the influence of ladder drills and rope jump exercises towards speed, agility, and power of limb muscle. Based on the above analysis, it can be concluded that there is a significant influence of ladder drills and rope jump exercises towards increasing speed, agility, and limb muscle power. Ladder drills are more effective than rope jump exercises and control groups in increasing speed and agility. While rope jump exercises are more effective than ladder drills and control groups in increasing limb muscle power [14]. The intention of the study was to investigate the magnificent promotion of muscular strength and explosive power among college female volleyball players due to the selected jump rope training. To achieve the study 30 female volleyball players were selected as subject in Christ university, Bangalore, Karnataka at random and their ages ranged from 17 to 22 years. The study was formulated as a true random group design, consisting of a pre-test and post-test. The groups were assigned as jump rope training and control group in an equivalent manner. The two groups were participated the training for a period of eight weeks to find the outcome of the training packages. Result of the study experimental group had significant improvement on muscular strength and explosive power when compare to control group [15]. The influence of different kinds of exercise on cardiopulmonary function of junior high girl students [22].The major purpose of this study was to examine the effects of a jump rope-based physical activity afterschool program on middle school students' physical fitness. Sixty students participated in a 12-week jump rope-based afterschool program. Participants were randomly assigned to three groups. The results found significant improvements in muscular strength (standing long jump, right-hand grip, and left-hand grip) in both intervention groups. Only the freestyle rope skipping group had increased BMD. Compared to the traditional jump rope, the freestyle rope skipping group showed significantly higher improvement in flexibility. These findings suggest that the jump rope-based afterschool program with freestyle rope skipping would be more effective than traditional jump rope to promote physical fitness performance among adolescents [23].

Conclusions:

Jumping rope has been burned some calories and built strength upper and lower body. Rope jumping requires the coordination of several muscle groups to sustain the precisely timed and rhythmic movements that are integral to the exercise. This training must be given focus by coaches, Physical Education teachers, sports teachers and authorities involved in sports programme because the effectiveness of the training can be proven after twelve weeks of training. The study was concluded that the experimental group on leg explosive power showed significantly greater improvement than the control group. The study was concluded that the experimental group on leg strength showed significantly greater improvement than the control group.

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Conflict of Interest:

The authors declare no conflict of interest.

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