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Effect of resistance training program on performance related fitness variables among untrained men

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Abstract

The purpose of the study was to find out the effect of resistance training on selected performance related fitness variables among untrained men. To achieve this purpose, 40 male students studying in various classes were randomly selected as subjects from Mailam Engineering and Technology, villupuram, Tamilnadu. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into two equal groups of 20 subjects each. Group - I underwent resistance training for three days per week for twelve weeks and group - II acted as control. The selected criterion variables namely cardiovascular endurance and explosive strength were assessed before and after the training period. The collected data were statistically analyzed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant improvement on explosive strength among the resistance training group when compared with the control group and there was no significant change on cardio respiratory endurance among the resistance training group when compared with the control group.

Keywords: Resistance training program, fitness variables, physical fitness

Introduction

Physical fitness is one of the basic requirements of life, broadly speaking it means the ability to carry out our daily tasks without undue fatigue. Physical fitness is one of the components of the total fitness of the individual, which also includes mental social and emotional fitness. Total fitness is essential (fitness) for health living [1]. Fitness is determined by what we do twenty four hours a day to live work sit, walk, think, eat and sleep fitness helps to enjoy the life [2]. Physical fitness is not a static factor and it varies from individual to individual and in the same person from time to time depending on various factor [3]. According to ucher [4] "fitness is the ability of an individual to live a full and balanced life. It involves physical, mental, emotional, social and spiritual factors and the capacity for their wholesome expression. Sports performance is complex mixture of genetic make-up and environmental influences like training etc. Nowadays, technico-tactical training has become very highly scientific and systematic. Physical fitness is the sum of numerous factors, which can vary from individual to individual and adequate training is necessary to ensure that athletes are prepared for performance in their sport. The type of training and methods used depends on factors such as the type of movement, skill requirements and specific demands of the activity in question. Soccer players have different needs to volley players, as do track athletes to field athletes, and weight lifters to gymnasts. Coaches and athletes need to understand the fact that there are different types of training specifically designed to develop aerobic and anaerobic capacity, strength and flexibility, and each is closely linked to the energy systems and principles of training. Different sports require different type of fitness emphasizing on a variety of fitness factors. Similarly the training varies sports discipline to sports discipline. Field training is a highly coordinative and well planned exercise. In modern sports training the game-specific field training is gaining tremendous popularity, which focus on game specific fitness as well as performance related skill factors.

Better performances is primarily the outcome of efficient technique, the progression of speed and the maturing competitive attitude on a sound basis of general endurance, all round strength and general mobility. The development of all round strength is best achieved through circuit training and then progressing this through resistance training. Resistance training is the

exercise that uses weights to condition the muscles by improving muscle tone, strength and endurance. Resistance training not only tones muscles, it reduces fat, speeds metabolism, increases endurance, improves posture, strengthens bones, and cuts your risk of injury and fight the signs of aging as it replaces muscle lost to aging by strength training. The principle behind resistance training is to add resistance to the body's natural movements so muscles get stronger. Resistance training machines often are tailored to a man's frame, they can better isolate the muscle working and don't need as much balance and coordination as free weights. Resistance training will give the strength and endurance to perform daily tasks more efficiently and safely during work, errands and recreation. It can also improve the body's muscle-to-fat ratio, helping to burn calories more efficiently and lose weight, help prevent injuries, especially to the arms, legs, and back, balance aerobic exercise and promote a smooth, toned appearance.

Muscle strength and power are important determinants of a successful performance in many individual and team sports. Consequently, during the past decades much attention both from coaches and researchers has been focused on determining the optimal training methods for the development of strength, power and competitive performance (1). Resistance training has two different meanings. A broader meaning that refers to any training that uses a resistance to the force of muscular contraction (better termed strength training), and elastic or hydraulic resistance, which refers to a specific type of strength training that uses elastic or hydraulic tension to provide this resistance. Resistance training is a form of strength training in which each effort is performed against a specific opposing force generated by resistance (i.e. resistance to being pushed, squeezed, stretched or bent). Exercises are isotonic if a body part is moving against the force. Exercises are isometric if a body part is holding still against the force. Resistance exercise is used to develop the strength and size of skeletal muscles. Properly performed, resistance training can provide significant functional benefits and improvement in overall health and well-being. The goal of resistance training, according to the American Sports Medicine Institute (ASMI), is to "gradually and progressively overload the musculoskeletal system so it gets stronger." Research shows that regular resistance training will strengthen and tone muscles and increase bone mass. Resistance training should not be confused with weightlifting, power lifting or bodybuilding, which are competitive sports involving different types of strength training with non-elastic forces such as gravity (weight training or Plyometrics) rather an immovable resistance (isometrics, usually the body's own

muscles or a structural feature such as a doorframe). Full range of motion is important in resistance training because muscle overload occurs only at the specific joint angles where the muscle is worked. Athletic performance in many sports demands the development of muscle strength, which is required for other performance related characteristics, notably speed and power. Muscle strength is routinely developed through prolonged participation in a structured resistance exercise programmes. Research has consistently indicated that moderate to heavy loads are required in order to gain an increase in muscle size, muscle activity and muscle strength. Correspondingly, an extensive review of the literature and current guidelines published by the American College of Sports Medicine (ACSM) suggest relatively heavy loads that equal, or are in advance of 80% of a one-repetition maximum (1RM) are required in order to achieve optimal strength gains (2). A number of studies that used the term strengthening in fact used resistance training. Because strengthening is a generic term and has received criticism for being a vague term that most often fails to define the type of strengthening used (3). Resistance exercise programmes can be modified not only by the external load, but also by the speed of contraction, and level of induced fatigue. Altering resistance exercise programmes in just one of these ways will induce a distinct skeletal muscle response.

Methodology

40 male students were randomly selected as subjects studying in various classes from Mailam Engineering and Technology, villupuram, Tamilnadu. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into two equal groups of 20 subjects each. Group - I underwent resistance training for three days per week for twelve weeks. The duration of the sessions was 60 minutes which includes 10 minutes each for warm up and warm down. The active duration of 40 minutes Group - I underwent resistance training and group - II acted as control. The subjects were assessed on selected criterion variables namely cardio respiratory endurance and explosive strength before and after the training period. The selected variables were measured by using standard testing procedures (Explosive strength: Sergeant Jump and Cardio respiratory Endurance: Coopers 12 Minutes run). The data collected from Resistance training and control groups before and after completion of the training period on selected variables were statistically examined by applying analysis of covariance (ANCOVA). All the data were analyzed using SPSS statistical package. The level of confidence was fixed at 0.05 level of significance.

Table 1: Analysis of Co Variance on Selected Variables among Resistance and Control Groups

Variable name	Group Name	Control Group	Resistance training group	'F' Ratio
Explosive strength	Pre-test Mean \pm S.D.	50.80 \pm 5.37	51.65 \pm 5.43	0.248
	post-test Mean \pm S.D.	51.30 \pm 5.12	59.90 \pm 5.09	28.39*
	Adj. Post-test Mean	51.66	59.54	111.46*
Cardio respiratory endurance	Pre-test Mean \pm S.D	1888.50 \pm 115.95	1891.50 \pm 115.90	.007
	Post-test Mean \pm S.D.	1884.50 \pm 118.84	1893.50 \pm 115.35	0.056
	Adj. Post-test Mean	1885.75	1891.50	0.986

* (The table value required for significance *el at*.05 level of confidence is 4.1)

Results

The Analysis of covariance on explosive strength and cardio respiratory endurance of the pretest and post test scores of Resistance training and control group have been analyzed and presented in the above table. The findings of the study shows that significant difference existing between resistance training and control group on explosive strength, since the obtained 'F' ratio of 111.46 for adjusted posttest means was greater than the required table value 4.1 for significance at 0.5 level of confidence. The findings of the study shows that there was no significant difference exists between resistance training and control group on cardio vascular endurance, since the obtained 'F' ratio of 0.986 for adjusted posttest means was less than the required table value 4.1 for significance at 0.5 level of confidence. From this study the resistance training has its influence in the performance related variable explosive strength and has no influence on cardio vascular endurance among untrained men.

Conclusion

Based on the results of the study,

- It is concluded that there was a significant difference between resistance training group and control group on explosive strength and cardio vascular endurance.
- It is concluded that there was no significant difference between resistance training group and control group on cardio vascular endurance.

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