



## Effect of Strength Training on Strength Endurance among Pre Pubescent, Pubescent and Post Pubescent Males

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### Abstract

The purpose of the study was to find out the effect of strength training on variable strength endurance among pre pubescent, pubescent and post pubescent males. To achieve this purpose fifteen ( $n = 15$ ) male pre pubescent (age 9-12 years), fifteen ( $n = 15$ ) male pubescent (age 13-18 years) were randomly selected from Sri Ramakrishna Higher Secondary School, Chidambaram, Tamil Nadu, India and fifteen ( $n = 15$ ) male post pubescent (age 19-25 years) from Faculty of Arts, Annamalai University, Annamalai Nagar were randomly selected as subjects for this study ( $N = 45$ ). The selected subjects were assigned as Group I pre pubescent (PP), Group II pubescent (PU) and Group III post pubescent (POP) respectively. All the three groups underwent strength training. A written consent was obtained from the subjects. However, they were free to withdraw their consent in case they felt any discomfort during the period of their participation, but there were no dropouts in this study. The selected criterion variable namely strength endurance was assessed before and after the training period. The data collected from experimental group I, group II and group III prior to and after the completion of the training period were statistically analysed for significant difference if any, by applying dependent 't' test. The paired mean gains of experimental groups were tested for significance by applying independent 't' ratio. The level of confidence was fixed at 0.05 level.

**Keywords:** Strength training, Strength variable and Strength endurance.

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### Introduction

Man has to do physical activities for proper growth and development and also to maintain good health. Muscular strength is the fundamental motor quality and all other physical and motor variables depend on strength. The development of physical efficiency for different types of sports and games is of great significance and requires a great deal of careful selection, specificity and training. Through the use of these modes, the athletes of the developed countries have attained a very high level of skill and performance proficiency. Strength training, or strength training, is for everyone. It is an important tool for achieving a complete healthy life. Strength training is essential for athletes, who want to build or tone muscle. Strength training has two different meanings – a more broad meaning refers to any training that uses a strength to the force of muscular contraction (better termed strength training), and specific type of strength training that uses elastic or hydraulic strength. Strength training works by causing microscopic damage or tears to the muscle cells, which in turn are quickly repaired by the body to help the muscles to regenerate and grow stronger. The breakdown

of the muscle fiber is called "catabolism", and the repair and re-growth of the muscle tissue is called "anabolism". Anabolic means to grow, and that's exactly what happens after break down of muscle fibers with strength exercise. In fact, many biological processes of growth in the body require some breakdown, or catabolism, prior to re-growth. The testosterone, insulin, growth hormone, protein, and other nutrients rush to the muscle after a strength-exercise session to repair the muscles and make them stronger. Importantly, the muscles heal and grow when they aren't working out, and so that's why it's necessary to leave time between workouts for recovery.

According to Hooks (1988) strength is the key to success in sports and games. The value of strength in athletics is not a new idea. There is a vast need for every one for a better understanding of strength. The primary objective in strength training is not to learn to lift as much strength as possible but to increase strength for application to the relevant sport. This is possible only when the coaches and physical education teachers use the correct and the most beneficial and economical means to train their sportsmen. Strength in the form of explosive power is used more in sports and games competition. Whenever an athlete has to accelerate himself, an external object, or both, his ability to generate force with speed will be a primary determinant of his success. Strength and speed are integral components of fitness found in varying degrees in

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virtually in all athletic movements. Simply put the combination of strength and speed is power. Power represents the one component of athletic fitness that may be most indicative of success in sports, requiring extreme and rapid force production. Maximal strength and power are not distinct entities, they have a hierarchical relationship with one another. Maximum strength is the basic quality that influences power performance. Power performance is affected by the interaction between agonist, antagonist and synergic muscles involved in joint movements

### Methodology

The purpose of the study was to find out the effect of strength training on selected strength variable strength endurance among pre pubescent, pubescent and post pubescent males. To achieve this purpose fifteen (n = 15) male pre pubescent (age 9-12 years), fifteen (n = 15) male pubescent (age 13-18 years) were randomly selected from Sri Ramakrishna Higher Secondary School, Chidambaram, Tamil Nadu, India and fifteen (n = 15) male post pubescent (age 19-25 years) from Faculty of Arts, Annamalai University, Annamalai Nagar were randomly selected as subjects for this study (N = 45). The

selected subjects were assigned as Group I pre pubescent (PP), Group II pubescent (PU) and Group III post pubescent (POP) respectively. All the three groups underwent strength training. A written consent was obtained from the subjects. However, they were free to withdraw their consent in case they felt any discomfort during the period of their participation, but there were no dropouts in this study. The selected criterion variable namely strength endurance was assessed before and after the training period. The data collected from experimental group I, group II and group III prior to and after the completion of the training period were statistically analysed for significant difference if any, by applying dependent 't' test. The paired mean gains of experimental groups were tested for significance by applying independent 't' ratio. The level of confidence was fixed at 0.05 level.

### Strength Endurance (Pull-ups)

The mean, standard deviation and dependent 't' ratio on the data obtained for strength endurance of pre and post-test of pre pubescent (PP), pubescent (PU) and post pubescent (POP) groups have been presented in Table I.

**Table I.** Mean, standard deviation and 't' ratio on strength endurance for pre and post test strength training of pre pubescent, pubescent and post pubescent males

Groups		Mean	S.D	DM	't'-ratio
Pre Pubescent Group	Pre-test	1.86	0.83	1.80	12.43
	Post-test	3.60	0.61		
Pubescent Group	Pre-test	4.46	0.83	4.4	16.14
	Post-test	8.86	1.59		
Post Pubescent Group	Pre-test	4.93	1.09	6.33	15.89
	Post-test	11.26	2.25		

The table value required for significant for df 14 is 2.14.

Table I shows the mean value of strength endurance before and after the strength training for pre pubescent group were 1.86 and 3.66 respectively. The mean difference of 1.80 resulted with a 't' ratio of 12.43. The table value required for significance at 0.05 level for df 14 is 2.14. As the obtained 't' ratio was higher than the table value it was concluded that the strength training has resulted in a significant improvement in strength endurance for pre pubescent group. The pre test mean value of strength endurance of pubescent group was 4.46 and the post test strength endurance was 8.86. The mean difference was 4.4. The obtained 't' ratio was 16.14 and it is higher than the table values 2.14 required for

significance at 0.05 level for df 14. It was inferred that the strength training had caused significant improvement on strength endurance for the pubescent group. The mean value of strength endurance of post pubescent group before the commencement of strength training was 4.93 and after the completion of twelve weeks training the mean was 11.26. It resulted with a mean difference of 6.33. The obtained 't' ratio was 15.89 and it was higher than the table value of 2.14 required for significance at 0.05 level for df 14. It was concluded that the strength training improved the strength endurance of post pubescent boy.

**Table II.** Comparison of mean gain on strength endurance between paired means among pre pubescent, pubescent and post pubescent males

Groups	Mean	S.D	SE	t-ratio
Pre Pubescent	1.80	0.56	0.14	9.62
Pubescent	4.4	1.05	0.27	
Pre Pubescent	1.80	0.56	0.14	11.52
Post Pubescent	6.33	1.54	0.39	
Pubescent	4.4	1.05	0.27	4.10
Post Pubescent	6.33	10.54	0.39	

The table value required for significance for df 28 is 2.05

Table II shows the mean gain for pre pubescent and pubescent group as a result of strength training were 1.80 and 4.40 respectively. It resulted with a 't' ratio of 9.62 and it was higher than the table value of 2.05 required for significant at 0.05 level to the df 28. It is concluded that improvement in strength endurance was significantly higher for pubescent boys than pre pubescent boys. The mean gain for pre pubescent and post pubescent group as a result of strength training were 1.80 and 6.33 respectively. It resulted with a 't' ratio of 11.52 and it was higher than the table value of 2.05 required for significant at 0.05 level to the df 28. It is concluded that improvement in strength endurance was significantly higher for post pubescent boys than pre pubescent boys. The mean gains for pubescent and post pubescent group as a result of strength training were 4.4 and 6.33 respectively. It resulted with a 't' ratio of 4.10 and it was higher than the table value of 2.05 required for significant at 0.05 level to the df 28. It is concluded that improvement in strength endurance was significantly higher for post pubescent boys than pubescent boys. Therefore the results of the study indicate that strength training improved strength endurance for all the three groups namely pre pubescent, pubescent and post pubescent males. It also indicated that the improvement for post pubescent was greater than pubescent and pre pubescent. The improvement for pubescent was significantly greater than pre pubescent.

### Conclusions

Based on the results of the study, it was concluded that strength training improved strength endurance for all the three groups namely pre pubescent, pubescent and post pubescent males. It also indicated that the improvement for post pubescent was greater than pubescent and pre pubescent. The improvement for pubescent was significantly greater than pre pubescent.

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