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Effect of progressive resistance and plyometric training on body composition parameters among adolescent boys

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Abstract

The purpose of the study was to find out the effects of progressive resistance training and plyometric training groups on selected body composition parameters among adolescent boys. To achieve the purpose of the study, sixty (60) adolescent boys were selected randomly as subjects from the St. Francis. Higher Secondary School, Vavarai, Tamil Nadu, India. The selected subjects were randomly assigned into one of three groups of twenty (n=20) each, such as group I underwent progressive resistance training, group II underwent plyometric training and Group III control group who was asked to refrain from any special training except their leisure time pursuit. The duration of training period for 12 weeks and the number of sessions per week was confined to three alternative days, in addition to the regular schedule of the curriculum. The independent variables were progressive resistance training and plyometric training and the dependent variables such as body weight, BMI, Percent body fat were selected for this study. The standardized tests were used to collect relevant data on the selected dependent variables such as weighing machine, BMI method by using peters formula and skin fold caliper respectively. The collected data from the three groups prior to and immediately after the training programme on selected criterion variables were statistically analyzed with dependent 't' test to find out the significant improvement between pre and post- test means of both groups. The level of significance was fixed at .05 levels, which was considered to be appropriate.

Keywords: Resistance training, plyometric training, body weight, BMI and percent body fat

Introduction

Resistance training is defined as an activity that develops and maintains strength, resistance, and muscle mass, and it has been practised by a wide variety of individuals with and without chronic diseases, since it is associated with favorable changes in cardiovascular function, metabolism, coronary artery disease risk factors, and psycho-social well-being. Besides, these exercises stimulate muscle hypertrophy and coordination, showing functional improvement of activities of daily living (Kelley & Kelley, 2009) [4].

Progressive resistance training, particularly in conjunction with regular aerobic exercise, can also have a profound impact on a person's mental and emotional health. Progressive resistance training is important for cardiac health because heart disease risk is lower when the body is leaner. Progressive resistance training programmes can increase fat-free mass and decrease the percentage of body fat.

Plyometric movements, in which a muscle is loaded and then contracted in rapid sequence, use the strength, elasticity and innervations of muscle and surrounding tissues to jump higher, run faster, throw farther, or hit harder, depending on the desired training goal. Plyometrics is used to increase the speed or force of muscular contractions, providing explosiveness for a variety of sport-specific activities. Plyometrics has been shown across the literature to be beneficial to a variety of athletes. Plyometrics consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue (Baechle and Earle, 1994) [1].

Plyometric training bridges the gap between strength and speed. In children and adolescents, it is well-established that training-induced gains in strength and power are indeed possible following participation in a resistance training program. More recent observations suggest that plyometric training may also be safe and effective for children and adolescents provided that age appropriate training guidelines are followed (Chu *et al.*, 2006)^[2].

Methodology

The purpose of the study was to find out the effects of progressive resistance training and plyometric training groups on selected body composition parameters among adolescent boys. To achieve the purpose of the study, sixty (60) adolescent boys were selected randomly as subjects from the St. Francis. Higher Secondary School, Vavarai, Tamil Nadu, India. The selected subjects were randomly assigned into one of three groups of twenty (n=20) each, such as group I underwent progressive resistance training, group II underwent plyometric training and Group III control group who was

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Table I: Dependent 't'- Test Values on Body Weight, BMI and Percent Body Fat of Progressive Resistance Training, Plyometric Training and Control Groups

Variables	Tests	Progressive Resistance Training		Plyometric Training		Control Group	
		Mean	SD	Mean	SD	Mean	SD
Body Weight	Pre test	59.65	5.96	59.75	5.00	60.20	4.61
	Post test	56.60	5.90	57.95	4.94	60.00	4.21
	t-Test	14.44*		13.08*		0.36	
BMI	Pre test	23.00	2.47	23.06	2.30	23.40	1.71
	Post test	20.23	2.56	22.17	2.08	23.45	1.68
	t-Test	13.55*		4.32*		0.27	
Percent Body Fat	Pre test	19.46	3.66	20.00	3.95	19.91	3.43
	Post test	16.35	3.50	17.60	3.24	19.05	3.14
	t-Test	18.90*		11.35*		1.57	

*Significant at .05 level. The table value required at .05 level with df 19 is 2.09.

Table I shows that the obtained dependent t-test values of body weight, BMI, Percent body fat between pre-test and post test means of progressive resistance training, plyometric training and control groups are 14.44, 13.08, 0.36; 13.5, 4.32, 0.27; and 18.90, 11.35, 1.57 respectively. The table value required for significant difference with df 19 at .05 level is 2.09. Since, the obtained t-test value of progressive resistance training and plyometric training groups is greater than the table value, it is understood that progressive resistance

training and plyometric training programme had significantly improved the performance of body weight, BMI, Percent body fat and the control group has not improved as the obtained t-test value was lesser than the table value because they were not subjected to any specific training. Pre and post test means of progressive resistance training, plyometric training and control groups on body weight, BMI, Percent body fat are graphically represented in Figure-1.

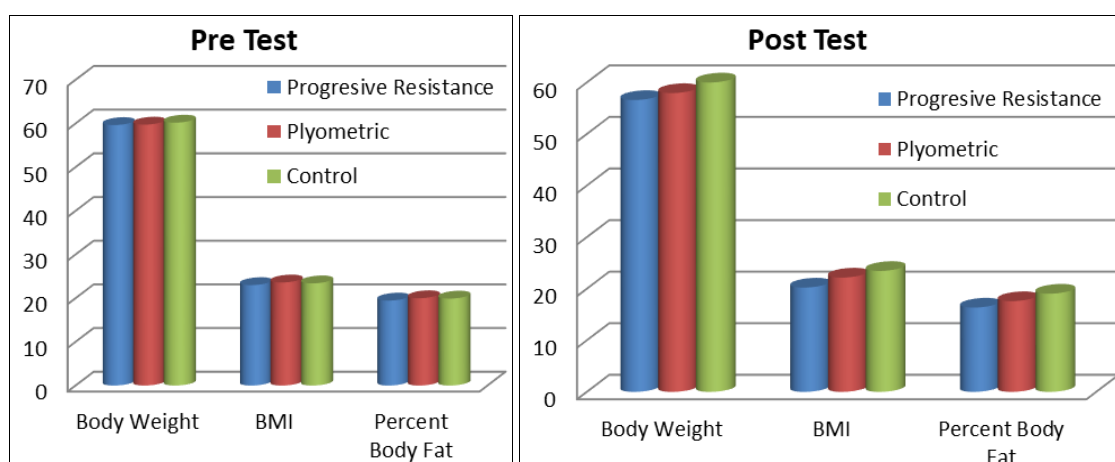


Fig 1: Pre and Post Test Means of Progressive Resistance Training, Plyometric Training and Control Groups on Body Weight, BMI, Percent Body Fat

Discussion on Findings

The result of the study indicated that the progressive resistance training improved the selected body composition

parameters such as body weight, BMI and percent body fat. The findings of the present study had similarity with the findings of David *et al.*, (2002)^[3] and Yarrow *et al.*, (2008)^[5].

Conclusions

The results of the study reveals that the body weight, BMI and percent body fat had shown significant improvement due to training effects of progressive resistance training and plyometric training programmes. The effect of the progressive resistance training was much greater than plyometric training on improving the body weight, BMI and percent body fat among adolescent boys. The result indicates that the control group does not shown any improvement on any of the selected body composition parameters.

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