EFFECT OF OWN BODY ISOMETRIC TRAINING ON SELECTED STRENGTH VARIABLES AMONG PREADOLESCENCE

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Abstract: The purpose of the study was to find out the effect of own body isometric training on selected strength variables among preadolescence. To achieve the purpose of this study, 30 preadolescence boys were selected as subjects at randomly from Government Higher Secondary School, Alangulam, Tamilnadu, India. Their age was 13 and 14 years only. The selected subjects were randomly divided into two groups, such as group 'A' own body isometric training (n=15) group and group 'B' acted as control group (n=15). Group 'A' underwent own body isometric training for three alternative days per week and each session lasted for an hour for six weeks. Control group was not exposed to any specific training but they were participated in regular activities. The abdominal strength was assessed by bent knee sit-ups test method (in numbers) and back strength was assessed by isometric back strength test (in seconds) were selected as variables. The pre and post tests data were collected on selected criterion variables prior to and immediately after the training program. The pre and post-test scores were statistically examined by the dependent "t" test and Analysis of co-variance (ANCOVA). The level of significant was fixed at 0.05 level. It was concluded that the own body isometric training group had shown significantly improved on abdominal strength and back strength. However the control group had not shown any significant improvement on abdominal strength and back strength.

Index Terms: ***Own Body Isometric Training, Abdominal Strength, Back Strength, Preadolescence***

I. INTRODUCTION

Good health and fitness cannot be taken for granted, especially with today's sedentary and automated life-styles [1]. Training is primarily a systematic athletic activity of long duration, which is progressively and individually graded. Training adaptation is sum of transformations brought about by systematically repeating exercise [2]

In the broad sense sports training is the entire systematic process of preparation of athletes for highest levels of athletic performance. It comprises all those learning influences and processes, including self-tuition by the athlete, which are aimed at improving performance [3]. Isometric exercise or isometrics are a type of strength training in which the joint angle and muscle length do not change during contraction (compared to concentric or eccentric contractions, called dynamic/isotonic movements). Isometrics are done in static positions, rather than being dynamic through a range of motion [4].

Isometric own body exercise is a building muscle and strength using nothing but self-resistance is possible. Here's how. Isometric exercises use the principle of the isometric contraction in order to build muscle and strength without moving a muscle. Isometric Exercises for Muscle Building and Strength Training is a modern take on this time proven discipline that will help you attain the body of your dreams in less than hour a day [5].Preadolescence, also known as pre-teen or tween is a stage of human development following early childhood and preceding adolescence. It commonly ends with the beginning of puberty, but may also be defined as ending with the start of the teenage years. For example, dictionary definitions generally designate it as 10–13 years. Preadolescence can bring its own challenges and anxieties [6].

Strength gains with training during adolescence The trainability of strength during adolescence is less contentious and, while the general patterns of strength development with training generally parallels that of adults, the magnitude of improvements may not necessarily be the same. With dynamic weight training, it appears that the strength gains are directly related to the frequency, intensity and duration of training. Nevertheless, as with the pre-adolescent population, data on girls are notably sparse and the optimal training stimulus for maximum strength gains has not yet been determined [7].

II. PURPOSE OF THE STUDY

The purpose of the present study was to find out the effect of own body isometric training on selected strength variables among preadolescence

III. METHODOLOGY

To achieve the purpose of this study, 30 male preadolescence were selected as subject at randomly from Government Higher Secondary School, Alangulam, Tamilnadu, India. Their age was 13 and 14 years only. The selected subjects were randomly divided into two groups such as group 'A' own body isometric training group (n=15) and group 'B' acted as control

group (n=15). Group 'A' underwent own body isometric training for three alternative days per week and each session lasted for an hour for six weeks of training. Control group was not exposed to any specific training but they were participated in regular activities. The abdominal strength was assessed by bent knee sit-ups test (in numbers) and back strength was assessed by isometric back strength test (in seconds) were selected as variables. The pre and post tests data were collected on selected criterion variables prior to and immediately after the training program. The pre and post-test scores were statistically examined by the dependent "t" test and analysis of co-variance (ANCOVA). The level of significant was fixed at 0.05 level of confidence.

IV. ANALYSIS OF DATA

The effect of own body isometric training on abdominal strength and back strength were analyzed and presented below,

4.1 Abdominal Strength

Table 4.1: Summary of mean and dependent't'-test for the pre and post tests on abdominal strength of experimental and control groups (bent knee sit-ups test in numbers)

Tests		Pre Test	Post Test	't' - Value
Experimental Group	Mean	16.27	23.07	12.03*
	SD	2.01	1.91	
Control Group	Mean	16.40	17.00	0.84
	SD	2.44	2.10	

Significant at .05 level. The table value required for 0.05 level of significance with df 14 is 2.15.

The table 4.1 shows that the pre-test mean value of experimental group and control group are 16.27 and 16.40 respectively and the post test means are 23.07 and 17.00 respectively. The obtained dependent t-ratio values between the pre and post test means of experimental and control groups are 12.03 and 0.84 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. Since, the obtained 't' ratio value of experimental group are greater than the table value, it is understood that experimental group had significantly improved on abdominal strength. However, the control group had not improved significantly. The 'obtained t' value is less than the table value, as they were not subjected to any specific training.

The analysis of covariance on abdominal strength of experimental and control groups have been analysed and presented in table 4.2.

Table 4.2: adjusted post test mean scores and analysis of covariance on abdominal strength between experimental and control groups

Adjusted Post Test Means		Source of Variance	Sum of Square	df	Means Square	F-ratio
Experimental Group	Control Group					
23.08	16.99	Between	278.08	1	278.08	**69.69***
		With in	107.85	27	3.99	

Significant at .05 level. The table value required for significance at 0.05 level with df 1 and 27 is 4.21.

Table 4.2 shows that the adjusted post test means of experimental and control groups are 23.08 and 16.99 respectively. The obtained F-ratio value is 69.69 which were greater than the table value 4.21 with df 1 and 27 required for significance at 0.05 level of confidence. Since the value of F-ratio is greater than the table value, it indicates that there is a significant difference among the adjusted post-test means of experimental and control groups. The mean values of experimental group and control group on abdominal strength were graphically represented in the figure 4.1.

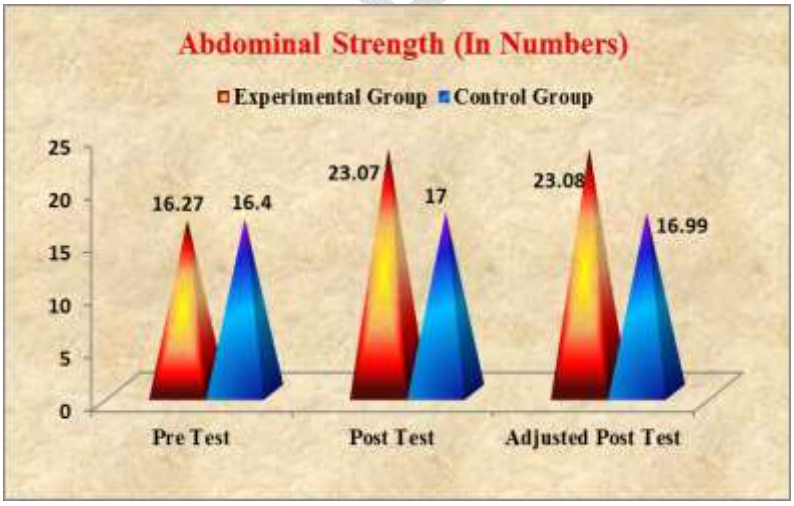

Fig-4.1: Mean values and adjusted post mean values of experimental and control groups on abdominal strength

4.2 Back Strength

Table 4.3: Summary of mean and dependent't'-test for the pre and post tests on back strength of experimental and control group (isometric back strength test in seconds)

Tests		Pre Test	Post Test	't' - Value
Experimental Group	Mean	79.25	98.06	8.26*
	SD	8.51	6.01	
Control Group	Mean	81.90	82.67	0.27
	SD	8.02	5.74	

*****Significant at .05 level. The table value required for 0.05 level of significance with df 14 is 2.15.*

The table 4.3 shows that the pre-test mean value of experimental and control group are 79.25 and 81.90 respectively and the post test means are 98.06 and 82.67 respectively. The obtained dependent t-ratio values between the pre and post test means of experimental and control groups are 8.26 and 0.27 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. Since, the obtained 't' ratio value of experimental group are greater than the table value, it is understood that experimental group had significantly improved on back strength. However, the control group had not improved significantly. The 'obtained t' value is less than the table value, as they were not subjected to any specific training.

The analysis of covariance on back strength of experimental and control groups have been analysed and presented in table 4.4,

Table 4.4: adjusted post test mean scores and analysis of covariance on back strength of experimental and control groups

Adjusted Post Test Means		Source of Variance	Sum of Square	df	Means Square	F-ratio
Experimental Group	Control Group					
98.17	82.56	Between	1780.29	1	1780.29	42.71*
		With in	1125.21	27	41.68	

*****Significant at .05 level. The table value required for significance at 0.05 level with df 1 and 27 is 4.21.*

Table 4.4 shows that the adjusted post test means of experimental and control groups are 98.17 and 82.56 respectively. The obtained F-ratio value is 42.71 which is greater than the table value 4.21 with df 1 and 27 required for significance at 0.05 level of confidence. Since the value of F-ratio is greater than the table value, it indicates that there is a significant difference among the adjusted post-test means of experimental and control groups.

The mean values of experimental and control groups on back strength were graphically represented in the figure 4.2.

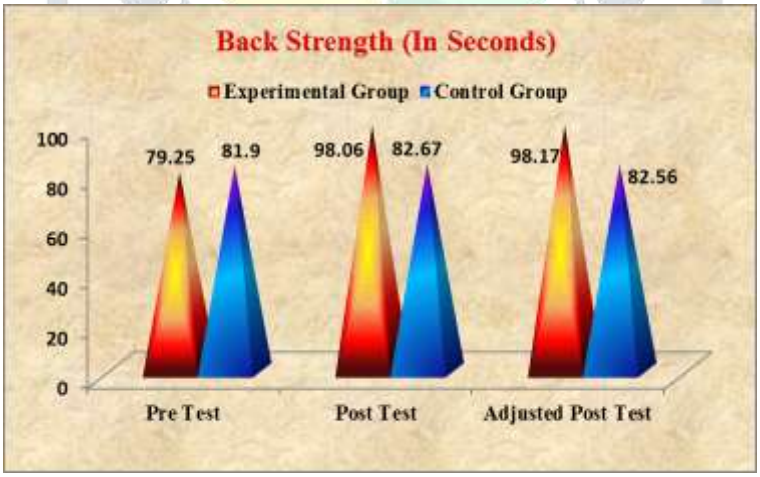

Figure 4.2: Mean values and adjusted post mean values of experimental and control groups on back strength

V. DISCUSSION AND FINDINGS

Tarnanen, Ylinen, Siekkinen, Mälkiä, Kautiainen, & Häkkinen, (2008) conducted a study on isometric exercises for the upper extremities could sufficiently activate core stabilizing muscles to increase muscle strength. The study concluded that these isometric exercises elicit sufficient levels of contraction of the trunk muscles for the development of their endurance and strength characteristics.

Granacher, Gollhofer, & Kriemler, (2010) investigated the effects of balance training on postural sway, leg extensor strength, and jumping height in adolescents. Balance training resulted in significantly improved postural control, increased jumping height, and enhanced rate of force development of the leg extensors. Physiological adaptations rather than learning effects seem to be responsible for the observed findings. These results could have an impact on improving the performance level

in various sports and on reducing the injury prevalence of the lower extremities. Arumugam, S. (2016) conducted a study on impact of mobility training on selected physical variables among soccer players. The conclusion of the study was leg strength shown significant improvement from the training.

Behringer, Heede, Matthews & Mester, (2011) delineated resistance training in children and adolescents to be effective and safe. These results emphasize that resistance training provides an effective way for enhancing motor performance in children and adolescents.

VI. CONCULSIONS

1. There was significant improvement on abdominal strength and back strength due to the effect of own body isometric training among preadolescence.
2. However the control group had not shown any significant improvement on any of the selected variables such as abdominal strength and back strength among preadolescence.

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