EFFECT OF VARIOUS STRENGTH TRAINING PROGRAMMES ON SELECTED PHYSICAL AND PERFORMANCE VARIABLES AMONG MALE ATHLETES

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Abstract

The purpose of the study was to find out the effect of various strength training programmes on selected physical and performance variables namely agility, muscular strength, explosive strength, flexibility, 100meter dash among male athletes. To achieve the purpose of the study thirty male athletes have been randomly selected from various colleges in the state of Tamil Nadu, India. The age of subjects were ranged from 18 to 25 years. The subjects had past experience of at least three years in athletes and only who those represented their respective college teams were taken as subjects. A series of physical fitness tests was carried out on each participant. This included agility assessed by 'T' agility run test, muscular strength assessed by sit ups, explosive strength assessed by standing broad jump, flexibility assessed by sit and reach, performance assessed by 100 meter sprint. The subjects were randomly assigned into two groups of fiften each, such as experimental and control groups. The experimental group participated in the various strength training programmes for 3 days a week, one session per day and for 8 weeks each session lasted 45 minutes. The control group maintained their daily routine activities and no special training was given. The subjects of the two groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups. The results of the study showed that there was significant differences exist between various strength training programmes group and control group. And also various strength training programmes group showed significant improvement on agility, muscular strength, explosive strength, flexibility, 100meter sprint compared to control group.

Key words: strength training, muscular strength, explosive strength, flexibility

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Introduction

Weight training is a common type of strength training for developing the strength and size of skeletal muscles. It uses the force of gravity (in the form of weighted bars, dumbbells or weight stacks) to oppose the force generated by muscle through concentric or eccentric contraction. Weight training uses a variety of specialized equipment to target specific muscle groups and types of movement. Weight training differs from bodybuilding, Olympic weightlifting, power lifting, and strongman, which are sports rather than forms of exercise. Weight training, however, is often part of the athlete's training regimen.

Resistance training as a term is actually applicable to all forms of strength training, as resistance can come from a variety of forces, including overcoming inertia, momentum, or acceleration from gravity. In a more specific usage (which excepts weight resistance training) it refers to 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 muscle and increase bone mass (http://en.wikipedia.org/wiki/Wikipedia).

Each sports activity demands difference types and level of different motor abilities, and when a sports man possesses these he is said to have the specific physical fitness of various abilities, regardless of any sport which this sportsman possesses. The contribution of physical fitness towards sports performance is indirect. But it never should be overlooked that

specific physical fitness depends largely on general physical fitness **(singh, 1991)**

Athletics is an exclusive collection of sporting events that involve competitive running, jumping, throwing, and walking. The most common types of athletics competitions are track and field, road running, cross country running, and race walking. The simplicity of the competitions, and the lack of a need for expensive equipment, makes athletics one of the most commonly competed sports in the world. Athletics is mostly an individual sport, with the exception of relay races and competitions which combine athletes' performances for a team score, such as cross country.

Methods and Materials

The purpose of the study was to find out the effect of various strength training programmes on selected physical and performance variables namely agility, muscular strength, explosive strength, flexibility, 100meter dash among male athletes. To achieve the purpose of the study thirty male athletes have been randomly selected from various colleges in the state of Tamil Nadu, India. The age of subjects were ranged from 18 to 25 years. The subjects had past experience of at least three years in athletes and only who those represented their respective college teams were taken as subjects. A series of physical fitness tests was carried out on each participant. This included agility assessed by 'T' agility run test, muscular strength assessed by sit ups, explosive strength assessed by standing broad jump, flexibility assessed by sit and reach, performance assessed by 100 meter sprint. The subjects were randomly assigned into two groups of fifteen each, such as experimental and control groups. The experimental group participated in the various strength training programmes for 3 days a week, one session per day and for 8 weeks each session lasted 45 minutes. The control group maintained their daily routine activities and no special training was given. The subjects of the two groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups.

TABLE-I
Criterion measures

S.No	Criterion measure	Test items	Unit of measurement
1	Agility	T' agility run test	In seconds
2	Muscular strength	Sit-ups	In count
3	Explosive strength	Standing broad jump	In centimeters
4	Flexibility	sit and reach	In centimeters
5	100 meter dash	100 meter run	In seconds

TABLE – II

Descriptive analysis of selected physical and psychological variables among control and experimental groups

S.No	Variables	Group	Pre-Test Mean	SD (±)	Post –Test Mean	SD (±)	Adjusted Mean
1	Agility	CG	12.26	0.09	12.17	0.09	12.18
		STPG	12.29	0.07	11.93	0.24	11.92
2	Muscular strength	CG	33.60	1.84	37.73	5.47	37.68
		STPG	32.53	2.64	43.26	3.08	43.31
3	Explosive strength	CG	1.85	0.29	1.83	0.28	1.81
		STPG	1.74	0.29	2.01	0.10	2.03
4	Flexibility	CG	19.53	1.45	20.40	0.82	20.42
		STPG	19.73	1.09	22.66	1.67	22.64
5	100 meter dash	CG	13.11	0.16	13.07	0.12	13.07
		STPG	13.14	0.11	12.95	0.18	12.94

STPG= Strength training programme group CG= Control group

The tables-II the pre, post-test means, standard deviations and adjusted means on selected physical and performance variables of male athletes were numerical presented. The analysis of covariance on selected variables of strength training programme group and control group is presented in table – III

TABLE – III

Computation of analysis of covariance on selected physical and performance variables among male athletes

S.No	variables	Test	Sum of variance	Sum of squares	df	Mean square	F ratio
1	Agility	Pre-test	Between groups	0.004	1	0.004	0.54
			Within groups	0.20	28	0.007	
		Post-test	Between groups	0.42	1	0.42	12.48
			Within groups	0.95	28	0.03	
		Adjusted means	Between sets	0.49	1	0.49	16.64
			Within sets	0.80	27	0.03	
2	Muscular strength	Pre-test	Between groups	8.53	1	8.53	1.64
			Within groups	145.33	28	5.19	
		Post-test	Between groups	229.63	1	229.63	11.65
			Within groups	551.86	28	19.71	
		Adjusted means	Between sets	225.18	1	225.18	11.04
			Within sets	550.46	27	20.38	
3	Explosive strength	Pre-test	Between groups	0.08	1	0.08	1.02
			Within groups	2.40	28	0.08	
		Post-test	Between groups	0.24	1	0.24	5.48
			Within groups	1.26	28	0.04	
		Adjusted means	Between sets	0.34	1	0.34	9.07
			Within sets	1.01	27	0.03	
4	Flexibility	Pre-test	Between groups	0.30	1	0.30	0.18
			Within groups	46.66	28	1.66	
		Post-test	Between groups	38.53	1	38.53	22.04
			Within groups	48.93	28	1.74	
		Adjusted means	Between sets	36.92	1	36.92	21.20
			Within sets	47.01	27	1.74	
5	100 meter dash	Pre-test	Between groups	0.006	1	0.006	0.28
			Within groups	0.55	28	0.02	
		Post-test	Between groups	0.11	1	0.11	4.497
			Within groups	0.71	28	0.02	
		Adjusted means	Between sets	0.11	1	0.11	4.457
			Within sets	0.70	27	0.02	

*Significant at 0.05level of confidences

(Table value for df 1 and 28 was 4. 20, Table value for df 1 and 27 was 4.21)

The obtained F-ratio of 16.64 for adjusted mean was greater than the table value 4.21 for the degree of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among control and experimental groups on agility. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on agility.

The obtained F-ratio of 11.04 for adjusted mean was greater than the table value 4.21 for the degree of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among control and experimental groups on muscular strength. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on muscular strength.

The obtained F-ratio of 9.07 for adjusted mean was greater than the table value 4.21 for the degree of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among control and experimental groups on explosive strength. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on explosive strength.

The obtained F-ratio of 21.20 for adjusted mean was greater than the table value 4.21 for the degree of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among control and experimental groups on flexibility. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on flexibility.

The obtained F-ratio of 4.45 for adjusted mean was greater than the table value 4.21 for the degree of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among control and experimental groups on 100meters dash. The above table also indicates that pre test of control and experimental groups did not differ significantly and post test of control and experimental groups have significant difference on 100meters dash.

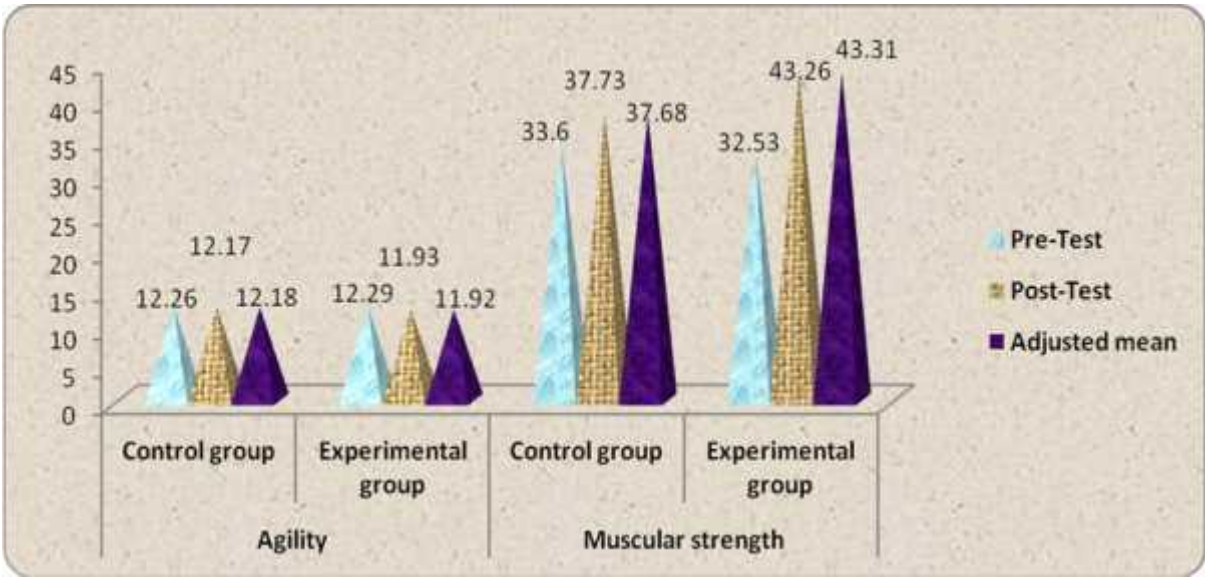

Figure-I The pre, post and adjusted mean values of agility, muscular strength of both control and experimental groups are graphically represented in the figure-I

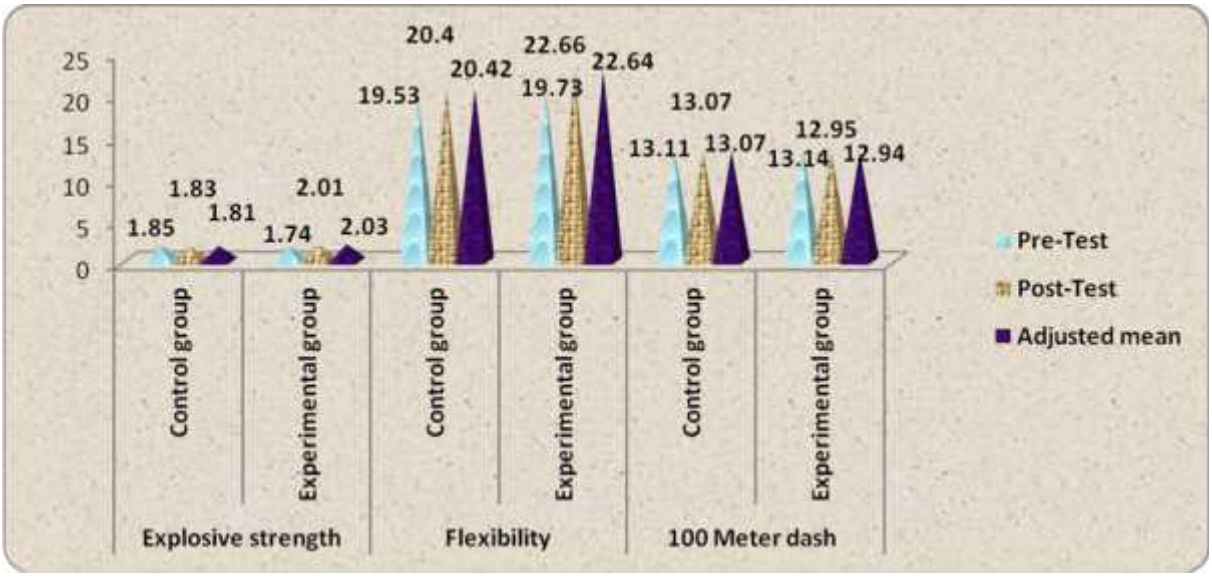

Figure-II The pre, post and adjusted mean values of explosive strength, flexibility, 100 meter dash of both control and experimental groups are graphically represented in the figure-II.

Discussion of findings

The results of the study indicate that the experimental group which underwent strength training programme had showed significant improved in the selected variables namely such as agility, muscular strength, explosive strength, flexibility, 100meter dash when compared to the control group. The control did not show significant improvement in any of the selected variables. The past study on selected physical and performance variables also reveals Dibble LE, et (2006). Kanehisa et.al (2002).

Conclusions

From the analysis of data, the following conclusions were drawn.

1. The experimental group athletes showed significant improvement in all the selected physical and performance variables such as agility, muscular strength, explosive strength, flexibility, and 100meter dash.
2. The control group athletes did not show significant improvement in any of selected variables.

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