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Effect of Varied Intensities and Frequencies of Weight Training On Selected Motor Fitness and Phsiological Variables among Athletes

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Abstract
Sports in the present world has become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and psychology excetera. All the coaches, trainers, physical educational personals and doctors are doing their best to improve the performance of the players of their country. Athlete players of all the countries are also trying hard to bring laurels, medals for their countries in International competitions.

Key Words*: Weight training, Motor variables, District Athletes (Tiruvannamalai)*

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I. Introduction

This study was designed to find out the effects of varied intensities and frequencies of weight training on selected motor fitness and physiological variables among athlete. This is an experimental research to achieve the purpose of the study. he purpose of the study was to find out the effects of varied intensity and frequencies of weight training on The selected motor ability components and physiological variables among athletes.

To achieve the purpose of this study, sixty athletes who represented their schools at Thiruvannamalai District Sports Meet were randomly selected as subjects. The selected subjects' age group was ranging from sixteen to eighteen years. The subjects were randomly divided into three groups and each group consists of twenty subjects. Group one acted as experimental group I and Group two acted as experimental group II and group three acted as control group. Control group was not given any exposure. Experimental Group I underwent High Intensity and Low frequency (HILF) of weight training and Experimental group II under went low intensity and high frequency (LIHF) of weight training for twelve weeks.

SELECTION OF VARIABLES

Motor Ability Components

1. Speed
2. Explosive Power

Independent Variables

1. 80% of 1 RM Intensity for two days in a week (High Intensity with Low Frequency) for twelve weeks.
2. 60% of 1 RM Intensity for three days in a week for (Low Intensity with High Frequency) twelve weeks.

EXPERIMENTAL DESIGN

The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of twenty athletes each. The groups were assigned as Experimental Groups I, II and control group respectively. Pre tests were conducted for all the subjects on selected motor fitness and physiological variables such as speed, explosive power and selected weight training exercises were selected for the study and 1 RM (Repetition Maximum) of the weight training exercises were determined for experimental group subject. The experimental groups participated in their respective high intensity (80% of 1 RM) low frequency (2 days per week) weight training and low intensity (60% of 1 RM) and high frequency (3 days per week) weight training a period of twelve weeks.

The post tests were conducted on the above said dependent variables after the experimental period of twelve weeks for all the three groups. The difference between the initial and final scores of the subjects on each variable was the effect of respective treatments. Statistical significance was tested through applying ANCOVA.

II. Conclusion

This is evident that weight training is beneficial for the improvement of physical as well as physiological variable among the athlete. The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of twelve athletes each. The groups were assigned as Experimental Groups I, II and control group respectively. Pre tests were conducted for all the subjects on selected motor fitness and physiological variables such as speed, explosive power, endurance, arm strength. The experimental groups participated in their respective high intensity (80% of 1 RM) low frequency (2 days per week) weight training and low intensity (60% of 1 RM) and high frequency (3 days per week) weight training for a period of twelve weeks. The post tests were conducted on the above said dependent variables after the experimental period of twelve weeks for all the three groups. The difference between the initial and final scores of the subjects on each variable was the effect of respective treatments. Statistical significance was tested through applying ANCOVA.

TEST OF SIGNIFICANCE

This is the vital portion of the thesis achieving the conclusion by examining the hypotheses. The procedure of testing the hypotheses was either by accepting the hypotheses or rejecting the same in accordance with the results obtained in relation to the level of confidence.

LEVEL OF SIGNIFICANCE

The subjects were compared on the effect of varied intensities and frequencies of weight training on selected motor fitness and physiological variables among athletes. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the groups on selected criterion variables. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as appropriate.

COMPUTATION OF ANALYSIS OF COVARIANCE AND POST HOC TEST

RESULTS ON SPEED

The statistical analysis comparing the initial and final means of Speed due to High Intensity and Low Frequency (HILF) weight training and Low Intensity and High Frequency (LIHF) weight training on selected motor fitness variable Speed among athletes in the below

Table 1

	HILF TRG GROUP I	LIHF TRG GROUP	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	2.24	2.29	2.19	Between	0.09	2	0.05	2.46
				Within	1.07	57	0.02	
Post Test Mean	2.27	2.34	2.18	Between	0.26	2	0.13	6.79*
				Within	1.07	57	0.02	
Adjusted Post Test Mean	2.27	2.29	2.22	Between	0.04	2	0.02	11.48*
				Within	0.11	56	0.002	
Mean Diff	0.03	0.05	-0.01					

HILF: High Intensity Low Frequency; LIHF : Low Intensity High Frequency Trg: Training
Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.15, 2 and 56 (df) =3.15.
*Significant

As shown in Table 1, the obtained pre test means on Speed on High Intensity Low Frequency (HILF) group was 7.12, Low Intensity High Frequency (LIHF) group was 7.15 and control group was 7.11. The obtained pre test F value was 0.27 and the required table F value was 3.15, which proved that there was no significant difference among initial scores of the subjects.

Scheffe's Confidence Interval Test Scores on Speed
TABLE 2

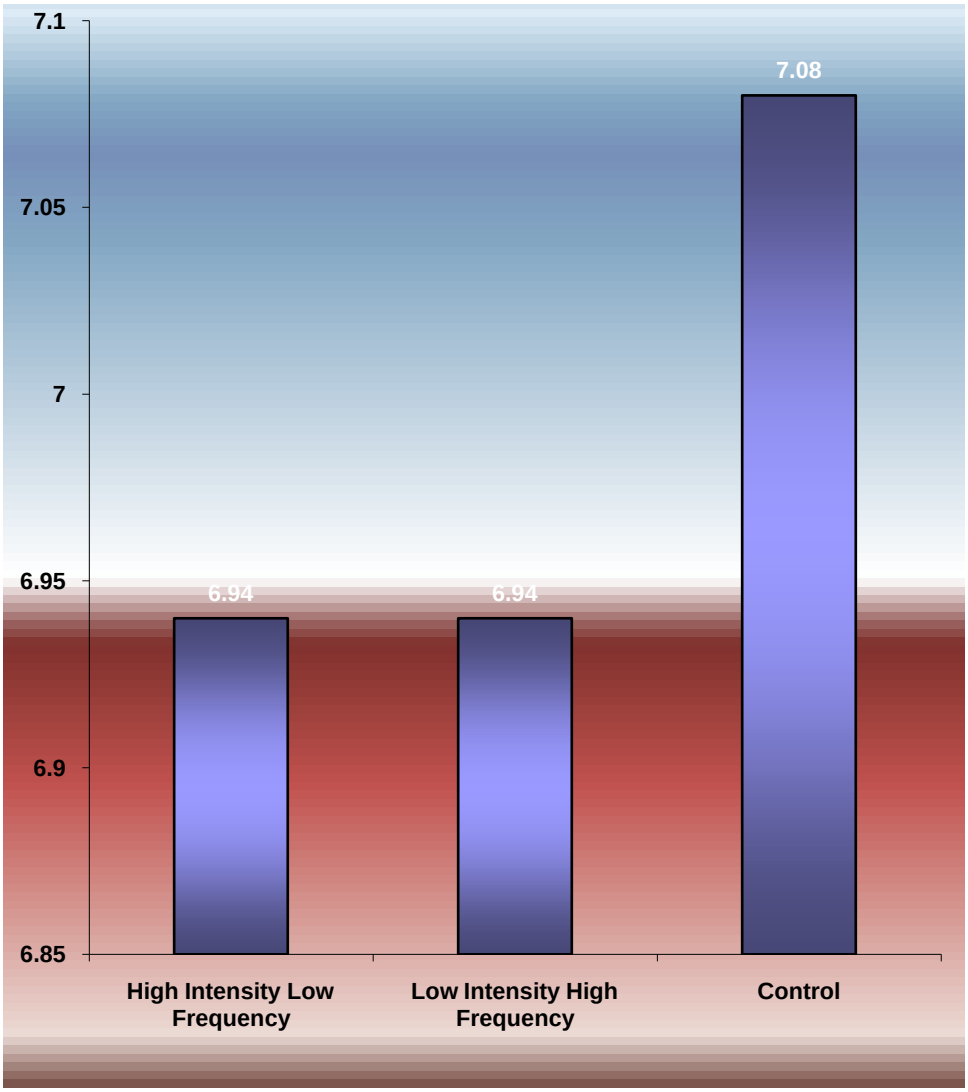
MEANS				Required C1
High Intensity Low Frequency (HILF) Group	Low Intensity High Frequency (LIHF) Group	Control Group	Mean Difference	

6.94	6.94		0.00	0.06
6.94		7.08	0.15*	0.06
	6.94	7.08	0.15*	0.06

Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between High Intensity Low Frequency (HILF) group and control group (MD: 0.15). There was significant difference between Low Intensity High Frequency (LIHF) group and control group (MD: 0.15). There was ingnificant difference between treatment groups, namely, High Intensity Low Frequency (HILF) group and Low Intensity High Frequency (LIHF) group. (MD: 0.00).*****

BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON SPEED
(In Seconds)
FIGURE 1



The findings of this study the varied intensities and frequencies of weight training significantly improved motor fitness variable on explosive power is in agreement with the findings of Rhea MR, et.al. (2009) who assessed the effect of heavy/slow movements and variable resistance training on peak power and strength development and found Variable resistance training with elastic bands appears to provide greater performance benefits with regard to peak force and peak power and speed which resulted in improved explosive power.

RESULTS ON EXPLOSIVE POWER

The statistical analysis comparing the initial and final means of Explosive Power due to High Intensity and Low Frequency (HILF) weight training and Low Intensity and High Frequency (LIHF) weight training on selected motor fitness variable Explosive Power among athletes is presented in the below Table.

COMPUTATION OF ANALYSIS OF COVARIANCE OF EXPLOSIVE POWER
(In Meters)
TABLE 3

	HILF TRG GROUP I	LIHF TRG GROUP	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	2.24	2.29	2.19	Between	0.09	2	0.05	2.46
				Within	1.07	57	0.02	
Post Test Mean	2.27	2.34	2.18	Between	0.26	2	0.13	6.79*
				Within	1.07	57	0.02	
Adjusted Post Test Mean	2.27	2.29	2.22	Between	0.04	2	0.02	11.48
				Within	0.11	56	0.002	
Mean Diff	0.03	0.05	-0.01					

HILF: High Intensity Low Frequency; LIHF: Low Intensity High Frequency Trg: TrainingTable F-ratio at 0.05 level of confidence for 2 and 57 (DF) =3.15, 2 and 56 (DF) =3.15 .
***significant**

The obtained post test means on Explosive Power on High Intensity Low Frequency (HILF) group was 2.27, Low Intensity High Frequency (LIHF) group was 2.34 and control group was 2.18. The obtained post test F value was 6.79 and the required table F value was 3.15, which proved that there was significant difference among initial scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value of 11.48 was greater than the required value of 3.15 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results are presented in the below Table.

Scheffe's Confidence Interval Test Scores on Explosive Power
(In Meters)
TABLE 4

MEANS				Required C1
High Intensity Low Frequency (HILF) Group	Low Intensity High Frequency (LIHF) Group	Control Group	Mean Difference	
2.27	2.29		0.02	0.03
2.27		2.22	0.04*	0.03
	2.29	2.22	0.07*	0.03

***significant**

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between High Intensity Low Frequency (HILF) group and control group (MD: 0.04). There was significant difference between Low Intensity High Frequency (LIHF) group and control group (MD: 0.07). There was insignificant difference between treatment groups, namely, High Intensity Low Frequency (HILF) group and Low Intensity High Frequency (LIHF) group. (MD: 0.02).

The ordered adjusted means are presented through bar diagram for better understanding of the results of this study in Figure.

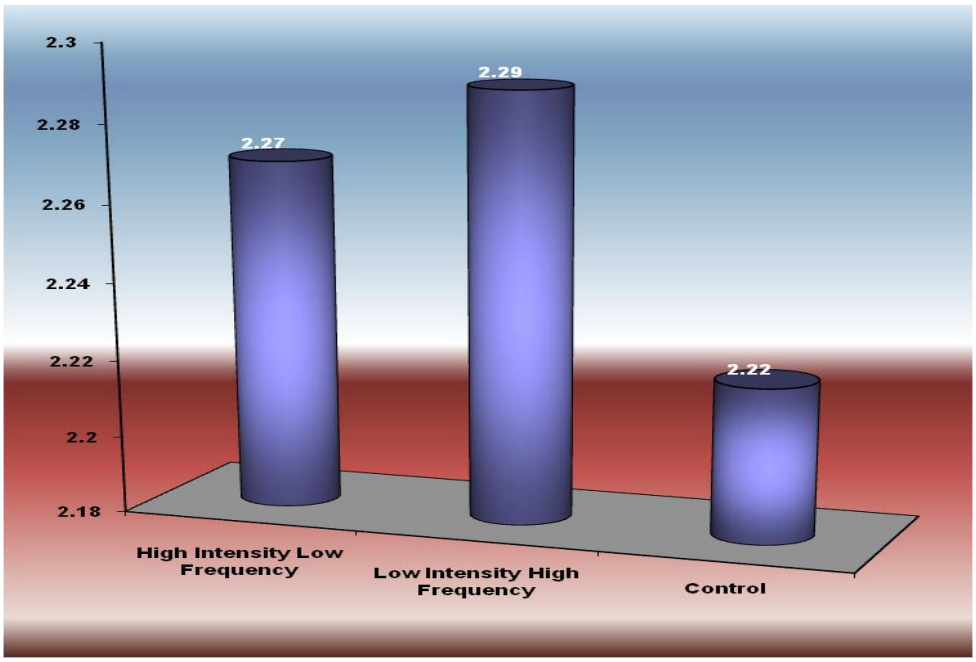


FIGURE 2
BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON EXPLOSIVE POWER(IN METERS)

The effect of High Intensity Low Frequency (HILF) and Low Intensity High Frequency (LIHF) on Explosive Power is presented in Table VI. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value of 11.48 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table VII proved that there was significant difference between High Intensity Low Frequency (HILF) group and control group (MD: 0.04) and Low Intensity High Frequency (LIHF) group and control group (MD: 0.07). Comparing between the treatment groups, it was found that there was insignificant difference between High Intensity Low Frequency (HILF) and Low Intensity High Frequency (LIHF) group among male athletes.

The findings of this study the varied intensities and frequencies of weight training significantly improved motor fitness variable on explosive power is in agreement with the findings of Rhea MR, et.al. (2009) who assessed the effect of heavy/slow movements and variable resistance training on peak power and strength development and found Variable resistance training with elastic bands appears to provide greater performance benefits with regard to peak force and peak power and speed which resulted in improved explosive power.

III. CONCLUSIONS

Wight training can provide significant functional benefits and improvement in overall health and well-being, including increased bone, muscle, tendon and ligament strength and toughness, improved joint function, reduced potential for injury, increased bone density, a temporary increase in metabolism, improved cardiac function, and elevated HDL (good) cholesterol. Training commonly uses the technique of progressively increasing the force output of the muscle through incremental increases of weight, elastic tension or other resistance, and uses a variety of exercises and types of equipment to target specific muscle groups.

1. It was concluded that varied intensities and frequencies of weight training (HILF and LIHF) significantly improved in selected motor fitness variable such as speed of the athletes compared to control group. And there was no significant difference between experimental groups in altering speed of the athletes.
2. It was concluded that varied intensities and frequencies of weight training (HILF and LIHF) significantly improved in selected motor fitness variable such as explosive power of the athletes compared to control group. And there was no significant difference between experimental groups in altering explosive power of the athletes.

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