



Effect of Varied Intensities of Weight Training on Selected Power Parameters among Untrained Women

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Abstract

The purpose of the study was to find out the effects of varied intensities of weight training on selected power parameters. To achieve this purpose of the study 60 untrained women studying in the faculty of arts and science, Annamalai University, Chidamdaram were selected as subjects at random. Their age ranged between 18 to 24 years. The selected subjects were divided into four equal groups of fifteen each. The experimental group - I underwent high intensity weight training, group - II underwent medium intensity weight training, group -III underwent low intensity weight training for three days per week for twelve weeks whereas the group -IV act as control group. The following variable namely elastic power, Explosive power in terms of horizontal and Explosive power in terms of Vertical was selected as criterion variable. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significant difference, if any among the groups. Whenever the obtained "F" ratio was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean difference, if any. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate. The results of the study showed that there was a significant difference exists among high, medium, low intensity weight training groups and control group on strength parameters. And also high intensity weight training group, medium intensity weight training group and low intensity weight training group showed significant improvement on power parameters when compared to control group.

Keywords: Weight Training, Elastic Power, Horizontal, Vertical.

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Introduction

Training is defined as "systematic process of repetitive progressive exercise or work, involving the learning process and acclimatization. Training is the process of preparation for some task. The term "training" is widely used in sports. But, there is some disagreement among coaches and sports scientists regarding the meaning of the word training. Weight training is the use of resistance to muscular contraction to build the strength, anaerobic endurance, and size of skeletal muscles. There are many different methods of strength training, the most common being the use of gravity or elastic/hydraulic forces to oppose muscle contraction. Weight training is a use of resistance other than weight of the body to develop specific areas of the body. Generally, it is used to develop muscular strength and power. It also develops muscular endurance elasticity and co-ordination. Weight training is the use of systematic exercises with weight and it is used merely as a mean to increase resistance of the muscle contraction. The primary objective is not to learn to lift as much

weight as possible, but to increase strength and power for application to some other sports. The essentials of weight training (strength training) and regularity and gradual increase in training intensity (principles of over loading) supported by good nutrition and adequate rest unlike endurance training, weight training does not spend many calories. As such, its role of reducing body weight is limited, On the other hand, weight due to muscle hypertrophy. Strength training doesn't mean one will loose flexibility or become muscle bound. Studies on olympic athletes have shown only the gymnasts have better flexibility than the weight lifter's. Weight training does not slow down muscular movement. It has also been established that increase in muscular speed (Explosive power) accompanies an increase in muscular strength. The benefits of weight training overall are comparable to most other types of strength training: increased muscle, tendon and ligament strength, bone density, flexibility, tone, metabolic rate and postural support. There are benefits and limitations to weight training as compared to other types of strength training.

Resistance training involves the application of elastic or hydraulic resistance to muscle contraction rather than gravity. Weight training provides the majority

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of the resistance at the beginning, initiation joint angle of the movement, when the muscle must overcome the inertia of the weight's mass. After this point the overall resistance alters depending on the angle of the joint. In comparison, hydraulic resistance provides a fixed amount of resistance throughout the range of motion, depending on the speed of the movement. Elastic resistance provides the greatest resistance at the end of the motion, when the elastic element is stretched to the greatest extent. The investigator makes an attempt to study the effects of different intensities of weight trainings on selected power parameters.

Methodology

The purpose of the study was to find out the effects of varied intensities of weight training namely high intensity weight training, medium intensity weight training and low intensity weight training on selected power parameters namely elastic power, explosive power in terms of vertical and explosive power in terms of horizontal. The purpose of the study was to find out the effect of different loads of weight training on selected power parameters. To achieve this purpose of the study 60 untrained women studying in the faculty of arts and science, Annamalai University, Chidamdaram were selected as subjects at random. Their age ranged between 18 to 24 years. The selected subjects were divided into four equal groups of fifteen each. The experimental group- I underwent high intensity weight training, group-

II underwent medium intensity weight training, group-III underwent low intensity weight training for three days per week for twelve weeks whereas the group-IV act as control group. The following variable namely elastic power, Explosive power term of horizontal and Explosive power term of Vertical was selected as criterion variable. The subjects of the four groups were tested on strength parameters at prior and immediately after the training period. The experimental group- I underwent high intensity weight training, group- II underwent medium intensity weight training, group-III underwent low intensity weight training for three days per week for twelve weeks. Every day the workout lasted for 45 to 60 minutes approximately including warming up and warming down periods. Group- IV acted as control who did not participate in any strenuous physical exercises and specific training throughout the training period.

Analysis of Data

The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significant difference, if any among the groups. Whenever the obtained "F" ratio was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean difference, if any. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

Results

Table I. Computation of Analysis of Covariance on Elastic Power

Tes t	High Intensit y Weight Trainin g Group	Medium Intensity Weight Training Group	Low Intensity Weight Training Group	Contr ol Group	Source of Varianc e	Sum of Square s	df	Mean Square s	Obtaine d 'F' Ratio
Pre Test									
Mea n	9.45	9.41	9.49	9.41	Between	0.06	3	0.02	0.65
S.D.	0.18	0.19	0.17	0.15	Within	1.81	56	0.03	
Post Test									
Mea n	9.80	9.58	9.59	9.51	Between	0.72	3	0.24	12.02*
S.D.	0.16	0.17	0.15	0.14	Within	1.45	56	0.02	
Adjusted Post Test									
Mea n	9.81	9.62	9.56	9.48	Between	0.86	3	0.28	90.33*
					Within	0.17	55	0.0031	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 3 and 56 and 3 and 55 are 2.776 and 2.78 respectively).

The table I shows that the pre-test mean values on elastic power of high intensity weight training, medium intensity weight training, low intensity weight training and control groups are 9.45, 9.41, 9.49 and 9.41 respectively. The obtained 'F' ratio of 0.65 for pre-test scores is less than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on elastic power. The post-test mean values on elastic power of high intensity weight training, medium intensity weight training, low intensity weight training and control groups are 9.80, 9.58, 9.59 and 9.51 respectively. The obtained 'F' ratio of 12.02 for post-test scores is more than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on elastic power. The adjusted post-test means high

intensity weight training, medium intensity weight training, low intensity weight training and control groups on elastic power are 9.81, 9.62, 9.56 and 9.48 respectively. The obtained 'F' ratio of 90.33 for adjusted post-test means is greater than the table value of 2.78 for df 3 and 55 required for significance at .05 level of confidence on elastic power. The results of the study indicated that there was a significant difference between the adjusted post-test means of high intensity weight training, medium intensity weight training, low intensity weight training and control groups on elastic power. Since, four groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table II.

Table II. The scheffe's test for the differences between paired means on elastic power

HIGH INTENSITY WEIGHT TRAINING GROUP	MEDIUM INTENSITY WEIGHT TRAINING GROUP	LOW INTENSITY WEIGHT TRAINING GROUP	CONTROL GROUP	MEAN DIFFERENCES	CONFIDENCE INTERVAL VALUE
9.81	9.62	-	-	0.19*	0.06
9.81	-	9.56	-	0.25*	0.06
9.81	-	-	9.48	0.33*	0.06
-	9.62	9.56	-	0.06*	0.06
-	9.62	-	9.48	0.14*	0.06
-	-	9.56	9.48	0.08*	0.06

* Significant at .05 level of confidence.

The table II shows that the mean difference values between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training and control group and low intensity weight training group and control group on elastic power 0.19, 0.25, 0.33, 0.06, 0.14 and 0.08 respectively which were equal and greater than the required confidence interval

value 0.06 for significance at .05 level of confidence. The results of this study showed that there was a significant difference between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on elastic power.

Table III. Computation of Analysis of Covariance on Explosive Power in terms of Vertical

Test	High Intensity Weight Training Group	Medium Intensity Weight Training Group	Low Intensity Weight Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test									
Mean	38.07	38.00	37.87	38.00	Between	0.67	3	0.22	0.19
S.D.	1.39	0.89	0.88	0.98	Within	67.07	56	1.19	
Post Test									

Mean	41.73	39.87	38.73	38.33	Between	104.40	3	34.80	32.20*
S.D.	1.48	0.96	0.68	0.70	Within	60.93	56	1.08	
Adjusted Post Test									
Mean	41.63	39.82	38.78	38.43	Between	91.96	3	30.65	74.73*
					Within	22.56	55	0.41	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 3 and 56 and 3 and 55 are 2.776 and 2.78 respectively).

The table III shows that the pre-test mean values on explosive power in terms of vertical of high intensity weight training, medium intensity weight training, low intensity strength training and control groups are 38.07, 38.00, 37.87 and 38.00 respectively. The obtained 'F' ratio of 0.19 for pre-test scores is less than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on explosive power in terms of vertical. The post-test mean values on explosive power in terms of vertical of high intensity weight training, medium intensity weight training, low intensity weight training and control groups are 41.73, 39.87, 38.73 and 38.33 respectively. The obtained "F" ratio of 32.20 for post-test scores is more than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on explosive power in terms of vertical. The adjusted post-test means high intensity

weight training, medium intensity weight training, low intensity weight training and control groups on explosive power in terms of vertical are 41.63, 39.82, 38.78 and 38.43 respectively. The obtained "F" ratio of 74.73 for adjusted post-test means is greater than the table value of 2.78 for df 3 and 55 required for significance at .05 level of confidence on explosive power in terms of vertical. The results of the study indicated that there was a significant difference between the adjusted post-test means of high intensity weight training, medium intensity weight training, low intensity weight training and control groups on explosive power in terms of vertical. Since, four groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table IV.

Table IV. The scheffe's test for the differences between paired means on explosive power in term of vertical

HIGH INTENSITY WEIGHT TRAINING GROUP	MEDIUM INTENSITY WEIGHT TRAINING GROUP	LOW INTENSITY WEIGHT TRAINING GROUP	CONTROL GROUP	MEAN DIFFERENCES	CONFIDENCE INTERVAL VALUE
41.63	39.82	-	-	1.81*	0.28
41.63	-	38.78	-	2.85*	0.28
41.63	-	-	38.43	3.20*	0.28
-	39.82	38.78	-	1.04*	0.28
-	39.82	-	38.43	1.39*	0.28
-	-	38.78	38.43	0.35*	0.28

* Significant at .05 level of confidence.

The table IV shows that the mean difference values between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on explosive power in terms of vertical 1.81, 2.85, 3.20, 1.04, 1.39 and 0.35 respectively which were greater than the required confidence interval value 0.28 for significance

at .05 level of confidence. The results of this study showed that there was a significant difference between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on explosive power in terms of vertical.

Table V. Computation of Analysis of Covariance on Explosive Power in terms of Horizontal

Tes t	High Intensit y Weight Trainin g Group	Medium Intensity Weight Training Group	Low Intensity Weight Training Group	Contr ol Group	Source of Varianc e	Sum of Square s	df	Mean Square s	Obtaine d 'F' Ratio
Pre Test									
Mea n	1.79	1.80	1.78	1.80	Between	0.0039	3	0.0013	0.28
S.D.	0.07	0.06	0.07	0.07	Within	0.27	56	0.0048	
Post Test									
Mea n	2.52	2.11	1.99	1.80	Between	4.17	3	1.39	185.33*
S.D.	0.07	0.11	0.08	0.06	Within	0.42	56	0.0075	
Adjusted Post Test									
Mea n	2.52	2.10	2.00	1.80	Between	4.13	3	1.376	199.42*
					Within	0.38	55	0.0069	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 3 and 56 and 3 and 55 are 2.776 and 2.78 respectively).

The table V shows that the pre-test mean values on explosive power in terms of horizontal of high intensity weight training, medium intensity weight training, low intensity weight training and control groups are 1.79, 1.80, 1.78 and 1.80 respectively. The obtained 'F' ratio of 0.28 for pre-test scores is less than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on explosive power in terms of horizontal. The post-test mean values on explosive power in terms of horizontal of high intensity weight training, medium intensity weight training, low intensity weight training and control groups are 2.52, 2.11, 1.99 and 1.80 respectively. The obtained "F" ratio of 185.33 for post-test scores is more than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on explosive power in terms of horizontal. The adjusted post-test means high intensity weight

training, medium intensity weight training, low intensity weight training and control groups on explosive power in terms of horizontal are 2.52, 2.10, 2.00 and 1.80 respectively. The obtained "F" ratio of 199.42 for adjusted post-test means is greater than the table value of 2.78 for df 3 and 55 required for significance at .05 level of confidence on explosive power in terms of horizontal. The results of the study indicated that there was a significant difference between the adjusted post-test means of high intensity weight training, medium intensity weight training, low intensity weight training and control groups on explosive power in terms of horizontal. Since, four groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table VI.

Table VI. The scheffe's test for the differences between paired means on explosive power in term of horizontal

HIGH INTENSITY WEIGHT TRAINING GROUP	MEDIUM INTENSITY WEIGHT TRAINING GROUP	LOW INTENSITY WEIGHT TRAINING GROUP	CONTROL GROUP	MEAN DIFFERENCES	CONFIDENCE INTERVAL VALUE
2.52	2.10	-	-	0.42*	0.09
2.52	-	2.00	-	0.52*	0.09
2.52	-	-	1.80	0.72*	0.09
-	2.10	2.00	-	0.10*	0.09
-	2.10	-	1.80	0.30*	0.09
-	-	2.00	1.80	0.20*	0.09

* Significant at .05 level of confidence

The table - VI shows that the mean difference values between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on explosive power in terms of horizontal 0.42, 0.52, 0.72, 0.10, 0.30 and 0.20 respectively which were greater than the required confidence interval value 0.09 for significance at .05 level of confidence. The results of this study showed that there was a significant difference between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on explosive power in terms of horizontal.

Discussion on Findings

The results of the study showed that there was a significant difference among high intensity weight training, medium intensity weight training, low intensity weight training and control groups on selected power parameters such as elastic power, explosive power in terms of vertical and explosive power in terms of horizontal. The results of the study further showed that there was a significant difference between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on selected power parameters namely elastic power, explosive power in terms of vertical and explosive power in terms of horizontal. And also it was found that there was a significant improvement on selected power parameters namely elastic power, explosive power in terms of vertical and explosive power in terms of horizontal due to high intensity weight training, medium intensity weight training and low intensity weight training. These findings were in accordance with the results of Hennessy and Watson found a resulted improvement in endurance, strength, power and speed due to strength training.

Conclusion

The results of the study showed that there was a significant difference among high intensity weight

training, medium intensity weight training, low intensity weight training and control groups on selected power parameters such as elastic power, explosive power in terms of vertical and explosive power in terms of horizontal.

There was a significant difference between high intensity weight training group and medium intensity weight training group, high intensity weight training group and low intensity weight training group, high intensity weight training group and control group, medium intensity weight training group and low intensity weight training group, medium intensity weight training group and control group and low intensity weight training group and control group on selected power parameters namely elastic power, explosive power in terms of vertical and explosive power in terms of horizontal.

And also it was found that there was a significant improvement on selected power parameters such as elastic power, explosive power in terms of vertical and explosive power in terms of horizontal due to high intensity weight training, medium intensity weight training and low intensity weight training.

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