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Influence of Isolated and Combined Weight and Interval Trainings on Speed and Strength Endurance

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Abstract

The purpose of this study was to find out the effects of isolated and combined weight and interval trainings on speed and strength endurance. To achieve this purpose of the study, sixty men students studying in the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects at random and they were divided into four equal groups of fifteen subjects each with age ranging from 18 to 24 years namely weight training group, interval training group, combined weight and interval training group and control group. The weight training group and interval training group underwent their respective trainings for three days per week for twelve weeks. Whereas, the combined weight and interval training group underwent weight training for three sessions per week for first six weeks and interval training for three sessions per week for remaining six weeks. The control group did not allow to participate in any special training programme apart from their regular physical education activities as per their curriculum. The following variables namely speed and strength endurance were selected as criterion variables. All the subjects of four groups were tested on selected dependent variables at prior to and immediately after the training programme. The analysis of covariance was used to analyze the significant difference, if any among the groups. 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, if any. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as an appropriate. The results of the study revealed that there was a significant difference among weight training, interval training, combined weight and interval training and control groups on speed and strength endurance. And also significant improvement were noticed due to weight training, interval training, combined weight and interval training.

Keywords: Weight Training, Interval Training, Speed, Strength Endurance.

Introduction

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. Weight training is 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.

Methodology

The purpose of this study was to find out the effects of isolated and combined weight and interval trainings on speed and strength endurance. To achieve this purpose of the study, sixty men students studying in the Department of Physical Education and Sports Sciences, Annamalai University were selected as subjects at random and they were divided into four equal groups of fifteen subjects each with age ranging from 18 to 24 years namely weight training group, interval training group, combined weight and interval training group and control group. The weight training group and interval training group underwent their respective trainings for three days per week for twelve weeks. Whereas, the combined weight and interval training group underwent weight training for three sessions per week for first six weeks and interval training for three sessions per week for remaining six weeks. The control group did not allow to participate in any special training programme apart from their regular physical education activities as per their curriculum. The following variables namely speed and strength endurance were selected as criterion variables. All the subjects of four groups were tested on selected dependent variables at prior to and immediately after the training programme. The analysis of covariance was used to analyze the significant difference, if any among the groups. 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, if any. The .05 level of confidence was fixed as the level of

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significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as an appropriate. During the training period, the Group I underwent weight training and Group II underwent interval training for three days per week (alternative days) for twelve weeks, Group III underwent combined weight and interval trainings for which they underwent weight training for first six weeks and interval training for the remaining six weeks for three days per week (alternative days). 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. However, they performed activities as per their curriculum.

Analysis of Data

The analysis of covariance on selected speed and strength endurance of weight training, interval training, combined weight and interval training and control groups have been analyzed and presented below,

Results

Table I. Analysis of covariance of the data on speed of pre and post tests scores of weight training, interval training, combined weight and interval training and control groups

Test	Weight Training Group	Interval Training Group	Complex Weight and Interval training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test									
Mean	7.90	7.89	7.88	7.91	Between	0.05	3	0.016	0.40
S.D.	0.101	0.11	0.02	0.02	Within	2.47	56	0.04	
Post Test									
Mean	7.79	7.62	7.44	7.90	Between	448.82	3	149.60	199.46*****
S.D.	0.101	0.11	0.02	0.02	Within	42.02	56	0.75	
Adjusted Post Test									
Mean	7.78	7.66	7.45	7.91	Between	452.29	3	150.76	255.52*****
					Within	32.85	55	0.59	

* 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 adjusted post-test means of weight training group, interval training group, combined weight and interval training group and control group are 7.78, 7.66, 7.45 and 7.91 respectively on speed. The obtained "F" ratio of 255.52 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 speed.

The results of the study indicated that there was a significant difference between the adjusted post-test means of weight training group, interval training group, combined weight and interval training group and control group on speed. 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 speed

Weight Training Group	Interval Training Group	Complex Weight and Interval training Group	Control Group	Mean Differences	Confidence Interval Value
7.78	7.66	-	-	0.12*	0.09
7.78	-	7.45	-	0.33*	0.09
7.78	-	-	7.91	0.13*	0.09
-	7.66	7.45	-	0.21*	0.09
-	7.66	-	7.91	0.25*	0.09
-	-	7.45	7.91	0.46*	0.09

* Significant at .05 level of confidence.

The table II shows that the mean difference values between weight training group and interval training group, weight training group and combined weight and interval training group, weight training group and control group, interval training group and combined weight and interval training group, interval training and control group, combined weight and interval training group and control group, 0.12, 0.33, 0.13, 0.21, 0.25 and 0.46 on speed which were greater than the required confidence interval 0.09 for significance. The results of this study showed that there was a significant difference between weight training group and interval training group, weight training group and combined weight and interval training group, weight training group and control group, interval training group and combined weight and interval training group, interval training and control group, combined weight and interval training group and control group on speed.

The analysis of covariance on strength endurance of the pre and post test scores of weight training, interval training, combined weight and interval training and control groups have been analyzed and presented in Table III.

Table III. Analysis of covariance of the data on strength endurance of pre and post tests scores of weight training, interval training, combined weight and interval training and control groups

Test	Weight Training Group	Interval Training Group	Complex Weight and Interval training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test									
Mean	37.93	37.88	37.86	37.95	Between	0.01	3	0.03	0.75
S.D.	2.102	2.115	2.023	2.021	Within	2.27	56	0.04	
Post Test									
Mean	43.33	40.18	45.89	38.00	Between	191.4	3	63.8	167.89*****
S.D.	2.099	2.101	2.011	2.014	Within	21.43	56	0.38	
Adjusted Post Test									
Mean	43.33	40.18	45.89	38.00	Between	169.17	3	56.39	48.61*****
					Within	61.42	55	1.16	

* 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 adjusted post-test means of weight training group, interval training group, combined weight and interval training group and control group are 43.33, 40.18, 45.89 and 38.00 respectively on strength endurance. The obtained "F" ratio of 48.61 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 strength endurance.

The results of the study indicated that there was a significant difference between the adjusted post-test means of weight training group, interval training group, combined weight and interval training group and control group on strength endurance. 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 strength endurance

Weight Training Group	Interval Training Group	Complex Weight and Interval training Group	Control Group	Mean Differences	Confidence Interval Value
43.33	40.18	-	-	3.15*	1.97
43.33	-	45.89	-	2.56*	1.97
43.33	-	-	38.00	5.33*	1.97
-	40.18	45.89	-	5.71*	1.97
-	40.18	-	38.00	2.18*	1.97
-	-	45.89	38.00	7.89*	1.97

* Significant at .05 level of confidence. 43.33, 40.18, 45.89 and 38.00

The table IV shows that the mean difference values between weight training group and interval training group, weight training group and combined weight and interval training group, weight training group and control group, interval training group and combined weight and interval training group, interval training and control group, combined weight and interval training group and control group, 3.15, 2.56, 5.33, 5.71, 2.18 and 7.89 respectively on strength endurance which were greater than the required confidence interval 1.97 for significance.

The results of this study showed that there was a significant difference between weight training group and interval training group, weight training group and combined weight and interval training group, weight training group and control group, interval training group and combined weight and interval training group, interval training and control group, combined weight and interval training group and control group on strength endurance.

Conclusions

1. The results of the study showed that there was a significant difference between the adjusted post-test means of weight training group, interval training group, combined weight and interval training group and control group on speed and strength endurance.
2. And also it was showed that there was a significant improvement on speed and strength endurance due to weight training, interval training, combined weight and interval training.

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