ISSN - 2250-1991 | IF : 5.215 | IC Value : 79.96

Original Research Paper

EFFECT OF FREQUENCY MODULATION IN RESISTANCE TRAINING ON EXPLOSIVE STRENGTH AMONG COLLEGE MEN STUDENTS

Dr. M. Elayaraja — Associate Professor, Dept. of Physical Education and Sports, Pondicherry University.

S.Kumaraguru — Ph.D. Scholar, Dept. of Physical Education and Sports, Pondicherry University.

ABSTRACT

The purpose of the study was to find out the effect of frequency modulation in resistance training on explosive strength among college men students with the help of 45 men students and aged between 18-21 years. The subjects were divided into Group I (3days in a week), Group II (5days in a week) and control group. The group I and group II named as experimental groups underwent resistance training program for 12 weeks as well as control group did not underwent any specific training program. The explosive strength was measured by medicine ball throw and standing broad jump before and after training. The collected data was analyzed by using (ANCOVA) analysis of covariance. The findings of the present study assert that the explosive strength has significantly improved in the experimental group than in the control group. Further, there was no significant difference between the 5days in a week resistance training and 3days in a week resistance training group after the 12 weeks of training.

KEYWORDS: Resistance training, Frequency and Explosive strength.

INTRODUCTION

Resistance training is also known as strength training or weight training. It is the capacity to overcome resistance or to perform against resistance for enhancing individuals' physical fitness and conditioning athletes. Fitness refers to a state of well-being of the human body and the mind. It is acquired through performing day-to-day activities without fatigue. Physical activity involves bodily movements through skeletal muscles by exhaustion of energy and it produces health benefits. It includes in particular walking to work, gardening, household chores, dancing and washing (Brown et al., 2006). Physical activity and positive lifestyle habits yield enormous benefits for human beings and it has been proved by scholars in the field of physical education. The healthy lifestyles for people in general are largely influenced by wise choices taken by them during their young age, which will determine their health in their middle and old age.

The workout for a particular muscle group that involves the number of training sessions in a week is called training frequency (Pfeiffer et al., 2014). The important factors of training frequency include training volume, intensity, selection of exercise, level of conditioning and recovery.

Explosive strength is the combination of strength and speed. It is referred to as the capacity to overcome resistance with contraction and relaxation of muscles in a quicker way: for example in sports of explosive nature, such as sprinting, weightlifting, swimming, cycling and javelin throw and also in team games and combat sports. The maximum movement of sports is explosive in nature and it plays a crucial role in every sport (Griffin & Watkins, 2014).

OBJECTIVE OF THE STUDY

The main objective of the study was to investigate the effect of frequency modulation in resistance training on explosive strength among college students.

METHODOLOGY

The purpose of the study was to find out the effect of frequency modulation in resistance training on explosive strength among college men students. 45 men students were randomly selected and aged between 18-21 years. The selected subjects were divided into Group I (3days in a week), Group II (5days in a week) and control group. The group I and group II named as experimental group underwent training program for three days per week especially on Mondays-Wednesdays-Friday: Group II underwent resistance training for five days per week especially on Mondays-Tuesday-Thursday-Friday-Saturday for 12 weeks of resistance training as well as the control group did not underwent any training program. The training programme consists of whole body workout that trained the entire muscle group. The number of exercises, intensity, repetition, and set were manipulated every four weeks as the training progressed. The explosive strength endurance was measured by medicine ball throw and standing broad jump before and after training. The collected data was analyzed by using (ANCOVA) analysis of covariance.

HYPOTHESES

It is hypothesis that there would be a significant difference among three days in week resistance training, five days in week resistance training and control groups on explosive strength parameters.

ANALYSIS OF THE DATA AND RESULTS OF THE STUDY

Table I. Analysis of Covariance for Medicine ball throw of 3 Days/Week Resistance Training, 5 Days/Week Resistance Training and Control Groups.

	3days/week RT Group	5days/week RT Group	Control Group	Source of Variance	Sum of squares	df	Mean Square	'F' Ratio
Pre-test Mean	8.37	8.60	8.40	B	0.34	2	0.21	2.21
S.D	0.31	0.26	0.33	W	3.73	42	0.09	
Post-test Mean	9.20	9.50	8.39	B	9.09	2	4.55	38.7
S.D	0.41	0.29	0.30	W	4.93	42	0.12	9*
Adjusted post Mean	9.22	9.34	8.44	B	6.89	2	3.44	76.8
				W	1.84	41	0.05	7*

*Significant at 0.05 level.
The required table value at 0.05 level of significance for 2 & 42, 2 & 41 degrees of freedom is 3.22.

The above table shows that the pre-test means of the 3-day-a-week resistance training, 5-day-a-week resistance training and control groups are 8.37, 8.60 and 8.40, respectively. The obtained F ratio 2.21 is lesser than the required table value 3.22 for 2 & 42 degrees of freedom at 0.05 level of significance. Correspondingly, there is no significant change in medicine ball throw between the control and the experimental groups before the training program.

The post-test means of the 3-day-a-week resistance training, 5-day-a-week resistance training and control groups are 9.20, 9.50 and 8.39, respectively. The obtained F ratio 38.79 is greater than the required table value 3.22 for 2 & 42 degrees of freedom at 0.05 level of significance. Hence, this analysis unfolds that there is a significant change in medicine ball throw after the training program.

The adjusted post-test means of the 3-day-a-week resistance training, 5-day-a-week resistance training and control groups are 9.22, 9.34 and 8.44, respectively. The obtained F ratio 76.87 is greater than the required table value of 3.23 for 2 & 41 degrees of freedom at 0.05 level of significance. As a corollary, there is a significant change in medicine ball throw due to the training program.

Table II. Scheffe's post hoc test to measure ordered adjusted medicine ball throw means between the experimental and control groups.

3days/week RT Group	5days/week RT Group	Control Group	Mean Difference	C.D
9.22	9.34		0.12	0.21
9.22		8.44	0.78	
	9.34	8.44	0.90	

The above table shows the Scheffe's post hoc test results for the two experimental groups: the 3-day-a-week resistance training group (adj. mean = 9.22) and 5-day-a-week resistance training group (adj. mean = 9.34) significantly performed better than the control group (adj. mean = 8.44) in medicine ball throw with adjusted mean differences of 0.78 and 0.90 (CD = 0.21), respectively. Nonetheless, there was no significant difference in medicine ball throw between the 3-day-a-week resistance training group and the 5-day-a-week resistance training group with an adjusted mean difference of 0.12 (CD = 0.21).

Line diagram I showing the mean values of medicine ball throw of 3 days/week resistance training, 5 days/week resistance training and control groups.

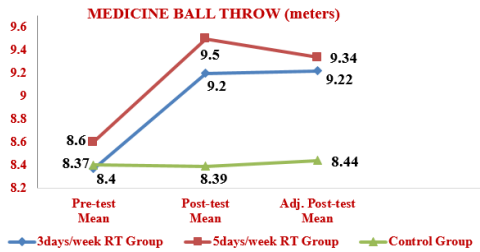


Table III. Analysis of covariance for standing broad jump of the 3 days/week resistance training, 5 days/week resistance Training and control groups.

	3days/week RT Group	5days/week RT Group	Control Group	Source of Variance	Sum of squares	df	Mean Square	'F' Ratio
Pre-test Mean	2.25	2.24	2.29	B	0.02	2	0.01	0.27
S.D	0.21	0.22	.12	W	1.47	42	0.04	
Post-test Mean	2.43	2.43	2.31	B	0.15	2	0.08	2.80
S.D	0.19	0.16	0.12	W	1.12	42	0.03	
Adjusted post Mean	2.44	2.45	2.29	B	0.24	2	0.12	28.02*
				W	0.18	41	0.004	

*Significant at 0.05 level.
The required table value at 0.05 level of significance for 2 & 42, 2 & 41 degrees of freedom is 3.22.

The above table shows that the pre-test means of the 3-day-a-week resistance training, 5-day-a-week resistance training and control groups are 2.25, 2.24 and 2.29, respectively. The obtained F ratio 0.27 is lesser than the required table value 3.22 for 2 & 42 degrees of freedom at 0.05 level of significance. This analysis discloses that there is no significant change in standing broad jump between the control and the experimental groups before the training program.

The post-test means of the 3-day-a-week resistance training, 5-day-a-week resistance training and control groups are 2.43, 2.43 and 2.31, respectively. The obtained F ratio 2.80 is lesser than the required table value 3.22 for 2 & 42 degrees of freedom at 0.05 level of significance. This analysis establishes the fact that there is an insignificant change in standing broad jump after the training program

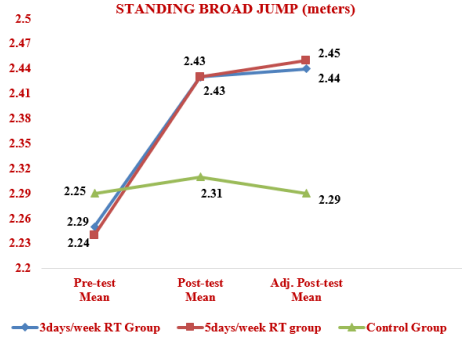
The adjusted post-test means of the 3-day-a-week resistance training, 5-day-a-week resistance and control groups are 2.44, 2.45 and 2.29, respectively. The obtained F ratio 28.02 is greater than the required table value of 3.23 for 2& 41 degrees of freedom at 0.05 level of significance. Thus, there is a significant change in standing broad jump due to the training program.

Table IV. Scheffe's post hoc test to measure ordered adjusted standing broad jump means between the experimental and control groups.

3days/week RT Group	5days/week RT Group	Control Group	Mean Difference	C.D
2.44	2.45		0.01	0.06
2.44		2.29	0.15	
	2.45	2.29	0.16	

The above table shows the Scheffe's post hoc test results for the two experimental groups: the 3-day-a-week resistance training group (adj. mean = 2.44) and the 5-day-a-week resistance training group (adj. mean = 2.45) significantly greater than the control group (adj. mean = 2.29) in standing broad jump with adjusted mean differences of 0.15 and 0.16 (CD = 0.06), respectively. Nonetheless, there was no significant difference in standing broad jump between the 3-day-a-week resistance training group and the 5-day-a-week resistance training group with an adjusted mean difference of 0.01 (CD = 0.06).

Line diagram II showing the mean values of standing broad jump of 3 days/week resistance training, 5 days/week resistance training and control groups.



DISCUSSION

This study discloses that explosive strength significantly improved in the experimental groups than in the control group. Correspondingly, there was no significant difference in explosive strength between the 3-day-a-week and 5-day-a-week resistance training groups. Besides, the three and five sessions in a week were equally effective for the upper and the lower explosive power. These findings establish the fact that due to the lack of high-speed resistance training, adequate contraction and relaxation of muscles and enough volume of exercise between the experimental groups result in the exclusion of optimum explosive power improvement and adaptations. The above finding is substantiated by earlier findings (Radaelli et al., 2015; Fisher et al., 2013; Ramírez-Campillo et al., 2013; Santos & Janeira, 2012; Benton et al., 2011; Clutch et al., 1983).

REFERENCES

1. Benton, M. J., Kasper, M. J., Raab, S. A., Waggener, G. T., & Swan, P. D. (2011). Short-term
2. effects of resistance training frequency on body composition and strength in middle-aged women. The Journal of Strength & Conditioning Research, 25(11), 3142-3149
3. Clutch, D., Wilton, M., McGown, C., & Bryce, G. R. (1983). The effect of depth jumps and weight training on leg strength and vertical jump. Research Quarterly for Exercise and Sport, 54(1), 5–10.
4. Griffin, M., & Watkins, P. (2014). Sport and exercise science: an introduction. Routledge, p. 256.
5. Radaelli, R., Fleck, S. J., Leite, T., Leite, R. D., Pinto, R. S., Fernandes, L., & Simão, R. (2015). Dose-response of 1, 3, and 5 sets of resistance exercise on strength, local muscular endurance, and hypertrophy. The Journal of Strength & Conditioning Research, 29(5), 1349–1358.
6. Ramírez-Campillo, R., Andrade, D. C., & Izquierdo, M. (2013). Effects of plyometric training volume and training surface on explosive strength. The Journal of Strength & Conditioning Research, 27(10), 2714–2722.
7. Santos, E. J., & Janeira, M. A. (2012). The effects of resistance training on explosive strength indicators in adolescent basketball players. The Journal of Strength & Conditioning Research, 26(10), 2641–2647.Singh, H. (1991). Science of Sports Training. New Delhi: D.V.S. Publication.