



Journal Homepage: - [www.journalijar.com](http://www.journalijar.com)  
**INTERNATIONAL JOURNAL OF  
ADVANCED RESEARCH (IJAR)**

Article DOI: 10.21474/IJAR01/3763  
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/3763>



### RESEARCH ARTICLE

#### INFLUENCE OF RESISTANCE TRAINING ON POWER AMONG UNDER GRADUATE STUDENTS.

Mary Varghese Kundukulam<sup>1</sup> and Dr. George Abraham<sup>2</sup>.

1. Ph. D Research Scholar, Dept. of Physical Education and Sports Sciences, Annamalai University, Tamil Nadu, India.
2. Assistant Professor, Dept. of Physical Education and Sports Sciences, Annamalai University, Tamil Nadu, India.

#### Manuscript Info

##### Manuscript History

Received: 16 January 2017  
 Final Accepted: 19 February 2017  
 Published: March 2017

##### Key words:-

Resistance training, explosive strength,  
 under graduate college female students

#### Abstract

The present study was to find out the effect of resistance training on power parameter among under graduate students. To achieve the purpose twenty under graduate female college students ( $n = 20$ ) were selected as subjects and their age ranged between 18 and 25 years. They were divided in to two equal groups, each group consisted of ten ( $n = 10$ ) subjects. The group I underwent resistance training (RTG), and group II acted as a control (CG) who did not exposed any special training apart from their regular activities. The training period of this study was limited to three days in a week for eight weeks. Explosive strength was selected as a criterion variable of this study and it was measured by using vertical jump. The analysis of covariance (ANCOVA) was applied as a statistical tool. In all cases 0.05 level of confidence was fixed to test the significant, which was considered as in appropriate. It was concluded from the result of the study that there was a significant improvement ( $p \leq 0.05$ ) on explosive strength due to resistance training compared to control group.

Copy Right, IJAR, 2017,. All rights reserved.

#### Introduction:-

Resistance training is a form of exercise that improves muscular strength and endurance. During a resistance training workout, you move your limbs against resistance provided by your body weight, gravity, bands, weighted bars or dumbbells. Some exercise machines can also be used for resistance training (<https://www.verywell.com/what-is-resistance-training>). Resistance training is the use of resistance to muscular contraction to build the strength, anaerobic endurance and size of skeletal muscles. Resistance training is based on the principle that muscles of the body will work to overcome a resistance force when they are required to do so. Resistance training has been general categorized into major type with different objectives: "strength type" and "hypertrophy-type". The former consists of high intensity exercises with two repetition and long rest periods between sets. This type of regimen is used for gaining strength. On the other hand, the hypertrophy type regimen consists of moderate intensity exercises with higher repetition and shorter rest periods between sets. This type of regimen has been thought to be effective in gaining muscle size (Kraemer, 2001). Recently, the use of a single particular type of regimen throughout the training period has become less common: instead, multiple training regimens are used in a periodized fashion, because it is thought that they course greater strength gains in muscles (Marx, 2001). When do the resistance training repeatedly and consistently, the muscles become fit. (<https://www.betterhealth.vic.gov.au/health/resistance-training-health-benefits>).

**Corresponding Author:- Mary Varghese Kundukulam.**

Address:- Ph. D Research Scholar, Dept. of Physical Education and Sports Sciences, Annamalai University, Tamil Nadu.

Power is defined as the amount of work performed per unit of time. Power is an element of skill-related fitness that is needed to excel in athletic performance. Increased strength does not always translate into increased power. For example, a strong upper body lifts a high amount of weight. However a strong upper body does not always have the ability to throw a shot put very far if enough speed cannot be generated ([www.livestrong.com](http://www.livestrong.com).Sports and Fitness). Although power is a fundamental part of human relations, little is known about power in daily life. We studied the everyday experience of power by surveying individuals multiple times over 3 d regarding their subjective feelings of power and positional power ([www.hydrol-earth-syst-sci.net](http://www.hydrol-earth-syst-sci.net)). Power dynamics were a common, though not constant, experience. Rather than power being concentrated among a few individuals, almost half of participants reported sometimes holding high-power positions. People's feelings of power did not always map onto the positions they held. Most variability in power was related to people's changing situations rather than their stable traits. Low power negatively affected mood and cognition. Contrary to negative stereotypes of power holders, higher power was associated with greater feelings of responsibility (Smith & Hofmann, 2016).

### Materials and Methods:-

The present study effort was made to find out the effect of resistance training on explosive strength of under graduate female college students. To achieve these purpose twenty (n = 20) under graduate female students were chosen as subjects from Physical Education Department, Calicut University, Kerala and their age ranged between 18 and 25 years. They were divided into two equal groups, each group consisted of ten (n = 10) subjects. The group I underwent resistance training (RTG) and group II acted as a control (CG) who did not exposed any special training apart from their regular activities. The training period of this study was limited to three days in a week for eight weeks. Explosive strength was selected as a criterion variable and it was measured by using vertical jump. For every training programmer there would be a change in various structures and system in a human body. The experimentation was subjected to eight weeks of resistance training. The training programme was scheduled for one session per day between 6 am to 7 am. Training was given under the direct supervision of the investigator. The progression of load was followed during experimentation. The following exercises were used to resistance training and performed with progressive methods squat, power clean, front squats, bench press, overhead press, dead lift, barbell row, pendlay row. The exercises were arranged from simple to complex.

**Table-I:-** Percentage of Intensity, Repetition and Sets of Resistance Training

Group I	Components	Weeks			
		I & II	III & IV	V & VI	VII & VIII
Resistance	Intensity	60%	70%	80%	90%
	Repetition	8 to 10	6 to 8	4 to 6	2 to 4
	Sets	2	2	3	3

### Data Analysis:-

Mean and Standard deviation were calculated for explosive strength for each training group. And the data analyzed by using analysis of covariance (ANCOVA). Statistical significance was fixed at 0.05 levels.

### Results:-

**Table – II:-** Analysis of Covariance on Explosive Strength of Resistance Training group and the Control Group

Test		RTG	CG	SOV	SS	df	MS	F ratio	
Pre test	Mean	21.9	22.1	B	.200	1	.200	.067	
	SD	1.6	1.8	W	53.80	18	2.9		
Post test	Mean	26.3	23.3	B	45.00	1	45.0	7.62*	
	SD	2.44	4.71	W	106.20	18	5.90		
Adjusted Post test	Mean	26.4	23.2	B	49.50	1	49.50	11.11*	
				W	74.95	17	4.40		

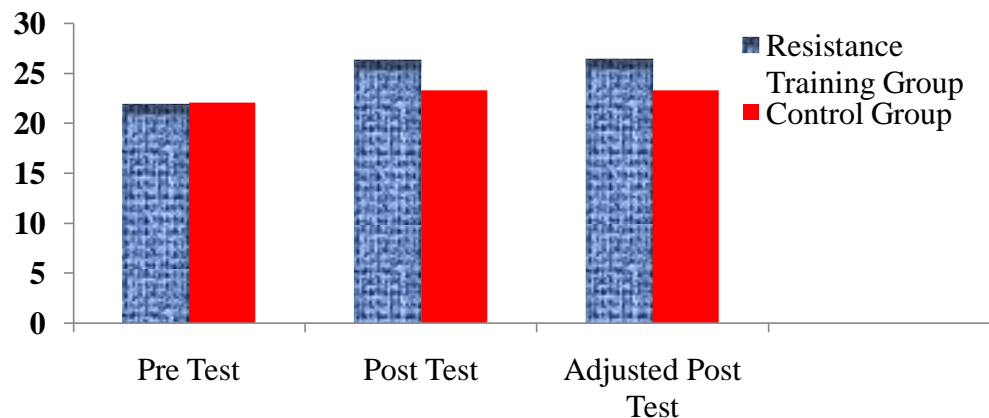
\*Significant at 0.05 level of confidence

(The table value required for significance at 0.05 level of confidence with df 1 and 18 and 1 and 17 are 4.41 and 4.45 respectively)

Table II shows that the pretest mean values on explosive strength for the resistance training group and the control group are 21.9 and 22.1 respectively. The obtained  $F$  ratio of .067 for the pre test mean is less than the table value 4.41 for df 1 and 18 required for significance at 0.05 level. The post tests mean of resistance training and control group are 26.3 and 23.3 respectively. The obtained  $F$  ratio of 7.62 for post test mean is higher than the table value 4.41 for 1 and 18 required for significance at 0.05 level. The adjusted post test mean of resistance training group and the control group are 26.4 and 23.2 respectively. The obtained  $F$  ratio of 11.11 for adjusted post test mean is higher than the required table value 4.45 for df 1 and 17 required for significant at 0.05 level.

The result of the study indicated that there was a significant difference between the adjusted post test mean of the resistance training and the control group on explosive strength at 0.05 levels. The pre, post and adjusted post test mean values of the resistance training and the control group on explosive strength is graphically represented in the figure 1.

**Figure 1:-** The pre, post and adjusted post test mean values of resistance training group and the control group on explosive strength



### Discussion:-

This study revealed that there was a significant improvement on explosive strength due to resistance training compared to control group. The result of this study is much related to other studies conducted before. Matavuji *et al.* (2001) conducted his study to evaluate the effects of resistance training on elite junior basketball players. The result of the study was proved that the training positively influenced the vertical jumping height of the selected subjects after the training duration. Markovic (2007) conducted his study to evaluate the effect of resistance training among the selected male subjects. The result of the study indicated that, the training was positively influenced the vertical jumping ability of the subjects as compared with the control groups. Martinez *et al.* (2011) included 40 women and 38 men medium level sprinters in their study. The resistance training was conducted for the duration of 8 weeks and reached the conclusion that the training was significantly improved the jumping ability of the both men and women subjects. Young *et al.* (1995) conducted his study to effects of resistance training on strength, power, among women. The result of the study was proved that the progressive resistance exercise can produce substantial increases in muscle strength and in power for women. Jeffrey *et al.* (2002) conducted his study to evaluate the effect of heavy- vs. light-load jump squats on the development of strength and power. The result of the study was proved that the investigation indicates that training with light-load jump squats results in increased movement velocity capabilities and those velocity-specific changes in muscle activity may play a key role in this adaptation. Moktar *et al.* (2008) conducted his study to evaluate of concurrent endurance and circuit resistance training sequence on muscular strength and power development. The result of the study was proved that the resistance circuit training alone induced strength and power improvements that were significantly greater than when resistance and endurance training were combined, irrespective of the intersession sequencing. So the present study clearly mentioned that there was a significant improvement made on explosive strength due to systematic of resistance training.

### Conclusion:-

The resistance training can be improved explosive strength during the age between 18 and 25 years of under graduate female college students. The results of the study indicated that there was a significant improvement on explosive strength due to eight weeks of resistance training. From the result we recommended that the resistance training is very suitable to improve explosive strength.

### References:-

1. Archie young., Dawn, A. Skelton., Dawn, A. Skelton., Carolyn, A. Greig., Katie, E. Malbut. (1995). Effects of resistance training on strength, power, among women, *Journal of American Geriatrics Society*, 43(10), p. 1081-1087.
2. Bride, M. C., Jeffery M., Triplett., Travis., Davie., Allan., Newton., & Robert, U. (2002). Evaluate the effect of heavy- vs. light-load jump squats on the development of strength and power, *Journal of Strength & Conditioning Research*, 16(1) p. 5-8.
3. Chtara, Moktar., Chaouachi, Anis., Levin, Gregory T., Chaouachi, Mustapha., Chamari, Karim., Amri, Mohamed., & Laursen, Paul B. (2008). Evaluate of concurrent endurance and circuit resistance training sequence on muscular strength and power development, *Journal of Strength & Conditioning Research*, 22(4), pp. 1037-1045.
4. Gary Morgan., & George McGlynn. (1990). *Dynamics of resistance Training*, San Francisco W.M.C Brown Publishers, P. 10.
5. Goran Markovic. (2007). Does resistance Training Improve Vertical jump Height A Meta – Analytical Review, *Br. Journal Sports Med*, p. 349-355.
6. <https://www.betterhealth.vic.gov.au/health/.resistance-training-health-benefits>.
7. <https://www.verywell.com/what-is-resistance-training>
8. Kraemer. (2001). Effect of Resistance Training on Women's Strength Power and Occupational Performance, *Medicine and Science in Sports and Exercises*, 33(6): p. 10-12.
9. Marx, J. (2001). Hyper tension Possible New Path for Blood Pressure, *Contract Science*, 10-154.
10. Matavulj, D., Kukolj, M., Ugarkovic, D., Jozsef Tihanyi., & Sloobodan Jaric. (2001). Effects on resistance Training on Jumping Performance in Junior Basketball Players, *Journal of Sports Medicine and Physical Fitness*, p. 159-64.
11. Pamela, K. Smith., & Wilhelm Hofmann. (2016). Power in everyday life, *Journal of National Academy of Sciences of the United States of America*, 113(36), p. 10043-10048.
12. Wwww. livestrong.com. Sports and Fitness.
13. www.hydrol-earth-syst-sci.net.