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Comparison of Three Methods of Weight Training to Increase the Power of the Male Students of Mazandaran University of Science and Technology

Mohammadbagher Forghani Ozrudi^{a*}, Shabanali Fathi Shob^a, Somayeh Rahimi Aliabadi^b

^a*M.A physical education, PE Teacher, Education Office, Babol, Iran*

^b*Teacher of Sama Elementary School, Sama technical & vocational college, Islamic Azad University, Babol Branch, Babol, Iran*

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Abstract

The purpose of this study was to compare the effects of three methods of weight training on Pectoral and quadriceps muscles of the thigh. The sample comprised 40 male students of Mazandaran University of Science and Technology formed. This research was quasi-experimental methods and practical. The maximum power of the test subjects with the gestures of one repetition maximum bench press and knee extension were measured before and after the course. Then, subjects were randomly assigned to three experimental groups (n = 10 per group) were placed in a control group of 10 subjects. Subjects in each group 8 weeks, 3 sessions per week for 45 minutes each session rehearsed. The control group subjects continued their normal life. Data using one-way ANOVA and post hoc LSD test with SPSS₂₀ software at a significance level ($p < 0.05$) were analyzed. Pectoral and quadriceps muscle strength training, all three groups were significantly increased compared with the control group. The flat pyramidal groups showed a significant increase in pectoral muscle strength and according to the findings of this study we can conclude that the purpose of weight training is to increase the power of the pyramid using flat priorities are skewed pyramid and inverted pyramid technique.

Keywords: Weight training, Increase the power, Male students

1. Introduction

Resistance training is a form of public sports organizations such as the American College of Sports Medicine Health Mai (ACSM) and the America Heart Association (AHA) is for many people, including adolescents, healthy adults, the elderly and sick people (people with heart disease and neuromuscular) is recommended (ACSM, 1998 & 2002; Kraemer et al., 2002). However, one of the most important

features of power is affecting sports performance .assist the body in maintaining healthy skeletal-muscle, preventing disease and abnormalities of the skeletal - muscle and reduced muscle injury, arthritis patients is essential . Several variable effectiveness of a resistance training exercise to achieve optimum results in increased power set (Gaeini et al., 2008). These variables include the type of muscle contraction used (Concentric or Eccentric) and contraction, exercise intensity, exercise volume, select

Move (single-joint movements and the movements of multiple joints), rest periods (between periods and between movements), muscle contraction speed (slow, medium, fast) frequency of exercise per week (ACSM, 2002). Interaction between intensity and volume as the most important variable in the construction of an optimal range of resistance may determine compatibility with resistance training is the most important role. Intensity is defined as the amount of weight placed on the move, and a lot depends on other variables such as exercise order, training volume, the effect of exercise, muscle action, speed, repetitions and rest intervals between sets and exercises (Kraemer & Ratamess, 2000; & 2003).

Intensity changed significantly in response to acute metabolic, hormonal, neurological, cardio-vascular resistance training plus transition effects (ACSM, 2002). When the aim of strength training is to increase the maximum power, intensity resistance training is one of the most important design variables (Tan, 1999). Studies have shown that exercise multiple sets to increase muscular strength and hypertrophy training methods, a single set of because of the amount of the exercise is superior to the more tender (Paulsen et al., 2003; Rhea, 2003). However, the most common protocol for multiple training sessions to increase maximal strength, training intensity One turns to the next turn (inverted pyramid) and the use of constant intensity at every turn with ease on the final turn (flat pyramid) (Herring, 2002; Fleck & Kraemer, 2004; Bompa, 1999). The method of gradual increase in intensity in 1952 was developed by Delorme. During the first athlete with a light-weight, in periods after using the extra time to train heavier weights until the end of the period with the heaviest weights may be able to do a repeat (one repetition maximum) (Fleck & Kraemer, 2004). Gradual reduction of the intensity workout Zinoviev was invented in 1951 by Sai Delorme method is the technique which used photo-heavy style known as. In this way, the athlete, after warming up, the first of which uses a weight equal to its maximum power. In the later periods, the

amount of weight and repetitions is reduced thus increases (Fleck & Kraemer, 2004).

American College of Sports Medicine (ACSM, 1988) is based on strengthening protocol (Arnhim & Prentice, 1993). The old ways of strengthening the power of the method has been modified Delorme and Zinoviev otherwise (Kurbacheh, 2007). Also Bompa new ways Cross pyramid (Pyramid method developed dual) and coined the flat pyramid. Bompa in an oblique pyramid says about the purpose of lowering exercise in the final round of diversification and incentives for athletes, because athletes tend to move in the final round with a speed faster to run. He's the best way to increase the maximum level pyramid model is introduced (Bompa, 1999). Studies of different modes of resistance training exercise with the variable being studied in each protocol are numerous occasions, have reported conflicting results. Kurdbacheh (2004) with Delorme Watkins compare with McCloy concluded that the increase in maximum quadriceps strength McCloy group was significantly higher than the Delorme Watkins. But no significant differences between training methods and large pectoral muscle did not increase maximal strength (Kurbacheh, 2007).

This research was also Gaeini et al. (2006) compared two methods of weight training on muscle strength in athletes beginner pectoral concluded the 8-week training on ways to increase the pectoral muscle has significant impact but the increase in pectoral muscles induced by exercise training caused significant difference was observed between the two methods pyramid Oxford (Gaeini et al., 2008). Morris and Elkins (1954) compared two methods of pyramid and inverted pyramid, increasing 5.5% more power in reverse pyramid method were reported (Fleck & Kraemer, 2004).

In other research, Fish et al., Compared with Delorme and Oxford corresponding increase in power exercising 1RM, 10RM reported (Fish et al., 2003).

But research Delorme (1952) and Bompa (1993) inverted pyramid lead the way in increasing muscle strength, demonstrated (Gaeini et al., 2008; Bompa, 1999). In this

study, with constant training volume in the three groups, we examine the issue which of the oblique pyramid, inverted, flattened favorable adaptations in muscle strength in untrained male students cause.

2. Materials and methods

The study was conducted by semi-empirical and field work and the non-athlete male students of Mazandaran University of Science and Technology of the Department of Public Physical Education were obtained previously had not participated in any weight training program, 40 were randomly selected sample formed.

After recording demographic data and measure the height and weight of the subjects, during two separate sessions, subjects were familiarized with the proper movement techniques and test methods.

Before beginning an exercise intended to structural adaptations, physiological and ready for exposure to the maximum loading, all subjects in the moderate-intensity resistance training program (40-60% 1rm), Eight weeks, and two sessions per week, with an interval of 3 minutes between moves were strategic (Bompa, 1999).

In this course, In the course of the movement to strengthen the central area was used as the primary mover. After adjustment for maximum strength test subjects and one repetition maximum (1RM) in the bench press and knee extension exercises were measured.

Then, subjects based on their maximum power in two selected were matched and randomly assigned to three groups: Group I (oblique pyramid, n=10) Group II (inverted pyramid, n=10), group III (flat pyramid, n= 15) indicates the fourth control (n=15) were exposed to in the course of training volume for the three groups of the formula (Set \times Repetition \times RM) were identical (chandler & Brown, 2007).

The subjects in each group 8 weeks, 3 sessions per week, each session was 45 min of exercise. Group exercise 5 times severely skewed pyramid (85.5%, 2 \times 95 %, 85%, and 80%), inverse pyramid 5 times the intensity (80%, 85%, 90%, 95%, and 100%) and flat pyramid 6 dose intensity (85%, 4 \times 90 %, 80%) Performed for each of the three groups as well as the distance between turns 3 and the rest 2 minutes were considered (Bompa, 1999). The control group subjects continued their normal life. After 8 weeks of basic training, maximal strength test subject's one repetition maximum in the bench press and knee extension exercises were measured. After extracting the data, descriptive statistics for the central scattering parameters (mean and standard deviation) was used. 's Part of the inferential tests, ANOVA and post hoc test (LSD) to determine differences between groups using the software SPSS₂₀& Excel in significance level ($p < 0.05$) were used.

3. Results

In Table 1 is reported to age, weight and height of subjects, including mean and standard deviation.

Table1. Individual subjects (mean \pm standard deviation)

Individual Groups	n	Age (year)	The height (cm)	Weight (Kg)
Cross Pyramid	10	19.32 \pm 1.28	176.12 \pm 3.15	73.85 \pm 5.21
Reverse Pyramid	10	19.39 \pm 1.37	174.44 \pm 4.32	74.37 \pm 7.38
Flat Pyramid	10	19.74 \pm 1.69	175.32 \pm 5.42	72.89 \pm 8.51
Control	10	19.29 \pm 1.54	174.76 \pm 5.07	73.34 \pm 8.19
Total	40	19.43 \pm 1.47	175.16 \pm 4.49	73.61 \pm 7.32

In Table 2, the mean & standard deviation of pre-test and post-test subject's maximum strength (Kg) in the bench press and knee extension was provided.

As seen in Table 3 according to the mandatory test and post-test at the significance level of the table between the groups in both the bench press LSD post hoc test showed a significant difference in the maximum power of the test subjects in the bench press among the three groups with the control group shows (Table 4).

LSD post hoc test showed a significant difference in the maximum power of the test subjects in the knee extension exercise among the three groups with the control group (Table 5). However, the maximum power level pyramid group ($F=9.826$, $P<0.000$), Knee extension ($F=10.071$, $P<0.000$), There is a difference significant ($p\leq 0.05$).

Table2. The mean and standard deviation of pre-test and post-test subject's maximum strength (kg)

action	Pyramid Cross		Reverse Pyramid		Flat Pyramid		Control	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Bench press	52.4±7.2	61.16±9.9	52.93±10.1	63.03±8.9	53.13±10.4	70.40±9.2	51.53±7.05	53.23±6.2
Knee extension	51.83±8.1	62.30±9.6	53.30±8.6	64.60±9.2	50.86±11.5	68.26±10.2	50.43±9.6	50.03±9.2

Table3. ANOVA test results for maximum power compared to subjects in the pre-test and post-test (kg) in the bench press and knee extension

Source of change		The sum of squares	Df	Average Total	F	sig
pre-test bench press (1RM)	Between groups	23.000	3	7.667	0.097	0.961
	Intergroup	4404.500	36	78.652		
	Total	4427.500	39			
post-test bench press (1RM)	Between groups	2237.546	3	745.849	9.846	0.000*
	Intergroup	4259.600	36	75.904		
	Total	6488.146	39			
pre-test knee extension (1RM)	Between groups	72.646	3	24.215	0.263	0.851
	Intergroup	5148.400	36	91.936		
	Total	5221.046	39			
post-test knee extension (1RM)	Between groups	2810.433	3	936.811	10.71	0.000*
	Intergroup	5209.167	36	93.021		
	Total	8019.600	39			

($p\leq 0.05$)*

Table4. The post hoc test sets to determine the location and post-test for differences in maximal strength (kg) bench press

Group I	Group J	mean difference (I-J)	Standard error	sig
Pyramid Cross	Reverse Pyramid	-1.86	3.18	0.560
	Flat Pyramid	-9.23	3.18	0.005*
	Control	7.93	3.18	0.016*
Reverse Pyramid	Flat Pyramid	-7.36	3.18	0.024*
	Control	9.80	3.18	0.003*
Flat Pyramid	Control	17.16	3.18	0.000*

($p\leq 0.05$)*

Also no significant difference in peak power than the flat pyramid group subjects into two groups skewed pyramid and inverted pyramid bench press at the show.

Subjects compared with the other groups increased, but the difference is not significant. Thus it can be concluded that the 8-week weight training to a significant increase in quadriceps strength training group and the control group is three ($p \leq 0.05$).

(DeLorme, 1946). According to this principle, increase strength, endurance and muscle bulk is possible only for certain time, and to the border of that muscle strength and exercise capacity are made (DeLorme, 1946). The review of previous research and the results of this research can be concluded that exercise with weights to increase strength is growing. It is also generally accepted that the development of peak force is proportional to muscle cross-

Table5. The post hoc test sets to determine the location and post-test for differences in maximal strength (kg) knee extension

Group I	Group J	mean difference (I-J)	Standard error	sig
Pyramid Cross	Reverse Pyramid	-2.30	3.52	0.516
	Flat Pyramid	-5.96	3.52	0.096*
	Control	12.26	3.52	0.001*
Reverse Pyramid	Flat Pyramid	-3.66	3.52	0.302
	Control	14.56	3.52	0.000*
Flat Pyramid	Control	18.23	3.52	0.000*

($p \leq 0.05$)*

4. Discussion

Analysis of variance showed significant differences among the groups, there is a power surge. To locate and test for differences LSD in the control group, a significant difference among the three training groups increased maximal strength chest press and knee extension showed indicated, but the difference was not statistically significant.

Therefore, the results obtained we can conclude that 8 weeks of weight training to a significant increase in thoracic muscles of the three training groups compared to the control group and Pyramidal groups than in the flat as well as hierarchical groups are skewed and inverted pyramidal ($p \leq 0.05$).

Raised by Rox& Lange theory in the early twentieth century, which, according to this theory, when the time, more than usual severity (severe muscle accustomed to it) is applied to the muscles, increases muscle size and strength (Hettinger, 1961). Among the first applications isotonic resistance increase is related to Delorme and Watkins in 1948 (Fox, 2012). The original form of the theory (Fox, 2012), then as Delorme developed the principle (PRE) of overload

sectional area of muscle contraction upoar.

As a result of that exercise increases muscle mass, muscle strength will increase (Kurdabeh, 2009). The first study to show an increase in non -athletic power effectively increases central nervous system stimulation is efficient and takes more novel caused a power surge occur hypertrophy. So power is not merely a muscle characteristic, but is also characteristic of the motor system (Robergs et al., 2000). First results of this study show significant differences in practice each of the techniques used in this research to increase maximal strength chest press and knee extension compared with the control group. This finding is consistent with research Gaeini et al.,&Kurdabeh.

This finding is not too far-fetched because the training literature indicates that weight training can increase strength. Another study found a significant difference in peak power pyramid group subjects than the flat bench press was biased and reverse motion (Gaeini et al., 2009; Kurdabeh, 2008).

Bompa has claimed the best fruiting pattern to achieve maximum power is used flat. Physiological benefit of this is that using a constant load, without causing

disruption in the body at different intensities, optimal adjustment of nerve - muscle the maximum power is obtained (Bompa, 1999). Another finding of the study is that the more the subjects' pyramidal peak power level compared to the other groups but not significant increase in the movement of knee extension. Perhaps one reason for this finding is the difference in the response of the same muscle groups to exercise. In support of this claim, Ferris and Kramer have reported that the exercise of power by different protocols may be different muscle group than the other groups (Fleck & Kraemer, 2004). In support of the theory Paulsen et al. observed that the lower body muscle in response to resistance exercise with moderate volume compared with low-volume resistance training showed a greater increase than the upper body muscle response was not different in the two cases (Paulsen et al., 2003).

Finally, according to recent research findings and the results of previous research, which suggests the purpose of weight training is to increase the maximum power, using a flat pyramid reverse pyramid methods and priorities are skewed pyramid. However, this proposal carefully presented and recommended for athletes who are training experience.

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Correspondence to: Mohammad Bagher Forghani, Department of PE in Education Office of Babol, Iran.
Email:
Mohammadbagher.forghani@gmail.com

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