RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

# EFFECT OF ELASTIC STRENGTH TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES OF CSJM UNIVERSITY KANPUR MEN ATHLETE

Author

Dr. Prabhash Chand Puri, Assit Prof. Department of Physical Education, DDPGU (PG) College, Kanpur, U.P.

**ABSTRACT**

The aim of the present study was to find out the effect of elastic strength training on selected physical fitness variables of CSJM university kanpur men athlete. To achieve the purpose of the study, twenty male athlete were selected randomly from Department of Physical Education, CSJM University, Kanpur. The selected subjects were classified into two groups of ten each. Group I underwent six weeks of elastic strength training programme, so as to be an experimental group. Group II acted as control group to find out the influence of elastic strength training programme. The criterion variables selected for the present study are speed –50 meters dash, leg strength –leg dynamometer and explosive power –vertical jump. The elastic strength training group underwent training 3 days per week for six weeks. They performed 50 to 80 foot contacts per session. The training resulted in significant improvement in speed ($F = 34.24$, $p < 0.05$), leg strength ($F = 48.46$, $p < 0.05$) and explosive power ($F = 19.62$, $p < 0.05$). It is concluded that men athlete experience significant improvement in lower extremities strength and power.

**KEYWORDS**: Elastic strength, athlete, speed, power, dynamometer.

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

**INTRODUCTION**

An increased knowledge about factors limiting jumping and speed ability is of interest for both coaches and athletes. A common experience among coaches is that up to a certain degree almost any type of training program will increase the jump and speed capacity which enhances jump and speed performance. However, an increased performance level of the athlete will require more specific and individually adapted training methods. In this age of specialization in athletics, the strength requirements of the jumps and track events, demand debate about maximum strength, strength endurance and elastic strength. The adjective "elastic" is particularly appropriate since muscles possess high elasticity. Muscles are composed of contractile elements (myosine and actin) and elastic elements that are in parallel and in series. The neuromuscular system accepts and expels rapid loading at high velocity through the coordination of both reflexes and these elastic and contractile components of muscle. Due to these facts the definition of "elastic strength" occurred: (the ability of the neuromuscular system to overcome resistance with a high speed of contraction). Using the jumping events as an example, coaches were aware that a pre stretch state had to precede the muscle work or flexion state of the muscles for the stretch reflex to work, so the idea of pre-tensing the leg muscles of the plant foot just before the foot landed in the plant phase of jumping became the norm. Gradually jump and short races events stated inculcating elastic strength training in their regular training schedule.

The aim of the present study was to find out the effect of elastic strength training on selected physical fitness variables of CSJM university kanpur men athlete. Methods Subjects Subjects and variable To accomplish the purpose of the study twenty novice male athlete were selected randomly from Department of Physical Education, CSJM University, Kanpur, U.P.. The selected subjects were classified into two groups of ten each. Group I underwent six weeks of elastic

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

strength training programme, so as to be an experimental group. Group II acted as control group to find out the influence of elastic strength training programme. The criterion variables

Selected for the present study are speed –50 meters dash, leg strength –leg dynamometer and explosive power –vertical jump. These subjects were tested before and after six weeks of training. Training. The elastic strength training group underwent training 3 days per week for six weeks. They performed 50 to 80 foot contacts per session.

**Schedule**

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 |
|---|---|---|---|---|---|---|
| Volume | 50 FC | | 60FC | | 70FC | |
| **Exercises** | Squat jumps1x10 | | Squat jumps 1x10 | | Squat jumps 1x10 | |
| | Multiple long jump 5x3 | | Split squat jump2x5 | | Split squat jump 3x5 | |
| | Lateral long jump 5x1 | | Tuck jump 5x1 | | Multiple cone hops 5x3 | |
| | Pike jump5x1 | | Lateral long jump 5x1 | | Lateral long jump 5x1 | |

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

| | | | |
|---|---|---|---|
| | | | |
| | Two leg jump/reach 5x1 | Weighted squat jump 10x1 | Weighted squat jump 10x1 |
| | Single leg jump/reach 5x1 | Box jump 2x5 | Box jump 2x5 |

Total Foot contacts per training session as determined by total sets and repetitions for that session Statistical technique. The experimental design used for the present investigation was Analysis of Covariance (ANCOVA). Since two groups are involved post hoc test was not applied to determine the significant paired mean differences. The level of confidence was fixed

At 0.05 to test the significance. The data was analyzed in computer system by using statistical package for social science (SPSS).

**RESULTS**

It is clear from the table that there is no significant difference between elastic strength training and control group on speed, leg strength and explosive power before commencement of training. However, there is a significant difference on speed ($F = 5.58$, $p < 0.05$), leg strength ($F = 7.58$, $p < 0.05$) and explosive power ($F = 8.09$, $p < 0.05$) during post-test. Thereby it inferred that the elastic strength training significantly improved selected physical fitness variables in male athlete.

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

**TABLE**

Summary of ANCOVA on aerobic capacity

| Variables | Testing Conditions | Elastic Stre-ngth training | Control group | SOV | SS | Df | MS | F |
|---|---|---|---|---|---|---|---|---|
| Speed (sec) | Pre (M ± SD) | 7.49±0.37 | 7.53±0.41 | B | 0.011 | 1 | 0.012 | 0.07 |
| | | | | W | 4.288 | 30 | 0.155 | |
| | Post (M ± SD) | 6.87±0.36 | 7.52±0.42 | B | 0.837 | 1 | .832 | 5.58* |
| | | | | W | 4.195 | 28 | 0.150 | |
| | Adjusted (M) | 7.07 | 7.55 | B | 0.005 | 1 | 0.005 | 35.4* |
| | | | | W | 0.004 | 27 | 0.0002 | |
| | Pre (M ± SD) | 46.20±6.07 | 46.25±5.21 | B | 0.01 | 1 | 10.0 | 1.07 |
| | | | | W | 0.24 | 28 | 8.43 | |

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Leg Strength (sec) | Post (M ± SD) | 50.21±6.42 | 46.95±4.99 | B | 0.215 | 1 | .215 | 7.58* |
| | | | | W | 0.779 | 28 | 0.026 | |
| | Adjusted (M) | 50.03 | 46.91 | B | 1121.6 | 1 | 1121.6 | 47.2* |
| | | | | W | 637.85 | 27 | 24.6 | |
| Explosive power (cm) | Pre (M ± SD) | 27.33±2.72 | 27.40±2.53 | B | 0.035 | 1 | 0.035 | 0.008 |
| | | | | W | 194.44 | 28 | 6.96 | |
| | Post (M ± SD) | 35.73±6.36 | 28.53±4.51 | B | 77.10 | 1 | 77.10 | 8.09* |
| | | | | W | 266.89 | 28 | 9.50 | |
| | Adjusted | 34.13 | 27.86 | B | 79.76 | 1 | 79.76 | |

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (sec) | (M) | | | W | 110.23 | 27 | 4.78 | 19.2* |

*Significant at 0.05 level of confidence

Further, table clearly shows that after adjusting pre-test scores, there was a significant difference between the two groups on adjusted post test scores on speed ($F = 35.4$, $p < 0.05$), leg strength ($F = 47.2$, $p < 0.05$) and explosive power ($F = 19.2$, $28 < 0.05$). Thus, it is concluded that six weeks of elastic strength training significantly improved speed (8.27%), leg strength (8.57%) and explosive power (30.13%) than control group.

**DISCUSSION**

Leg strength is the primary source of power in many sports. According to Gambetta (2007) the legs can be seen as a functional unit of a closed kinetic chain without which an athlete cannot have strength, speed, power or suppleness to perform. In the present study 8.57% of improvement is elicited in leg strength as result of elastic strength training. Since, leg strength significantly influences jumpers and races speed and explosive power which may enhance their jumping racing performance. Hence, it has been shown that muscular strength is related to sprinting performance. Speed and explosive power significantly improved as a of elastic strength training. In the present study the changes are elicited in selected physical fitness variables may be because of effective elastic strength training programmers with optimal level of male athlete that enhanced both neural and muscular characteristics.

RESEARCH PAPER
Times International Journal of Research
A creative Journal for Research
July issue 2014
ISSN No.:-2349-4867

## CONCLUSION

It is concluded that elastic strength training programme for 6 weeks is effective in improving the male athlete performance on speed, leg strength and explosive power. This optimal training load may be adopted during preparation of novice athlete who require greater amount of leg strength, speed and explosive power to jump higher.

## REFERENCES

1. Delecluse, C. (1997). Influence of strength training on sprint running performance: current findings and implications for training Sports Medicine, 24(3): 147–156.

2. Gambetta, G. (2007). Athletic development: The art & science of functional sports conditioning. Champaign, Illinois: Human Kinetics.

3. Markovic, G. & Mikulic, P. (2010). Neuro-musculoskeletal and performance adaptations to lower-extremity plyometric training. Sports Medicine, 40(10): 859-895.

4. Sáez-Sáez De Villarreal, E.; Requena, B. & Newton, R. U. (2010). Does plyometric training improve strength performance? A meta-analysis. Journal of Science and Medicine in Sport, (13): 513–522.

5. Sáez-Sáez De Villarreal, E.; Kellis, E.; Kraemer, W.J. & Zquierdo, M. (2009). Determining variables of plyometric training for improving vertical jump height performance: a meta-analysis. Journal of Strength and Conditioning Research, 23(2): 495-506.

6. Salvi Shah. (2012). Plyometric exercises. International journal of health sciences and research, 2(1): 115-126.

7. Young, W.B., McLean, B. and Ardagna, J. (1995). Relationship between strength qualities and sprinting performance, 68(6): 236-243.