



EFFECT OF WEIGHT TRAINING AND YOGA PRACTICE AND COMBINATION OF WEIGHT TRAINING PLYOMETRIC TRAINING AND YOGA PRACTICES ON LEG STRENGTH AND VITAL CAPACITY

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Abstract

The purpose of the present study was to find the effect of weight training and yoga practice and combination of weight training, plyometric training and yoga practices on leg strength and vital capacity. For this purpose, forty five male students from Kruti Institute of Engineering and Technology, Raipur, Uttar Pradesh, in the age group of 17 – 23 years were selected. They were divided into three equal groups (n = 15), each group consisted of fifteen subjects, in which group – I underwent weight training and yoga practice, group – II underwent combination of weight training, plyometric training and yoga practice and group – III acted as control group who did not participate in any special training. The training period for this study was three days in a week for twelve weeks. Prior to and after the training period the subjects were tested for leg strength and vital capacity. Leg strength was assessed by administering sit and reach test and vital capacity was assessed by using expirograph. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in this study the Scheffè S test was used as pos-hoc test. It was concluded from the result of the study that the weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group has positively altered the criterion variables, such as, leg strength and vital capacity. The result of the study also shown that there was no significant difference occurred between the experimental groups, such as, weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group.

Key Words: *weight training yoga practice, plyometric training, leg strength, vital capacity.*

INTRODUCTION

Physiological, anatomical, biochemical, and psychological changes all contribute to physical exercise. The length, repetition, distance, velocity, weight, and frequency of workouts used to improve an individual's performance are all factors. The timetable should be considered with particular characteristics in mind during dynamic training; functional and psychological aspects will be presented during competition dependent on the training. Maximum hours of training periods/sessions should be introduced, with physical, physiological, or psychological factors coloured to achieve the aim.[1]

Athletic performance has improved dramatically in recent years. Performance levels that were previously unthinkable are becoming more prevalent, and the number of athletes capable of extraordinary feats is increasing. One factor is that athletics is a demanding activity, and high desire has resulted in long and exhausting practise sessions. Furthermore, coaching has become more sophisticated as a result of technology improvements. [2]

Sports training is a scientifically based athletic development technique that allows players to produce great and record-breaking athletic performances by systematically developing mental and physical efficiency, capability, and motivation. [3] One of the most important aspects of high-performance training is physical training. The goal of physical training is to maximise an athlete's physiological potential and improve biomotor abilities to their highest degree.[2]

Numerous studies have demonstrated that progressive resistance exercise improves muscular strength in older adults, even the elderly.[4-6] To enhance the key muscle groups involved in weight carrying and lifting, progressive resistance strength training steadily increases load during the session. The training has been recommended to assist older people in avoiding or reducing late-life impairment. The idea of specificity of training asserts that training in a single activity is the best way to maximise performance in that activity. Functional training is based on this notion. [7-8]

In addition to physical workouts, yoga poses are promoted at the gym. It can be done before or after an exercise regimen, depending on the intensity, kind, and amount of repetitions. In low to high intensity training regimes, several types of yoga positions are recommended for relaxation and cool down after a workout. Yoga positions have several health advantages, including pain relief[9-13], improved flexibility and balance[14], muscle strength[15-16], skeletal muscle oxygen uptakes[17], and lung function[18], among others.

Plyometric training, often known as ballistic training, is used to increase jumping ability and performance. [19] Plyometric training has also been shown to be an effective technique or tool for increasing strength, running economy, agility [22-23], and sprint capacity. [24-25] Plyometric refers to the pursuit for enhanced power production and is derived from two Greek words: plio, which means more, and metric, which means to measure. [25]

Plyometric workouts make muscle fibres and connective tissue more elastic, allowing the muscle to store and release energy during deceleration and acceleration. [26-29]

Leg strength is extremely important in human daily activities. It is a requirement for practically all games and sports to have it. An athlete will only go as far as his legs will take him, according to an old adage.[30,31] Leg strength is critical for athletes and other sportspeople. The cross sectional area, or girth, of a muscle is proportional to its strength. The stronger a muscle is, the larger it is. It is feasible to establish whether extra strength is required by comparing strength to performance.

The volume of air in the lungs is split into four volumes and four capacities during various periods of the respiratory cycle. The four lung volumes are total lung capacity (TLC), vital capacity (VC), inspiratory capacity (IC), and functional residual capacity (FRC), whereas the four lung capabilities are total lung capacity (TLC), vital capacity (VC), vital capacity (V), and residual volume (RV) (FRC). [32]

METHODS

This study under investigation involves the experimentation of weight training and yoga practice and combination of weight training, plyometric training and yoga practices on leg strength and vital capacity. Only college male students from Kruti Institute of Engineering and Technology, Raipur, Uttar Pradesh, in the age group of 17 – 23 years were selected. They were divided into three equal groups (n = 15), each group consisted of fifteen subjects, in which group – I underwent weight training and yoga practice, group – II underwent combination of weight training, plyometric training and yoga practice and group – III acted as control group who did not participate in any special training. The training programme was carried out for three days (Monday, Wednesday and Friday) per week during morning session only (6 am to 8 am) for twelve weeks. Leg strength was assessed by administering sit and reach test and vital capacity was assessed by using expirograph.

ANALYSIS OF DATA

The data collected prior to and after the experimental periods on leg strength and vital capacity of weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group and control group were analysed and presented in the following table - I.

Table – I

Analysis of Covariance and 'F' ratio for Leg strength and Vital capacity for Weight Training and Yoga Practice Group, Combination of Weight Training, Plyometric Training and Yoga Practice Group and Control Group

Variable Name	Group Name Test ± S.D	Experimental Group – I	Experimental Group- II	Control Group	'F' Ratio
Leg strength (in Kg)	Pre-test Mean ± S.D	47.27 ± 3.73	47.13 ± 4.03	48.13 ± 2.67	0.356
	Post-test Mean ± S.D.	49.93 ± 3.75	49.60 ± 3.85	46.67 ± 2.72	4.008*
	Adj. Post-test Mean	50.169	49.964	46.068	134.27*
Vital capacity (Liters)	Pre-test Mean ± S.D	4.467 ± 0.06	4.433 ± 0.059	4.436 ± 0.091	1.02
	Post-test Mean ± S.D.	4.66 ± 0.076	4.65 ± 0.042	4.423 ± 0.08	56.54*
	Adj. Post-test Mean	4.639	4.657	4.430	243.14*

* Significant at .05 level of confidence. (The table value required for significant at .05 level with df 2 and 42 and 2 and 41 are 3.22 and 3.23 correspondingly).

Table – I displays the 'f' - ratio values of pre-test means of leg strength for weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group and control group was 0.356, which was less significant. The 'f' - ratio of post- and adjusted post-test means were 4.008 and 134.27 were superior to the requisite table value of 3.22 and 3.23 for significance with df 2 and 42 and 2 and 41 at .05 level of confidence.

The result of this study showed that there was a significant dissimilarity among weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group and control group on muscular endurance.

The above table shows the 'f' - ratio values of pre-test mean of vital capacity for weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group and control group was 1.02, which was not significant at 0.05 level of confidence. The 'f' ratio of post and adjusted post-test means was 56.54 and 243.14 was superior to the requisite table value of 3.22 and 3.23 for significance with df 2 and 42 and 2 and 41 at .05 level of confidence. The result of this study showed that there was a significant dissimilarity among weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group and control group on vital capacity.

Further to determine which of the paired means has a significant difference, Scheffé S test was applied as post-hoc test. The result of the follow-up test is presented in Table - II.

Table - II

Scheffé S Test for the Difference Between the Adjusted Post-Test Means of Leg strength and Vital capacity

Adjusted Post-test Mean of Leg strength				
Experimental Group - I	Experimental Group- II	Control Group	Mean Difference	CI
50.169		46.068	4.101*	0.711
50.169	49.964		0.205	0.711
	49.964	46.068	3.896*	0.711
Adjusted Post-test Mean of Vital capacity				
4.639		4.430	0.209*	0.028
4.639	4.657		0.018	0.028
	4.657	4.430	0.227*	0.028

* Significant at 0.05 level of confidence.

Results

After applying the analysis of covariance, the result of this study showed that there was a significant difference among weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group and control group on the changes in leg strength and vital capacity after twelve weeks of training. The criterion variables such as, leg strength and vital capacity was improved for both the weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group. Basically the weight training and yoga practice group and combination of weight training, plyometric training and yoga practice group has tremendously improves the physical fitness and physiological.

Conclusions

When compared to the control group, the weight training with yoga practise group, as well as the combination of weight training, plyometric training, and yoga practise groups, showed a substantial gain in leg strength. Weight training considerably enhanced leg strength among male football players, according to **Rawte and Yadav** [33] (2020). **Blakeyl and Dan Southard** (1987) [34] found that a combination weight and plyometric training regimen improved leg strength considerably. When compared to plyometric training programme, weight and plyometric training group enhanced leg strength, while resistance training alone group also improved leg strength (**Al Ameer's**, 2020) [35].

The study's findings revealed that respiratory measures such as vital capacity improved significantly. After the weight training and circuit weight training exercises, **Dinesh and Raja** (2020) [36] and **Velmurugan** (2019) [37] discovered a considerable improvement in vital capacity. **Kare** (2019) [38] further stated that plyometric training resulted in a considerable increase in vital capacity. A short term of yoga practice has significantly improved the pulmonary function among healthy subjects from 20 to 65 years of age [39].

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