EFFECTS OF PLYOMETRIC TRAINING AND COMBINATION OF PLYOMETRIC TRAINING AND YOGA ON LEG EXPLOSIVE POWER AND BODY FAT PERCENTAGE OF INTER COLLEGIATE MEN VOLLEYBALL PLAYERS

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Abstract

In order to assess the real facts the investigator made an attempt to examine the effect of plyometric training and combination of plyometric training and yoga on leg explosive power and body fat percentage of inter collegiate men volleyball players. To achieve the purpose of the study 45 Subjects from Coimbatore district. Their age ranged from 18 to 23 years. The subjects were randomly assigned to three equal groups. Group- I (n=15) underwent plyometric training group (PTG) and Group – II (n=15) underwent plyometric training with yoga group (PTWYG) and Group - III (n=15) acted as control group (CG). The plyometric training and combination of plyometric training was given to the experimental group for the periods of 8 weeks. The control group was not given any sort of training except their routine work. The following variables were measured with standard test items: leg explosive power and body fat percentage. Pre and post test was conducted on separate days with warmup. The leg explosive power assessed by standing broad jump test with unit of measurements in meters and body fat percentage assessed by moronic 306 handheld body fat monitor test with unit of measurement in points. The data collected from the subjects were statistically analyzed using 't' test to find out whether significant mean difference existed at 0.05level of confidence.

Key words: Plyometric training, Yoga, leg explosive power,body fat percentage,Volleyball.

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Introduction

Plyometric training, otherwise referred to as 'plyometrics' or 'shock training', is a training modality which often requires athletes to jump, hop, bound and/or skip. Plyometrics should not be confused with 'ballistic' training, which is ultimately another word for 'trajectory' training. Ballistic training involves the trajectory of objects and implements (e.g. barbells and medicine balls), whereas plyometric training uses the previously mentioned movements. Having said this, it is important to understand in some circumstances there is a degree of crossover, where some movements are considered both ballistic and plyometric. Ultimately the differing factor between the two is that plyometric training typically involves rapid reactive contacts with a surface (e.g. foot contacts during sprinting), whilst ballistic training involves the trajectory of objects/implements **Blair (1990).**

Plyometrics is a type of exercise training that uses speed and force of different movements to build muscle power. Plyometrics training can improve your physical performance and ability to do different activities. Plyometrics can include different types of exercises, like pushups, throwing, running, jumping, and kicking. Athletes often use plyometrics as part of their training, but anyone can do these workouts. People who are in physical rehab after an accident or injury use plyometrics to get back into good shape and physical function. If you're in good shape and looking to ramp up our workout, we may enjoy the challenge of plyometrics. It's a great way to train if you're into high-impact sports that involve a lot of running or jumping, like tennis, skiing, or basketball. When you're getting started, work with an experienced trainer who can show us how to safely jump and land. Start slow and low. Mix a few plyometric moves into our regular workout. **Kolata and Gina (2002).**

Yoga is the fine tuning of the human body or engine. It enables us to perform up to our potential. Yoga can be described as a condition that helps us for better look, pleasant feel and do our best. Yoga, a conscious and systematic process to accelerate the growth of human mind, is now emerging as a new tool in this search. meditation, in particular, is providing man a means to reach the subtle layers of mind. It has been shown through the experimental results on meditation; that knowledge and creativity are structured in subtler layers of mind or deeper states of science

are now being found in deeper states if our consciousness. Brought a breakthrough in unraveling the hidden dimensions of mind (**Iyengar, 2001**).

Therefore, this study aimed to analyze the leg explosive power and body fat percentage in male volleyball players after 8 weeks of plyometric training and combination of plyometric and yoga training.

EXPERIMENTAL APPROACH TO THE PROBLEM

In order to address the hypothesis presented herein, we selected 45 inter collegiate men volleyball players from Coimbatore District. Their age ranged from 18 to 23 years. The subjects were randomly assigned in to three equal groups namely, plyometric training Group - I (n=15) *(PTG)* and Group – II (n=15) underwent plyometric training with yoga group (PTWYG) and Control Group (n=15) (CG). The respective training was given to the experimental group the 5 days per weeks for the training period of eight weeks. The control group was not given any sort of training except their routine.

DESIGN

The evaluated parameters were leg explosive power assessed by standing broad jump test with unit of measurements in meters and body fat percentage assessed by moronic 306 handheld body fat monitor test with unit of measurement in points. The parameters were measured at baseline and after 8 weeks of plyometric training and plyometric training with yoga were examined. The intensity was increased once in two weeks based on the variation of the exercises.

TRAINING PROGRAMME

The training programme was experimental group I underwent plyometric training for the period of 8 weeks. The training was given 3 days per week during morning time. Each training session lasted for 45 minutes that included 5 minutes warmup and 5 minutes warm down. experimental group II underwent plyometric training with yoga for the period of 8 weeks. The training was given 3 days per week during morning time. Each training session lasted for 45 minutes that included 5 minutes warmup and 5 minutes warm down. The load was increased from low intensity to high intensity as mentioned in the training schedule.

PLYOMETRIC TRAINING SCHEDULE

Training week	**Training volume** (Foot contacts)	**Drill**	**Sets × Reps**	**Intensity**
1 - 2	90	Front cone hops Side to side ankle hops Bilateral Hurdle Jump Skate Jump	6 × 5 2 × 15 4 × 3 3 × 6 (Each leg)	Low
3 - 4	120	Standing long jump Lateral Jump over barrier Tuck jump with knees up Unilateral CMJ	2 × 15 8 × 4 6 × 5 6 × 6 (Each leg)	Medium
5 - 6	140	Single leg bounding Lateral Jump single leg Tuck jump with knees up Laying kick	3 × 10 3 × 10 6 × 8 2 × 8 (Each leg)	High
7 - 8	120	Standing long jump Lateral Jump over barrier Tuck jump with knees up Unilateral CMJ	2 × 15 8 × 4 6 × 5 6 × 6 (Each leg)	Medium

COMBINATION OF PLYOMETRIC AND YOGA TRAINING SCHEDULE

Training week	Asanas & Plyometric Drills	Sets × Reps	Intensity
1 - 2	Surya Namaskar Vajrasana Bhujangasana Paschimottanasana Savasana Front cone hops Side to side ankle hops	5 cycles 2 mins 1 min 1 min 2 min 6 × 5 2 × 15	Low
3 - 4	Surya Namaskar Parvathasana Navasana Shalabasana Makrasana Front cone hops Side to side ankle hops Standing jump and reach	7 cycles 2 mins 1 min 1 min 2 min 6 × 5 2 × 15 2 × 15	Medium
5 - 6	Surya Namaskar Halasana Paschimottanasana Sarvangasana Balasana Savasana Front cone hops Side to side ankle hops Standing jump and reach Tuck jump with high knees up	8 cycles 2 mins 1 min 2 min 2 min 2 min 6 × 5 2 × 15 2 × 15 4 × 10	High
7 - 8	Surya Namaskar Parvathasana Naukasana Shalabasana Makrasana Front cone hops Side to side ankle hops Standing jump and reach	7 cycles 2 mins 1 min 1 min 2 min 6 × 5 2 × 15 2 × 15	Medium

TABLE - I

COMPUTATION OF 'T' RATIO ON LEG EXPLOSIVE POWER ON EXPERIMENTAL GROUP AND CONTROL GROUP

(Scores in Numbers)

GROUPS	PRE TEST	POST TEST	SD	't' RATIO
Plyometric Training Group	1.61	1.75	0.13	8.14*
Plyometric Training with Yoga Group	1.62	1.76	0.17	10.39*
Control Group	1.62	1.61	0.17	1.51

*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and't' ratio on selected variables namely leg explosive power of plyometric and plyometric with yogic practice group. The obtained 't' ratio on leg explosive power were 8.14 and 10.39 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained't' values were greater than the table value it was found to be statistically significant.

Further the computation of mean, standard deviation and't' ratio on selected variables parameters namely leg explosive power of control group. The obtained 't' ratio on leg explosive power were 1.51 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained't' values were lesser than the table value it was found to be statistically not significant.

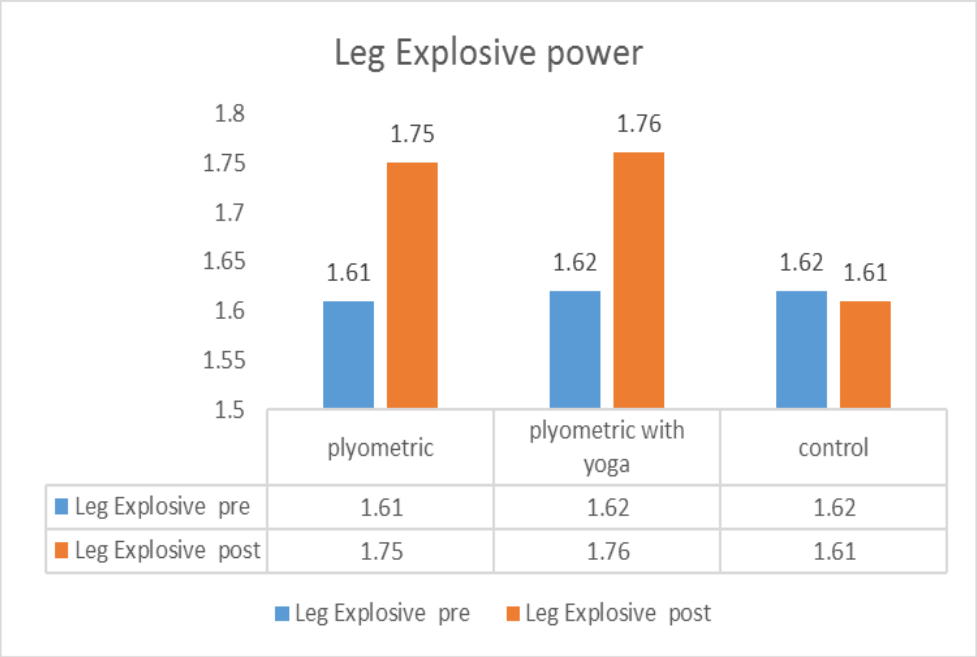

FIGURE- I

BAR DIAGRAM SHOWING THE MEAN VALUE ON LEG EXPLOSIVE POWER ON EXPERIMENTAL GROUP AND CONTROL GROUP

(Scores in Numbers)

TABLE - II

COMPUTATION OF 'T' RATIO ON BODY FAT PERCENTAGE ON EXPERIMENTAL GROUP AND CONTROL GROUP

(Scores in Numbers)

GROUPS	PRE TEST	POST TEST	SD	't' RATIO
Plyometric Training Group	21.47	20.23	2.03	4.97*
Plyometric Training with Yoga Group	21.45	19.29	2.32	8.41*
Control Group	21.68	21.87	2.46	0.95

*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table II reveals the computation of mean, standard deviation and't' ratio on selected variables namely body fat percentage of plyometric and plyometric with yogic practice group. The obtained 't' ratio on body fat percentage were 4.97 and 8.41 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant.

Further the computation of mean, standard deviation and't' ratio on selected variables parameters namely body fat percentage of control group. The obtained 't' ratio on body fat percentage were 0.95 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained't' values were lesser than the table value it was found to be statistically not significant.

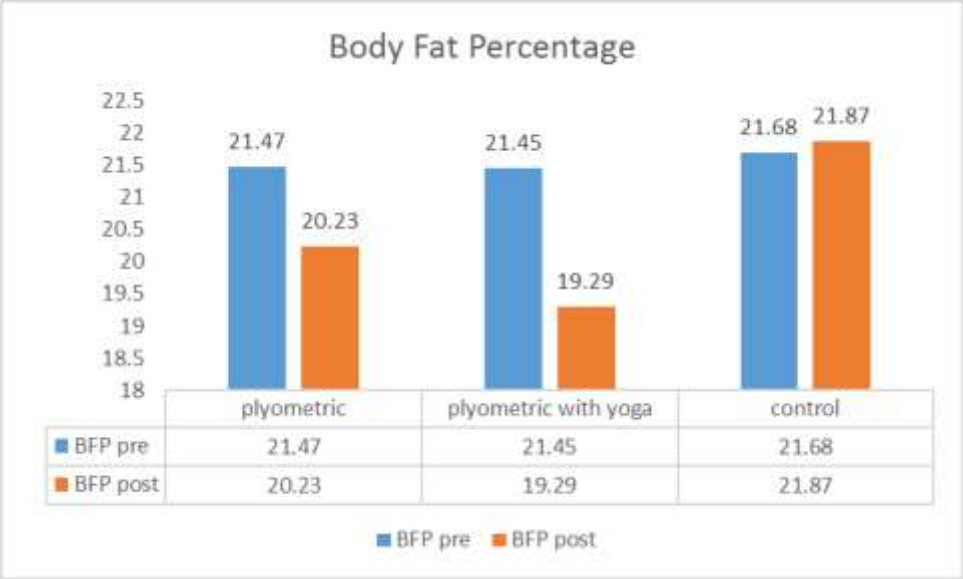

FIGURE- II

BAR DIAGRAM SHOWING THE MEAN VALUE ON BODY FAT PERCENTAGE ON EXPERIMENTAL GROUP AND CONTROL GROUP

(Scores in Numbers)

DISCUSSION AND FINDINGS

The present study experimented the influence of eight weeks plyometric and combination of plyometric with yogic training on the selected parameters of inters collegiate men volleyball players. The results of this study indicated that plyometric and combination of plyometric with yogic practice training is more efficient to bring out desirable changes over the leg explosive power and body fat percentage of inter collegiate men volleyball players.

Faigenbaum *et al.,* **(2006)** expressed the effects of short-term plyometric and resistance training programme produced significant improvement in performance on standing broad jump. **Markovic** *et al.,* **(2007)** reported that high-intensity plyometric exercise at 2 times a week for 6 weeks increased standing long jump. **Engels** *et al.,* **(2002)** expressed that the bench/step group exercise with and without extremity loading decreased the fat percentage in women.

This review shows there is a lack of proposals of tools to support these volleyball players during their training. Therefore, this encourages us to participate actively in the generation of interactive systems which address the skill development needs motivating and engaging context. Hence, it concluded that combination of plyometric with yogic practice improved the leg explosive power and body fat percentage of inter collegiate volleyball players.

Conclusions

From the results of the study and discussion the following conclusions were drawn.

1. Based on the result of the study it was concluded that the eight weeks training of plyometric training have been significantly changes leg explosive power and body fat percentage of inter collegiate men volleyball players.

2. The eight weeks training of plyometric with yogic practice training have been significantly changes leg explosive power and body fat percentage of inter collegiate men volleyball players.

3. Further it was concluded that plyometric with yogic practice training had produced better result on leg explosive power and body fat percentage of inter collegiate men volleyball players then plyometric training.

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