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## Effect of plyometric training program on motor fitness development among college level volleyball players in Nizamabad district

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### Abstract

Plyometric training is a specialized form of exercise that focuses on developing explosive power, speed, and agility in athletes and fitness enthusiasts. The objectives of the study, "The Impact of a Plyometric Training Program on Motor Fitness Development in College Volleyball Players in Nizamabad District," To assess the baseline motor fitness levels (power, speed, and agility) of college-level volleyball players in Nizamabad District. Motor fitness Variables are Agility, Explosive Power and Speed were administrated on Plyometric Training group, and control group in the age group of 18 to 22 years from 100 men Nizamabad district volleyball players. In the experimental group, there is a substantial decrease in the mean speed from 10.8730 (pre-test) to 7.4970 (post-test). Similar to speed, the experimental group shows a significant decrease in mean agility from 14.7106 (pre-test) to 10.0422 (post-test). The experimental group demonstrates a noteworthy increase in explosive strength, with the mean values going up from 1.8950 (pre-test) to 2.3320 (post-test). Conclusion the plyometric training program significantly improved explosive strength, a critical component of motor fitness, in college-level volleyball players. However, this improvement was accompanied by reductions in speed and agility. These findings underline the importance of tailoring training programs to the specific needs and demands of the sport. Further research is warranted to refine plyometric training programs for volleyball players and explore how to maintain or enhance other motor fitness components while maximizing explosive strength.

**Keywords:** Agility, explosive power, speed and plyometric training

### Introduction

Plyometric training is a specialized form of exercise that focuses on developing explosive power, speed, and agility in athletes and fitness enthusiasts. This training method has gained popularity in various sports and fitness programs due to its effectiveness in enhancing athletic performance. Plyometrics, often referred to as "plyos" or "jump training," involves quick and powerful movements designed to increase muscular strength, coordination, and power.

Plyometrics primarily target the stretch-shortening cycle of the muscles. This cycle involves a rapid stretch (Eccentric contraction) followed by an immediate shortening (Concentric contraction) of the same muscle group. This cycle is essential for generating maximum force in minimal time. Plyometric exercises typically include various types of jumps, hops, and bounds. Common plyometric exercises include squat jumps, box jumps, depth jumps, bounding, and medicine ball throws. These exercises can be modified to suit different fitness levels and athletic needs. Enhanced Athletic Performance, Athletes in various sports, including basketball, volleyball, track and field, and soccer, benefit from plyometric training to enhance their ability to jump, change direction, and explode into action.

Plyometric workouts are typically short and intense, making them a time-efficient training method for those with busy schedules. It's important to note that plyometric training is not suitable for everyone. Beginners or individuals with certain medical conditions or joint problems should consult with a fitness professional or healthcare provider before starting a plyometric program. Additionally, proper warm-up and cool-down routines are essential to prevent injury and optimize the benefits of plyometric training. Plyometric training is a dynamic and effective method for enhancing power, speed, and agility in athletes and fitness enthusiasts.

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When incorporated into a well-rounded training program and performed with proper technique, plyometrics can lead to significant improvements in athletic performance and overall fitness.

**Statement of the study**

This research study aims to investigate the effects of a specifically designed plyometric training program on the motor fitness development of college-level volleyball players in Nizamabad District. The study seeks to assess whether the implementation of a structured plyometric training regimen can lead to significant improvements in the motor fitness components, including power, speed, and agility, among this group of athletes. By conducting this research, we aim to provide valuable insights into the potential benefits of plyometric training for enhancing the performance and physical capabilities of college volleyball players in the Nizamabad District, contributing to the existing body of knowledge in sports science and conditioning.

**Objectives of the Study**

The objectives of the study, "The Impact of a Plyometric Training Program on Motor Fitness Development in College Volleyball Players in Nizamabad District," can be outlined as follows:

- To assess the baseline motor fitness levels (power, speed, and agility) of college-level volleyball players in Nizamabad District.
- To design and implement a structured plyometric training program tailored to the specific needs of the volleyball players in the study.
- To measure the impact of the plyometric training

program on the motor fitness development of the participants.

- To provide practical recommendations for coaches, trainers, and athletes in Nizamabad District regarding the incorporation of plyometric training into their training regimens.
- To identify any limitations of the study and suggest areas for further research in the field of sports science and conditioning.

**Hypothesis of the study**

There will be no significant difference in the motor fitness development (Power, speed, and agility) among college volleyball players in Nizamabad District after the implementation of a plyometric training program.

**Methods and Materials**

The following Motor fitness Variables are Agility (4 x 10 shuttle run), Explosive Power (Vertical Jump), Speed (60 yard dash), were administrated on Plyometric Training group, and control group in the age group of 18 to 22 years from 100 men Nizamabad district volleyball players from Telangana state pre- test were administrated and post-test were taken after systematic training of 12 weeks training plyometric training program.

**Results and Discussions**

Table 1 Showing the Mean Values, SD, ‘t’ value difference between pre – test and post on effect of plyometric training program experimental group and control group among Nizamabad district volley ball players in relation to their motor fitness.

**Table 1:** Showing the Mean Values, SD, ‘t’ value difference between pre – test and post on effect of plyometric training program experimental group and control group among Nizamabad district volley ball players

S. No	Variables	Groups	Pre-Test Mean	Post-Test Mean	SD	‘t’ ratio
1.	Speed	Experimental Group	10.873	7.497	0.293	14.15
		Control Group	10.186	10.801	0.764	4.64
2.	Agility	Experimental Group	14.710	10.042	0.624	18.83
		Control Group	14.185	14.531	0.925	10.63
3.	Explosive Strength	Experimental Group	1.895	2.332	0.120	6.14
		Control Group	1.191	1.847	0.291	10.88

**Discussion of the study**

The table presents mean values, standard deviations (SD), and ‘t’ ratios indicating the difference between the pre-test and post-test measurements of various motor fitness variables in an experimental group (Those undergoing plyometric training) and a control group (Those not undergoing the training) among volleyball players in Nizamabad district. Let's discuss the implications of the data presented:

**Speed**

- In the experimental group, there is a substantial decrease in the mean speed from 10.8730 (pre-test) to 7.4970 (post-test).
- The standard deviation (SD) in the experimental group is relatively low, suggesting consistent changes.
- In contrast, the control group experienced only a slight change in speed, with a ‘t’ ratio of 4.643.

**Agility**

- Similar to speed, the experimental group shows a significant decrease in mean agility from 14.7106 (pre-test) to 10.0422 (post-test).

- The SD in the experimental group is moderate, indicating some variation.
- The control group, on the other hand, had a smaller change in agility with a ‘t’ ratio of 10.639.

**Explosive Strength**

- The experimental group demonstrates a noteworthy increase in explosive strength, with the mean values going up from 1.8950 (pre-test) to 2.3320 (post-test).
- The SD in the experimental group is low, suggesting relatively consistent improvements.
- In the control group, there is also an increase in explosive strength, but the ‘t’ ratio of 10.882 suggests that the improvement in the experimental group is more pronounced.

**Discussion of the study**

The data in the table suggests that the plyometric training program had a significant impact on the motor fitness of the volleyball players in the experimental group. It led to a substantial decrease in speed and agility, indicating that the training program likely focused on improving explosive

power and strength at the expense of speed and agility. Conversely, explosive strength, a key component of motor fitness, showed significant improvement in the experimental group. This supports the hypothesis that plyometric training can enhance explosive strength. It's important to note that the control group also showed some improvements, possibly due to regular volleyball training or other factors, but these improvements were less pronounced compared to the experimental group.

Overall, these findings suggest that plyometric training had a targeted effect on explosive strength development, which is crucial for volleyball players. The decrease in speed and agility may be a trade-off for improved strength, emphasizing the need for a balanced training program to maintain all aspects of motor fitness. Additional research is required to fully understand the long-term impact of plyometric training on these athletes and whether adjustments to the training program can maintain or improve other motor fitness components while still enhancing explosive strength.

### Conclusion

The findings of this study provide valuable insights into the impact of a plyometric training program on the motor fitness development of college-level volleyball players in Nizamabad district. The data analysis and 't' ratios revealed significant changes in the measured motor fitness components, including speed, agility, and explosive strength, between the experimental group (undergoing plyometric training) and the control group (not undergoing plyometric training). The plyometric training program had a notable impact on speed and agility in the experimental group, resulting in a significant decrease in these components. This suggests that the training regimen may have prioritized explosive strength and power development over speed and agility. In contrast, explosive strength showed a significant increase in the experimental group, aligning with the primary objective of the plyometric training program. This is a positive outcome for volleyball players, as explosive strength is vital for actions such as spiking, blocking, and jumping in the sport.

In conclusion, the plyometric training program significantly improved explosive strength, a critical component of motor fitness, in college-level volleyball players. However, this improvement was accompanied by reductions in speed and agility. These findings underline the importance of tailoring training programs to the specific needs and demands of the sport. Further research is warranted to refine plyometric training programs for volleyball players and explore how to maintain or enhance other motor fitness components while maximizing explosive strength.

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