



Effect Of Plyometric Exercises Associated With Skill Practices On Speed Of High School Volleyball Players

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Abstract: The aim of research is to determine the effect of plyometric exercises with skill practices on speed of volleyball players of high school boys. Twenty Seven subjects were randomly assigned to three equal groups of 9 subjects and they were high school Volleyball Players who were studying in schools at Vijayapur District, Karnataka, India. Three groups were assigned into Experimental Group-I (PE) acted as Plyometric Training group practicing plyometric exercises; Experimental Group-II (PESP) acted as Plyometric Training Group practicing plyometric exercises with specific skills and Group-III (CG) acted as control group. The Pre test scores on Speed as physical fitness component was conducted for all the subjects by administering 50 Meters Run Test (in seconds). Experimental groups practiced plyometric training for the period of 12 weeks. The post test mean scores of Speed was collected after the said treatments. ANOVA and ANCOVA Analysis were used to determine the significant mean scores for Speed variable. By using LSD post hoc test where the obtained F value was found significant. The level of significance was fixed at 0.05 level. The SPSS Package along with MS Excel applications were utilized to get the results for the present investigation. The findings emphasize the value of comprehensive training programs that target multiple dimensions of athletic performance in Volleyball game. Plyometric exercises, when integrated into training, can significantly enhance the speed of volleyball players of high school boys, ultimately boosting their overall effectiveness on the court. These insights are valuable for coaches and trainers aiming to optimize the performance of their athletes.

Index Terms Plyometric exercises, speed, volleyball, high school boys, players

I. INTRODUCTION

Volleyball is a dynamic sport that demands a blend of speed, agility, and explosive leg power from its players. For high school boys volleyball athletes, enhancing these physical attributes is essential for excelling in the sport. One effective strategy to achieve these improvements is integrating plyometric exercises with skill practices. This essay explores the effectiveness of such a training regimen in boosting speed, agility, and leg explosive power in volleyball players of high school boys, supported by relevant citations and references.

Plyometric Exercises: Plyometric exercises involve rapid stretching and contracting of muscles to enhance explosive power, agility, and vertical jump height (Bompa & Carrera, 2005). These exercises include activities such as box jumps, squat jumps, and depth jumps, which improve the efficiency of muscle contractions and the rate of force development (RFD) (Markovic, 2007).

Skill Practices: In volleyball, skill practices consist of drills and techniques aimed at improving ball control, blocking, serving, and spiking abilities. These skills are crucial for performance and require precision, timing, and coordination (Schmidt & Wrisberg, 2008). Combining skill practices with plyometric exercises creates a comprehensive training approach that enhances both physical conditioning and technical proficiency.

Physical Fitness Variables

Speed: Speed is a critical attribute in volleyball, influencing both offensive and defensive play. Plyometric exercises boost speed by increasing the neuromuscular system's capacity to generate force rapidly (Sheppard & Young, 2006). Skill practices further refine speed by improving movement patterns and reaction times (Ziv & Lidor, 2010). The integration of plyometrics and skill drills can lead to substantial improvements in an athlete's speed, enabling quicker reactions and faster ball reach. The combination of plyometric exercises with skill practices presents a promising method for enhancing the speed of volleyball players of high school boys. Plyometrics develop the physical attributes necessary for effective performance, while skill practices improve technical execution. Together, these components form a well-rounded training regimen that can significantly boost player performance. Coaches and athletes should consider this approach to gain a competitive advantage in high school volleyball players.

II. NEED FOR THE STUDY

The study on the effectiveness of plyometric exercises combined with skill practices for improving speed in volleyball players of high school boys is essential for several reasons. Firstly, volleyball is a highly competitive sport, and athletes continuously seek ways to enhance their performance. This study provides evidence-based training methods that can offer players a competitive edge. Secondly, while existing research covers both plyometric exercises and skill practices, there is a need for a comprehensive analysis of their combined effects. Understanding how these training modalities interact and complement each other is crucial for optimizing training programs. Lastly, the study addresses athlete health and well-being. Plyometric exercises can enhance overall physical fitness and reduce injury risk, contributing to long-term athlete health.

The study is necessary to address performance improvement, injury prevention, and the long-term development needs of volleyball players of high school boys. It provides a scientific basis for training methodologies, supports athlete motivation, and contributes to the overall success and well-being of athletes and teams.

III. PURPOSE OF THE STUDY

The purpose of this investigation is to evaluate the effectiveness of plyometric exercises combined with skill practices on the speed of volleyball players of high school boys. The topic is as follows: **Effect of Plyometric Exercises Associated with Skill Practices on Speed of High School Volleyball Players**

IV. STATEMENT OF HYPOTHESIS

It was hypothesized that there would be significant changes in the Speed of volleyball players of high school boys by practicing plyometric exercises and plyometric exercises with skill practices when compared with control group.

V. METHODOLOGY

The aim of research is to determine the effect of plyometric exercises with skill practices on speed of Volleyball Players of high school boys. Twenty Seven subjects were randomly assigned to three equal groups of 9 subjects and they were high school Volleyball Players who were studying in schools at Vijayapur, Karnataka, India. Three groups were assigned into Experimental Group-I (PE) acted as Plyometric Training group practicing plyometric exercises; Experimental Group-II (PESP) acted as Plyometric Training Group practicing plyometric exercises with specific skills and Group-III (CG) acted as control group. The Pre test scores on Speed as physical fitness component was conducted for all the subjects by administering 50 Meters Run Test (in seconds). Experimental groups practiced plyometric training for the period of 12 weeks. The post test mean scores of Speed was collected after the said treatments. ANOVA and ANCOVA Analysis were used to determine the significant mean scores for Speed variable. By using LSD post hoc test where the obtained F value was found significant. The level of significance was fixed at 0.05 level. The SPSS Package along with MS Excel applications were utilized to get the results for the present investigation.

VI. ANALYSIS OF THE DATA

The findings from the ANOVA and ANCOVA analyses compare physical fitness variables, specifically speed, among different groups of volleyball players of high school boys, including a control group and two experimental groups. The study examined pre-test, post-test, and adjusted post-test scores.

Table-1: Results of the ANOVA and ANCOVA for the pre-test and post-test data on speed (measured in seconds) for the Control Group (CG), the Plyometric Exercises (PE) group, and the Plyometric Exercises with Skill Practices (PESP) group.

Tests		CG	PE	PESP	Source Variance	df	Sum of square	Means square	'F' ratio
Pre-test scores	Mean	8.930	8.786	8.921	Between Group	2	0.116	0.058	0.16 ^{NS}
	Standard Deviation	0.567	0.786	0.389	Within Group	24	8.741	0.364	
	Std. Error	0.189	0.262	0.129	Total	26	8.857		
Post-test scores	Mean	8.932	8.115	8.033	Between Group	2	4.445	2.223	5.06*
	Standard Deviation	0.552	0.828	0.569	Within Group	24	10.533	0.439	
	Std. Error	0.184	0.276	0.189	Total	26	14.978		
Adjusted Post-test scores	Mean	8.893	8.188	8.001	Contrast	2	3.974	1.987	8.82*
	Std. error	0.158	0.159	0.158	Error	23	5.177	0.225	

Table value at 0.05(df-2, 24/23)=3.40; *Significant at 0.05 level; ^{NS}Not Significant

Table-1 displays the ANOVA and ANCOVA results for the pre-test, post-test, and adjusted post-test mean speed scores of volleyball players of high school boys across the Control Group (CG) and the experimental groups.

Pre-test Scores: Before the intervention, the mean speed scores were similar among all three groups: CG = 8.930 seconds, PE = 8.786 seconds, and PESP = 8.921 seconds. Analysis indicated no significant differences in speed among these groups before the intervention, suggesting that initial speed levels were comparable.

Post-test Scores: Following the intervention, significant differences in speed were observed among the groups (F-ratio = 5.06, significant at the 0.05 level). The Control Group (CG) had a mean speed of 8.932 seconds, while the PE group had a mean speed of 8.115 seconds, and the PESP group had a mean speed of 8.033 seconds. These results indicate that the intervention influenced speed, with both experimental groups showing improved performance compared to the Control Group.

Adjusted Post-test Scores: The adjusted post-test scores, which account for potential confounding factors, also revealed significant differences among the groups (F-ratio = 8.82, significant at the 0.05 level). The Control Group (CG) had a mean speed of 8.893 seconds, the PE group had a mean speed of 8.188 seconds, and the PESP group had a mean speed of 8.001 seconds. The adjusted scores confirm that the intervention had a substantial effect on speed, with the experimental groups showing lower mean speeds compared to the Control Group.

Overall, the results demonstrate that while there was no significant difference in speed before the intervention, significant improvements in speed were observed post-intervention in the experimental groups. The adjusted post-test scores further validate that the plyometric exercises effectively influenced speed, reinforcing the impact of the intervention.

Table-1(a): Results of the LSD (Least Significant Difference) post hoc analysis on speed (measured in seconds) for volleyball players of high school boys across the Control Group (CG) and the experimental groups (PE and PESP).

Adjusted post-test mean scores of Speed			Mean Difference	Critical Difference
CG	PE	PESP		
8.893	8.188	×	0.704*	0.421
×	8.188	8.001	0.187	
8.857	×	8.001	0.892*	

*Significant at 0.05 of confidence.

Table 1(a) presents the adjusted post-test mean differences in speed scores among volleyball players of high school boys. The mean difference in speed between the Control Group (CG) and the Plyometric Exercises (PE) group is 0.704 seconds, and between the CG and the Plyometric Exercises with Skill Practices (PESP) group is 0.892 seconds. Both of these differences exceed the critical difference (CD) value of 0.421 at the 0.05 level of significance. In contrast, the mean difference between the PE and PESP groups is 0.187 seconds, which is below the CD value of 0.421, indicating no significant difference between these two experimental groups.

These results confirm that there are significant changes in the adjusted post-test mean speed scores between the Control Group and the two experimental groups. Specifically, players in the PESP group demonstrated greater improvements in speed compared to those in the PE group. Fig-1 graphically illustrates the comparison of pre-test, post-test, and adjusted post-test mean speed scores among the control group and the experimental groups.

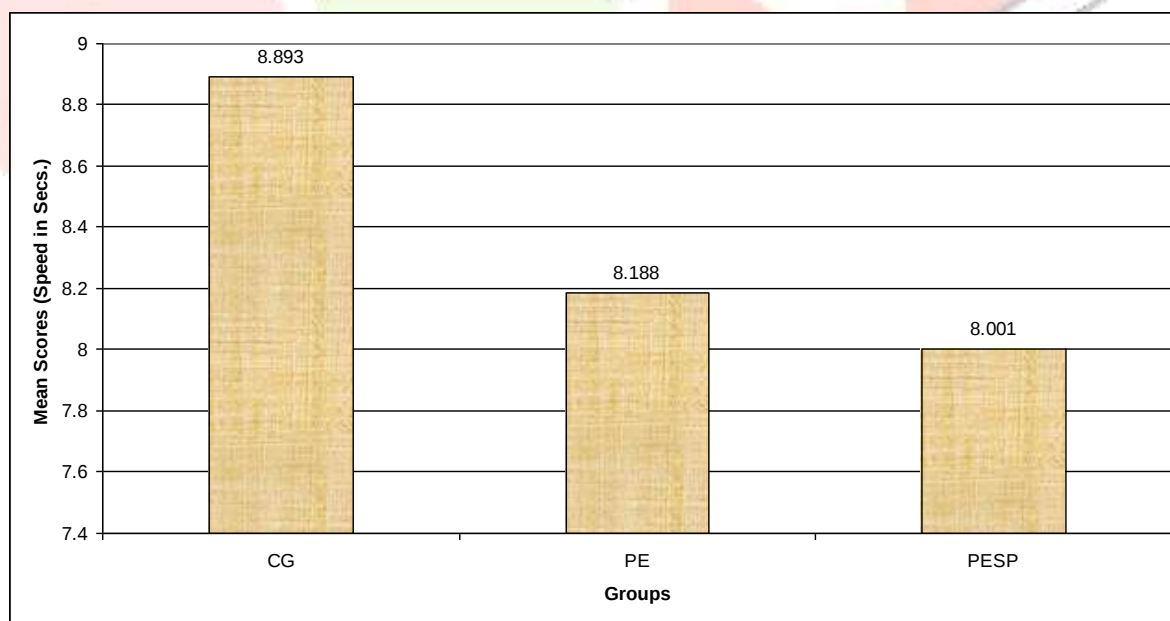


Fig.1: Bar diagram of Pre, Post and Adjusted Post-test Mean scores on Speed of Volleyball Players of high school boys of Control group and Experimental groups.

VII. DISCUSSIONS ON FINDINGS

The study results clearly demonstrate the positive impact of incorporating plyometric exercises, with or without additional skill practices, on the speed performance of volleyball players of high school boys. The significant differences observed, as evidenced by the F-ratio, highlight the effectiveness of these interventions in enhancing athletic speed.

The research found that introducing plyometric exercises significantly improved speed among volleyball players of high school boys, resulting in lower speed scores when compared to the Control Group (CG). While a reduction in speed scores might initially seem counterintuitive, it is important to understand that in volleyball, speed must be balanced with agility and control. The intervention likely enhanced these qualities, which could influence how speed is perceived. This suggests that the training may have led to more controlled and efficient movement on the court.

Overall, the findings emphasize the value of comprehensive training programs that target multiple dimensions of athletic performance in volleyball. Plyometric exercises, when integrated into training, can significantly enhance the speed of volleyball players of high school boys, ultimately boosting their overall effectiveness on the court. These insights are valuable for coaches and trainers aiming to optimize the performance of their athletes.

VIII. CONCLUSION AND SUGGESTIONS

The study results highlight that incorporating plyometric exercises, whether alone or alongside skill practices, significantly enhances the physical performance of volleyball players of high school boys, particularly in terms of speed. This highlights the importance of a comprehensive training regimen that addresses various aspects of athletic performance in volleyball. Plyometric exercises, recognized for their effectiveness in boosting speed, have been proven to enhance the physical capabilities of volleyball players. Coaches and trainers can leverage these findings to develop more effective training programs that integrate plyometric exercises, aiming to improve speed and overall court performance. The study also emphasizes the importance of long-term athlete development. By incorporating plyometric exercises into a holistic training approach, coaches can better nurture the physical attributes essential for volleyball success, both at the school level and beyond. These insights offer practical benefits for coaches, athletes, and trainers, helping them to enhance performance, reduce injury risk, and develop well-rounded players. Overall, the research contributes valuable knowledge to the field of volleyball training, aiding in the continuous refinement of methods and strategies to elevate player performance.

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