

EFFECTS OF SKILL AND PLYOMETRIC TRAINING ON VO₂ MAX AND ATTACK HIT AMONG SCHOOL VOLLEYBALL PLAYERS

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ABSTRACT

Aim of the Study find out the assess effect of skill and plyometric training on VO₂ Max and attack hit among school volleyball players. The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=60) were randomly assigned to three equal groups of fifteen The selected subjects were divided into three equal groups and each group consisted of twenty subjects. group-I skill training group experimental group-II – plyometric training group and control group respectively not participate in any special training apart from their regular physical education programme in the curriculum. Experimental period and after the experimental period of twelve weeks to determine the training effects. The subjects were re-tested after three weeks of cessation of training to found the detraining effects. To identify the significant difference among the groups due to training and detraining mean gain method was followed.

Key Words: VO₂ Max and attack hit

I. INTRODUCTION

Performance sports aim at high sports performance and for most physical and psychic capacities of sports men are developed to extreme limits. This normally does not happen in other areas of human activities. As a result, performance sports field possesses valuable knowledge about the limits to which human performance and various performance factors can be developed. It also led to discovery of means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high level. This knowledge can be faithful by applied to other areas of sports and human activities.

The science of sports training is a recent to the field of sports science. The sports science discipline has improved at a very fast pace in the past few decades. The knowledge

gained by these disciplines has to be understood by the coaches and trainers to apply it correctly to the training process. But majority of the coaches does not have sufficient scientific background and training to make full and effective use of the knowledge acquired by the sports science disciplines.

II. STATEMENT OF THE PROBLEM

The purpose of this study is to find out the “effects of skill and plyometric training on VO_2 Max and attack hit among school volleyball players”..

III. LIMITATIONS

1. Heredity which contributes to both physical and mental efficiency will not be controlled.
2. Diet of the subject, general activity, motivation of the subjects is beyond the control of the researcher.
3. Practice sessions are not taken into consideration.
4. Academic pressure, like coaching class is not taken into consideration.
5. Certain factors like food habits, life style, daily routine, climatic conditions and the environmental factors which may have an effect on this study were not taken into consideration while interpreting the results.

IV. DELIMITATIONS

1. The study was limited among 60 school level volleyball players randomly selected from different schools Guntur District.
2. This research confined among schoolboys in the age group of 12 to 15 years.
3. This study was delimited to the following physiological, and performance variables.

V. SELECTION OF SUBJECTS

To facilitate the study, 60 school level volleyball players from different schools of Guntur District were randomly selected as subjects and their age ranged between 12-15 years. They were further divided into three groups namely volleyball skill training group , plyometric training group , and control group , on random basis consisting of 20 in each group.

Before the commencement of the training, purpose of the study and method of performing, volleyball skill training, and Plyometric training were explained to the subjects for their cooperation and to avoid injuries.

VI. SELECTION OF VARIABLES

DEPENDENT VARIABLES

1. VO_2 Max
2. Attack hit

Independent variables

1. Volleyball Skill Training (STG)
2. Polymeric Training (PTG) for 12 weeks

VII. EXPERIMENTAL DESIGN

The study was formulated as a true random group design consisting of a pre-test and Post-Test. The subjects (N=60) were randomly assigned to three groups of twenty school level volleyball players. The groups were designed as experimental group-I skill training group (STG) experimental group-II – plyometric training group (PTG) and control group (CG) respectively. Pre-test was conducted for all the 60 subjects on VO_2 Max Attack hit The experimental groups, the participated in respective training for a period of twelve weeks. The control group did not participate in any of the training programme. The post-test was conducted on the above said dependent variables after an experimental period for all the three groups. The difference between initial and final mean scores of the groups was the effect of respective experimental treatment on the subjects. The differences in the mean scores were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed test the hypothesis of the study.

VIII. TEST ADMINISTRATION

VO₂ MAX

Purpose

To measure the VO_2 max (cardio respiratory endurance)

Equipment

Whistle, stopwatch, 400 meters track.

Description

Subjects assemble behind the starting line at the starting signal, they, run or walk as far as possible with in the 12 minutes time limit. An experienced pacer should accompany

performers around the running area during the actual test. At the signal 'to stop' performers should remain where they finished long enough for test administrators to record the distance covered. Ample time should be given for stretching and warm-up as well as cool down.

Scoring

The distance in meters covered in 12 minutes

The VO₂ max in ml/min/kg was calculated based on the formulae suggested by Cooper (1960) was:

$$VO_2 \text{ max} = \frac{d_{12} - 505}{45}$$

Where, d₁₂ is the distance (in meters) covered in 12 minutes.

ATTACK HIT (Spiking)

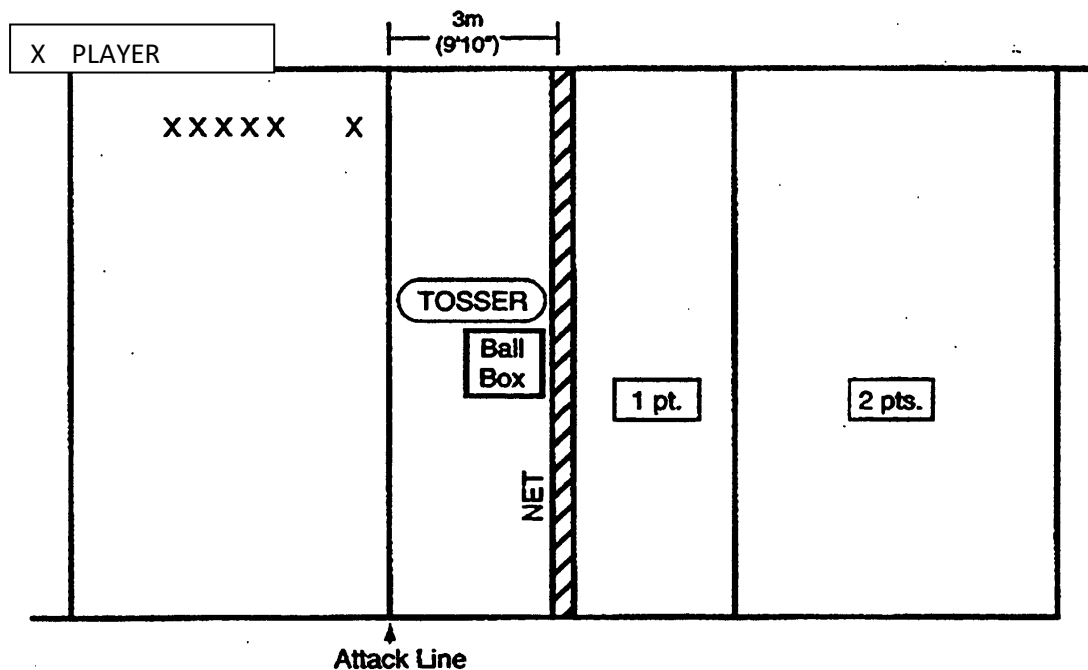
Purpose

To measure the spiking ability of the subjects, they were rated in subjective manner during the match by the investigator and two coaches.

Field Marking

Use a regulation size court of 18m (59') long and 9m (29' 6") wide, five volleyballs, net (2.43m [7' 11 5/8"]) standards, antennas, measuring tape, floor tape or chalk and ball box as shown in Figure.

Volleyball Test – Spike Diagram:



Test

Tosser will toss the ball in front of the player and 2m (6' 6 3/4") above the net. Tosses that were not at the proper height were repeated. The player stood in the court 3.05-4.57m (10-15') off the net, made a spiking approach, and spikes the ball over the net and within the boundaries of the opponent's court. Each player was given 10 attempts.

Scoring

Subject received two points for each spike that landed beyond the attack line in the back court and one point for each spike that landed between the net and the attack line within the opponent's front court. A tip (dink) or half-speed shot was not recorded as a spike. The subject's final score should be the total of all 10 attempts.

IX. RESULTS ON VO₂ MAX

The statistical analysis comparing the initial and final means of VO₂ Max due to Volleyball skill training and Plyometric training among volleyball players is presented in Table-I

Table-I**COMPUTATION OF ANALYSIS OF COVARIANCE OF VO₂ MAX**

	Volleyball Skill Training	Plyometric Training	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre-Test Mean	37.54	36.96	38.70	Between	31.28	2	15.64	0.63
				Within	1412.00	87	24.77	
Post-Test Mean	41.37	41.21	38.90	Between	76.40	2	38.20	2.10
				Within	1035.94	87	18.17	
Adjusted Post-Test Mean	41.50	41.75	38.23	Between	150.94	2	75.47	11.80*
				Within	358.20	86	6.40	
Mean Diff.	3.82	4.25	0.20					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.10, 2 and 86 (df) =3.10.

*Significant at 0.05 level

Since significant differences were recorded, the results were subjected to post-hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table-II

Table-II**Scheffe's Confidence Interval Test Scores on VO₂ Max**

MEANS	Required

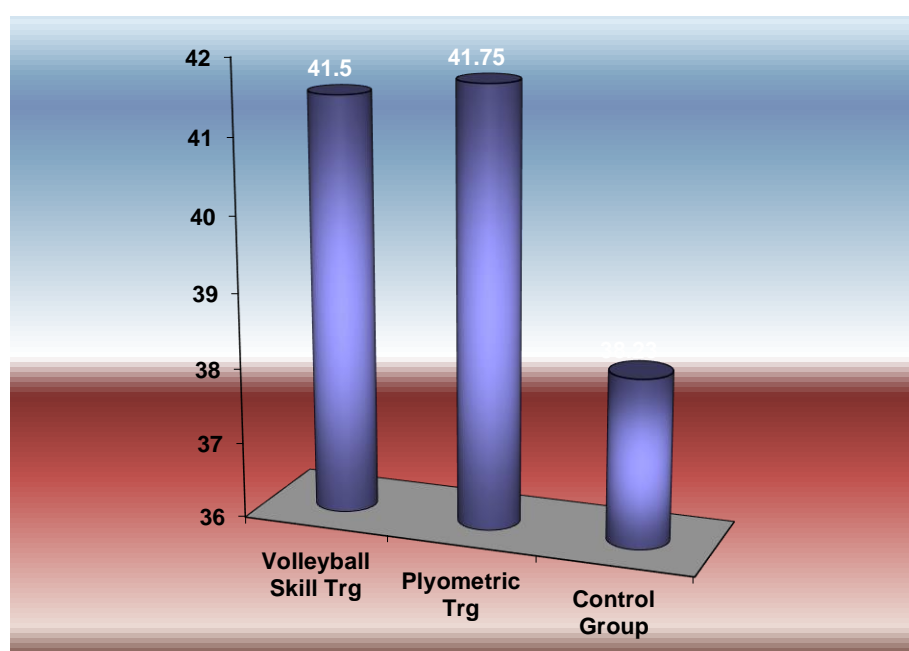
Volleyball skill training Group	Plyometric training Group	Control Group	Mean Difference	C.I.
41.50	41.75		0.25	2.01
41.50		38.23	3.27*	2.01
	41.75	38.23	3.52*	2.01

* Significant at 0.05 level

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure-I

Figure-I

BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON VO₂ MAX



DISCUSSIONS ON FINDINGS ON VO₂ MAX

The effect of Volleyball skill training and Plyometric training on VO₂ Max is presented in Table-I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 11.80 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table-II proved that there was significant difference between Volleyball skill training group and control group (MD: 3.27) and Plyometric training group and control group (MD: 3.52). Comparing between the treatment groups, it was found that there was no significant difference between Volleyball skill training and Plyometric training group among volleyball players.

Thus, it was found that Volleyball skill training and plyometric training were significantly better than and control group in improving VO₂ Max of the volleyball players. It was also found that both the training methods were equal in improving physiological variable, VO₂ max as there was no significant difference between them.

X. RESULTS ON ATTACK (SPIKING ABILITY)

Table-III

COMPUTATION OF ANALYSIS OF COVARIANCE OF ATTACK (SPIKING ABILITY)

	Volleyball Skill Training	Plyometric Training	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
Pre-Test Mean	9.90	10.20	10.05	Between	0.90	2	0.45	0.36
				Within	71.95	87	1.26	
Post-Test Mean	11.60	11.05	10.35	Between	15.70	2	7.85	6.75*
				Within	66.30	87	1.16	
Adjusted	11.71	10.94	10.35	Between	18.59	2	9.29	19.79*

Post-Test Mean				Within	26.30	86	0.47	
Mean Diff.	1.70	0.85	0.30					

Table F-ratio at 0.05 level of confidence for 2 and 87 (df) =3.10, 2 and 86 (df) =3.10.

*Significant at 0.05 level

Since significant differences were recorded, the results were subjected to post-hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table-IV.

Table-IV

Scheffe's Confidence Interval Test Scores on Attack

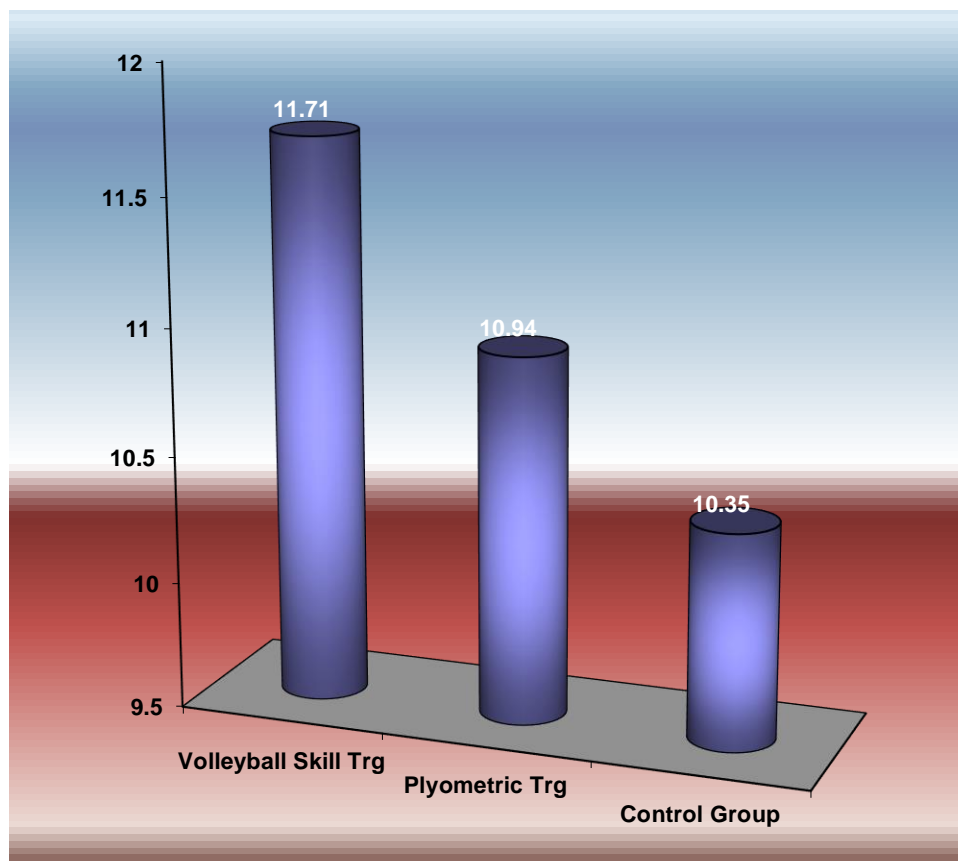
MEANS				Required
Volleyball training Group	skill Plyometric training Group	Control Group	Mean Difference	C.I.
11.71	10.94		0.77*	0.54
11.71		10.35	1.36*	0.54
	10.94	10.35	0.59*	0.54

* Significant at 0.05 level

The ordered adjusted means were presented through bar diagram for better understanding the results of this study in Figure-2.

Figure-II

BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON ATTACK (SPIKING)



DISCUSSIONS ON FINDINGS ON ATTACK (SPIKING)

The effect of Volleyball skill training and Plyometric training on Attack is presented in Table-III. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 19.79 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table-IV proved that there was significant difference between Volleyball skill training group and control group (MD: 1.36) and Plyometric training group and control group (MD: 0.59). Comparing between the treatment groups, it was found that there was significant difference between Volleyball skill training and Plyometric training group among volleyball players.

Thus, it was found that Volleyball skill training was significantly better than Plyometric training and control group in improving volleyball skill performance variable, such as, attack (spiking) ability of the volleyball players.

XI. CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn.

1. It was concluded that 12 weeks volleyball skill training and plyometric training was able to significantly improve physiological variable, such as, VO₂ max of the school level volleyball players compared to control group. It was also found that there was no significant difference between the treatment groups in altering VO₂ max.
2. It was concluded that 12 weeks volleyball skill training and plyometric training was able to significantly improve skill performance variable attack hit ability of the school level volleyball players compared to control group. It was also found that there volleyball skill training was significantly better than plyometric training in improving attack hit ability of school level volleyball players.

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