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## **Efficacy of Plyometric and Specific Skill Training on Selected Performance Related Fitness and Skill Performance Variables of College Level Men Volleyball Players**

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### **ABSTRACT:**

Games and sports have crossed many mile stones in the universe. Now a day's performance oriented scientific investigation has been tremendously increased to enhance the performance of sportsman. These kinds of performances are being attained due to the scientific investigation's biomechanical analysis, sport nutrition with the help of exercise physiology and sports psychology etc. With all these allied sciences the excellence in sports performance came into existence. The Purpose of this study was to find out the efficacy of plyometric and specific skill training on selected performance related fitness and skill performance variables of college level men volleyball players on selected performance related fitness and skill performance variables. To selected thirty-six (36) college level men volleyball players from Acharya Nagarjuna University. The subjects were randomly divided into three equal groups men volleyball players. Both the experimental groups underwent the respective experimental trainings for a period of eight (8) weeks and the control group did not undergo any special training programme apart from their regular routine. The selected subjects were randomly segregated into three equal groups namely, plyometric training group (PTG), specific skill training group (PTG) and control group (CG). The performance related fitness variables namely leg explosive power and skill performance variables namely service variables of the study.

**Keyword:** leg explosive power and serving ability

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### **Introduction**

Sport is a valid physical activity, therefore, given the criteria of increasing its levels for the purpose of improving health; it can be adapted and modified to take into account the target population group. Sports developers have been aware of this for decades as they work at grassroots level across communities from different sectors in society; and have managed to work with the complexity of sport and health promotion. Its simplicity, however, has contributed to the misunderstanding that sporting excellence is at the pinnacle of participation, which can alienate the health-related participant. It is also not compatible with sport can reduce health inequalities; particularly as elite sport carries its own issues of health.

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### **Methodology**

The Purpose of this study was to find out the efficacy of plyometric and specific skill training on selected performance related fitness and skill performance variables of college level men volleyball players on selected performance related fitness and skill performance variables. To selected thirty-six (36) college level men volleyball players from Acharya Nagarjuna University. The subjects were randomly divided into three equal groups men volleyball players. Both the experimental groups underwent the respective experimental trainings for a period of eight (8) weeks and the control group did not undergo any special training programme apart from their regular routine. The selected subjects were randomly segregated into three equal groups namely, plyometric training group (PTG), specific skill training group (PTG) and control group (CG). The performance related fitness variables namely leg explosive power and skill performance variables namely service variables of the study.

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### **Training procedure**

The subjects were given enough orientation on the training programme to be given by the investigator. The investigator selected thirty-six college level men volleyball players from Acharya Nagarjuna University Their age was ranged from 17 to 23 years. The selected subjects were divided in to three equal groups with 12 subjects each namely two experimental groups and one control group. Experimental groups underwent plyometric training and specific skill training programmes for a period of 8 weeks on five days per week. Each training session was for an hour. Control group did not undergo any treatment.

### Statistical Techniques

The collected data was analysed with application of 't' test to find out the individual effect from pre to post-tests if any. Further Analysis of Covariance (ANCOVA) was used to determine the significant difference among the treatment means and control group. Whenever the 'F' ratio was found to be significant, pairwise comparison was applied to test the significant difference between the paired adjusted post-test means. The level of confidence was fixed at 0.05 level for all the variables to test the level of significance. It was considered as sufficient for the present study.

## Results and Discussion

The performance related fitness variable namely leg explosive power was measured through vertical jump test. The results on the efficacy of plyometric training, specific skill training and control groups are presented in table- I

### Results on leg explosive power

TABLE I

#### Computation of Analysis of Covariance on Leg Explosive Power

Test	Means			Sum of Variance	Sum of Square	Mean Square	F	'p' Value
	Plyometric Training	Specific Skill Training	Control Group					
Pre	42.08	39.58	40.83	B	37.50	18.75	0.64	0.53
				W	967.50	29.32		
Post	49.83	42.33	41.08	B	537.50	268.75	10.09*	0.01
				W	879.25	26.64		
Adjusted Post	48.69	43.48	41.08	B	356.36	178.18	91.40*	0.01
				W	62.38	1.95		
Mean Gain	7.75	2.75	0.25					

\*Significant difference at 0.05 level of confidence

Table I shows that the pre-test mean of leg explosive power of plyometric training group (PTG) was 42.08, specific skill training group (SSTG) was 39.58 and control group (CG) was 40.83.

The obtained 'p' value on pre-test 0.53 was greater than the required 'p' value of 0.05 to be significant at 0.05 levels. This proved that there were no significant differences among the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning subjects to groups. The post-test analysis proved that there was a significant difference among the groups, as the obtained 'p' value 0.01 was lesser than the required 'p' value of 0.05. This was proved that there were significant differences among the post-test means of all the groups.

Taking into consideration of the pre and post-test among the groups, the adjusted post-test were calculated and subjected to statistical treatment. The obtained 'p' value of 0.01 was lesser than the required 'p' value of 0.05. This proved that there were significant differences among the means of experimental groups due to the respective experimental trainings on leg explosive power. Since the significant differences were recorded, the results were subjected to pair wise comparison among the groups. The results are presented in table II

TABLE II

#### Paired Mean Significant Difference on Leg Explosive Power

Adjusted Post Test Means				Mean Difference	'p' Value
Plyometric Group	Training	Specific Skill Training Group	Control Group		
-		43.48	41.08	2.40*	0.01
48.69		-	41.08	7.60*	0.01
48.69		43.48	-	5.20*	0.01

The above table II clearly indicates that the paired mean significant difference on the level of leg explosive power among experimental and control groups. And the variation in leg explosive power among the experimental and control groups were found to be significant difference between the paired means of plyometric training and specific skill training groups, plyometric training and control groups and specific skill training and control groups.

**Fig. I: BAR DIAGRAM SHOWS THE ADJUSTED POST-TEST MEANS OF LEG EXPLOSIVE POWER OF EXPERIMENTAL AND CONTROL GROUPS**



The results presented in the table II showed that obtained adjusted post-test means on leg explosive power of plyometric training group (PTG) was 48.69, specific skill training group (SSTG) was 43.48 and control group (CG) was 41.08.

The differences among pre-test, post-test and adjusted post-test mean of the subjects were statistically treated by using ANCOVA and the 'p' values obtained were 0.53, 0.01 and 0.01 respectively. Since the obtained 'p' values were lesser than the 'p' value of 0.05 it was found that the leg explosive power of post-test and adjusted post-test means were differ significantly.

Plyometric training group (PTG = 18.42%), specific skill training group (SSTG = 6.95%) would be effective in causing significant improvement among experimental groups on leg explosive power. And also, when comparing the

adjusted post-test mean values of leg explosive power the plyometric training means had most effective training means in improving the leg explosive power than the other training means.

While testing the isolated efficacy of plyometric training group (PTG) and specific skill training (SSTG) each one had significantly improved the leg explosive power of college level men volleyball players. Whereas the control group was concerned the observed mean difference from base line to post test was not differ significantly. Hence it is clearly understood that the selected training means had influenced significantly to increase the leg explosive power.

The results of this investigation is also supported by the study done by **Suwirman & Weny Sasmitha (2020)** and **Thenmozhi & Ramesh (2019)** and concluded that the plyometric training and specific skill training influenced significantly to increase the leg explosive power.

#### Results on Serving Ability

The skill performance variable namely serving ability was measured through russell lange volleyball test. The results on the efficacy of plyometric training, specific skill training and control groups are presented in table III.

**TABLE- III**

#### Computation of Analysis of Covariance on Serving Ability

Test	Means			Sum of Variance	Sum of Square	Mean Square	F	'p' Value
	Plyometric Training	Specific Skill Training	Control Group					
Pre	30.17	30.83	30.42	B	2.72	1.36	0.12	0.88
				W	362.25	10.98		
Post	32.92	35.58	30.83	B	136.06	68.03	6.86*	0.01
				W	327.50	9.92		
Adjusted Post	33.19	35.26	30.88	B	114.65	57.33	54.24*	0.01
				W	33.82	1.06		
Mean Gain	2.75	4.75	0.41					

Table III shows that the pre-test mean of service ability of plyometric training group (PTG) was 30.17, specific skill training group (SSTG) was 30.83 and control group (CG) was 30.42.

The obtained 'p' value on pre-test 0.88 was greater than the required 'p' value of 0.05 to be significant at 0.05 levels. This proved that there were no significant differences among the experimental and control groups indicating that the process of randomization of the groups was perfect while assigning subjects to groups.

The post-test analysis proved that there was a significant difference among the groups, as the obtained 'p' value 0.01 was lesser than the required 'p' value of 0.05. This was proved that there were significant differences among the post-test means of all the groups.

Taking into consideration of the pre and post-test among the groups, the adjusted post-test were calculated and subjected to statistical treatment. The obtained 'p' value of 0.01 was lesser than the required 'p' value of 0.05. This proved that there were significant differences among the means of experimental groups due to the respective experimental trainings on serving ability.

Since the significant differences were recorded, the results were subjected to pair wise comparison among the groups. The results are presented in table IV.

**TABLE IV**

**Paired Mean Significant Difference on Service Ability**

Plyometric Training Group	Specific Skill Training Group	Control Group	Mean Difference	'p' Value
-	35.26	30.88	4.38*	0.01
33.19	-	30.88	2.31*	0.01
33.19	35.26	-	2.07*	0.01

The above table IV clearly indicates that the paired mean significant difference on the level of serving ability among experimental and control groups. And the variation in serving ability among the experimental and control groups were found to be significant difference between the paired means of plyometric training and specific skill training group, plyometric training and control group and specific skill training and control groups.

**FIG. 2 : BAR DIAGRAM SHOWS THE ADJUSTED POST-TEST MEANS OF SERVICE ABILITY OF EXPERIMENTAL AND CONTROL GROUPS**



The results presented in the table III showed that obtained adjusted post-test means on serving ability of plyometric training group (PTG) was 33.19, specific skill training group (SSTG) was 35.26 and control group (CG) was 30.88

The differences among pre-test, post-test and adjusted post-test mean of the subjects were statistically treated by using ANCOVA and the 'p' values obtained were 0.88, 0.01 and 0.01 respectively. Since the obtained 'p' values were lesser than the 'p' value of 0.05 it was found that the serving ability of post-test and adjusted post-test means were differ significantly.

Plyometric training (PTG = 9.12%) and specific skill training (SSTG = 15.41%) training would be effective in causing significant improvement among experimental groups on service ability. And also, when comparing the adjusted post-test mean values of serving ability the specific skill training means had most effective training means in improving serving ability than the other training means.

While testing the isolated efficacy of plyometric training group (PTG) and specific skill training group (SSTG) each one had significantly improved the serving ability of college level men volleyball players. Whereas the control group was concerned the observed mean difference from base line to post test was not differ significantly. Hence it is clearly understood that the selected training means had influenced significantly to increase the serving ability.

The results of this investigation are in consonance with the study done by **Tomislav Kristicevic et al. (2016)** and concluded that the volleyball specific skill training significantly improved the serving ability.

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## Conclusions

Based on the findings and within the limitations imposed by the experimental conditions the following conclusions were drawn.

The plyometric training is an effective training module to improve significantly on the selected performance related fitness variables namely leg explosive power and skill performance variable namely serving ability of college level men volleyball players.

The specific skill training is an effective training module to improve significantly on the selected performance related fitness variables namely leg explosive power and specific skill performance variables namely serving ability of college level men volleyball players.

The control group showed no significant improvement on all the selected performance related fitness and skill performance variables, hence the improvement of the experimental groups was due to the respective experimental training alone. There were significant difference among the experimental and control groups on the selected dependent variables due to the eight weeks of plyometric training and specific skill training of college level men volleyball players.

While comparing the effect of plyometric training and specific skill training the plyometric training had produced better improvement in leg explosive power than the other training. The specific skill training had produced better improvement serving ability then the plyometric training.

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