International Journal of Physical Education, Sports and Health 2022; 9(4): 304-306

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2022; 9(4): 304-306

www.kheljournal.com
Received: 06-05-2022
Accepted: 17-06-2022

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Investigation of the changes on explosive power of volleyball players due to core with speed training and plyometric with speed training

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Abstract
The purpose of the study is to find out the investigation of the changes on explosive power of volleyball players due to core with speed training and plyometric with speed training. To achieve the purpose of the study, thirty six (n=36) college volleyball players were selected as subject from K.G.S. Arts College, Srivaikundam, Nazareth Margoschis College at Pillaiyanmanai, Nazareth and Aditanar College of Arts and Science, Virapandianpatnam, Tiruchendur. The selected subjects had participated in Manonmaniam Sundaranar University intercollegiate tournaments by representing their respective colleges. The age of the subjects ranged from 18 to 24 years. In which, thirty-six were assigned into three groups of twelve subjects each (n=12). Group, I underwent Core with Speed Training (CSTG), group II underwent Plyometric with Speed Training (PSTG) and group III acted as control. According to matched group design the K.G.S. Arts College, Srivaikundam volleyball players underwent Core with Speed Training; Nazareth Margoschis College at Pillaiyanmanai, Nazareth volleyball players underwent Plyometric with Speed Training and Aditanar College of Arts and Science, Virapandianpatnam, Tiruchendur, volleyball players acted as control in their respective campus for 12 weeks of 60-morning sessions.Prior to and after the exercises period the subjects were tested for, explosive power. Explosive power measured by sargent jump. The statistical tool were used for the present study is ANACOVA. The result of the study was a significant increase on explosive power after twelve weeks of core with speed training and plyometric with speed training. However the increase was favour of experimental group. There was a significant difference was occurred between experimental and control groups after twelve weeks of core with speed training and plyometric with speed training.

Keywords: Core with speed training, plyometric with speed training, volleyball and explosive power

Introduction
Core Training - The progressive training of the musculature of the lumbo-pelvic-hip complex and/or the Transversus Abdominis, which has a central role in posture and in stabilizing the lumbar spine.
Bounding exercises in which maximum effort is expended while a muscle group is lengthening during eccentric contractions and doing negative work. Examples of plyometric exercises include any jumping exercise in which a landing followed by a jump occurs.
Speed training usually involves moving at high rates of speed. Speed training involves running and other rapid movements.
Speed is the ability to move quickly across the ground or move limbs rapidly to grab or throw.
Explosive Power is the ability of a muscle or group of muscles to generate maximum force in a single explosive effort or force in the fastest possible time.

Methodology
The purpose of the study is to find out the investigation of the changes on explosive power of volleyball players due to core with speed training and plyometric with speed training. To achieve the purpose of the study, thirty six (n=36) college volleyball players were selected as subject from K.G.S. Arts College, Srivaikundam, Aditanar College of Arts and Science, Virapandianpatnam, Tiruchendur and Nazareth Margoschis College at Pillaiyanmanai, Nazareth. The selected subjects had participated in Manonmaniam Sundaranar University intercollegiate tournaments by representing their respective colleges.

The age of the subjects ranged from 18 to 24 years. In which, thirty-six were assigned into three groups of twelve subjects each (n=12). Group, I underwent Core with Speed Training (CSTG), group II underwent Plyometric with Speed Training (PSTG) and group III acted as control. According to matched group design the K.G.S. Arts College, Srivaikundam volleyball players underwent Core with Speed Training; Nazareth Margoschis College at Pillaiyanmanai, Nazareth volleyball players underwent Plyometric with Speed Training and Aditanar College of Arts and Science, Virapandianpatnam, Tiruchendur, volleyball players acted as control in their respective campus for 12 weeks of 60-morning sessions. Prior to and after the exercises period the subjects were tested for, explosive power. explosive power measured by Sargent jump. The statistical tool were used for the present study is ANACOVA.

Analysis and interpretation of data

The data collected prior to and after the experimental periods on explosive power on core with speed training and plyometric with speed training and control group were analyzed and presented in the following table -1.

Table 1: Analysis of covariance of explosive power on core with speed training and plyometric with speed training and control group

Test	CSTG	PSTG	Control group	SOV	Sum of Square	df	Mean Square	Obtained "F'' Ratio
Pre test								
Mean	71.83	70.91	70.92	B	21.29	2	21.29	0.787
S.D	1.29	1.36	1.34	W	321.22	33	18.65	
Post test								
Mean	73.31	74.14	71.14	B	127.54	2	127.54	11.32*
S.D	1.51	1.58	1.61	W	45.86	33	18.78	
Adjusted Post test								
Mean	73.01	74.06	71.02	B	20.09	2	10.05	44.25*
				W	4.74	32	.148	

*Significant at 0.05 level of confidence. Table value required for significance at 0.05 level with df 2 and 33 and 2 and 32 are 3.31and 3.30.

Table- 1 showed that the pre-test and S.D values of explosive power for core with speed training and plyometric with speed training and control group were 71.83 ± 1.29, 70.91 ± 1.36 and 70.92 ± 1.34 respectively. The obtained 'F' ratio value of 0.787 for pre-test score of core with speed training and plyometric with speed training and control group on explosive power was less than the required table value of 3.31 for significance with df 2 and 33 at 0.05 level of confidence.

The post-test and S.D values of explosive power for core with speed training and plyometric with speed training and control group were 73.31 ± 1.51, 74.14 ± 1.58 and 71.14 ± 1.61 respectively. The obtained 'F' ratio value of 11.32 for post-test score of core with speed training and plyometric with speed training and control group on explosive power was greater than the required table value of 3.31 for significance with df 2 and 33 at 0.05 level of confidence.

The adjusted post-test mean value of explosive power for core with speed training and plyometric with speed training and control group were 73.01, 74.06 and 71.02 respectively. The obtained 'F' ratio value of 44.25 for adjusted post-test score of core with speed training and plyometric with speed training and control group was more than the required table value of 3.30 for significant with df 2 and 32 at 0.05 level of confidence.

Since the value of F-ratio is higher than the table value, it indicates that there exists a significant difference between the adjusted post-test means of core with speed training, plyometric with speed training groups in improving the performance of explosive power. So Scheffe's post hoc test on explosive power of core training with speed training, plyometric training with speed training and control groups have been applied and the results were presented in table - II

Table 2: Scheffe's post hoc test for the differences between paired means on explosive power

CSTG	PSTG	Control Group	Mean Difference	CI
73.01	74.06		1.05*	0.79
73.01		71.02	0.99*	
	74.06	71.02	3.04*	

Result

The above table indicated that the post hoc pairwise mean difference between the adjusted posttest mean values of CSTG and PSTG on the development of explosive power with confidence interval value 0.79. Since the pairwise comparison mean difference values 1.05 of CSTG, PSTG are higher than the respective confidence interval value of 0.79, it is clearly understood that there exists a significant difference between core with speed training and plyometric with speed training on explosive power. Further, the pairwise comparison means difference values 0.99 of CSTG and control group are higher than the respective confidence interval value of 0.79. It is clearly understood that there exists a significant difference between CSTG and control group. Further, the pairwise comparison means difference values 3.04 of Plyometric with PSTG and control group are higher than the respective confidence interval value 0.79. It is also clearly understood that there exists a significant difference between plyometric with speed training group and control group.

Conclusions

Within the limitations and delimitations of this study the following conclusions were drawn from the result.

1. It was concluded that there was significant development of explosive power among volleyball players due to core with speed training and plyometric with speed training.
2. The result of the study reveal that plyometric with speed training group have better development of explosive power compared with core with speed training group and control group .

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