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PHYSICAL EDUCATION

COMBINED EFFECT OF CROSS TRAINING AND INSTRUCTIONAL SKILL TRAINING ON SELECTED PHYSICAL FITNESS AND SKILL PERFORMANCE VARIABLES OF SCHOOL VOLLEYBALL PLAYERS

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Abstract

This study aims to design a training program using cross- training and skill based instructional then to identify its effect on some of the volleyball skills such as pass, service and attack among the rural volleyball players, and percentage of improvement for different measurements of both control and experimental groups. In this study the researcher used the experimental method on a sample of 60 school volleyball players from Chennai in Tamil Nadu under 14-16 years old, training were given as cross training and instructional skill training for twelve weeks. Most important tools of data collection were references survey, single skills tests. Statistical work was done using arithmetic mean, standard deviation, T test, Ancova. Training program using combined cross-training and instructional training led to development skill performance within volleyball research sample. And clear improvement rates between experimental and control groups in all variables under consideration in favor of experimental group.

Keywords: Cross training, Instructional training, Pass, service and attack.

INTRODUCTION

The concept of cross training is a relatively recent athletic application, in which a training regime includes the use of one distinct athletic discipline to build skills or fitness in another. In the not-so-distant past, sporting success was equated to the devotion of an athlete to the discipline. For an individual pursuit such as running or cycling, devotion was translated into the athlete spending every training opportunity engaged in one aspect or another of the sport to simulate competition. In team sports, the athlete would play or practice at every available moment; where there were no formal practices or games, the striving basketball player, soccer player, or ice hockey player would find a pickup game in their sport to continue the quest for excellence. Increased popular interest in multi-sport events such as the triathlon in the 1980s, and the appreciation by the wider sport community of the training demands that such sports required, spurred a broader interest in the use of cross training. It became a fashionable approach to physical improvements in a very wide range of sports. European sports trainers had advocated variety and intensity in athletic training regimens since the 1940s, usually through the introduction of cycling or an aerobic sport like soccer into an anaerobic training discipline, both for the building of strength as well as an understanding that, for the mental health of a serious athlete, "a change is often as good as a rest."

Today, the principles of effective cross training are well established. Cross training generally is accepted as building a better all-around athlete, while providing a measure of protection for injury through increased fitness, as well as reducing the mental fatigue associated with a lack of training variety. Cross training also permits an injured athlete to continue with workouts and thereby reduce the degree of fitness that might otherwise be lost to injury. The specific areas of human performance that are addressed in a typical cross-training program include: cardiovascular fitness; power, through increased muscle strength; speed; agility/reflexes; the use of all three of the body's energy systems, the aerobic system (endurance), the anaerobic lactic (intense energy demands of up to 90 seconds in duration), and the anaerobic lactic (short, very intense energy requirements); musculoskeletal flexibility; and mental acuity.

Instructional skill training has been shown to improve an athlete's ability to reach their full potential, minimize injuries, and increase their ability and fitness. Many coaches believe that the instructional volleyball training molds the players by targeting areas for improvement more directly than group sessions or practices can, and is a recommended way to develop the athlete's ability and become a stronger player.(www.coachup.com/volleyball). Talita M., a volleyball coach, believes that the instructional lessons are a great way to get an athlete ready for their school or club teams and in fighting shape for matches and scrimmages. By focusing on specific skills and techniques, instructional volleyball coaching grooms players to evolve their skills to be prepared to play at the next level. Talita noted most players are looking for a confidant in the sport to provide motivation, push them when they lose focus, and instruct training drills to help

them develop more technical skills. An athlete is driven towards success when there is a person available to turn to with questions or direction with their position or game. (www.coachup.com/volleyball)

The Olympic sport Volleyball has developed into a highly competitive sport and no doubt which requires a high demand in terms of physical capacities and skill performance. The game at a high level of competition requires quicker sudden movements and fast reaction. Volleyball matches have no time limit and matches can last for several hours, if the teams are evenly matched. So one has to master over the skills and should attain the required fitness. Research reveals that skill-based conditioning games offer a specific training stimulus to simulate the physiological demands of competition and the improvements in physical fitness after training were greater with skill-based conditioning games (Gabbett 2008) Cross training represents a modern trend in training and is regarded as organizational form, which includes the use of different activities, sports as well as training means and methods and what suit it from facilities available, which can be utilized during the training in accordance with players capabilities, cross-training contributes in development of physical abilities represented in aerobic, anaerobic work, muscular endurance, force, power, agility and f flexibility, it is also working on development of physiological aspects related to sports performance in addition to the development of psychological aspect of an athlete (Mohammed 2002).

METHODS

To achieve the purpose of this study, 60 school volleyball players were randomly selected. The subjects were in the age group of 14 to 16 years with standard deviation of $\pm$ 0.52. The skill performance pass, service and attack were selected as variables for this study. The selected subjects were equally divided into four groups and each group consists of twenty subjects. Group I acted as experimental group which underwent cross training (CT), group II underwent instructional skill training (IST), group III underwent combined cross training and instructional skill training (CTIST) and group IV did not participated in any special training and were strictly under control (CG). Pre measurement was taken and recorded for the chosen variables. Cross training and instructional skill training was formulated and implemented accordingly for twelve weeks. After the treatment period the post measurements was taken and recorded. The collected data were analysed using ANCOVA to find out the effect of training on the selected variables. The results are presented below.

Table I

COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON PASS

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	32.00	32.80	32.40	33.35	B	19.94	3	6.65	0.78
Std Dev	2.34	2.86	2.95	3.41	W	644.55	56	8.48	
Post Test Mean	33.70	34.90	35.10	33.35	B	30.64	3	10.21	1.42
Std Dev	2.36	2.75	2.95	3.41	W	548.35	56	7.22	
Adjusted Post Test Mean	34.27	34.76	35.31	33.22	B	46.91	3	15.64	28.61*
					W	41.00	55	0.55	

* Significant at 0.05 level of confidence

In the table I, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in passing ability among the school volleyball players and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in Table II.

Table II
SCHEFFE'S POST HOC ANALYSIS ON PASS

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean deference	C.I
34.27	34.76			0.49	0.67
34.27		35.31		1.05*	0.67
34.27			33.22	1.05*	0.67
	34.76	35.31		0.55	0.67
	34.76		33.22	1.54*	0.67
		35.31	33.22	2.09*	0.67

***** Significant at 0.05 level.

The multiple mean comparisons shows in the above table proved that there existed significant difference between the experiential groups and the combined training group had better improvement than the cross training and instructional skill training group in improving passing ability among the school volleyball players. The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 1.

Figure 1
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON PASS

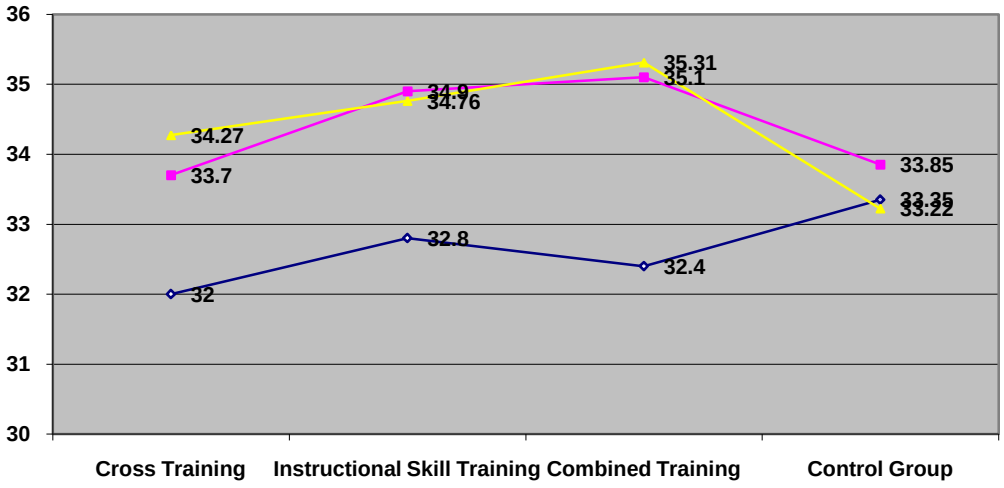


Table III
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON SERVICE

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	27.55	27.70	27.30	27.90	B	3.84	3	1.28	0.16
Std Dev	2.91	3.15	2.08	2.99	W	601.15	56	7.91	
Post Test Mean	29.50	30.15	30.60	27.90	B	74	3	25	2.96*
Std Dev	2.80	3.33	2.08	2.99	W	635	56	8	
Adjusted Post Test Mean	29.56	30.07	30.89	27.78	B	103.22	3	34.41	22.31*
					W	115.68	55	1.54	

* Significant at 0.05 level of confidence

From the above table III, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in serving ability among the school volleyball players and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in Table IV.

Table IV
MULTIPLE COMPARISONS AND SCHEFFE'S POST HOC ANALYSIS ON SERVE

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	Mean difference	C.I
29.56	30.07			0.51	1.12
29.56		30.89		1.33*	1.12
29.56			27.78	1.78*	1.12
	30.07	30.89		0.82	1.12
	30.07		27.78	2.29*	1.12
		30.89	27.78	3.11*	1.12

***** Significant at 0.05 level.

The multiple mean comparisons shows in the above table proved that there existed significant difference between the experiential groups and the combined training group in serving ability of the school volleyball players had better improvement than the cross training and instructional skill training group. The pre test, post test and ordered adjusted means were presented through line graph for better understanding of the results of this study in Figure 2.

Figure 2
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON SERVE

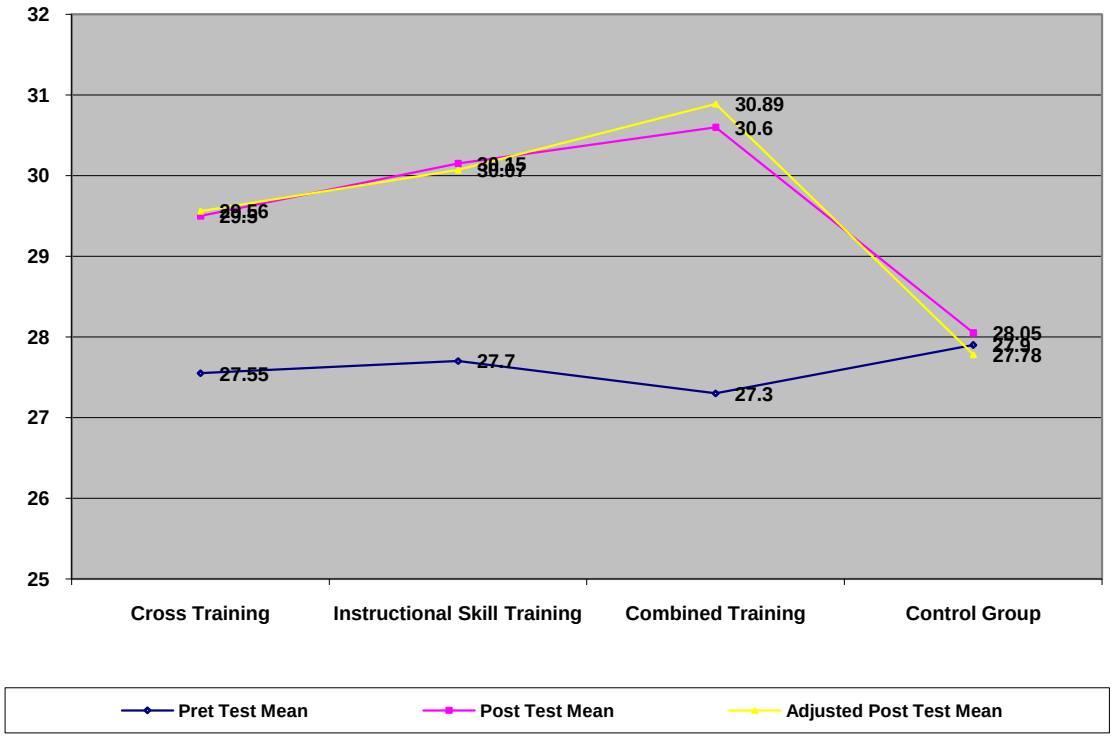


Table V
COMPUTATION OF ANALYSIS OF COVARIANCE DUE TO CROSS TRAINING, INSTRUCTIONAL SKILL TRAINING AND COMBINED TRAINING ON ATTACK

	Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	SOV	Sum of Squares	df	Mean Squares	Obtained F
Pre Test Mean	8.85	8.75	8.90	8.90	B	0.30	3	0.10	0.14
Std Dev	0.75	0.85	0.85	0.97	W	55.90	56	0.74	
Post Test Mean	10.00	10.40	10.80	8.90	B	37.94	3	12.65	13.94*
Std Dev	0.97	0.88	0.85	0.97	W	68.95	56	0.91	
Adjusted Post Test Mean	10.00	10.48	10.76	8.91	B	39.91	3	13.30	34.90*
					W	28.59	55	0.38	

* Significant at 0.05 level of confidence

From the above table V, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in attack ability among the school volleyball players and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in Table VI.

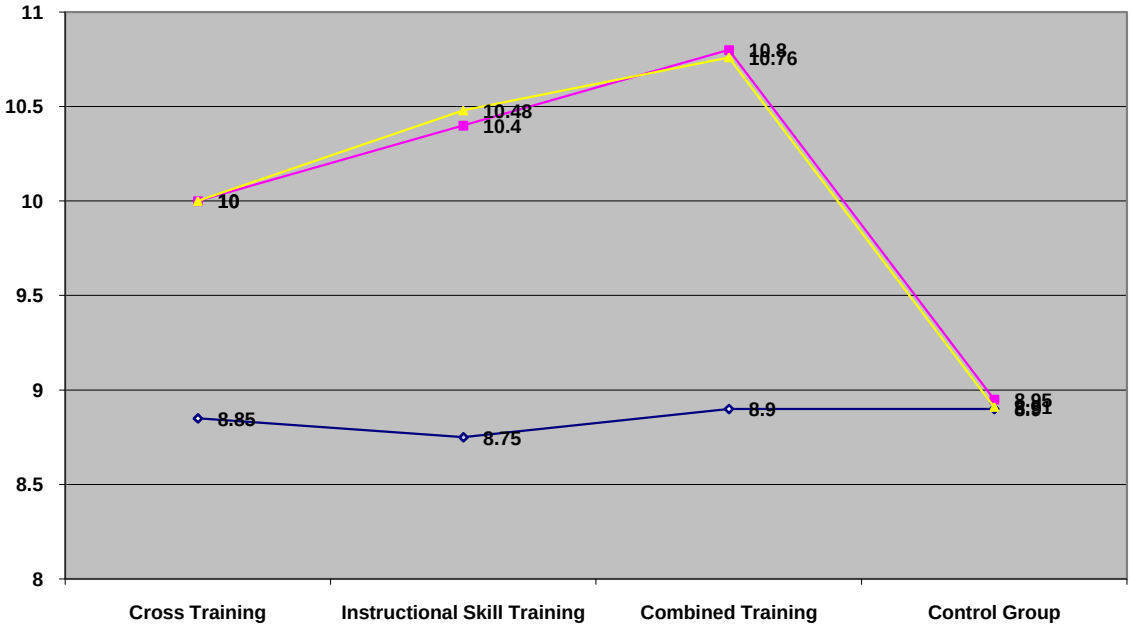
Table VI
MULTIPLE COMPARISONS AND SCHEFFE'S POST HOC ANALYSIS ON ATTACK

Cross training Group	Instructional skill training Group	Com-bined Group	Control Group	MEAN DIFF	C.I
10.00	10.48			0.48	0.56
10.00		10.76		0.76*	0.56
10.00			8.91	1.09*	0.56
	10.48	10.76		0.27	0.56
	10.48		8.91	1.58*	0.56
		10.76	8.91	1.85*	0.56

***** Significant at 0.05 level.

From the above table VI, it is observed that the pre test found to be insignificant and the post test means, adjusted post test means were statistically significant and there was an improvement in attack ability among the school volleyball players and to find out which group had significant improvement Schefee's post hoc test was used to determine the paired mean difference and the results were presented in figure -3.

Figure 3
LINE GRAPH SHOWING PRE, POST AND ADJUSTED MEANS ON ATTACK



DISCUSSION

The results reveal that the significant differences between the pre and post measurements of experimental group in skill performance such as pass service and attack at 0.05 level in favor of post measurement, Researcher attribute this to the objective selection of cross training activities in the training program which featured with using this method overall the training sessions also session characterized with its suitability for under 18 years age group in the formation of the training loads and follow sound foundations in development of physical elements under discussion and achieve the target of these elements after the training program end. This is in line with Mohammed (2004)study about that there is positive effect of cross training method on developing physical abilities of volleyball players, according to Mohammed (2006) study cross training method has positive impact on developing physical side of Judo players,, also these results in agreement with Mohammed (2002) study, which confirmed the superiority of experimental group that used cross-training in the physical side than the control group, which used the traditional program. Results also agreed with what mentioned by Fitzgerald (2004) and Brislin (1998) that cross training improves the performance of technical and develop special physical abilities, it is a tool for the training underlying strength and helps to reach the top level in competitions.

Gabbett (2008), in his study proved that the instructional training improved the physical fitness and skills in junior elite volleyball players. It was observed that the skill-based conditioning games induced improvements in vertical jump, spike jump, speed, agility, upper-body muscular power, and estimated maximal aerobic power, whereas technical instruction improved only spike jump and speed while instructional training induced meaningful improvements in all measurements of skill, whereas improvements in technical skill after skill-based conditioning games were uncommon and typically small. Hence, the benefits of cross training, instructional training and combined effect of cross training and instructional training on skill performance variables, were explored and hence, an attempt was made in this study. Thus, the findings of this study that the combined effect of cross training and instructional skill training significantly altered selected skill performance variables were in agreement with these previous studies.

CONCLUSIONS

Combined effect of cross training and instructional skill training and isolated cross training and instructional skill training significantly improved physical fitness variables such as pass, service and attack of school volleyball players. It was also found that there combined group was significantly better than isolated cross training groups in improving skill performance pass of the school volleyball players.

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