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Comparative effect of plyometric training yogic exercises and game specific training on selected psychomotor variables among college men volleyball players

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Abstract

The purpose of the study was to compare the effects of plyometric training, yogic exercises and games specific training on selected physical fitness variables of men volleyball players. To achieve the purpose of the study, totally sixty college men volleyball players were selected as subjects. In that, 15 players each selected from SACS MAVMM Engineering College, Vaigai College of Engineering, Latha Mathavan Engineering College and Velammal College of Engineering and Technology, Madurai, Tamil Nadu, India and their age ranged from 17 to 23 years. The subjects were divided into four equal groups of fifteen men volleyball players each. Group I acted as Experimental Group I (Plyometric training), Group II acted as Experimental Group II (Yogic exercises), and Group III acted as Experimental Group III (Game-specific training) Group IV acted as and Control Group. The duration of experimental period was 12 weeks. The pre-test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant; Scheffe's post hoc test was used. In all cases 0.05 level of confidence was fixed to test hypotheses. In comparing the effect of experimental groups on reaction time, visual accommodation and depth perception from the obtained f-ratios, it was observed that all the groups produced similar effect.

Keywords: Plyometric training, yogic exercises, game specific training, volleyball

Introduction

Plyometrics alludes to practice that empowers a muscle to achieve most extreme power in the briefest conceivable time. With a concentric muscle development, the muscle abbreviates while it contracts. With an offbeat muscle compression, the muscle protracts while it is applying power. The muscle is stacked with a whimsical (extending) activity, pursued quickly by a concentric (shortening) activity. A muscle that is extended before a concentric constriction, will contract all the more mightily and all the more quickly. An exemplary model is a plunge only preceding a vertical hop. By bringing down the focal point of gravity rapidly, the muscles engaged with the hop are quickly extended delivering an all the more dominant development (Chu, 1998) [3].

Yoga can be rehearsed by all ages and it very well may be taken up at any phase of life. It is never past the point where it is possible to start. Through yoga one can make the progress of life. The reality, yoga assumes a significant job for lessening pressure, strain and tension of basic to all just as players. Mostly the pressure and uneasiness assume a significant job in sports, as these are a vital piece of the "inspiration for pinnacle performance". In later aggressive circumstance, force huge pressure and strains on players while pointing of winning an award. The abnormal state of sports nervousness exasperates body mindfulness and influence physiological capacities which oppose the smooth development of muscles, joints and so on. Different types of yogic exercise increase the flexibility of back, spine, hip, improve the concentration and balancing ability, improve the efficiency of liver and digestive system, cure the neurosis and cardiac diseases, remove the blood pressure problems, strengthen the back and shoulder muscles, improve breath and release the mental tension and centering emotions of the sportsmen,

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which are the main essentials related to the performance of the players in different games and sports of immense use in improving the sense of aesthetics in sports. Yoga can contribute to enhance the aesthetic aspects. So that players improves ease in movements and skill performance. Sports specific training can improve quality, adaptability and stamina whereby the players can improve his presentation in specific sports. For this particular training is deprived to about creating physical molding to improve execution and aptitudes at a specific game. Likewise, understanding the necessities of the game at the right pace so as to meet sports prerequisites. Sports specific is the new pattern with regards to quality and molding programs for competitors.

Methodology

The purpose of the study was to compare the effects of plyometric training, yogic exercises and games specific training on selected physical fitness variables of men volleyball players. To achieve the purpose of the study, totally sixty college men volleyball players were selected as subjects. In that, 15players each selected from SACS MAVMM Engineering College, Vaigai College of Engineering, Latha Mathavan Engineering College and Velamma College of Engineering and Technology, Madurai, Tamil Nadu, India and their age ranged from 17 to 23 years. The subjects were divided into four equal groups of fifteen men volleyball players each.

Group I acted as Experimental Group I (Plyometric training), Group II acted as Experimental Group II (Yogic exercises), and Group III acted as Experimental Group III (Game-specific training) Group IV acted as and Control Group. The duration of experimental period was 12 weeks. The pre-test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant; Scheffe's

post hoc test was used. In all cases 0.05 level of confidence was fixed to test hypotheses.

Results of reaction time

An examination of table - XXIII indicated that the pre-test means of plyometric training, yogic exercises, game-specific training and control groups were 0.25, 0.26, 0.27 and 0.27 respectively. The obtained F-ratio for the pre-test was 1.99 and the table F-ratio was 2.76. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 3 and 56. This established that there were no significant difference between the experimental and control groups indicating that the procedure of randomization of the groups was ideal while conveying the subjects to groups.

The post-test means of the plyometric training, yogic exercises, game-specific training and control groups were 0.21, 0.20, 0.22 and 0.26 respectively. The obtained F-ratio for the post-test was 4.02 and the table F-ratio was 2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. This proved that the differences between the post-test means of the subjects were significant.

The adjusted post-test means of the plyometric training, yogic exercises, game-specific training and control groups were 0.21, 0.20, 0.22 and 0.26 respectively. The obtained F-ratio for the adjusted post-test means was 39.58 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on reaction time.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-1.

Table 1: The scheffe's test for the differences between the adjusted post-test means on reaction time

Adjusted Post-Test Means				Mean Difference	Confidence interval
PTG	YEG	GSTG	CG		
0.21	0.20	---	---	0.01	0.03
0.21	---	0.22	---	0.01	
0.21	---	---	0.26	0.05*	
---	0.20	0.22	---	0.02	
---	0.20	---	0.26	0.06*	
---	---	0.22	0.26	0.04*	

* Significant at 0.05 level of confidence

The multiple comparisons showed in Table XXII proved that there existed significant differences between the adjusted means of plyometric training and control group (0.05), yogic exercises and control group (0.06), game specific training group and control group (0.04). There was no significant difference between plyometric training and yogic exercises (0.01), plyometric training and game specific training group

(0.01) and yogic exercises and game specific training group (0.02) at 0.05 level of confidence with the confidence interval value of 0.03.

The pre, post and adjusted means on reaction time were presented through bar diagram for better understanding of the results of this study in Figure-1.

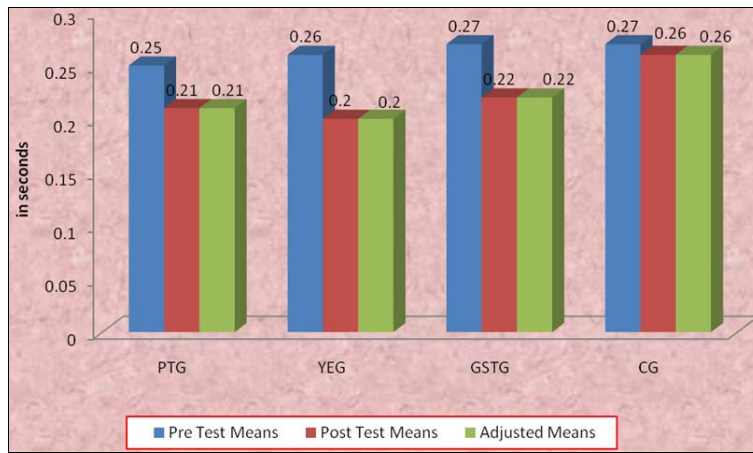


Fig 1: Pre post and adjusted post-test differences of the, plyometric training yogic exercises game-specific training and control groups on reaction time

Discussion on reaction time

The results presented in table 2 showed that obtained adjusted means on reaction time among yogic exercises group was 0.20, followed by plyometric training group with mean value of 0.21, followed by game-specific training group with mean value of 0.22 and control group with mean value of 0.26. The differences among pre-test scores, post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and the obtained F values were 1.99, 44.02 and 39.58 respectively. It was found that obtained F value on pre test scores were not significant and the obtained F values

on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.76 and 2.77. The post hoc analysis through Scheffe’s Confidence test proved that due to twelve weeks training of plyometric training, yogic exercises and game specific training group has increased reaction time than the control group and the differences were significant at 0.05 level. Further, the post hoc analysis showed that there was significant differences exist between the experimental and control groups.

Table 2: Computation of analysis of covariance of plyometric training yogic exercises game-specific training and control groups on visual accommodation (in numbers)

	PTG	YEG	GSTG	CG	Source of Variance	Sum of Squares	Df	Means Squares	F-ratio
Pre-Test Means	30.13	30.40	30.80	30.26	BG	3.733	3	1.244	0.51
					WG	136.667	56	2.440	
Post-Test Means	36.66	36.33	36.40	30.46	BG	405.933	3	135.311	68.88*
					WG	110.000	56	1.964	
Adjusted Post-Test Means	36.68	36.33	36.37	30.47	BG	403.734	3	134.578	67.65*
					WG	109.407	55	1.989	

BG- Between Group * - Significant

WG- Within Group (Table Value for 0.05 Level for df 3 & 56 = 2.76) df- Degrees of Freedom (Table Value for 0.05 Level for df 3 & 55 = 2.77)

Results of visual accommodation

An examination of table-2 indicated that the pre-test means of plyometric training, yogic exercises, game-specific training and control groups were 30.13, 30.40, 30.80 and 30.26 respectively. The obtained F-ratio for the pre-test was 0.51 and the table F-ratio was 2.76. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 3 and 56. This established that there were no significant difference between the experimental and control groups indicating that the procedure of randomization of the groups was ideal while conveying the subjects to groups.

The post-test means of the plyometric training, yogic exercises, game-specific training and control groups were 36.66, 36.33, 36.40 and 30.46 respectively. The obtained F-ratio for the post-test was 68.88 and the table F-ratio was

2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. This proved that the differences between the post-test means of the subjects were significant.

The adjusted post-test means of the plyometric training, yogic exercises, game-specific training and control groups were 36.68, 36.33, 36.37 and 30.46 respectively. The obtained F-ratio for the adjusted post-test means was 67.65 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on visual accommodation.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe’s post hoc test. The results were presented in Table-3.

Table 3: The scheffe’s test for the differences between the adjusted post-test means on visual accommodation

Adjusted Post-Test Means				Mean Difference	Confidence Interval
PTG	YEG	GSTG	CG		
36.68	36.33	-	-	0.35	1.48
36.68	-	36.37	-	0.31	
36.68	-	-	30.47	6.21*	
-	36.33	36.37	-	0.04	
-	36.33	-	30.47	5.86*	
-	-	36.37	30.47	5.90*	

* Significant at 0.05 level of confidence

The multiple comparisons showed in Table 3 proved that there existed significant differences between the adjusted means of plyometric training and control group (6.21), yogic exercises and control group (5.86), game specific training group and control group (5.90). There was no significant difference between plyometric training and yogic exercises

(0.35), plyometric training and game specific training group (0.31) and yogic exercises and game specific training group (0.04) at 0.05 level of confidence with the confidence interval value of 1.48. The pre, post and adjusted means on visual accommodation were presented through bar diagram for better understanding of the results of this study in Figure-VIII.

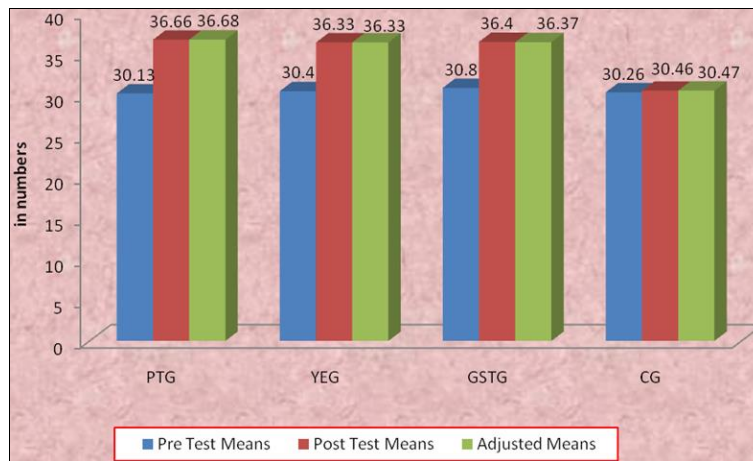


Fig 2: Pre post and adjusted post-test differences of the, plyometric training yogic exercises game-specific training and control groups on visual accommodation

Discussion on Visual Accommodation

The results presented in table XXV showed that obtained adjusted means on visual accommodation among plyometric training group was 36.68 followed by game-specific training group with mean value of 36.37, followed by group with mean value of 36.33 and control group with mean value of 30.47. The differences among pre-test scores, post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and the obtained F values were 0.51, 68.88 and 67.65 respectively. It was found that obtained F value on pre test scores were not significant and the obtained

F values on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.76 and 2.77. The post hoc analysis through Scheffe’s Confidence test proved that due to twelve weeks training of plyometric training, yogic exercises and game specific training group has increased visual accommodation than the control group and the differences were significant at 0.05 level. Further, the post hoc analysis showed that there was significant differences exist between the experimental and control groups.

Table 4: Computation of analysis of covariance of plyometric training yogic exercises game-specific training and control groups on depth perception (in millimeters)

	PTG	YEG	GSTG	CG	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	2.20	2.17	2.21	2.20	BG	0.012	3	0.004	0.35
					WG	0.649	56	0.012	
Post-Test Means	1.73	1.71	1.72	2.18	BG	2.387	3	0.796	51.01*
					WG	0.873	56	0.016	
Adjusted Post-Test Means	1.73	1.72	1.71	2.18	BG	2.358	3	0.786	52.87*
					WG	0.817	55	0.015	

BG- Between Group * - Significant

WG- Within Group (Table Value for 0.05 Level for df 3 & 56 = 2.76) df- Degrees of Freedom (Table Value for 0.05 Level for df 3 & 55 = 2.77)

Results of depth perception

An examination of table-4 indicated that the pre-test means of plyometric training, yogic exercises, game-specific training and control groups were 2.20, 2.17, 2.21 and 2.20 respectively. The obtained F-ratio for the pre-test was 0.35

and the table F-ratio was 2.76. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 3 and 56. This established that there were no significant difference between the experimental and control groups indicating that the procedure of randomization

of the groups was ideal while conveying the subjects to groups.

The post-test means of the plyometric training, yogic exercises, game-specific training and control groups were 1.73, 1.71, 1.72 and 2.18 respectively. The obtained F-ratio for the post-test was 51.01 and the table F-ratio was 2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. This proved that the differences between the post-test means of the subjects were significant.

The adjusted post-test means of the plyometric training, yogic

exercises, game-specific training and control groups were 1.73, 1.72, 1.71 and 2.18 respectively. The obtained F-ratio for the adjusted post-test means was 52.87 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on depth perception.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-5.

Table 5: The scheffe's test for the differences between the adjusted post-test means on depth perception

Adjusted Post-Test Means				Mean Difference	Confidence interval
PTG	YEG	GSTG	CG		
1.73	1.72	---	---	0.01	0.12
1.73	---	1.71	---	0.02	
1.73	---	---	2.18	0.45*	
---	1.72	1.71	---	0.01	
---	1.72	---	2.18	0.46*	
---	---	1.71	2.18	0.47*	

* Significant at 0.05 level of confidence

The multiple comparisons showed in Table 5 proved that there existed significant differences between the adjusted means of plyometric training and control group (0.45), yogic exercises and control group (0.46), game specific training group and control group (0.47). There was no significant difference between plyometric training and yogic exercises (0.01), plyometric training and game specific training group

(0.02) and yogic exercises and game specific training group (0.01) at 0.05 level of confidence with the confidence interval value of 0.12.

The pre, post and adjusted means on depth perception were presented through bar diagram for better understanding of the results of this study in Figure-IX.

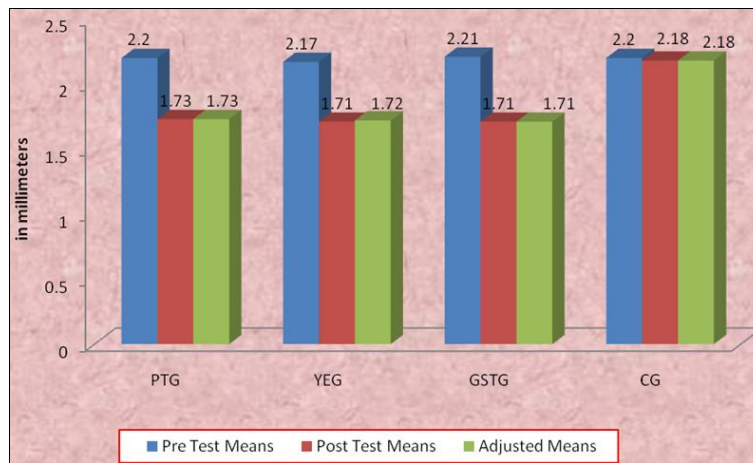


Fig 3: Pre post and adjusted post-test differences of the, plyometric training yogic exercises game-specific training and control groups on depth perception

Discussion on Depth Perception

The results presented in table 5 showed that obtained adjusted means on depth perception among game-specific training group was 1.71, followed by yogic exercises group with mean value of 1.72, followed by plyometric training group with mean value of 1.73 and control group with mean value of 2.18. The differences among pre-test scores, post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and the obtained F values were 0.35, 51.01 and 52.87 respectively. It was found that obtained F value on pre test scores were not significant and the obtained F values on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.76 and 2.77. The post hoc analysis through Scheffe's Confidence test proved that due to twelve weeks training of plyometric training, yogic exercises and

game specific training group has improved depth perception than the control group and the differences were significant at 0.05 level. Further, the post hoc analysis showed that there was significant differences exist between the experimental and control groups.

Conclusions

1. The plyometric training significantly improved the psychomotor variables. The 't' values of the selected variables have reached the significant level.
2. The yogic exercises significantly improved the selected psychomotor variables. The 't' values of the selected variables have reached the significant level.
3. The game-specific training significantly improved the psychomotor variables. The 't' values of the selected variables have reached the significant level.

4. In the control group the obtained 't' value on all the variables were failed to reach the significant level.
5. The significant mean difference does not exist among all the four groups in the pretest on reaction time, visual accommodation and depth perception.
6. In testing posttest mean difference among the four groups statistically significant on variables of reaction time, visual accommodation and depth perception. In testing the post adjusted mean among the four groups also predicts the above result.
7. In comparing the effect of plyometric training and yogic exercises on psychomotor variables, from the obtained f-ratios, it was observed that YEG showed better performance on flexibility and resting heart rate for remaining variables both the groups produced similar effect.
8. In comparing the effect of plyometric training and game-specific training on psychomotor variables, from the obtained f-ratios, it was observed that both the groups produced similar effect.
9. In comparing the effect of yogic exercises and game-specific training on psychomotor variables, from the obtained f-ratios, it was observed that GSTG showed better performance on breath holding capacity and for remaining variables both the groups produced similar effect.
10. Results of the present study explain clearly that in case of psychomotor variables, the observed results significantly favoured the experimental groups namely plyometric training, yogic exercises and game-specific training as compared to control group.
11. It was concluded that men volleyball players should practice plyometric training, yogic exercises and game-specific training for positive enhancement of health.
12. Thus based on the result, it was concluded that all the training methods would provide better means and methods for developing the psychomotor variables that are needed for men volleyball players.

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