



Effect of perceptual skill training and yoga training on psychomotor variables and playing ability of preadolescent basketball players

B. Sangeetha* and A. Pushparajan

*Research Scholar, Department of Physical Education, Karpagam University, Coimbatore, Tamilnadu, India.

Article History : Received 06 April 2014, Accepted 28 June 2014

Abstract

The objective of the present investigation was to examine the effect of perceptual skill training and yoga training on selected psychomotor variables and playing ability of preadolescent basketball players. To achieve the purpose of the study 45 preadolescent school going basketball players of Coimbatore district were selected as subjects. The age of the subjects ranged between 10 – 14 years. They were randomly assigned into three groups equally so that each group has 15 subjects. The first group was named as the perceptual training group (PTG). The second group was named as the perceptual training and yoga training group (PYTG) and the third was a control group (CG). The training period was scheduled for 12 weeks. Experimental group 1 (PTG) underwent a perceptual skill training program. Experimental group 2 (PYTG) underwent perceptual skill training and yoga training and the control group did not undergo any specific training. After 12 weeks of the training period post test was conducted on the dependent variables for all the groups. The perceptual training group (PTG) and perceptual training and yoga training group (PYTG) had shown significant improvement in ($P < 0.05$) the selected variables, hand eye co-ordination finger dexterity speed dribble and wall bounce. The experimental group 1 (PTG) perceptual training group was better than the control group. The perceptual training group was lesser than the perceptual and yoga training group. The experimental group 2 (PYTG) perceptual and yoga training group was better than the control group. The perceptual and yoga training group was better than the perceptual training. The control group did not show any significant improvement on the selected variables.

Keywords : Perceptual skill training, yogic training, psychomotor variables, playing ability, preadolescent, basketball players.

Introduction

Basketball is a game played between two teams of five players each. The aim of the game is to score into the opponents' basket and to prevent the other team from gaining control of the ball or scoring. The ball may be passed, thrown, tapped, rolled or dribble in any direction, subject to restrictions of the relevant articles on the rules. Basketball is a sport of almost constant motion, for the players and the ball. Players are not developed overnight and a coach cannot create miracles by cutting corners through over looking scientific methodologies (Bompa, 1999). There may

be various training methods for a series of skills which are the requisites of a wholesome basketball player. One among those is the perceptual skill which might seem light but which makes a player perform unique.

Perception refers to the process of taking in, organizing, and interpreting sensory information. Perception is multimodal, with multiple sensory inputs contributing to motor responses (Bertenthal, 1996). An infant's turning his head in response to the visual and auditory cues of the sight of a face and the sound of a voice exemplifies this type of perception.

Selection of Subject and Variables

The present study was designed to examine the effect of perceptual skill training and yoga training on selected psychomotor variables and playing ability of preadolescent basketball players. Forty five preadolescent school going basketball players of Coimbatore district acted as subjects. The age of the subjects ranged between 10 – 14 years. The selected psychomotor variables were hand eye co ordination and finger dexterity and the selected skills were wall bounce and speed dribble. Tests were conducted to all the selected subjects before and after the training. The experimental group underwent a twelve week perceptual training program.

Experimental design

In this study 45 preadolescent basketball players were randomly divided into three groups namely, experimental group 1 (Perceptual skill training program (n=15 PYG), experimental group 2 (Perceptual skill training along with yoga training program (n=15, PYTG) and control group (n=15, CG). Each group consists of 15 subjects. The selected subjects were initially tested on the selected psychomotor variables namely hand eye co ordination, finger dexterity and skill performance. After the completion of the pre test, the subjects belonging to experimental group 1 and 2 were treated with their respective training program for 12 weeks. After 12 weeks of training period, post test was conducted on the psychomotor variables of hand eye co ordination, finger dexterity and selected skills were wall bounce and speed dribble, for all the three groups.

Test procedure

The following tests were chosen for testing variables. Hand eye co-ordination was measured by a mirror drawing trace board, finger dexterity was measured by O' corners 'tweezers dexterity board wall bounce and speed dribble was measured by using Knox basketball test.

The chosen tests were highly standardized, appropriate and ideal to assess the selected variables.

Hand eye co ordination

The purpose of the test was to measure the coordinative ability between the hand and the eye. Mirror and drawings trace board required for this experiment.

The tracing mirror was placed safely on the table. A calling bell was also attached to the tracing mirror. Concentration was given as the plus point. To find out the hand eye co-ordination the subjects were asked to move the tracing plate through the way which was given in the tracing plate by seeing the mirror. If the needle touches any side of the path, the error was counted. Three trials were given to the subjects, scoring of average of all trails was taken as the score for calculations.

The score was recorded as the number of total errors and the score was the time taken to complete one trial and recorded in seconds.

Finger dexterity

The purpose of the test was to measure the finger dexterity. O' corners 'tweezers dexterity board, pins, paper, stopwatch and pen are required for this experiment.

The subject inserted pins in its holes which were to be inserted in two conditions 1, by the right hand and 2, by the left hand. The pins were kept to the side of the subject so that the subject did not face any trouble; in picking up the pins. The correct condition of insertion of pins was to start insertion from right side of the subject if work started by the right hand and then from left to right repeating in the same way till the works is finished. The time was noted by the stopwatch. Errors were committed when the pins were not inserted correctly or were slanting or otherwise or are fallen. Time taken for as score.

Speed Dribble test

The purpose of the test was to develop high bounce dribble with cross dribble. Ball, measurement tape and hurdles or chairs are need for this experiment.

The subject places the ball on the start. Finish line and then stands back of it, with hands on knees, with the signal "Go" the subject pick up the ball and dribble down and back through the line of chairs (obstacles). The watch is started with the signal "Go" and is stopped as the subject returns to the start finish line. Scoring: The score is the total number of seconds from the command "Go" until the subject returns to start-finish line.

Wall Bounce Test

The intention of the test to develop the speed pass and rebound. Ball, measurement tapes are required for this study.

A line is marked on the floor 5 feet from the wall and parallel to it. The subject stands behind the line and rebounds the basketball from the wall as rapidly as possible fifteen times, using the chest pass. The score is the number of seconds from the signal "Go" until the ball hits the wall fifteen times. If it rebounds and it requires the subject to take more than one step for recovery, the test is repeated.

Training programme

Perceptual training schedule

Perceptual skill training was given for 12 as for one hour a session for 6 days a weeks. The specially designed perceptual skill training programme was given to the experimental group 1 (PTG) which included exercises to improve peripheral vision training, attention drills, visual acuity drills and reaction drills. Load was managed by increasing the repetition of the exercises once for the second month and thrice for the third month (Table -1)

Perceptual training and yoga training group (PYTG)

The perceptual training and yoga training group (PYTG) was given 30 minutes for twelve weeks as one session a day for 6 days a week (Table -2).

The above mentioned training programs were executed for the respective groups in the morning sessions only. In the evening sessions all the groups underwent regular basketball training which included skills, drills and game practice.

Statistical analysis

To analyse the comparative treatment effects of training 't' ratio was used. To compare the significance of the mean differences among the three groups analysis of co-variance was used. When the F-ratio was significant, Scheffe's post-hoc test was used to identify the significant differences between the training groups. To test the significance of the derived results, the alpha level was set at 0.05 level of confidence.

Results

Analysis of covariance was applied to determine whether the training programmes produced any significant difference by improvements in hand eye co ordination, finger dexterity, wall bounce and speed dribble depth among perceptual skill training, perceptual training and yoga training group. The analysis is presented in tables 3 - 5.

Table -3 show that the obtained t-ratio's between the pre and post test means of the control group, perceptual training group and perceptual training and yoga training group on hand eye coordination of pre adolescent basketball players as 1.435, 8.843, and 4.620 respectively. The obtained t-values of perceptual training group, perceptual training and yoga training group, were found to be higher than the required table value 2.145 df 1 and 14 at 0.05 level of significance. Hence the null hypothesis was rejected

Table - 1. Perceptual training schedule

Sl. no	Exercise	Repetition	Set	Rep rest	Set rest	Time
1.	Eye warm up	2*60 sec	2	10 sec	20 sec	5 min
2.	Color light drill	5*30 sec	3	30 sec	60 sec	10 min
3.	Pattern light drill	5*30 sec	3	30 sec	60 sec	10min
4.	Focus flexibility	5*30 sec	3	30 sec	60 sec	10 min
5.	Fast break drill	5*30 sec	3	30 sec	60 sec	10 min
6.	5 star passing drill	5*30 sec	3	30 sec	60 sec	10 min
7.	Warm down	1*300 sec	1			5 min
Total time						60 mins

Table - 2. Perceptual training and yoga training schedule

Sl. no	Exercise	Repetition	Set	Rep rest	Set rest	Time
1.	Eye warm up	2*60 sec	2	10 sec	20 sec	5 min
2.	Color light drill	3*30 sec	2	30 sec	30 sec	5 min
3.	Focus flexibility	3*30 sec	2	30 sec	30 sec	5 min
4.	Fast break drill	3*30 sec	2	30 sec	30 sec	5 min
5.	5 star passing drill	3*30 sec	2	30 sec	30 sec	5 min
6.	Warm down	1*300 sec	1			5 min
Total time						30 min
Yoga training						
1.	Loosening exercise	1*120 sec	1	-	-	2 min
2.	Trataka	1*120sec	1	30 sec	30 sec	3 min
3.	Surya Namaskar	2 rounds* 120 sec	2	30 sec	30sec	5 min
4.	Mayurasana	3*30 sec	2	30 sec	30 sec	5 min
5.	Hanumanasana	3*30 sec	2	30 sec	30 sec	5 min
6.	Savasana	1*300 sec	1	-	-	5 min
Total time						30 min

Table - 3. Significance of the mean difference of pre and post test of perceptual skill training group, combined group and control group on hand eye co ordination, finger dexterity wall bounce and speed dribbling

Variables	Groups	Pre-test Mean ± SD	Post-test Mean ± SD	't' ratio	% changes
Hand eye coordination	PTG	28.73±6.52	18.13±5.30	4.620	36%
	PYTG	27.60±6.05	12.67±3.39	8.843	54%
	CG	28.53±5.79	26.60±4.17	1.435	7%
Finger dexterity	PTG	18.40±4.98	12.80±3.80	3.981	30%
	PYTG	18.87±4.93	10.27±4.93	6.865	46%
	CG	18.07±5.57	16.73±4.68	0.724	7%
Wall bounce	PTG	19.13±4.58	15.00±2.85	2.674	22%
	PYTG	20.27±6.12	12.40±2.77	5.400	39%
	CG	19.13±4.03	20.33±4.61	1.829	6%
Speed dribble	PTG	19.13±4.58	14.93±4.23	5.290	22%
	PYTG	20.27±6.12	13.60±4.17	3.474	33%
	CG	19.13±4.03	20.33±4.61	1.829	6%

at 0.05 level of significance. Thus it may be concluded that hand eye co ordination increased by 36%, 54%, and 7% for perceptual training group, perceptual training and training group and control group respectively.

Table -3 show that the obtained t-ratio's between the pre and post test means of the control group, perceptual training group and perceptual training group and yoga training group on finger dexterity of pre adolescent basketball players were 0.724, 6.865 and 3.981 respectively. The obtained t-values of perceptual training group, perceptual training and yoga training group, were found to be higher than the required table value 2.145 df 1 and 14 at 0.05 level of significant. Hence the null hypothesis was rejected at 0.05 level of significance. Thus it may be concluded that hand eye co ordination increased by 30%, 46%, and 7% for perceptual training group, perceptual training and yoga training group and control training group respectively.

Table -3 show that the obtained t-ratio's between the pre and post test means of the control group, perceptual training group and perceptual training group and yoga training group on wall bounce of pre adolescent basketball players were 2.674, 5.400 and 1.829 respectively. The obtained t-values of perceptual training group, perceptual training group and yoga training group, were found to be higher than the required table value 2.145 df 1 and 14 at 0.05 level of significant Hence the null hypothesis was rejected at 0.05 level of significance. Thus it may be concluded that wall bounce increased by 22%, 39%, and 6% for perceptual training group, perceptual training and yoga training group and control training group respectively.

Table -3 show that the obtained t-ratio's between the pre and post test means of the control group, perceptual training group and perceptual training group and yoga training group

on speed dribble of pre adolescent basketball players were 5.290, 3.474 and 1.829 respectively. The obtained t-values of perceptual training group, combined training group, were found to be higher than the required table value 2.145 df 1 and 14 at 0.05 level of significant. Hence the null hypothesis was rejected at 0.05 level of significance. Thus it may be concluded that speed dribble increased by 22%, 33%, and 6% for perceptual training group, perceptual training and yoga training group and control training group respectively.

Table - 4 indicates that the pre test mean value of PTG, PYTG, and CG were 29, 28, 29 respectively on hand eye co ordination. The obtained F ratio of 1.14 was found to be lower than the table value 3.23 for df 2 and 42, it is found to be insignificant at 0.05 levels. It is inferred that statistically there was no significant variation among PTG, PYTG, and CG on hand eye co ordination before commencement of the training. The post test means values of PTG, PYTG, and CG 18, 13, 26 respectively on hand eye co ordination. The obtained F ratio of 27.39 was found to be higher than the table value 3.23 for df 2 and 42, it is found to be significant at 0.05 levels. It reveals that significantly there was a significant difference among PTG, PYTG, and CG. It is concluded that hand eye co ordination had a significant improvement after 12 weeks of training. The obtained adjusted post test F ratio of 26.11 was also found to be statistically significant.

Table -4 indicates that the pre test mean value of PTG, PYTG, and CG were 18.40, 18.87, 18.07 respectively on finger dexterity. The obtained F ratio of 1.61 was found to be lower than the table value 3.23 for df 2 and 42, it is found to be insignificant at 0.05 levels. It is inferred that statistically there was no significant variation among PTG, PYTG, and CG on finger dexterity before commencement of the training.

Table - 4. Analysis of covariance on pre, post and adjusted post test means on hand eye co ordination, finger dexterity wall bounce and speed dribble of perceptual training group (PTG), combined training group (PYTG) and control group (CG)

Variables	Groups	Test			F - value		
		Pre-test	Post - test	Adjusted post - test	Pre-test	Post-test	Adjusted post-test
Hand eye co ordination (Scores in numbers)	PTG	29	18	18	1.14	27.39*	26.11*
	PYTG	28	13	13			
	CG	29	27	26			
Finger dexterity (Scores in minutes)	PTG	18.40	12.80	13.18	1.61	5.79*	6.55*
	PYTG	18.87	10.27	10.50			
	CG	18.07	16.73	17.21			
Wall bounce (Scores in minutes)	PTG	19.13	15.00	15.28	1.01	12.68*	15.64*
	PYTG	20.27	12.40	12.35			
	CG	19.13	20.33	20.61			
Speed dribble (Scores in minutes)	PTG	19.13	14.93	15.30	1.01	6.70*	9.19*
	PYTG	20.27	13.60	13.53			
	CG	19.13	20.33	20.70			

* Values are Significant at 0.05 levels

Table - 5. Scheffe's - Post -Hoc test analysis

Variables	Group	Adjusted mean	Obtained ' f ' value		Required ' f ' value (k-1) f 5%
			PTG	PYTG	
Hand eye co-ordination	CG	26.630	24.653*	66.047*	8.318
	PTG	18.150		9.997*	
	PYTG	12.750			
Finger dexterity	CG	17.210	7.019	19.460*	8.318
	PTG	13.180		3.104	
	PYTG	10.500			
Wall bounce	CG	20.610	19.078*	45.819*	8.318
	PTG	15.280		5.65	
	PYTG	12.350			
Speed dribble	CG	20.700	13.913*	24.529*	8.318
	PTG	15.300		1.495	
	PYTG	13.530			

* Values are Significant at 0.05 levels

The post test means values of PTG, PYTG, and CG 12.80, 10.27, 16.73 respectively on finger dexterity. The obtained F ratio of 5.79 was found to be higher than the table value 3.23 for df 2 and 42, it is found to be significant at 0.05 levels. It reveals that there was a significant difference among PTG, PYTG, and CG. It is concluded that finger dexterity had a significant improvement after 12 weeks of training. The obtained adjusted post test F ratio of 6.55 was also found to be statistically significant.

Table - 4 indicates that the pre test means value of PTG, PYTG, and CG was 19.13, 20.27, and 19.13 respectively on wall bounce. The obtained F ratio of 1.01 was found to be lower than the table value 3.23 for df 2 and 42, it is found to be insignificant at 0.05 levels. It is inferred that statistically there was no significant variation among PTG, PYTG, and CG on wall bounce before commencement of the training. The post test means values of PTG, PYTG, and CG 15.00, 12.40, 20.33 respectively on wall bounce. The obtained F ratio of 12.68 was found to be higher than the table value 3.23 for df 2 and 42, it is found to be significant at 0.05 levels. It reveals that significantly there was a significant difference among PTG, PYTG, and CG. It is concluded that wall bounce had a significant improvement after 12 weeks of training. The obtained adjusted post test 'F' ratio of 15.64 was also found to be statistically significant.

Table - 4 indicates that the pre test means value of PTG, PYTG, and CG were 19.13, 20.27, 19.13 respectively on speed dribble. The obtained F ratio of 1.01 was found to be lower than the table value 3.23 for df 2 and 42, it is found to be insignificant at 0.05 levels. It is inferred that statistically there was no significant variation among PTG, PYTG, and CG on hand eye co ordination before commencement of the training. The post test means values of PTG, PYTG, and CG 14.93, 19.13, 20.33 respectively on speed

dribble. The obtained F ratio of 6.70 was found to be higher than the table value 3.23 for df 2 and 42, it is found to be significant at 0.05 levels. It reveals that there was a significant difference among PTG, PYTG, and CG. It is concluded that speed dribble had a significant improvement after 12 weeks of training. The obtained adjusted post test F ratio of 9.19 was also found to be statistically significant.

Table - 5 shows the Scheffe's F test analysis obtained by adjusted post test means of hand eye co ordination, finger dexterity, wall bounce, and speed dribble.

In case of hand eye co ordination it was observed that the obtained Scheffe's F test for perceptual training group had significantly improved than the combined group. All the two experimental groups had significant improvement in hand eye co ordination, than the control group.

In case of finger dexterity it was observed that the obtained Scheffe's F test for perceptual training group had significantly improved than the combined group. All the two experimental groups had significant improvement in finger dexterity, than the control group.

In case of wall bounce it was observed that the obtained Scheffe's F test for perceptual training group had significantly improved than the combined group. All the two experimental groups had significant improvement in wall bounce, than the control group.

In case of speed dribble it was observed that the obtained Scheffe's F test for perceptual training group had significantly improved than the combined group. All the two experimental groups had significant improvement in speed dribble, than the control group.

Discussion

This study confirms that perceptual training and yoga training had produced improvements in hand eye co ordination, finger

dexterity, wall bounce and speed dribble of the preadolescent basketball players but there was a trend in favor of the perceptual training.

Hand eye co-ordination

The perceptual training group and combined training group significantly improved the hand eye co ordination from pre test to post test. The hand eye co ordination increased in perceptual training group from pre test (29) to post test (18), perceptual and yoga training group from pre test (28) to post test (13). Thus hand eye co ordination had significantly improved pre test to post test in all the two groups with no changes in control group. The result of the present study is in line with previous study found that the perceptual training can improve hand eye co ordination (Hagemann *et al.*, 2006).

Finger dexterity

The perceptual training group and combined training group significantly improved the finger dexterity from pre test to post test. The finger dexterity increased in perceptual training group from pre test (18.40) to post test (12.80), perceptual and yoga training group from pre test (18.87) to post test (10.27). Thus finger dexterity had significantly improved pre test to post test in all the two groups with no changes in control group. The result of the present study is in line with previous study (Hagemann *et al.*, 2006).

Wall bounce

The perceptual training group and combined training group significantly improved the wall bounce from pre test to post test. The wall bounce increased in perceptual training group from pre test (19.13) to post test (15.00), perceptual and yoga training group from pre test (20.27) to post test (12.40). Thus wall bounce had significantly improved pre test to post test in all the two groups with no changes in

control group. The result of the present study corroborates the previous study of Hagemann *et al.* (2006) was found that the perceptual training can improve wall bounce.

Speed dribble

The perceptual training group and combined training group significantly improved the speed dribble from pre test to post test. The speed dribble increased in perceptual training group from pre test (19.13) to post test (14.93), perceptual and yoga training group from pre test (20.27) to post test (13.60). Thus speed dribble had significantly improved pre test to post test in all the two groups with no changes in control group. The result of the present study supports with previous study (Hagemann *et al.*, 2006) where they found that the perceptual training can improve the speed dribble.

Conclusion

The present work discussed the features of perceptual training program in a two way approach and suggested the potential benefits of such training for basketball players. It is hoped that future research will continue to investigate the perceptual training components and programs to further build the theoretical bases for such interventions and examine their efficacy.

References

- Bertenthal, B.I. 1996. "Origins and Early Development of Perception, Action and Representation," *Annual Review of Psychology*, 47: 431 - 59.
- Bompa, T.O 1999. *Periodization: theory and methodology of training*. Champaign: Human Kinetics.
- Hagemann, N., Strauß, B. and Cañal-Bruland, R. 2006. Training perceptual skill by orienting visual attention. *Journal of Sport & Exercise Psychology*, 28 (2) : 143 - 158.
