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INFLUENCE OF THE AEROBICS WITH AND WITHOUT COMBINATION OF THE PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION ON THE ENDURANCE AND SKILL PERFORMANCE OF THE INTERCOLLEGIATE BASKETBALL PLAYERS

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ABSTRACT

INTRODUCTION: *The purpose of the study was to find out the influence of the aerobics with and without combination of the proprioceptive neuromuscular facilitation on the endurance and skill performance of the intercollegiate basketball players.*

METHODOLOGY: *The study was formulated as pre and post test random group design. The subjects, selected from Coimbatore district intercollegiate basketball tournament. The age of the selected subjects for the study was ranged between 18 to 25 years. The subjects were randomly selected and divided into three equal groups- Group I was called as the Aerobic training group, Group II was called as the Aerobic training with PNF Stretching group, Group III was called as the Control group consisting of 15 subject in each group. The selected subjects were initially tested on the criterion variables used in the study and it was considered as the pretest. After assessing the pretest, the subjects belonging to the Group I was treated with the aerobic training, Group II was treated with the aerobic training with PNF Stretching training and Group III was not given specific training.*

STATISTICAL TOOL: *The collected data were statistically analyzed with a paired (sample) t test to find out the significant improvement between the pre and post test of all the groups. The groups underwent a training of an experimental period of twelve weeks and the criterion measures were tested for the significance by applying t test at 0.05 level, It was considered as sufficient for the present study. The collected data was processed by using the Analysis of Covariance (ANCOVA) to determine the significant difference among the treatment means of each variable. If the analysis of covariance showed the significant differences between the treatment means, Scheffe's post hoc test was applied to test the significance difference between the paired adjusted means at 0.05 level of confidence.*

DISCUSSION: For the three groups pre test and post test were conducted before and after the training period. Subjects in the group I was treated with the aerobic training and group II was treated with Aerobic training with PNF Stretching for three days a week for the duration of 12 weeks. After completion of the treatment period all the subjects were again tested on the criterion variables and it was considered as the post test.

CONCLUSION: It was concluded that the group I, Aerobic training group and group II, Aerobic training with PNF Stretching group, after 12 weeks of training showed a significant improvements in the Abdominal Endurance, Cardio respiratory endurance, Shooting, Dribbling and Passing.

Keywords: PNF, Abdominal Endurance, Cardio respiratory endurance, Shooting, Dribbling and Passing.

INTRODUCTION

Basketball is a team sport; the objective is to shoot a ball through a basket horizontally positioned and to score points by following a set of rules. Usually, two teams of five players play on a marked rectangular court with a basket at each width end. Basketball is one of the world's most popular and widely viewed sports.

Endurance, strengthening, stretching and flexibility are the important parts of playing any aerobic type sport e.g., basketball. Close games are won late in the game often by the team with the best physical conditioning. Basketball is played mainly by the commonly used techniques like shooting, passing, dribbling, and rebounding, as well as specialized player positions and offensive and defensive structures and techniques. Typically, the tallest members of a team will play as the "center", "power forward" or "small forward" positions, while shorter players or those who possess the best ball handling skills and speed play will play as the "point guard" or "shooting guard". Basketball was originally played with an association football. The first balls for playing basketball was made brown in colour, and in the late 1950s by Tony Hinkle, introduced on orange ball that would be more visible to the players and spectators which is now in common use. Dribbling was not part of the original game except for the "bounce pass" to the teammates. Passing the ball was the primary means of the ball movement. Dribbling was eventually introduced but limited by the isometric shape of the early balls. Dribbling only became a major part of the game around 1950s, because of the improved the ball shape (Griffiths and Sian, 2010). Aerobic exercise is physical activity that makes a person sweat, causes to breathe harder, and makes the heart to beat faster than at rest. It strengthens the heart and lungs and trains the cardiovascular system to manage and deliver oxygen more quickly and efficiently throughout the body. Aerobic exercise uses the large muscle group which is rhythmic in nature, and maintained continuously for at least 10 minutes.

Cardiovascular system is made up of heart and blood vessels e.g., arteries, veins, and capillaries that transports blood throughout the body. Aerobic refers to how body using the oxygen sufficiently to meet the energy demands during the exercise.

PNF Stretching is an abbreviation for the Proprioceptive Neuromuscular Facilitation and a technique for increasing flexibility which combines the muscle tension with a passive stretching, and also called as isometric stretching. PNF Stretching is currently the fastest and most effective way known to increase the static-passive flexibility. PNF Stretching is an acronym for the proprioceptive neuromuscular facilitation. It is not really a stretching type but is a technique of combining passive stretching and isometric stretching in order to achieve a maximum static flexibility. Actually, the term PNF Stretching is itself a misnomer. PNF Stretching is initially developed as a method of rehabilitating stroke victims. PNF Stretching refers to any of the several post-isometric relaxation stretching techniques in which a muscle group is passively stretched, and then contracts isometrically against the resistance while in the stretched position, and then passively stretched again through the increased range of motion. PNF Stretching usually employs the use of a partner to provide the resistance against the isometric contraction and then passively take the joint through its increased range of motion. It may be performed, however, without a partner, although it is usually more effective with a partner's assistance (Anthony R. Arredondo, 2009).

METHODOLOGY

The selected subjects were the participants of the intercollegiate level basketball tournaments in the Coimbatore District. The age of the selected subjects for the present study was ranged between 18 to 25 years. The subjects were randomly selected and divided into three equal groups namely Experimental group-I Aerobic training (ATG) Experimental group-II Aerobic training with PNF Stretching (ATWPNFSG) and Group-III Control Group (CG) each consisting of 15 subjects. The selected subjects were initially tested on the criterion variables used in the study and it was considered as the pretest. After assessing the pretest, the subjects belonging to the experimental group I were treated with the aerobic training and the subjects belonging to the experimental group II were treated with the aerobic training with PNF Stretching. As far as the subjects in the group III - Control Group were concerned they were not given any specific training. Subjects in the experimental groups I and II were treated with their respective treatments for three days a week and for a duration of 12 weeks. After completion of the treatment period, all the subjects were again tested on the criterion variables and it was considered as the post test.

TABLE-I

SIGNIFICANCE OF THE MEAN GAINS AND LOSSES OF THE PRETEST AND POSTTEST OF THE AEROBIC TRAINING GROUP, AEROBIC TRAINING WITH ROPRIOCEPTIVE NEUROMUSCULAR FACILITATION STRETCHING GROUP AND CONTROL GROUP

GROUP	VARIABLES	PRE TEST	POST TEST	MD	SD	t-ratio
ATG	Abdominal Endurance	24.13	29.63	5.5	1.39	4.61*
ATWPNFSG		23.47	28.56	5.09	1.17	3.96*
CG		23.89	24.12	0.23	0.21	1.43
ATG	Cardio Respiratory Endurance	214.10	199.866	14.24	0.31	6.27*
ATWPNFSG		220.62	208.72	11.9	1.47	4.31*
CG		209.67	207.43	2.24	0.19	0.87
ATG	Shooting	47.92	52.36	4.44	1.39	4.31*
ATWPNFSG		46.81	51.91	5.1	2.01	3.72*
CG		48.25	47.88	0.37	0.13	1.62
ATG	Dribbling	24.53	22.18	2.35	1.33	5.43*
ATWPNFSG		23.74	21.67	2.07	1.81	4.07*
CG		23.97	24.18	0.21	0.28	1.82
ATG	Passing	40.04	38.12	1.92	1.65	3.74*
ATWPNFSG		38.92	35.86	3.06	2.07	2.97*
CG		41.23	41.56	0.33	0.74	1.91

*0.05 level of significance (2.14)

The Table-I reveals that the pre and post test values of the aerobic training group, aerobic training with PNF Stretching group and control group on the selected Abdominal Endurance, Cardio respiratory endurance, Shooting, Dribbling and Passing. The pretest mean values of the aerobic training group are 24.13, 214.10, 47.92, 24.53 and 40.04 respectively. The pretest mean values of the aerobic training with PNF Stretching group are 23.47, 220.62, 46.81, 23.74, and 38.92 respectively. The pretest mean values of the control group are 23.89, 209.67, 48.25, 23.97 and 41.23 respectively.

The posttest mean values of the aerobic training group are 29.63, 199.866, 52.36, 22.18 and 38.12 respectively. The posttest mean values of the aerobic training with PNF Stretching group are 29.63, 208.72, 51.91, 21.67 and 35.86 respectively. The posttest mean values of the control group are 24.12, 207.43, 47.88, 24.18 and 41.56 respectively.

The obtained t-values of the ATG are 4.61, 6.27, 4.31, 5.43 and 3.74, APWPNFSG are 3.96, 4.31, 3.72, 4.07 and 2.97 respectively. The required table value is 2.14. Since the obtained t-ratios are greater than the required table value at 0.05 level of confidence and there are significant difference, between pre and post test values of the Endurance and Skill Performance among the Intercollegiate Basketball Players.

The obtained t-values of the control group are 1.43, 0.87, 1.62, 1.82 and 1.91 respectively. The required table value is 2.14. Since the obtained t-ratios are less than the required table value at 0.05 level of confidence and there are insignificant difference, between pre and post test values of the Endurance and Skill Performance among the Intercollegiate Basketball Players.

TABLE- II
ANALYSIS OF CO VARIANCE AMONG AEROBIC TRAINING GROUP, AEROBIC TRAINING WITH PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION STRETCHING GROUP AND CONTROL GROUP ON SELECTED VARIABLES

VARIABLES	SV	SQ	df	Mean square	‘F’
Abdominal Endurance	Between	109.54	2	54.77	26.20*
	Within	85.72	41	2.09	
Cardio Respiratory Endurance	Between	686.18	2	228.73	10.41*
	Within	1648.13	41	21.98	
Shooting	Between	160.435	2	130.218	59.44*
	Within	122.668	41	2.19	
Dribbling	Between	222.09	2	161.05	53.87*
	Within	122.59	41	2.99	
Passing	Between	233.132	2	116.566	65.47*
	Within	99.7	41	1.78	

*0.05 level of significance (3.22)

The obtained ‘F’ ratio for the adjusted post test mean of the ATG, ATWPNFSG and CG on the Abdominal endurance, Cardio respiratory endurance, Shooting, Dribbling and Passing are 26.20,10.41,59.44,53.87 and 65.47 respectively, since the F - value is higher than the required table value of 3.22 for the degree of freedom 2 and 41, it is significant at 0.05 level of the confidence.

Whenever the ‘F’ value among the adjusted post test mean of the aerobic training group (ATG), aerobic training with the PNF Stretching group (ATWPNFSG) and control group (CG) are found to be significant, in

order to find which of the training group is improved the Endurance. The Skill Performance is higher than the other training groups and the scheffe's post hoc test is applied.

TABLE- III

SCHEFFEE'S POST HOC VALUES OF THE ADJUSTED POST TEST MEAN DIFFERENCE ON THE EXPERIMENTAL GROUP-I AEROBIC TRAINING GROUP, GROUP –II AEROBIC TRAINING WITH PNF STRETCHING AND GROUP-III CONTROL GROUP

Variables	Aerobic Training Group (Group I)	Aerobic Training with PNF Stretching Group (Group II)	Control Group	Mean Difference	C.I
Abdominal Endurance	28.67	28.74	-	0.07	0.20
	28.67	-	23.92	4.75*	
	-	28.74	23.92	4.82*	
Cardio Respiratory Endurance	200.83	208.89	-	8.06*	0.64
	200.83	-	207.26	6.43*	
	-	208.89	207.26	1.63*	
Shooting	52.58	51.37	-	1.21*	0.20
	52.58	-	47.89	4.69*	
	-	51.37	47.89	3.99*	
Dribbling	22.07	21.79	-	0.28*	0.23
	22.07	-	24.27	2.2*	
	-	21.79	24.27	2.48*	
Passing	39.93	35.96	-	3.97*	0.18
	39.93	-	41.62	1.69*	
	-	35.96	41.62	5.66*	

Table III reveals that the result it is inferred that the twelve weeks of Aerobic training group is improved on the Abdominal Endurance, Cardio Respiratory Endurance, Shooting, Dribbling and Passing which is significantly higher than the other training groups of ATWPNFSG and CG.

From the result it is inferred that the twelve weeks of Aerobic training with PNF Stretching group is improved on the Abdominal Endurance, Cardio Respiratory Endurance, Shooting, Dribbling and Passing which is significantly higher than the other training groups of ATG and CG.

DISCUSSION ON FINDINGS

Having more salient features the investigator is intended to the aerobic and aerobic training with proprioceptive neuromuscular facilitation stretching as training programmes in different forms in the present study. It was tested under two different forms namely Experimental group-I Aerobic training group (ATG), and Experimental group-II Aerobic training with PNF Stretching group (ATWPNFSG). The derived results on the Aerobic training group (ATG- Experimental group-I), Aerobic training with PNF Stretching group (ATWPNFSG- Experimental group-II) and Control group (CG- group-III) on the criterion variables from their base line to the post treatment, the treatment groups I and II produced significant effects.

The result of the study showed that the Aerobic training with PNF Stretching group (ATWPNFSG) will have significant effects on the endurance and skill performance components namely Abdominal Endurance, Dribbling and Passing of the intercollegiate basketball players.

The result of the study showed that the Aerobic training group (ATG) will have significant effects on the endurance and skill performance components namely Cardio Respiratory Endurance and Shooting of the intercollegiate basketball players.

CONCLUSIONS:

In light of the above findings of the present study the following conclusions are made:

- It is concluded that the aerobic training group (ATG) and aerobic training with PNF Stretching group (ATWPNFSG) produced significant improvements on the selected endurance and skill performance components namely Abdominal Endurance, Cardio Respiratory Endurance, Shooting, Dribbling and Passing of the intercollegiate basketball players.
- It is concluded that the Control group (CG) does not produce any significant difference on the selected endurance and skill performance components namely Abdominal Endurance, Cardio Respiratory Endurance, Shooting, Dribbling and Passing of the intercollegiate basketball players.
- It is concluded that the Aerobic training with PNF Stretching group (ATWPNFSG) produce more significant improvement than the Aerobic training group (ATG) and Control group (CG) on the selected endurance and skill performance components namely Abdominal Endurance, Dribbling and Passing of the intercollegiate basketball players.

➤ It is concluded that the aerobics training group (ATG) produce more significant improvement than the Aerobic training with PNF Stretching group (ATWPNFSG) and Control group (CG) on the selected endurance and skill performance components namely Cardio Respiratory Endurance and Shooting of the intercollegiate basketball players.

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