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Effect of Static, Dynamic and PNF Stretching with Specific Football Training Package on Agility of Football Players

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Abstract

The intention of this study was to determine the impact of static, dynamic, and proprioceptive neuromuscular facilitation stretching with specific football training package on agility of football players. To achieve the purpose of the study, forty eight male football players participated in the inter-school level football tournaments from Kanyakumari district, Tamilnadu, India were selected as subjects. The inclusion criteria of the participants were that the individual was male between the age of 13-17 years, and recreationally active (engage in some form of physical activity at least 30mins and 3-4 days per week). The exclusion criteria of the participants were that the individual was free from lower extremity pain or injury in the past 6 month or any other physical deficit that limited them in performing the stretching protocols. The selected subjects were randomly assigned into four equal groups of 12 subjects each. Group-I performed static stretching with football training, group-II performed dynamic stretching with football training, group-III assigned proprioceptive neuromuscular facilitation stretching with football training package and group-IV was control. The subject of control group was not allowed to perform any specific stretching exercises before undergoing football training. 't' test, ANCOVA and scheffes's test were used to analyse the data. In altering agility of the football players dynamic stretching practice is significantly better than static and PNF stretching training however, no significant differences existed between static and PNF stretching.

Keywords: Stretching, Agility, Flexibility, Football.

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Introduction

Static stretching is a category of this kind of action. It involves stretching while the body is in a state of rest. Static literally means "without movement". Static stretching involves passively stretching into a near maximal position and holding for an extended (15-30 seconds) period of time. This is in opposition to dynamic stretching, which involves quick, repetitive movements to achieve a stretch. Dynamic stretching is the act of moving a joint through its entire range of motion in a quick manner with little resistance. Dynamic stretching consists of exercises that are functionally based and incorporate sport-specific movements to prepare the body for activity. The stretches are designed in a manner that replicates repetitive movements identical to those performed during an athletic event or exercise session. Some of the benefits of dynamic stretching include raising of core body and deep muscle temperatures, stimulation of the nervous system, decreases in the inhibition of antagonist muscles, increases postactivation potentiation and possibly reduces the risk of injury.

PNF stretching is an advanced form of flexibility training that involves contraction and stretching of muscles. The technique was originally born in the clinical rehabilitative environment, but has worked its way into mainstream gyms because it is so effective. PNF stretching requires the help of a partner or an inanimate object.

Football is the world's most popular sport. According to the International Federation of Association Football, approximately 265 million players and 5 million referees and officials are actively involved. This is equivalent to 4% of the world's population. The game is intermittent in nature and involves multiple motor skills such as running, dribbling, kicking and jumping. Performance depends upon a variety of individual skills and their interaction and integration among different players within the team. Technical and tactical skills are considered to be predominant factors, but physical capabilities must also be well developed in order to become a successful player. The sum of all individual skills determines the team's potential. These skills must be correctly balanced across playing positions in order to solve various tasks during play.

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Methodology

The intention of this study was to determine the

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randomly assigned into four equal groups of 12 subjects each. Group-I performed static stretching with football training, group-II performed dynamic stretching with football training, group-III assigned proprioceptive neuromuscular facilitation stretching with football training package and group-IV was control. The subject of control group was not allowed to perform any specific stretching exercises before undergoing football training. ‘t’ test, ANCOVA and scheffes’s test were used to analyse the data.

Results

The descriptive analysis of the collected data on agility of experimental and control groups are presented in table 1.

Table 1
Descriptive Analysis of the Data on Agility

Name of the Group	Testing Period	Mean Score	SD	Range Value	MD	Obtained ‘t’Ratio	Magnitude of Changes
Static Stretching Group (SS)	Pre	11.03	0.93	4.00	1.03	4.61*	9.42
	Post	9.99	0.38	3.00			
Dynamic Stretching Group (DS)	Pre	11.01	1.25	4.00	1.97	3.34*	17.98
	Post	9.03	1.11	4.00			
PNF Stretching Group (PNF)	Pre	11.00	1.03	6.00	0.98	3.28*	9.01
	Post	10.01	0.71	3.00			
Control Group (CG)	Pre	10.86	1.11	5.00	0.09	0.33	0.82
	Post	10.95	1.06	4.00			

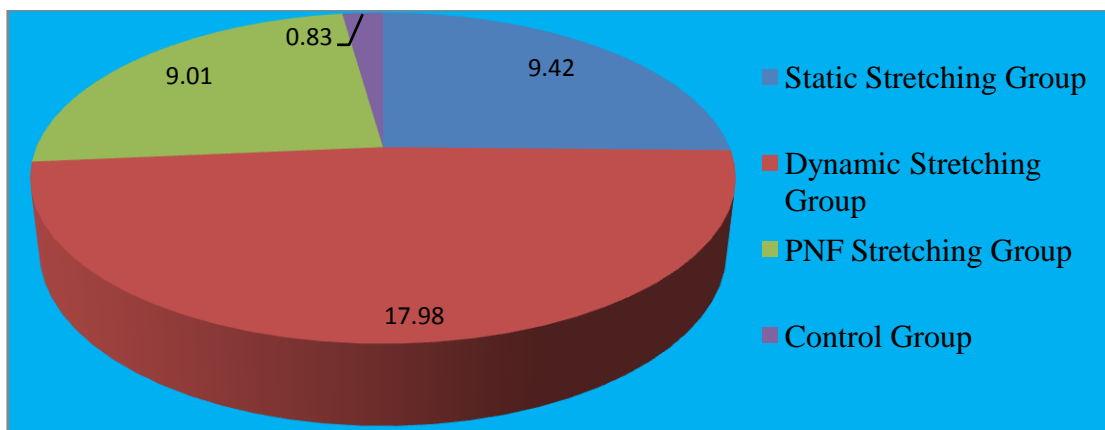
Table Value for 11 degrees of freedom is 2. 20

*Significant at 0.05 level of confidence

Table 1 shows that the obtained ‘t’ values 4.61, 3.34 and 3.28 respectively of the static, dynamic and PNF stretching groups are higher than the table value (2.20) required for significant at 05 level for 11 degrees of freedom. It exposed that significant mean differences existed on agility between the pre and post test scores of experimental groups. On the other hand, insignificant differences were found between the pre test and post test

means of control group on agility as, the obtained ‘t’ value 0.33 is lesser than the table value (2.20)required for significance. The result of the study produced 9.42%, 17.98% and9.01% of improvement due to static, dynamic and PNF stretching on agility. The magnitude of changes on agility of static, dynamic and PNF stretching and control groups are graphically shown in figure I for better understanding.

Figure 1
Pie Diagram Showing the Percentage of Changes on Agility



The data collected from the four groups on agility was statistically analyzed by ANCOVA and the

outcomes are presented in table 2.

Table 2
Analysis of Covariance on Agility of Experimental and Control Groups

	Static Stretching	Dynamic Stretching	PNF Stretching	Control Group	S o v	SS	df	MS	Obtained 'F' ratio
Pretest Mean	11.03	11.01	11.01	10.86	B	0.21	3	0.07	0.059
SD	0.93	1.25	1.03	1.11	W	52.17	44	1.18	
Posttest Mean	9.99	9.03	10.01	10.95	B	22.06	3	7.35	9.75*
SD	0.38	1.11	0.71	1.06	W	33.18	44	0.75	
Adjusted Posttest Mean	9.98	9.03	10.01	10.96	B	22.35	3	7.45	9.81*
					W	32.64	43	0.75	

(Table value for df 3 & 44 and 3 & 43 is 2.82)
*Significant at 0.05 level

The pre-test mean and standard deviation values (11.03 ± 0.93, 11.01 ± 1.25, 11.01 ± 1.03 and 10.86 ± 1.11) on agility of static stretching, dynamic stretching, PNF stretching and control groups are shown in Table 2. Since, the 'F' ratio value (0.059) obtained for the pre test means on agility of all the four groups is less than the table value (2.82 for df 3&44)required for significant at 0.05 level of confidence, it is assumed that no statistical significant differences existed among the static, dynamic, PNF stretching and control groups during pre test period. Table 2 also shows the posttest means and SD values (9.99 ± 0.38, 9.03 ± 1.11, 10.01 ± 0.71 and 10.95±1.06) on agility of static stretching, dynamic stretching and PNF stretching and control groups. While, the 'F' value

ratio value (9.75) on agility is greater than the table value (2.82 for df 3&44) at 0.05 level of confidence, it is concluded that significant differences existed between the groups during the post test period. The static, dynamic and PNF stretching and control group's adjusted post-test means values on agility are 9.98, 9.03, 10.01 and 10.96 respectively. Since, the obtained 'F' ratio value (9.81) is greater than the table value (2.82), it is concluded that significant differences existed between the adjusted post tests means of experimental and control groups on agility. Further, to find out the paired mean difference, the Scheffe's test is applied as post hoc test and it is given in table 3.

Table 3
Scheffe's Post Hoc Test on Agility of Experimental and Control Groups

Static Stretching	Dynamic Stretching	PNF Stretching	Control Group	MD	C I
9.98	9.03			0.95*	0.91
9.98		10.01		0.03	0.91
9.98			10.96	0.98*	0.91
	9.03	10.01		0.98*	0.91
	9.03		10.96	1.93*	0.91
		10.01	10.96	0.95*	0.91

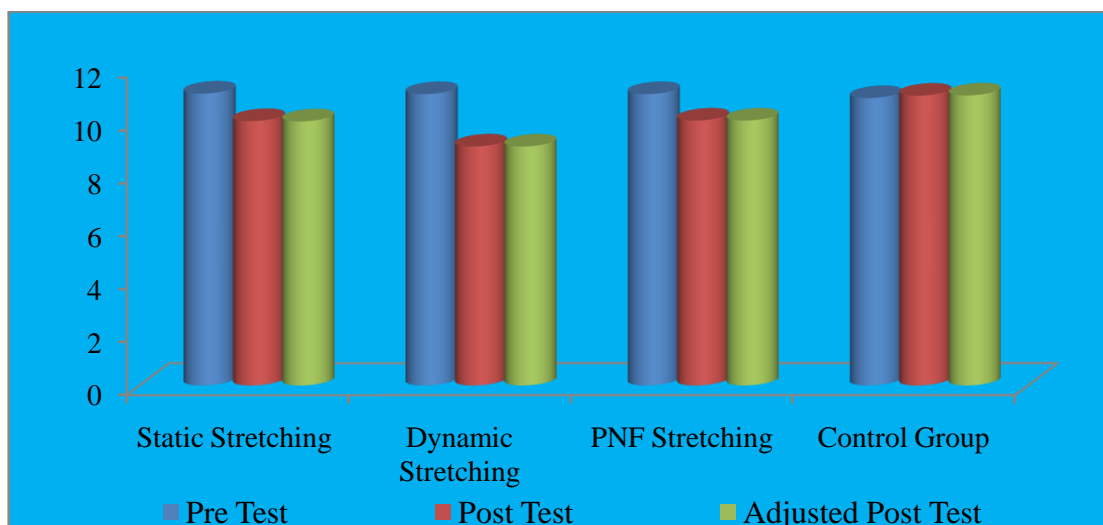
*Significant

From table 3 it is concluded that due to the effect of static (0.98), dynamic (1.93) and PNF stretching (0.95) the agility of the football player is significantly improved when compared with the control group since, the mean differences are higher than the confident

interval value (0.91). It is also concluded that dynamic stretching practice is significantly better than static (0.95) and PNF stretching (0.95) however, no significant differences existed between static and PNF stretching (0.03) in altering agility of the football players.

Figure II

Graphical Representation of the Mean Values on Agility of Static, Dynamic and PNF Stretching and Control Groups (Unit of Measurements: Seconds)



Conclusion

In altering agility of the football players dynamic stretching practice is significantly better than static and PNF stretching training however, no significant differences existed between static and PNF stretching. As a result of static, dynamic and PNF stretching with football training 9.42%, 17.98% and 9.01% of improvement were observed.

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