



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 4.69
IJPESH 2016; 3(2): 395-397
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www.kheljournal.com
Received: 19-01-2016
Accepted: 21-02-2016

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Effect of circuit training and speed agility quickness training on motor fitness variables among school football players

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Abstract

The study was designed to investigate the effect of circuit training and speed agility quickness training on selected motor fitness among junior football players. For this 30 school boys junior football players were selected randomly from sports school at Neyveli as subjects. Their age ranged from 15 to 17 years. They were divided into three equal groups namely Experimental Group I, Experimental Group II and control group. Five days in a week, the Experimental Group I underwent circuit training, Experimental Group II underwent SAQ training and Group III control group was not given any specific training. The following criterion variables were chosen, namely speed and agility. They were assessed before and after the training period of 12 weeks. The analysis of covariance was used to determine any significant difference present among the three groups of the dependent variables. The study revealed that the selected motor fitness variables were significantly improved due to the influence of circuit training and SAQ training among junior football players.

Keywords: Circuit training, SAQ training, speed, agility

Introduction

Sports have become an important part of nations cultural as well as of other cultures throughout the world. Sports provide society to such an extent that it has been described by many as a microcosm of society. In other words, sports mirror the values structures and dynamics of our society. As such sports reflect characteristics of society. The training is a process of preparing an individual for any event or an activity or job. Usually in sports we use the term sports training which denote the sense of preparing sports persons for the highest level of preparing sports persons for the highest level of performance. But now a days sports training is not just a term but it is very important subject that affects each and every individual who takes up physical activity or sports either for health and fitness or for competition at different levels hence, sport training is the physical, technical, intellectual, psychological and moral preparation of an athlete or a player by means of physical exercises.

Circuit training is a very popular and effective organizational form of doing physical exercises. In circuit training a certain number of exercises are done one after the other in the form of circuit. This circuit is repeated three or more times circuit training can be used for the improvement of technical and tactical elements for the improvement of conditional abilities. Speed, agility and quickness training can cover the complete spectrum of training intensity, from low to high intensity. Every individual will come into a training programme at a different levels, thus training intensity must coincide with the individuals abilities. Low intensity speed, agility and quickness drills can be used by everyone for different application. SAQ drills can also be used to teach movement, warm-up or to condition an athlete.

Soccer requires players to perform numerous actions that require strength, power, speed, agility, balance, stability, flexibility and endurance (Bloomfield *et al.*, 2007; Gorostiaga *et al.*, 2004; Helgerud *et al.*, 2001) [2, 3, 4] suggesting that the physical conditioning of players is a complex process. During a soccer match, players cover about 10 km in total, which includes a sprint every 90 seconds (11% of overall activity) with each action lasting on average of 2 to 4 seconds and covering a distance of 15 m (Stolen *et al.*, 2005) [5]. Although speed represents a very important component of fitness for a soccer player, quickness (acceleration speed during

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the first steps) is probably more important. This is because sprints in soccer are mainly performed over short distances undertaken at maximal intensity although the longest distances tend to be about 40 m and usually involves several changes in direction (Jovanovic *et al.*, 2011; Rienzi *et al.*, 2000) [5, 7].

Methodology

Subjects

The purpose of the study was to explore effect of circuit training and SAQ training on selected bio motor ability among junior football players. To achieve this purpose of the study, thirty school boys, and junior football players were selected randomly from sports hostel at Neyveli as subjects. Their age ranged from 15 to 17 years. They were divided into three equal groups namely Experimental Group I, Experimental Group II and control group. Five days in a week the Experimental Group I underwent circuit training, Experimental Group II underwent SAQ training and Group III control group was not given any specific training.

Training Protocol

The training session includes warming up and lumbering down. Every day the work out lasted for 60-90 minutes approximately. Experimental group I the training program was consists of warm up exercise for 10 munities (jogging, slow space running, stretching exercises etc.), circuit training exercise of core and trunk and lower and upper body, cool down exercises. Sit ups (lower abdominals), pushups, Squat jumps, Compass jumps, astride jumps, Shuttle runs were selected for the main training schedule. Experimental group

performed 25 to 35 seconds work on each exercise with a 20 to 30 seconds recovery. They performed 2 to 4 sets with a 2 to 3minutes recovery between each set. The training program was conducted three days in a week of two months. Experimental group II designed SAQ training dynamic flex warm-up: 20 min, mechanics 15 min, soccer specific conditioning, innervations (soccer related movement drills, agility, speed, multi directional 25 min), explosion (resisted random agility and assisted drills), to develop multi directional speed. Ratio: mechanics 70% and explosive 30% active recovery. Soccer specific SAQ training work outs examples: 10 x80 m, 8 x60 m, 6 x40 m timed active recovery. Cool down/ static stretching (20 min. Group III designed as a control group did not practice any specific training programme. The following criterion variables were chosen namely speed and agility, was assessed by 50 meters dash and shuttle run. The data were collected before and after the twelve weeks of SAQ training and small sided games practice groups.

Statistical Technique

The data collected from the three groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained F ratio was found to be significant for adjusted posttest means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases statistical significance was fixed at .05 levels.

Result of the study

Table 1: Analysis of Covariance for Pre and Post Test Data on Speed and Agility of Circuit Training SAQ Training Group and Control Group

		Group- I	Group- II	Group -III	SOV	Sum of square	df	Mean squares	'F'ratio	
Speed	Pre-test									
	Mean	7.59	7.23	7.89	B:	2.22	2	1.11	1.68	
	SD	1.23	0.53	0.43	W:	17.77	27	0.66		
	Post-test									
	Mean	7.25	6.84	7.84	B:	5.09	2	2.54	13.84*	
	SD	0.34	0.42	0.41	W:	4.96	27	0.18		
	Adjusted Post-Test									
Mean	7.25	6.87	7.82	B:	4.07	2	2.04	10.93*		
				W:	4.84	26	0.19			
Agility	Pre-test									
	Mean	10.43	10.44	10.51	B:	0.042	2	0.02	0.53	
	SD	0.20	0.19	0.20	W:	1.068	27	0.04		
	Post-test									
	Mean	9.99	9.91	10.36	B:	1.14	2	0.574	30.35*	
	SD	0.11	0.10	0.18	W:	0.51	27	0.019		
	Adjusted Post-Test									
Mean	9.98	9.92	10.35	B:	1.03	2	0.516	33.69*		
				W:	0.39	26	0.015			

* Significant at 0.05 level of confidence. The table value required for significance at 3.57

The adjusted post-test mean on speed for circuit training group is 7.25, SAQ training group is 6.87 and control group is 7.82. The obtained 'F' ratio of 10.93 for adjusted post-test mean is more than the table value of 3.37 required for significance at 0.05 level for df 2 and 26. The results of the study showed that there was significant difference among three groups on speed.

The adjusted post-test mean on agility for circuit training group is 9.98, SAQ training group is 9.92 and control group is 10.35. The obtained 'F' ratio of 33.69 for adjusted post-test mean is more than the table value of 3.37 required for significance at 0.05 level for df 2 and 26. The results of the study showed that there was significant difference among three groups on agility.

Table 2: Scheffe's Post Hoc Test for the adjusted post-test paired means difference on SPEED and AGILITY

	Adjusted Post-Test means			mean difference	confidence interval
	Circuit Training	SAQ Training group	Control group		
Speed	7.24	6.87	-	0.37	0.50
	7.24	-	7.82	0.58*	0.50
		6.87	7.82	0.95*	0.50
Agility	9.98	9.92		0.06	0.14
	9.98		10.35	0.37	0.14
		9.92	10.35	0.43	0.14

*significant at 0.05 level of confidence.

Table II shows that the adjusted posttest paired mean difference between circuit training and SAQ training, circuit training and control group and SAQ training and control group are 0.37, 0.58 and 0.95 for speed and 0.06, 0.37 and 0.43 for agility respectively. they were greater than the confidence interval value of 0.050 and 0.14 at 0.05 level which indicate that there was a significant difference among all paired mean on speed and agility whereas for speed and agility there was no significant difference only between the two training groups.

Discussion on Finding

The speed and agility have increased significantly for SAQ training and small sided game practice groups as compared to control group. Whereas with regard to speed and agility both the experimental groups resulted with almost same gain indicating no significance between these two training groups. These results demonstrate that specific speed and agility training (SAQ), as part of the overall training process, can be considered a useful tool for the improvement of speed and agility among young soccer players. The statistical analysis of the study stated that the Circuit Training had significantly improved the speed, leg power, arm power and agility of subjects. Similar results were founded in the study carried out by Suresh Kumar (2014) ^[11]. Influence of Circuit Training on Selected Physical Fitness Variables among Men Hockey Players Significant improvement was founded for Speed, Agility, and Explosive Strength. The results are also in conformity with the study carried out by Saugata sarkar (2013). Effect of Circuit Training Program on Explosive Strength and Strength Endurance of School Going Students. Significant improvement was founded for Explosive strength and strength endurance. So it is concluded that motor abilities can be improved by circuit training. But training should be systematic, planned and scientific. They also confirm Bloomfield *et al.* (2007) ^[2] viewpoint that the SAQ regimen is an important training method for the improvement of speed and quickness. Importantly, the tests used in this study assessed sprinting performance in a very soccer specific manner i.e. with changes of direction from 5 to 15 meters, with and without the ball, as this type of movement represents 90% of all sprint activities during soccer matches (Bangsbo, 1994) ^[1]. Furthermore, Weineck, (2000) ^[12] suggested that agility along with quickness and speed during the first three steps represent the most significant motor ability of a soccer player. Although it is considered that the best period for the development of agility is at the age of 16 (Markovic *et al.*, 2007) ^[6], this study has shown that agility can also be improved in later years using an appropriate training programme. This confirms previous findings by Sporis (2010b) ^[9] where a poly-structural complex training programme produced improved performance in young soccer players.

Conclusion

The result of study reveal that there was significant improvement after the twelve weeks of circuit training and SAQ training groups in improve the speed and agility as compare to the control group whereas for speed and agility there was no significant difference only between the two training groups.

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