

Original Research Paper

Physical Education

THE EFFECT OF A STRENGTH AND SPEED TRAINING PROGRAM IN SPEED IMPROVEMENT OF FEMALE SOCCER PLAYERS

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ABSTRACT Female soccer is a popular team sport, which is characterized by the requirements of the technical features, and high fitness level of the players. Few studies have been describing requirements in female Soccer regarding the physical requirements. The aim of this study was to investigate the effect in speed improvement of female soccer players after the implementation of a specific strength and speed training program. The sample of the research was 20 female soccer players without injury problems. They were randomly divided into experimental (EG, n = 10) and control group (CG, n = 10). Measurements of 10m acceleration, 10m flying start and 30m maximum speed were carried out at the beginning and after the implementation of the 6-week power and speed training program. Speed and acceleration measured by photocells fences (Autonics Beam Sensor BL5M - MFR) and a digital timer (Saint Wien Digital Timer Type H5K. To test the effect of the program and identify statistically significant differences in the individual dependent variables between measurements (before and after) we used two-way analysis of variance (two wayAnova) with repeated measures (REPEATED MEASURES) the second factor (2X2). After analyzing the interaction followed independent analyzes of samples t-test and paired t-test. For this purpose we used the statistical package SPSS 18.0 and significance level will be set to p < 0.05. In all variables we found a statistically significant interaction between groups and repeated measurements of the experimental group and the control group Followed by paired t test (paired t test) and found significant differences in the following variables (been adjusted Bonferroni) t10m, t10mmax t30m. Speed is an important factor in the selection of talent in development groups, and for this reason must be contained in the design of training programs.

KEYWORDS : Female soccer, acceleration, maximum speed, power and speed training

Introduction

Women's Soccer is well known and his popularity is constantly increasing. The last 10 years the clubs have female soccerhave increased in the United States and throughout the world (Krustrup et al., 2005). Few studies have been describe requirements in female Soccer (Krustrup et al., 2005; Mohr et al., 2008; Andersson et al., 2010) and have used speed limits originally from men soccer data (Bangsbo et al., 1991) without taking into account the gender differences in the speed of the sprint (Mujika et al., 2009). Speed is a complex skill that is composed of different subskills (Weineck, 2004; Kollath and Rehhagel, 2005). It is the mobility to react quickly to a stimulus and to perform cyclic or acyclic movements with maximum motor speed with or without external resistors (Martin, Carl and Lehnertz, 1991). Within a 90-min aerobic game, a sprint lasting 2-4sec (Bangsbo et al., 1991) took place every 90sec (Reilly & Thomas, 1976). The sprint comprise 1-11% of the total distance covered in a match (Reilly & Thomas, 1976; Bangsbo et al., 1991), which is 0.5 to 3.0% of the actual time with the ball in the game (Ali &Farrally, 1991; Bangsbo et al., 199).

A soccer player, covering about 10 kilometers during a match of 90 minutes (Bangsbo et al., 1991) from which the 8-18%, is the

maximum acceleration efforts (Ekblom, 1986). It is worth noting that the running speed is very important in soccer regardless of gender. The research ofDavis and Brewer (1993) showed that female soccer players covering about the same distance as that of men during a match.

The 90-95% of the total time duration in high level women's soccer match has to do with stopping, walking, and running low intensity (Krustrup et Al, 2005 mohr et Al, 2008), however the amount at speeds distinguish between higher and lower intensity during the match (mohr et Al, 2003). Soccer requires athletes to perform short speeds, directional changes, and many vertical jumps during the match (Krustrup et Al, 2005 Stolen et Al, 2005).

Polman et al., (2004), examined the effect of three fitness programs over twelve weeks. Both groups followed a fitness program, of speed and agility. One of the two groups followed resistance program and speed development program with SAQ training, while the other group followed training program with traditional equipment. The third group performed normal training schedule. All three groups reduced their body mass index and fat percentage of the body and increased flexibility - agility and maximum oxygen uptake. Participants between groups showed that there were significantly greater improvements in the group with the training program compared to the control group in the speed of fatigue, to 25m. Speed, left and right lateral agility and the vertical and horizontal strength tests.

The aim of the research was the implementation of a specific strength and speed training program, and the effect in speed improvement of female soccer players

Materials & Methods

Participants

The sample of the research was 20 healthy female soccer players with no history of neurological injuries or diseases, gave written consent to participate in this study. They were selected by random sampling from all the athletes who have expressed interest in participating in this research. They were randomly divided into experimental (EG, n = 10) and control group (CG, n = 10). Approval for the project was obtained from the committee on human research at the Aristotle University of Thessaloniki.

Procedure

They performed three repetitions in 10m sprint, three repetitions in 10m flying start (20m) sprint and three repetitions in 30m sprint. These procedures were carried out at the beginning and after the implementation of the 6-week power and speed training program

Test protocol/speed - acceleration and top speed

For the first measurement of 10m sprint players started at the start, on their own initiative, tried to speed for 10 meters. The second measure was the measurement of the maximum speed, where the players taking time ten meters, and passed at a maximum speed in the next ten meters in which the time was recorded. Last test was accelerated to thirty meters. For the last measurement of 30m sprint, again was starting from a standing position and started the test on their own initiative. The time was recorded with a digital timer with 1/100 of a second, with duplicate sets of photocells.

Instruments

Speed and acceleration measured by photocells fences (Autonics Beam Sensor BL5M - MFR) comprised of two sets of two pairs of photocells each and a digital timer (Saint Wien Digital Timer Type H5K), with a minimum measuring time 0.01 sec and measurement error + - 0.01 sec / sec (figure).



Figure 1: Beam photocell with digital timer

Training Program

Participants followed a 6-week power and speed training program that is shown in the following table

	TrainingMethod	Intensity	Frequenc	Duratio
			У	n / Set /
				Rest
1Week	MaximumStrengthTraining	40% – 60	3 / Week	6-10/3-
		%		5/ 3' – 5'
2 Week	ExplosivestrengthTraining	30% – 60	3 / Week	6-10/3-
		%		5/ 3' – 5'
3 Week	Maximum Strength Training	90% –	2 / Week	5-12/1-
	- Coordination Training	100 %		5/ 3' – 5'

Volume-6, Issue-2, February - 2017 • ISSN No 2277 - 8160CoordinationTrainingHigh1 / Week6/ 4 / 5'Explosivestrength -Maximu1 / Week6-10/ 3-

	coordinationnaling		, meen	0, .,0
4 Week	Explosivestrength - plyometrics	Maximu m	1 / Week	6-10/ 3- 5/ 3' – 5'
	AccelarationandSpeedtraini ng	High	2 / Week	2/ 8 /5'
5 Week	Explosivestrength - plyometrics	Maximu m	1 / Week	6-10/ 3- 5/ 3' – 5'
	AccelarationandSpeedtraini ng	High	2 / Week	2/ 8 /5'
6 Week	Explosivestrength - plyometrics	Maximu m	1 / Week	6-10/ 3- 5/ 3' – 5'
	EnduranceinSpeedTraining	High	2 / Week	2/ 4/ 20- 30''

Table 1: 6-week power and speed training program

Statistical analysis

To test the effect of the program and identify statistically significant differences in the individual dependent variables between measurements (before and after) we used two-way analysis of variance (two way Anova) with repeated measures (REPEATED MEASURES) the second factor (2X2). After analyzing the interaction followed independent analyzes of samples t-test and paired t-test. For this purpose we used the statistical package SPSS 18.0 and significance level will be set to p <0.05.

Results

Speed - acceleration and top speed

At maximum speed (10) meters, the maximum speed of ten (10) meters (flying start) and the maximum acceleration to thirty meters (30) found a statistically significant interaction between groups and repeated measurements of the experimental group and the control group as well as their change over time in the respective variables, the maximum acceleration retroactive ten meters, t10m (1,1000) = 11,123, p =, 004, the maximum running speed, t10mmax (1,1000) = 35,241, p =, 000 and the maximum acceleration retroactive to thirty (30) meters, t30m (1,1000) = 12,687, p =, 002

Followed by paired t test (paired t test) and found significant differences in the following variables (been adjusted Bonferroni) t10m 2,29 \pm 0,26 to 2,14 \pm 0,16 with t (9) = 4,599 and p =, 001 , t10mmax 1,75 \pm , 10 to 1,67 \pm , 10 with t (9) = 8,887 and p =, 000 and t30m 5,17 \pm ,49 to 4,96 \pm , 51 with t (9) = 4,051 and p =, 003.



Graph 1: Maximum acceleration ten meters (10 meters).



Graph 2: Maximum running speed flying start, 10m

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Graph 3: Maximum acceleration to thirty meters (30 meters).

Discussion

The combined training method results in the greatest improvement in performance in muscle strength parameters (Adams K, et al., 1992; Fatouros et al., 2001). This may be because train and the two elements that makes up the power, the power through the high resistance and speed through the fast movements during eccentric exercise.

In the present study tested the effect of specific strength and speed training programs with a view to evaluating the gymnasts, regarding selected variables of power and speed to determine the impact of these combinatorial coaching strength and speed development program so that the results will be evaluated and used for planning and implementing programs to improve their physical strength and speed abilities of female athletes soccer women.

This training program had a statistically significant effect on the speed of soccer athletes that were selected.At maximum speed of ten (10) meters in running speed, the maximum speed of ten (10) meters (flying start) and the maximum acceleration to thirty meters (30) found a statistically significant interaction between groups and repeated measurements of the experimental group and the control group as well as their change over time in the respective variables, the maximum acceleration retroactive ten meters, t10m (1,1000) = 11,123, p =, 004, the maximum running speed, t10mmax (1,1000) = 35,241, p =, 000 and the maximum acceleration retroactive to thirty (30) meters, t30m (1,1000) = 12,687, p =, 002.

There were changes in the time of 10m. dromic acceleration with t10m from 2,29 \pm 0,26sec to 2,14 \pm 0,16sec, then the maximum running speed, t10mmax from $1,75 \pm$, 10sec at $1,67 \pm$, 10sec, and the maximum acceleration in retroactive thirty (30) t30m measures from 5,17 ±,49sec at 4,96 ±, 51sec.

There are a large number of studies relating to combined power and speed of training programs at proagonistiki period (Michailidis C, et al., 2002; Buchheit, M et al, 2010; MaioAlves, JM et al., 2010; Ronnestad, BR et al ., 2008; Siegler, J, et al., 2003; Wong, PL, et al., 2010a; 2010b) and during the season (Chelly, MS et al., 2009), the results of which agree and the results of this investigation.

Based on the findings of this study, it is only natural to claim that better speed capability, it can make a player more effective, and thus more valuable. The Fastest players are probably able to use techniques and their regular abilities better than the slower players with similar skills. The possibility of overtaking an opponent with the ball (dribbling), as a successful defensive function increases when the soccer players improves speed capacity.

Conclusion

The soccer athletes must develop multiple skills, and that is why coaches should take into account the speed combined with the balance training program. According to Reilly et al. (2000B), the speed is an important factor in the selection of talent in development groups. Several authors have reported that the high level (elite) young players, tend to be faster than their peers lower levels (Vaeyens et al, 2006;.Gil et al, 2007;.Le Gall et al, 2010).

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