European Journal of Physical Education and Sport Science
ISSN: 2501 - 1235
ISSN-L: 2501 - 1235
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.1034696 Volume 3 | Issue 11 | 2017

IMPACT OF 12 WEEKS OF SPEED TRAINING ON NUMBER OF STEPS IN YOUNG FOOTBALL PLAYERS

Arjan Hyka[1i], Edmond Bicoku[1], Ali Mysliu[1], Agron Cuka[2]
[1]University Aleksander Xhuvani, Elbasan, Albania
[2]Sports University of Tirana, Albania

Abstract:
The aim of this article was to monitor and improve the number of steps on speed through a 12-week training program for young players in the city of Elbasan. The 12 week training intervention was carried out with the focus on biomechanical running parameters and mainly on the densities of the steps during the training sessions. The participants in this study were 28 younger players 15.1 ± 0.3 years (control group and intrusion group). The speed time (50m sprint) was evaluated during the sprint test (50m) and also the anthropometric parameters (weight, height, body fat in percentage) were measured at both study times (first T1 measurements and T2 second measurements). Skin thickness measurements were used to estimate the percentage of the body fat of the child. Data from the analysis on this research study by groups show that there is an improvement in mean values for step counts from T1 to T2 as follows; for control group by 1.3 steps (SD 0.8 seconds; t= 4 p=0.01) while for intervention group there is an improvement also by 2.8 steps (SD 1.1 steps; t= 5.7 p=0.005). Finally, statistical analysis show a significant difference in improvements (T1 to T2) between groups for the number of steps (p= 0.03) in favor of the improvement of the intervention group.

Keywords: youth, training, intervention, steps

1. Introduction

Training on speed and fitness not only increases quality but also increases confidence in youth training. The result is that they are more likely to enjoy sports participation.

[i] Correspondence: email arohyka@ymail.com

Sports participation promotes an assessment of coaching, self-assessment and interaction in a team environment. Training speed and recruitment training improves acceleration, response time and coordination. It is also important in youth footballers for improving foot speed, speed changes and directional change. Athletics is the secret to being constantly improved in a sport. Building a solid foundation of athletic skills and motor skills enables the child to develop the special sports skills in a balanced and healthy way. Every sports discipline involves physical and mobile actions that are accomplished at a certain speed (specific speed) and the race is won by athletes running or performing faster technical actions. Studies by Gil et al., (2007) and Gravina et al., (2008) revealed that for different playing positions there are specific physiological demands and anthropometrical prerequisites.

Several studies have investigated the association between strength and sprint performances, showing that stronger athletes perform better during sprint performances (Baker and Nance 1999; Comform et al., 2012).

Speed is a specific fitness that is nurtured and perfected in training conditions and especially in the race. Speed is not a matter of fate, gift or genetic gift, but a physical skill that takes place in exercise. In interaction with explosive strength, speed plays an important role in acyclic athletic types, especially in the realization of the basic phases of the technique.

Speed capability is particularly noticeable in speeding. It is directly dependent on the primary influence of two important components, which have a certain performance from one age to the other, namely: the size of the steps and the degree of the steps. The aim of this article was to monitor and improve the technique and speed of running through a 12-hour training program for young players in the city of Elbasan.

2. Methods

The 12-hour training intervention was conducted with the main focus on biomechanical running parameters and mainly on the densities of steps during training sessions. For this purpose, it was randomly selected a football association of young ages from the associations that conduct coaching in the city of Elbasan and the selection of teams within the association was made randomly.

The participants in this study were 28 young players (control group and intruder group). The age of the participants was 15.1 ± 0.3 years. The speed time (50m sprint) was evaluated during the sprint test and also anthropometric parameters (weight, height, body fat in percentage) were measured at both study times (first T1 measurements and T2 second measurements).

Body height and body weight were measured using a 402 KL Health O Meter scales. The values were recorded at 0.1 cm closest and 100 g respectively. The body mass index is calculated using the usual formula; BMI = body mass (kg) / body height (m 2).

Skin thickness measurements were used to assess the percentage of the body fat of the children. Triceps and scapular thickness were measured in the nearest 0.1mm using a dagger on the right side of the body (Harpenden Skinfold Caliper; Baty International RH15 9LR, Angli). All skin folds are taken three times by the same examiner to ensure consistency in the results with the average of the three values used as the final value. To predict the percentage of body fat the equation described by Slaughter et al. (1988) is used.

3. Intervention Program (Program protocol)

On some details of the training plan used during the training at the football team "Pepa" Elbasan, during November 2015 - February 2016. This training (addition to team training sessions) consists in interfering with biomechanical running parameters and mainly in the densities of the steps. The intervention in this scientific paper was directed at increasing the rhythm and frequency of the steps during the special running exercises. Mainly through the exercise protocol, we focused at the end of the training session. The team we worked with was in football, so we did not get to the part of the various technical elements of football, but the focus was on the technique of running. For about 12 weeks, it was worked through a specialized training by interfering with increasing the frequency of motion actions.

4. Statistical analysis

Descriptive statistics (mean and standard deviation) were calculated for the variables estimated in this study. A specific database was created in the excel file (first T1 measurement results and after T2 intervention) and then converted to the SPSS database. All variables evaluated in this study were tested for normality and ANOVA test for T2 and T1 comparison of variables measured in this study. Values $p \leq 0$ .05 was considered statistically significant. All analyzes were performed using the SPSS 17 statistical system.

5. Results

Descriptive statistics for BMI, body fat, and count steps for 50 m are shown in table 1 for both groups of participants. Mean values for control group on T1: BMI 18.2 kg/m2 (SD 1.8, min 15.5 and max 21.5 kg/m2) and T2: BMI 19.1 kg/m2 (SD 2.9, min 16 and max 23.1 kg/m2) and intervention group T1: BMI 18.4 kg/m2 (SD 1.9, min 15.3 and max 21.3 kg/m2) and T2: BMI 19.1 kg/m2 (SD 3.5, min 16.5 and max 23.1 kg/m2).

Mean values on body fat for control group on T1 : 10 % (SD 4.7, min 5.4 and max 23.6 %) and T2: 8.9% (SD 3.8, min 5 and max 15.5%) and intervention group T1: 8.9 % (SD 3.4, min 5 and max 16.6%) and T2: 8.8% (SD 3.7, min 4.7 and max 14.2 %).

Also data (Table 1) for mean values on step counts during performing 50m sprint test show: for control group on T1 show: 31.4 steps (SD 2.6, min 28 and max 36 steps) and T2: 29.2 steps (SD 2, min 27 and max 33 steps) and intervention group T1: 31.5 steps (SD 0.5, min 31 and max 32 steps) and T2: 28.6 steps (SD 1.1, min 27 and max 30 steps).

Table 1: Descriptive statistics for BMI, body fat, speed and steps (50m) for control and intervention groups

Group		Minimum	Maximum	Mean	Std. Deviation
Control	BMI_T1	15.55	21.50	18.4269	1.84312
	BMI_T2	15.99	23.12	19.1700	2.98089
	Body fat T1	5.4	23.6	9.958	4.7738
	Body fat T2	5.0	15.5	8.945	3.7687
	Steps (counts) 50m T1	28	36	31.42	2.548
	Steps (counts) 50m T2	27	33	29.17	2.041
Intervention	BMI_T1	15.27	21.23	18.3919	1.87819
	BMI_T2	16.46	23.12	19.1488	3.51130
	Body fat T1	5.0	16.6	8.878	3.4675
	Body fat T2	4.7	14.2	8.754	3.6647
	Steps (counts) 50m T1	31	32	31.45	.497
	Steps (counts) 50m T2	27	30	28.60	1.140

There is a difference in mean (Table 2) while comparing the variables from T2 to T1 of the measurement as follows; for BMI there is an increase by 0.7 kg/m2 (SD 3 kg/m2; t= -0.7, p=0.48) and for body fat also an increase in mean values by 1.6 % (SD 1.6%; t= -0.3, p=0.76), for step counts an improvement in efficiency from T1 to T2 by 2 steps (SD 1.1 steps; t= 5.6, p=0.00).

Table 2: Paired differences samples test, for time one T1 and time two T2 of measurement for BMI, body fat and number of steps.

	Paired Differences					
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	t	Sig. (2-tailed)
				Lower		
BMI T1 - BMI T2	-.72303	2.97950	.99317	-3.01328	-.728	.487
Body fat T1 - T2	-.1408	1.5589	.4500	-1.1313	-.313	.760
Steps 50mT1 – Steps 50mT2	2.000	1.183	.357	1.205	5.606	.000

Data on table 3 for step counts also show an improvement in efficiency from T1 to T2 for control group by 1.3 steps (SD 0.8 seconds; t= 4 p=0.01) while for intervention group there is an improvement also by 2.8 steps (SD 1.1 steps; t= 5.7 p=0.005)

Table 3: Paired Samples Test by group for number of steps in speed test

Group	Paired Samples Test							
	Paired Differences					t	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
				Lower	Upper		
Control	Steps 50mT1 – Steps T2	1.333	.816	.333	.476	2.190	4.000	.010
Intervention	Steps 50mT1 – Steps	2.800	1.095	.490	1.440	4.160	5.715	.005

Data on table 4 show the analysis for the improvement between groups; control and intervention for number of steps in performing speed test. There is a significant difference (p= 0.03) between the improvement of intervention with control group in favor of the improvement of the intervention group.

Table 4: Comparison for the difference between groups for number of steps in speed test

ANOVA

Diff_stepsT1_T2

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	**5.867**	**1**	**5.867**	**6.492**	**.031**
Within Groups	**8.133**	**9**	**.904**		
Total	**14.000**	**10**			

6. Discussion

The findings show an increase (T1 to T2) for BMI by 0.7 kg/m2 (SD 3 kg/m2; t= -0.7, p=0.48), for body fat also an increase in mean values by 1.6 % (SD 1.6%; t= -0.3, p=0.76). In total for both groups there is a difference in mean values while comparing the variables from T2 to T1 for step counts by 2 steps (SD 1.1 steps; t= 5.6, p=0.00).

Data from the analysis on this research study by groups show that there is an improvement in mean values for step counts from T1 to T2 as follows; for control group by 1.3 steps (SD 0.8 seconds; t= 4 p=0.01) while for intervention group there is an improvement also by 2.8 steps (SD 1.1 steps; t= 5.7 p=0.005). Finally, statistical analysis show a significant difference in improvements (T1 to T2) between groups for the number of steps (p= 0.03) in favor of the improvement of the intervention group. After puberty, players will benefit from a more structured training approach. The speed training for players at this stage of development must be based on the "Smart" principle (ie, structuring in technical training in a way that benefits the player's physical preparation as well as his technical skills). This type of exercise is very effective as it is very effective with reference to exercise time. It is also very specific for football. The speed training should be more specialized when the players reach the stage after puberty. At this stage, players must complete both types of training as "Productivity" and "Performance Conservation". Although we must pay attention also to the training of strength. Different author from studies have shown a direct relationship between muscle strength and running speed: the strongest athletes achieve the greatest running speed (Chelly et al., 2009; Seitz et al., 2014; Wisloff et al., 2004). In conclusion, training of athletes needs to continue progressively and carefully, it requires ample time and respect for the fundamental stages since childhood. The steepness of the steps increases sharply from T1 to T2 due to the training of lower limb, and developmental coordination skills, easily. Finally, we recommend that the athlete's development speed training program (densities and steps) be carefully taken into account. Need to taking

into account the stages of their physical and mental development and in accordance with the findings outlined above.

References

1. Baker, D and Nance, S. The relationship between running speed and measures of strength and power in professional rugby league players. J Strength Cond Res 13: 230–235, 1999
2. Chelly MS, Fathloun M, Cherif N, Amar MB, Tabka Z, Van Praagh E. Effects of a back squat training program on leg power, jump, and sprint performances in junior soccer players. J Strength Cond Res, 2009; 23(8): 2241-2249
3. Comfort, P, Bullock, N, and Pearson, SJ. A comparison of maximal squat strength and 5-, 10-, and 20-meter sprint times, in athletes and recreationally trained men. J Strength Cond Res 26: 937–940, 2012
4. Gil, SM, Gil, J, Ruiz, F, Irazusta, A, and Irazusta, J. Physiological and anthropometric characteristics of young soccer players according to their playing position: relevance for the selection process. J Strength Cond Res 21: 438–445, 2007.

   Gravina, L, Gil, SM, Ruiz, F, Zubero, J, Gil, J, and Irazusta, J. Anthropometric and physiological differences between first team and reserve soccer players aged 10-14 years at the beginning and end of the season. J Strength Cond Res 22: 1308–1314, 2008.
5. Slaughter MH, Lohman TG, Boileau RA, Horswill CA, Stillman RJ, Van Loan MD, Bemben DA. Skinfold equations for estimation of body fatness in children and youth. Hum Biol 1988;60:709–23. [PubMed]
6. Seitz LB, Reyes A, Tran TT, Saez de Villarreal E, Haff GG. Increases in lower-body strength transfer positively to sprint performance: a systematic review with meta-analysis. Sports Med, 2014; 44(12): 1693-1702
7. Wisloff U, Castagna C, Helgerud J, Jones R, Hoff J. Strong correlation of maximal squat strength with sprint performance and vertical jump height in elite soccer players. Br J Sports Med, 2004; 38(3): 285-288