

THE EFFECTS OF USING SMALL-SIDED GAMES ON THE DEVELOPMENT OF ENDURANCE IN ELITE YOUTH FOOTBALL PLAYERS (U17)

Gabriel SIMION¹

Abstract: *In this research we started from the premise that the use of small-sided games will lead to the development of endurance in elite youth football players (U17). The presented material deals with the influence of the application of the proposed training program which includes the use of small-sided games (4v4+goalkeepers and 6v6+goalkeepers, on pitch sizes 40x30 m and 50x40 m, duration of 4x4 minutes, recovery break 3 minutes) for 8 weeks, in three times a week on the development of endurance.*

Key words: *small-sided games, endurance, football players, U17*

1. Introduction

Over the last years there has been a substantial growth in research related to specific training methods in soccer with a strong emphasis on the effects of small-sided games (SSG's).

The physical training is seen by specialists as a set of procedures that ensures the functional capacity of the organism, the development of the basic and specific motor skills, the development of the morpho-functional indices, the improvement of motor skills and good health [7–11], [18]. Many specialists consider that physical training has two basic components: general physical training and specific physical training [3–6], [11], [16]. The study of specialty literature discriminates the fact that

football specialists [2–4], [7], [11], [14], [16], [18], [19] consider that specific physical training action systems should follow two paths: development of the combined motor skills that are specific to football and enhancement of motor skills related to ball games, of footwork skills with or without the ball, in order to efficiently perform the technical and tactic actions required by the football match. Also, “the trials and norms from the system of selection must be correlated with the stage of preparation.” [7, p.132].

The modern and competitive football play requires remarkable general and specific strength and endurance (as foundation for physical fitness). Buiac D. [2] states that “if we take into account the simplest parameters of the football match, meaning 90 minutes’ effort, 10 to 12

¹ Department of Motric Performance”, *Transilvania* University of Braşov.

kilometres completed, jumps and other proceedings, and so on, the role of endurance is clear. Although the general characteristic of the match is determined by speed, in both running and proceedings, we must not forget that fatigue depletes the physical potential. After sixty or seventy minutes of play, even the fastest or the most technical players cannot withstand competition without proper physical training." [2].

In conducting this study we aimed to establish the effects of small-sided games on resistance in elite youth football players (U17).

2. Objectives

In this research we started from the premise that the use of small-sided games will lead to the development of endurance in elite youth football players (U17).

In this respect, the experiment was oriented to check the efficiency of application small-sided games to develop endurance.

3. Material and Methods

The research was conducted on two junior teams from Brasov County: A.C.S. Kids Tampa – the experimental group, and C.S.S. Brasovia – the control group, each with 20 players U17. The research was carried on during four stages.

In the first stage, we studied the specialized literature, we established our research direction, we organized the ascertaining experiment and we elaborated the training program destined to the development of resistance by using small-sided games (SSG's).

The training program was prepared for a period of 8 weeks of training during the regular season which included SSG's three times a week. The small-sided games used in the program were in the form of 4v4+goalkeepers and 6v6+goalkeepers, on pitch sizes 40x30 m, respectively 50x40 m, with a duration of 4x4 minutes, recovery break 3 minutes [12], [20]. The categories used in those training sessions were for attacking SSG's, possession SSG's, non-directional possession SSG's, passing and movement SSG's, finishing SSG's, and aimed at developing endurance and achieving tactical goals [1], [12], [20].

The second stage (March 2019) addressed the preliminary experiment. At this stage, the initial tests were performed on the junior footballers from the experimental group and from the control group subjected to research.

The third stage, April - May 2019, consisted in implementing the program developed in preparation of the experimental group for 8 weeks.

The fourth stage consisted in completing the experiment, by performing the final test. The tests used to determine the level of development of resistance to the initial and final testing were the Gacon test and the Yo-Yo Intermittent Endurance test Level 2. Subsequently, we processed and interpreted the data obtained from the research, formulated the final conclusions and proposals.

4. Results and Discussions

As for the data recorded at the initial test and at the final test, they are centralized in Table 1.

Table 1
Comparative results for the assessment of resistance to initial and final tests in experimental and control groups ($n_e - 20$; $n_c - 20$)

No. Crt.	Tests	Group of subjects	Initial testing	Final testing	t	P
			M \pm SD	M \pm SD		
1	Gacon test (kilometers/hour - km/h)	EG	18.75 \pm 2.5	20.37 \pm 3.5	2.93	<0.01
		CG	18.52 \pm 3	19.25 \pm 2.5	0.95	>0.05
	t; P	EG-CG	0.24 ; >0.05	2.13; <0.05	-	-
2	Yo-Yo Intermittent Endurance test Level 2 (meters - m)	EG	1581 \pm 243	1866 \pm 262	3.12	<0.01
		CG	1565 \pm 307	1680 \pm 298	1.00	>0.05
	t; P	EG-CG	0.38; >0.05	2.15; <0.05	-	-

EG=experimental group, CG=control group, M=average, SD=standard deviation, t=test Student, P=significance level, n=number of subjects

Note:

P		0.05	0.01	0.001
t	f=19	2.093	2.861	3.883
	f=38	2.025	2.713	3.570

With reference to the Gacon test, in what concerns the difference between the average results of the experimental group at both initial and final testing, the “t” index computed at 2.93 is bigger than tabular “t” at threshold of 0.01, showing

significant differences between assessments. For the control group, the computed “t” is 0.95 which is smaller than the statistic “t” and thus showing insignificant differences between the testing sessions for $P > 0.05$ (Table 1 and Figure 1).

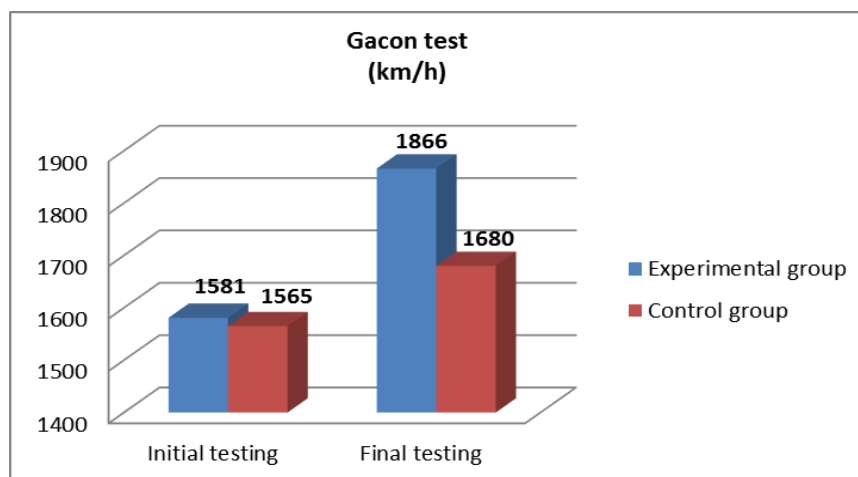


Fig.1. Dynamics of average values of the Gacon test (km/h) of the experimental and control group at the initial and final test

Comparing the average results obtained for the Yo-Yo Intermitent Endurance test Level 2, we can see that in the initial testing the average for the experimental group is of 1581 meters, while the average for the control group is 1565 meters. The computed "t" variable ($t = 0.38$, $P < 0.05$) shows that for this parameter there is no statistically significant difference between

the two groups, therefore they are homogenous (Table 1 and Figure 2).

Analyzing the results registered in the final testing compared to the initial ones, we found that for the experimental group there is significant statistic threshold difference for $P < 0.01$, while for the control group the threshold value of "t" is lower than 5% ($P < 0.05$).

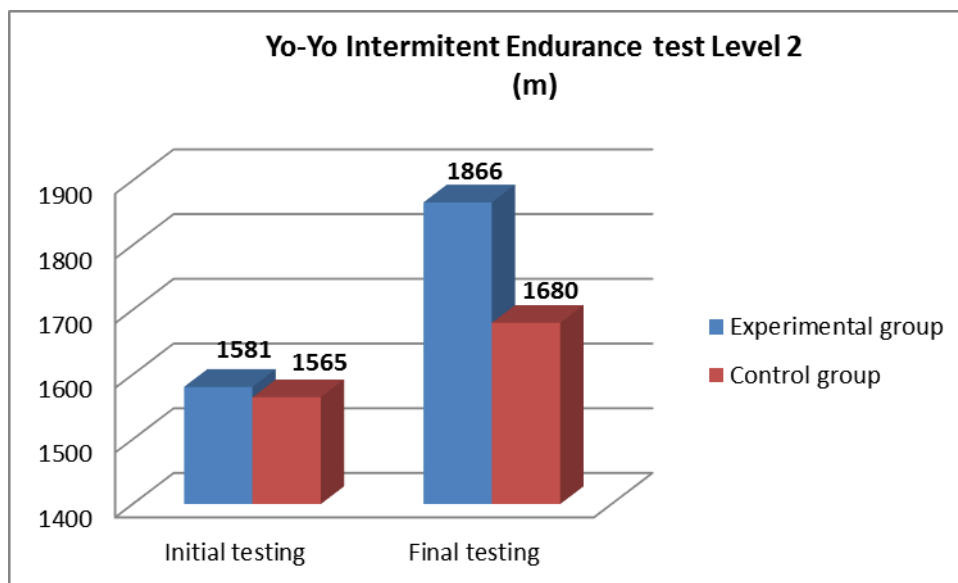


Fig.2. Dynamics of average values of the Yo-Yo Intermitent Endurance test Level 2 (m) of the experimental and control group at the initial and final test

In terms of progress, the growth rate of the experimental group is higher than that of the control group. It can be stated that the significant growth shown by the results of the experimental group as compared to those of the control group stress the positive effect of the training programme on endurance.

5. Conclusions

In conclusion, the comparative analysis of the values recorded by the two groups subjected to the pedagogical experiment,

between the initial test and the final test, confirms that their evolution is evident in the experimental group, in relation to the control group ($P < 0.01$). This fact allows us to state that the research hypothesis is confirmed, the small-sided games included in the proposed program and used in the preparation of the experimental group for the development of resistance being thus verified.

In SSG the players experience similar situations that they encounter in competitive matches. Due to this fact, game-based conditioning using SSG has

become a popular method of developing specific aerobic fitness for soccer players.

As a result of the theoretical and practical undertaking of the pedagogical experiment focused on the enhancement of junior footballer endurance the following recommendations arise:

- Drawing of adequate programme which should optimally systematize and phase the training objectives, indices, methods and means together with a strict register of the activity

- Paying special attention to enhancement of players endurance, which should become priority objective of the physical training

- Making the players theoretically conscious of the importance of their physical progress, including the practical significance of the optimization of endurance for their competitive status

- Making use of emulating and attractive training methods and means to help the players' training process improve the duration of intensity of their effort; Selection and application of small-sided games for the development of resistance that require solving concrete situations performed in game mode and in conditions of adversity

- Furthermore, as we seek to optimize our players' state of physical conditioning, it seems necessary to include stimuli that approach or even exceed the demands of competition. As such, it is appropriate to include other types of tasks in addition to those proposed by the researchers responsible for this study; analytical situations focused on intermittent running [13], playing situations with larger spatial dimensions, finishing situations involving few players and a large space [1], may be alternatives in this process of optimizing the players state of physical conditioning,

including for the development of resistance.

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