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RESEARCH ARTICLE

EVALUATION OF CONTINUOUS RUNS OF 16 YEARS OLD FOOTBALL PLAYERS AT THE START AND END OF TRAINING AND IMPACT ON DURABILITY

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ABSTRACT

The purpose of this study is to assess whether the continuous running, which has an important place in the planning of soccer training, to be implemented by a 16-year-old football player at the beginning and at the end of the training in terms of the endurance development of the athletes. Target population of the study is 16 years old football players in Turkey. However, the material universe was designated as the Feriköy Sports Club operating in Istanbul. An example of this study in this context is the Feriköy Sports Club-16, which operates in Istanbul, and the samples are volunteers among the athletes. Sample individuals consist of a total of 28 people in two groups of 14 persons. This research is designed according to the relational screening model. It has been implemented over 8 week period. In the year 2016, months of ...; training of first group was provided at the start of the first group training, while the other group was subjected to continuous running tests at the end of the training. The obtained data were analyzed with the help of SPSS program and expressed in tables. As a result of this evaluation, it was observed that the continuous running at the beginning of the training and the continuous running at the end of the training affected the endurance of the athlete. Continuous running at the end of the training was evaluated to be more efficient in terms of endurance development.

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INTRODUCTION

The purpose of this study is to try to determine whether there is a difference between pre-training or end-training for the continuous running durability in football training planning by comparing the continuous running conditions of the 16 year old football players with the continuous running conditions at the end of the training. The endurance of the athlete is a fitness feature that arises from the aerobic energy production of the organism. In this sense, when the training is done continuously for over 5 minute, aerobic energy system operates. In this sense, the highest level of endurance of the athlete is defined as his/her highest aerobic capacity. According to a different explanation, endurance training and exercise can continue training without fatigue (Sahin, 2003). In this case, durability can be expressed as the athlete's ability to resist fatigue. In the same way, Harre described it as "the ability to resist fatigue in long-term sportive exercises", while Schmolinsky expressed it as "relative performance within unit time" (Seyis, 2011). Strength, an important motor feature in all sports branches, is the ability to overload during exercises, training and workouts and to resist fatigue during long-term work (Sevinç, 2008).

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Bompa describes durability as determining the boundaries of the time such a study will reveal (Bompa, 2003). The durability ability plays an important role in almost all types of sports in a variety of forms and is very important in terms of both the strength of the competition and the ability to resist the fatigue of dynamic and static workloads and long-running loadings in training (Günay and Yüce, 2008). For durability, various classifications and groupings have been conducted by experts: These are mainly evaluated in terms of energy generation systems. Here, durability is divided in two groups as aerobic (oxygenated) durability and anaerobic (oxygen-free) durability. Another classification is made by time according to Harre. These are short, medium and long endurance. Lastly, durability has been evaluated as basic and special durability (Sevinç, 2008).

Aerobic Endurance and Its Implementation in Football

This type of endurance can be defined as the time slot at which the effort stimulating the highest percentage of maxVo2 is sustained. According to a different definition, maximum aerobic power can be sustained over a long period of time. In exercises related to aerobic endurance, the fat tissue of the organism is involved and it supports energy generation. Biochemical studies become economical, the cardiovascular

system is strengthened and the respiratory system becomes active and vital capacity is increased (Şentürk, 2009). The aerobic endurance, which is considered to be the ability to carry on any work for a long time, is measured by a number of exercise methods. The most important and most preferred method is maximum oxygen usage. On the other hand, various lactate threshold concepts have been used recently as performance criteria for running and swimming (Dumlupınar, 2007). In terms of the duration of the game in football, the aerobic metabolism is usually at the forefront. During the game, 80 to 90 percent of the time require medium and low intensity activity, while 10 to 20 percent have high intensity activities. The workload measured as maximum percentage during the course of the game is close to the anaerobic threshold. The highest exercise from the anaerobic threshold (Stolen, Chamari, Castagna and Wisloff, 2005). The durability in the soccer field, where mobility is complex and high, is a very important motor feature. It also affects speed in football. Low endurance is disadvantageous in terms of performance (Sevinç, 2008). In this case, there may be minor breaks in the ligaments and muscle fibrils in the match or intense training, causing the muscles to become hard and hard for a few days, the performance is diminished and prevents the filling capacity of the glycogen deposits and the typical footballer's injuries are minor injuries in the form of muscle pain.

In such situations, football players can return to normal with low intensity exercise methods and use them more effectively. On the other hand, muscle pain is reduced. During a football game the player runs 11 kilometers throughout the game. In addition, complicated movements complete the whole thing. Therefore, the durability of these players must be high. Training in durability capacity are ADY training as improvement training and AYY training as complementary training. On the other hand, the main point of the high intensity endurance ability is the aerobic exercise capacity with the AYY training (Bansgbo, 1996). One of the basic conditions for improving and strengthening physiological parameters with aerobic exercises is frequent overloading. Thus, the severity, duration and frequency of the overload must be well defined. If the programs are personalized ones, success can be achieved in a shorter time and healthier. Regular exercise programs have been found to physiologically affect respiratory, circulatory and blood parameters (Gökdemir, Koç and Yüksel, 2007).

Anaerobic Durability and Its Implementation in Football

Anaerobic support is the organism's anaerobic energy generation system. It has two parts: ATP-CP system (alaxite) and lactic acid system (lactacid). During all physical activities, pre-existing ATP (adenosine triphosphate) enters the muscle cell. Then, if there is not enough oxygen in the environment, the energizing materials are burned without oxygen. In this process, the product called lactic acid (milk acid) is generated (Sevinç, 2008). The anaerobic training in football consists of the combination of other trainings. These trainings include; speed, development and protection training. Anaerobic endurance effects speed in football. The speed depends not only on physical conditioning, but also on the ability to move quickly and make decisions. From this point of view, it is the purpose of speed training in football is to ensure that the football player can quickly perceive and assess the situation and improve his ability to move quickly. Speed training must be implemented in order to improve these results. In conjunction, speed training allows the muscles to generate power quickly and increases muscle capacity.

As a result, these types of training provide players with the opportunity to exercise in high-grade, frequent periods and long periods of time. This is an important competence for high level players and is closely related to endurance (Bansgbo, 1996).

METHODS

Continuous running which are included to the training planning of 16 years old youth, endurance prior to training for the development or which aimed to determine whether there is a difference between making after training target population of this study was 16 years of age in Turkey. As is known, the target sample is the abstract world that the researcher wants to achieve, but is difficult to reach and reflects the ideal choice. However, the accessible sample is a material platform for realistic selection of young football players aged 16 years (Büyüköztürk, 2012). In this context, our research universe in material sample in Turkey, Istanbul province, on the European side of Istanbul, Feriköy Football Club players in the age group of 16 are determined. As the study is long term, voluntary participation becomes an obligation. For non-random sampling methods, sampling is preferred. As it is easy to sample, it is to choose the sample from easily accessible and practicable units due to the limitations in terms of time, money and labor (Büyüköztürk, 2012). In this context, this study was applied to the volunteers of Feriköy Sports Club, U-16 team in Istanbul. It consists of two groups of 14 people consisting of 28 people in total. As a result of this, following hypotheses are tested.

- There is a significant difference between the grades obtained from the continuous running at the beginning and end of the training.
- There is a significant difference between the endurance vales at the beginning and end of the training.
- There is a meaningful relation between the continuous runs and endurance at the beginning of training.
- There is a meaningful relation between the continuous runs and endurance at the end of training.
- There is a meaningful difference between the continuous runs Groups 1 and 2 make in the beginning of training
- There is a meaningful difference between the continuous runs Groups 1 and 2 make in the end of training
- There is a meaningful difference between the endurance values Groups 1 and 2 have in the beginning of training
- There is a meaningful difference between the endurance values Groups 1 and 2 have in the end of training

This research is designed according to the relational screening model. It has been implemented over 8 week period. In the year 2016, months of ...; training of first group was provided at the start of the first group training, while the other group was subjected to continuous running tests at the end of the training. Study was conducted in Ferikoy Sports Club artificial grass area. Shuttle run test and endurance test were applied and the values of athletes were obtained at the beginning of study and after 8 weeks. The identification values of the groups

participate in the study are determined. Differences between the pre-test and after test results of groups are determined. Differences between the performance variables are evaluated by Wilcoxen Sign test (a non-parametric test) that measures the difference between pre-test and after test (p<0,05).

RESULTS

The average weight of the athletes in the study group is 63.93 kg, average age is 16, average height is 172 cm. The average of the Shuttle Run Test before the training of the Group 1 of the athletes in the study was 83.83, and the average of Shuttle Run test applied after the training to Group 2 is 93.96. The averages of the athletes in the study group were 47.03 in group 1 and 49.93 in group 2. The hypothesis test results based on these descriptive statistics are listed as follows.

Comparison of continuous running test values before and after training in two different groups

Table 1 indicates the values of continuous running test performed before and after training in two different groups. According to Wilcoxen Sign test applied to these values, significance value P = 0,000 <0,05 was found for the continuous running (shuttle run) test before and after training. According to this result P <0.05, there is a significant difference between the continuous running conditions at the beginning and the end of the training. In this context, H1 has been accepted.

Table 1. Comparison of continuous running values before and after training

	(X ± SS)	Z	P	N
Shuttle run before training	83,86±7,86	-4,628	0.000	28
Shuttle run after training	93,96±9,35			

Comparison of endurance test values before and after training in two different groups. The significance value for the pre- and post-training endurance test according to Wilcoxen Sign test was P = 0,000 <0.05 (Table 2). According to this result, there is a significant difference between endurance values at the beginning of the training and endurance values at the end of the training, since P <0.05. Therefore second hypothesis is accepted.

Table 2. Comparison of endurance test values before and after training

	(X ± SS)	Z	P	N
Endurance before training	47,04±2,45	-4.624	0.000	28
Endurance after training	49,99±2,86			

Assessment of the relationship between continuous running (shuttle run) and endurance at the beginning of training

Table 3. Comparison of continuous runs and endurance values before training

Correlations			
		Shuttle run before training	Endurance before training
Shuttle run before training	Pearson Correlation	1	,997**
	Sig. (2-tailed)		,000
	N	28	28
Endurance before training	Pearson Correlation	,997**	1
	Sig. (2-tailed)	,000	
	N	28	28

**. Correlation is significant at the 0.01 level (2-tailed).

The Correlate / Bivariate test (Table 3) was conducted to determine whether there is a significant relationship between continuous running and endurance at the beginning of the training. As a result, P=0,000<0,05 In this context, continuous training at the beginning of the training increases the endurance.

Evaluation of the relationship between continuous running and endurance after training

The value of the Correlate / Bivariate test for evaluating the relationship between the values of the endurance test and the shuttle run after training was found to be P = 0,000 <0,05. According to this result, there is a meaningful relationship between continuous runs and endurance at the end of training. In this context, H 4 is accepted.

Comparison of continuous runs at the beginning of training for Group 1 and 2

According to the results of the Correlate / Bivariate test, the significance value between pre-training shuttle run tests of Group 1 and post-training shuttle run tests of Group 2 was P = 0,855> 0,05. According to this result, P> 0,05, there is no significant difference between the continuous running value of Group 1 at the beginning of training and the continuous running value of Group 2 at the beginning of training. In this context, it can be said that both groups have similar characteristics. In this context, the H5 hypothesis is rejected.

Comparison of continuous runs during the training for Group 1 and 2

There is no meaningful difference between the continuous run value of Group 1 at the beginning of training and the continuous run value of Group 2 at the end of training. As Table indicates, P=0,445>0,05.

Comparison of endurance data at applied at the beginning of training for Group 1 and 2

There is no meaningful difference between the endurance values Groups 1 and 2 have in the beginning of training. Because, the result in this test is P=0,845>0,05. Therefore, H7 is also rejected.

Comparison of endurance test data for Group 1 and 2 at the end of training

The significance level P = 0,411> 0,05 was found as a result of the Correlate / Bivariate test for comparison of endurance test data of Group 1 and 2 at the end of training. There was no significant difference between the two values in this context. H8 is rejected.

DISCUSSION

The aim of this study is to compare the data obtained from the continuous running of the U-16 young football players at the beginning and end of training. It also aims to assess whether there is a difference between pre- or post-training regarding the endurance improvement of continuous runs. The data obtained as a result of the research can be summarized as follows.

Table 4. Comparison of post-training endurance test values with continuous running

Correlations			
		Shuttle run after training	Endurance after training
Shuttle run after training	Pearson Correlation	1	,996**
	Sig. (2-tailed)		,000
	N	28	28
Endurance after training	Pearson Correlation	,996**	1
	Sig. (2-tailed)	,000	
	N	28	28

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5. Comparison of continuous runs at the beginning of training for Group 1 and 2

Correlations			
		1. Group 1 Shuttle run before training	Group 2 Shuttle run before training
Group 1 Shuttle run before training	Pearson Correlation	1	-,054
	Sig. (2-tailed)		,855
	N	14	14
2. Group 1 Shuttle run before training	Pearson Correlation	-,054	1
	Sig. (2-tailed)	,855	
	N	14	14

Table 6. Comparison of continuous runs at the end the training for Group 1 and 2

Correlations			
		Group 1 Shuttle run after training	Group 2 Shuttle run after training
Group 1 Shuttle run after training	Pearson Correlation	1	-,222
	Sig. (2-tailed)		,445
	N	14	14
Group 2 Shuttle run after training	Pearson Correlation	-,222	1
	Sig. (2-tailed)	,445	
	N	14	14

Table 7. Comparison of endurance data at applied at the beginning of training for Group 1 and 2

Correlations			
		Group 1 endurance before training	Group 2 endurance before training
Group 1 endurance before training	Pearson Correlation	1	-,058
	Sig. (2-tailed)		,845
	N	14	14
Group 2 endurance before training	Pearson Correlation	-,058	1
	Sig. (2-tailed)	,845	
	N	14	14

Table 8. Comparison of endurance test data for Group 1 and 2 at the end of training

Correlations			
		Group 1 endurance after training	Group 2 endurance after training
Group 1 endurance after training	Pearson Correlation	1	-,239
	Sig. (2-tailed)		,411
	N	14	14
Group 2 endurance after training	Pearson Correlation	-,239	1
	Sig. (2-tailed)	,411	
	N	14	14

The average weight of the athletes in the study group is 63.93 kg, average age is 16, average height is 172 cm. The Test 1 average of the athletes in study group is 83.83 and the average for Test 2 is 93.96. For the athletes in the study group 1.MaksVO2 average is 47.03, and 2.MaksVO2 average is 49.93. According to the Wilcoxen Sign test result, there is a significant difference between the continuous running rates and endurance values made before and after the training. According to the results of the Correlate / Bivariate test, there is a significant relationship between continuous running and endurance at the beginning of traning and continuous running and endurance at the end of training. According to the result of Correlate/Bivariate test; no significant result have been found for continuous running values of Group 1 at the beginning of training and the continuous running values of Group 2 at the beginning of training; continuous running values of Group 1 at the beginning of training and the continuous running values of Group 2 at the end of training; endurance values of Group 1 at the beginning of training and the endurance values of Group 2 at the beginning of trainin and the endurance values of Group 1 at the end of training and the endurance values of Group 2 at the end of training. There are similar studies in Turkish and international literature. Some of these studies are as follows:

In the study conducted on running trainings,Tamer found that there was a significant increase for the challenging vital values of continuous running groups and short range running groups (Tamer, 1995). Bale had significant improvements in terms of challenging vital capacity in endurance training for 5 weeks in a similar study (Bale, 1993). Balatacı et.al. (1996) have found significant differences between challenging vital capacities of experimental and control groups according to the results of their research on lung volume and capacities of 29 male college students.

Malkoçoğlu et al. (1997) have also found that there is a significant increase in the expiration values of the groups according to the results of the research performed on 42 people from different sports branches. Tamer et al. (1995) reported that their study was directly related to the intensity, duration, and frequency of training with aerobic capacity. They also stated that endurance was improved by exercises performed at a severity of 50-85 % for 3-5 days a week and 15-60 minutes a day, and physical condition had been increased. Pulur (1995) has conducted the study in order to determine the impact of two different training methods on the performance values of active basketball players and to reveal the differences. 45 male students/athletes who were enrolled at Gazi University, School of Physical Education and Sports and who played active basketball have participated in the study voluntarily. Subjects in the study were divided into three groups: control (n = 15), combined force training (group A, n = 15), and general strength training (group B, n = 15). Performance measurements of subjects were determined by standardized laboratory and field tests. All measurements were made one week before and one week after the training schedule. Groups were trained for 10 days, 3 days a week and 1.5 hours a day, while the control group was not trained at all. Statistical analyzes were done by "t" test and variance analysis (ANOVA).

The body weights of the subject groups have decreased, and reductions in the resting pulse were significant in group B, and no significant change in blood pressure occurred. Significant improvements in the anaerobic power increases in the vertical-horizontal and box-top jumps of the subject groups were observed, while the 20 m sprint and sit-up values were similar, no significant change was observed in the control group. The increase of distance to throw med ball was higher in group A, and both groups had significant decreases in terms of body fat percentage and there has been no change in the control group. The subject groups had significant improvement in maximal squat, bench-press, right and left hand grip strength and leg strength. In group A, the force increased by 12.53% while in group B it increased by 7.09%. Öztin has conducted a study in 1999 in order to determine the impact of 8 week fast strength and plyometric training program on some physical and physiological parameters of 15-16 years old male basketball players. 45 basketball players have participated in the study, 30 of them were subject group and 15 of them as control group. The subject groups performed the technical training with fast strength and plyometric studies for 3 days a week for 8 weeks; the control group had 3 days of technical training per week. The physical and physiological parameters of the subjects were determined by laboratory and field tests with accepted scientific validity. The results obtained from the subjects were analyzed by arithmetic mean (X), standard deviation (SD) percentage change, t-test and variance analysis of pre- and post-tests. As a result of the 8 week training program, there was a significant change in IKAS, vertical jump, horizontal jump, 30 m speed, anaerobic power, 20 m shuttle, body density, body fat percentage and lean body weight of the quick force group ($p < 0.01$). There was a significant change in body weight ($p < 0.05$). There was no significant change in the value of elasticity ($p > 0.05$). There was a significant improvement of plyometric group in terms of IKAS, vertical jump, horizontal jump, 30 m speed, anaerobic power, elasticity, body density, body fat percentage values ($p < 0.01$), body weight value ($p < 0.05$). There was no significant improvement in lean body weight ($p > 0.05$).

There was a significant improvement in the IKAS, 20 m shuttle, horizontal jump values ($p < 0.01$) in the control group athletes. The vertical jump and 30 m values had an improvement in the level of ($p < 0.05$). There were no significant changes in body weight, flexibility, anaerobic power, body density, body fat percentage, lean body weight values ($p > 0.05$). As a result of the study, it has been determined that the fast strength and plyometric exercises made for 8 weeks are effective on the physical and physiological characteristics of athletes in general.

RESULTS AND SUGGESTION

According to the data above, there is a meaningful change between continuous running and endurance at the beginning and end of training, but it is understood that there is no relation between the values of two independent groups. In this case, both the efficiency in continuous running and the improvement in the endurance process have developed positively as a result of the 8-week training program. At this point, as in every sports branch, the necessity and importance of training in football was also observed in this research. All these results have helped us to determine that combined and regularly performed studies on the light have increased the anaerobic power, speed and durability significantly among the athletes within the training group. Naturally, this improvement will also affect the athlete's performance positively. Particularly, continuous implementation of such works (throughout the season) could be a significant factor of success in the branches where anaerobic strength is important. As in every sport, in recent years, the development of a clear and steadily growing power has been evident, as well as technique and tactics in the world and our country's football methods. This development is not limited to external factors such as field, material, etc., but it also depends on extensive scientific research and studies. Therefore; the long, medium and short-term goals that we anticipate to reach for our teams and our athletes can be achieved by well-organized, scientific-based training planning.

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