RESEARCH OF THE EFFECT OF 8-WEEK SWIMMING TRAINING ON THE FLAMİNGO BALANCE PERFORMANCE IN ATHLETES 9-12 AGED

8 HAFTALIK YÜZME EĞZERSİZİNİN 9-12 YAŞ SPORCULARDA FLAMİNGO DENGE PERFORMANSINA ETKİSİNİN ARAŞTIRILMASI

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ABSTRACT
The aim of this study was to investigate the differences between the swimming athletes before and after 8 weeks training. The sample of the study consists of athletes aged 9-12 in Uşak Youth Sports Club in 2018-2019. A total of 30 athletes participated in 14 boys and 16 girls. Data were measured with Static Equilibrium Flamingo Equilibrium Test (FDT) and Dynamic Equilibrium Star Equilibrium Test (HDT). Data were analyzed using SPSS 22.0 program. In the statistical analysis of the data, the confidence interval was selected as 95% and values $<p<0.05$ were considered significant. As a result: there was no difference in the flexibility test in the male group, but there was a significant difference between the flexibility test values in the female group. In vertical jump, it was seen that there was a significant difference in pre-post test jump test of boys and girls. According to the elasticity result, no significant difference could be detected. There was no significant difference for vertical jump and Flamingo balance test. The Flamingo balance test can be said to have a negative effect. As a result, some parameters showed positive effects of 8 weeks training on athletes.
Keywords: Flamingo Balance, Swimming, Sport

ÖZET
Araştırma 9-12 yaş yüzme sporcularında antrenman öncesi ve 8 haftalık antrenman sonrası farklılıkları incelemek amacıyla yapılmıştır. Araştırmanın örneklemini 2018-2019 yılında Uşak Gençlik Spor Kulübünde 9-12 yaş sporcular oluşturmaktadır. 14 Erkek 16 Kız toplam 30 sporcu katılmıştır. Veriler Statik denge Flamingo Denge Testi (FDT) ile Dinamik denge Yıldız Denge Testi (YDT) ile ölçülmüştür. Veriler SPSS 22.0 programı kullanılarak incelenmiştir. Verilerin istatistiksel analizinde güven aralığı %95 olarak seçilmiş ve p<0,05'in altındaki değerler anlamlı kabul edilmiştir. Sonuç olarak: erkek grubu, esneklik testinde fark olmadığı, fakat kız grubunda, esneklik testi değerleri arasında anlamlı farklılık olduğu görülmüştür. Dikey sıçramada, erkek ve kız grubunun ön-son test sıçrama testinde anlamlı farkın olduğu görümüştür. Esneklik sonucuna göre, anlamlı bir fark tespit edilememiştir. Dikey sıçrama ve Flamingo denge testine yönelik anlamlı bir farklılık belirlenmemiştir. Flamingo denge testi negatif yönde bir etki yaptığı söylenebilir. Sonuç olarak yapılan testlerde bazı parametrelerde 8 haftalık antrenmanın sporcular üzerinde olumlu etkileri görülmüştür.
Anahtar Kelimeler: Flamingo Denge, Yüzme, Spor

INTRODUCTION
Balance has direct effects on many body functions in human life and therefore it plays an important role in our lives. We can state the factors affecting the balance are; age, body weight, regular exercise and process, joint disorders, proper posture, fatigue and substance

use, motivation and concentration. Due to the effects of exercises on athletes, the body composition and the balance controls of athletes are of high importance in terms of success. Sport, in today's world, has become a universal phenomenon concerns all people, without recognizing a bio-social-cultural distinction within societies. The concept of sports has undergone a rapid change as in many other fields and has also transformed many of its dependent areas, as well. It is a very well known fact that sports has a very strong and hidden relationship with the society in historical process (Yıldırım et al. 2006). Sport is a phenomenon enabling the adaptation of the individuals to the environment by contributing to the development of their mental health and their characteristic qualities, to the formation of their personality and by enriching their knowledge and skills (Dalbudak & Çelik, 2019). And in a different definition, sport is considered as one of the healthy, balanced, useful physical and social activities within the daily activities of individuals.

Daneshjoo et al. (2012) define balance as the ability to remain stable with minimal swinging and to perform a task while maintaining this position. Balance is an important factor that combines with the physical fitness in sporting performance and in daily life (Aksu, 1994). In normal upright posture, the center of gravity of the human body falls over the center of pressure. Therefore, it is important to provide the balance during training and competition. Balance, as the definition of the concept, is the status of standing of an object or a human without toppling over. And as the physical definition of the balance, it is the status of standing of an object or a human as the result of the forces destroying eachother (Sucan et al., 2005). Hrysomallis (2007) defined balance as the process of protecting the center of the gravity of the body within the balance support area. In another definition, the balance is defined as the ability of maintaining the posture of the body on the support base (Spirduso, 1995). The dynamic balance is needed in order to walk, run and, climb stairs in daily life (Özmen, 2016).

Athletes should perform at a high level in terms of their physiological and motoric properties, in order to be successful in sports. One of the parameters that will ensure this, is the balance performance (Eliöz et al., 2013). Balance is an important factor which is in combination with the physical fitness in sporting performance and in daily life (Rose, 2003). Balance is the ability of the body to enable the desired position during movement. In order to do the required movement in well-developed motoric activities, it is essential that the body to be in an upright position (Şahin, 2004). Controlling balance is a complex motoric ability that includes planning and implementation of flexible sport movements, as well as the integration of sensory inputs (Ferdjallah, at al., 2002).

Balance, is an important property at a certain level in all sports. It is emphasized that maintaining the necessary desired body stability is important for a successful performance in sports. Therefore, in dynamic sports involving sudden postural changes, balance forms a basis (Altay, 2001). It is stated that senior athletes exhibit improved balance control in connection with the requirements of each discipline. Learning and training a sport in a long time period, improves the effectiveness of dynamic and static postural control in daily living activities (Perrin et al., 2002). Balance ability, as well as basic biomotor properties such as strength, speed and durability, plays a role in providing of postural control which is a necessity in a successful implementation of athletes' technical, tactical and motoric skills during struggles in the games (Paillard & Noé, 2006). Achieving sporting success requires providing both static and dynamic balance conditions properly. Appropriate balance control in achieving motoric abilities, appropriate displacement, movement adaptation and adequate hand, arm or head movement, impaired movements and techniques in sports applications, the synergy that minimizes displacement of the center of gravity while maintaining an upright posture are based on muscles (Altay, 2001). Balance is an important factor in maintaining the body composition which is necessary for a successful performance in sports. Therefore, it is the

bases for dynamic sports which include sudden changes in movement pattern. All sports contain balance at a certain level (Eler, 1996).

MATERYAL ve METOT

Research Group

The research group consists of 9-12 year old swimming athletes in Uşak Youth Sports Club in 2018-2019 and it was aimed to investigate the differences in balance levels of male and female athletes before and after 8 week of training. A total of 30 athletes, 14 male and 16 female, participated in this research regularly.

Statistical Analysis

The measurements of the athletes participated in this research were realized with Flamingo Balance Test (FBT) for Static Balance and Star Excursion Balance Test (SEBT) for Dynamic Balance. In order to evaluate the data, the computer programme SPSS 22.0 (SPSS Inc., Chicago, IL, USA) was used. At first, the mean and standard deviation values of the data analyzed, were calculated. Then, before all statistical procedures, Shapiro-Wilk test was applied to determine whether the data showed normal distribution. According to the data obtained from this test, it was found that pre and post test results about elasticity and vertical jump within male and female groups, showed normal distribution, while Flamingo balance test results did not show normal distribution.

In the study, paired sample t-test was used to compare the data obtained from elasticity and vertical jump pre-test and post test for the male group which showed a normal distribution. Similarly, the data from elasticity and vertical jump pre-test and post test for the female group were analyzed using paired sample t-test. Regarding the Flamingo balance test results which did not show normal distribution, pre-test and post-test measurements of the male group and pre-test and post-test measurements of the female group were compared with Wilcoxon Sign Rank Test. In order to determine whether there is a difference between pre-tests and then the post-tests of the elasticity and vertical jump which showed a normal distribution for the male and female groups, and also in order to determine whether there is a difference between groups, Independent-Samples T-Test was used. As a result of Independent-Samples T-Test which was used for the statistical analysis of findings, it was determined whether the data were significant depending on the level of significance of Levene's test. Flamingo balance test results which were not normally distributed were analyzed according to M Whitney U test. In the statistical analysis of the data, the confidence interval was selected as 95% and values below $p < 0.05$ were considered significant.

FINDINGS

In this section, the results of the static balance Flamingo Balance Test (FBT) and dynamic balance Star Excursion Balance Test (SEBT), which were applied to the athletes participated in this research, have been presented and interpreted.

Table 1. Descriptive characteristics of the participants

Group	N	Age (year)	Height (cm)	Body Weight (kg)
Male	14	10.14±1.46	141.07±7.94	36.50±9.28
Female	16	10.12±1.36	139.56±12.42	36.50±12.51

Table 2. Paired Samples T Test Results of Male and Female Group Elasticity Pre-test and Post-Test Values

Groups		N	$\overline{X}$	S	t	df	P
Male	Pre-test	14	21.36	4.361	-2.110	13	0.055
	Post-test	14	21.71	4.122			
Female	Pre-test	16	23.13	3.998	-2.657	15	0.018*
	Post-test	16	23.94	4.106			

* p<0,05

When Table 2 was examined; In order to determine whether there was a difference between the mean values of elasticity tests before and after the training program of the male group, t-test was used for related samples. As a result of the test, there was no significant difference between the mean values of elasticity pre-test ($\overline{X}$ Pre-test=21,36) and elasticity post-test ($\overline{X}$ Post-test=21,71) [$t_{(13)}$ = -2.110, p>0.05]. And, in order to determine whether there was a difference between the mean values of elasticity tests before and after the training program of the female group, t-test was used for related samples. As a result of the test, there was a significant difference between the mean values of elasticity pre-test ($\overline{X}$ Pre-test=23,13) and elasticity post-test ($\overline{X}$ Post-test=23,94) [$t_{(15)}$ = -2.657, p<0.05]. As a result, it can be said that, according to the values of male group elasticity pre-post test, the training programme applied did not have an effect. Also, according to the significant values found for the female group elasticity pre-post test, we can see that there is an eefect of training programme applied.

Table 3. Paired Samples T Test Results of Male and Female Groups' Vertical Jump Pre-test and Post-Test Values

Groups		N	$\overline{X}$	S	t	df	P
Male	Pre-test	14	24.64	4.749	-3.319	13	0.006*
	Post-test	14	25.86	4.721			
Female	Pre-test	16	21.88	5.227	-3.437	15	0.004*
	Post-test	16	22.94	4.932			

* p<0,05

When Table 3 was examined; In order to determine whether there was a difference between the mean values of vertical jump tests before and after the training program of the male group, t-test was used for related samples. As a result of the test, there was a significant difference between the mean values of vertical jump pre-test ($\overline{X}$ Pre-test=24,64) and vertical jump post-test ($\overline{X}$ Post-test=25,86) [$t_{(13)}$ = -3.319, p<0.05]. And, in order to determine whether there was a difference between the mean values of vertical jump tests before and after the training

program of the female group, t-test was used for related samples. As a result of the test, again there was a significant difference between the mean values of vertical jump pre-test ($\overline{X}$ Pre-test=21,88) and vertical jump post-test ($\overline{X}$ Post-test=22,94) [$t_{(15)}$ = -3.437, p<0.05]. As a result, it can be said that, according to the values of both male & female groups vertical jump pre-post tests, there is an effect of the training programme applied.

Table 4. Wilcoxon Signed-Ranks Test Results of Male and Female Groups' Flamingo Balance Test Pre-test and Post-Test Values

Male Group Pre test-Post test	N	Rank mean	Rank Sum	z	P
Negative rank	4	2.50	10.00	-1.890	0.059
Positive rank	0	0.00	0.00		
Equal	10				

Female Group Pre test-Post test	N	Rank mean	Rank Sum	z	P
Negative rank	3	2.00	6.00	-1.633	0.102
Positive rank	0	0.00	0.00		
Equal	13				

When table 4 was examined; Wilcoxon Signed-Ranks Test results were given, regarding whether pre-test and post-test results directed to flamingo balance test of male and female groups, showed a significant difference at p<0.05 level. The results of the analysis showed that there wasn't a significant difference between the flamingo test pre-test and post-test of male and female groups (Male z=-1.890 p=0.059, Female z=-1.633p=0.102). According to pre and post-test results of the training applied, we can say that the training programme had a negative effect on Flamingo balance test results in both male and female groups.

Table 5. Comparison of the results of the elasticity test pre-test and post-test with the Independent-Samples T Test

Groups		N	$\overline{X}$	S	t	df	P
Pre-test	Male	14	21.36	4.361	-1.158	28	0.257
	Female	16	23.13	3.998			
Post-test	Male	14	21.71	4.122	-1.477	28	0.151
	Female	16	23.94	4.106			

When Table 5 was examined; The pre-test results of elasticity test of males and females, were compared with the Independent-Samples T-Test. According to the pre-test results, there was no significant difference found between the mean elasticity test of males ($\overline{X}$ Male = 21.36) and the mean elasticity test of females ($\overline{X}$ Female = 23.13) [$t_{(28)}$ = -1.158, p>0.05]. In a similar way, according to the results of post-test, there was no significant difference between the

mean elasticity test values of males ($\overline{X}_{\text{Male}} = 21.71$) and the mean elasticity test values of females ($\overline{X}_{\text{Female}} = 23.94$) [$t_{(28)} = -1,477$, p>0,05].

Table 6. Comparison of the results of the vertical jump test pre-test and post-test with the Independent-Samples T-Test

Groups		N	$\overline{X}$	S	t	df	P
Pre-test	Male	14	24.64	4.749	1.509	28	0.142
	Female	16	21.88	5.227			
Post-test	Male	14	25.86	4.721	1.650	28	0.110
	Female	16	22.94	4.932			

When Table 6 was examined; The pre-test results of vertical jump test of males and females, were compared with the Independent-Samples T-Test. According to the pre-test results, there was no significant difference found between the mean value of vertical jump test of boys ($\overline{X}_{\text{Male}} = 24.64$) and the mean value of females ($\overline{X}_{\text{Female}} = 21.88$) [t $_{(28)} = 1,509$, p> 0.05]. Similarly, according to the post-test results, no significant difference was found between the mean value of vertical jump test of males ($\overline{X}_{\text{Male}} = 25.86$) and the mean value of females ($\overline{X}_{\text{Female}} = 22.94$) [t $_{(28)} = -1.477$, p> 0.05].

Table 7. Comparison of the results of Males and Females Groups' Flamingo Balace Test pre-test and post-test with the Mann Whitney-U Test

Groups			N	Rank Mean	Rank Sum	u	P
Flamingo Balance Tesi	Pre-test	Male	14	15.86	222.00	107.00	0.810
		Female	16	15.19	243.00		
	Post-test	Male	14	15.79	457.50	108.00	0.847
		Female	16	15.25	208.50		

When Table 7 was examined; There was no statistically significant difference between male and female groups of pre-test results for flamingo balance test at p> 0.05 level (u = 107.0, p = 0.810). Similarly, no statistically significant difference was found between male and female groups of flamingo balance test at the level of p> 0.05 (u = 108.0, p = 0.847).

DISCUSSION AND RESULTS

The results were evaluated by reviewing the findings obtained in this study and the literature. In the study, while there was no significant difference between the mean values of elasticity tests before and after the training programme applied in the elasticity test of the male group, there was a significant difference observed in the elasticity test mean values in femail group [t (15)=-2,657, p<0,05]. According to these results, it can be stated that the training

programme did not cause any change according to the values observed from elasticity pre-post tests of male group, while we can say that the training program me applied had an effect in the female group since there was a significant difference in mean values of elasticity pre and post test in the female group.

There was a significant difference between the mean values of vertical jump male and female values. Male [$t_{(13)}$=-3.319, p<0.05], female [$t_{(15)}$=-3.437, p<0.05]. According to these results, it can be seen that there was an effect of training programme applied, due to the values of pre-post tests of vertical jump test of both male and female groups. The results of the analysis directed to the flamingo balance test showed that there was no significant difference between the pre-test and post-test of flamingo balance test of male and female groups (Male z = -1.890 p = 0.059, Female z = -1.633 p = 0.102). According to these results, it can be said that the training programme applied according to the pre-post test results had a negative effect on the flamingo balance test results in both male and female groups. Vertical jump test pre-test results were compared with Independent-Samples T Test. According to the pre-test results, no significant difference was found between the mean value of vertical jump test of males (Male = 24.64) and the mean value of vertical jump test of females (Female = 21.88) [t (28) = 1.509, p> 0.05]. When we check the similar studies, there are some studies showing parallelism with ours. There are some studies which their training programmes had a positive effect on balance development (Atılgan et al., 2012). Tetik emphasized that when the teams consists of the athletes with higher balance skills, they can achieve higher scores and take place in higher ranks in the league (Tetik, 2013). Cote et al., think that static balance and dynamic balance are necessary for a proper performance in daily life and sports activities (Günay & Cicioğlu 2001). Dalvin, in his study, found that the balance performance of the athletes was better than non-athlete control group (Suveren, 2009). It is known that the training programmes prepared according to the critical age periods, contribute positively to children's development and speed up their learning of skills (Tüfekçioğlu, 2008).

As a result, the data obtained from the study show that the regular training and exercise programmes have a positive effect on the success of the athletes and their development. In our study, it is thought that the training programme applied, will have a positive effect on balance development, balance control and the success, and it will be beneficial in terms of sports/training in the future.

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