1. (music, relationships with partners, organizational framework, etc.) which favor the habit of making physical efforts or to work.This skill becomes a habit that is involved in leisure activities (as a countervailing concern).
2. Our research has revealed useful information on the level of motility of female students motility who practice the aerobics class. After the experiment it was found that especially strength and endurance development can be done by means of aerobic gymnastics.
3. Both the experimental group and the control had higher averages at the final testing than the baseline for each indicator in question, but in different proportions. The progress of the experimental group compared to the control one, proves the efficiency of methodical processes and aerobics programs used for the experimental group.
4. After the experiment it could be determined a system of ways and means to act effectively in order to increase motility parameters of female students, which is actually the purpose of the work.

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THE EFFECTS OF A 12-WEEK-SWIMMING TRAINING ON SOME ANTHROPOMETRIC PARAMETERS AND HAND GRIP STRENGTH OF MALE ELEMENTARY SCHOOL STUDENTS BETWEEN THE AGES OF 8-12

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Abstract

Aim: Regular exercise is to increase children's physical and functional capacities. Significant degree of physical working capacity in children with growth changes. Developmental age children tend to grow faster than the body parts of the body. This period of major changes occur in the children's motor skills. The aim of this study, that boys swimming training as height, weight, and in particular to investigate whether the effect of the arms and hand grip strength of the development in 8-12 age of boys.

Materials and methods: Group of subjects trained in swimming for 12 weeks (40), do not exercise any control group (40) generated a total of 80 8-12 age of male students. Each of the two groups were evaluated by pre-test and post-test measurements.

participants' body weights, body mass index (BMI), Circumference measurements, hand grip strength were measured.

Findings: After the measurements and comparison of the experimental and control groups' averages, a significant decrease ($p<0.01$) was observed between the experimental group's Flex. Biceps preliminary and final test values: the former 23,96±5,13 and the latter 21,31±3,76. Likewise, a significant decrease ($p<0,01$) was observed between the Ext. Biceps preliminary test values 21,69±3,46 and final test values 20,28±3,61. No significant change was observed in the preliminary and final measurements of the experimental group's Weight, BMI, Forearm Circumference and Handgrip ($p>0,05$). Also, no significant difference was observed between the preliminary and final testing of the control group ($p>0,05$). Comparing the measurement averages of the Experimental and Control groups, a significant difference ($p<0,05$) was found out in the Flex. Biceps preliminary/final tests and the averages of the left arm Handgrip final test (Table.1)

Results: The pre-test and post-test measurements, the boys swimming training on weight, front arm circumference, handgrip right, there were significant differences between the values of the left Handgrip. The results obtained in the

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experimental group compared to the control group of boys, especially the flexion of biceps and extansion of biceps are more than rapid development.
Key words: swimming, exercise, handgrip.

Introduction

Besides being a key manifestation of general health and physical fitness, having a good body composition, size and structure has utmost significance in reaching an optimal phyiscal performance (Açıkada, 1990; Boileau and Horswill, 2000; Heyward, 1998). Regular exercise programs change the body composition. Cardiorespiratory training sessions decrease the body weight. There have been considerable amount of studies conducted on how significantly aerobic stamina training affects the body composition (Kannin and Phil 2005; Galliven et all. 1997). It is a well-known fact that any kind of sportive activity increases oxygen consumption, staves off clogged arteries and raises the heart rate. Physical activity plays an important role in living a healthy and balanced life. However, since swimming is performed in a horizontal position, heart and circulatory system function much better while swimming. Therefore, swimmers have more efficient circulatory systems than other athletes. Exercised in water, swimming is one of the rare sports that leads to excellent physical development (Olaru, 1994; Çelebi, 2008; Bozdoğan, 2006). In swimming, where the gravity is almost zero, all muscles of the swimmer work in harmony. Since swimming is performed against the resistance of water, it increases the strength of body without any harm. At the same time, as one of the rare sports used in physical therapy, it improves muscles in a balanced and symmetrical way (Bozdoğan, 2006; Anonymous www.alternatifsporlar.net/yüzme).

The aim of this study is to investigate the effects of a 12-week-swimming training on some anthropometric parameters and handgrip strength of male elementary school students between the ages of 8-12.

Tools and Method

Choosing the participants:80 voluntary male students were chosen randomly from elementary school grades. 40 of them, with the average age of 10,87±1,42 and the average height of 138,98±14,25, constituted the experimental group, and the other 40, with the average age of 10,68±1,46 and height of 141,10±12,68 cm, acted as the control group

Measuring the body weight:

The body weights of the participants were taken with an electronic scale with 0.1 kg sensitivity. The participants were bare feet, wearing only shorts and a t-shirt (Otman A.S. et. al. 1995).

Body mass index:

It was calculated by dividing the body weight in kilograms (kg) by the square of the participants' height in meters (kg/m^2).

Circumference Measurements

Anthropometric tape measure with 1mm sensitivity was used to measure the participants' biceps in flexion and extension together with the forearm circumference (İkiz İ. et. al. 1995).

Measuring the Hand Grip Strength:

Measuring was done with Takei Hand Grip Dynamometer. The reading was done after a five-minute warm-up as the volunteers were standing up with their arms unbent in a 45^o angle and not touching their bodies. The procedure was repeated three times for the right and left hands, and the highest value is used as the hand grip strength value (Tamer, K. 2000).

Statistical Analysis

The raw data derived from the measurement was processed by SPSS-16 package program. In order to examine the differences between the two independent groups, i.e. Experimental and Control groups, Student's T test was conducted on independent groups. The differences between the groups' preliminary and final test results were evaluated by Dependent t test. Significance level was chosen as 0.05 and 0.01 to interpret the difference between the variables.

Findings

After the measurements and comparison of the experimental and control groups' averages, a significant decrease ($p<0.01$) was observed between the experimental group's Flex. Biceps preliminary and final test values: the former 23,96±5,13 and the latter 21,31±3,76. Likewise, a significant decrease ($p<0,01$) was observed between the Ext. Biceps preliminary test values 21,69±3,46 and final test values 20,28±3,61. No significant change was observed in the preliminary and final measurements of the experimental group's Weight, BMI, Forearm Circumference and Handgrip ($p>0,05$). Also, no significant difference was observed between the preliminary and final testing of the control group ($p>0,05$). Comparing the measurement averages of the Experimental and Control groups, a significant difference ($p<0,05$) was found out in the Flex. Biceps preliminary/final tests and the averages of the left arm Handgrip final test (Table.1)

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Table:1 Comparison of Experimental and Control Group Measurement Parameters

Parameters	Measurements	Experimental Group (n=40)	Control Group (n=40)	**p
Age	-	10,87±1,42	10,68±1,46	
Height (cm)	-	138,98±14,25	141,10±12,68	
Weight (kg)	Pre Test	37,97±14,56	39,10±13,13	0,548
	Post Test	36,80±14,74	39,06±12,53	0,218
	*p	0,412	0,976	
BMI (body mass index)	Pre Test	18,97±3,96	19,14±3,72	0,754
	Post Test	18,70±4,11	18,98±3,67	0,599
	*p	0,610	0,709	
Flex. Biceps	Pre Test	23,96±5,13	22,79±3,19	**0,034**
	Post Test	21,31±3,76	22,30±3,50	**0,045**
	*p	**0,000**	0,189	
Ext. Biceps	Pre Test	21,69±3,46	21,12±2,96	0,191
	Post Test	20,28±3,61	20,71±3,47	0,379
	*p	**0,001**	0,228	
Front arm circumference	Pre Test	21,17±4,77	22,30±7,47	0,212
	Post Test	20,47±2,95	20,39±8,78	0,939
	*p	0,164	0,053	
Handgrip (right)	Pre Test	28,83±11,87	31,18±14,06	0,197
	Post Test	30,87±12,16	32,23±15,88	0,497
	*p	0,122	0,483	
Handgrip (left)	Pre Test	24,89±9,41	27,48±12,28	0,096
	Post Test	24,81±10,37	28,88±13,50	**0,017**
	*p	0,942	0,280	

***P:** measuring the differences before and after exercise
****P:** Differences in the experimental and control groups

Discussion

Our research studied the effects of swimming exercises on some anthropometric parameters and hand grip strength of 8-12 year old males. According to the results, the primary and final test comparisons of the experimental group's biceps flexion and extension were found to be statistically significant (Table 1). After comparing the average measurements of the experimental and control group, the measures of biceps in flexion and left hand grip strength were found to be significant. On the other hand, no significant difference was identified among the measurements of body weight, BMI and forearm circumference.

The findings of the following research studies support the results that we have reached in our own study: The study of Balci S. et al titled "An Evaluation of Physical Fitness and Performance of the Students between 9-11 ages", where they found no statistically significant difference in body weight and BMI parameters (Balci et al 2000); the study of Kutlu et al where they found no significant difference in body weight measurements after they studied the effect of plyometric training on the anaerobic strength of young soccer players (Kutlu et al. 2001); the results of the study of Polat et al which aims to examine fitness and anthropometric qualities in children and which found the values of the body weight of athletes and sedanters, biceps flexion, biceps extension and BMI not statistically significant.

Also, certain studies in the literature on the changes of body weight do not run parallel to our study (Koc et al 1997; Gearon, 1987)

It can be argued that the reason why there was no change between the pre and post-exercise values of body weight in our study is that while there was a decrease in body fat, there was an increase in total body liquid and muscle mass.

According to our study, after a comparison of the hand grip strength of the experimental and control groups, the left hand grip strength is statistically significant.

In this respect, the results of the following studies are in parallel to those of ours: the study of Ibis et al which compares physical and physiological parameters of children participating and not participating in soccer summer schools and which found a significant difference between the right hand and left hand grip power; the study of Akkus et al which examines the motoric qualities of the 12-14 year-old male tennis players on power training and which identifies significant differences between the right had and left hand grips of the control and experimental groups; a similar study by Aydos et al which found a statistically significant difference between the parameters of right

hand grip and left hand grip; the study of Kurkcu et al which reports a statistically significant difference between the parameters of right hand grip and left hand grip; and Erol's quick power study on 28 young athletes between the ages of 16-18 which found the experimental group's right and left hand grip power statistically significant (Erol, 1992).
The studies conducted about how regular exercise improves grip power (Katie et al 2003) support the values that we derived from our own study.

Conclusion

The pre-test and post-test measurements, the boys swimming training on weight, front arm circumference, handgrip right, there were significant differences between the values of the left Handgrip. The results obtained in the experimental group compared to the control group of boys, especially the flexion of biceps and extension of biceps are more than rapid development.
In conclusion, we can say that the 12-week swimming training affected the anthropometric parameters and hand grip strength of male elementary school students. We believe that this stems from the unique qualities of the swimming activity.

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