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The effect of 8-week thera-band exercises on male swimmers' 100 m freestyle swimming performance

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Abstract

The aim of this study is to investigate 8 weeks Thera-Band trainings' effects on male swimmers' 100 m freestyle swimming performance.

The study group is created by 20 (n = 20) licenced male athletes that had trained at least 3 days in a week and have been active in swimming sport at least 3 years in Gebze Gençlerbirliği Swimming Club 20 (n = 20). Athletes were divided into experiment group (n = 10) and control group (n = 10) randomly. Training programme was applied to the study group for 55-60 minutes for 3 days on alternate days and times when the club does not have swimming training. 12 different Thera-Band trainings were applied for 40-45 mins and each set was 15 minutes.

Mann-Whitney U test was used to analyze differences between groups and Wilcoxon signed rank test was applied for analyzing the differences of intra-groups. SPSS 21.0 Statistics package software was used for statistical analyzes. The results show that there are no significantly differences between experimental group's and control group's post test results. (p>0.05). Statistically significant differences are found as a result of intra-group comparison of the experimental group's pre-test and post-test results (p<0.05).

Depending on the results obtained after reviewing the literature, it can be concluded that Thera-Band training is effective on the performance improvement of swimmers aged 13-15 years.

Keywords: swimming; freestyle; thera-band performance; swimmers; performance

Introduction

Swimming has significant effects on strength and general athletic conditioning because it requires force production against water resistance (Bozdoğan, 2003). In order to become successful as a swimmer, athletes should pay attention to following aspects; training regularly using quality programs, recovery from training and nutritional regulations (Selçuk, 2013).

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Swimming has many positive contributions on the development of adolescents thus in many countries at elementary schools swimming is a part of physical education programs (Çelebi, 2008). Besides, due to the external pressure effect on the lungs during swimming the energy required to swim a distance is almost four times the energy required to run the same distance (Odabaş, 2003).

Elastic resistance equipments such as bands and tubes are commonly used in sports and rehabilitation medicine for increasing muscular strength and endurance (Hostler et al., 2001, Mikesky et al., 1994). Past studies have shown that elastic band trainings are suitable method to increase strength (Hughes et al., 1999) Rubber bands and tubes are preferred by dint of its ability to set force and traction ratio (Baltacı et al., 2016). Elastic resistance bands can be used to train one or more joints at the same time, this type of bands never works depend on gravity. The more elastic band is stretched, the more resistance it is created (Selçuk, 2014; Kocaoğlu, 2015).

In children and adolescents, a significant increase of 300-500% in muscle mass occurs between the ages of 7-17 years. In men, maximal strength development is slower between 10-13 years than in previous periods, but accelerates again in age of 13-14 years. The basis for this is the increase in testosterone hormone in men. Especially in men, the age of 13 is the period when testosterone release and strength development is rapid. In this period, in the studies aiming at the development of strength, the general force property must first be developed in strength training. Regardless of the type of sport the athlete can absolutely start with strength-training for large muscle groups, then with push-pull or with light additional weights (Hekim and Hekim, 2015).

In this context, it is aimed to investigate the effect of 8-week Thera-Band training on 100-m performance of free style in 13-15 year old male swimmers.

Material and Method

Research Group:

The research group is created by 20 (n = 20) licensed male athletes that have participated in swimming training at least three years and have followed on swimming trainings at least 3 days regularly in Gebze Gençlerbirliği Swimming Club Athletes were divided into experiment (n = 10) and control (n = 10) groups randomly and permissions are obtained from both athletes and their parents.

Table 1. Age, training age, height and weight of the experimental and control group

	Experimental Group	Control Group
	n=10	n=10
	$\bar{X} \pm SS$	$\bar{X} \pm SS$
Age (year)	14,30 ± 0,67	14,10 ± 0,87
Training age (year)	4,00 ± 1,33	4,30 ± 1,33
Height (cm)	162,20 ± 6,44	163,50 ± 5,19
Weight (kg)	56,60 ± 3,92	56,70 ± 5,59

Data Collection Tools:

Body Height and Weight Measurement:

Measurements of height and weight of the athletes were made. The height and weight of the athletes were measured by unshod and sportswear. For the weight and the height measurement, the Premier model PWS 2027 digital scale (sensitivity: 100g / 0.2 lb) and Holtain (UK) height scale with 0.1 cm accuracy were used. The obtained value was recorded as cm (height) and kg (weight).

100 m Swimming Test:

Swimming measurements were made in Kocaeli Gebze Olympic Indoor Swimming Pool. The pool measures 50 × 25 meters and 2 meters deep, also with 10 laps (full Olympic pool). Before the test, the athletes performed warming exercise specific to the land and 50 m free style warming in the water. The test started with "Ready! Whistle sound! ". The athletes made the grab start and the time started. Until the athletes touched the wall, researcher followed athletes by the long side of the pool and the effort time was measured by Casio brand hand clock. Athletes swam freestyle during effort. 2 measurements were taken and the best value test score was recorded. Measurements were taken after a full rest (1 hour) was given.

Collection of Data

Research Plan:

The application of the pre-test and the informative meeting to the experiment and control group in the study were completed on March 21, 2016 and the last test was completed on 16 May 2016. The data of the research was collected by the researcher in Kocaeli Gebze Olympic Indoor Swimming Pool. The average pool temperature was measured as 26-27 C⁰ during the tests were being carried out, the pH ratio was 7.0, and the chlorine ratio was 1.9. Measurements were made between 5 p.m and 8 p.m for the experiment and control group to reduce the effect of biological rhythm.

The following procedures were applied to the both groups, respectively:

- Height and body weight were determined,
- The 100 meters time was measured.

Tests were completed in same day. Following the pre-test, 10 people who formed the control group were not involved in any exercise program except their routine trainings for 8 weeks. After 8 weeks, post-tests were applied.

Practice of Training Program:

20 licensed male athletes voluntarily participated in the Gebze Gençlerbirliği Swimming Club were randomly assigned to the experimental (n = 10) and control (n = 10) groups. Experiment group followed 8-week training program as 3 days in a week and each session was 45 minutes. Trainings were implemented on alternate days when the athletes hadn't had swimming training. The implementation of a Thera-Band set is 15 minutes. With a total of 12 different Thera-Band exercises, 40-45 minutes training time has been reached. Control group only participated in their yearly swimming trainings.

Their swimming trainings in the annual plans of the Experiment and Control group was not taken into account in the study.

The blue color Thera-Band Exercise Band was used during training. The blue colored exercise bands are extra thick and the level of difficulty is Medium / Advanced.

Table 2. Thera-Band Unit Training Program

	Movements	1-4 week	4-8 week
Upper Zone	Biceps Curl	3X10	3X15
	Triceps Extension	3X10	3X15
	Lateral Raise	3X10	3X15
	Lateral Pull Down Back	3X10	3X15
Core (center) Zone	Reverse Crunch	3X10	3X15
	Push Ups	3X10	3X15
	Lower abdominal Shuttle	3X10	3X15
	Stomach	3X10	3X15

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Sub zone	Hip Extension	3X10	3X15
	Hip Flexion	3X10	3X15
	Hip Abduction	3X10	3X15
	Hip Adduction	3X10	3X15
	Leg Press	3X10	3X15
	Backstroke Adduction	3X10	3X15
Relaxation between movements: 45 sec			
Resting Between Sets: 3 - 5 min			

Analysis of Data:

SPSS 21.0 Statistics package software was used for statistical analyzes of datas obtained in the study. Frequency analysis was used as descriptive analysis, Mann-Whitney U test was used to analyze differences between groups and Wilcoxon signed rank test was applied for analyzing the differences of intra-groups.

Results

Table 3. Comparison of Experiment and Control Groups of Pre and Post Test Results (Mann-Whitney U)

		n	X±SS	z	p
Pre test	Experiment Groups	10	1:14:11 ± 0:01:42	-0,663	0,508
	Control Groups	10	1:14:25 ± 0:01:27		
Post test	Experiment Groups	10	1:13:07 ± 0:01:39	-1,718	0,086
	Control Groups	10	1:14:20 ± 0:00:59		

As seen in Table 3, as a result of comparing the pre test results of experimental and control group, there were no significant differences statistically ($p > 0,05$). In the post test results, although there was a difference in the averages, statistically significant difference wasn't found ($p > 0,05$).

Table 4. Comparison of Pre and Post Test Results of Experiment and Control Groups (Wilcoxon Signed Ranks)

		n	Ort.± Ss	z	p
Experiment Groups	Pre test	10	1:14:11 ± 0:01:42	-2,807	0,005*
	Post test	10	1:13:07 ± 0:01:39		
Control Groups	Pre test	10	1:14:25 ± 0:01:27	-0,255	0,799
	Post test	10	1:14:20 ± 0:00:59		

$p < 0,05^*$

As seen in Table 4, Statistically significant difference was found as a result of comparison of pre test and post test results of the experimental group ($p < 0,05$). For control group, there was no difference between pre test and post test results ($p > 0,05$).

Discussion and Conclusion

Statistical analysis showed that there was no statistically significant difference ($p > 0,05$) when the post test of the experiment and control groups were compared. In the experimental group, statistically significant difference was found as a result of comparison of pre-test and post-test results ($p < 0,05$). It can be said that Thera-band trainings have positive effects on swimming performances depending on the fact that they provide muscular strength development to the athletes. Yolcu (2010) has applied strength development exercises with resistance machines and rubber bands in children. At the end of the study, it was found that children working with resistance machines provided more strength development than children working with rubber band,

but a significant increase in strength was also found in children who used rubber band. Hawley et al. (1992) investigated the relationship between 50 m sprint development and strength training, and found that muscle strength acquired during 8-week strength training was an important factor for 50 m sprint capacity.

Investigations show that children aged 11-13 years will be able to develop strength with training but the developmental characteristics of children should be paid attention to strength training to be applied on this age group of children. Thus, the development of strength in children will occur more healthily. The use of Thera-Band during training also has an important place for strength development in children aged 11-13 years. Canlı (2017) found that as a result of the strength training done using the Thera-band, the athletes' biomotor properties have increased. Contributing to the development of strength in children, Thera-Band provides versatile strength development as it can be used in different angles and resistances (Selçuk, 2013). These researches support the results of our study. Soydan (2006) divided participants into two groups in his study, one group was doing weight training and the other group was exercising with their own body weights. At the end of the study, 200 m Freestyle swimming times were compared in both groups and it was found that they showed similar development. In the same study, it was stated that the athletes in both groups had a significant decrease at 50 m, 100 m, 150 m and 200 m transition ratios. Nowadays, elastic bands are used in various activities such as physiotherapy and rehabilitation after injuries, increasing functional capacities of individuals, increasing functional capacities of chronic ailments and athletes. Elastic bands can be used to strengthen certain muscle groups that machines cannot function in a certain muscle group, and also allow exercises to develop flexibility and balance (Selçuk, 2014). At the same time, in exercise with Thera-Band, we can say that only the speed and the number of repetitions can be changed to achieve weight loss, body tightness, general strength and conditioning. When the information in the literature is assessed, it is indicated that a well-planned combination of applied swimming and strength trainings are needed to improve strength training and swimming performance (Tanaka and Swensen, 1998).

As a result, when the end-test values of the experimental and control groups were compared, there was no statistically significant difference ($p > 0,05$). In the experimental group, significant differences were found in pre-test and post-test results ($p < 0,05$). It can be concluded that Thera-Band training, within the scope of literature review, is effective on the performance improvement of swimmers aged 13-15 years.

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