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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 and Wilcoxon signed rank test was applied to the obtained data in SPSS 21.0 software. The results show that there are no significant differences between test 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 test group's pre-test and post test results (p<0.05).

According to the results of comparison of post-test values of the experimental and control groups, there was no statistically significant difference although the swimming group's effort time averages were better than the control group (00: 01: 17ss). In the experimental group, significant differences were found in pre-test and post-test results. Depending on the results obtained after reviewing the literature, it can be concluded that Thera-Band training is effective on the performance improvement of athletes aged 13-15 years.

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

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7 Introduction

8 Swimming sport refers to the whole meaningful movement that a person makes in order to reach a
9 certain distance in the water. Swimming branch in sport is defined as the ability of the athlete to
10 swim at certain distances within the liquid with the free, back, breaststroke, butterfly and mixed
11 techniques as soon as possible (Selçuk,2012).

12 Due to being a sport against water resistance, it has significant contributions to strength and
13 condition (Bozdoğan, 2003). In order to be successful, the sportsman should pay attention to
14 regular training, resting and feeding with quality training programs (Selçuk, 2012).

15 Swimming is a sports branch that needs to be done by our children because of its positive
16 contribution to the development period and even in many countries it is obligatory to learn (Çelebi,
17 2008). Besides, there is pressure effect on the breathing of the water which makes it difficult to
18 breathe. For this reason it can be said that the energy required to swim a distance is four times the
19 energy required to run the same distance (Odabaş, 2003).

20 The highest and fastest strength development in men occurs during the second puberty period. In
21 this period, the highest and fastest increasing in strength is seen on young men. . The load /
22 strength ratio has come also better status in young men. In the case of appropriate stimuli, strength
23 tolerance also develops in accordance with the maximal strength (Dündar, 2007).

24 Nowadays, elastic bands are being used in various activities such as physical therapy and
25 rehabilitation after injuries, increasing functional capacities of individuals, increasing functional
26 capacities of chronic ailments and athletes as well as using motor skills such as strength and
27 strength durability (Baltacı et al, 2003, Doğaner, 2012, Page and Ellenbecker, 2011, Thera-Band,
28 2006).

29 Thera-Band is preferred because of its ability to adjust individual strength and traction ratio (Baltacı
30 et al., 2003). Elastic bands can be used to strengthen muscle groups such as the rotator cuff and
31 peroneus longus, which can not be operated by machines in a certain region, and allow for
32 flexibility and balance-enhancing exercises (Page and Ellenbecker, 2011).

33 Elastic bands don't work depending on gravity, such as resistance machines. For this reason, the
34 elastic resistance depends on stretching of the elastic band. As the elastic band stretch, the
35 resistance producing increases. That is, the longer the elastic bands are extended, the more
36 resistance is encountered. Resistance of the elastic bands increases the mass and strength of the
37 muscles to which they are applied on. One or more joints can be operated effectively and efficiently
38 with elastic resistance exercises (Page and Ellenbecker, 2011, Yolcu, 2010).

39

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

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

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53 **Material and Method**

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55 **Research Group:**

56 The research group is created by 20 (n = 20) licensed male athletes participating in regular
57 swimming training in Gebze Gençlerbirliği Swimming Club at least 3 days, and have participated in
58 swimming training at least three years. Athletes were divided into random (n = 10) and control (n =
59 10) groups and permissions are obtained from both athletes and their parents.

60

2

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

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

61

62 **Data Collection Tools:**

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64 **Body Length and Weight Measurement:**

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

69

70 **100 m Swimming Test:**

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

79

80 **Collection of Data**

81

82 **Research Plan:**

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

89

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

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

93

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

97

98 **Practice of Training Program:**

99

100 4 licensed male athletes voluntarily participated in the Gebze Gençlerbirliği Swimming Club were
101 randomly assigned to the experimental (n = 10) and control (n = 10) groups. For the experiment
102 group, training programme was applied to the study group for 55-60 minutes for 3 days on
103 alternate days and times when the club does not have swimming training. The implementation of a
104 Thera-Band set is 15 minutes. With a total of 12 different Thera-Band exercises, 40-45 minutes
105 training time has been reached. Control group only participated in their yearly swimming trainings.
106 Their swimming trainings in the annual plans of the Experiment and Control group was not taken
107 into account in the study.

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

110

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
	Lat Pull Down Back	3X10	3X15
Core (center) Zone	Riverse Crunch	3X10	3X15
	Push Ups	3X10	3X15
	Lower abdominal Shuttle	3X10	3X15
	Stomach	3X10	3X15
Sub zone	Hip Extensiyon - Fleksiyon	3X10	3X15
	Hip Abduction - Adduction	3X10	3X15
	Leg Press	3X10	3X15
	Backstroke Adduction	3X10	3X15
Relaxation between movements: 45 sec Resting Between Sets: 3 - 5 min			

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113 **Analysis of Data:**

114 The data obtained in the study were statistically analyzed in the SPSS 21.0 program. Frequency
115 analysis was used as descriptive analysis, number of the samples were less than 30 person, so non-
116 parametric tests were preferred. Mann-Whitney U and Wilcoxon Signed Ranks tests were applied
117 for statistical analysis of pre-test and post-test data in the study.

118

119 **Results**

120

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

121 13 seen in Table 3, as a result of comparing the pre test results of experimental and control group,
122 there were no significant differences statistically ($p > 0.05$). In the post test results, although there
123 was a difference in the averages, statistically significant difference wasn't found ($p > 0,05$).

124

11
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		

$p < 0,05^*$

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Discussion and Conclusion

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

4 licensed male athletes from Gebze Gençlerbirliği Swimming Club participated in this study. They
were randomly assigned to the experiment ($n = 10$) and control ($n = 10$) groups. 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. The implementation of a Thera-Band set is
15 minutes and with a total of 12 different Thera-Band exercises, the duration of training is 40-45
minutes.

For the control group, yearly swimming training programme was followed. Experiment and control
groups' swimming trainings were ignored. The effects of 8 Thera-Band exercises was compared
among groups and within groups. In this section, the findings obtained without investigation are
discussed in the light of relevant literature. Although the swimming time averages of the
experimental group were better than the control group (00: 01: 17ss), statistical analysis showed that
there was no statistically significant difference ($p > 0,05$) when the test 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 ($p < 0,05$). This conclusion indicates that the study is
reached to its purpose. We can say that Thera-Band exercises have an effect 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. Contributing to the development of strength in children,
Thera-Band provides versatile strength development as it can be used in different angles and

162 resistances (Selçuk, 2012). These researchs support the results of our study. Soydan (2006) divided
163 participants into two groups in his study, one group was doing weight training and the other group
164 was exercising with their own body weights. At the end of the study, 200 m Freestyle swimming
165 times were compared in both groups and it was found that they showed similar development. In
166 the same study, it was stated that the athletes in both groups had a significant decrease at 50 m, 100
167 m, 150 m and 200 m transition ratios. Nowadays, elastic bands are used in various activities such as
168 physiotherapy and rehabilitation after injuries, increasing functional capacities of individuals,
169 increasing functional capacities of chronic ailments and athletes. Elastic bands can be used to
170 strengthen certain muscle groups that machines can not function in a certain muscle group, and
171 also allow exercises to develop flexibility and balance (Selçuk, 2014). At the same time, in exercise
172 with Thera-Band, we can say that only the speed and the number of repetitions can be changed to
173 achieve weight loss, body tightness, general strength and conditioning. When the information in the
174 literature is assessed, it is indicated that a well-planned combination of applied swimming and
175 strength trainings are needed to improve strength training and swimming performance (Tanaka and
176 Swensen, 1998).

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

183 **References**

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