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THE EFFECT OF 8 WEEKLY FOOT STRENGTH EXERCISES AND STRENGTHENING EXERCISES ON UNDERWATER DOLPHIN HIT

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ABSTRACT

This study aimed to investigate the effect of 8 weeks ankle flexibility exercises and strengthening exercises on the performance of underwater dolphin in Van Yüzüncü Yıl University. The research group consisted of 10 male swimmers (5 experiments and 5 control group) who were 22-35 years old in Van Yüzüncü Yıl University. The participants were given 8 weeks, 2 days a week, 30 minutes per day, ankle flexibility exercises, isometric strengthening exercises in ankle muscles, resistance stretching exercises and terabant or elastic band exercises. The pre-test and post-test were applied to the ankle flexibility exercises and strengthening exercises were examined under the effect of underwater dolphin stroke. Length, weight, 3 meters, 5 meters and 7 meters, underwater dolphin grades were taken before and after the training. After the 8-week training program, Paired-Samples t-test was used for the pre-test and post-test analysis of the experimental and control groups. The data were analyzed with SPSS 17.0 package program. As a result of the analysis, the difference between the pre- and post-test scores of the 3 and 7-meter performances of the experiment group as a result of underwater dolphin stroke was found to be statistically significant ($p < 0.05$). The difference between the pre- and post-test of the 5-meter underwater dolphin stroke was not statistically significant ($p > 0.05$). As a result, it can be said that 8-week ankle flexibility exercises and strengthening exercises make a positive contribution to the underwater stroke.

Keywords: Flexibility, dolphin, exercise

1. INTRODUCTION

It is a known fact that sport protects and creates physical and mental health. The kinds of sports that are suitable for the human structure are certainly well chosen and the rules based on science is applied, and if it integrates with education, the human body and soul gains vigour and endurance and even provides its beauty. It is an important factor that can be done without disturbing the order of sport, education and life in human life. Despite the privilege of colour, language and religion, our world is a sport that they apply jointly. It is the swim which is the most beneficial sport to the human body that can gather such beauty and positive developments of the sport. Swimming, in water and above the organs of people in a harmonious movement and human factor as a result of the personal efforts of the result of aesthetic sports and competition in the form of proving the power of experts in the world and our country 's opinions of experts in medicine is such (Guner, 2007). , the defence of the country, sports contacts and the importance of getting rid of accidents by looking at the very old times we see (Bozdogan and Ozuak,2003). Swimming is one of the main sports that provides the opportunity to develop the physical and spiritual characteristics that form the basis of all sports. Skill, coordination, endurance, speed, quickness, flexibility and mobility features by developing self-confidence, friendly play and compete to gain behavior (Urartu, 1994).

1.1. Characteristics of Swimming

Swimming is a set of meaningful movements that an individual makes to cover a certain distance in the water. Sportive swimming is defined as the ability of the athlete to cover certain distances as soon as possible. Swimming branch is a sports branch where the risk of disability is lower than other branches and the motoric features can contribute to the development. In order to achieve sporting efficiency in this branch, the athlete must start sports at an early age, be run by a coach with good technical knowledge, and receive support from the family and school environment. If a swimmer wants to be successful in swimming, he should do regular training with quality training programs and pay attention to rest and nutrition (Gunay, 2007, Selcuk, Cinar, Sarikaya and Oner, 2018).

1.2. Benefits of Swimming

The benefits of swimming can be listed as follows:

- ❖ Enhances heart and lung capacities by strengthening the heart.
- ❖ Improves durability and flexibility.
- ❖ Contributes to the development of muscle and balance properties.
- ❖ Change the physical appearance, regulate the circulatory system.
- ❖ Protects against diseases such as varis.
- ❖ Increases energy usage capacity and contributes to weight control.
- ❖ Reduces stress and tension.
- ❖ In joints such as inflammation of joints and ligaments, less strain is recommended because of the type of exercise.
- ❖ Can be used for physical and rehabilitation purposes by treating muscle weakness.
- ❖ It is especially useful in individuals with weight problems, pregnant and inactive people (Celebi, 2008).

1.3. Butterfly Swimming Technique

Butterfly swimming technique; it is a swimming technique where both arms are used at the same time and both feet are used in the same plane and foot strokes are called dolfin (Özlü, 2012).

The body position is close to the horizontal. The foot stroke movement was taken from the dolphin swimming form and named as f dolfin. Dolfin movement consists of up and down foot strokes at the same time with legs closed, both feet inward. Movement, waist, hips and legs participate in a coordinated manner. In the butterfly technique, the movement of the arms consists of both arms being thrown forward from the outside of the water at the same time and pulling back from the water in a similar manner to the letter S. Two foot strokes are performed at each arm cycle. Top; it enters the water before the arms in coordination with the arm movement and exits the water before the arms. The number of breathing varies according to the desire and the distance to swim (Selcuk, 2013).

2. INDIVIDUALS AND METHOD

2.1. Subjects

The research group consisted of 10 male swimmers, 5 experimental and 5 control groups, aged 22-35, who were trained in swimming at Van Yüzüncü Yıl University. Ankle flexibility exercises, isometric strengthening exercises around the ankle muscle groups, resistant stretching exercises and teraband or elastic band exercises were applied to the participants for 8 weeks, 2 days a week and 30 minutes a day. Height, weight, 3 meters, 5 meters and 7 meters, underwater dolfin degrees were obtained from the athletes before and after the training. Paired-Samples t-test was used for the analysis of the participants. The data obtained were analyzed with SPSS 17.0 package program.

Anthropometric Measurements: Height Measurement: A wall scale with a sensitivity of 0.1 cm was used for height measurement. The athletes' feet were bare or the measurement was made with socks whose thickness could be ignored. During this measurement, it was ensured that no object could affect the

measurement at the beginning of the athletes. While taking measurements, the body and head are upright, the soles of the feet are on the ground and adjacent to the scale, arms are freely hanging from side to side. Under these conditions, the length value on the scale was read. The obtained value was recorded with a sensitivity of 0.1 cm (Ozer, 1993). Weight measurement: 0.1 kg weighing scale was used for this measurement. There were no clothing that would affect the weight of the athletes. The athletes stood on the scale, looking upright, and the reading was recorded in kg (Ozer, 1993).

Training Program: Regular ankle stretching and exercises were applied to the experimental group 2 days a week (Wednesday, Saturday) for 8 weeks. 20 minutes of warm-up exercises were applied in each exercise. 10 minutes of warm-up exercises, 10 minutes of mobility and flexibility were used. The main stage in the training of the experimental group lasted 25-30 minutes. In addition to working with various materials, ankle stretching and ankle strengthening exercises were applied to the swimmers. After the training, swimmers were given active and passive stretching exercises and cooling exercises.

Ankle flexibility exercises: Flexibility; the ability of the joints to move fully, without limitation of movement and pain. This exercise includes active / passive range of motion (A / P ROM) and stretching exercises. The athletes are allowed to move the ankle back and forth in a sitting position with the trunk 90°. At another stage, stretching exercise was performed in the same position with the ankles right and left and back and back (Ofluoglu, 2014).

Isometric strengthening exercises in the ankle muscle groups: In this strengthening exercise the athletes' feet were held against a resistance. The ankle was then moved up and down. At another stage, the athletes were left with their feet at a 45° angle to the wall. The trunk was held in a 90° angle to the ground. Afterwards, the ankles were moved up and down and left for 5-10 minutes (Can and İkiz, 2013).

Resistant Stretching Exercises: Sandbags weighing 5 kilograms were attached to the ankle tips of the athletes. At another stage, the ankle was moved up and down with these sandbags (Ofluoglu, 2014).

Terrabant or elastic band exercises: Exercises with terrabants or elastic bands are important because they also include eccentric contractions. For this reason, the elastic band is attached to the ankles of the athletes and the other side of the band is tied against a resistance. Afterwards, the ankles were moved and stretched in various directions and ankle strengthening work was provided (Selcuk, 2013).

3 Meters, 5 Meters, 7 Meters Test: The first 3 meters performance of the swimmers under the breath of dolphin (undulation) movement underwater without breathing, 5 meters performance lastly 7 meters performance with hand stopwatch (Fastime 29 DRA-V11) was recorded.

Foot Biomechanics: Ankle movements mostly refer to tibial and subtalar joint movements. The basic movements of the ankle are flexion and extension. There is no rotation between primary movements. The mechanical axis of the ankle passes between the ends of the internal and external malleolus. Due to the oblique position of the ankle axis, rotation of the foot occurs secondary during flexion and extension. In the ankle, joint, mean dorsal flexion is 20° and plantar flexion is 36°. The rotation width of the foot is 19–20° depending on the degree of flexion. For normal walking, at least 10° dorsiflexion and 20° plantarflexion are needed (Akdogan and Ates, 2016).

3. FINDINGS

Table-1 Age, Height and Weight Distributions of Experimental and Control Groups

VARIABLES	Experimental Group	Control Group
	N=5 X±SS	N=5 X±SS
AGE	24.40 ± 3,20	27.40 ± 5,50
HEIGHT	180.60 ± 0,07	179.20 ± 0,06
WEIGHT	72.40 ± 7,86	75.20 ± 5,35

Table-2 Test Group Test Analysis

VARIABLES		N	Mean	S.S	t	P
THREE METRES	PRE-TEST	5	2,31	0,35	5,96	0,04
	POST-TEST	5	2,236	0,35		
FIVE METRES	PRE-TEST	5	5,54	0,39	4,18	0,14
	POST-TEST	5	5,404	0,38		
SEVEN METRES	PRE-TEST	5	8,87	0,52	12,67	0,00
	POST-TEST	5	8,57	0,51		

In Table 2, a statistically significant difference was found as a result of the comparison of the 3-meter pretest and post-tests of the experimental group and the 7-meter pretest and post-test results ($p < 0.05$). As a result of the comparison of the 5-meter pre- and post-test results of the experimental group, no statistically significant difference was found ($p > 0.05$).

Table-3 Control Group Test Analysis

VARIABLES		N	Mean	S.S	t	P
THREE METRES	PRE-TEST	5	2,418	0,23	0,956	0,393
	POST-TEST	5	2,452	0,3		
FIVE METRES	PRE-TEST	5	5,774	0,33	0,473	0,661
	POST-TEST	5	5,786	0,35		
SEVEN METRES	PRE-TEST	5	9,336	0,65	2,175	0,095
	POST-TEST	5	9,4	0,69		

In Table 3, no statistically significant difference was found as a result of the comparison of the test results of the control group ($p > 0.05$).

4. CONCLUSION

The effect of 8 week ankle flexibility exercises and strengthening exercises on underwater dolphin strokes of male students studying at swimming faculty in Van Yuzuncu Yıl University was investigated. According to the results of the analysis, a statistically significant difference was found between the 3-meter and 7-meter pre-test and post-test average results of the experimental group ($p < 0.05$). Good ankle stretching and strengthening exercises give the athlete more load, while at the same time providing more efficient and good technical movements. In terms of sports performance, it can be said that a good productive study applied to the areas where the lower extremity is weak gained great importance for the swimmer.

In a related study, a significant improvement was observed in all parameters of isokinetic and proprioceptive exercises with ankle functional instability (Cankurtaran, 2011; Sarikaya, Cinar & Selcuk, 2016).

In his studies, he says that Strengthening with Flexibility Exercises will create a significant improvement and strengthening difference in individuals and will lead to better quality and efficient performance. These studies will allow athletes to acquire efficient and quality technical behavior by using less energy. As a result, the performance of the athletes in the competitions will be productive and positive (Ofluoglu, 2014).

An ankle sprain is the most common form of injury in volleyball, and KAI is the most common type of injury that affects performance and sport continuity in volleyball as a result of recurrent ankle sprains. Injuries to the ankle lateral ligament complex are associated with mechanical imbalances and; Peroneal muscles and tendons, superficial peroneal nerve, ankle joint proprioceptors due to injuries caused by functional imbalances characterized by neuromuscular dysfunction caused by increasing the susceptibility to an ankle injury for these reasons, he said KAI (2018).

Yamanerand colleagues (2009) reported that amateur and professional footballers were generally exposed to lower extremity injuries; they are seen as sprains, stresses, injuries, contusions (Yamaner et al, 2009). Therefore, it is possible to say that ankles prevent possible injuries with efficient stretching and quality exercise.

The importance of stretching and strengthening the central region (lower extremity) in daily life and in improving sports performance is emphasized in other sources in the literature. Unlike physical activities carried out on land, swimming in an environment where the effect caused by gravity is considerably reduced provides the athlete convenience on the vertical axis, and the fact that the activity is performed in a more intense environment than the air emerges as resistance to the swimmer. For this reason, the performance in swimming depends on the relationship between the pushing force generated by the swimmer and the resistance of the water to the swimmer (Yapici and Cengiz C, 2015; Pancar, Ozdal, Sarikaya & Cinar, 2018). Clearly, well developed core region provides strong and high quality body rotation (Gonener, Demirci, Gonener, Ozer & Yilmaz, 2017; Sarikaya, Selcuk, Gencer, Temur and Onturk, 2017; Turgut, Argun & Sarikaya, 2014;).

As a result, it can be said that 8-week ankle flexibility exercises and strengthening exercises make a positive contribution to underwater dolphin stroke.

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