For cited: *Göksu, Ö. C. (2018). Effect on Flexibility Development of 8 Weekly Dynamic Strength Exercises Applied to 10-12 Age Male Swimmers. Journal of Strategic Research in Social Science, 8 (2), 155-170.*

Journal of Current Researches on Social Sciences (JoCReSS)
www.stracademy.org/jocress
ISSN: 2547-9644

Year:2018
Volume: 8
Issue: 2

Research Article/Araştırma Makalesi

Crossref doi: 10.26579/jocress-8.2.11

Effect on Flexibility Development of 8 Weekly Dynamic Strength Exercises Applied to 10-12 Age Male Swimmers*

Ömer Can GÖKSU[1]

Keywords
Male Swimmers, Flexibility, Dynamic Strength Exercise.

Abstract
The purpose of this study was to examine the effect of 8-week dynamic stretching exercises on flexibility development in 10-12 year old male contestant swimmers. The study was carried out voluntarily with 20 contestants participating trained in water and field training on average 12-18 hours a week. . Subjects were divided into two gruops, these were 10 swimmers for experimental group from Galatasaray sports Club, with age of 11,08±0,7 years, body weight of 37,08±4,8 kg and height of 150,8±8,6 cm and 10 swimmers for control group from Yeşilyurt Sports Club; with age of 10,08±0,8 years, body weight of 38±3,3 kg, height of 148,8±6,5 cm. For the experiment group, 12 predetermined stretching movements for 3 days per a week and during 8 weeks were performed in the warming section of the workout as 2 repetitions and 30 seconds. During this 8-week period, the control group continued their swimming and field work without doing a flexible exercises. Flexibility values were measured before and after the exercise program without any warm-up working, with the aim of determining the basic flexibility twice; shoulder flexion, shoulder posture, trunk flexion, trunk flexion, hip flexion, hip flexion, dorsi flexion and plantar flexion flexibility were measured between 16.00 and 18.00 hours. The study was done as a pre-test-post test model and comparison of experimental-control groups.The body flexibility values of all subjects participating in the study (experimental-control group) were recorded. Statistical analysis of the obtained data was performed using SPSS 11.0 for Windows package program. Paired Samples t test was used for intra-group comparisons and Independent Samples t tests were used for intergroup comparisons. Significance levels of differences between the measurements were examined and $p < 0.05$ and $p < 0,01$ significance level. As a result; 10 of the participants in the experimental group participated in the study, as a result of 8 weeks of dynamic stretching exercises; right-left shoulder flexion-extension, right-left hip flexion-extension, right-left plantar flexion flexibility values were found to be statistically significant both within the group and between the groups. While it was determined that the values of dorsi flexion flexibility in the right and left feet were increased only statistically as a result of the intra-group comparisons, it was found that the difference between the right and left shoulder extensibility flexibility values was not significant between both groups.

Article History
Received
15 May, 2018
Accepted
23 June, 2018

---

* This article modifyied and enlarged version presented in 8th International Conference of Strategic Research on Scientific Studies and Education (ICoSReSSE) which held in Vienna University, Vienna-Austria from 11 to 13 May 2018.

[1] Corresponding Author. Istanbul University Faculty of Sports Science, omercangoksu@gmail.com

1. Introduction

It is known that flexibility in the success of sporting events is important. Flexibility is seen as an anatomic skill with less scientific work than other biomaterial features. The work that is being done is focused especially on gymnasts, volleyball players, swimmers and wrestlers. With the influence of new researches done, the importance of flexibility is increasing day by day. Flexibility studies have become an indispensable part of the training process in terms of maintaining the natural flexibility of the joints, increasing productivity and eliminating the risk of injury. Flexibility is considered a factor that directly affects performance. Because this feature is intertwined with important elements such as force, speed, coordination, mobility (Kıratlı, 2001).

Swimming is, in many ways, different from other sport branches as exercise. The most distinctive difference of swimming sports is the energy expenditure for horizontal movement by using the arms and legs at the same time and separately to stay on the water. The other differences are the factors needed to overcome or minimize the friction that impedes movement in the water. In addition, there is pressure effect on the breathing of the water which makes it difficult to breathe. For this reason, the energy required to swim a distance is four times the energy required to run the same distance. Swimming is not only used for competition sports, but also for leisure time evaluation, strength training, rehabilitation and treatment of some diseases (Güler, 2000).

Swimming has the characteristic of being a sport in horizontal position, in an unusual environment compared to other sports disciplines, in water and in an unusual position. There is a pressure effect on water breathing. This effect is not an effect that facilitates respiration but is a difficult effect. From the other side, the lifting force of the water meets the gravity force. The movement in the water is faced with more resistance than in air, and inspiration and expiration must be adapted to the flaps (Akgün, 1996).

Flexibility is defined as the optimal mobility that joint and muscle tissue makes possible. Because it not only includes the amount of your flexibility, but also the distance and angular extent of the optimal range of motion (Demirel, et al., 1996). It is parts of muscular performance such as flexibility, strength and endurance (Urartu, 1994). Flexibility is defined as the optimal mobility that joint and muscle tissue makes possible. Because it not only includes the amount of your flexibility, but also the distance and angular extent of the optimal range of motion (Demirel,et al., 1996).

Flexibility exercises besides performance determining factors such as durability, strength, speed, coordination should be used in practice as one of the basic motor skills. A large part of the efficiency in the built-up is directly related to the development of the level of flexibility. Factors that determine the efficiency of elasticity include joint capsule, muscle mass, joint structure, tendon retreat grade, ligaments, skin play an important role in childhood (Urartu, 1994). Muscle capsule, muscle mass, joint structure and tendons, ligament and skin tension levels have a significant contribution to the flexibility development (Guyton, 2013). A decrease in muscle viscosity with an increase in flexibility has a positive effect on

the coordinative function of the neuromuscular system (Karabina & Pirselimoğlu, 2012).

Besides the hand and leg joints of the swimmers, the range of motion also concerns the knee, skeletal structure and ankle joints. Muscle structure and joints take an important place in the application of movements. Stretching exercises made before swimming training increase the flexibility of muscles and joints (Saygın, et.al., 2005).

Our country; the geographical structure of a peninsula surrounded by water on three sides makes it impractical to have any success in the international branch of swimming today. In our country, which has no uncommon possibilities in terms of physical possibilities today, we should give more importance to the scientific studies related to the swimming branch and we have to be in the countries having the promise in this sports field in the international arena. Scientifically framed training programs will be possible with a good selection of talent and the training of trainers who are fully equipped in every sense.

2. Materials and Methods

In the study, the experimental group had 3,3 ± 7.9 years of swimming training in Galatasaray Sports Club, average age; 11,08 ± 0,7 years, body weight average of 37,08 ± 4,8 kg, and height average; 150 ± 8.6 cm. The control group is; 3,3 ± 11,1 years swimming training in Yeşilyurt Sports Club; The average age; 10,8 ± 0,8 years, body weight average of 38 ± 3,3 kg and average height; 148,8 ± 6,5 cm. A total of 20 young men participated in the survey as volunteer swimmers.

The research was done in the format of pre-test-post test model and comparison of experimental-control groups. Firstly, all selected subjects (experimental-control group) were recorded by taking body elasticity values. Experimental and control groups were instructed to practice 8 weeks of land and swimming training for 12-18 hours a week. Experiment group; In addition to these 8-week training sessions, 12 different stretching exercises were applied 3 days a week. Each movement was repeated 3 times and for 30 seconds (figure 7)

During this 8-week period, the control group did not perform flexibility exercises, and continued swimming and field training. At the end of 8 weeks, the second measurements from the experimental and control groups were taken and evaluated statistically.

The flexibility measurements in the study were taken between 16.00 and 18.00 hours, without any warm-up work, as it was intended to determine the basic flexibility. The received flexibility values were repeated at least three times for each measurement and the best value was obtained.

In the research, voit brand gymnastic crown, chalk, Leon steel meter for size measurement and Tefal brand digital scale with 0.1 kg error rate were used to determine body weights. CYBEX Elektronic Digital Inclinometer 320 (CYBEX EDI 320) goniometer was used to determine the elasticity values of the body extremities. The CYBEX EDI 320 contains a section of the moving segment that displays the value of the angle at which it is moving during and at the end of the move.

The starting and ending positions were taken into account when measuring the width of the motion. The starting position is the anatomic position or the specific position of the movement-specific joint and segment. The initial position value seen on the monitor is zero in both cases. The end position is the last state that the joints and muscles can reach. The value on the monitor is fixed. Thus the flexibility value of the movement is recorded in degrees. Eight different parametric measurements were taken for this study:

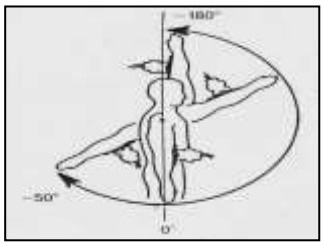
Shoulder Flexion

Start Position: The arms of the denture stand in the normal position, with palms facing the body.

Instrument Placement: The proximal end of the forearm and its front face are placed parallel to the radius.

Movement: Forward flexion (figure1)

Figure 1: Forward flexion - Rear extension



Shoulder Extension

Start Position: The arms of the denture stand in the normal position, with palms facing the body.

Instrument Placement: The proximal end of the forearm and its front face are placed parallel to the radius.

Movement: Rear extension (figure 1)

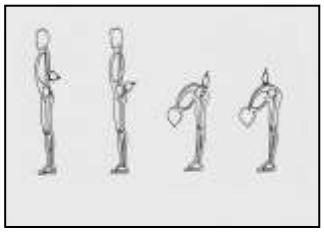
Body Flexion

Start Position: The arms of the subject are standing in the normal position, with the palms facing the body.

Placement: Thorax (T) 12 - Lumbar (L) 1, parallel to the waistbone

Movement: forward flexion (figure 2)

Figure 2: Forward flexion



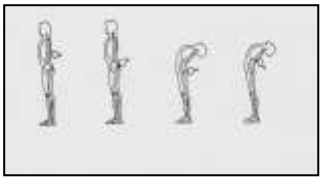
Gövde Ekstansiyonu

Start Position: The arms stand in the normal position, with the palms facing the body.

Placement of the instrument*:* Thorax (T) 12-Lumbar (L) 1, parallel to the backbone

Movement: Ekstension to the back (figure-3)

Figure 3: Ekstension to the back



Hip Flexion

Start Position: The knee joints are on the side, the legs are in the normal position, the knees are stretched, the back lies on the back.

Placement of the instrument: To the front and upper part of the thigh, parallel to the femur

Movement: Frontal flexion (figure-4)

Figure 4: Frontal flexion

Hip Extension

Start Position: Arms are on the side, the legs are in the normal position, the knees are stretched, the face lies down.

Placement of the instrument: To the back of the thigh and to the upper part, parallel to the femur

Movement: Back ekstension (figure-5)

Figure 5: Back ekstension

Dorsiflexion

Start Position: Your feet are in normal position

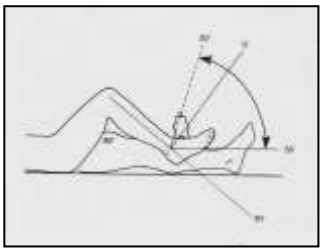
(approaching the tibia at right angle), the knees are

twisted on a 90 degree angle. The other foot is stretched forward taut.

Placement of the instrument: The dorsal side of the middle part of the foot, parallel to tibia

Movement: Flexion towards the tibia (figure-6)

Figure 6: Flexion towards the tibia



Plantar Fleksiyon

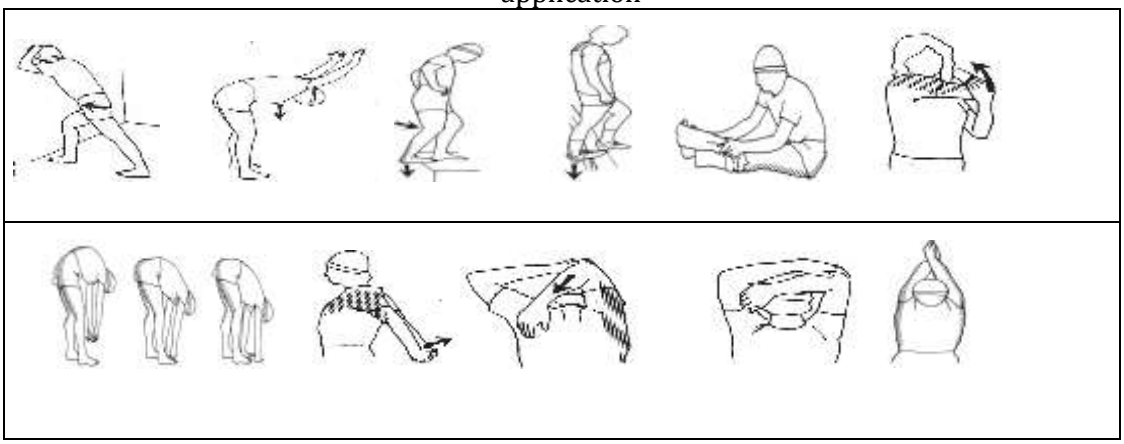
Start Position: The knee is lying on a twisted back posture at a 90-degree angle, with the feet of the examinee in the normal position (approaching the tibia at the right angle). The other foot is stretched forward in a taut manner.

Instrument Placement: The dorsal face of the middle part of the foot, parallel to the tibia

Movement: The flexion away from Tibia (figure-6)

Recommended Stretching Movements

Figure 7: Dynamic stretching exercise models applied to the experimental group and its application



2.1. Statistical Analysis

Statistical analysis of the obtained data was performed using SPSS (Statistical Package for Social Scientist) 10.0 for Windows package program. For this purpose, $p < 0.05$ and $p < 0.01$ significance level were examined using Paired Samples t test and Independent Samples t tests.

2.2. Results

Table 1: Average General Values of Groups

Variables	n	Age	Weight	Height	Training Age
		X±SD	X±SD	X±SD	X±SD
Experiment	10	10,7±0,8	41,9±7,2	153,2±6,15	3,1±11,2
Control	10	11,1±0,8	40,8±6,3	154,2±6,08	3,3±8,8

Table 2: Comparison of Right and Left Shoulder Flexion and Extension Values Obtained After the 1st and 2nd Measurements of Experimental and Control Groups and Comparison of These Values

	Groups	1st Measurement	2st Measurement	T Value
		X±SD	X±SD	
Right Shoulder Flexion	Experiment	180,2±7,8	187,8±8,4	**-6,219****
	Control	178,8±4,6	181,1±4,3	**-4,445***
	T	0,485	2,230	
Left Shoulder Flexion	Experiment	178,9±8,2	189,2±8,7	**-5,641****
	Control	178,9±5,1	180,6±4,9	**-4,019***
	T	0,000	2,702	

	Groups	1st Measurement	2st Measurement	T Value
		X±SD	X±SD	
Right Shoulder Ext.	Experiment	69,7±12,8	84,3±7,4	**-5,226****
	Control	82,3±6,5	83,9±5,9	-2,954
	T	-2,754	**6,016****	
Left Shoulder Ext.	Experiment	67,7±12,9	85,6±8,4	**-6,939****
	Control	82,2±6,2	83,9±5,8	0,693
	T	**-3,195***	**5,433****	

** $p<0.01$, * $p<0.05$

Experimental and control groups participating in the study evaluated the values of right and left shoulder flexion and extension values in swimming groups I and II. the values obtained after the measurements, the arithmetic mean, the standard deviation and the significance levels of the differences between the groups are given in Table 2. As a result of statistical evaluation; It was found that the 8 week stretching exercises significantly increased the right shoulder flexion and

extension values and the left shoulder flexion and extension values of the sportsmen in the experimental group according to the first measure (p <0,01.

In the control group, there was a significant difference in right-left shoulder flexion values by 0,05 significance level and no significant difference was found between right shoulder extensor values (p> 0,05). As a result of comparison between experiment and control group, right-left shoulder flexion and right shoulder extensions values I and II. There was no significant difference in the results of the measurements (p> 0,05). in the left shoulder extensions values, the athletes in the experimental group had higher values (p <0.05). After the second measurements, the right and left shoulder extensions values of the athletes in the experimental group were found to be higher statistically (p <0,01) (Table: 2).

Table 3: Trunk Flexion and Extension Values Obtained After Measurements 1 and 2 from the Experimental and Control Groups and Comparison of These Values

	Groups	**1st Measurement**	**2st Measurement**	t.
		X±SD	X±SD	
Trunk **Flexion**	Experiment	84,5±22,1	87,3±20,2	-2,129
	Control	72,6±15,6	73,7±15,2	-3,498
	T	1,390	1,700	
Trunk Extens.	Experiment	25,8±4,9	30,0±4,3	**-5,250****
	Control	22,8±4,3	23,3±3,9	-1,861
	T	1,443	**3,598***	

** p<0.01, * p<0.05

Arithmetic mean, standard deviation, and T-values and significance levels of the differences between the groups are given in Table 3, after the 1st and 2nd measurements of the body flexion and extension values of the swimming and control groups participating in the study. The difference between the first and second measurements of body flexion values in group and group comparisons was not significant (p> 0,05). While the difference between the first and second measurements of the body extensions values was significant for experimental group (p <0,01), no significant difference was found in the control group (p> 0,05). After the second measurement, the body extensions of the experimental group were found to be statistically higher than those of the control group (p <0,05).

Table 4: Values of Right and Left Hip Flexion and Extension Values Obtained from the Experimental and Control Groups after 1st and 2nd Measurements and Comparison of Their Values

	Groups	1st Measurement	2st Measurement	T Value
		X±SD	X±SD	
Right hip Flexion	Experiment	77,5±11,7	89,6±9,2	**-5,791****
	Control	73,9±10,0	75,9±9,2	**-6,000****
	T	0,762	2,928	
Left hip Flexion	Experiment	76,5±8,8	88,9±8,5	**-5,580****
	Control	73,9±8,6	75,4±10,1	**-4,025***
	T	0,541	**3,209***	

	Groups	1st Measurement	2st Measurement	T Value
		X±SD	X±SD	
Right Hip Extension	Experiment	33,6±8,8	41,9±5,9	**-5,146****
	Control	31,0±5,1	32,0±4,1	-2,372
	T	0,843	**4,328****	
Left Hip Extension	Experiment	33,2±6,9	41,1±6,4	**-5,700****
	Control	31,0±4,5	31,9±4,2	-2,753
	T	0,801	**3,799****	

** p<0.01, * p<0.05

Arithmetic mean standard deviation values of the data obtained after the first and second measurements of the right and left hip flexion and extension values of the experimental and control group swimming participated in the study and the significance levels of the differences between the groups are given in Table 4. After the first measurements, there was no significant difference between right and left hip flexion and extension values of the athletes in the experimental and control groups (p> 0,05). However, in both the first and second measurements of left and right hip flexion values, there were significant differences in both experimental and control groups (p <0.01, p <0.05). As a result of comparison between the groups, it was determined that the left hip flexion values were higher in the experimental group. (P <0.05). Similarly, there was no significant difference between the groups in the first measurements, while the difference between the first and second measurements of the experimental group was significant. As a result of the comparison of the second measurements between the groups, the right and left hip extensor scores of the experimental group were found to be higher (p <0,01).

Table 5: Values of Right and Left Foot Plantar, Right and Left Foot DorsiFlexion-Extension Values Obtained from the Experimental-Control Groups After the First and Second Measurements and Comparison of These Values

	Groups	1st Measurement	2st Measurement	T Value
		X±SD	X±SD	
Right Foot Plant. Fexion	Experiment	55,8±9,5	64,9±5,3	**-4,789****
	Control	57,4±9,82	58,4±9,2	-1,539
	T	-0,370	1,918	
Left Foot Plant. Flexion	Experiment	54,2±9,1	66,3±5,9	**-5,866****
	Control	58,3±9,9	59,0±9,3	-1,561
	T	-0,959	2,080	

	Groups	1st Measurement	2st Measurement	T Value
		X±SD	X±SD	
Right Dorsiflexion	Experiment	33,8±3,1	39,1±4,7	-3,572
	Control	35,1±8,6	35,1±8,2	0,000
	T	-0,447	1,288	
Left Dorsiflexion	Experiment	33,7±5,1	38,0±4,8	**-3,998***
	Control	36,3±8,7	36,3±8,6	0,000
	T	-0,814	-0,423	

** p<0.01, * p<0.05

The significance levels of the data obtained from the first and second measurements of right and left leg dorsiflexion values, arithmetic mean, standard deviation and difference between experimental and control groups are given in Table 5. There was no statistically significant difference (p> 0.05) between the groups of the right and left plantar flexion and the groups of the right and left leg dorsiflexion values (experimental group - control group). In the group comparison, there was no significant difference between the first and second measurements of the left leg dorsiflexion of the experimental group (p> 0,05). There was also a significant difference between the left leg plantar flexion and the left leg dorsiflexion values (p <0,05) . No significant difference was found between any of the first and second measurements of the control group after intra-group comparison (p> 0,05),

3. Discussion And Conclusion

The study was conducted to investigate the effect of 8-week dynamic stretching exercises on flexibility development in 10-12 age group contestant male swimmers. The experimental and control groups selected for the study were found to have similar age, body weight, height and training age averages.

As a result of comparison of the first measurements between the groups, it was found that the control group had a higher left shoulder strength value than the experimental group and this was statistically significant ($p < 0,05$).

As a result of comparing the measured values of the athletes of the experimental-control (inter-group) group after the second measurements; right-left shoulder extension for the athletes in the experimental group; 0.01, trunk extension and left hip flexion; 0.05, right - left hip flexion; 0.05 and right - left hip extension values were found to be higher than the control group at significance level of 0.01. From here; it can be said that the above mentioned parameters have a positive effect on the experimental group depending on the effect of the flexibility exercises.

As a result of the first and second measurements; left and right shoulder flexion values and right - left hip flexion values of the experimental group were compared with those of the experimental group and the right and left shoulder extension of the experimental group and the body extension of the experimental group, right - left hip plantar flexion and right leg plantar flexion and left leg dorsiflexion statistically significant differences were found between the parameters indicated after the intra-group comparisons of the first and second measurements of the values. From this, it was determined that there was more flexibility in the parameters especially in the experimental group after the studies.

As a result of the comparison of the second measures between the groups; the values of right - left shoulder extension ($p<0,01$), trunk extension ($p<0,05$), left hip flexion ($p<0,05$), right - left hip extensions ($p<0,01$) were found to be higher in the experimental group.

Flexibility is an important parameter in achieving strength and speed as well as forming a spartan aesthetic. Flexibility is a work that can shorten the swimming time by increasing the speed of the swimmer. This improvement is achieved by increasing the applied force by distance and level. Lewin (1979) reported body regions that should be given special emphasis to improve flexibility to improve swimming performance. These regions are; ankles, spine, shoulder and knees (Güler, 2000). It is stated that frog-style swimmers should have good dorsiflexion at the source (Alpar, 1998).

It has been observed that 10-week dynamic stretching exercises improve sitting-stretching flexure, arm, knee and shoulder flexion and extension, hip extension, torso. There is no significant change in flexion and extension, bridge flexion, hip flexion rates. In conclusion, it is indicated in a study investigating the effects of dynamic stretching exercises on elasticity, which can be achieved during the warming phase of the training (Döver, et.al.,2005).

The fact that the training programs that will help the formation of the force are not supported by the flexibility studies and the inadequacy of the flexibility program which is prepared also affects the achievement of the highest performance of the athlete in the negative direction. Because flexibility is seen as a great help in the use of strength and speed at the highest level. In addition, the flexible muscles are less injured in sudden force applications (Alpar, 1998).

Reasons why increased joint flexibility contributes to time. Increased mobility in some joints leads to more efficient traction mechanics. In some joints, the increase in the range of motion leads to less flexibility in horizontal and lateral traction, and

therefore an increase in traction. The increase in mobility is stated as the reduction of energy loss because the movement will reduce internal resistance (Alpar, 1998).

In order to achieve the highest efficiency from a swimmer working in a particular swimming style, the swimmer is first to benefit from the physical strength of that swimmer. However, depending on the swimmer's style, the joints in the more frequently used regions require greater freedom of movement. For example, arms and legs may need to reach the range of motion to the extent possible. In this case, the joints should not be forced unnecessarily even a single joint and should be flexible enough to allow the extremities of the swimmer to always be directed in the most efficient way. The point you should not forget here is that your flexibility varies according to the sport branch or the lower branches of a sport branch. It is the swimming style that determines this when swimming. Therefore; for example, the butterfly and the free-standing swimmer must be capable of lifting their elbows upwards without unduly pushing the shoulder joints during the withdrawal phase (Alpar, 1998).

The shoulder and wrist flexibility is advantageous for all styles. For example, the success of supine swimmers in underwater traction is dependent on shoulder flexibility. Butterflies and free tech swimmers need a shoulder flexure in the direction of water withdrawal (Alpar, 1998) .

In a work done; It was reported that there was a significant negative correlation between the shoulder flexure of the 12-14 age group female swimmers and the 100m freestyle swimming performance values (Galedas, et al., 2005).

Twenty-four girls and 24 children aged 9 to 12 years were determined to have a significant improvement in flexibility levels and a significant reduction in 25-meter freestyle swimming in a six-month training program. (Günay, 2007).

In another study of 68 students in the 11-12 age group, hip flexion and extension were found to be a significant improvement in pre-test results and a significant difference in the control group before the flexibility study in the exercise group in shoulder flexion. There was a significant difference between the groups in the results of the post-test of hip extension and shoulder flexion, and the pre-test results of hip flexion in the exercise group, but there is no significant difference in shoulder extension results (Müftüoğlu, 2105).

On the other hand, ankle flexibility is also required for all swimming styles. Especially; all swimmers who are floating in free, back and butterfly styles must have very good plantar flexion. This particular position of the foot will allow your swimmer to take a better kick, get more driving power and therefore go faster. To improve this flexibility, the lower leg needs to be elasticized by stretching the anterior muscles (heel and finger dorsi flexors). In addition, butterfly and back swimmers need the flexibility to turn inward on the the tip of the thumb. With such flexibility, a more effective repulsive environment is provided during entry and exit of the foot into the water (Alpar, 1998).

The frog style swimmers must have heel flexibility (straightening towards the calf bone of the foot), completely in the opposite direction. Because; keeping your feet flexed forward, as in the free, back and butterfly (dolfin) styles, reduces the driving

force on the frog style. Flexibility in this reverse direction is essential for the frogglers; the feet will make the water repel the backward movement again. To develop such flexibility, the back muscles of the lower leg (gastrocnemius and soleus) need to be stretched (Alpar, 1998).

As discussed above at the basic level, in the flexibility studies the whole body should be considered as a whole and the specific mobility required for swimming should be developed on the basis of general mobility. A body with a knuckle joint, movable and bendable; it is well suited for fluent and wave-like movements in water (Alpar, 1998).

There are two reasons why good swimmers put their flexibility work into their training programs. First; to increase the length of the fibers and the flexibility of the muscles. Longer muscle fibers may produce more strength during muscle shortening. Therefore, flexibility exercises increase the traction ability of the muscles while swimming in the water. The second is; it causes less turbulence in the water and allows the athlete to swim faster. The most important reason why turbulence (friction) occurs during swimming is related to the inability of the body movements to move smoothly in the water. Flexibility exercises increase the proportion of joint movements, allowing the whole body to slide comfortably and smoothly in the water and reduce friction to a minimum. Flexibility allows to the swimmers to float efficiently, smoothly, and swiftly (Hagerman, 2006).

Swimmers must regularly perform flexibility exercises. Flexibility exercises are more important than exercise, especially for beginners. Because the most important elasticity losses are between the ages of 11 and 13, and the natural flexibility of swimming should be emphasized throughout the sport life (www.wandsworthsc.com/).

For the swimmer to move faster, stronger and longer, the movement of the shoulder, spine, knee joint, protection of vital energy and technical development are important. Flexibility training protect swimmers from injuries such as muscle contraction and shoulder joint pain, which are common due to weak flexibility (www.wandsworthsc.com/).

The aim of a swimming is to finish a certain distance as soon as possible. The swimming performance is determined by the time the swimmer finishes the race. Grade is a general evaluation of the athlete's race performance. Degree of swim; respectively, expressed in minutes, seconds, and seconds (Güler, 2000). Flexibility affects the coordinative skills and techniques of the athlete in all cases (Akandere, 1999). This is directly reflected in the performance of the competition.

As a result; 10 male swimmers participated in the study, as a result of 8 weeks of dynamic stretching exercises; right - left shoulder flexion, right - left hip flexion, right - left shoulder extension, trunk extension, right - left hip extension, right - left foot plantar flexion and left leg dorsiflexion were found to be higher in the second measurements. There was no significant difference between the left leg dorsiflexion and trunk flexion values of the athletes in the experimental group. From this it is considered that the increase in flexibility in the above parameters of the swimmers will affect the swimming performances positively and therefore the

flexibility studies should be used in every workout as an important part of swimming training.

References

Akgün, N.; "Egzersiz ve Spor Fizyolojisi". VI. Baskı, Ege Üniversitesi Basımevi, İzmir, 1996.

Akandere, M.; "17–22 Yaş Grubu Kız Sporcuların Esnekliklerinin Geliştirilmesinde Statik ve Dinamik Gerdirme Egzersizlerinin Etkisi", Beden Eğitimi ve Spor Bilimleri Dergisi, 1: 10–15, 1999.

Alpar, R.; "Yüzme ve Sutopu Antrenmanlarının Temelleri", Yüzme Atlama Sutopu Federasyonu Yayın No: 4, İstanbul, 1988.

Demirel, N., Yüktaşır, B., Yalçın, B., Tanesen, B.; "Statik Germe Egzersizlerinin Kız Çocukların Esneklik Gelişimi Üzerine Etkisi", Atatürk Üniversitesi Beden Eğitimi ve Spor Bilimleri Dergisi, 2: 25-30, 2004.

Döver E., Kürkçü R., Yeniçeri M., Can S.," 18-25 Yaş Grubu Bayanlarda Dinamik Gerdirme Egzersizlerinin Esnekliklerine Etkisi" Atatürk Üniversitesi BESBD.7.p.1, 2005. [In Turkish]

Galedas, N.D., Nassis, G.P.,Pavliceviç, G.P.; "Somatic and Physical Traits Affecting Sprint Swimming Performance in Young Swimmers", Int.J.Sports Med., 2005 Mar; 26(2):139-44.

Güler, Ç.; "9-12 Yaş Grubu Yarışmacı Yüzücülerde Eklem Hareket Genişliğinin ve Antropometrik Parametrelerin Yüzme Performansı İle İlişkisi ve Bunu Temel Alan Yeni Bir Esneklik Programının Düzenlenmesi". Doktora Tezi, İstanbul, 2000.

Guyton.A.C., Hall.J.E., Tıbbi Fizyoloji, 12. Baskı, Nobel Tıp Kitabevleri, pp.172-256, İstanbul, 2013.

Günay E., Düzenli Yapılan Yüzme Antrenmanlarının Çocukların Bazı Fiziksel ve Fizyolojik Parametreleri Üzerine Etkisi. Yüksek Lisans Tezi, Gazi Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara. 2007.

Hagerman, P.S.: "Flexibility for swimming", NSCA'a Performance Training Journal, Vol:1 Num:7, www.nsca-lift.org/perform, 01.17.2006.

Karabina.F.,Pirselimoğlu.E.T., Antrenman Bilgisi, 3. Baskı, MEB Yayınları, pp.41-165, Ankara, 2012.

Kıratlı E. ; "Esneklik Antrenmanın Anaerobik Performansa Etkisi"; Gençlik Ve Spor İl Müdürlüğü Bilgi İşlem Servisi; Konya – 2001

Müftüoğlu N.E., Serbest Cimnastik ve Pilates Mat Egzersizlerinin 11-12 Yaş Çocuklarında Omuz ve Kalça Esnekliğine Etkileri. Yüksek Lisans Tezi, Gazi Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara, 2015.

Urartu, Ü.; "Yüzme Teknik-Taktik-Kondisyon", I. Baskı, İnkilap Kitapevi, İstanbul, 1994.

Saygın Ö., Polat Y., Karacabey K.,˝ Çocuklarda Hareket Eğitiminin Fiziksel Uygunluk Özelliklerine Etkisi˝ Fırat Üniversitesi Sağlık Bilimleri Dergisi, 19.pp.205-212, 2005.

http://www.wandsworthsc.com/flexibility.htm, Flexibility For Swimmers/ 01.04.2018.