

AN IN-DEPTH STUDY ON THE EFFECT OF STRETCHING EXERCISES ON THE BODY SCULPTING OF TEENAGE GIRLS OF 11 – 12 YEARS OLD

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Abstract

*This paper starts from the **premises** that flexibility (range of motion and muscle elasticity) can be improved by using stretching type exercises, also contributing to enhancing the movement of individuals.*

*Through the chosen theme, the paper proposes the following **objectives**: improving muscle elasticity and joint mobility acts to increase driving efficiency and enhanced flexibility, in all joints and muscle groups and also the prevention and correction of postural deficiencies (poor attitudes).*

Keywords: *flexibility, mobility, stretching, physical education lesson*

INTRODUCTION

People's concern for improving their physical appearance has always been manifested and has grown with the development of modern society. The general physical development of the human body, as part of optimal health status of man, is evidenced by the development of motor skills. The entire range of motor actions performed by an individual in terms of daily or sporting activity is done correctly and consistently and it is directly related to the degree of development of motor skills. There are numerous concepts, methods and tools for developing motor skills and these eventually lead to achieving physical and mental harmony and hence an optimal state of health. One of the most commonly used methods to create this state of "well-being" is "stretching", which can be practiced anywhere and anytime because it does not require special equipment or sophisticated equipment - it is extremely easy to learn and the results are beginning to show after only a few lessons.

The benefits of stretching exercises largely overlap with the benefits of any sport, inducing the general state of „well-being”, physical and mental relaxation, reducing pain and muscle tension, for both sedentary and sporting people (Dobrescu, 2008).

Stretching-type exercises also present a number of special qualities: they improve tissue flexibility, increase the ability to learn or to perform various movements, reduce the risk of musculoskeletal injuries and causes a higher level of awareness of one's body (Anderson, 2007).

OBJECTIVES

Using stretching exercises type in physical education classes for 11-12 year-old girls, and also during sporting activities or independent activity of schoolgirls, contributes to the following **objectives**:

increasing the degree of flexibility, increasing and maintaining high flexibility, reduce muscle tension, improving the segmental coordination, increased efficiency of motor acts, reducing the risk of injury while performing motor acts, developing the capacity of awareness and coordination of their body, preventing and correcting postural deficiencies, improving the capacity of mental and physical relaxation etc.

HYPOTHESIS

In the formulation of the **hypothesis**, it is assumed that if during the physical education lessons, the sports hours or the independent activity of 11-12 year-old schoolgirls proper stretching type exercises are used, this improves the flexibility of individuals, and better results can be obtained in the acquisition and development of different specific motor acts and this contributes to the prevention and correction of postural deficiencies.

MATERIALS AND METHODS

a. Research protocol

The research was conducted at the No. 33 Secondary School of Galati, between 16.01.2012 and 3.06.2012 (6 months), in the gym for two hours a week, each of 50 minutes.

b. Subjects

The work sample was represented by 16 pupils (girls) in the fifth grade, aged between 11 and 12 years.

c. Groups

The experimental group (EG) and control group (GC) consisted each of 8 students from grades 5A and 5B. Both groups benefited from the same conditions during the lessons, and the same basic material.

d. Assessment tests

The mobility indicators that were tested were as follows:

* *Coccyx - femoral mobility in the previous plan* (the gym bench was used, and also a ruler graded in centimeters - the point 0 is the surface of the bench, and above and below the gym bench there are gradations from 1 to 50 cm). The performer is in a sitting position with the trunk bent on the gym bench, and their fingertips sliding along the graded ruler – they maintain the position for 2-3 seconds for the data to be recorded. The records above the 0 level are calculated with "-" (minus), while the records below the 0 level are calculated with "+" (plus) - (**M_A**);

* *The mobility of the spine in a sideway plan* (a graded ruler was used – the performer has their body bended in a sideway plan with the palm sliding along the ruler – they maintain the position for 2-3 seconds - the number of inches above the 0 level are taken into consideration) - (**M_L**);

* *The mobility of the spine in a back plan* (the performer makes the gymnasts' bridge from the floor - the distance between the supporting legs and palms is measured and taken into account) - (**P**);

* *Coccyx - femoral mobility in the front plan* (the gymnastics exercise known as the lateral string is performed - the distance from the ground

to the bottom of the pubis is measured in cm and taken into consideration) - (**S_L**);

* *Coccyx - femoral mobility in the sagittal plan* (the left leg string is performed) - (**S_S**);

* *Coccyx - femoral mobility in the sagittal plan* (the right leg string is performed) - (**S_D**).



e. Types of complexes of exercises


After the analysis of the initial test results recorded for GE it has been developed and implemented an experimental training program with stretching type exercises for developing suppleness children of 11-12 years of secondary school, tracking also the overall physical development and the selective influence of the locomotor apparatus.

The experimental training program for developing the female students' suppleness was divided into three complexes of stretching type exercises staggered over three months (4 weekly cycles - 8 lessons) 10 exercises being executed by in each complex, about 10 minutes / lesson.

No.1 complex of exercises was proposed between February 13th and March 11th, 2012 and included stretching type exercises of low-difficulty in order to initiate individuals - Table I.


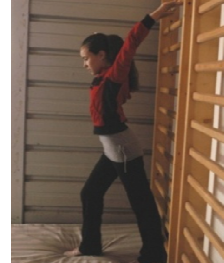

Table I Types of low-difficulty stretching exercises

No. 1 Complex of Exercises		
<i>Description of exercise</i>		<i>Dosing</i>
<p>P.I. Standing slightly apart <i>Action and final position</i> - twisting the torso to the right, and simultaneously raising backwards the right arm, with the opposite arm bent forward at the level of the right shoulder - fig. 1</p>		<p>- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also in the opposite way</p>
<p>P.I. Standing slightly apart <i>Action and final position</i> - bending the head to the left simultaneously with the left arm bent, hand on the crown with pressure - fig. 2</p>		<p>- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also in the opposite way</p>

<p>P.I. Placed on knees and heels <i>Action and final position</i> - right/ left arm stretched to the left / right, parallel to the ground, and the other arm bent at the level of the elbow of the opposite arm - pressure in the stretched arm - fig. 3</p>		<p>- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also by changing the arms' position</p>
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No. 2 complex of exercises ran from March 12th to April 8th, 2012, and the exercises used had an average degree of difficulty - Table II.




Table II Types of medium-difficulty stretching exercises

No. 2 Complex of Exercises			
<p>1.</p>	<p>P.I. Standing slightly apart, with the left / right arm bent over, and the right / left arm bent underneath, fingers crossed at the back. <i>Final action and posture</i> - back extension with the arms bent backwards and with the hands caught by the fingers – fig. 4</p>		<p>- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also by changing the arms' position</p>
<p>2.</p>	<p>P.I. Standing with the back on a fixed scale, arms up and crossed over the head <i>Action and final position</i> - High lunge forward with the left / right foot, simultaneously with the extension of the back - maintaining the position 8 seconds, 3 reps, pause 8 seconds - fig. 5</p>		<p>- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also with the opposite leg</p>
<p>3.</p>	<p>P.I. Standing with the right / left shoulder towards a fixed scale, with the arm opposite the fixed ladder up, grabbed by an overhead stage, and the other arm, bent backwards. <i>Action and final position</i> - bending of the trunk in the lateral plane, on the fixed ladder side, with the bottom side out in the lateral plane - fig. 6</p>		<p>- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also on the opposite side</p>

Between April 9th and May 6th **no. 3 complex** was applied, with stretching exercises of high difficulty - Table III.

Table III Types of high-difficulty stretching exercises

No. 3 Complex of Exercises

1.	P.I. Standing on one knee, with the other leg stretched forward <i>Action and final position</i> - bending of the trunk on the leg stretched forward, and the palms provide support on the ground on both sides of the stretched leg - fig. 7		- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also with the opposite leg
2.	P.I. Sitting with the right leg stretched up <i>Action and final position</i> - traction and maintaining the up-stretched leg towards the trunk with palms resting at the level of the knee on the back side - fig. 8		- maintaing 8'' x 3 repeats with 8'' of relaxation - the action is repeated also with the opposite leg
3.	P.I. Sitting with the arms up <i>Action and final position</i> – bending the trunk forward and grabbing the ankles from the side – fig. 9		- maintaing 8'' x 3 repeats with 8'' of relaxation

f. Statistical methods used

The statistical processing of the results achieved was made by using the Microsoft Office Excel 2007 programme.

values relatively low for both GE and the GC, after applying experimental programme in order to develop joint mobility and muscle flexibility, GE results are superior to those recorded by the GC, and there is also a significant progress between the two tests of the same group (Tables IV, V, VI).

RESULTS

If the initial test on the development of suppleness of 11-12 year-old children recorded some average

Table IV Mean values and significance of the mean difference of TI and TF at GE

Mobility indicators (GE)												
Proba	M _A (cm)		M _L (cm)		P (cm)		S _L (cm)		S _S (cm)		S _D (cm)	
Subject Ind.stat	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.
1.	-10	-4	47	33	49	35	34	30	22	12	25	13
2.	-10	-5	33	20	69	50	28	22	24	11	27	15
3.	-10	-4	46	25	61	48	26	22	17	10	20	8
4.	-7	0	38	22	40	28	27	23	11	8	14	7
5.	-10	-2	38	20	68	52	32	25	35	23	38	25
6.	-5	+2	44	27	50	39	20	14	27	11	30	20
7.	-10	-2	36	28	70	50	35	25	23	8	26	15
8.	-13	-5	47	24	63	44	38	26	34	16	37	22
Σ	-75	-20	329	199	470	346	240	187	193	99	217	125
x	-9,3	-2,5	41,1	24,8	58,7	43,2	30	23,3	24,1	12,3	27,1	15,6
σ	2,38	2,50	5,51	4,42	11,1	8,53	5,83	4,59	8,04	4,98	8,04	6,41
± m	0,84	0,88	1,95	1,56	3,93	3,02	2,06	1,62	2,85	1,76	2,85	2,27
m ²	0,71	0,78	3,81	2,45	15,49	9,14	4,27	2,64	8,12	3,11	8,12	5,16
Cv%	25,4	100	13,39	17,76	18,89	19,72	19,4	19,63	33,3	40,24	29,64	41,02
t	5,62		6,49		3,12		2,52		3,50		3,15	
p	<0,05		<0,05		<0,05		<0,05		<0,05		<0,05	

Table V Mean values and significance of the mean differenc of TI and TF at GC

Mobility indicators (GC)												
Proba	M _A (cm)		M _L (cm)		P (cm)		S _L (cm)		S _S (cm)		S _D (cm)	
Subiect Ind.stat	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.	T.I.	T.F.
1.	-14	-12	50	48	64	60	40	38	25	24	28	27
2.	-19	-18	41	41	46	45	24	24	15	13	18	18
3.	-10	-12	40	39	71	68	39	38	29	29	32	30
4.	-5	-5	50	48	69	69	33	33	27	25	30	30
5.	-10	-9	45	40	32	30	26	25	16	18	20	20
6.	-10	-10	41	41	60	55	35	35	20	17	23	20
7.	-15	-13	46	44	68	65	36	33	30	28	35	33
8.	-8	-8	44	40	70	68	37	35	34	32	37	35
Σ	-91	-87	357	341	480	460	270	261	196	186	223	213
x	-11,3	-10,8	44,6	42,6	60	57,5	33,7	32,6	24,5	23,2	27,8	26,6
σ	4,89	3,87	3,92	3,62	13,94	13,8	5,84	5,37	6,86	6,62	6,95	6,50
± m	1,73	1,37	1,39	1,28	4,943	4,89	2,07	1,90	2,43	2,34	2,46	2,30
m ²	3,01	1,88	1,93	1,64	24,43	23,9	4,28	3,62	5,91	5,51	6,07	5,31
Cv%	43,07	35,58	8,78	8,49	23,23	24	17,30	16,4	28	28,47	24,93	24,41
t	0,22		1,05		0,35		0,39		0,36		0,37	
p	>0,05		>0,05		>0,05		>0,05		>0,05		>0,05	

Table VI Mean values and significance of the mean differenc the TF of GE and GC

Mobility indicators												
Proba	M _A (cm)		M _L (cm)		P (cm)		S _L (cm)		S _S (cm)		S _D (cm)	
Subiect Ind.stat	T.F. GE	T.F. GC	T.F. GE	T.F. GC	T.F. GE	T.F. GC	T.F. GE	T.F. GC	T.F. GE	T.F. GC	T.F. GE	T.F. GC
1.	-4	-12	33	48	35	TF	30	38	12	24	13	27
2.	-5	-18	20	41	50	60	22	24	11	13	15	18
3.	-4	-12	25	39	48	45	22	38	10	29	8	30
4.	0	-5	22	48	28	68	23	33	8	25	7	30
5.	-2	-9	20	40	52	69	25	25	23	18	25	20
6.	+2	-10	27	41	39	30	14	35	11	17	20	20
7.	-2	-13	28	44	50	55	25	33	8	28	15	33
8.	-5	-8	24	40	44	65	26	35	16	32	22	35
x	-2,5	-10,8	24,8	42,6	43,2	68	23,3	32,6	12,3	23,2	15,6	26,6
t ₁	5,13		8,76		2,47		3,68		3,70		3,39	
p	<0,05		<0,05		<0,05		<0,05		<0,05		<0,05	

DISCUSSIONS

It should be mentioned that, if during the *initial tests*, the two groups showed similar average values (M_A: EG -9,3 cm, CG -11,3; M_L: EG 41,1cm, CG 44,6 cm; S_D: GE 27,1 cm, CG 27,8 cm) during the *final testing*, EG has an improved average result of M_A improved by 6 cm, M_L, P, S_L by 14 cm, and the average S_S is improved by 10 cm, while the average S_D is improved by 12 cm.

In the final tests, CG shows a slight increase in the amount of the 6 complexes applied, the average is 2 cm, the largest increase - 4 cm was recorded in P.

For the complexes listed above, the statistical indicators regarding the uniformity of results for both groups were also calculated. In initial testing, the results show high homogeneity testing only for the the M_L of CG (8.78%), average homogeneity -

M_L 13.39, P 18.89, S_L 19.40 - to EG and to S_L 17,30 to CG and lack of uniformity to the other values recorded.

During the final testing, of the indicators analysis concerning the uniformity of results, it can be observed that both EG and CG present low variability, but the lack of uniformity, except the CG results regarding M_L (8.49 - high homogeneity).

P = 2.36 (the significance level) for n = 8 Fisher's table.

EG has a "t" value in all samples tested, above the significance level (p < 0.05) - diagram 1. GC values between 0.22 and 1.05 present the variable "t" above the significance level (p < 0.05) in all samples and tests applied - diagram 2.

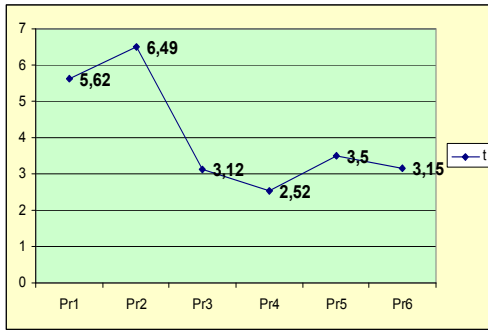


Diagram 1 Evolution of materiality "t" for the EG

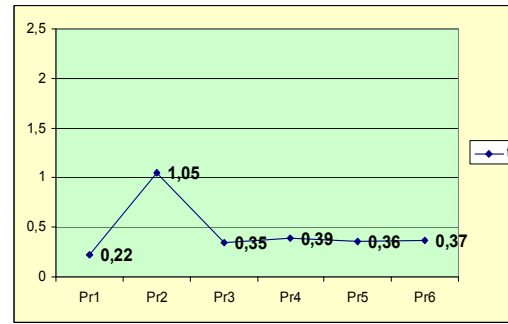


Diagram 2 Evolution of materiality "t" for the CG

The analysis of mean values and significance testing mean difference between the two groups investigated final results above threshold indicate significant ($p < 0.05$), diagram 3 - in all 6 samples tested.

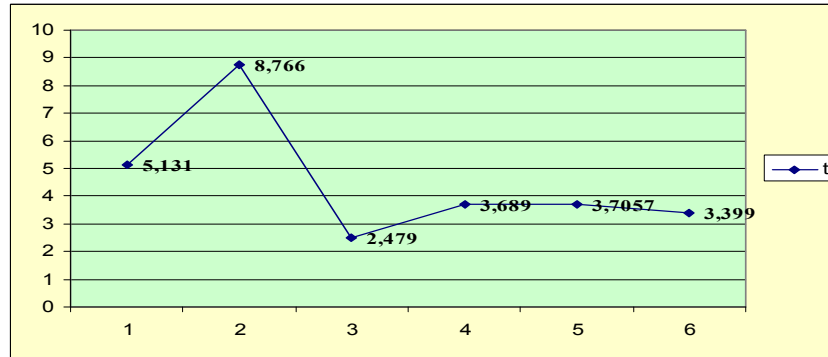


Diagram 3 Evolution of materiality "t1" for final testing of the two groups

CONCLUSIONS

1. After processing and interpretation of the data drawn from comparing the two groups of children aged between 11 and 12 years, the hypothesis that flexibility can be developed at this age if used type appropriate stretching exercises is confirmed.
2. Stretching helps to increase coxo-femoral joints, scapula, humerus and spine mobility.
3. By using stretching type exercises, the time allocated to the selective influence of the locomotor apparatus is reduced, as part of physical education lessons.
4. Stretching helps to relax muscle groups and joints to which stretching type exercises were applied.
5. Stretching type exercises help to maintain and improve the amplitude of segmental movements and reduce the risk of injury.
6. By using stretching exercises, the health of individuals is improved, and they have a significant role in correcting some deficient attitudes or deficiencies caused by poor or incorrect body posture.

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STUDY REGARDING THE INFLUENCES OF AEROBICS MAINTENANCE EXERCISES ON TEENAGE GIRLS OF 14-16 YEARS

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Abstract

This paper assumes that the constant and regular practice of aerobic gymnastics of maintenance can help decrease body excess of teenage girls while improving their confidence and self-esteem.

By choosing this topic, the paper proposes the following objectives: the development of effort capacity, the formation of optimal foundations of physical training, a harmonious physical development, the formation of a properly kept and aesthetic figure, improving muscle elasticity and joint mobility and removing the excess body fat in adolescent girls.

Keywords: *overweight, experimental programs, aerobics gymnastics exercises of maintenance*

INTRODUCTION

The everyday life of the contemporary man is dominated by the explosion of scientific technical and informational progress, and this is what creates better living and working conditions, but also generates changes in the sphere of biological, physical and mental development of individuals. If some of the changes mentioned above influence positively the health of individuals and bring an important contribution to the socio-economic progress, others negatively affect the optimal functioning of the body from both a somatic and psychic points of view.

Sedentariness is the most important factor that generates negative effects on the health of the modern man and is the root of most diseases that shorten the human life nowadays. It is the natural consequence of *comfort* civilization against the amount of daily exercise, the volume and intensity of exercise reducing the potential human energy, which is indispensable in order to counteract stress factors from the external environment. The most common disorders caused by inactivity that can be mentioned are: the poor functional capacity of respiratory and cardiovascular apparatus, degenerative disorders of the osseous and joints systems, the phenomenon of increased irritability, overweight etc. It is alarming that in Romania more than 30% of the school population are obese according to statistics from the Ministry of Health, and within the European Union the number of overweight schoolchildren grows by about 400,000 per year, with about 200 million overweight or obese adults.

Many authors (Brick, LG, 1996 Dobrescu, T., 2008, Nanu, L., 2010) concluded that physical exercise

resulted from any kind of physical activity (long walks, jogging, sports, cycling, swimming, aerobics gymnastics exercises of maintenance etc.) and a controlled diet with reduced calorie meals can ensure a long and healthy life of individuals regardless of age, sex, level of education or work.

Aerobics gymnastics exercises of maintenance is a form of movement that is attracting more and more people, due to the diversification of exercises, their inter-twinning with dance steps and elements of ballet, tae bo, stretching and others indispensable made with an appropriate musical background, determine an increasing number of individuals who step into specially designated spaces for such physical activities that lead to a harmonious physical development, in order to form a properly kept and aesthetic figure, and not infrequently to eliminate excess body fat, but also to create a state of good mood and also increased confidence and self-esteem.

OBJECTIVES

Maintenance exercises of aerobics gymnastics help to develop the effort capacity, a harmonious physical development, the formation of a properly kept and aesthetic figure, improves muscle elasticity and joint mobility in order to eliminate excess body fat in adolescents, improves the capacity of physical and mental relaxation, and also leads to increased confidence and personal respect.

HYPOTHESIS

In the formulation of the working hypothesis it is assumed that if adolescent girls of 14-16 years that execute maintenance exercises of aerobic gymnastics in special centers under the guidance of