

- Almost 50% spend more than 8 hours in a sitting position (in front of the TV, the office, the computer, while driving, etc.);
- 33.8% prefer using the elevator to climbing the stairs;
- 48.5% frequently think about food during the day;
- 19.3% frequently eat fast-food products;
- 59.9% eat sweets daily;
- 26.5% admit being sedentary people.

Even if 26.5% of the respondents say they consider themselves sedentary people, the recorded results of the survey make us consider that the percentage is much higher.

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# DYNAMICS OF THE INDICES OF GENERAL PHYSICAL TRAINING FOR 18-22 YEAR-OLD TEENAGERS, AFTER APPLYING A SPECIFIC TRAINING PROGRAM IN ORDER TO COMBAT SEDENTARY

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## Abstract

This study is aimed at producing an increase of the assessment indicators for the level of physical training and for the sensory-motor ability of 18-22 year-old teenagers (students), by applying specific training programs to fight a sedentary life – aerobic gymnastics (girls) and bodybuilding (boys).

**Sedentary**, as well as stress are nowadays known as the „diseases of the 21<sup>st</sup> century”, that generate most of the illnesses which shorten a person's life in the contemporary society, even though they cannot be medically defined as diseases.

It is obvious that modern life encourages sedentary through its attractive offers of a comfortable lifestyle, but the striking decline of the amount of exercise leads in most of the cases to the occurrence or aggravation of diseases produced by the lack of physical movement, such as: *joint diseases, cardiovascular diseases, spine conditions, respiratory diseases, obesity and overweight, digestive disorders, diabetes, cellulite, infertility, susceptibility to infections, high level of blood cholesterol* and others.

It is alarming that the sedentary lifestyle has started affecting preschoolers too, due to their chaotic program, where they spend hours in front of the computer or the TV, not willing to play outside anymore, to interact with other children.

Therefore, it is of utmost importance to form the habit of doing physical activities every day, to have a varied diet, according to the amount of effort made in order to combat sedentary and obesity, that is associated most of the time with a sedentary lifestyle, but also with the occurrence of other disorders which destroy the bodies of millions of people.

**Keywords:** *physical training, sensory-motor capacity, physical tasks, sedentary, teenagers, student;*

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## 1. Introduction

The contemporary scientific revolution has a profound influence on the individuals' way of thinking and living, and the accelerated technological progress has changed people's way of living. Besides the advantages offered by the evolution of technique, there are also disadvantages of a civilized world, consequences which have a negative influence on the health state of people, in the sense that they increasingly deprive people of exercise, and demand even more from them intellectually, leading to nervous strain. Both sedentary work and lack of exercise keep people away from the natural sources of health, from nature, from movement – essential factors for an optimal physical fitness and for keeping and maintaining life (Bota A., 2006).

Sedentary has become a way of life dominated by physical inactivity, reducing people's physical and motor abilities, that in time lead to numerous functional, metabolic disorders, and many times to mental disorders: heart diseases, brain, liver and kidney disorders, the lack of oxygen in tissues, cells and organs, muscle atrophy, obesity and even cell metabolic disorders that may lead to cell cancerous degeneration.

**The purpose of the study** is to point out the level of physical and sensory-motor preparation in 18-22 year-old teenagers, before and after experimenting specific training programs – aerobic gymnastics for maintenance (for girls) and bodybuilding (for boys) in order to fight sedentary.

**The tasks of the study** are the following: apply record and analyze the results obtained for 18-22 year old teenagers (students in the 1<sup>st</sup> year) in a series of physical and sensory-motor tests, in order to find the level of general physical preparation for this age segment, but also to form the habit of doing exercise independently.

## 2. Materials and Methods

The research took place during 15.10.2014 - 30.05.2015, in the gym of the Faculty of Physical Education and Sports in Galati and in the Human Performance Research Centre, the Biomechanics laboratory.

**The sample group** consisted of 151 students in the 1<sup>st</sup> year of the Faculty of Medicine and Pharmacy within the „Lower Danube” University of Galati, specializing in general nursing (GN1, GN2, GN3) and dental medicine (DM1, DM2, DM3). The researched group, made of teenagers aged between 18 and 22, has a gender distribution dominated by females that is 58.2%, while 41.8% of the sample group are males.

In order to perform the analysis of the physical and sensory-motor parameters, a number of 8 tests have been used. We have calculated their arithmetic means, the mean deviation, the standard deviation and the coefficient of variation, and the recorded performance were turned into grades according to the scoring grid established by the faculty and used to grade students from various faculties within the „Lower Danube” University of Galati – table 1.

Table 1. Evaluation grid for the performance recorded in the physical tests

NO.	EVALUATION ITEMS	M/F	5	6	7	8	9	10
	GRADE							
1.	C <sub>30"</sub> - crunches 30" (reps)	M	12	15	18	22	26	30
		F	12	15	18	22	26	30
2.	E <sub>30"</sub> - extension exercises 30" (reps)	M	12	15	18	22	26	30
		F	12	15	18	22	26	30
3.	S <sub>30"</sub> - squats 30" (reps)	M	15	18	22	26	30	33
		F	12	15	18	22	26	30
4.	P <sub>30"</sub> - push-ups 30" (reps)	M	10	12	15	18	22	26
		F	6	8	10	12	15	18
5.	S <sub>L</sub> - standing long jump (cm)	M	200	210	220	230	240	250
		F	160	165	170	177	185	195

Description of the **assessed parameters**: abdominal muscle strength (C<sub>30"</sub>) - supine, crouching position, legs apart, hands behind the head – trunk-lifts for 30", reps; back muscle strength (E<sub>30"</sub>) - prone, bent arms, hands behind the head - body extensions for 30", reps; leg muscle strength (S<sub>30"</sub>) – standing position, legs apart, bent arms, hands behind the head – squats in 30", reps; arm muscle strength (P<sub>30"</sub>) – prone position on the knees and legs raised – push-ups in 30", reps; explosive strength – standing long jump (S<sub>L</sub>) - executed from standing position, legs apart, arms up – lower arms forwards – backwards – down, and on raising arms forward the feet push is achieved with feet off the ground – the long jump as far from the starting point as possible – recorded in centimetres; the Romberg test (T<sub>R</sub>) – subject keeps standing position on one leg, the other leg bent, supported at the knee level, arms to the side, fingers spread, eyes closed (blindfolded). We count the number of seconds while the subject remains in the required equilibrium position, on one leg and then on the other; the Matorin test (T<sub>M</sub>) – consists in performing a jump, detaching from the ground and a vertical rotation around the body axis, rotation to the left and to the right – the qualitative assessment and evaluation follow specific existing scales; fine motor coordination and memory test (S<sub>M</sub>) – explained, terminologically described and demonstrated 2 times. We give one point for each motor time correctly executed (T<sub>1</sub>, T<sub>3</sub>, T<sub>5</sub>, T<sub>7</sub>) – maximum 4 points, to which we add 1 point as general assessment of the execution, if appropriate: **I.P. (Initial Position) Standing**: T<sub>1</sub> – jump in standing position, legs apart and simultaneously raise left/right arm forward, the other arm up; T<sub>2</sub> – return; T<sub>3</sub> – idem T<sub>1</sub> arms raised oppositely; T<sub>4</sub> – return; T<sub>5</sub> – jump in standing position, legs apart sagittally, left/right leg forwards and simultaneously raise front arm up and the other laterally; T<sub>6</sub> – return; T<sub>7</sub> – jump in standing position, legs apart sagittally, the other foot forward compared to the jump in T<sub>5</sub> - arms raised oppositely; T<sub>8</sub> – return in I.P.

**The Statistical Methods** used for the sample group were statistically processed, using the following indicators: the sum of the results for each group included in the study, the arithmetic mean, the standard deviation, the mean difference and the coefficient of variation.

**The recorded results** were statistically processed, on the computer, using Microsoft Excel and proved the fact that the initial tests applied to 18-22 year old teenagers included in the experimental study had a low level of physical preparation, the values of the recorded results allowing them to have a maximum 6 grade.

In order to assess the efficiency of the methodology applied in the experimental study, we monitored the changes occurred when recording results, in final tests related to the level of physical and sensory-motor preparation in 18-22 year old teenagers, after the application of the experimental program, using means specific to aerobic gymnastics for girls and bodybuilding for boys.

After having applied the experimental program, there was an improvement in the mean of the results obtained by the subjects in the sample group investigated in all tests. And on both initial and final tests the boys' results were superior to those of the girls in 7 out of 8 events. The comparative values of the dynamics of the recorded results after the application of the experimental training programs are shown in table 2.

Table 2. Dynamics of the recorded results for the assessment of the level of physical preparation (18-22 years old)

Statistical indicators Tests		C 30"	E 30"	S 30"	P 30"	S <sub>L</sub>	T <sub>R</sub>		T <sub>M</sub>		S <sub>M</sub>
							left	right	left	right	
		rep.	rep.	rep.	rep.	cm	sec.	sec.	dgr.	dgr.	points
INITIAL	Σ	274 6	309 8	363 0	112 0	2650 3	169 2	202 2	4778 0	4716 0	177
	x	18.5	20.7	24.1	7.7	179. 1	11.2	13.3	321	316	1.1
	σ	1.01	0.48	0.28	0.67	1.43	0.47	0.27	0.83	1.6	0.008
	± m	2.5	0.8	0.7	2.3	21.8	1.6	0.9	24	22	0.1
	V %	5.4	2.3	0.01	8.7	0.7	4.1	2	0.2	0.5	7.2
FINAL	Σ	388 3	393 5	415 0	218 3	2846 2	630 7	647 1	6852 0	6692 0	575
	x	25.8	26.2	27.6	15	191. 8	41.6	42.9	460	449	3.7
	σ	0.33	0.25	0.34	1.1	1.2	0.53	0.26	4	3.15	0.01
	± m	0.8	0.6	0.8	3	20.3	1	0.5	37	32	0.1
	V %	1.2	0.9	1.2	7.3	0.6	1.2	0.6	0.8	0.7	0.2
P		7.3	5.5	3.5	7.3	12.7	30.6	29.6	139	133	2.6

For the event testing the abdominal strength, on analyzing the evolution of the arithmetic mean of the initial and final test, we could notice an obvious improvement of the results, the mean for the initial testing being 18.5 repetitions, and for the final testing 25.8 repetitions, thus recording a progress of 7.3 repetitions. The standard deviation had very good values, on the initial (1.01) and the final testing (0.33), indicating low variability and high homogeneity.

For the event testing the back muscle strength, the value of the arithmetic mean at the final testing is considerably higher, having recorded a progress of 5.5 repetitions, fact that demonstrates the efficiency of the proposed means. If for the initial testing the standard deviation had values of 0.48 and 0.26, for the final testing, we can state that there was low variability - 2.3% initial and 0.9% final, indicating a high homogeneity of the results.

The recording of the number of repetitions for squats demonstrated the fact that there was an improvement of the leg muscular strength, with a greater number of repetitions: 24.1 repetitions for the initial and 26.7 repetitions for the final that is a progress of 3.5 repetitions. The standard deviation had values of 0.28 for the initial and 0.34 for the final, and the coefficient of variation indicated a variability of 0.01% initially and 1.2% finally, which means very good results, low variability and high homogeneity.

On statistically analyzing the results for the arm muscular strength– push-ups – the results demonstrated low variability and high homogeneity, the standard deviation for the initial testing was 0.67, the coefficient of variation 8.7% while for the final testing, the standard deviation was 1.1 and the coefficient of variation 7.3%, showing a progress of 7.3 repetitions.

As for the event testing the explosive strength, by measuring the length of the standing long jumps, superior values were recorded for the final testing, compared to the initial testing, the progress being 12.7 cm, the standard deviation and the coefficient of variation indicating low variability and high homogeneity of the results.

On testing the level of development of the sensory-motor capacity, by applying the Romberg and Matorin tests, we could also notice remarkable results on comparing the 2 tests after the application of the specific training programs, recording a progress of 30.6" (left leg) and 29.6" (right leg) for Romberg test and 139° (to the left) and 136° (to the right) on Matorin test.

The motor structure used to determine the fine motor coordination and memory test was representative even by its way of execution, as the highly improved values between the two testing were represented by the score achieved, the progress recorded being of 2.6 points, the standard deviation and the coefficient of variation showing low

variability and high homogeneity of the results: 0.08 for the initial and 0.01 for the final, with a 7.2% homogeneity for the initial testing and 0.2% for the final testing.

The progress achieved between the two testing, regarding the level of physical preparation in 18-22 year old teenagers (the first 4 tests), after the application of the experimental training is shown in figure 1.

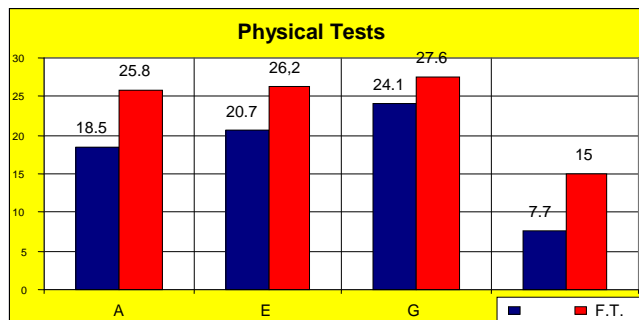


Figure 1 The progress between the initial and the final testing

If for the initial testing the value of the performance recorded and turned into grades indicated an indulgent maximum value of 6, for the final testing, there were results that could be associated with the value of 9, fact that proves the efficiency of the programs proposed to 18-22 year old teenagers, in order to improve the level of general physical preparation.

### 3. Conclusions:

1. The study of the literature of specialty related to the issues, influences and effects of sedentary are not enough researched and approached by experts, and there is also no statistical database regarding age, sex and features of the individuals predisposed to sedentary.
2. The sample group presented a low level of general physical preparation – the boys had better results in all tests.
3. The teenagers included in the experimental study had a reduced capacity of motor means, skills and knowledge that could be regarded as prophylaxis in sedentary.
4. After having applied the experimental training programs, but also after having compared the results of the initial and final tests, the recorded results of the physical, sensory-motor, fine coordination and motor memory proved the perfectibility of the indicators above.
5. The efficiency of the proposed experimental programs is demonstrated by the progressive dynamics of the recorded results between the initial and final testing.
6. The lower values recorded for some indicators may be explained by the fact that the acquisition of specific motor skills is achieved differently by the subjects, the differences being determined by the individual features of each individual and their previous motor skills.

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