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THE IMPACT OF PHYSICAL EDUCATION AND SPORTS ON THE SOMATO-FUNCTIONAL AND MOTRIC INDEX OF THE UMF BUCHAREST STUDENTS

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Abstract
Objectivs: The purpose of this study was to contribute at the investigations upon the Somato-Functional and Motric Profile of the medical students. We also wanted to see if the P.E. lessons in our university, based on learning and practicing different sports, are effective on increasing the fitness level of our students.
Subjects: The research was conduct on 120 subjects, boys and girls, students of „Carol Davila" University of Medicine and Pharmacy in Bucharest, first year, from the Volleyball and Fitness Grupes.
Tests: We tried to accomplish the tasks using simple tests , the kind of tests any P.E. Teacher can conduct in his Gym, without using specialized laboratories. We measured the height, the weight and the heart rate of the subjects, and basing on that dates we calculated the Ruffier Index as an idicator of the Functional Potential (Functional Fitness) . We also used athletic tests to evaluate the Motric Potential of the medical students (endurance, upper –body strenght, lower-body power.)
Conclusions:
1. Percentage of boys (37%) and especially the girls (50%) falling in the grade of "unsatisfactory" at Functional Index revealed in Ruffier Tests the at the initial testing shows a worrying state of facts in the secondary education segment.
2. Both Motric Potential and Functional Potential of the students can be improved after attending physical education and sports classes.
3. Differences between the results of the initial and final test can be summarized as follows:
- decreases the percentage of subjects rated "unsatisfactory" at Ruffier Index of Functional Fitness (from 49% to 28% of girls, respectively from 37% to 22% of boys).
- all three aspects of the Motric Potential (lower body power, upper body strength, general endurance) improved at Final Tests compared to the initial levels , but the most significant progress was in general endurance.

4. Knowledge of simple methods for assessing the functional status of the organism, especially at medical students, is an effective way of persuading them to understand the necessity of practicing sports regulary, both in physical education classes and recreational sports activities.
Keywords: Medical Students, Phisical Education and Sports Lessons , Somato-Functional Profile, Bio-Motric Potential

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Introduction

Contemporary man lives in a changing society. The transformations of the increasingly accelerated economic and social life are targeted to ease the work and to increase quality of people's life (J. D., Cohen, J., Drury, and J. R., Wright, 1988). Nevertheless "in today's society is shaped as a trend the need for phisical exercise but its absence from the usual program of modern people is obvious" (V., Grigore et. al., 2007). As a result people tend to adopt a sedentary lifestyle followed by a whole suite of morbid conditions: obesity, poor body posture, a weak tone of the Core muscles (J., Eilmore, D., Costill, 2005), increased Body Mass Index and adipose tissue, spinal deformity, stiffness (J., Morrow, A. , Jackson, J., Disch, D. , Mood, 2005), lack of mobility and flexibility, muscular atrophy, disturbance of cardiovascular functions, anxiety, etc. (T., Bompa, 2001) .

In this context, taking account the profile of our university, we considered it necessary to know the somatic, functional and motoric profile of future physicians and see how it can be optimized through the methods which the Physical Education and Sports Department of our University has at its disposal. We refer both to Physical Education lessons (based on practicing different sports, depending on the students choice), and recreational sports activities organized by our Department (I Year Cup, II Year Cup , "Carol Davila" Cup, UMF Championship, etc.).

Premises

We started from the need to develop the database of Physical Education and Sports by providing relevant data regarding the current bio-motoric profile of the Medical Students.

Purpose

The purpose of this study was to outline the somatic and functional profile of the medical students. by means within the reach of physical education teachers (without laboratory tests). We also intended to fiind aut in what extent the physical education course based on practicing diffrent sports manages to increase student`s bio-motoric potential. However, we intend that this study should constitute a starting point for broader and more specialized investigations in this area.

Objectives

The operational objectives of the research were: documentation; choosing the somato functional indicators that will be investigated; establishing the most appropriate means to determine these indicators; establishing the sample of subjects; measurements; data recording; data processing,; formulating conclusions.

Hypothesis:

Regulary attending the physical education course based on practicing different sports has a significant effect for optimizing the somatic and functional index and Motric Potential of the students at UMF.

Research Content:

Subjects and research duration:

The **analyzed sample** included a total of **120 subjects** , 60 boys and 60 girls,students of UMF "Carol Davila" Bucharest, Faculty of Medicine and Dentistry, First Year.

For each faculty, Physical Education was included in the curriculum with one lesson per week with duration of 100 minutes in obligatory regime, with mark , having assigned 4 credits . Groups were formed based on students options . The study was conducted during October 2009 - June 2010. Subjects were tested at the beginning and the end of the academic year. Between tests, students attended the P.E lessons in volleyball and fitness groups, following the specific programs of those sports,and participating in recreational sports activities organized by our Department.

Somatic and functional indices were analysed in order to determine the profile of "Carol Davila" students. **Somatic indices** analyzed were**: height** and **weight**
• To determine the height was used a taliometer.
• To determine the weight we used a medical scale with 100 grams acuracy (A., Dragnea, I., Bota, 1999).

Based on these values were determined:
• **Ruffier Index** (M., Cordun, 2009) , fitness assessment using the formula: $\frac{(P1+P2+P3)-200}{10}$ where P1 is the resting heart rate , in sitting position; P2, pulse immediately after the execution of 30 squats (rhythmic metronome 90) and P3 pulse one minute after exercise.

Functional indices investigated: **heart rate**
• pulse was recorded by palpation at the radial artery, performed by each subject (previously trained) (Drăgan, I. , 1994).

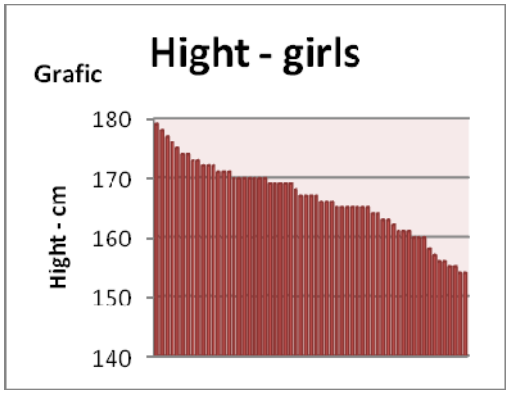
To evaluate the **Motric Potential** we used the following tests (D., Tudor, 2007):
1. **Standing long jump** - to determine **the legs power ;**
2. **Push-ups** - to assess **upper body strength** (for boys - lying on the ground,for girls - with their hands resting on the gymnastics banch or other support 30cm high);
3. **The shuttle** - for **endurance**: launched running on specified distance (interval) (13m - boys 12m - girls) with a minimum time for the scroll (5 sec.) – We recorded the number of complete laps which fall under the specified conditions :

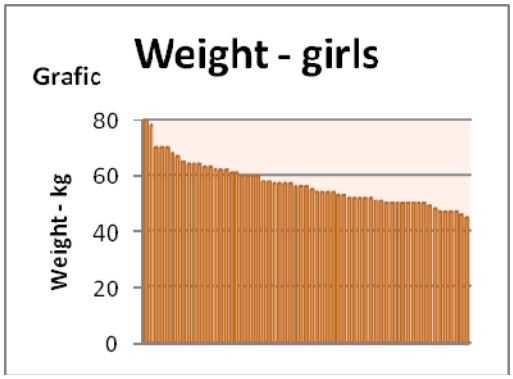
- An audio signal every 5 seconds
- Among the signals the subjects have to scroll the interval
- No one enters the interval before the signal;
- Stop when a performer gives up or does not fall within the time
- The number of crossings is recorded.

State of the somatic indicators

• **Height**

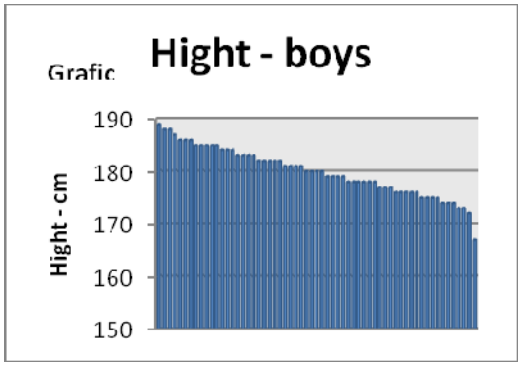
Girls: the minimum value recorded was 154 cm, maximum 179 cm, and **average 169, 2 cm.**





Boys: the minimum value was 167 cm , maximum 189 cm and the **average 182.9 cm**

Boys minimum weight was 70 kg, maximum 90 kg, and the **average 81.3kg**.



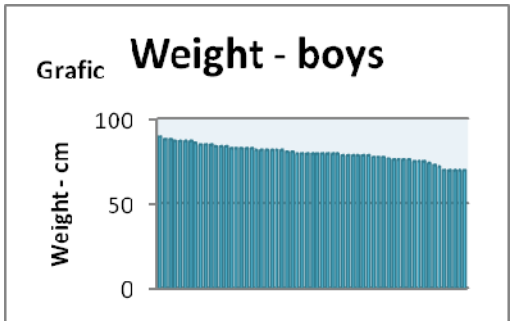


Table 1: The Hight index state

Table 1	Hight (cm)	
Values	Boys	Girls
Min.	167	154
Max.	189	179
Average	182,9	169,2

Table 2: Situation of Weight indices

Table 2	Weight (kg)	
Values	Boys	Girls
Min.	70	45
Max.	90	80
Average	81,3	57,6

• Weight

Girls were found with minimum values of the weight of 45 kg, maximum 80 kg and **average value 57,6 kg.**

Analysis and interpretation of the Functional Indicators

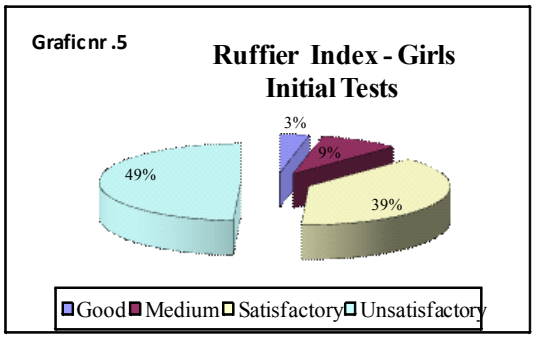
• Index Ruffier

- **Initial Tests**

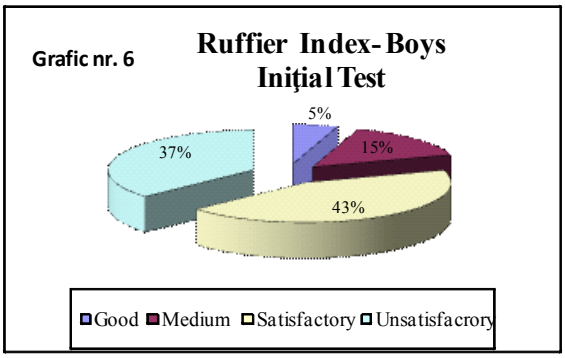
The Functional Fitness objectified by the Ruffier Index results generally modest at initial testing.

Girls: In initial testing, fitness evaluation 4 girls (3%). rated "good" (Ruffier Index value 0-5) An „average" physical condition (Ruffier index value5-10) occurred in 11 students

(9%) and 46 students (39%) were assessed as having a physical condition "satisfactory" (Ruffier index value10-15) Physical condition assessed as "unsatisfactory" had 59 girls (49%) with the Ruffier index values over 15.

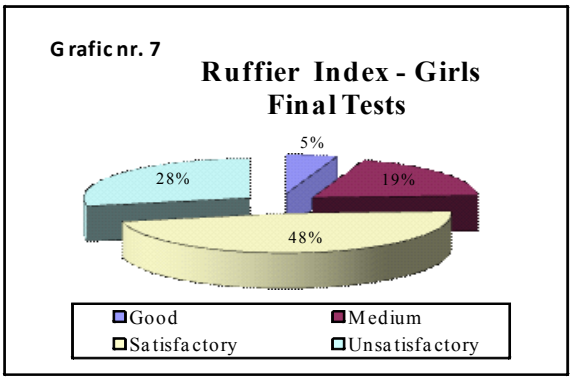


Boys: On initial testing 52 boys (43%) ranked "satisfactory" and 18 (15%) „average”,
6 students (5%) ranked „good” and 44 (37%) „ unsatisfactory”
As for female students, for the boys we also note the very high percentage of subjects with poor Functional Fitness.

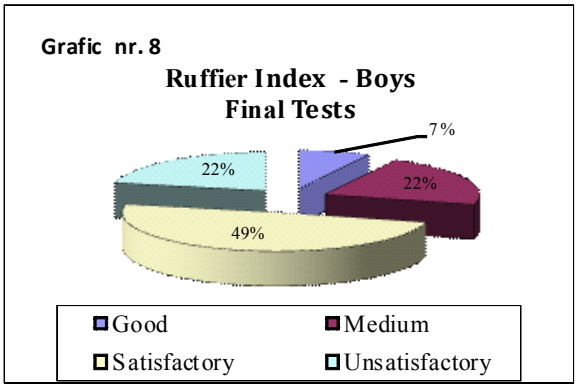


- **Final Tests**

Girls: The final testing shows that the percentage of female students who received "unsatisfactory" was strongly diminished (from 49% to 28%). We also note the increase in “satisfctory” (39% -48%) and "medium" (9 % -19%). Percentage of girls who ranked "good" increased slightly from 3-5%. The overall rating should be referred to the declining share of "unsatisfactory"(originally 49%!) and rising the proportion of "medium" and "satisfactory. "



Boys: The final testing of students have registered growth of qualifications rates obtained in"good" (7% vs 5% initial testing), "medium" (from 15% to 22%) and "satisfactory " (from 43% to 48%), accompanied by the decrease of the percentage rating "unsatisfactory" - from 37% to 22%. Summing percentages "good", "medium" and "satisfactory" in the two trials we note an increase from 63% to 78%.



Analyzing the graphyc obtained on the whole, boys and girls, we note a distribution in conforme with Gause's curve, shifted to the right, for the satisfactory and unsatisfactory ratings,especially in initial testing. This leads us to assert that during senior high school, students' Functional Fitness is neglected.

Although the final test results are improvin g, overall distribution remains asymmetric.

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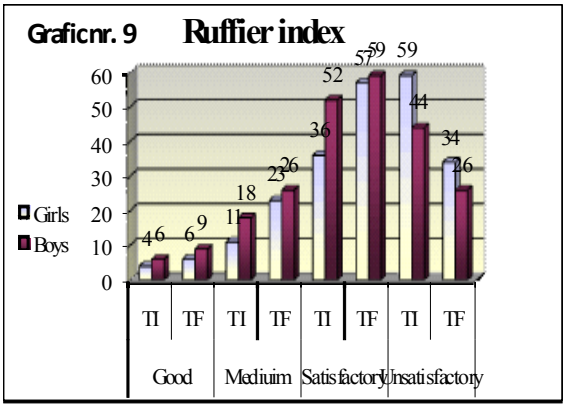

Analysis and interpretation of the athletic tests

1. Long Jump

Test results for the lower limbs power show a significant increasing trend , the difference between the initial and final testing being 4 cm for both boys and girls.

Tabel 4	Standing Long Jump (m)			
	Comparative statistical indicators			
Values	Initial Tests		Final Tests	
	Boys	Girls	Boys	Girls
Min.	1,70	1,20	1,78	1,23
Max.	2,38	1,80	2,40	1,80
Average	2,09	1,43	2,13	1,47

2. Push-ups

Tabel 5	Push-ups (nr. reps.)			
	Comparative statistical indicators			
Values	Initial Tests		Final Tests	
	Boys	Girls	Boys	Girls
Min.	3	0	8	4
Max.	24	15	27	16
Average	14,60	7,03	17,77	9,03

At the strength test for upper body, there is also a growing trend, the average values of final testing being significantly higher than the initial ones, especially for boys (with the addition of 3 reps) but also for the girls (2 reps more) .

3. Endurance Shuttle

The most significant progres was noted at the endurance test. The number of crossings of the established distance increased on average by 7,2 for boys and 4.73 for girls in the final test compared to the initial one.

Tabel 6	Shuttle (nr. reps.)			
	Comparative statistical indicators			
Values	Initial Tests		Final Tests	
	Boys	Girls	Boys	Girls
Min.	9	10	15	12
Max.	80	45	92	48
Average	32,67	23,37	39,87	28,10

Looking at the overall results achieved in the athletic tests, it can be said that all three aspects of the Motric Potential (lower body power, upper body strength and overall endurance) showed improved results at the final testing. However the most significant progress was found in general endurance.

Conclusions:

1. The **initial tests** showed that **37% of the boys** and **49% of the girls ranked "unsatisfactory"** at the Functional Index revealed in **Ruffier Tests**.

This leads us to assert that during senior high school, student's Functional Fitness is neglected.
2. Both **Motric Potential** and **Functional Potential** of the students **can be improved** after attending physical education and sports classes.
3. **Differences** between the results of the **Initial** and **Final Test** can be summarized as follows:

- decreases the number of subjects rated "unsatisfactory" at Ruffier Index of Functional Fitness (from 49% to 28% of girls , respectively from 37% to 22% of boys).
- all three aspects of the Motric Potential (lower body power, upper body strength, general endurance) improved at Final Tests compared to the initial levels , but the most significant progress was in general endurance.

4. **Knowledge of simple methods** for assessing the **functional status** of the organism, especially at medical students, is an effective way of persuading them **to understand the necessity of practicing sports** regulary, both in physical education classes and recreational sports activities.

Bibliography

BOMPA, T., 2001, *Dezvoltarea calităţilor motrice*, Editura Ex. Ponto, Contanţa

COHEN, J. D., DRURY, J. AND WRIGHT, J.R., 1988: *Promoting exercise and physical fitness in the medical school curriculum*. Journal of Medical Education, 63

CORDUN, M., 1999, *Kinetologie medicală*, Editura Axa, Bucureşti

CORDUN, M. 2009, *Kinantropometrie,* Editura CD Press, Bucureşti, 267-268

DRAGNEA, A., BOTA, I., 1999, *Teoria activităţii motrice*, Editura Didactică şi pedagogică, R.A., Bucureşti

DRĂGAN, I. , 1994, *Medicina sportiva aplicată*, Bucureşti, Editura Edis

EILMORE, J., COSTILL, D., 2005, *Phisiology of Sport and Exercise*, Human Kinetics, Champaign

EPURAN, M. 2005, *Metodologia cercetării activităţilor corporale în educaţie fizică şi sport*, Editura FEST, Bucureşti

GRIGORE, V. – COORD. 2007, *Exerciţiul fizic factor activ pentru prevenirea îmbătrânirii şi instalării bolilor degenerative*, Editura Didactică şi Pedagogică, Bucureşti

MORROW, J., JACKSON, A. , DISCH, J., MOOD, D., 2005, *Measurement and evaluation in human performance*, Human Kinetics , Champaign

TUDOR, D., 2007, *Opţiunea sportivă generatoare de potenţial motric la studenţi din profilul medical,* Teză de Doctorat, A.N.E.F.S. Bucureşti.