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ASSESSMENT OF THE ROMANIAN POPULATION TRUNK
FLEXIBILITY USING EUROFIT

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Abstract

Creating a data base for the population aged 20-29 is an element of actuality, generated by the need of permanent enrichment of the knowledge platform in accordance to the newest trends of the modern process of training and education at the academic level. The performed research is the first one of that kind in Romania aiming to initiate important different fitness branches in accordance to the recommendations of the Committee for sports development researches with the intention to implement and asses the concept of Health Related Fitness (HRF) as well as for evaluating of the European Council. Within this context, the aim of this research is to evaluate the torso flexibility for the young population of Romania using EUROFIT tests battery for adults. The research was performed with the participation of a number of 1469 young people aged between 20-29 years. Among them, 927 (63%) were male subjects and 542 (37%) were female subjects. In order to evaluate the torso flexibility, an element of the musculoskeletal fitness, we used the Sit-and-reach test, part of the Eurofit tests battery for adults. As a result of analyzing and comparing the results in the test of torso flexibility to the standards set by the Committee for sports development of the European Council for the tests in the Eurofit tests battery for adults one can observe differences at a level of +5% and -7.5%. As a conclusion, the results of this study confirm that the direction we are heading to is the correct one.



1. Introduction

The education system in Romania is implementing, at an alert pace, an ample and a complex restructuring program designed to harmonize it with the requirements of the educational and professional training system in the European Community, by taking into account and equally valuing the positive experience, the traditions and the resources of the Romanian education system.

The training and education of the young generation has to be a priority of our society, a society that is in continuous change. Because of the stress and mental overload, which are increasingly present in our daily life, training has to aim at developing the individual physically, aesthetically, morally, physically, etc. in accordance with the society requirements. Vințanu (2008, p. 29) states that "education is a fundamental component of the society".

Creating a database of the population aged 20-29 is an element pertaining to the current trends generated by the need to permanently enrich the knowledge platform in accordance with the latest trends of the modern training process in universities. The university activity is characterized by training, emancipating and valuing students so that they can acquire their own distinct, educated and high-performance identity (Stoicoviciu, 2009, p. 15).

In what concerns higher education, Physical Education is the only subject in the curriculum that specifically addresses the human physique. "As an institutionalized activity, Physical Education means to select the most appropriate and effective physical exercises, according to the pedagogical principles and rules, the physiological ones specific to the characteristics of age, gender and educational purposes" (Dragnea et. al., 2002, p. 32).

At this age the human body has great need to practice physical exercises, since increasing physical ability helps young people cope far more easily with the intellectual workload imposed by the academic activity.

The Council of Europe elaborated two official documents promoting sports and recreational sports: the European Sports Charter and the Code of Sports Ethics. Expert Group on Human Resources Development strengthens the role of sports in man's education and training stating that "sport and physical activity are clearly an essential part of society and of the lives of European citizens" (Expert Group on Human Resources Development in Sport- TASS, EU Work Plan for Sport, 2014-2017, p. 6).

Starting this study marks a major challenge for us, and it also brings into focus, in the attention of specialists, the motor development of the young people.

2. Problem Statement

In the recent years there have been concerns determined by the somatic, functional and motor potential of the youth from the University Politehnica of Bucharest. Following the current observations and practical findings during the teaching activity we noted the lack of information in the assessment system on the development of the students' general motor skills.

3. Research Questions

To what extent does applying the Eurofit test battery contribute to completing the database regarding the somatic, functional and motor potential of the youth aged 20-29?

Are there significant differences between the values of the trunk flexibility - a component of the musculoskeletal fitness - of the Romanian population subjects compared to the Swedish subjects existent in the Eurofit test battery?

4. Purpose of the Study

The purpose of this research is: to assess, on a significant sample of the Romanian population, aged 20-29, the neuromuscular fitness levels - by means of its component the trunk elasticity using the Sit-and-reach trial from the Eurofit for adults test battery; to compare the results obtained with standards recommended for this trial by the Council of Europe and the Committee for the sport development; to establish benchmarks for the Romanian population, aged 20-29, on the trunk elasticity, investigated by means of the Sit- and-reach trial from the "Eurofit for adults" test battery.

5. Research Methods

5.1. Subjects

The investigated sample consisted of subjects aged 20-29, of both sexes, of Romanian nationality, students of the University Politehnica of Bucharest.

The selection technique used was aleatory.

The sample size is of 1451 subjects including 927 males and 542 females. It does not differ from the target population.

The research was conducted during 01.11.2015-15.01.2016 in the Sports Hall from the Sports Complex of the University Politehnica of Bucharest.

The environment in which we conducted the study provided optimal course of research.

The research was completed in a single stage for each subject.

5.2. Research Techniques Used

In order to assess the trunk flexibility, the component of the musculoskeletal fitness, we applied the Sit-and-reach test from the Eurofit for adults test battery.

In Figure 01 we present the device used for the Sit-and-reach test.

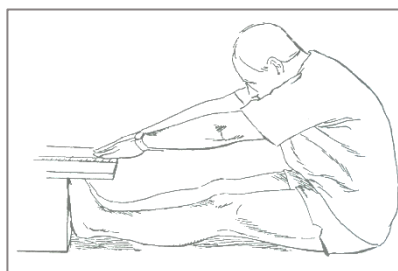


Figure 01. Sit-and-reach box (Pekka & Tuxworth, 1995, p. 61)

To execute this test subject, in a sitting position with the legs stretched out and feet flat on the vertical surface of the Sit-and-reach box, leans forward as much as possible.

During the execution of the teacher stands on the subject's side with one hand on their knees to make sure they are stretched throughout the test.

Before taking the test we will do a specific heating.

The test is performed without sports shoes.

Before the test the teacher demonstrates the sequence of movements.

In the test subject performs some bending forward completed the two maximal executions. They must be kept at least for 2 -3 sec.

These two maximal executions are assessed at the nearest centimeter measure on the scale. The scale on the Sit-and-reach box is positioned in such a way that the vertical surface on which the soles lean is on centimeter 25. If the subject exceeds by 12 centimeters the vertical surface on which the feet lean, then the score will be of 37 centimeters.

5.3. Research Design

This study used an empirical, observational research therefore its design is transversal.

We used in the research primary data and we collected them in a database.

In doing the research we aimed to "ensure the ethical and medical conditions for the subjects participation in the investigations proposed" and "to conduct the research according to the project management – the program plan and time schedule" (Epuran, 2005, p. 68). The measurements taken were recorded in protocols and forms which were centralized, processed statistically and mathematically and presented in tables and graphics.

6. Findings

The data obtained after applying the Sit-and-reach test for finding the musculoskeletal fitness level, are similar to the method recommended by the Council of Europe and the Committee for the Development of Sport in the "Eurofit for adults" (Pekka & Tuxworth, 1995, p. 98). The benchmarks of the standards for the tests in the "Eurofit for adults" battery are those of the Swedish population.

We used, in the data analysis, percentiles and quintiles, respectively. The data distribution was divided into five classes each comprising one-fifth of the total population investigated.

Table 01 has the results in quintiles for 1541 subjects (male and female), aged 20-29, on the trunk elasticity, and investigated through the Sit-and-reach test from the "Eurofit for adults" test battery.

Table 01. Quintile percentage value for the Sit-and-reach test (cm) / Romanian male and female

Percentile	cm	
	Male	Female
20th	22	28
40th	28	33
60th	32	37
80th	37	41

The qualitative assessment of the results was performed by comparing them to the standards proposed by the Council of Europe, the Committee for the Development of Sport; the benchmarks derived from the investigations conducted on the population of Sweden.

Figure 01 presents comparatively, in quintiles, the trunk flexibility values, obtained by applying the Sit-and-reach test for the male population (927 subjects) of Romania and Sweden aged 20-29.

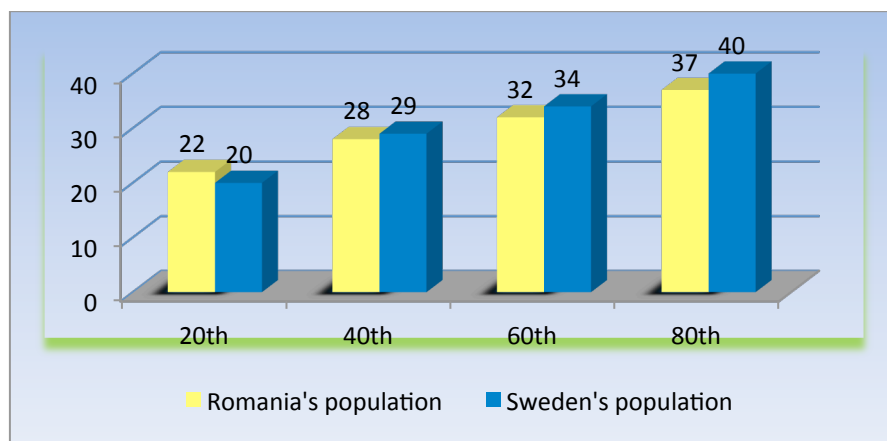


Figure 02. [Quintile percentage value for the Sit-and-reach test (cm) for the Romanian male population versus the Swedish male population]

Analyzing and reporting the data obtained from the trunk flexibility trial according to the standards proposed by the Committee for the Development of Sports of the Council of Europe for the trials contained in the Eurofit for adults test battery, we remark differences between + 5% and -7.5%. Thus male subjects in Romania have values higher by 5% of the lower quintile (the 20th). The trunk flexibility for most subjects investigated is lower to the reference population by between 2.5% and 5% for the middle quintiles (the 40th and 60th) and by 7.5% for the top quintile (the 80th).

The comparative values of the trunk flexibility assessed by the Sit-and-reach test for the female population of Romania and Sweden, the aged 20-29, in quintiles is shown in Figure 02.

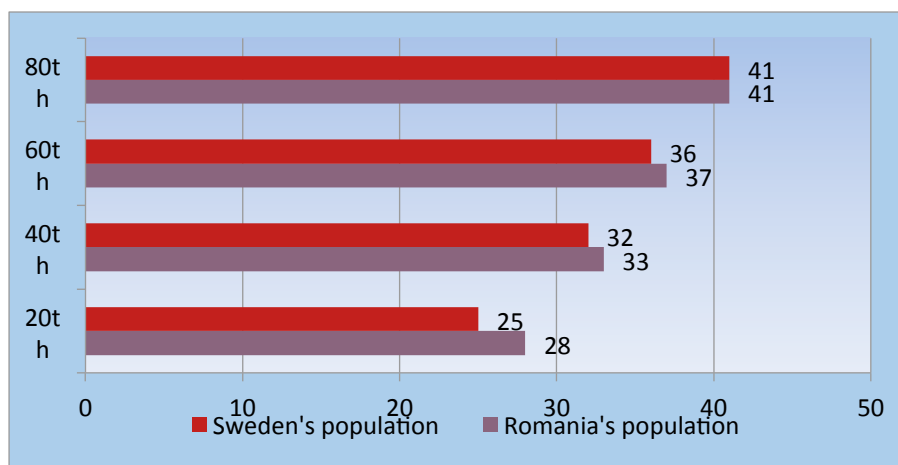


Figure 03. [Quintile percentage value for the Sit-and-reach test (cm) for the Romanian female population versus the Swedish female population]

We note that the values of all the quintiles are superior or equal for the Romanian female population versus the Swedish female population.

The highest differences are found in the lower quintile (the 20th), of 7.3%. Thus for the Romanian female population the trunk flexibility value below which 20% of the subjects find themselves is of 28 cm compared to 25 cm for the Swedish female population.

For the middle quintiles (the 40th and 60th) the values for the Romanian female population are by 2.4% higher than those of the Swedish female population.

We find an equalization of the trunk flexibility values (41 cm.) in the two populations at higher performances (the 80th quintile).

The value of 41 cm for the trunk flexibility, obtained by the Romanian female population on the top quintile, below which 80% of values are, reveals that this part of the musculoskeletal fitness, the trunk flexibility, the superior performances match those considered as benchmark by the Committee for the Development of Sports of the Council of Europe.

7. Conclusion

Through this research we carried out a major assessment of the trunk flexibility, a component of the musculoskeletal fitness, for the Romanian population aged 20-29.

Comparing the results from the Swedish population data, considered as standards at European level, we highlight that they differ in a small percentage compared to the benchmark.

We find a significant difference in the trunk flexibility values for the male and female subjects compared to the Swedish population data, in favor of the Romanian female population whose performances are either equal or better up to 7.3% compared with the Romanian male population whose values are higher than the standards only on the lower quintile (5%). On the middle and upper quintiles they have a trunk flexibility between 2.5 and 7.5% which is lower than the homologous Swedish population.

Through the sample size researched, the values obtained from this study can serve as benchmarks for the trunk flexibility investigated by using the Sit-and-reach test on the Romanian population aged 20-29.

The research conducted is the first of its kind in Romania which aims to initiate ample research for both implementing and assessing the Health Related Fitness (HRF) concept and also to assess the different fitness sides as recommended by the Committee for the Development of Sports of the Council of Europe.

After analyzing the Romanian population data and comparing it to the Swedish population standards proposed by the Eurofit for adults, we highlight the fact that the results obtained both by the male and the female subjects from the investigated sample are very close as value to those of the reference population for this age group.

We believe these relatively equal values obtained in this trial, between the Romanian and the Swedish population, are due to the application in the Romanian universities of physical education programs consistent with the European Community.

The results obtained in this study, confirm that the direction we are going to is the right one. The comparison with the population of Sweden is important since it is known that this country has one of the highest-performance education systems in Europe.

We believe the Eurofit test batteries are complete and important for the motor development of different age groups and also relevant for assessing the present and future state of health.

Depending on the nature of the Eurofit tests we use, we can set the forecasts on the evolution of the functional level for various large muscle groups and dominant joints, with direct reflection on the present and future state of health for various age categories.

Acknowledgments

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