COMPARATIVE STUDY OF THE GENERAL MOTOR CAPACITY OF THE SECONDARY SCHOOL STUDENTS IN WESTERN MOLDAVIA

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Abstract: This study aims to analyse the somatic and physical parameters in the context of a region set on different altitudinal floors. The place of origin may influence the motor capacity of each subject, therefore we also considered the agricultural aspects of the area. We intended to find the means and ways of working in the case of the children living both in high and low altitudes by analysing areas from the point of view of their daily consumption in relation to the number of individuals living in that area. The structuring of the hygienic and sanitary rules and their application in the lives of children and youth communities is based on the knowledge of the types and relationships between the young body and the natural and social environment. These relationships are different from those of adults because the possibilities of adapting are different in the case of young bodies and the conditions in which children work are specific. The tests used were motility tests and somatic-functional tests approved and recommended by the Ministry of Education. The results reveal the interaction of geography factors with the sports side of children. They may be the composition of a general database focusing on the analysis of the characteristics related to the studied geographical area. This may explain certain aspects of the motor capacity for each altitudinal interval set in the study itself.

Keywords*: motor capacity, altitude floors, Western Moldavia, students.*

1. Introduction

In any country, the attention directed towards health is a factor that emphasizes the development of the population. The individual has always wanted to maintain a healthy mind in a healthy body *("mens sana in corpore sano"*) as the famous roman poet, Juvenal, recommended.

Child's body undergoes a constant effort throughout childhood. These features can be found starting with the toddler age (0-3 years), when he develops his weight and stature, but also in the preschool (3-6/7 years) and lower school stage (10-12 years), when the body undergoes stature changes. Organizing children's activity must be planned so that all these issues must be respected. Energy inputs allow the body to maintain compensation EXPENSES (related to the functionality of the vital organs) and expenses that correspond to life conditions (thermoregulation, transforming nutrients into energy sources, physical activity, increased body weight) (Gavăt, Petreanu Albu, 2006).

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The human body is an open system that responds to environmental factors. Natural environmental factors and socio-cultural factors are known in the literature as mesologic factors (Cordun, 2009).

The geographical environment influences growth and development through micro-climate conditions: air, sun, temperature, light, humidity and atmospheric pressure. The warm climate is guilty for the leg length, and cold for the trunk length. This explains why Africans have long legs and Eskimos the torso well developed. The morphological differences caused by the geographical environment can significantly alter sporting performance of the highest level.

So, African sprinters and height jumpers, due to their body length and basin, an undeniable advantage in jumping tests where the high production of energy on short periods is crucial.

Geography has always been concerned with how populations are distributed in space. As the country has different landforms, the population is inevitably not evenly distributed in space.

That is why it is important to approach the problems connected to the selective influence on the motor skills and qualities of secondary school pupils having as an independent variable the different configuration of the territory with its inherent implications.

2. Material and methods

In order to achieve this research, we used a series of tests to determine the value of the motor capacity of the subjects involved in the study. In addition to somatic and functional measurements (height, body weight, Ruffier test - figures 1 and 2) we also used some motility samples ("commute", pushups, rounders ball throw, long jump on the spot, flexion and trunk extension, resistance running - figures 3 and 4).

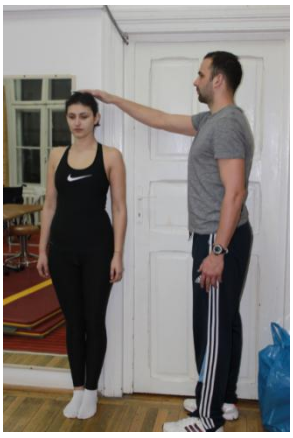

Figure 1 Height measurement

Figure 2 Ruffier Test

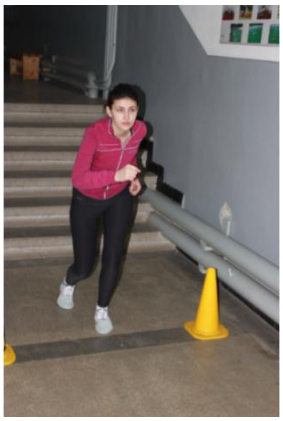

Figure 3 "Commute"

Figure 4 Trunk flexion

The main objective of this paper is to study the general motor capacity grade of the students from the fifth grade in Western Moldova depending on geographical factors. Thus, we decided to analyse the results of the tests from the schools located in the following areas: 0-200m altitude, 200-400m, 400-600m, 600-800m.

For this reason, we compared the following schools: two in Vrancea County, five in Botosani County, one in Iasi and sixteen in Suceava County. Thus, we tested 24 schools with 29 of fifth grade, with 681 students (368 boys, 313 girls).

3. Results and discussions

To perform the necessary analysis study we compared the areas planted with different crops to various results obtained by students after being tested. It followed the hypothesis that subjects living on different altitude floors consume mainly foods that are obtained by harvesting and processing them. It is considered that cereals (wheat, corn), tuberculifer plants (potato) are found by converting them into food, in the daily caloric intake of the individual, and therefore the research was focused on studying them.

Cereals (wheat, rye, corn) have already represented and will always do the most important group of plants for mankind. And this is due to their chemical composition (more than 60% carbohydrates, 10-14% protein substances, minerals, fats, vitamins), cereal grains providing a direct human food base. Soil is not the only element the influences the content of wheat grain in protein substances; environmental factors (such as climate and nitrogen content of soil) play an even more significant part (Torje, 1972).

For an altitude of 0-200m, we analysed six counties: Vrancea, Iasi, Botosani with cultivated surfaces such as (table 1):

Table 1 - Area cultivated for studied localities (RAR, 2010)

	Potato (ha)	**Wheat (ha)**	**Corn (ha)**	**Other crops (ha)**
Altitude 0 - 200m	471	1482.59	4493.11	10449.04

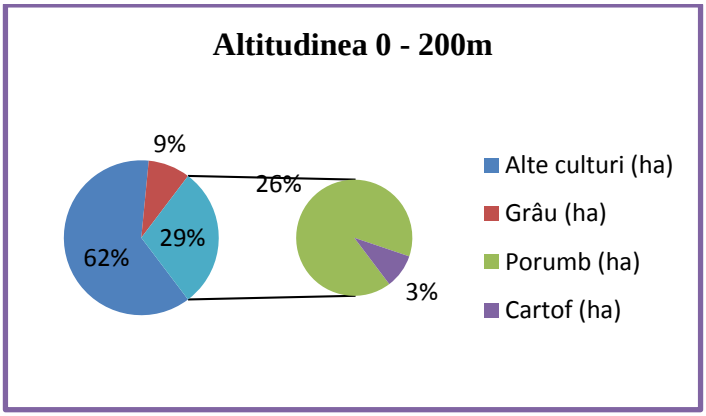

Figure 5 - Share of wheat, corn and potato areas out of the agricultural area

Using the percentage of the whole agricultural area, the crops that are of interest to us in order to conduct our research were represented by wheat (9%), corn (26%) and potatoes (3%) (figure 5). The test results are shown in figure 6, the two sexes being represented separately.

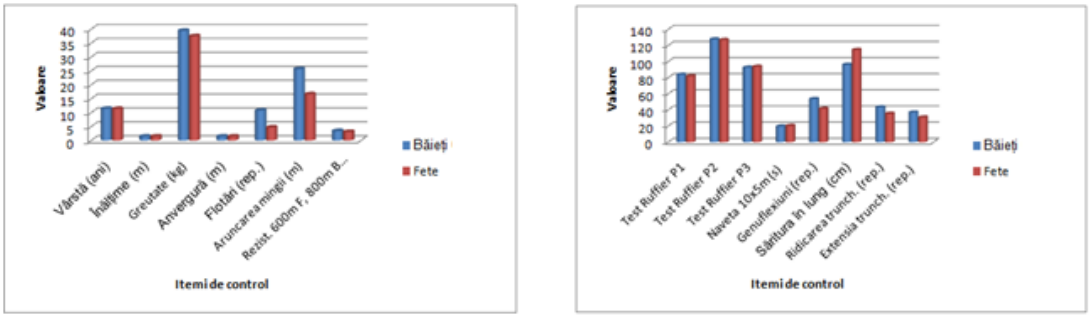

Figure 6 - Average test results for students at an altitude of 0 - 200m

For an altitude of 200-400m we studied students from eight schools in Suceava, using the same items in assessing the relation between the agricultural crops suggested in the research and the students' average test results. At this altitude (200-400m), we notice an increase in the areas planted with potatoes, which is emphasized in table 2 and figure 7:

Table 2 - Area cultivated for studied localities (RAR, 2010)

	Potato (ha)	**Wheat (ha)**	**Corn (ha)**	**Other crops (ha)**
Altitude 200 - 400m	2688	2340.21	5879.06	10540.52

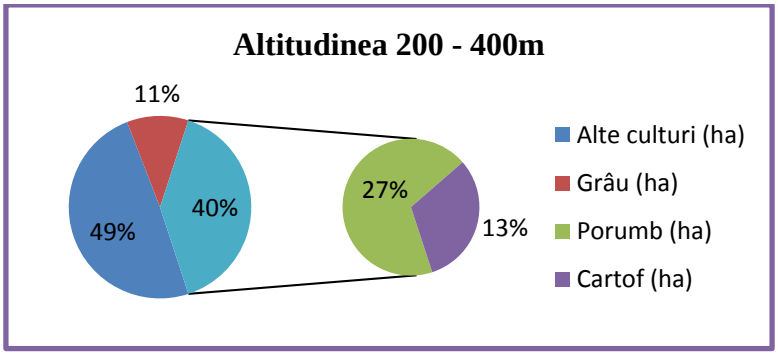

Figure 7 – Share of wheat, corn and potato areas out of the agricultural area

Following the tests carried out, we see equal values for anthropometric measurements, but when it comes to the test of upper body strength, boys have significantly higher results than girls (figure 8).

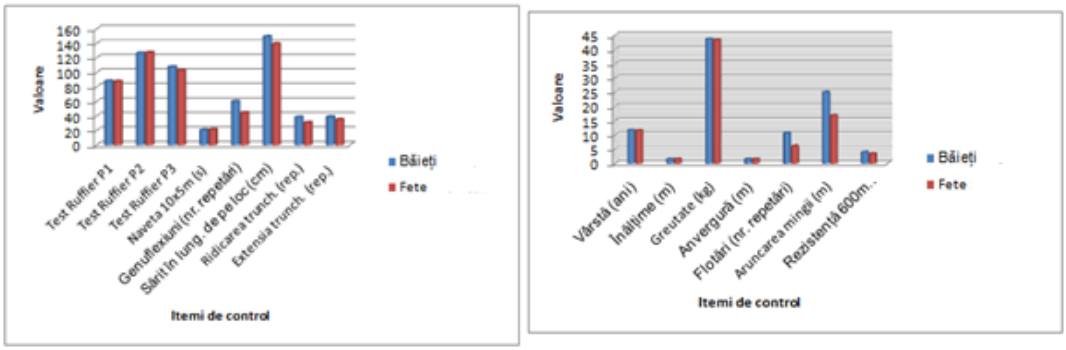

Figure 8 – Average test results for students at the altitude 200 – 400m

For an altitude of 400-600m, 4 schools were studied, the research subjects recording the culture values revealed in table 3.

Table 3 - Cultivated area for studied localities (R.A.R., 2010)

	Potato (ha)	**Wheat (ha)**	**Corn (ha)**	**Other crops (ha)**
Altitude 400 - 600m	1117	143.99	414.63	4688.95

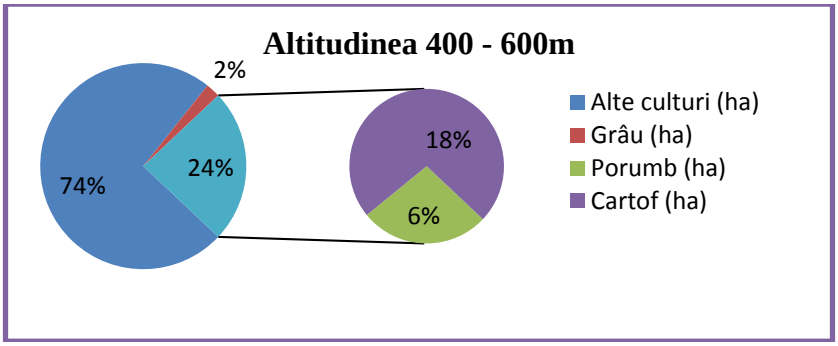

Figure 9 – Share of wheat, corn and potato areas out of the agricultural area

As altitude increases, there is a change in the cultures grown as follows: 2% of the total is covered with wheat, corn drops to 6 % and the potato increases to 18% (Figure 9).

The graphical representation of the appropriate testing for the altitude of 400 - 600m (Figure 10) shows us the same trend of major differences between boys and girls, valued in different tests: upper body strength, found in tests as "rounders ball throw" and "float".

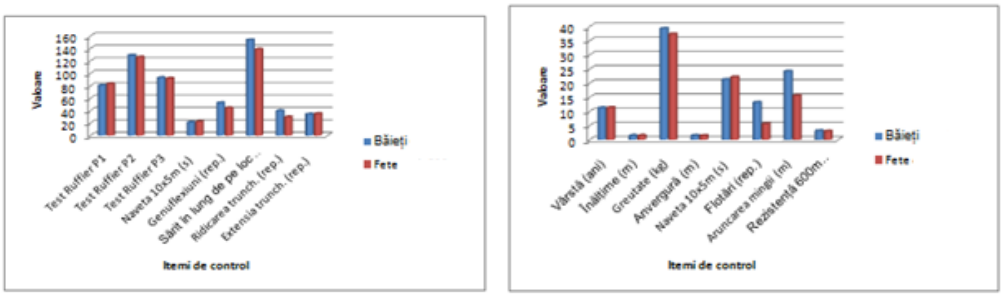

Figure 10 – Average test results for students at the altitude 400 – 600 m

The altitude of 600 – 800 m differs from the other areas of study in respect of the crops that can be found here. Thus, the research conducted in the studied localities reveals the fact that there are areas that have not been cultivated with the studied elements so far (Table 4). Thus, only the potato can be found in the graphical representation (Figure 11), the other crops being insignificant. The sport tests results of this altitudinal range can be found in Figure 12.

Table 5 - Area cultivated for studied localities (R.A.R., 2010)

	Potato (ha)	**Wheat (ha)**	**Corn (ha)**	**Other crops (ha)**
Altitude 600 - 800m	190	1.44	3.9	6938.38

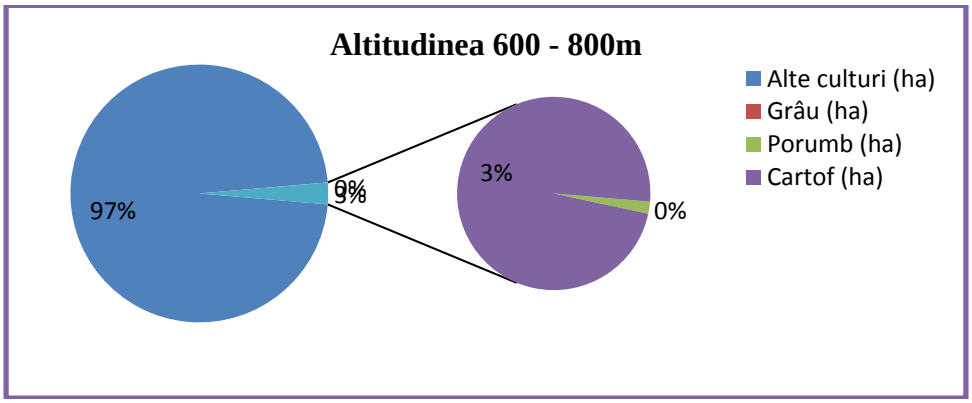

Figure 11 – Share of wheat, corn and potato areas out of the agricultural area

Figure 12 reveals the fact that the girls in the study area have a weight which is larger than the boys' but, although their upper and lower train power is smaller than that of boys, it is much higher than the girls' who live in other lower altitude floors.

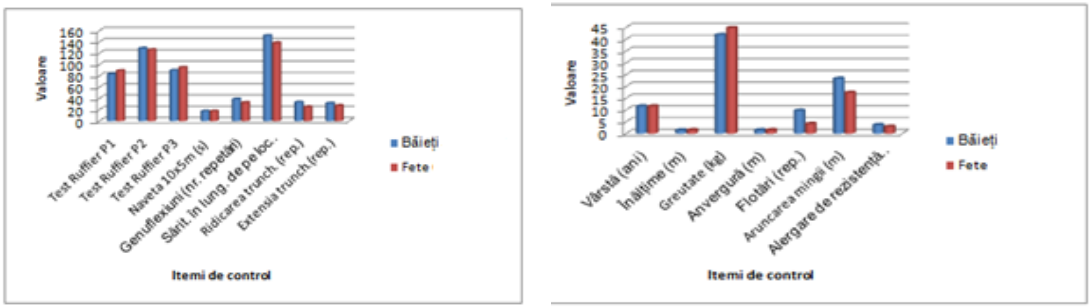

Figure 12 - Average test results for students at the altitude of 600-800 m

Figures 14 and 15 show the graphic representation of the average results of the tests performed within the investigation. Thus, they compare, at the level of all the altitude floors in the study, the results obtained by all 5th grade students in the studied localities, having as an operational model the results that represent the value related to one single person (Figure 13).

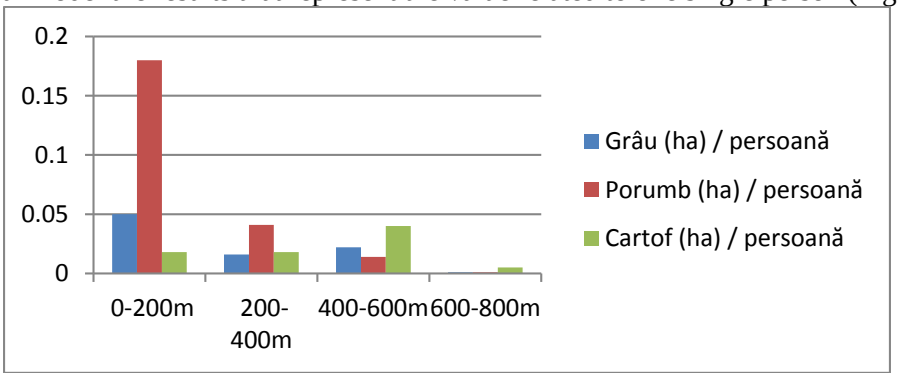

Figure 13 – Graphical representation of the area covered with crops per one person on different altitudinal floors

As regards the anthropometric measurements, in the case of boys we can notice relatively close values from the point of age, size and scale. Only in the case of the weight test we can see increased differences between children at 200-400 m altitude and those at 400-600m (4.44 kg).

The biggest contrast between the sports test results is represented by the difference in the sample "long jump on the spot". If students situated at an altitude of 400m have close results (153.66, 151.27, respectively), those at 0-200m altitude have an average jump of 96.23 cm. The difference of 57.43 cm and 55.04 cm shows the explosive pushing force in lower body for students who live at high altitudes. The results of the specific test for the early stages of initiation in athletics can be explained in two ways - execution technique together with motor skills development (Ursanu, 2008). As we did not influence in any way the execution technique (students using only their basic information in terms of the motor act), it results that the development of the force of fifth graders is higher in the areas above 400m in comparison to those at 0 -200m.

In the "800m resistance running" test, the best average values are recorded by the boys who live at an altitude of 400-600m (3.15) in comparison to those at an altitude of 200-400m (4.38), 0-200m (3.42) or 600-800 (4.05). This difference of 1.25 minutes is

representative of the age of 10-12, aerobic capacity thus being developed for boys living at an altitude of 400-600m. The larger distance covered by students who live at altitude 400-600m in comparison to those at an altitude of 200-400m is, as calculations show (Ursanu, 2008), of approximately 339m. We can explain this based on the increased lung capacity of these students, lung capacity developed in the absence of O2 in inspired air.

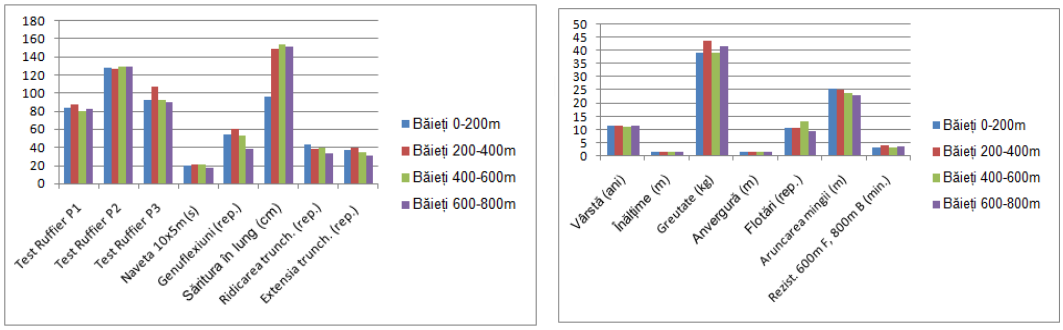

Figure 14 - Final results of the average values of the tests used on different altitude floors for boys

In case of the final results on girls, the differences are obvious: we observe an increase in the average weight of 7.33 kg for girls living at high altitudes (600-800m) in comparison to those living at an altitude of 0-200m.

In the case of the "long jump on the spot" test, fifth grade girls at 0-200m altitude floor have significantly lower results than the other girls in the research. The differences are significant (24.87 cm), which indicates that the strength in the lower body is much reduced compared to the other higher floors. The explanation is the same as for boys.

In respect of the "trunk flexion" test, the girls at the altitude of 600-800m have final results which are 18.38 repetitions fewer than in the case of those living at an altitude of 0-200m. This phenomenon can be easily explained by analysing weight, which directly determines trunk flexion. A larger weight brings about the risk of the appearance of a fat layer, which influences the number of repetitions within the examination. This phenomenon is illustrated by the results of the "600-metres resistance running" test. Those at an altitude of 0-200m record a shorter time (24 seconds) than those who live at an altitude of 600-800m.

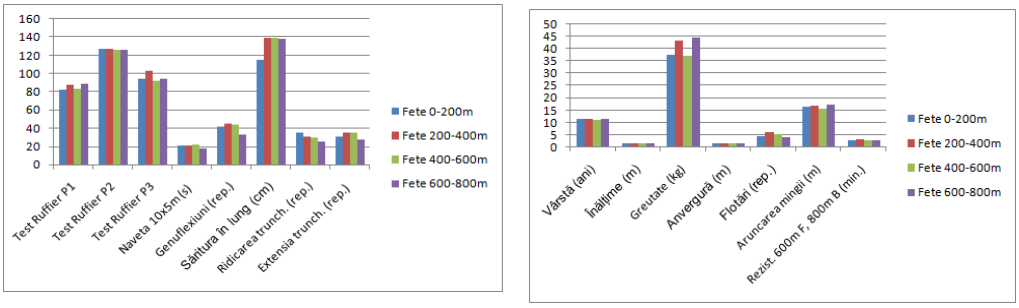

Figure 15– Final results of the average values of the tests used on different altitude floors for girls

4. Conclusions

By analysing the planted areas on these altitude floors and the amount of crop corresponding to each girl in the study, we drew the conclusion that they influence the final weight of the student. In other words, even if they do not dispose of a variety of crops on each altitude floor, the body weight of 5th grade female students increases with the dominance of the potato in their diet. This is supported by the analysis of the share of potato crops within the agricultural area of the region in comparison to the other crops studied (57 square metres / person for potato in comparison to 0.44 square metres / person for wheat).

As the study reveals, the results of the "trunk flexion" test are good for female students living at an altitude of 0-200m in comparison to those who live at an altitude of 600-800m. If we also take into consideration the fact that the girls living at an altitude of 600-800m have an average of 7 kg more, then we can draw the conclusion that the results obtained follow the logic of body motility.

Following the obtained results, we can state that the crop mainly used on different altitude floors is closely related to the weight of the investigated students. This influence leads to the use of modern methods and means of acting against childhood obesity, which can guarantee the normal evolution in terms of motor, physical and mental health.

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