Vol. XXV, Issue 2 / 2024

G Y M N A S I U M

Scientific Journal of Education, Sports, and Health

Original Article

Study on current trends in the level of motor skills of ninth grade students

Boțilă Viorel [1*]
Mihăilescu Liliana Niculina [2]
Enache Ion-Sebastian [3]
[1,2]*Polytechnic University of Science and Technology Bucharest, Pitesti University Centre, Doctoral School of Sport Science and Physical Education, Romania*
[3] *Polytechnic University of Science and Technology Bucharest, Pitesti University Centre, Romania*

DOI: 10.29081/gsjesh.2024.25.2.5

Keywords: *motor ability, physical education, assessment.*

Abstract

This study was conducted out of the need to know the level of development of motor skills of high school students, in the discipline of physical education and sports which has only one lesson/week in Romania, and in the last 12 years there have been no determinations at this level at the national level. Through a series of measurements identical to those used at the national level, we tried to establish the motor profile of 9th grade students at the zonal level. From the data obtained from the results, we can argue that the values obtained by the target group are in regression compared to the values obtained at the national level in 2012, for most indicators, which requires the adoption of effective strategies to improve the motor capacity of students at the age in question.

1. Introduction

The somato-functional and motor potential of the young generation has preoccupied and continues to preoccupy specialists in the field of physical education and sport at school, pre-university and university levels, as well as in sports medicine, public health and other fields. They believe that health depends on an individual's biological and motor resources, and that so-called physical fitness creates a healthy, balanced internal environment and a state of physical and mental well-being. Regular physical activities reduce the risk factors of many diseases such as hypertension, diabetes and obesity (Chaddha et al., 2017, Tătaru & Enache., 2018). The transition from middle school to high school involves behavioral changes in the lives of students due to the environment and the

* *E-mail*: ion.enache1109@upb.ro

transition to adolescence. Young people's understanding and knowledge of terms such as health, fitness and physical activity are important issues for specialists in the field of physical education and sport (Harris et al.,2016).

Fitness refers to the general state of health and well-being of the body, encompassing factors such as cardiovascular endurance, muscular strength, flexibility, agility. This is achieved through regular exercise, proper nutrition and adequate rest, contributing to improved physical and mental health (Făgăraș et al., 2024).

Physical education is considered "the activity that systematically capitalizes on all forms of practicing physical exercises in order to increase, mainly, the biological potential of man in accordance with social requirements" (Terminology of physical education and sport, 1974).

Motor ability is defined as a "complex of predominantly motor manifestations (skills and abilities), conditioned by the level of development of motor qualities, morpho-functional indices, psychological processes (cognitive, affective, motivational) and metabolic biochemical processes, all summed, correlated and mutually conditioned, resulting in the efficient performance of actions and acts required by the specific conditions in which motor activities are practiced" (Dragnea 1999, p.44). It is also related to the formation of habits regarding the inclusion of motor activities in daily activities, the ability to move, as part of a physical capital, transmits and legitimizes values in a specific educational context of physical education or in a social context, but it is also related to sport and physical activities (Dragnea & Bota 1999; Tidén et al 2021).

The WHO considers physical inactivity, cardiovascular diseases, sedentary lifestyles and obesity to be a major danger. It has equal weight with malnutrition and infectious diseases in determining the causes of human deaths. In Europe, one in three 11-year-old children is obese and, at the same rate, it is predicted that in 2025 more than 50% of the world's population will suffer from this chronic disease called obesity. In Romania, the number of people suffering from obesity has increased alarmingly as a result of poor education, poor dietary education and lack of physical activity. Only 23% of children and adolescents and 30% of adults consider themselves to be sufficiently physically active. Lack of sport leads to social exclusion (Tudor et al., 2020). The World Health Organization (WHO) recommends physical activity for children and adolescents for at least 60 minutes per day (Yuksel et al., 2020). The W.H.W.O. estimates that in Romania, by 2030, approximately 500,000 children between 5 and 19 years of age will suffer from obesity.

2. Material and methods

In this context we set out to conduct a study on the level of motor ability of high school students. The subjects are 9th grade students from three urban high schools where we constituted a sample of 59 boys and 56 girls aged between 14 and 16 years, Liceul Teoretic "Traian Lalescu" in Orșova, Mehedinți, Colegiul National Pedagogic "Ștefan Odobleja" in Turnu Severin, Mehedinți and Colegiul " Alexandru cel Bun" in Gura Humorului, Suceava.

Hypothesis of the research: It was assumed that the periodic assessment of

the level of motor ability of pupils will lead to the identification of trends over time at the age under consideration, the restructuring of the paradigm of school physical education in secondary school and the updating of teaching strategies of physical education in secondary school.

Aim of the research

The aim of the research is the realization of the motor profile of 9th grade students on the zonal level.

Research objectives

O1. To identify the level of motor ability of the research subjects.

O2. To determine the trends of evolution, stagnation or involution of the motor ability of ninth grade students at the zonal level in 2024

O3. To identify the deficiencies manifesting themselves in the development of motor ability in the target group.

Research approach

To determine the level of motor ability of 14-16 year old students we used samples and tests used in other studies and research conducted on the national realized nationally before 2024. The designed tests are part of the national assessment system and include a set of tests, each testing a particular aspect of the individual motor ability of the first year of the secondary school cycle, as a cumulative effect of the motor skills training in the secondary school cycle.

The tests applied by us are:

- 10 x 5 m shuttle - time was recorded in seconds and thousandths of a second;
- the long jump from the spot without moose - the distance of the jump was recorded in meters and centimeters;
- trunk lift from supine - the number of correctly performed repetitions was recorded;
- endurance run 1000m boys/800m girls - time was recorded in minutes and seconds.

3. Results and Discussions

The analysis of the level of motor ability in the target group was realized by applying the four tests, the interpretation of the results being made in comparison with the results obtained in these tests in 2012 (Cojocaru 2015) both at national level and at the level of Mehedinți and Suceava counties. The values of the group statistical indicators, for the analyzed categories of subjects, derived from their results are presented in Tables 1 and 2 for boys and 3, 4 for girls.

The results obtained in our research subjects at the level of motor capacity show that in the trunk raising from supine (RT) compared to the results obtained at the national level we find a significant difference in favor of the subjects at the national level in 2012 at a threshold of $p < 0.01$. This shows that at the level of strength in the resistance regimen at the level of the abdominal musculature the target group subjects are deficient. Significant differences also exist at the two-county level for $p < 0.01$.

Table 1. *Statistical indicators in the trunk lifts, 9th grade, boys*

Statistical indicators	**RT**					
	Sub.Cercet. 2023	Rez. naț. 2012	Rez.MH 2023	Rez.MH 2012	Rez. SV 2023	Rez.SV 2012
M	**31.53**	**37.19**	**32.42**	**33.68**	**30.75**	**35.18**
AS	**2.62**	**2.13**	**2.61**	**2.13**	**2.38**	**2.12**
C V	**8.33**	**-**	**8.05**	**38.79**	**7.75**	**34.70**
t	**8.36**		**1.26**		**5.24**	
p	**< 0.01**		**< 0.01**		**< 0.01**	

Legend: Sub. Cercet.= research subjects
Rez. naț.= national results
Rez.MH = results Mehedinți
Rez.SV = results Suceava

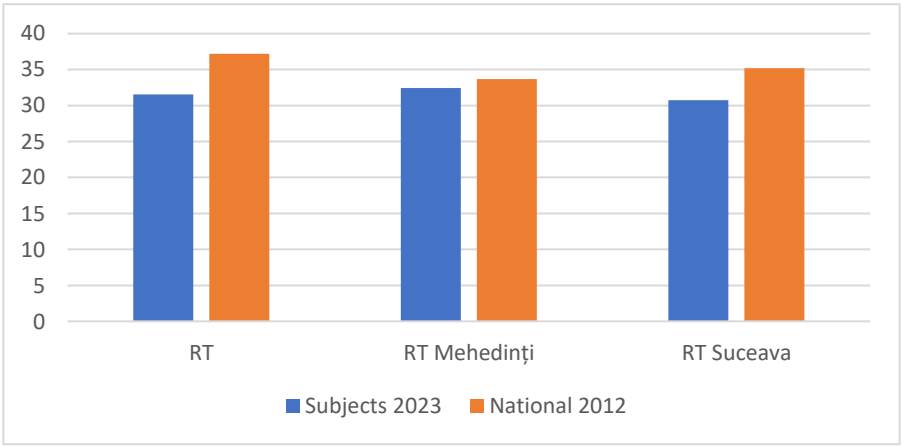

Figure 1. *Representation of the values of the statistical indicators for the RT test, 9th grade, boys*

This shows that the subjects in the target group are deficient in strength in the resistance regimen of the abdominal muscles. Significant differences also exist in the two counties for $p < 0.01$.

For the long jump without moose (Sl.f.e.) event, the comparative analysis of the results between the two tests (2023 and 2012) shows a significant difference in favor of the subjects at the national level in 2012 at a threshold of $p < 0.01$. We find the same regression trend at the level of the two counties.

Table 2. *Statistical indicators in the Long jump without moose, 9th grade, boys*

Statistical indicators	**Sl.f.e.**					
	Sub.Cercet. 2023	Rez nat. 2012	Rez.MH 2023	Rez.MH 2012	Rez. SV 2023	Rez.SV 2012
M	**1.71**	**1.85**	**1.71**	**1.84**	**1.71**	**1.92**
AS	**0.17**	**0.27**	**0.18**	**0.22**	**0.16**	**0.22**
C V	**9.96**	**-**	**10.54**	**12.38**	**9.43**	**11.89**
t	**3.18**		**1.88**		**3.67**	
p	**< 0.01**		**< 0.05**		**< 0.01**	

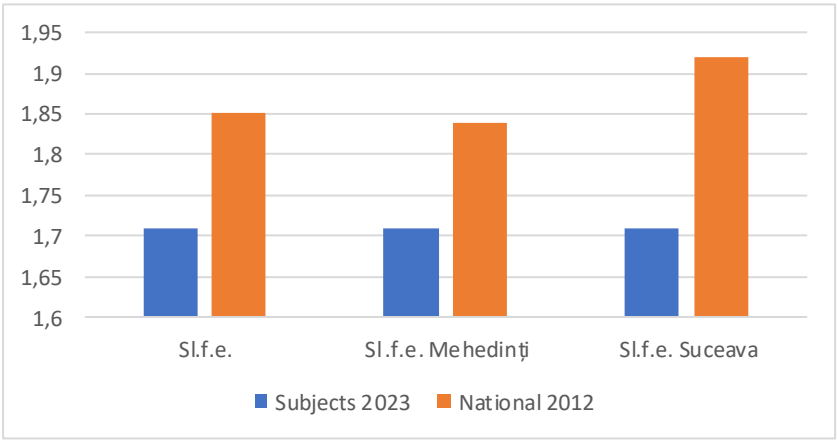

Figure 2. *Representation of the values of the statistical indicators for the Sl.f.e. test, 9th grade, boys*

Table 3. *Statistical indicators for shuttle test, 9th grade, boys*

Statistical indicators	**Shuttle test**					
	Sub.Cercet. 2023	Rez.nat. 2012	Rez.MH 2023	Rez.MH 2012	Rez.SV 2023	Rez.SV 2012
M	**22.88**	**20.09**	**23.01**	**17.46**	**22.76**	**19.54**
AS	**2.93**	**4.34**	**2.39**	**3.01**	**3.33**	**2.23**
C V	**12.82**	**-**	**10.39**	**17.25**	**14.63**	**11.43**
t	**3.68**		**6.05**		**2.72**	
p	**< 0.01**		**< 0.01**		**< 0.01**	

The analysis of the difference between the results recorded by our research subjects and the national results in the Shuttle test 5x10m event indicates a

significant difference in favor of the subjects at the national level in 2012 at a threshold of $p < 0.01$. The same regression trend is also recorded at the level of the two counties. Thus, we find that there is a regression also at the level of motor quality speed at the level of the two counties: in Mehedinți county it is significant at $t = 6.05$ for $p < 0.01$, and in Suceava county at $t = 2.72$ for $p < 0.01$.

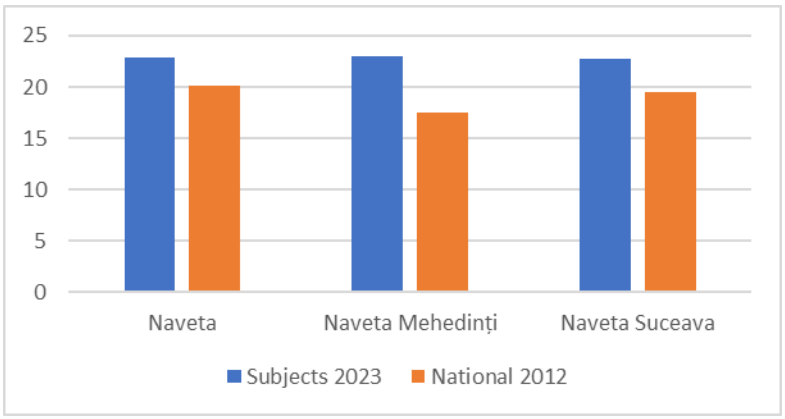

Figure 3. *Representation of the values of the statistical indicators for the Shuttle test, 9th grade, boys*

The results obtained in our research subjects at the level of motor capacity show that in endurance running 1000m (Al.1000m) compared with the results obtained at national level we find a non-significant difference at $t = 0.33$ for $p > 0.01$. At Mehedinți county level there is a significant difference between the two tests at $t = 2.98$ for $p < 0.01$ as well as at Suceava county level at $t = 10.92$ for $p < 0.01$. We note that at the level of aerobic capacity there are differences at the level of the two counties in favor of subjects at the national level.

Table 4. *Statistical indicators for endurance running, 9th grade, boys*

Statistical indicators	**Al 1000m**					
	Sub.Cercet. 2023	Rez.nat. 2012	Rez.MH 2023	Rez.MH 2012	Rez.SV 2023	Rez.SV 2012
M	**4.29**	**4.31**	**4.21**	**4.59**	**4.36**	**3.97**
AS	**0.23**	**0.70**	**0.31**	**1.00**	**0.09**	**0.43**
C V	**5.58**	**-**	**7.57**	**21.81**	**2.06**	**10.77**
t	**0.33**		**2.98**		**10.92**	
p	**>0.01**		**< 0.01**		**< 0.01**	

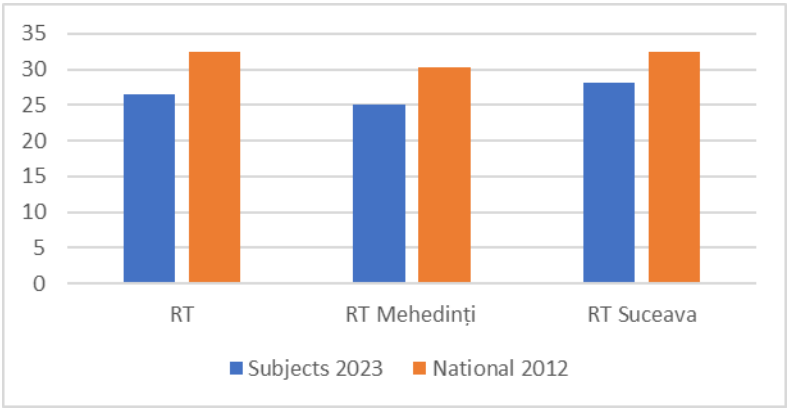

Figure 4. *Representation of the values of the statistical indicators in the endurance running, 9th grade, boys*

The values of the group statistical indicators, for the analyzed categories of subjects, derived from the results are presented in the following table.

Table 5. *Statistical indicators for the trunk lifts, class IX, girls*

Statistical indicators	**RT**					
	Sub.Cercet. 2023	Rez.naț. 2012	Rez.MH 2023	Rez.MH 2012	Rez.SV 2023	Rez.SV 2012
M	**26.54**	**32.46**	**25.11**	**30.26**	**28.05**	**32.52**
AS	**3.80**	**12.84**	**3.49**	**11.64**	**3.52**	**12.53**
C V	**14.33**	**-**	**13.91**	**38.48**	**12.55**	**38.53**
t	**9.12**		**5.10**		**4.68**	
p	**< 0.01**		**< 0.01**		**< 0.01**	

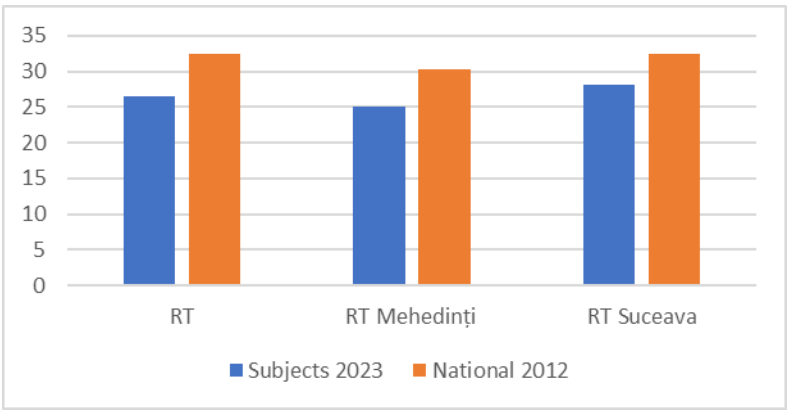

Figure. 5. *Representation of the values of statistical indicators for the RT test, 9th grade girls*

The results obtained in our research subjects (girls) show that in the trunk raising from supine position (RT) compared to the results obtained at national level we find a significant difference in favor of the subjects at national level in 2012 at a threshold of $p < 0.01$.

And at the two-county level there is a significant difference between the two tests for $p < 0.01$. We thus note a depreciation in strength in the resistance regimen in the abdominal musculature.

For the long jump without moose (Sl.f.e.) event, the analysis of the results between the two tests (2023 and 2012) shows a significant difference in favor of the subjects at the national level in 2012 at a threshold of $p < 0.01$. The depreciation is also found at the level of the two counties at a threshold of $p < 0.01$, which means that at the lower limb level the explosive force is regressing between the two tests.

Table 6. *Statistical indicators for the long jump without moose, class IX, girls*

Statistical indicators	**Sl.f.e.**					
	Sub.Cercet. 2023	Rez. nat. 2012	Rez.MH 2023	Rez.MH 2012	Rez. SV 2023	Rez.SV 2012
M	**1.30**	**1.56**	**1.34**	**1.59**	**1.27**	**1.59**
AS	**0.12**	**0.24**	**0.13**	**0.20**	**0.11**	**0.20**
C V	**9.90**	**-**	**9.98**	**13.14**	**8.85**	**13.07**
t	**12.77**		**7.75**		**11.61**	
p	**< 0.01**		**< 0.01**		**< 0.01**	

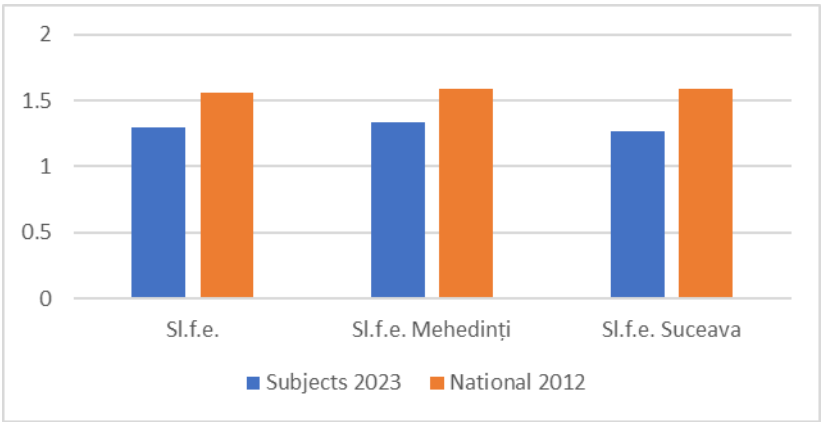

Figure 6. *Representation of the values of the statistical indicators for the Sl.f.e. test, 9th grade girls*

The analysis of the difference between our research subjects (girls) and the national results in the Shuttle test 5x10m event indicates a non-significant difference between the two tests at t = 1.51 for p > 0.01. At county level, however, we find a significant difference between the two tests for p < 0.01. This shows us that there is a regression between the two tests at the level of speed motor quality.

Table 7. *Statistical indicators for the shuttle test, 9th grade, girls*

Statistical indicators	**Shuttle test**					
	Sub.Cercet. 2023	Rez.naț. 2012	Rez.MH 2023	Rez.MH 2012	Rez. SV 2023	Rez.SV 2012
M	**22.49**	**21.64**	**21.71**	**18.54**	**23.31**	**21.07**
AS	**3.31**	**4.19**	**2.53**	**4.19**	**3.81**	**2.45**
C V	**14.75**	**-**	**11.69**	**22.59**	**16.35**	**11.64**
t	**1.51**		**5.01**		**2.41**	
p	**>0.01**		**< 0.01**		**< 0.01**	

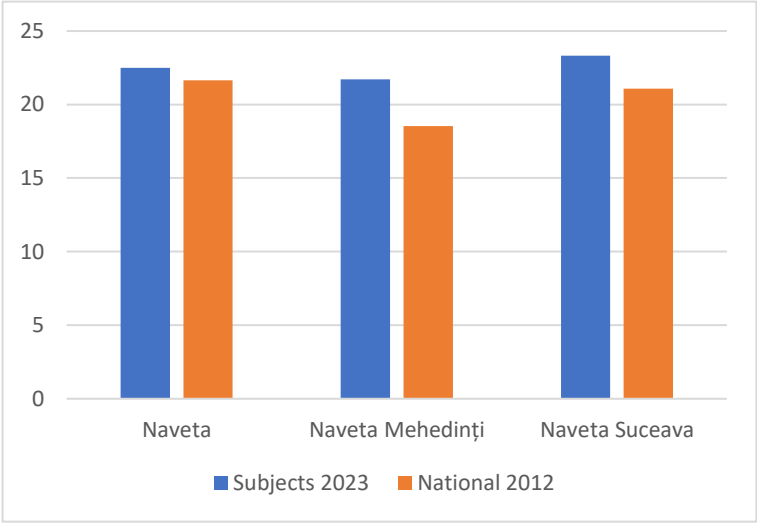

Figure 7. *Representation of the values of the statistical Indicators in the Shuttle test, 9th grade girls*

The results obtained in our research subjects at the level of motor capacity show that in 800m endurance running (Al. 800m) compared to the results obtained at the national level we find a non-significant difference at t = 0 for p > 0.01. In Mehedinți county there is an insignificant difference between the two tests at t = 0.87 for p > 0.01. In Suceava county the differences are significant at t = 14.67 for p < 0.01, which means that in this county the aerobic capacity of the pupils is decreasing.

Table 8. *Statistical indicators for endurance running, 9th grade, girls*

Statistical indicators	Al 800m					
	Sub.Cercet. 2023	Rez. nat. 2012	Rez.MH 2023	Rez.MH 2012	Rez. SV 2023	Rez.SV 2012
M	**4.36**	**4.36**	**4.36**	**4.50**	**4.36**	**4.06**
AS	**0.06**	**0.73**	**0.65**	**0.96**	**0.06**	**0.42**
C V	**1.53**	**-**	**1.48**	**21.29**	**1.57**	**10.39**
t	**0**		**0.87**		**14.67**	
p	**>0.01**		**>0.01**		**<0.01**	

Figure 8. *Representation of the values of the statistical indicators for the Al. 800m., 9th grade girls*

4. Conclusions

C1. The data resulting from our study by testing subjects in the four motor ability tests show that there is a significant regression compared to the values recorded in 2012 at national level, both for boys and girls. With the exception of the boys' endurance running test, where the values are close to those in the national study, in all the other tests the values are below those in 2012.

This conclusion is supported by an objective argument, respectively the difference in numbers in each event and the significance threshold at significant differences;

C2. The trend that is manifesting itself zonally in the target group of our research is alarming, of evident involution of the motor capacity of the students, natural however for students who do not practice other motor activities in addition to the one hour/week of physical education provided in this class and the peculiarities of growth and development of adolescents at this age.

C3. In order to remedy the downward trend clearly manifested in 2023 in the subjects of our research, we propose for pupils of the secondary school cycle that the physical education and sport hour be supplemented with physical education and sport activities as extracurricular activities, with a minimum volume of two hours/week.

References

1. CHADDHA, A., JACKSON, E.A., RICHARDSON, C.R., & FRANKLIN, B.A. (2016). Technology to Help Promote Physical Activity. *Am J Cardiol*. 1;119(1):149-152. doi: 10.1016/j.amjcard.2016.09.025, PMID: 27889045.
2. COJOCARU, V., coord. (2015). *Raport privind evaluarea potențialului somatic, funcțional și motric al populației școlare din Romania.* București: Editura Discobolul.
3. DRAGNEA, A., & BOTA, A. (1999). *Teoria activităților motrice*. București: Editura Didactică și Pedagogică.
4. DRAGNEA, A. (2002), *Teoria educației fizice și sportului*. București: Editura Fest.
5. FĂGĂRAȘ, P.S., RADU, L.E., POPOVICI, I.M., ENACHE, I.S., & RUS, C.M., (2024). Analyses of Health Status Indicators and Physical Fitness Level of Medical Students from Targu Mures, BRAIN Broad research in artificial intelligence and neuroscience 15(2):122-143Volume 15, Issue 2, pages: 131-152 |https://doi.org/10.18662/brain/15.2/568
6. HARRIS, J., CALE, L., DUNCOMBE, R., & MUSSON, H. (2016). Young people's knowledge and understanding of health, fitness and physical activity: issues, divides and dilemmas. Sport, Education and Society, 23(5), 407–420. https://doi.org/10.1080/13573322.2016.1228047
7. Programa școlară de educație fizică și sport clasa a IX. (2017). Retried from: https://www.ise.ro/wp-content/uploads/2017/01/Educatie-fizica-si-sport.pdf.
8. TĂTARU, A.M., & ENACHE, I.S. (2018). Studies concerning the importance of physical exercise in prevention and treatment the obesity in children with ASD, *Journal of Physical Education and Sport* ® (JPES), 18 Supplement issue 5, Art 324, pp.2143 - 2146, DOI:10.7752/jpes.2018.s5324.
9. Terminologia educației fizice și sportului. (1974). București: Editura Stadion.
10. TIDÉN, A., BRUN SUNDBLAD, G., & LUNDVALL, S. (2021). Assessed movement competence through the lens of Bourdieu – a longitudinal study of a developed taste for sport, PE and physical activity. Physical Education and Sport Pedagogy, 26(3), 255–267. https://doi.org/10.1080/17408989.2021.1886269.

11. TUDOR, V., PELIN, F., GHITESCU, G.I., MOANTA, A.D., GRIGORE, V., HIDI, I., MUJEA, A.-M., HARCAU, D., NOSA, R., ONITA, D., VASILICA, C.D., RADOI FULGA, I.B., LEPA, M.-F., SCHVANER, A., STETZ, D.B., & MUTHI, M.L. (2020). Somato-Functional Profile of Children at Risk of Educational and Social Exclusion in Western Romania. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 11(4Sup1), 200- 222. https://doi.org/10.18662/brain/11.4Sup1/165
12. YUKSEL H.S., ŞAHIN F.N., MAKSIMOVIC N., DRID P., & BIANCO, A. (2020). School-Based Intervention Programs for Preventing Obesity and Promoting Physical Activity and Fitness: A Systematic Review, School-Based Intervention Programs for Preventing Obesity and Promoting Physical Activity and Fitness: A Systematic Review *Int. J. Environ. Res. Public Health*, 17(1), 347; https://doi.org/10.3390/ijerph17010347