Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XXV, ISSUE 2, 2025, Romania
The journal is indexed in: ERIH PLUS, Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning, Cabell's Directories

Science, Movement and Health, Vol. XXV, ISSUE 2, 2025
June 2025, 25 (2): 282-293
Original article

THEORETICAL AND PRACTICAL CONSIDERATIONS REGARDING THE PROACTIVE AND SEDENTARY BEHAVIOR OF MIDDLE SCHOOL PUPILS

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Abstract

Aim. The aim of the study was to examine the proactive or sedentary behavior of pupils from 5th to 8th grade, schooled in an educational unit from Romania.

Methods. 80 pupils from the Secondary School no 280 from Bucharest took part in this research. It is about a number of 20 pupils from each of the following classes: 5th B, 6th G, 7th H and 8th B, with an age between 10 an 14 years old. Evaluation tests were applied to evaluate the physical fitness. Concretely, the tests used in the research were: Legs Raises Test, Dynamometry test, 10X5 Shuttle Run Test, Plate tapping Test, 505 Agility Test, Hexagon Test, Standing Stork Test. To identify the sedentary behavior of pupils, the Global Physical Activity Questionnaire (GPAQ), developed by the Wolrd Health Organization, was also applied.

Results. Descriptive statistics was used to identify the proactive and sedentary behavior of the investigated pupils. Statistical analysis was performed by Skewness Test, Kurtosis Test and T-test.

Conclusions. The application of evaluation tests on secondary school pupils in order to determine proactive and sedentary behavior, revealed significant differences in a repetitive way between 5th grade students and the rest of the pupils from 6th, 7th and 8th grade. Within the 7 tests used to evaluate the physical fitness. These significant differences appeared mostly due to age differences, the level of motricity but also because of somato-functional peculiarities.

Keywords: physical fitness components, evaluation tests, motor level, Romanian students.

Introduction

Numerous studies published in the domain's literature mention the importance of developing fitness components in order to form a proactive behavior in young people (Morina, Miftari & Badau, 2021; Jankauskiene et al., 2019), The sedentary behavior adopted for a long time being negatively associated with the fitness components (Tremblay et al., 2011; Gu et al., 2020; Fadillah, Maulang & Hardiyanty, 2021), and physical inactivity (Dong et al., 2021), affecting their development.

Physical inactivity and sedentary behavior can pose major health risks and therfore, a horough approach is required to investigate their negative impact (González, Fuentes & Márquez, 2017). It has been demonstrated through research that the absence of physdical activity can have a major effect on health (Lavie et al., 2019) and the level of fat tissue (Chen & Gu, 2018). Both overweight and obesity during the ontogenetic period from birth to adolescence, which is also included, have increased in recent times, affecting not only developed countries but also various parts of the world, to a considerable extent. A high body mass index (BMI) is associated with a low level of phiysical fitness (Dong et al., 2021), while a normal BMI indicates better physical condition (Guo et al., 2024), highlighting the importance of BMI as a determinant factor of physical fitness (Zaqout et al., 2016).

There are several factors that can pose a risc attributed to being overweight. Among the important factors are socio-economic status, sedentary behavior and parental obesity (Thibault et al., 2010).

In a highly technologized society, where people engage in activities that involve the use of various computerized systems, which can often lead to the adoptation of a sedentary behavior, physical activity is a subject of ovewrwhelming importance. The subject becomes even more sensitive when it targets a category of the population for which measures top revent sedentary behavior and lack of physicial activity require significant efforts (Lavie et al., 2019).

Thus, educationg pupils to acquire a proactive behavior and a high level of physical fitness is a major priority for physical education teachers (Claver et. al., 2020). A major challenge for all researchers and professionals of the physical activities and sports but also health domain ist o discover effective methods for encouraging participation in physical activity, which can be adapted to the age and capabilities of all participants, so that they can equally benefit from the

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advantages in terms of inclusion, learning ans participation in this type of physical activity (Gaetano, 2016), combined with reduced sedentary behavior (Koletzko et al., 2020).

Recent research on adolescent behaviors regarding lifestyle reveals a significant increase in the level of physical inactivity over time, especially among girls (Ortega et al., 2008), with boys demonstrating a higher level of physical fitness compared to girls (Monacis, Pascali & Collela, 2024).

Therefore, the task of prevention, along with organized control over the dietary plan, behavioral improvements and physical activity, represents fundamental measurea that must be used against obesity (Kar, Dube & Kar, 2014) and physical inactivity.

Objectives

The purpose of the study was to identify the status of proactive or sedentary behavior of middle school students in accordance with the motor skills level of the participants and their involvement in different types of motor activities.

Research questions

Applying several tests to evaluate the components of physical fitness can determine the identification of proactive and sedentary behavior of middle school pupils?

Applying the global physical activity questionnaire proposed by the World Health Organization can determine the identification of proactive and sedentary behavior of middle school pupils?

Materials and methods

Participants

The research was conducted on a number of four classes belonging to the middle school cycle, with a total of 80 participants, both girls and boys aged between 10 and 14 years. The research took place at Secondary School No. 280 from Bucharest.

The research included 20 pupils from each of the following classes: 5th B, 6th G, 7th H and 8th C.

Procedure

The content of the research includes the application of a set of evaluation tests, as well as the application of a physical activity questionnaire to identify the proactive and sedentary behavior of middle school students. The global physical activity questionnaire was developed by the World Health Organization (Global Physical Activity Questionnaire – GPAQ).

In order to determine the physical fitness level, the following evaluation tests were applied: Legs Raises Test, Dynamometry test, 10x5m Shuttle Run Test, Plate Tapping Test, 505 Agility Test, Hexagon Test, Standing Stork Test.

Results

Evaluation tests

Table 1. Descriptive statistics – results for the 5th B grade

Statistical indicators	Legs Raises Test (reps)	Dinamometry Test (kg)	10x5m Shuttle Run test (seconds and tenths)	Plate tapping test (seconds and tenths)	505 Agility Test (seconds and tenths)	Hexagon Test (seconds and tenths)	Standing Stork Test (seconds and tenths)
N	20	20	20	20	20	20	20
M	23.50	21.30	22.57	16.58	3.39	17.88	4.97
Median	23.00	21.25	22.32	16.50	3.35	17.7	4.58
S	2,66	2.63	1.51	1.57	0.27	1.19	1.37
CV	0.11	0.12	0.06	0.09	0.07	0.06	0.27
Skewness	0,43	0.12	0.18	0.31	0.08	0.43	0.59
Kurtosis	-1.14	-0.07	-0.34	-0.04	-0.85	-0.19	-0.57

M, mean; DS, standard deviation; CV, variability coefficient; n, number of subjects

Table 2. Descriptive statistics – results for the 6th G grade

Statistical indicators	Legs Raises Test (reps)	Dinamometry Test (kg)	10x5m Shuttle Run test (seconds and tenths)	Plate tapping test (seconds and tenths)	505 Agility Test (seconds and tenths)	Hexagon Test (seconds and tenths)	Standing Stork Test (seconds and tenths)
N	20	20	20	20	20	20	20
M	28.45	25.32	20.30	13.14	5.22	18.98	6.07
Median	28.5	23.55	20.07	13.07	5.23	18.96	5.76
S	2.25	7.05	1,81	0.94	0.23	0.68	1.69
CV	0.07	0.27	0.08	0.07	0.04	0.03	0.27
Skewness	0.01	0.86	0.00	0.07	0.16	0.03	0.45
Kurtosis	-1.23	-0.27	-0.12	-0.51	-0.13	-0.26	-1.08

M, mean; DS, standard deviation; CV, variability coefficient; n, number of subjects

Table 3. Descriptive statistics – results for the 7th H grade

Statistical indicators	Legs Raises Test (reps)	Dinamometry Test (kg)	10x5m Shuttle Run test (seconds and tenths)	Plate tapping test (seconds and tenths)	505 Agility Test (seconds and tenths)	Hexagon Test (seconds and tenths)	Standing Stork Test (seconds and tenths)
N	20	20	20	20	20	20	20
M	25.55	28.58	19.99	12.81	5.24	19.10	6.77
Median	24.00	27.50	20.01	12.73	5.21	19.07	6.92
S	4.28	5.37	2.39	1.18	0.58	0.81	1.96
CV	0.16	0.18	0.11	0.09	0.11	0.04	0.29
Skewness	0.21	0.57	0.33	0.18	0.29	0.35	0.07
Kurtosis	-1.29	-0.63	-0.44	-0.86	-0.60	-0.05	-1.22

M, mean; DS, standard deviation; CV, variability coefficient; n, number of subjects

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Table 4. Descriptive statistics – results for the 8th C grade

Statistical indicators	Legs Raises Test (reps)	Dinamometry Test (kg)	10x5m Shuttle Run test (seconds and tenths)	Plate tapping test (seconds and tenths)	505 Agility Test (seconds and tenths)	Hexagon Test (seconds and tenths)	Standing Stork Test (seconds and tenths)
N	20	20	20	20	20	20	20
M	27.95	33.20	20.57	11.35	5.19	19.25	5.29
Median	28.00	32.50	20.29	11.30	5.19	19.35	4.79
S	2.11	7.43	1.59	0.79	0.27	1.05	1.47
CV	0.07	0.22	0.07	0.06	0.05	0.05	0.27
Skewness	0.18	0.23	0.63	0.29	0.47	0.51	1.01
Kurtosis	-0.48	-0.57	-0.00	-0.17	-0.11	-0.01	-0.08

M, mean; DS, standard deviation; CV, variability coefficient; n, number of subjects

Table 5. Comparison of the results for Legs raises Test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (reps)	23.5	28.45	25.55	27.95	26.36
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 23.50 M6 = 28.45	4.95		p = .00001	
T5:T7	M5 = 23.50 M7 = 25.55	2.05		p = .13525	
T5:T8	M5 = 23.50 M8 = 27.95	4.45		p = .00005	
T6:T7	M6 = 28.45 M7 = 25.55	2.90		p = .01421	
T6:T8	M6 = 28.45 M8 = 27.95	0.50		p = .95046	
T7:T8	M7 = 25.55 M8 = 27.95	2.40		p = .05830	

In terms of comparing the results (table 5) of the 5th B grade with the 6th G grade, the significance level p = .00001 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes..

Regarding the comparison of the results of the 5th B grade with the 8th C grade, the significance level p = .00005 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

The comparison of the results of the 6th G grade with the 7th H grade showed that the significance level p = .01421 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test.

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Table 6. Comparison of the results for Dinamometry Test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (kg)	20.81	25.32	28.58	33.20	26.98
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 20.81 M6 = 25.32	4.52		p = .09050	
T5:T7	M5 = 20.81 M7 = 28.58	7.77		p = .00061	
T5:T8	M5 = 20.81 M8 = 33.20	12.39		p = .00000	
T6:T7	M6 = 25.32 M7 = 28.58	3.25		p = .32423	
T6:T8	M6 = 25.32 M8 = 33.20	7.88		p = .00050	
T7:T8	M7 = 28.58 M8 = 33.20	4.63		p = .07932	

In terms of comparing the results (table 6) of the 5th B grade with the 7th H grade, the significance level p = .00061 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

Regarding the comparison of the results of the 5th B grade with the 8th C grade, the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes..

The comparison of the results of the 6th G grade with the 8th C grade showed that the significance level p = .00050 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test.

Table no 7. Comparison of the results for 10x5 m Shuttle Run Test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (seconds and tenths)	22.57	20.30	19.99	20.57	20.86
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 22.58 M6 = 20.30	2.27		p = .00131	
T5:T7	M5 = 22.58 M7 = 20.00	2.58		p = .00021	
T5:T8	M5 = 22.58 M8 = 20.58	2.00		p = .00586	

T6:T7	M6 = 20.30 M7 = 20.00	0.31	p = .95364
T6:T8	M6 = 20.30 M8 = 20.58	0.27	p = .96634
T7:T8	M7 = 20.00 M8 = 20.58	0.58	p = .75717

In terms of comparing the results (table 7) of the 5th B grade with the 6th G grade, the significance level p = .00131 is less than p = .05, which confirms that there are significant differences between the results obtained by the students of the two classes.

Regarding the comparison of the results of the 5th B grade with the 7th H grade, the significance level p = .00021 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

The comparison of the results of the 5th B grade with the 8th C grade showed that the significance level p = .00586 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test

Table no 8. Comparison of results for Plate tapping test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (seconds and tenths)	16.58	13.14	12.81	11.352	13.47
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 16.59 M6 = 13.14	3.44		p = .00000	
T5:T7	M5 = 16.59 M7 = 12.81	3.77		p = .00000	
T5:T8	M5 = 16.59 M8 = 11.35	5.23		p = .00000	
T6:T7	M6 = 13.14 M7 = 12.81	0.33		p = .80716	
T6:T8	M6 = 13.14 M8 = 11.35	1.79		p = .00003	
T7:T8	M7 = 12.81 M8 = 11.35	1.46		p = .00089	

In terms of comparing the results (table 8) of the 5th B grade with the 6th G grade, the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

Regarding the comparison of the results of the 5th B grade with the 7th H grade, the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes. .

The comparison of the results of the 5th B grade with the 8th C grade showed that the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

In terms of comparing the results of the 6th G grade with the 8th C grade, the significance level p = .00003 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

In terms of comparing the results of the 7th H grade with the 8th C grade, the significance level p = .00089 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

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By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test.

Table no 9. Comparison of the results for 505 Agility Test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (seconds and tenths)	3.39	5.22	5.24	5.19	4.76
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 3.39 M6 = 5.22	1.83		p = .00000	
T5:T7	M5 = 3.39 M7 = 5.24	1.85		p = .00000	
T5:T8	M5 = 3.39 M8 = 5.20	1.80		p = .00000	
T6:T7	M6 = 5.22 M7 = 5.24	0.02		p = .99818	
T6:T8	M6 = 5.22 M8 = 5.20	0.03		p = .99532	
T7:T8	M7 = 5.24 M8 = 5.20	0.05		p = .97689	

In terms of comparing the results (table 9) of the 5th B grade with the 6th G grade, the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

Regarding the comparison of the results of the 5th B grade with the 7th H grade, the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

The comparison of the results of the 5th B grade with the 8th C grade showed that the significance level p = .00000 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test.

Table no 10. Comparison of the results for Hexagon Test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (seconds and tenths)	17.88	18.98	19.10	19.25	18.80
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 17.89 M6 = 18.99	1.10		p = .00280	
T5:T7	M5 = 17.89 M7 = 19.11	1.22		p = .00073	

T5:T8	M5 = 17.89 M8 = 19.26	1.37	p = .00013
T6:T7	M6 = 18.99 M7 = 19.11	0.12	p = .97770
T6:T8	M6 = 18.99 M8 = 19.26	0.27	p = .80644
T7:T8	M7 = 19.11 M8 = 19.26	0.15	p = .96022

In terms of comparing the results (table 10) of the 5th B grade with the 6th G grade, the significance level p = .00280 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

Regarding the comparison of the results of the 5th B grade with the 7th H grade, the significance level p = .00073 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

The comparison of the results of the 5th B grade with the 8th C grade showed that the significance level p = .00013 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test.

Table no.11. Comparison of the results for Standing Stork Test

Grade	5th B	6th G	7th H	8th C	Total
N	20	20	20	20	80
Mean (seconds and tenths)	5.02	6.07	6.77	5.29	5.79
Comparison of mean between grades		*Significant difference*		*Significance level p*	
T5:T6	M5 = 5.03 M6 = 6.08	1.05		p = .20149	
T5:T7	M5 = 5.03 M7 = 6.77	1.75		p = .00769	
T5:T8	M5 = 5.03 M8 = 5.30	0.27		p = .95560	
T6:T7	M6 = 6.08 M7 = 6.77	0.70		p = .55352	
T6:T8	M6 = 6.08 M8 = 5.30	0.78		p = .45774	
T7:T8	M7 = 6.77 M8 = 5.30	1.48		p = .03266	

In terms of comparing the results (table 11) of the 5th B grade with the 7th H grade, the significance level p = .00769 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

Regarding the comparison of the results of the 7th H grade with the 8th C grade, the significance level p = .03266 is less than p = .05, which confirms that there are significant differences between the results obtained by the pupils of the two classes.

By comparing the results of the other classes, no significant differences were recorded between the results obtained in the test.

Questionnaire

The purpose of this questionnaire is to find out about the types of physical activities that middle school pupils do in their daily lives. The questions were addressed to the pupils based on the time they spent doing physical activities in the last 7 days.

Before completing the questionnaire, each pupil agreed that the results of the questionnaire could be used in the study.

The first item of the questionnaire (*Does your activity involve high-intensity activities that cause large increases in breathing or heart rate for at least 10 minutes? – P1*), completed by the 80 participants, revealed that all pupils engage in vigorous activitie

Regarding the second item of the questionnaire (*In the last seven days, on how many days did you do vigorous physical activities, such as lifting weights or climbing stairs as part of your activity? – P2*), it appears that 52,5% of the participants, respectively 42 of them did vigorous physical activities between two and four days a week, 28,8% of the participants, respectively 23 pupils, did vigorous physical activities more than four days a week, while the smallest percentage, represented by 18,7% of the participants, respectively 15 pupils, did vigorous physical activities one day a week.

For the third item of the questionnaire, (*How much time did you usually spend on one of this doing vigurous physical activities as part of your activity? – P3*) a high percentage of 52,5% of the participants, respectively 42 of them, did vigurous physical activities as part of their activity for 30 minutes a day, 37,5% of the participants meaning 30 pupils did vigurous physical activities as part of their daily activity for one hour a day and the smallest percentage is represented by 10%, respectively 8 pupils who did vigurous physical activities for more than 2 hours a day.

The fourth item of the questionnaire (*Does your activity involve moderate-intensity activities that cause small increases in breathing or heart rate for at least 10 minutes? – P4*) has shown that all 80 participants engaged in moderate-intensity activities.

Regarding the fifth item of the questionnaire (*In the last seven days, on how many days did you do moderate activities such as carrying light loads as part of your activity? – P5*), the highest percentage, namely 47.5% of the participants, respectively 38 pupils, did moderate activities as part of their activity between two and four days a week, 21.3% of participants, meaning 17 pupils did moderate activities as part of their activity more than four days a week, 16.2% of all participants, respectively 13 pupils didn't do this type of activities as part of their own activity, and the smallest percentage represented by 15% of all participants, respectively 12 pupils did moderate activities as part of their activity one day a week.

Regarding the sixth item of the questionnaire (*How much time did you usually spend in one of this days doing moderate physical activities as part of your activity? – P6*), it appears that 47.5% of all participants, respectively 38 pupils did moderate activities as part of their activity 30 minutes a day, 36.2% of all participants, respectively 29 pupils did moderate activities as part of their activity 1 hour a day, 8.8% of all participants, respectively 7 pupils did not do this kind of activities, and the smallest percentage is represented by 7.5%, respectively 6 pupils, who did moderate activities as part of their activity more than two hours a day.

For question no 7 (*Do you walk or use a bycicle for at least 10 minutes continuously to get to and from certain placesi? – P7*) pupils responce was unanimously affirmativ.

For item number 8 (*In the last 7 days, on how many days did you walk or cycle for at least 10 minutes at a time as part of your activity? – P8*), a high percentage of 65% of the participants, respectively 52 pupils, walked for at least 10 minutes as part of their activity, more than four days a week, 25% of the participants, respectively 20 pupils, walked for at least 10 minutes as part of their activity, between two and four days a week, and the smallest percentage is represented by 10%, respectively 8 pupils, who walked for at least 10 minutes as part of their activity, more than four days a week.

Regarding item number 9 of the questionnaire (*How much time did you usually spend on one of these days walking or cycling as part of your activity? – P9*), the highest percentage, namely 60% of the participants, respectively 48 pupils, walked as part of their activity for 30 minutes a day, 25% of the participants, respectively 20 pupils, walked as part of their activity for 1 hour a day, and the smallest percentage, represented by 15% of the participants, respectively 12 pupils, walked as part of their activity for more than two hours a day.

For question no 10 of the questionnaire (*Do you practice high-intensity sports that cause large increases in breathing or heart rate for at least 10 minutes continuously? – P10*) 100% of the participants, respectively 80 pupils, practice sports or recreational activities where the intensity of the effort increase.

For item number 11 of the questionnaire (*In the last 7 days, on how many days did you practice high-intensity sports or recreational activities? – P11*), 35% of the participants, respectively 28 pupils, practiced between two and four days a week, a similar percentage to the previous one, namely 35% of the participants, respectively 28 pupils, practiced more than four days a week, and 30% of the participants, respectively 24 pupils, practiced one day a week.

Regarding item number 12 of the questionnaire (*How much time do you usually spend in a typical day practicing high-intensity sports or recreational activities? – P12*), it appears that 50% of the participants, respectively 40 pupils spend 30 minutes a day, 28.7% of the participants, respectively 23 pupils spend 1 hour a day, and 21.3%, respectively 17 pupils spend more than 2 hours a day.

Regarding item number 13 of the questionnaire (*Do you practice moderate-intensity sports or recreational activities that cause a slight increase in breathing or heart rate for at least 10 minutes continuously? – P13*) all pupils answered affirmatively.

For item number 14 (*In a typical week, on how many days do you do moderate-intensity sports or activities? – P14*) 73.7% of the participants, respectively 59 pupils, do moderate-intensity sports or activities between two and four days a week, 22.6% of the participants, respectively 18 pupils, do moderate-intensity sports or activities two days a week, and 3.7% of the participants, respectively 3 pupils, do moderate-intensity sports or activities one day a week.

Regarding item number 15 of the questionnaire (*How much time do you spend doing moderate-intensity sports or recreational activities on a typical day? – P15*), it appears that 50% of the participants, respectively 40 students, spend between 3 and 4 hours a day, 37.5% of the participants, respectively 30 pupils, spend between 2 and 3 hours a day, and the smallest percentage, 12.5% of the participants, respectively 10 pupils, spend less than 1 hour a day.

For item number 16 of the questionnaire (*How much time do you usually spend sitting or lying down on a typical day?*), 71.3% of the participants, respectively 57 pupils, spend more than 8 hours a day, 22.5% of the participants, respectively 18 pupils, spend 7 hours a day, and the smallest percentage, 6.2% of the participants, respectively 5 puupils, spend less than 6 hours a day.

Discussions

Regarding the application of evaluation tests on middle school pupils to determine proactive and sedentary behavior, significant differences were repeatedly found between the 5th B grade students and the 6th G, 7th H, and 8th C grade pupils in all 7 evaluation tests. These significant differences largely appeared due to age differences, motor skill levels, and somato-functional peculiarities. The results obtained by the pupils included in the research were compared with the evaluation normative data published in the specialized literature. We present below the results obtained, specified for each evaluation test.

Within the test *Legs Raises Test*, referring to the normative data of this test, the average results obtained by the 5th B grade pupils is 23.50 repetitions, representing an average performance. The 6th G grade pupils obtained an average of 28.45 repetitions, indicating an above-average value, the results with an average of 25.55 repetitions obtained by the 7th H grade pupils reflect an average value, and the results obtained by the 8th C grade pupils are on average 27.95 repetitions, indicating an above-average performance.

Regarding the Dynamometry test, referring to the normative data of this test, the average results obtained by the 5th B grade pupils is 21.30 kg, representing a low performance. The 6th G grade pupils obtained an average of 25.32 kg, representing a weak index, the results with an average of 25.55 kg obtained by the 7th H grade pupils reflect a weak performance, and the results obtained by the 8th C grade pupils are on average 27.95 kg, representing a satisfactory index.

Regarding the Hexagon test, referring to the normative data of this test, the average results obtained by the 5th B grade pupils is 17.88 seconds, representing a below-average performance. The 6th G grade pupils obtained an average of 18.98 seconds, indicating a poor value, the results with an average of 19.10 seconds obtained by the 7th H grade pupils reflect a low index, and the results obtained by the 8th C grade pupils are on average 19.25 seconds, indicating a low performance.

In the Standing Stork test, referring to the normative data of this test, the average results obtained by the 5th B grade pupils is 4.97 seconds, representing a low performance. The 6th G grade pupils obtained an average of 6.07 seconds, indicating a poor value, the results with an average of 6.77 seconds obtained by the 7th H grade pupils reflect a weak index, and the results obtained by the 8th C grade pupils are on average 5.29 seconds, indicating a low performance.

Regarding the 10x5 m Shuttle Run Test, referring to the normative data of this test, the average results obtained by the 5th B grade pupils is 22.57 seconds, representing a poor performance. The 6th G grade pupils obtained an average of 20.30 seconds, indicating a poor value, the results with an average of 19.99 seconds obtained by the 7th H grade pupils reflect a below-average value, and the results obtained by the 8th C grade pupils are on average 20.57 seconds, indicating a low performance.

Regarding the 505 Agility Test, the best time of each pupil was recorded from two attempts. The average results obtained by the 5th B grade pupils is 3.39 seconds, the 6th G grade pupils obtained an average of 5.22 seconds, the results with an average of 5.24 seconds obtained by the 7th H grade pupils and the results obtained by the 8th C grade pupils are on average 5.19 seconds.

In the Plate Tapping test, the best time of each pupil was recorded from two attempts. The average results obtained by the 5th B grade pupil is 16.58 seconds, the 6th G grade pupil obtained an average of 13.14 seconds, the 7th H grade pupils obtained an average of 12.81 seconds, and the 8th C grade pupils obtained an average of 11.35 seconds

It is noted that the level of development of the physical fitness components predominantly shows low, below-average, or average results. In this context, the systematic practice of physical exercises in the formation and promotion of proactive behaviors can have positive influences (Badau et al., 2021) in the attempt to optimize the components of physical fitness (Morina, Miftari & Badau, 2021) and their education field (Balan et al., 2012).

Conclusions

Following the aplication of the questionnaire on physical activity in order to identify the proactive and sedentary behavior of meddle school pupils, the following aspects were highlighted: 10% of the pupils participating in the study are involved in high-intensity activities, exceeding 120 minutes; 7.5% of the pupils participating in the study are involved in moderate-intensity activities, lasting more than 120 minutes; 21.3% of pupils are practicing a sports discipline of a high-intensity or recreational activities of high-intensity, lasting over two hours; 50% of pupils are involved in moderate-intensity sports or recreational activities, lasting over 180 minutes. The obtained percentages are not encouraging, given that the World Health Organization's standards recommend that young people should practice at least 60 minutes of moderate or intense physical activities per day (WHO, 2020).

As a result of the obtained information from applying the questionnaire, we can conclude that the average level of development of the components of physical fitness is also duet o the low number of minutes given to the systematic practice pf physical exercises.

Concluding, combating sedentarism and promoting proactive behavior in middle school pupils, not only improves their well-being, but also contributes to the formation of the responsible and active adults in society. It is vital that efforts in this direction to be continuous and supported by factors involved in the education and development of pupils.

Authors' Contributions

All authors have equally contributed to this study and should be considered as main authors.

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