

## COMPARATIVE STUDY ON SEDENTARISM AT FIFTH GRADE CHILDREN IN RURAL AND URBAN ENVIRONMENT

COSMIN PRODEA<sup>1\*</sup>, RAUL NEMEȘ<sup>2</sup>, CLAUDIU BOANCĂ<sup>3</sup>

**ABSTRACT. Introduction.** This article highlights the importance of physical education for a healthy lifestyle in the context of modern technology which is continuously developing. It's not necessary to move a lot in order to communicate or play with other persons and all these have a negative impact on daily physical activity of children. The objectives of this study were to underline the negative influence of technology on physical education and to see if there are differences between urban and rural environment concerning the level of physical activity. **Methods.** Ten subjects were selected from urban environment, from Ion Bob School, and ten subjects were selected from rural environment, from Chinteni School. Both groups were formed of five girls and five boys and were monitored seven days a week, 24 hours a day. Data were recorded every morning by the physical education teacher. **Results.** We can see a clear difference in favor of rural environment regarding the physical activity carried out. If in the case of boys the differences are not very big, in the case of girls the differences are important. Moreover, during the weekend the level of physical activity increases in the rural environment, while in the urban environment there are no significant changes. **Conclusion.** New gadget technology breakthroughs have beneficial but overused aspects can have important negative effects on the child in terms of physical activity and health. I can lead to a low energy of the child, sleep disturbances, and even sedentary.

**Key words:** *physical activity, rural environment, urban environment, sedentary, pedometer.*

**REZUMAT. Studiu comparativ între mediul rural și mediul urban privind sedentarismul la copiii de clasa a V-A. Introducere.** Acest articol subliniază importanța activității fizice pentru a avea un stil de viață sănătos pe fondul unei tehnologii moderne în continuă dezvoltare. Nu trebuie să ne deplasăm prea mult pentru a comunica cu o persoană sau pentru a ne juca iar toate acestea au

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<sup>1</sup> University of Babeș-Bolyai, Faculty of Physical Education and Sport, Cluj-Napoca, Romania

<sup>2</sup> Teacher at Chinteni Gymnasium School, Romania

<sup>3</sup> Teacher at "Ioan Bob" Gymnasium School, Cluj Napoca, Romania

\*Corresponding Author: [prodeacosmin@gmail.com](mailto:prodeacosmin@gmail.com)

un impact negativ asupra activității fizice zilnice a copiilor. Obiectivele acestui studiu au fost de a arăta influența negativă a tehnologiei asupra activității fizice și de a determina dacă există diferențe între mediul urban și cel rural privind nivelul activității fizice. **Metode.** S-a ales un număr de 10 subiecți din mediul urban de la Școala Gimnazială „Ioan Bob” respectiv un număr de 10 subiecți de la Școala Gimnazială Chinteni, din mediul rural. Ambele grupuri au fost formate din cinci fete și cinci băieți și au fost monitorizate șapte zile pe săptămână 24 de ore. Datele s-au înregistrat în fiecare dimineață de către profesorul de educație fizică. **Rezultate.** Se poate vedea o diferență clară în favoarea mediului rural din punct de vedere al rezultatelor înregistrate privind activitatea fizică. Dacă în cazul băieților diferențele nu sunt deosebit de mari, în cazul subiecților de sex feminin aceste diferențe se accentuează. Mai mult de atât în ceea ce privește weekendul nivelul de activitate fizică crește la cei din mediul rural în timp ce la copiii din mediul urban nu se înregistrează diferențe semnificative. **Concluzii.** Noile descoperiri tehnologice în materie de gadget-uri au aspecte benefice dar folosite în exces pot avea efecte negative importante asupra copilului din punct de vedere al activității fizice și al stării de sănătate. Pot conduce la o energie scăzută a copilului, tulburări de somn, și chiar sedentarism.

**Cuvinte cheie:** *activitate fizică, mediul rural, mediul urban, sedentarism, pedometru.*

## Introduction

The recent worrying statistics show a considerable increase in the number of overweight and even obese people in both the adult population and the young and children. Studies have shown two main causes that increase the number of people with weight problems: a diet rich in sugars and body fat, and the other cause is the lack of physical activity.

Physical activity aims at expressing or improving physical and mental condition, developing social relationships, or achieving results in competitions at all levels through an organized or non-organized activity. The principle that governs these activities is based on the accessibility and the acquisition of a healthy way of life which are essential finalities (Lucut, 2000).

The state of health and, implicitly, the quality of life can be significantly improved by practicing physical exercises. Systematic physical activity determines the improvement of the physical condition directed towards health and the awareness of the well-being from a physical, mental, material and term perspective.

According to the national health report of children and young people in Romania issued by the National Institute of Public Health in 2015, 28.4% of urban children have a disharmonic physical development compared to rural areas; only 14.6% have disharmonic physical development (CNA, 2009).

These worrying data made me observe the physical movement volume in both rural and urban areas in children, comparing the recorded data and determining the physical movement difference, if identified, between children in Urban and rural areas.

### **Theoretical data of the experiment**

Cucu (2016) argues that the level of physical activity is of great importance in the control of body weight regardless of age, by increasing the frequency of practicing physical activity, the risk of certain chronically diseases affecting respiratory system, circulatory system, muscular system and bone is low. Also based on previous studies, physical activity has been shown to reduce anxiety and prevent or ameliorate mild and moderate depression.

Also due to these worrying statistics, various campaigns to promote regular physical activity were launched, among which the most widespread is the campaign "For a healthy lifestyle" initiated by the National Audio-visual Council (CAN) and the International Advertising Association (IAA) 2009 which includes 5 messages that are still broadcast on TV:

- A) "For a healthy life, eat fruits and vegetables daily";
- B) "For a healthy life, make exercise for at least 30 minutes each day";
- C) "For a healthy life, consume at least two litres of liquid per day";
- D) "For a healthy life, respect the main meals of the day";
- E) "For your health, avoid excess salt, sugar and fat" (CNA, 2009).

Regular practice of physical exercise has indirect beneficial effects on nutrition, a person's energy needs are directly proportional to physical activity, when the physical activity is more intense, the energy needs grow and nutrition balancing becomes easier.

If we take a close look at the physical effort we will see that physical effort has beneficial effects on muscle tone, sleep quality, and implicitly on mental capabilities, resulting in a good health by endorphin release at the cerebral level.

Regarding the lack of activity of children a main cause would be the "lack" of parents' time to form healthy child habits and to regularly practice various physical activities. For high efficiency, it is recommended that these habits of balanced nutrition and physical activity be implemented at family level starting with parents who could become an example for children and even a motivational factor (Baciu, 2006).

To determine the physical activity level of the subjects surveyed, a pedometer was used to monitor the number of steps, the distance travelled, the calories burned, and the total time the subject was in motion. The pedometer is

a pager-sized electrical device that can be attached to the belt, the straps or even a bag or backpack, provided that when we are in motion and that baggage accompanies us.

For the vast majority of healthy adults, 10,000 daily steps are a pretty good objective, but in children, for a good outcome, they have to accumulate between 12,000 and 16,000 steps a day (Schneider, 2005).

**Table 1.** The evaluation of the activity level

Adults Steps/day	Activity level	Children Steps/day
< 5000	SEDENTARY	< 7000
5000 – 7499	LOW ACTIVITY	7000 – 9499
7500 – 9999	SLOW ACTIVITY	9500 – 11999
10000 – 12500	ACTIV	12000 – 14500
> 12500	HIGH ACTIVITY	> 14500

## The participants

A total of 20 subjects, including 10 female subjects and 10 male subjects, took part in the research. It should be noted that the sample was divided into two groups: Group A from Chinteni Gymnasium School in Chinteni and Group B from the "Ioan Bob" Gymnasium School in Cluj-Napoca. Group A subjects have their domicile in the rural area at a distance of 15 km to 25 km from Cluj-Napoca.

These 100% of the children live at home, come from families with an unstable financial situation, except for only two female subjects. Group B children all live in the urban area and 50% of them live at home and enjoy solid financial stability with access to the latest technology and having the possibility of practicing various classic or new sports.

It should be noted that no subject is practicing a regular sport by joining a club or sports association. This did not leave a special footprint on the subject's BMI. As we can see in the tables below, rural subjects have a smaller waist than those in the urban area averaging 6.1 cm and weighing less 6 kg. Although subjects in the urban area are more physically developed, BMI is higher with only 0.6, which shows a proportional development.

Only one problem with BMI was recorded in each group, a BMI of 29.4 was recorded in group A, indicating increased overweight with high risk of obesity, and in Group B was reported a BMI indicating a slight overweight with Value of 25.6.

**Table 2.** Subjects of Group A from Gymnasium School Chinteni

<b>Nr.</b>	<b>Subject</b>	<b>Sex</b>	<b>Height</b>	<b>Weight</b>	<b>BMI</b>
1	I.T	F	146	34	16
2	I.G	F	157	54	21.9
3	R.P	F	148	50	22.8
4	G.V	F	142	38	18.8
5	D.M	F	155	38	15.8
6	I.C	M	157	56	23.4
7	P.N	M	144	38	18.3
8	D.C	M	151	46	20.2
9	I.R	M	158	49	19.6
10	A.O	M	151	67	29.4
11	Average F		149.6	42.8	19
12	Average M		152.2	51.2	22.1
13	Average A		150.9	47	20.5

**Table 3.** Subjects of Group B from Gymnasium School 'Ioan Bob' Cluj-Napoca

<b>Nr.</b>	<b>Subject</b>	<b>Sex</b>	<b>Height</b>	<b>Weight</b>	<b>BMI</b>
1	N.A	F	150	50	22.2
2	G.T	F	152	48	20.8
3	C.B	F	161	54	20.8
4	I.C	F	156	48	19.7
5	N.A	F	148	44	20.1
6	P.A	M	155	50	20.8
7	P.D	M	158	54	20
8	P.V	M	163	68	25.6
9	C.A	M	159	56	22.2
10	M.P	M	171	58	19.8
11	Average F		153	48.8	20.7
12	Average M		161	57.2	21.6
13	Average A		157	53	21.1

## Period

The research was divided into three stages. The first stage included the presentation of the subjects' equipment, tests on it, the way it works, and the relevance of the data. This stage was 10 days from March 20, 2016 to March 29, 2016. During the first three days of this stage, comparative pedestrian tests were performed in relation to metric measurements. The next two days presented Group A pedometers and tested it for 48 hours on how to record data and how to use it. The sixth day of this stage was devoted to reviewing appliances. The next two days, seven and eight, also benefited the Group B for the presentation and testing of pedometers. The last two days of this stage have been devoted to reviewing its devices, checks and preparations for starting the research itself.

The second stage of the survey included the monitoring of subjects from the Chinteni Gymnasium School. This stage started on 31 March 2016 and lasted until April 7 at 10:00 AM when the latest data of the subjects was recorded.

The third stage of the research was dedicated to the monitoring of subjects from the "Ioan Bob" High School in Cluj-Napoca. This stage began immediately after the end of the second stage of research on April 8, 2016, and ended on April 15, 2016, as well as at 10 am, recording the latest research data.

An important variable in the recorded results was the status of time because of the different monitoring period of the subjects it could have a strong influence, but this did not happen because it was a meteorologically stable period.

**Table 4.** Monitoring weather conditions during the research period

<b>Gymnasium School Chinteni Research Period 31.03.2016 - 7.04.2016</b>			<b>Gymnasium School „Ioan Bob” Cluj-Napoca Research Period 08.04.2016 - 15.04.2016</b>		
	Temperature Max/Min	Precipitations	Precipitations	Temperature Max/Min	
Average	22°/6°	0,75 mm	0,87 mm	19,5/9°	Average
Average Saturday + Sunday	16,5°/2°	2 mm	1 mm	20,5/11°	Average Saturday + Sunday

## Organization of research

Before the actual research began, the pedometers were tested on 100 m in straight line and 100 m in winding line. Thus the distance was previously measured with tape line and this distance was travelled by four different subjects with each pedometer. The weight of the subjects varied between 45kg and 68kg and their height between 150 cm and 175 cm respectively.

Following pedometer testing, I noticed an error of  $\pm 30$  steps / 1000 steps performed on average in both straight line and winding distance. With respect to the distance travelled, an error of  $\pm 1$  m per 100m was recorded, and there were also no differences between straight-line or winding.

The pedometers were used by the subjects on the trouser belt even though they had the option of being worn on the hand or in the backpack; we preferred to use them on the trouser belt for greater accuracy of the data.

The data were recorded every day at 10:00 in the presence of Professor Nemeş Raul at Gymnasium School Chinteni and Professor Boanca Claudiu at the Ioan Bob Gymnasium School in Cluj-Napoca. On Saturdays and Sundays, the results were telephoned by the subjects.

## Results

To determine as accurately as possible the impact of the environment on physical activities, we have chosen to conduct a differentiated gender analysis as well as a general analysis.

The tables below show the average of the results of female subjects in the two groups. We can see an enormous difference in favor of rural people living in an active lifestyle as opposed to urban subjects who, according to figures, have a sedentary lifestyle.

As far as the activity level on weekends (Saturday and Sunday) is higher in the rural area than in the rest of the week, it means that the subjects prefer to spend the spare time actively and dynamically.

For female females in the urban area, free weekend surplus time brought an insignificant improvement in physical activity relative to the rest of the week.

**Table 5.** Average results of female subjects in rural areas

	Day	Steps	Km	Kal	Time
1	Friday	19.579	13.69	1295	2.31
2	Saturday	16.592	10.47	892	2.14
3	Sunday	13.753	8.59	722	2.08
4	Monday	9.192	5.87	518	1.06
5	Tuesday	9.014	6.89	556	1.31
6	Wednesday	12.085	7.75	655	1.57
7	Thursday	10.005	6.34	523	1.37
8	Average of days	12.880	8.51	737	1.5
9	Average of working days	11.972	8.10	709	1.29
10	Average of weekend days	15.172	9.53	807	2.11

**Table 6.** Average results of female subject in urban areas

	Day	Steps	Km	Kal	Time
1	Saturday	7.368	4.41	333	1.16
2	Sunday	3.529	2.16	173	0.25
3	Monday	5.131	3.16	261	0.45
4	Tuesday	6.172	3.77	293	0.56
5	Thursday	4.314	2.66	212	0.3
6	Friday	5.945	3.71	325	0.48
7	Wednesday	5.245	3.36	280	0.44
8	Average of days	5.386	3.31	268	0.47
9	Average of working days	5.361	3.33	274	0.49
10	Average of weekend days	5.448	3.28	253	0.45

For male subjects, research data has changed. The rural subjects had a total average of the results indicating a very high physical activity style, and the results of the urban subjects showed an average of the results indicating a physically active lifestyle.

Weekend days for both groups of subjects showed an increase of the level of physical activity, for rural subjects who had exceptional results. Urban subjects have seen outstanding results indicating a very high physical activity.



**Table 7.** Average of results registered by male subject in rural areas

	<b>Day</b>	<b>Steps</b>	<b>Km</b>	<b>Kal</b>	<b>Time</b>
1	Friday	19.579	13.694	1295	2.31
2	Saturday	20.774	11.54	1053	2.3
3	Sunday	16.647	12.47	1043	2.3
4	Monday	14.465	9.46	603	1.59
5	Tuesday	12.078	8.14	699	1.43
6	Wednesday	15.588	11.36	1063	2.36
7	Thursday	13.14	9.4	922	2.02
8	Days average	16.038	10.86	954	2.12
9	Working days average	14.970	10.48	922	1.54
10	Weekend days average	18.718	12	1048	2.3

**Table 8.** Average results of male subjects from urban areas

	<b>Day</b>	<b>Steps</b>	<b>Km</b>	<b>Kal</b>	<b>Time</b>
1	Saturday	16.843	11.92	1106	2.38
2	Sunday	13.194	9.44	930	2.21
3	Monday	13.161	9.34	930	2.02
4	Tuesday	13.762	9.49	947	2.04
5	Wednesday	12.838	9.21	919	1.59
6	Thursday	14.63	9.35	933	2.04
7	Friday	13.14	9.4	922	2.02
8	Days average	13.938	9.73	955	2.09
9	Working days average	13.506	9.35	930	2.19
10	Weekend days average	15.018	10.68	1018	2.29

From the average of the results of all subjects in each group of subjects, we can say that the results recorded by rural subjects are higher than the results of urban subjects, this imbalance being largely due to female subjects and being accentuated by male subjects.

It can be noticed how this difference is more emphasized in the weekend when rural subjects reach a level of exceptional physical activity while urban subjects manage to reach a result indicating moderate physical activity.

Another interesting aspect is the actual time in which the activity took place. This indicator shows that rural subjects were active for 107 minutes, unlike urban subjects who were only active for 78 minutes.

**Table 9.** Average general outcomes recorded by rural subjects

	<b>Day</b>	<b>Steps</b>	<b>Km</b>	<b>Kal</b>	<b>Time</b>
1	Friday	15.311	10.356	944	2.03
2	Saturday	18.682	11.01	972	2.22
3	Sunday	15.248	10.53	882	2.19
4	Monday	11.828	7.66	560	1.32
5	Tuesday	10.546	7.51	627	1.37
6	Wednesday	13.836	9.55	859	2.2
7	Thursday	12.618	8.28	696	1.57
8	Days average	14.009	9.27	791	1.47
9	Working days average	13.231	8.77	746	1.24
10	Weekend days average	16.965	10.77	927	2.2

**Table 10.** Average of general results by subjects from urban areas

	<b>Day</b>	<b>Steps</b>	<b>Km</b>	<b>Kal</b>	<b>Time</b>
1	Saturday	12.105	8.16	719	1.57
2	Sunday	8.361	5.8	552	1.23
3	Monday	9.146	6.25	595	1.23
4	Tuesday	9.967	6.63	620	1.3
5	Wednesday	8.576	5.93	565	0.45
6	Thursday	10.287	6.53	629	1.26
7	Friday	9.192	6.38	601	1.23
8	Days average	9.622	6.52	611	1.18
9	Working days average	9.433	6.34	602	1.29
10	Working days average	10.223	6.98	635	1.4

## Conclusions

Based on the recorded and presented data, we can state that the rural children's lifestyle is a much more physically active one. This becomes even clearer in the case of female subjects, surprising because girls are not as busily involved as boys in home physical activities.

Consideration should also be given to the material situation of subjects who directly influence their lifestyle through access to technology. The material possibilities of children in the urban area are higher and the technology they have access to is higher, being more attractive than physical activity. Instead, in rural areas, children often take part in everyday household activities and spend most of their leisure time on the village's streets in the company of friends and neighbors.

With regard to weather conditions, these did not have a significant influence on the results of the research.

Lower urban physical activity is not reflected in BMI, but it is reflected in visual disturbances (three subjects in the urban area) and disturbance of attention (a subject in rural areas) that is unidentified in rural areas.

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