

Original Article

**Socioeconomic Status of The Place of Residence As
A Determinant of Physical Activity of Youths**

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Abstract

Physical activity performed at recommended levels is associated with multiple health benefits. The aim of the study is to describe the relationship between socioeconomic characteristics (SES) of the environment and the volume of physical activity performed by youths. The research group consisted of 159 participants (100 women, 59 men) aged 15, living in the Prešov region. Physical activity levels were assessed using the international physical activity questionnaire IPAQ (long version). The SES of districts in the Prešov region was assessed based on the data available in databases of the Statistical Office of the Slovak Republic. The presented study was supported by VEGA 1/0840/17 project. The relationship between socioeconomic characteristics of the environment and volume of physical activity was examined using the Spearman's rank correlation coefficient. The results did not reveal any significant relationships between SES and the volume of physical activity practiced by the monitored group of population.

1. Introduction

The fact that the volume of physical activities performed by contemporary population of children and youths exceeds the lower limit, which is characterized as a biological need, creates a requirement for modern science to look for causes of this state.

We fully agree with the statement by Sallis et al. (1992) that it is necessary to understand the factors that influence type, frequency, duration and intensity of

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children's physical activity. Monitoring conditions for the implementation of physical activities in the context with socioeconomic environment where children grow up shall be helpful in searching for causes of negative tendencies that primarily determine the interest and availability for practising physical activities and, secondarily, reflect in students' fitness and health status. Nowadays, in Slovakia, there is a lack of comprehensive analyses from the perspective of economic security of families and the environment in which children grow up.

An important research question is undoubtedly identification of factors that significantly increase probability of participation in physical activities. Several research teams attempt to explain or predict physical activity behaviour of individuals and groups and to reveal particular factors, change of which could cause changes in behaviour of individuals of groups Seefeld, Malina and Clark (2002).

An important factor affecting child's development is a socioeconomic status of the family; generally, in Slovakia, we can observe enormous differences between children from richer and poorer families. The biggest problem appears to be poverty since it includes unemployment, low income and poor quality of parental education. Such an environment is not very favourable for children and it may be risky in terms of child's physical and mental development. Parents from marginal subcultures are less sensitive to abilities of their children and do not know and do not think it is necessary to support their children to develop their abilities, which may have a negative impact on their inclusion into society in the future (Matoušek, & Pazlarová, 2010). The income itself has the weakest effect on parental behaviour. On the contrary, factors that are more important are parental education and employment.

A higher socioeconomic status of family is mostly projected into creating a more stimulating environment for children. Taking part in extra-curricular activities, ski and swim courses considerably limits financial capacities of particular families.

There is a higher probability that parents with a higher socioeconomic status spend more time, money and energy on their children's future and, moreover, they put greater demands on children's school success (Conger & Donnellan, 2007). The socioeconomic status of family and parental education have a very significant impact on children's achievements in school as they spend more time with developing activities (Hill & Yeung, 2000). Such parents tend to be more active in supporting their children with homework and often personally supervise its process (Katrňák, 2004).

2. Material and methods

The aim of the study is to describe the relationship between socioeconomic characteristics (SES) of the environment and the volume of physical activity performed by youths.

The research was designed as a nonrandomized cross-section study of 15-years-old youths from the Prešov region. The research group consisted of 159

participants (100 women, 59 men) with average decimal age 15.6 ± 0.3 years, average body height 169.0 ± 8.3 cm and body weight 61.0 ± 11.4 kg. For assessing eventual different impact of factors of the socio-economic status on girls and boys, participants were divided according to gender into two groups.

Descriptive characteristics of somatic indicators of the research sample are listed in summary Table 1.

The Prešov region is divided into 13 districts. In the group of boys, each district was represented by various number of participants, while in the group of girls only 11 districts were represented. At the time of measurement, the tested subjects did not have any disorders of musculoskeletal system that could interfere with results of examined participation in physical activity.

Table 1. *Descriptive characteristics of the research sample*

	Age (years)	Body height (cm)	Body weight (kg)	BMI (kg.m ⁻²)	Body fat (%)
	Mean \pm standard deviation (minimal value/maximal value)				
Girls (n = 100)	15.6 ± 0.3 (15.0/15.9)	164.7 ± 5.6 (147.0/177.0)	57.9 ± 9.6 (40.9/81.6)	21.1 ± 3.0 (15.6/29.2)	24.8 ± 7.6 (9.0/43.0)
Boys (n = 59)	15.6 ± 0.2 (15.0/15.9)	176.4 ± 6.9 (158.4/191.9)	66.1 ± 12.6 (46.8/101.0)	21.5 ± 3.6 (16.4/30.7)	16.4 ± 8.8 (4.3/37.5)
Total (n = 159)	15.6 ± 0.3 (15.0/15.99)	169.0 ± 8.3 (147.0/191.9)	61.0 ± 11.4 (40.9/101.0)	21.2 ± 3.2 (15.6/30.7)	21.7 ± 9.0 (4.3/43.0)

Prior to the survey on SES and the volume of performed physical activity, measurement of basic somatic characteristics was carried out as a means of better description of the research sample since these characteristics may have some impact on individual's physical activity. Body height was measured using a mobile stadiometer (SECA 217, Hamburg, Germany).

Body mass together with percentage of fat mass was measured using a direct segmental multi-frequency bioelectric impedance analysis (InBody 230 devices, Biospace Co., Ltd.; Seoul, Korea), keeping all conditions of bioimpedance measurements (Kyle et al., 2004). In the phase of data processing, the tested subjects were divided into groups according to districts where they lived and were assigned values of the examined factors of SES for the particular district.

The socioeconomic status of the environment of districts was assessed based on the data available in databases of the Statistical Office of the Slovak republic; the variables taken into account were population density (people per km²), average salary and the unemployment rate in percentage in the district. Physical activity volume data were obtained using standardized International physical activity questionnaire (IPAQ), long version (IPAQ group, 2015). Questionnaires were filled in online during teaching units.

The administration was controlled in accordance with the manual and with one trained person per 10 students. There were four outputs of the questionnaire, namely vigorous physical activity, medium physical activity, walking and total sum of physical activity performed over one week. Values of physical activity were recorded in MET/minutes/week.

To describe the collected data, we used the median as a measure of central tendency and quartile deviation as a measure of variability. The Shapiro-Wilk test was used to test normality of data distribution as a means of selection of statistical tests. To examine the association between indicators of the socioeconomic status and volume of physical activity, Kruskal-Wallis analysis of variance (K-W ANOVA) was used.

To determine the significance of the difference among socioeconomic statuses, multiple comparisons for non-normally distributed variables (Mann-Whitney test with Bonferroni's correction of p-value) were used. The level of significance was set at 95 % for all statistical parameters ($p < .05$). The relationship between the indicators of physical activity volume and socioeconomic statuses of the children living in districts was evaluated using Spearman's rank correlation analysis.

The strength of the relationship was defined using Evans's guide (1996), where $r_s = 0.19$ represents very weak, $r_s = 0.39$ weak, $r_s = 0.59$ moderate, $r_s = 0.79$ strong and $r_s \geq 0.80$ very strong association.

Statistical analysis was carried out using the Statistica v. 13.1 software (StatSoft, Inc.; Tulsa, USA).

A participant's legal guardian received a verbal description of the study procedures before testing, agreed with publishing of the collected data and completed a written informed consent. Measurements were taken according to the ethical standards of the Declaration of Helsinki (Harriss & Atkinson, 2011).

3. Results and Discussions

Table 2 presents results of the descriptive analysis and levels of significance of differences in the volume of physical activity among participants divided into groups according to the selected factors of the socioeconomic status (average salary, unemployment rate). In this sense, participants were divided into three groups G1 – G3 according to the gross average nominal salary in the district where they lived (up to 800 €, between 800 and 900 €, over 900 €). In the case of assessing the level of unemployment, groups G1 – G3 consisted of participants living in districts with up to 10 % unemployment rate, between 10 and 14 % and over 14 %. Thus, G1 group included participants living in districts with the highest gross average nominal salary and the lowest unemployment rate; conversely, G3 group consisted of participants living in districts with the lowest average salary and the highest unemployment rate.

Table 2 Results of descriptive statistics and comparison of groups divided according to the average salary and unemployment rate (K-W ANOVA)

Volume of physical activity	Group variable_ average salary				Group variable_ unemployment rate				
	ME	QD	H	p	ME	QD	H	p	
Girls (n = 100)									
VMET	G1	60.0	360.0			60.0	360		
	G2	630.0	600.0	4.488	0.106	720.0	780.0	11.482	0.032
	G3	660.0	1080.0			840.0	1125.0		
MMET	G1	720.0	602.5			700.0	557.5		
	G2	880.0	967.5	6.582	0.037	700.0	350.0	0.904	0.636
	G3	392.5	335.0			545.0	870.0		
WMET	G1	792.0	861.5			990.0	602.3		
	G2	1039.5	1212.8	0.974	0.614	1221.0	1212.7	0.545	0.761
	G3	1146.8	990.0			1064.3	1410.5		
SUMMET	G1	2076.0	1943.8			2076.0	1937.0		
	G2	3961.5	2469.8	2.265	0.322	3752.0	2330.5	3.885	0.144
	G3	2708.3	2183.0			3366.0	2416.0		
Boys (n= 59)									
VMET	G1	690.0	600.0			465.0	680.0		
	G2	480.0	1035.0	0.449	0.799	1095.0	945.0	1.879	0.391
	G3	810.0	1102.5			1080.0	1530		
MMET	G1	1125.0	560.0			995.0	546.3		
	G2	1000.0	1180.0	0.353	0.838	1287.5	1016.3	1.027	0.598
	G3	1425.0	1123.3			1475.0	1721.3		
WMET	G1	1221.0	1155.0			1023.0	445.5		
	G2	726.0	841.5	0.879	0.644	1245.8	639.4	2.341	0.310
	G3	1196.3	685.0			1617.0	792.0		
SUMMET	G1	2721.0	2933.0			2620.8	1537.3		
	G2	2917.0	3321.3	0.513	0.774	3998.8	2475.0	2.361	0.307
	G3	3996.8	2508.3			4467.5	2797.3		
Overall (n = 159)									
VMET	G1	90.0	450.0			120.0	450.0		
	G2	585.0	735.0	4.550	0.103	840.0	780.0	10.766	0.005
	G3	720.0	1080.0			840.0	1155.0		
MMET	G1	895.0	602.5			895.0	615.0		
	G2	952.5	1227.5	1.814	0.404	720.0	567.5	4.022	0.134
	G3	710.0	802.5			1255.0	1222.5		
WMET	G1	990.0	849.8			990.0	544.5		
	G2	1023.0	1167.3	0.138	0.933	1221.0	1130.3	1.941	0.379
	G3	1196.3	783.8			1534.5	924.0		
SUMMET	G1	2545.5	2151.0			2412	1780.0		
	G2	3636.3	2597.2	0.649	0.723	3752.0	2344.5	5.412	0.067
	G3	3439.0	2565.5			4024	2806.3		

Note. ME – median; QD – quartile deviation; H – value of test criterion of Kruskal-Wallis analysis of variance; p – significance; VMET – MET/minutes/week of vigorous intensity physical activity, MMET – MET/minutes/ week of medium intensity physical activity, WMET – MET/minutes/week spent on walking, SUMMET – MET/minutes/week of the performed physical activity

When assessing the volume of physical activity in the group of girls divided into subgroups according to the average salary in the particular district, we only recorded significant differences in physical activity performed at medium intensity ($H_{2,100} = 6.582$; $p = 0.037$). Subsequent analysis showed a significant difference in groups of girls living in districts with medium and low average salary ($p_{G2-G3} = 0.036$). Concerning another SES factor, unemployment rate, we found significant differences in comparison of vigorous physical activity ($H_{2,100} = 11.482$; $p = 0.032$). Multiple comparisons confirmed a significant difference between the group of girls living in low employment districts and girls living in districts with medium and high unemployment rate ($p_{G1-G2} = 0.011$; $p_{G1-G3} = 0.012$). Differences in other monitored intensities of physical activity were not significant at the level of $p < 0.05$ (Table 2).

In the group of boys, we did not find any significant differences ($p > 0.05$) in the level of physical activity in relation to any of the assessed SES indicators (Table 2). From statistical point of view, it seems that the level of macroeconomic indicators does not affect the level of physical activity of boys in this age group.

In the whole tested group, regardless of gender, significant differences only appeared in the volume of vigorous physical activity in relation to the unemployment rate ($H_{2,159} = 10.766$; $p = 0.005$). Multiple comparisons revealed a significant difference between youths living in low employment districts and youths from districts with the medium and high unemployment rate ($p_{G1-G2} = 0.017$; $p_{G1-G3} = 0.015$). Comprehensive results are listed in Table 2.

One of the purposes of practising physical activities should be their health benefit. To achieve some health benefits, it is necessary to perform physical activity at least at medium intensity. On the other hand, we have to note that activities performed at higher intensity lead to greater health benefits (Jansenn & Leblanc, 2010). Therefore, we focused right on this field in our analysis. Based on the synthesis of results, we can state that we recorded a linear relationship between the increase in the volume of performed vigorous physical activities (VMET) and the average salary for both girls and boys. The same phenomenon was observed in the increase of the unemployment rate. However, these changes were not statistically significant.

In our study, we confirmed that girls perform less physical activities at higher intensity, which can also be caused by their smaller participation in organized physical activities, the irreplaceable benefit of which is the fact that they significantly increase the proportion of activities performed at medium or high intensity (Belanger et al., 2009, Marques, Ekelund & Sardinha, 2016). In general, women and girls engage in sport less than boys, which was also confirmed by our study (Table 2). According to several authors (Telama, Yang, Hirvensalo & Raitakari, 2006; Belanger et al., 2009), the most significant decrease in the volume of performed physical activity occurs between 12 and 27 years. From the perspective of gender, in this period, boys are more active than girls, which is manifested by a higher volume and frequency of performed physical activities (Telama & Yang, 2000).

Evaluation of the total volume of MET/minutes/week (SUMMET) showed the following findings. Concerning boys, in both cases (average salary and unemployment rate), the volume of physical activity is graduated. Table 2 shows that overall MET/minutes/week rises with decreasing average salary and increasing unemployment rate. The same phenomenon was observed in overall assessment of participants, regardless of gender, when examining the factor of unemployment. We suppose that unemployed parents have more opportunities and time to be spent with children. On the contrary, amount of free time of employed parents noticeably reduces, especially during weekdays.

Families with a higher income usually have at least one car and parents tend to drive the children to and from school, as well as to sport facilities. On the contrary, lower income families solve transport to and from school, eventually to and from afternoon activities, using public transport, or other options of transport. This results in higher volume of total physical activity. Charvát (2001) reported that children from low-income families do not generally have the same opportunities as other children who are engaged in sport activities as an integral part of the process of current and future socialization. However, they may not have just the same opportunities for organized physical and sport activities. We can agree with Voss, Hosking, Metcalf, Jeffery & Wilkin (2008) who stated that children from low-income families have less access to sports facilities but are not less physically active. Brodersen, Steptoe, Boniface & Wardle (2007) reported that a lower volume of performed physical activity and sedentary way of life are characteristic for adolescents from families with a lower socioeconomic status. Conversely, our analysis indicates that the lowest overall volume of practiced physical activity was recorded in participants (both girls and boys) with the highest socioeconomic status, both in the case of the highest average salary and the lowest unemployment rate.

However, these results are not clear and tendencies in the volume of performed physical activities at various intensities are only hardly predictable. In our opinion, it can be caused by the fact that within the Prešov region, where the research was carried out, there are not such significant socioeconomic differences or potentially dangerous areas (disadvantaged areas) as in other countries, where the effect of SES on physical activity was much stronger (e.g. Mota & Esculcas, 2002; Bohr, Brown, Laurson, Smith & Bass, 2013; Eyre & Duncan, 2013; Eyre, Duncan, Birch & Cox, 2014). Furthermore, the research sample only consisted of major population; marginalised groups were not included in research activities.

Table 3 shows results of the relationship analysis between socioeconomic characteristics (SES) of the environment and the volume of physical activity performed by youths. Outputs of this analysis were individual indicators of the volume of physical activity that were correlated with the values of the selected SES indicators of districts where participants lived. Results of Spearman's rank correlation indicate that between the place of residence and physical activity of youths there only are very weak and weak relationships in boys, girls and also in the overall group, regardless of gender.

Table 3 Results of the relationship analysis of the volume of physical activity and the socioeconomic status of children living in particular districts (Spearman's rank correlation)

	Boys (n = 59)			Girls (n = 100)			Overall (n = 159)		
	F1	F2	F3	F1	F2	F3	F1	F2	F3
VMET	0.00	0.05	-0.02	-0.15	0.27*	-0.17	-0.10	0.18*	-0.12
MMET	-0.12	0.11	-0.07	0.15	0.01	0.26*	0.01	0.04	0.10
WMET	0.22	0.20	-0.07	-0.02	0.09	-0.04	0.09	0.14	-0.03
SUMMET	0.06	0.18	-0.08	-0.05	0.18	-0.04	0.00	0.18*	-0.05

Note. F1 - factor of population density expressed as the number of people per km²; F2 - factor of the unemployment rate in percentage in districts; F3 - factor of the average salary in districts; VMET - MET/minutes/week of vigorous intensity physical activity; MMET - MET/minutes/week of medium intensity physical activity; WMET - MET/minutes/week spent on walking; SUMMET - MET/minutes/week of the performed physical activity

4. Conclusions

Although results are not clear they indicate that, in the group of 15-years-old students from the surveyed region, SES characteristics, namely the macroeconomic indicators of the place of residence, play only a small role in practising physical activities. In future, it would be desirable to focus on SES characteristics of individual participants, which, however, appears as problematic under current legislation; in this way, individual differences could be much more manifested. Furthermore, parental education should also be included in the assessed factors, in terms of individual differences, as unemployed or low-income parents do not automatically equal to the lack of education and the lack of knowledge on the importance of physical activity.

References

1. BELANGER, M., GRAY-DONALD, K., O'LOUGHLIN, J., PARADIS, G., HUTCHEON, J., MAXIMOVA, K., HANLEY, J. (2009). Participation in organised sports does not slow declines in physical activity during adolescence. *Int J Behav Nutr Phys Activ*, 6:22. <https://doi.org/10.1186/1479-5868-6-22>.
2. BOHR, A.D., BROWN, D.D., LAURSON, K.R., SMITH, P.J.K., BASS R.W. (2013). Relationship between socioeconomic status and physical fitness in junior high school students. *J Sch Health*, 83(8), 542–547. DOI: 10.1111/josh.12063.

3. BRODERSEN, N.H., STEPTOE, A., BONIFACE, D.R., WARDLE, J. (2007) Trends in physical activity and sedentary behavior in adolescence: ethnic and socioeconomic differences. *Br J Spor Med*, 41(3), 140-144. DOI:10.1136/bjism.2006.031138.
4. CHARVÁT, M. (2001). Sociální aspekty sportovních pohybových aktivit dětí a mládeže. *Role tělesné výchovy a sportu v transformujících se zemích středoevropského regionu*. Brno: MU. 284-285.
5. CONGER, R.D., DONNELLAN, M.B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annu Rev Psychol*, 58, 175-199. DOI:10.1146/annurev.psych.58.110405.085551.
6. EVANS, J.D. (1996). *Straightforward Statistics for the Behavioral Sciences*. Pacific grove: Brooks/Cole Publishing.
7. EYRE, E.L.J., DUNCAN, M.J. (2013). The impact of ethnicity on objectively measured physical activity in children. *ISRN Obesity*, 1-15. DOI:10.1155/2013/757431.
8. EYRE, E.L.J., DUNCAN, M.J., BIRCH, S.L., COX, V.M. (2014). Low socioeconomic environmental determinants of children's physical activity in Coventry, UK: A Qualitative study in parents. *Prev Med Rep*, 1, 32-42. DOI:10.1016/j.pmedr.2014.09.002.
9. HARRISS, D.J., ATKINSON, G. (2011). Update - ethical standards in sport and exercise science research. *Int J Sports Med*, 32, 819-821. DOI:10.1055/s-0031-1287829.
10. HILL, M.S., YEUNG, W.J. (2000). Behavior and Status of Children, Adolescents and Young Adults. Available online at: www.minedu.govt.nz.
11. JANSSEN, I., LEBLANC, A.G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *Int J Behav Nutr Phys Act*, 7(40). DOI: 10.1186/1479-5868-7-40.
12. KATRŇÁK, T. (2004). *Odsouzení k manuální práci: Vzdělanostní reprodukce v dělnické rodině*. Praha: Slon.
13. KYLE, U.G., BOSAEUS, I., DE LORENZO, A.D., DEURENBERG, P., ELIA, M., GOMEZ, J.M., et al. (2004). Bioelectrical impedance analysis-part I: review of principles and methods. *Clin Nutr*, 23, 1226-1243. DOI:10.1016/j.clnu.2004.06.004.
14. MARQUES, A., EKELUND, U., & SARDINHA, L.B. (2016). Associations between organized sports participation and objectively measured physical activity, sedentary time and weight status in youth. *J Sci Med Sport*, 19(2), 154-157. DOI: 10.1016/j.jsams.2015.02.007.
15. MATOUŠEK, O., PAZLAROVÁ, H. (2010). *Hodnocení ohroženého dítěte a rodiny*. Praha: Portál.
16. MOTA, J., ESCULCAS, C. (2002). Leisure-time physical activity behavior: Structured and unstructured choices according to sex, age and level of physical activity. *Int J Behav Med*, 9(2), 111-121. PMID: 12174530.
17. SALLIS, J.F., SIMONS-MORTON, B.G., STONE, E.J., CORBIN, C.B., EPSTEIN, L.H., FAUCETTE, N., et al. (1992). Determinants of physical

- activity and interventions in youth. *Med Sci Sport Exerc*, 24(6), 248-257. PMID: 1625550.
18. SEEFELDT, V., MALINA, R.M., CLARK, M.A. (2002). Factors affecting levels of physical activity in adults. *Sport Med*, 32(3), 143-168. DOI:10.2165/00007256-200232030-00001.
 19. TELAMA, R., YANG, X. (2000). Decline of physical activity from youth to young adulthood in Finland. *Med Sci Sports Exerc*, 32, 1617-1622. PMID:10994914.
 20. TELAMA, R., YANG, X., HIRVENSALO, M., RAITAKARI, O. (2006). Participation in Organized Youth Sport as a Predictor of Adult Physical Activity: A 21-Year Longitudinal Study. *Pediatr Exerc Sci*, 17(1), 76-88. DOI: 10.1123/pes.18.1.76.
 21. The IPAQ Group (2015). Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire. Available online at: <http://www.ipaq.ki.se>
 22. VOSS, L. D., HOSKING, J., METCALF, B.S., JEFFERY, A.N., & WILKIN, T.J. (2008). Children from low-income families have less access to sports facilities, but are no less physically active: cross-sectional study (Early Bird 35). *Child: Care, Health and Development*. 34(4), 470-474. DOI: 10.1111/j.1365-2214.2008.00827.x.



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