# Particularities of the Level of Physical Activity Performed by Adolescents

**IOANA TUTA SAS[1], ANCUTA BANU[1], NICOLETA NICOLAE[1], RADU BAGIU[1], IULIA BAGIU[2], CORNELUTA FIRA MLADINESCU[1], GIORGIANA SITARU[1], OANA SUCIU[1], SALOMEIA PUTNOKY[1]*, CODRUTA BACEAN[1], ROXANA FOLESCU[3], ROXANA BUZATU[4], BRIGITHA VLAICU[1]**

[1] Victor Babes University of Medicine and Pharmacy, Timisoara, Department 14 Microbiology, Discipline of Hygiene, 2 Eftimie Murgu Sq., 300041, Timisoara, Romania

[2]Victor Babes University of Medicine and Pharmacy, Timisoara, Department 14 Microbiology, Discipline of Microbiology, 2 Eftimie Murgu Sq., 300041, Timisoara, Romania

[3]Victor Babes University of Medicine and Pharmacy, Timisoara, Anatomy and Embriology Department, 2 Eftimie Murgu Sq., 300041, Timisoara, Romania

[4] Victor Babes University of Medicine and Pharmacy, Timisoara, Dental Medicine, 2 Eftimie Murgu Sq., 300041, Timisoara, Romania

*The research aims to investigate the particularities of the regime of physical activity in adolescents from Timisoara, Romania. The work sample included 243 students: 37.9% in middle school and 62.1% in high school; 56.4% girls and 43.6% boys; aged 11 to 18. The work method was cross-sectional population study of the case study type. The results indicate practicing physical activities in order to lose weight or not gain weight in over half of respondents: 57.3% of middle school students and 57.9% of high school students, more often girls. The boys in the age group 15 to 18 practice more often both moderate and intense physical activities than girls, and the number of days per week in which students participate in sports classes is more reduced in high school compared to middle school.*

*Keywords: children, adolescents, body weight, moderate and intense physical activity*

In Europe there is strong evidence of the increasing prevalence of obesity trends. The annual rate of prevalence in childhood has increased steadily over the second half of the twentieth century, and now, the prevalence of obesity in childhood is 3 times higher than in the 1980s [1]. In the European Union, the number of overweight children is expected to increase by 1.3 million children per year, while the number of obese individuals is expected to increase by 300 000 per year [2].

Cross-sectional studies that examined the relationship between the various measures of body fat and physical activity evaluated objectively using accelerometry usually indicated a negative relationship [3]. A European multicenter study conducted on 1,292 children aged 9 to 10 analysed the associations between the objectively measured physical activity level and the indicators of total body fat measured as the sum of 5 skin folds and the body mass index [4]. The findings suggested that spending time with moderate and vigorous physical activity is inversely proportional, but weak, to the size of total body fat. Wittmeier et al. [5] investigated 251 children aged 8 to 11 from Canada, and found that the time spent on moderate to intense physical activity was inversely correlated with the body mass index and the body fat estimate from skin folds. However, several studies have suggested that intense physical activity may be more important than lower intensity physical activity to prevent obesity in children and adolescents.

More recently, Ekelund et al. [6] showed in a meta-analysis that included 20,871 children aged 4 to 18 that the time spent on moderate and vigorous physical activities, measured by accelerometers, was associated with cardiometabolic markers, regardless of gender, age, monitor wear time, time spent with sedentary activities, and waist circumference. Time spent with sedentary activities was independent of the time spent on moderate and vigorous physical activity. The conclusion of this study was that time spent on moderate and vigorous physical activity is related to the amount of fat accumulated in children, but the relationship is weak.

We proposed a study on the particularities of the regime of physical activity in adolescents from Timi°oara, Romania.

## Experimental part

### *Material and Methods*

The study sample totalled 243 students from a high school in Timisoara: 37.9% in middle school and 62.1% in high school; 56.4% girls and 43.6% boys, the two groups being homogeneous in terms of gender distribution, $p=0.248$; aged 11 to 18, with an average age of 15.04 and a standard deviation of 2.124.

The work method was a cross-sectional population study of the case study type based on the use of the CORT 2004 Questionnaire on health risk behaviours in adolescents and young people. The questionnaire was validated by the Ethics Committee of the Victor Babes University of Medicine and Pharmacy. The study was conducted with the written approval of the school unit. Students were included in the study only after having expressed their consent to participate in the study, observing their individual rights.

The processing and interpretation of data uses modern advanced medical statistical methods using the PASW 18 (SPSS 18) 2010 software. The threshold statistical significance value was set at $p < 0.05$, except in cases where the Bonferroni correction was applied, the text stating the accepted threshold level. For ordinal data comparisons, we used the Mann-Whitney and Kruskal-

* email: salomeia65@yahoo.com; Phone: 0740 830 885

Wallis test. The chi-square test was used for ordinal/ nominal data. The logistic regression test was also used.

## Results and discussions

*Changes in the Physical Activity Levels of the Past Month*

More than half of students carried out physical exercises in order to lose weight or not gain weight: 57.3% of middle school students and 57.9% of high school students, more often girls. In both age groups, 11 to 14 and 15 to 18, no differences between genders were found in terms of the frequency with which students exercise to lose weight or not gain weight. We found no differences in the frequency with which the two age groups exercise to lose weight or not gain weight in girls ($p=0.946$) or in boys ($p=0.991$).

*The Number of Days/Week of Physical Education Classes at School*

Most commonly, 67% of the middle school students state that they have 2 days/week of physical education, while 49.3% of high school students state that they have 1 day/ week of physical education. 4.4% of the middle school students and 3.5% of the high school students say they have no day/week of physical education. In the age group 11 to 14, we have not found gender differences in the frequency of the number of hours of physical education they attend, $p = 0.383$. In the 15 to 18 age group, boys attend more physical education hours per week compared to girls, $U=2024$, $z=-2.06$, $p=0.039$. In boys, we found no differences between groups in the frequency of the number of physical education hours they attend, $p=0.972$. In girls, the 15 to 18 age group participates in physical education classes significantly less often than the 11 to 14 age group, $U=1405.5$, $z=-3.06$, $p=0.002$.

*Intense physical activity*

More often during a week, middle school students participate in exercises for strength or muscle tone, such as pushing exercises, squats, weight lifting, 2 days/week at the rate of 14.3%, and high school students 3 days/week at a rate of 15.4%. 11% of middle school students and 9.8% of high school students do such exercises daily, while 27.5% of middle school students and 23.1% of high school students never do such exercises.

In the age group 11 to 14, we have not found gender differences in the frequency of practicing strength exercises, $p=0.620$. In the age group 15 to 18, boys more frequently practiced strength exercises compared to girls, $U=1552$, $z=-3.79$, $p=0.000$. In boys, the 15 to 18 age group practices strength exercises significantly more frequently than the 11 to 14 age group, $U=950$, $z=-2.22$, $p=0.026$. In girls, we found no differences between groups in the frequency of practicing strength exercises, $p=0.700$ (table 1).

*Moderate physical activity*

During a week, students participate more frequently in moderate physical activities, such as fast walking, cycling, skating, housework, in 2 days/week in middle school at the rate of 16.5%, and one day/week in high school at a rate of 16.7%. 16.5% of middle school students and 11.1% of high school students do daily moderate physical exercises, while one-fifth of the students of the two cycles never participate in moderate physical activities, i.e., 20.9% and 20.1%, respectively.

In the age group 11 to 14, we have not found gender differences in the frequency of practicing moderate physical activities, $p = 0.576$. In the age group 15 to 18, boys engaged in more moderate physical activities than girls, $U = 1735.5$, $z = -3.12$, $p = 0.002$. We could not find differences between groups in the frequency of practicing moderate physical activities, either in boys ($p = 0.104$) or girls ($p = 0.095$).

In the HELENA cross-sectional study [7] which retrieved data from 2.200 adolescents from nine European countries, the authors found that the proportion of boys who reached the recommendations of moderate to vigorous exercise activities was significantly higher than the proportion of girls. They also found that the average time per day spent by European teenagers with sedentary activities was 9 hours, and that those practicing moderate to vigorous physical activities spent significantly less time with sedentary activities.

Regarding organised physical activity at school, the participation in fewer sports classes during weekdays is seen only for girls from the 15 to 18 age group, compared to boys of the same age. We found that boys in the 15 to 18 age group practice intense physical activities significantly more often than girls of the same age and than younger boys, and practice moderate physical activities significantly more often only than girls in the same age group.

Vigorous physical activity in more than 2 days a week is a characteristic of boys, without being influenced by age, current weight or a desire to lose weight.

In a prospective analysis [8] on a sample with an increased numbers of participants ($N = 6.413$), the authors found no association between time spent with vigorous activities or time spent with sedentary activities, and waist circumference at follow-up, but a greater circumference in the initial assessment was correlated with an increased time spent with sedentary activities at follow-up.

For children in the age group 11 to 14, an important factor contributing to the choice of activities is the perception of parents on neighbourhood safety. Time spent outdoors is strongly correlated with the level of physical activity in children, and playground safety is one of the most important

**Table 1**

FACTORS INCLUDED IN THE PREDICTION MODEL FOR THE DECISION TO PRACTICE INTENSE PHYSICAL ACTIVITY MORE THAN 2 DAYS/WEEK WITH THE PURPOSE TO REDUCE WEIGHT OR TO KEEP WEIGHT CONSTANT

| | B | SE | p | OR | 95% from CI for OR | |
|---|---|---|---|---|---|---|
| | | | | | Inferior | Superior |
| Group(1) | .394 | .301 | .190 | 1.482 | .822 | 2.672 |
| Sex(1) | .822 | .303 | .007 | 2.276 | 1.257 | 4.121 |
| BMI | -.075 | .051 | .138 | .928 | .840 | 1.024 |
| Wish to reduce weight | -.657 | .343 | .055 | .518 | .265 | 1.015 |
| Constant | 1846 | 1.101 | .094 | 6.336 | .000 | .000 |

*Legend: (1) = first category taken into consideration as reference for categorical variables included in the model; B= $\beta$ coefficient; SE= $\beta$ coefficient standard error; p= p value; OR=odds ratio*

factors taken into account by parents when selecting locations for children's physical activities. A 2012 study [9] shows that both cross-sectional and longitudinal models indicate more time spent watching TV and less time spent with physical activities for children whose parents perceive their neighbourhood as unsafe. We need to further investigate the reasons for the reduced number of hours spend in physical activity for the students in Timisoara. Children stay too more in front of different gadgets and observed visual and ocular problems problems [10-12].

Another study [13] also focused on the relationship between the level of physical activities in young people and their living environment. This study suggests that deficiencies in how neighbourhoods were planned and the need for investments in locations that meet the needs of young people has a major impact on the level of physical activities of young people.

## Conclusions

There are differences between the number of sports classes reported by the two groups of students: in high school, the number of sports classes is lower than in middle school. Students consider other activities more important and, unfortunately, teachers share these views. Moderate physical exercises are practiced less frequently with the transition to high school. It is necessary to investigate the causes related to the environment in which these children carry out their activities so as to propose a strategy for the change of regime of physical activity to develop an infrastructure allowing children a higher level of physical activity.

## References


1.*** WHO Europe. Data and statistics on Obesity. [Internet], http://www.enhis.org/object_document/o4745n27385.html.

2.KOSTI RI, PANAGIOTAKOS DB. Central European Journal of Public Health. 2006, 14:1 51–159.

3.DENCKER M, ANDERSEN LB. Clinical Physiology and Functional Imaging. 2008, **28**: 133–144.

4. EKELUND U, SARDINHA LB, ANDERSSEN SA, et al. American Journal of Clinical Nutrition, 2004, **80,** 584–590.

5. WITTMEIER KD, MOLLARD RC, KRIELLAARS DJ. Applied Physiology, Nutrition, and Metabolism. 2007, **32**: 217–224.

6.EKELUND U, LUAN J, SHERAR LB, et al. JAMA/ : the journal of the American Medical Association. 2012, **307**(7): 704-712. doi:10.1001/jama.2012.156.

7.RUIZ JR, ORTEGA FB, MARTYNEZ-GOMEZ D. Am. J. Epidemiol. 2011, **174** (2): 173-184.

8.EKELUND U, LUAN J, SHERAR LB, et al. JAMA. 2012, **307**(7): 704-712.

9.DATAR A., NICOSIA N., SHIER V. Am J Epidemiol. 2013. **177**(10): 1065–1073.

10.BOGDANICI C., SANDULACHE D., NECHITA C. Rom J Ophthalmol, 2017, **61**(2): 112-116.

11.BOGDANICI, S.T., MARTINESCU, G., SANDULACHE, C., BOGDANICI, C. Revista de cercetare si intervenie sociala. **52**, 2016, 87-194.

12.BOGDANICI, ST, COSTIN, D, BOGDANICI, C. Rev Med Chir Soc Med Nat, **119**, 2015, 214-220.

13.LAKE A.A., TOWNSHEND T.G. Journal of Public Health, 2012, **35**(1): 57-66.



Manuscript received: 2.08.2017