

PHYSICAL EDUCATION: EFFECTS OF THE SCHOOL SUBJECT ON THE PHYSICAL ACTIVITY REGIMEN OF 15-16-YEAR-OLD ADOLESCENTS

KATERINA KRALOVA

Department of Pedagogy, Psychology and Didactics of PE and Sport, Faculty of Physical Education and Sport, Charles University in Prague, Czech Republic

Received: December 2018/Final Acceptance: April 2020

Word count:2868

ORCID : 0000-0001-7419-7596

kralo.katerina@gmail.com

Abstract

The aim of the paper is to analyze the popularity and significance of physical education (PE) and its influence on the physical activity regimen of adolescents aged 15-16. The research was attended by 315 students of secondary vocational schools (153 girls and 162 boys), and it was analyzed that 19.7% of students had a lack of physical activity on weekdays, while 52.7% had a lack of physical activity on weekends. The values show that school attendance increases the amount of physical activity of students. The increase is manifested not only in the number of steps per day but also in the intensity of physical activity (especially during the PE lessons). Physical education is often the only regular activity of high school students (for 48% of students) and therefore the only means by which it is possible to systematically reduce the negative impacts of the sedentary lifestyle. The following questionnaire survey analyzed that physical education is a popular subject for 64.82% of students, 56% of students place it among the less demanding subjects. 51.8% of students consider Physical education to be an important school subject. The demonstrated increase in physical activity as well as the high popularity of physical education determine PE as an optimal possibility of reducing the number of hypokinetic and obese youth.

Keywords: physical education, adolescence, stepcounter, hypoactivity.

Introduction

Physical activity (also *locomotion*) is a basic human need that is performed by muscles and requires energy output. It is necessary for optimal body functioning and it contributes to the physical, mental and social development of the individual (Logstrup, 2001; Timmons et al. 2012). Moreover, significant benefits of physical activity include the maintenance of physical fitness and prevention of lifestyle diseases, while it is also beneficial on a mental level as it helps maintain well-being (Bendíková, 2014; Jago et al., 2011; Penedo, Danh, 2005). Although these and many other benefits of physical activity are well known these days, there is an apparent trend towards a lack of it (hypokinesia) in modern society throughout all age categories (Dumith et al., 2011). The authors agree that there are several causes of hypokinesia: sedentary work and a limited amount of physical activity at school, the preference for passive leisure activities, the development of services, transport and mass media and the negative influence of parents (Lindqvist et al. 2015). This trend brings with it many complications such as high blood pressure, diabetes, lipid metabolism disorders, gout, skeletal muscle function disorders, etc. A study by Lee et al. (2012) shows that insufficient physical activity accounts for 6% of all deaths in modern society, which is the same as smoking or obesity.

The occurrence of hypokinesia also affects children and adolescents. This is a serious problem, as it has been confirmed that an inappropriate level of physical activity in this developmental stage leads to continued insufficient physical activity even later in adulthood (Telama, 2009; Neely, Holt, 2014). One frequently-used method for monitoring probands' physical activity is the use of pedometers, which many authors believe to be valid and reliable devices for this type of measurements (Park et al., 2014; Trapp et al., 2013). Sigmundová et al. (2015) researched adolescent physical activity. She agrees with Fröml et al. (1999) on the recommended number of steps that each 14 to 18-year-old should take daily: 9,000 steps for girls and 11,000 steps for boys. The study by Sigmundová et al. (2015) claims that 55% of boys and 75% of girls follow these recommendations. In comparison with previous research, it is obvious that the number of boys who meet these recommendations decreases every year.

Besides the biological need for physical activity as such, an individual is influenced in childhood and adolescence by other factors, especially social ones – influence of family, friends, fashion trends and school. These diverse influences are the subject of many studies on young people's levels of physical activity (e.g. Chiarlitti, Kolen, 2017; Cooper et al. 2015; Kurka et al. 2015; Tannehill et al. 2013) aimed at explaining the issue and finding suitable programmes and strategies that would contribute to the improvement of the *status quo*.

Research shows that 70% of schoolchildren spend more than 4 hours a day watching TV or engaging in activities on a computer or mobile. Only every third schoolchild has regular physical activity. The preference for passive, sedentary pastimes has resulted in an increase in the prevalence of overweight, obesity and other diseases of modern civilization from an early age (Sigmundová et al., 2015). What has a great influence on adolescents' level of physical activity is physical education: in P.E. classes teachers can develop children's locomotor skills and abilities and help them build a positive relationship with physical activity and sport. According to the estimates of Klein and Hardman (2008), an investment of 1 euro in young people's physical education will save 3 euros on future medical costs linked with diseases of modern civilization and insufficient physical activity. There are more and more adolescents who only regularly do sport in P.E. classes. Despite the high importance of physical education, the number of classes per week has remained the same in the Czech Republic: 45 minutes twice a week (Antala, Labudová, 2011).

OBJECTIVES OF THE STUDY

The objective of this study was to analyse what role physical education at school plays in the level of physical activity of secondary school students aged 15 and 16. The information gathered allows for a better understanding of adolescents' level of physical activity and their relationship with physical education at school. On the basis of this knowledge, it will be possible to determine whether physical education at school develops a positive relationship with sport activity and whether it has a sufficient impact on decreasing the negative trend of hypokinesia in young people.

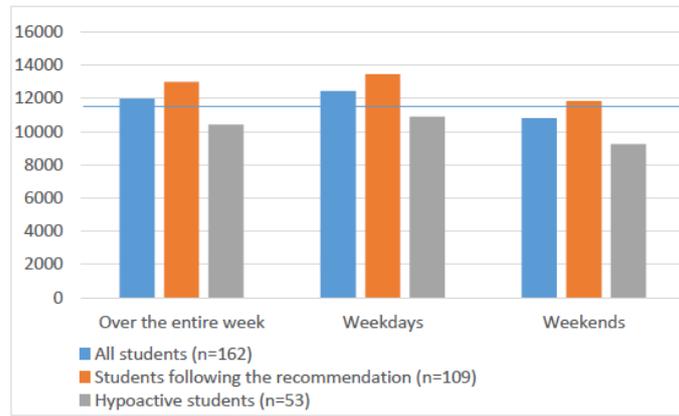
RESEARCH METHODOLOGY

The research was carried out in the Czech Republic at four vocational schools in the Moravia-Silesia, Olomouc and Prague Regions in March – June 2017 and October – November 2017. On the basis of selection criteria where respondents had to be students in a vocational programme without a graduation exam and aged between 15 and 16, the study included 357 students. Complete data sets were obtained from 315 of them (153 girls and 162 boys). The group of students gathered for research came from a middle or poor socioeconomic background. They live in the cities where the primary mode of transportation is public transport. The students' curriculum alternate between learning their trade or theoretical lessons. The research took place during the week of theoretical lessons. All students that participated in the research agreed in writing, additionally their parents provided written consent. The research was conducted in accordance with generally binding legal regulations and approved by the Ethics Committee of Charles University's Faculty of Physical Education and Sport. The criterion for the correct use of the Sigma ACTIVO fitness band was its placement on each proband's forearm for at least 12 hours a day for one week. The purchase of the portable devices was made possible thanks to the Charles University Grant Agency (GAUK), Prague. The data from the trackers were transferred to mobile phones via Bluetooth and assessed by the SIGMA ACTIV application cooperating with the device used. The application shows not only the number of steps taken but also the intensity of the physical activity and its time distribution throughout the day. The measurements were complemented by standardized questionnaires compiled by Antala et al. (2012) which collected data on the enjoyability, difficulty and importance of physical education. Students evaluated the parameters using a five-point scale ranging from (1) very enjoyable to (5) very unenjoyable; from (1) very difficult to (5) very easy; from (1) very important to (5) unimportant. Students answered each question by selecting a mark from 1 to 5, and we subsequently calculated the average value for each parameter.

RESULTS

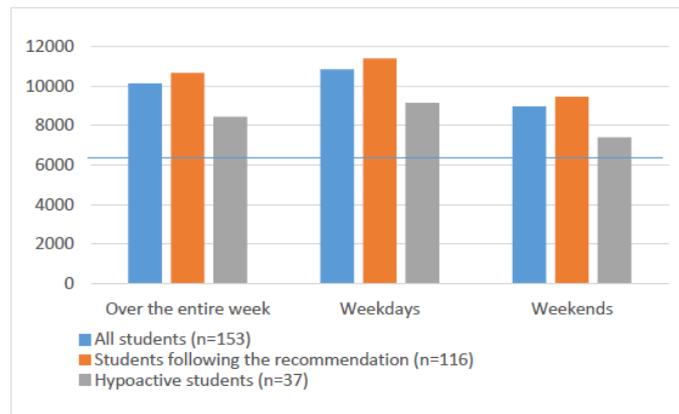
The recommendation concerning the number of steps to be taken by adolescents aged 15 - 16 was followed by 71.4% of students (i.e. 225 students). 83.8% of students had sufficient physical activity on weekdays, while at weekends it was 49.5%. The trend towards decreasing the number of steps at weekends is apparent in both sexes.

The recommendation of 11,000 steps per day was followed by 67.3% of boys. 78.4% of boys followed the recommendation on weekdays, and 54.9% of boys followed it at weekends.



Graph 1 Trend in boys' physical activity – steps taken per day
 Legend: n – number of male students in the cohort

The average number of 9,000 steps recommended to adolescent girls was taken by 75.8% of them during the week monitored. On weekdays, the number rose to 89.5% of girls, and it dropped to 43.8% at the weekend.



Graph 2 Trend in girls' physical activity – steps taken per day
 Legend: n – number of female students in the cohort

Subsequently, we analysed the enjoyability, difficulty and importance of physical education using the standardized questionnaire.

The average values indicate high enjoyability of physical education, relatively low difficulty and medium importance among boys attending secondary schools. It is more enjoyable for students whose physical activity was assessed as sufficient. The same cohort considers the subject to be less difficult but more important than the cohort of hypoactive boys does.

| | All students (n=162) | Students following the recommendations (n=109) | Hypoactive students (n=53) |
|--------------|----------------------|--|----------------------------|
| Enjoyability | 1.64 | 1.54 | 1.74 |
| Difficulty | 4.31 | 4.86 | 3.76 |
| Importance | 2.72 | 2.63 | 2.81 |

Chart 1 Enjoyability, difficulty and importance of physical education according to boys Legend: n – number of boys in the cohort; evaluation – (1) very enjoyable to (5) very unenjoyable; (1) very difficult to (5) very easy; (1) very important to (5) unimportant

A similar trend occurred in girls who also consider physical education to be their favourite subject, but of medium difficulty and medium importance. Hypoactive girls find physical education to be a subject of medium enjoyability, medium difficulty and medium importance. Hypoactive girls are the cohort that rates physical education as the least enjoyable, most difficult and least important.

| | All students (n=153) | Students following the recommendations (n=116) | Hypoactive students (n=37) |
|--------------|-------------------------|--|-------------------------------|
| Enjoyability | 2.16 | 1.82 | 2.50 |
| Difficulty | 3.65 | 4.07 | 3.23 |
| Importance | 3.26 | 3.05 | 3.47 |

Chart 2 Enjoyability, difficulty and importance of physical education according to girls

Legend: n – number of girls in the cohort; evaluation – (1) very enjoyable to (5) very unenjoyable; (1) very difficult to (5) very easy; (1) very important to (5) unimportant

Generally speaking, physical education is considered a favourite subject (by 64.82% of all students), less difficult (56% of all students) and of medium importance (51.8% of all students). The average values for each category are shown in Chart 3.

| | All students (n=315) | Students following the recommendation (n=225) | Hypoactive students (n=90) |
|--------------|-------------------------|--|-------------------------------|
| Enjoyability | 1.90 | 1.68 | 2.12 |
| Difficulty | 3.98 | 4.47 | 3.50 |
| Importance | 2.99 | 2.84 | 3.14 |

Chart 3 Enjoyability, difficulty and importance of physical education according to boys and girls

Legend: n – number of students in the cohort; evaluation – (1) very enjoyable to (5) very unenjoyable; (1) very difficult to (5) very easy; (1) very important to (5) unimportant

DISCUSSION

28.6% of the researched population of secondary school students show hypoactivity, which is more common in boys. However, the recommended number of steps to be taken per day is 2,000 steps higher for boys than for girls of the same age. The trend towards insufficient physical activity is more apparent at weekends when adolescents do not go to school, do not have a physical education class or any other organized physical activity and have more free time which they prefer to spend on passive pastimes. On weekdays, 83.8% of students had sufficient physical activity, whereas at weekends it was only 49.5%. Therefore, mere school attendance works as an efficient tool in fighting insufficient physical activity.

An important task of each physical education teacher and of the subject as such is to pique students' interest and thus help them form a positive relationship with physical activity. This aim can be achieved more easily if the subject is evaluated by students as enjoyable, medium difficulty and important. Physical education is more enjoyable for the cohort of boys. Nevertheless, even girls consider this subject to be their favourite. An interesting finding is the fact that hypoactive cohorts of students consider physical education to be their favourite or medium-favourite subject. Most students do not find physical education to be a difficult subject, but it is generally more difficult for girls than for boys. P.E. is more difficult for hypoactive students than for their more active classmates. Girls find physical education to be less important than do boys. Even the group of hypoactive boys find the subject to be more important than do the group of girls with sufficient physical activity. The reason may be the generally greater popularity of sports among men.

CONCLUSIONS AND RECOMMENDATIONS

Physical education at schools is a tool that can systematically and regularly influence young people's relationship with physical activity and sport. It is evidenced that the amount of physical activity is higher on weekdays when the students have physical education classes. Therefore, an increase in the number of physical education classes together with an improvement in quality and greater efficiency could work as an effective tool in fighting hypokinesia among young people (and later adults).

REFERENCES

- Antala, B. et al. 2012. *Telesná a športová výchova v názoroch žiakov základných a stredných škôl*. 1. Bratislava: END. ISBN 9788089324095.
- Antala, B., Labudová, J. 2011. *Prečo zvýšiť počet hodín telesnej a športovej výchovy v kurikulumách?* Tel. Vých. Šport. 21(4),8-11.
- Bendíková, E. 2014. *Lifestyle, physical and sports education and health benefits of physical activity*. In European researcher : international multidisciplinary journal. - Sochi : Academic publishing house Researcher. 2014, 69(2), 343-348. ISSN 2219-8229.
- Cooper, A. R. et al. 2015. *Objectively measured physical activity and sedentary time in youth: the International*

children's accelerometry database (ICAD). *International Journal of Behavioral Nutrition and Physical Activity*. 12(1), 113-128.

Chiarlitti, M. A., Kolen, A.M. 2017. Parental Influences and the Relationship to their Children's Physical Activity Levels. *International Journal of Exercise Science*. 10(1), 205-212.

Dumith, S. C., Gigante, D. P., Domingues, M. R., Kohl, H. W. 2011. Physical activity change during adolescence: a systematic review and a pooled analysis. *Int J Epidemiol*. 40(3), 685–698.

Frömel, K., Novosad, J., Svozil, Z. 1999. *Pohybová aktivita a sportovní zájmy mládeže*. Olomouc: Univerzita Palackého. ISBN 978-807-0679-456.

Jago, R. et al. 2011. Parenting styles, parenting practices, and physical activity in 10- to 11-year olds. *Preventive Medicine*. 52(1):44-47.

Klein, G., Hardman, K. 2008. *Physical Education and Sport Education in European Union*. Editions Revue EPS, Paris, 453 p.

Kurka, J. M. et al. 2015. Patterns of neighborhood environment attributes in relation to children's physical activity. *Health & Place*. 34(1):164-170.

Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T. 2012. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet*. 380(9838):219-229.

Lindqvist, A., C. Kostenius, G. Gard, Rutberg, S. 2015. Parent participation plays an important part in promoting physical activity. *International journal of qualitative study health well-being*. 10(10).

Logstrup, S. 2001. Children and young people - the importance of physical activity. A paper published in the context of the European Heart Health Initiative. Brussels

Neely, K., Holt, N. 2014. Parent's perspectives on the benefits of sport participation for young children. *Sport Psychology*. 28:255-268.

Park, W., Lee, V. J., Tanaka, B. K. U. 2014. Effect of walking speed and placement position interactions in determining the accuracy of various newer pedometers. *Journal of Exercise Science and Fitness*. 12(1):31-37.

Penedo, F. J., Dahn, J. R. 2005. Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*. 18(2):189-193.

Sigmundová, D., J. Stelzer, Řepka, E. 2013. The influence of monitoring interval on data measurement: an analysis of step counts of university students. *International Journal of Environmental Research and Public Health*. 10(2):512-527.

Tannehill, D. et al. 2013. What young people say about physical activity: the Children's Sport Participation and Physical Activity (CSPPA) study. *Sport, Education and Society*. 20(4):442-462.

Telama, R. 2009. Tracking of Physical Activity from Childhood to Adulthood: A Review. *Obesity Facts: The European Journal of Obesity*. 2(3):187-195.

Timmons, B., Leblanc, A., Carson, V., Connor, G., Dillman, C., Janssen, I., Kho, M., Spence, J., Stearns, J., Tremblay, M. 2012. Systematic review of physical activity and health in the early years (aged 0-4 years). *Applied Physiology Nutrition and Metabolism*. 37(4):773-792.

Trapp, G. S., et al. 2013. Measurement of children's physical activity using a pedometer with a built-in memory. *Journal of Science and Medicine in Sport*. 16(3):222-226.

Tudor-Locke, C. 2005. How many days of pedometer monitoring predict weekly physical activity in adults? *Preventive Medicine*. 40(3):293-298.

Ferrera L. A. 2005. *Body mass index: new research*. New York: Nova Biomedical Books. ISBN 1594542821.

Samaras, T., Rollo, C. D., Bartke, A. 2007. *Human body size and the laws of scaling: physiological, performance, growth, longevity and ecological ramifications*. New York: Nova Science Publishers. ISBN 9781600214080.

