PHYSICAL ACTIVITY AND MAJOR CARDIOVASCULAR RISK FACTORS IN SECONDARY SCHOOL CHILDREN

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ABSTRACT

Assessment of cardiovascular risk factors and physical activity (compulsory physical education (PE) and extra-curriculum sport activities) in secondary school children followed by education in effective lifestyle measures. Participation in compulsory physical education was studied in 760 students (295 boys, 465 girls), age 15-18 years of 55 secondary schools, residents of Bratislava, were studied in years 2011-2013. Participation in extra-curricular sports activities was studied in subgroup of 211 children (119 boys, 92 girls). We measured anthropometric parameters and blood pressure and tested physical ability by Ruffier test. We found out by Ruffier test that students regularly participating in compulsory PE are more physically fit (p=0.012). Students spending more hours per day at the computer are physically less fit (p=0.02). We found out that smoking students avoid compulsory PE twice than students - non-smokers. The number of smoking girls is 1.2 times higher than the number of smoking boys. For other indicators, a statistically significant difference was not confirmed, but more favorable results in blood pressure, weight and BMI were shown for regularly participating students at the compulsory PE. We found out that there is relationship between level of education of mother and children´s participation in extra-curricular sports activities (p=0.027). We confirmed that the Ruffier test of extra-curricular sports active children testified better physical ability (p=0.048). We demonstrated relationship between regular nutrition and BMI values (p=0.016). Because of physical activity children feel their life more interesting and fulfilled. Compulsory PE and in the same way extra-curricular sports activities of secondary school children have positive impact on cardiovascular risk factors. Negative habits (avoid the PE and smoking) of lifestyle in young people often multiply. Qualified professional teachers of PE and as well parents play key role in creation of positive attitude towards physical activities in children.

Key words: physical education, cardiovascular risk factors

INTRODUCTION

Shift from malnutrition and infectious diseases to chronic diseases (cardio metabolic diseases, cancer, diabetes mellitus) is typical for current epidemiological situation (Riečanský, 2009). Mortality of cardio metabolic diseases is 2,5 times higher how is average in European countries (Pella, 2010, p. 23). Physical activity is important for a young developing body. The problem of contemporary teenagers is a sedentary lifestyle spending the time in front of computers and television (Jurkovičová, 2005). The research is based on project "Respect for Health". We analysed relationship between participation in compulsory PE and cardio metabolic risk factors (blood pressure, weight and body mass index). At the same time we evaluated participation in compulsory PE with physical ability and smoking.

Assessment of cardiovascular risk factors and physical activity (compulsory physical education (PE) and extra-curriculum sport activities) in secondary school children followed by education in effective lifestyle measures. How PE affects the incidence of cardiovascular risk factors. The additional aim was inclusion of Public Health students in large epidemiological project.

METHODS

Participation in compulsory physical education was studied in 760 students (295 boys, 465 girls), age 15-18 years of 55 secondary schools, residents of Bratislava, were studied in years 2011-2013. Participation in extra-curricular sports activities was studied in subgroup of 211 children (119 boys, 92 girls). Data was collected by 2 type of questionnaire (questionnaire of parent and questionnaire of student). We measured anthropometric parameters (neckline, chestline and hipline), blood pressure and tested physical ability by Ruffier test.

Project: "Respect for Health" monitoring the situation in the cardiovascular health of secondary school students. The project was initiated by the Bratislava Region in collaboration with the Regional Public Health Institute in Bratislava. The main idea of the project is based on the recognition that risk factors cardiovascular diseases can occur at a young age. Elimination of risk is possible thanks to prevention and change of eating habits. The project was implemented by the Regional Institute of Public Health in Bratislava with Public Health students of Slovak Medical University.

RESULTS

Really good news is that 73% of students excercise regularly. But worrying is that 1/7 of students purposely avoid PE. This is literary red number.

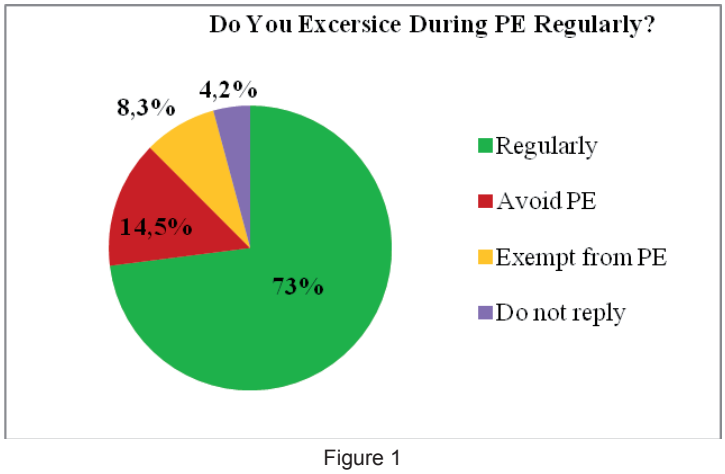

Figure 1

Table 1 Relationship between participating in compulsory PE and Ruffier index

		Regularly Participating in Compulsory PE			Total
		Regularly	Avoid PE	Exempt from PE	
Ruffier index	Excellent	79	13	6	98
	%	14,6	13	13,6	14,3
	Very Good	260	46	13	319
	%	48,1	46	29,5	46,6
	Good	156	28	16	200
	%	28,8	28	36,4	29,2
	Weak	46	13	9	68
	%	8,5	13	20,5	9,9
	Total	541	100	44	685
	%	100	100	100	100

We found out by Ruffier test that students regularly participating in compulsory PE are more physically fit (p=0.012).

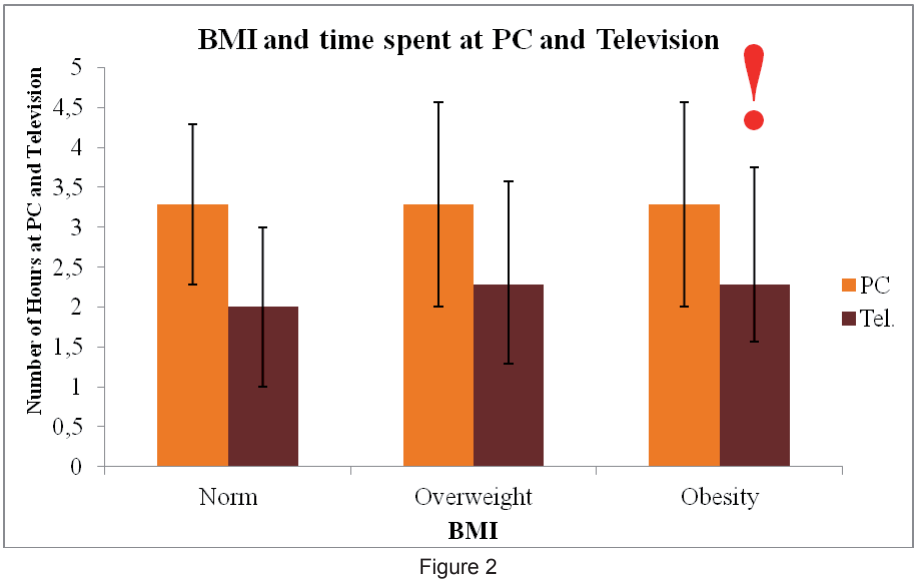

Figure 2

Students spending more hours per day at the computer are physically less fit (p=0.02). In front of computer students spend the same time (3,5 hours per a day) for all BMI categories. It is not significant result because time spend at computer is a part of everyday life (for study, social life). The most significant result is in group of obesity in relationship with time spend at television. Students with obesity spend 2,8 hours per a day watching television. This is disturbing news because watching television is passive entertainment. Ruffier index increases with the number of hours spent at the computer during the work week.

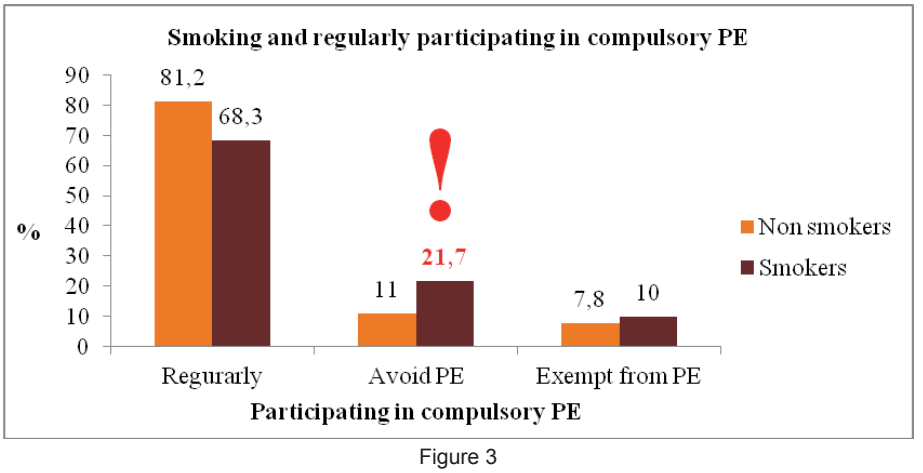

Figure 3

We found out that smoking students avoid compulsory PE twice bigger than students non-smokers. The current problem is smoking in young children and the number of smokers in young age are multiple (Cvopová, 2011). The number of smoking girls is 1.2 times higher than the number of smoking boys. This is really good example how one negative habit pick on another and they multiply.

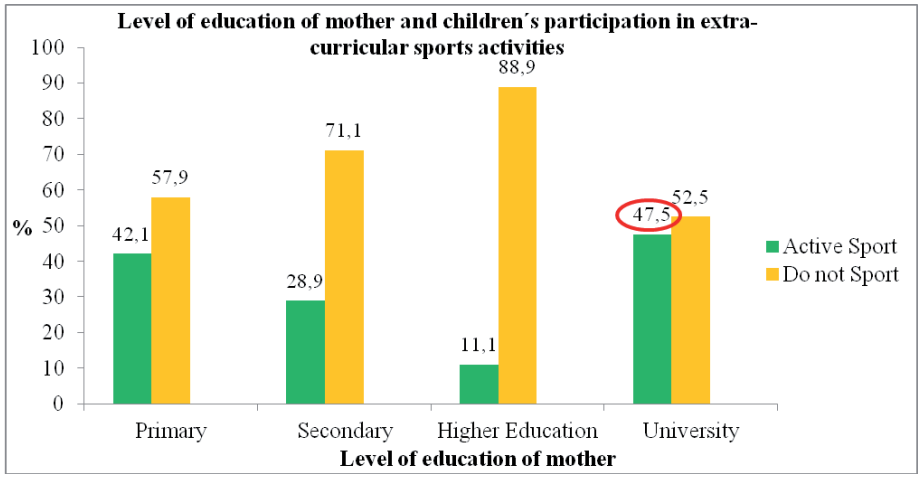

Figure 4

Relationship between level of education of mother and children´s participation in extra-curricular sports activities (p=0.027). University educated mothers play key in case of choice extra-curricular sports activities. They lead their children to the movement and healthy lifestyle more than others.

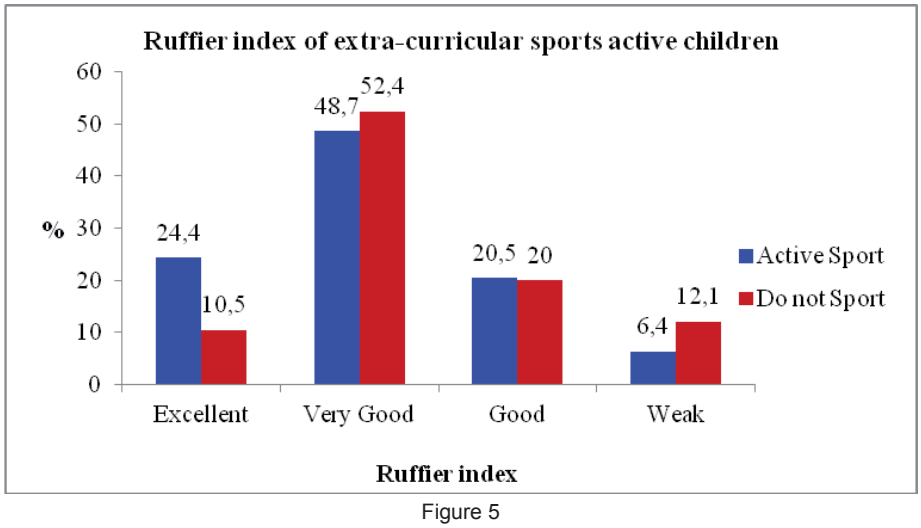

Figure 5

Ruffier test of extra-curricular sports active children testified better physical ability (p=0.048). The results of Ruffier test are 2 times better in students which visit sport group like their non sport active schoolmates.

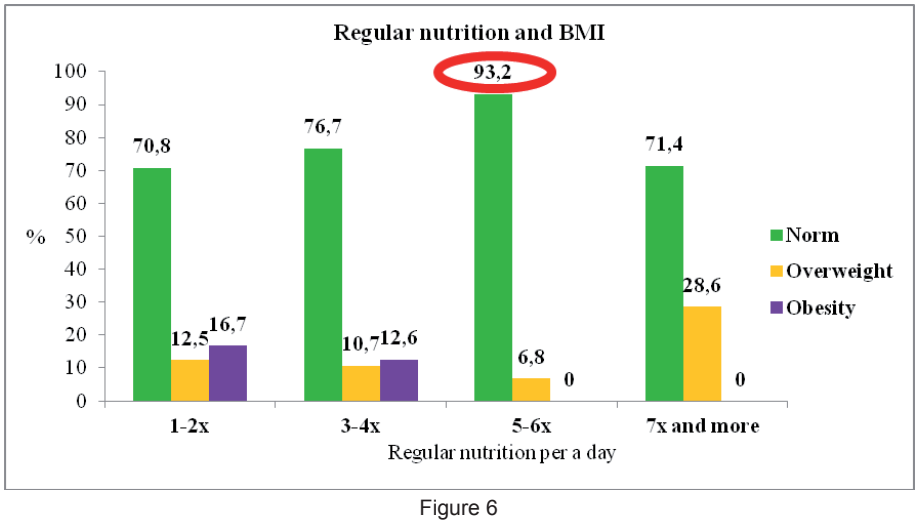

Figure 6

We demonstrated relationship between regular nutrition and BMI values (p=0.016). The best way how to achieve ideal weight is to eat regularly 5-6x per a day.

CONCLUSION

Lack of physical activity is one of the major risk factors of cardio metabolic diseases, with significant impact on years of disability adjusted life (DALYs) in the European region (WHO, 2006). Compulsory PE and in the same way extra-curricular sports activities of secondary school children have positive impact on cardiovascular risk factors. Negative habits (avoid the PE and smoking) of lifestyle in young people often multiply. Qualified professional teachers of PE and as well parents play key role in creation of positive attitude towards physical activities in children. “The movement is life” and in case of cardiovascular prevention this true are multiple (Farský, 2010). Parents should be an example for their children in choice of extra – curricular sport activity. They should support children in sport activity with enthusiasm (Račková, 2011).

Recommendations for practise

not to reduce the PE lessons, in any case
to increase interest of students in PE lessons (diversity, increase the joy of movement, create positive habit)
qualified teachers of PE (professionalism command respect)
modernization of gyms, playgrounds
to organize school league
financial support for parents, which children doing sports actively

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