PHYSICAL ACTIVITY RECOMMENDATION AND ITS ASSOCIATION WITH DEMOGRAPHIC VARIABLES IN CZECH UNIVERSITY STUDENTS

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Educated people have got better information about the importance of a proper amount of physical activity, but whether Czech university students meet recommendations for physical activity is not clearly known. International Physical Activity Questionnaire – short version, was collected from 2400 university students and analyzed by the logistical regression method. Meeting recommendations for vigorous PA, moderate PA and walking served as independent variables. Czech university students are a sufficiently active social group, more than 85% of them meet physical activity recommendations and the most influential variable is regular participation in PA. Although students practice an adequate amount of PA in total, there should be some promotion of moderate intensity PA and its suitable portion for young adults.

Keywords: IPAQ – short version, university students, vigorous PA, moderate PA, walking.

INTRODUCTION

Physical activity all leisure and non leisure body movement produced by the skeletal muscles and resulting in an increase in energy expenditure and exercising. A form of leisure time physical activity that is planned, structured, and repetitive. Its main objective is to improve or maintain physical fitness (Public Health Agendy of Canada, 2008) is regarded as part of positive health lifestyle practices (Cockerham, 2007) and have a strong effect on the prevention of many chronic diseases, such as coronary artery disease, high blood pressure, diabetes mellitus, obesity, some cancers and various musculoskeletal conditions (Jones, Ainsworth, Croft, Macera, Lloyd, & Yusuf, 1998). Especially inactive women are vulnerable to osteoporosis, decreased muscular strength and endurance, a low level of physical fitness, and various chronic diseases that are associated with a loss of independence in older age (US Department of health and human services, 1996).

The level of time spent in leisure time physical activity participation declines with age and the transition from adolescence to adulthood is the most critical period in one's life course. This transition means changing roles, e.g. leaving school, getting married, entering full time employment, and starting a family (Zick, Smith, Brown, Fan, & Kowaleski-Jones, 2007). The sooner young people finish their education, the faster their participation in PA starts declining because of changing their social roles. People with low educational attainment also manifest low rates for participation in leisure time physical activity. University or college study post-

pones role change because leaving school may be a key transition. Studying longer means not only obtaining good knowledge about the importance of a healthy life style, including physical activity participation, but also to devoting time with schoolmates to the practice of various kinds of sport discipline. That's why youth stay physically active longer during their university or college studies and might strengthen the habit of physical activity participation and thus form their own lifestyle (Huang, Harris, Lee, Nazir, Born, & Kaur, 2003).

Educated people better understand the significance of participation in different types of physical activities (range of sport disciplines). If their belief in the importance of regular exercise for health becomes stronger a gradual increase in their prevalence of exercise was evident (Steptoe, Wardle, Fuller, Holte, Justo, Sanderman et al., 1997). Socially and economically disadvantaged people, that is, those with a lower level of education, have fewer opportunities to use the different options available in society. They do not have any interest or reason unless they got used to exercising from childhood.

We investigated, in the sample of the Czech population, whether or not Czech university students meet physical activity guidelines (3×20 minutes of vigorous PA or 5×30 minutes of moderate PA or 5×30 minutes of walking in a week) necessary for achieving health benefits (for instance desease prevention). For this purpose we analyzed them using the International Physical Activity Questionnaire where students recalled their physical activity practiced during the past week. A second concern we were interested in was which type of PA (vigorous PA, moderate PA or walking) prevails

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in students' leisure time. Finally, we studied different variables that may be associated with meeting the PA guidelines for vigorous intensity PA, moderate intensity PA and walking. Among the very commonly mentioned variables (Sallis, Prochaska, & Taylor, 2000) are age and sex. There is enough evidence that young men are more likely to exercise and to engage in frequent physical activity than young women in 21 European countries except for Finland (Steptoe, Wardle, Fuller, Holte, Justo, Sanderman et al., 1997).

METHODS AND MATERIALS

Population studied

From 2002 to 2004 (Spring and Autumn) trained distributors submitted, helped to complete if necessary and collected 30258 International Physical Activity Questionnaires (short version). It was a sample of randomly selected people (aged 15–69 years) from the whole Czech Republic. From this data set we chose young people aged 20–27 years (n = 2719) who study at different universities or colleges in the Czech Republic. The difference between their age and the number of years of education they have completed was 6 or 7 years because at that age children start attending basic school. We were interested in completely filled out questionnaires with all data about PA, demographic questions and additional information so that questionnaires from students where this information were missing we excluded from the further statistical analysis. Of the 319 excluded records (11.73%), 137 were missing information on location, residence, smoking, living status and having a car, a bike or a cottage, whereas 111 students' questionnaires contained implausible data such as more than 7 days of activity per week, in 10 records students did not mention any physical activity in the past week, 3 records had outliers in self reported BMI and in 58 records the sum of PA and sitting did not correspond with a common lifestyle where we regard 8 hours of sleeping time as the norm. After cleaning up IPAQ data according to guidelines for the data processing and analysis of the "International Physical Activity Questionnaire" (IPAQ website) there were 2400 records from university students who were enrolled in school full time to analyze. From the 2002 Autumn survey we gathered for statistical processing 725 questionnaires, from Spring 2003, there were 285 questionnaires, from Spring 2004, there were 669 questionnaires, and from Autumn 2004, there were 721 questionnaires.

Physical activity behavior

Their recalled physical activity during the last 7 days (prior to filling in the form) was recorded using the validated International Physical Activity Questionnaire (short version). The short form of IPAQ is suitable because it is comprised of four generic items – data on vigorous PA, moderate PA and walking were obtained from participants for the number of days per week and the duration (hours per day and minutes per day). Also a question about time spent sitting on a week day was answered. Demographic and additional information contained personal data (age, gender, body mass index based on self reported height and weight), behavioral information (place of residence – flat or house, smoking status, regular participation in organized PA – in the questionnaire is described as participation in physical activity regularly for most of the time in a year – organized by person or institution), and environmental status (size of and location of residence, living status – alone or in a family, having a car or bike).

Definition of meeting PA guidelines

According to existing recommendations, a person who met any of the following three criteria was considered sufficiently physically active:
- 3 or more days of vigorous PA of at least 20 minutes per day during the last week;
- or 5 or more days of moderate PA and/or walking of at least 30 minutes per day during the last week;
- or 5 or more days of any combination of walking, moderate or vigorous PA during the last week, achieving a minimum of at least 600 MET min. per week.

One MET is defined as the energy spent during quiet sitting (equivalent to $[4.184 \text{ kJ}].\text{kg}^{-1}.\text{h}^{-1}$). For different types of PA and their intensities, reported weekly minutes spent were multiplied by 6 MET for vigorous PA, by 4 MET for moderate PA and by 3.3 MET for walking. Individual total PA per week in MET was the sum of walking, moderate and vigorous MET minutes week scores.

For our specific conditions, we applied stricter conditions to students and regarded them to be sufficiently physically active if they met the first or second of the above mentioned criteria. University students who performed, for 3 or more days, vigorous PA of at least 20 minutes per day during the last week were considered to have met recommendation for vigorous PA. Students who performed, for 5 or more days, moderate PA, respectively walking of at least 30 minutes per day during the last week, were considered to have met the recommendation for moderate PA, respectively walking.

Statistical procedures

Data from 2400 university students' questionnaires were statistically processed using the SPSS version of

the 16.0 SPSS Inc., Chicago, U.S. software. We used logistical regression to find associations between PA recommendations for vigorous intensity PA, moderate intensity PA and walking and other dependent variables. An independent variable was (a) fulfillment of 3 times 20 minutes of vigorous intensity PA per week (0 – no, 1 – yes), (b) fulfillment of 5 times 30 minutes of moderate intensity PA per week, and (c) fulfillment of 5 times 30 minutes of walking per week. As dependent dichotomous variables included into analyses were sex (0 – male, 1 – female), residence (0 – flat, 1 – house), smoking status (0 – nonsmoker, 1 – smoker), having a car (0 – no, 1 – yes), having a bike (0 – no, 1 – yes), and regular participation in PA (0 – no, 1 – yes). Also dependent categorical variables were inserted – age (5 groups), BMI (0 – normal, 1 – underweight, 2 – overweight), location of residence (4 groups) and living status (0 – alone, 1 – in a family, 2 – in a family with children). We calculated odds ratios with their statistical significance and confidential intervals for all dependent variables using the enter method for logistical regression. Cross tabulations were used to express the percentage of students who successfully met PA guidelines in each category.

RESULTS

A description of our data set is presented in TABLE 1. Data from 2400 university or college students of the white/Caucasian race from the Czech Republic (age 24.86 ± 1.52 years; self reported body weight 67.29 ± 12.24 kg; self reported body height 174.33 ± 9.28 cm) were analyzed. Czech university students are very active because 85.38% of them (n = 2049) met guidelines for PA and only 14.62% (n = 351) did not.

The mean time spent in sitting in university students is 400 minutes per day which is more than 6 hours per day and more than 46 hours per week. If we take into account this cut off point (sitting more than 6 hours per day), 51.04% of students (n = 1225) tend to sit more than six hours per day. But on the other hand, 83% of these students (n = 1016) met health related recommendation for PA.

From TABLE 1 it is evident that meeting PA guidelines declines with age, after the first year – familiarization with the university study system, 21 year old university students (sophomores) are the most active. Over ninety percent of students who own a bike are more likely to meet PA guidelines than those without a bike. Other determinants influencing meeting PA guidelines are regular participation in organized PA, those who do not participate in organized PA regularly are less likely to meet PA guidelines.

Odds ratios and confidential intervals for different demographic, behavioral, and environmental variables are presented in TABLES 2 and 3.

TABLE 2 shows meeting guidelines for vigorous PA which is less likely to be met by girls, smokers, underweight and overweight students, and students in their last study years. On the other hand, a proper level of vigorous PA is easily met for students owning a bike and regularly participating in organized physical activity. Overall, 43.71% of university students met a vigorous PA guideline, which is surprising, compared to only 19.04% of students who met moderate PA guidelines. The recommendation for walking was met by 75.08% of university students.

The effect of a demographic variable on meeting guidelines for moderate PA and walking by Czech university students is shown in TABLE 3, and is less likely to be met by girls and smokers. Five or more days of moderate PA of at least 30 minutes per day is more likely to met by students regularly participating in organized PA. Fulfillment of meeting guidelines for walking is less likely to be achieved by boys (significantly), students having a car, and living in houses. On the other hand, walking is more likely for students owing a bike, living in villages (less than 1000 inhabitants) and regularly participating in organized PA.

For illustration, Fig. 1 shows the distribution of students according to their PA level. A high PA level means that individuals meet one of two criteria: a) vigorous PA on at least 3 days achieving a minimum total PA of at least 1500 MET minutes/week or b) 7 or more days of any combination of walking, moderate PA or vigorous PA achieving a minimum total physical activity of at least 3000 MET minutes/week. Moderate PA level means that individuals meet one of two criteria: a) 3 or more days of vigorous PA of at least 20 minutes per day or b) 5 or more days of moderate PA and/or walking of at least 30 minutes per day. Those individuals who do not meet criteria for moderate or vigorous PA level are considered to have a "low" PA level.

DISCUSSION

In Czech university students walking prevails (more than 75% of students meet the recommendations) they walk an average of 10 hours per week. It is followed by moderate PA (a mean time of 4.0 hours per week) even though only 19% of students meet moderate PA recommendations, which is similar to the results found in the case of US college students (Centers for Disease Control and Prevention, 1997). The problem is that students exercise for a longer time less than five times per week and thus do not meet PA recommendation even if they have enough moderate PA to enhance their health. This indicates a need for the promotion of the appropriate

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amount of moderate physical activity for health benefits in university students.

Regarding vigorous PA mean time, for students it is 3.9 hours per week and the recommendation is met by more than 43%. In a Russian survey (Levin, Ainsworth, Kwok, Addy, & Popkin, 1999) Russian youth (6–18 years old) spent, in moderate physical activities, 4.7 hours/week and in vigorous intensity activities 2.1 hours/week. Compared to the study done by Suminski, Petosa, Utter and Zhang (2002) among ethnically diverse college students where 53% of the women and 40.3% of the men did not engage in vigorous PA during the month preceding the study, according to our results Czech university students are sufficiently active and meet the PA recommendation for healthy lifestyle.

One of the definitions of a sedentary person suggests that it is an individual who spends less than 10% of their daily energy expenditure in moderate to vigorous intensity activities (Bernstein, Morabia, & Sloutskis, 1999). Even if our students reported more than 46 hours of sitting per week (including studying, sitting at lectures and at computers) most of these students compensated for their sedentary behavior by an adequate level of physical activity. Thus results show that Czech university students are not sedentary people at all.

Variables which were the most influential in the meeting of the PA recommendations in Czech university students are sex, with more males meeting PA guidelines than females which is more consistently supported also by findings in the age group of adolescents 13–18 years old (Sallis, Prochaska, & Taylor, 2000), and age, for example 21 year old students are more likely to meet PA guidelines thanks to their adaptation to the university lifestyle and their specific time constraints related to their academic schedules (Buckworth & Nigg, 2004). Another variable studied was BMI but our results do not prove that body weight can influence the amount of PA which does not correspond with the study done by Sulemana, Smolensky and Lai (2006). The same percentage of overweight (BMI ≥25) students as students with normal weight (BMI 19–24.9) met health related PA recommendations in our study.

Variables connected with living showed that students who live in a small village (<1000 inhabitants) are more likely to meet PA recommendations and also those who live in a family with children are more physically active. Support from the family was found to be very important to female students and on the other hand support from friends or peers was more powerful for male students (Keating, Guan, Piñero, & Bridges, 2005). Living in a flat (not in a house) is an additional factor related to a sufficient level of PA in university students because we feel that staying in a flat forces young people to go out and more often to practice some sports outside or in fitness centers together with friends or mates. But this

factor need to be further investigated as to up to what level it may influence students' decisions.

Analyses done by Kerr, Norman, Sallis and Patrick (2008) revealed that the presence of exercise equipment was related to PA in adolescent girls and also in their parents. Such equipment and also a means of transport is a bike as well and its ownership has got a significant impact on the meeting of PA recommendations in Czech university students.

Among the most frequently studied variables, although smoking was indeterminate according to Sallis, Prochaska and Taylor (2000), our results indicate that nonsmokers are more likely to meet PA recommendation than smokers. If we have a close look at the association with meeting the recommendations for vigorous PA, moderate PA, and walking, results show that smoking was inversely significantly related to vigorous PA and moderate PA, but not with regard to walking.

The most influential variable in meeting PA guidelines is regular participation in physical activity. This fact plays the main role for Czech university students and is part of their healthy lifestyle. We did not investigate in which sport discipline they are engaged most often or which is their favorite, so this may be further investigated. Some studies (Leslie, Owen, Salmon, Bauman, Sallis, & Lo, 1999; Reed & Ainsworth, 2007) found that college aged women were less likely than college age men to engage in regular physical activity, but we did not distinguish gender association with regular PA participation. Overall, students are willing to practice some sports in their leisure time if they have the opportunities to exercise which is a consistently positive association with PA (Sallis, Prochaska, & Taylor, 2000).

The short form of the IPAQ "last 7 days recall" in a self administration mode is recommended for national monitoring (Craig et al., 2003). Criterion validity is comparable to most other self report validation studies. It can be used for monitoring population levels of PA among 18 to 65 year old adults under various conditions. But it was administered over three years and only in the Spring and Autumn seasons. That's why it can be a limit of this study due to different weather conditions in those periods of the year and in the students' program (Autumn being at the beginning of the semester in contrast to Spring being at the end of the semester, finishing with exams). It would be interesting to analyze seasonal differences and differences between each year to see whether some trend in physical activities and sitting exists.

Another limitation is that participants were from different universities and with different study programs. Those who study PE as a major or subjects related to sport disciplines may produce above average data about their PA. Despite this fact, age is associated with the level of PA as students reach their 22nd year, PA starts declining for both genders.

TABLE 1
Number of participants according to different variables and their meeting PA guidelines

	Number of participants	Percentage from all participants (n = 2400)	Meeting guidelines for PA	
			n	%
Age (year)				
20	431	17.96	370	85.8
21	747	31.13	659	88.2
22	530	22.08	460	86.8
23	330	13.75	276	83.6
24–27	362	15.08	284	78.5
Gender				
Male	997	41.54	870	87.3
Female	1403	58.46	1179	84.0
BMI				
Normal (19–24.9)	1788	74.50	1528	85.5
Underweight (<19)	282	11.75	239	84.8
Overweight (≥25)	330	13.75	282	85.5
Location				
Metropolis (≥100 000 inh.)	678	28.25	577	85.1
Big city (30 000–100 000 inh.)	502	20.91	431	85.9
Town (1000–29 999 inh.)	880	36.67	747	84.9
Village (less than 1000 inh.)	340	14.17	294	86.5
Living status				
Alone	316	13.17	269	85.1
In a family	1668	69.50	1421	85.2
Family with children	416	17.33	359	86.3
Residence				
Flat	1289	53.71	1108	86.0
House	1111	46.29	941	84.7
Smoking				
No	2026	84.42	1740	85.9
Yes	374	15.58	309	82.6
Having a car				
No	1059	44.13	905	85.5
Yes	1341	55.87	1144	85.3
Having a bike				
No	217	9.04	177	81.6
Yes	2183	90.96	1872	85.8
Regular participation in PA				
No	796	33.17	636	79.9
Yes	1604	66.83	1413	88.1

TABLE 2
Effect of demographic variables on meeting guidelines for vigorous PA (2400 university students)

	Vigorous PA 3 × 20 min./week		
	%	OR	95% CI
Age (year)			
20	45.2	1.00	Ref.
21	44.2	0.96	0.75–1.24
22	45.8	0.98	0.75–1.29
23	43.6	0.92	0.68–1.26
24–27	37.8	0.73*	0.53–1.00
Gender			
Male	54.2	1.00	Ref.
Female	36.3	0.45**	0.37–0.54
BMI			
Normal	45.7	1.00	Ref.
Underweight	34.0	0.75*	0.57–1.00
Overweight	40.9	0.75*	0.58–0.97
Location			
Metropolis	44.5	1.00	Ref.
Big city	43.8	0.94	0.73–1.20
Town	43.0	0.92	0.73–1.16
Village	43.8	1.05	0.76–1.44
Living status			
Alone	42.7	1.00	Ref.
In a family	44.4	0.91	0.69–1.20
Family with children	41.8	0.75	0.54–1.05
Residence			
Flat	43.7	1.00	Ref.
House	43.7	0.92	0.76–1.13
Smoking			
No	45.5	1.00	Ref.
Yes	34.2	0.68*	0.53–0.87
Having a car			
No	41.2	1.00	Ref.
Yes	45.7	1.11	0.93–1.33
Having a bike			
No	30.4	1.00	Ref.
Yes	45.0	1.54*	1.11–2.14
Participation in PA			
No	23.4	1.00	Ref.
Yes	53.8	3.77**	3.09–4.59

Legend: OR – odds ratio, CI – confidence interval, *p < .05, **p < .001.

TABLE 3
Effect of demographic variables on meeting guidelines for moderate PA and walking

	Moderate PA 5 × 30 min./week			Walking 5 × 30 min./week		
	%	OR	95% CI	%	OR	95% CI
Age (year)						
20	19.0	1.00	Ref.	76.6	1.00	Ref.
21	20.9	1.14	0.84–1.55	78.8	1.15	0.87–1.54
22	21.1	1.11	0.81–1.54	76.2	0.98	0.72–1.32
23	15.5	0.77	0.52–1.15	72.1	0.81	0.58–1.13
24–27	15.5	0.78	0.53–1.15	66.6	0.63*	0.45–0.87
Gender						
Male	23.0	1.00	Ref.	71.9	1.00	Ref.
Female	16.3	0.61**	0.49–0.75	77.3	1.28*	1.06–1.56
BMI						
Normal	19.6	1.00	Ref.	74.5	1.00	Ref.
Underweight	18.1	1.05	0.76–1.47	78.0	1.16	0.85–1.57
Overweight	17.0	0.79	0.58–1.09	75.8	1.15	0.87–1.52
Location						
Metropolis	18.3	1.00	Ref.	74.5	1.00	Ref.
Big city	19.1	1.04	0.77–1.41	76.3	1.11	0.84–1.46
Town	18.1	0.93	0.70–1.23	73.9	0.98	0.76–1.25
Village	22.9	1.22	0.84–1.76	77.6	1.24	0.87–1.75
Living status						
Alone	19.3	1.00	Ref.	74.4	1.00	Ref.
In a family	18.8	0.81	0.58–1.12	75.0	0.98	0.73–1.32
Family with children	20.0	0.85	0.57–1.26	76.0	1.00	0.70–1.44
Residence						
Flat	17.5	1.00	Ref.	76.0	1.00	Ref.
House	20.9	1.20	0.94–1.52	74.1	0.84	0.68–1.04
Smoking						
No	19.8	1.00	Ref.	75.3	1.00	Ref.
Yes	14.7	0.72*	0.53–0.99	73.8	0.94	0.72–1.21
Having a car						
No	18.7	1.00	Ref.	76.1	1.00	Ref.
Yes	19.3	0.94	0.76–1.17	74.3	0.92	0.75–1.21
Having a bike						
No	14.3	1.00	Ref.	72.8	1.00	Ref.
Yes	19.5	1.23	0.82–1.86	75.3	1.17	0.84–1.63
Participation in PA						
No	13.4	1.00	Ref.	72.6	1.00	Ref.
Yes	21.8	1.70**	1.34–2.17	76.3	1.18	0.97–1.44

Legend: OR – odds ratio, CI – confidence interval, *p < .05, **p < .001.

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Fig. 1
Physical activity level in university students (n = 2400)
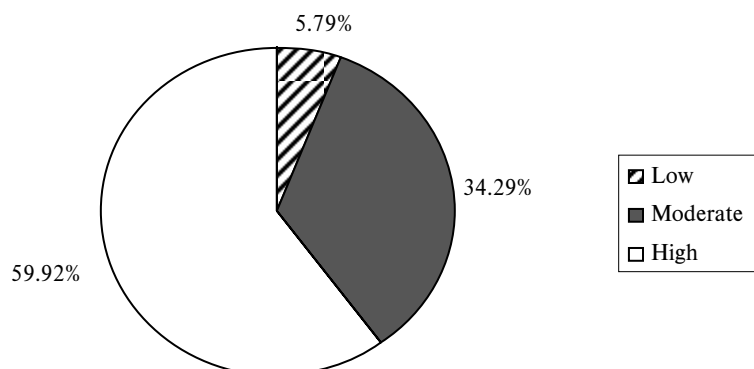
CONCLUSION

In conclusion, a large percentage of the university students we studied met health related recommendations for PA. This is a very positive result, but recommendations for moderate PA is reached by less than twenty percent of the students. That's the reason why we have to promote the right portion and dose of moderate PA. Further research on university students whose major is not PE or sport disciplines is going to be challenging and necessary.

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REFERENCES

Bernstein, M. S., Morabia, A., & Sloutskis, D. (1999). Definition and prevalence of sedentarism in an urban population. *American Journal of Public Health, 89(6)*, 862–867.

Buckworth, J., & Nigg, C. (2004). Physical activity, exercise and sedentary behavior in college students. *Journal of American College Health, 53(1)*, 28–34.

Centers for Disease Control and Prevention. (1997). Youth risk behavior surveillance: National college health risk behavior survey – US 1995. *Morbidity and Mortality Weekly Report, 46(S6)*, 1–54.

Cockerham, W. C. (2007). New directions in health lifestyle research. *International Journal of Public Health, 52(6)*, 327–328.

Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J. F., & Oja, P. (2003). International physical activity questionnaire: 12 country reliability and validity. *Medicine & Science in Sports & Exercise, 35(8)*, 1381–1395.

Jones, D. A., Ainsworth, B. E., Croft, J. B., Macera, C. A., Lloyd, E. E., & Yusuf, H. R. (1998). Moderate leisure time physical activity. Who is meeting the public health recommendations? A national cross sectional study. *Archives of Family Medicine, 7(3)*, 285–289.

Huang, T. T. K., Harris, K. J., Lee, R. E., Nazir, N., Born, W., & Kaur, H. (2003). Assessing overweight, obesity, diet and physical activity in college students. *Journal of American College Health, 52(2)*, 83–86.

International Physical Activity Questionnaire. Retrieved 20. 7. 2008 from the World Wide Web: http://www.ipaq.ki.se

Keating, X. D., Guan, J., Piñero, J. C., & Bridges, D. M. (2005). A meta analysis of college students' physical activity behaviors. *Journal of American College Health, 54(2)*, 116–125.

Kerr, J., Norman, G. J., Sallis, J. F., & Patrick, K. (2008). Exercise aids, neighborhood safety, and physical activity in adolescents and parents. *Medicine and Science in Sports and Exercise, 40(7)*, 1244–1248.

Leslie, E., Owen, N., Salmon, J., Bauman, A., Sallis, J. F., & Lo, S. K. (1999). Insufficiently active Australian college students: Perceived personal, social and environmental influences. *Preventive Medicine, 28(1)*, 20–27.

Levin, S., Ainsworth, B. E., Kwok, C. W., Addy, C. L., & Popkin, B. M. (1999). Patterns of physical activity among Russian youth: The Russian longitudinal monitoring survey. *European Journal of Public Health, 9(3)*, 166–173.

Public Health Agency of Canada. (2008). *Healthy living unit.* Retrieved 17. 10. 2008 from the World Wide

Web: http://www.phac-aspc.gc.ca/pau-uap/fitness/
definitions.html

Reed, J., & Ainsworth, B. (2007). Perceptions of envi-
ronmental supports on the physical activity behav-
iors of university men and women: A preliminary
investigation. *Journal of American College Health,
56(2)*, 199–204.

Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000).
A review of correlates of physical activity of children
and adolescents. *Medicine and Science in Sports and
Exercise, 32(5)*, 963–975.

Steptoe, A., Wardle, J., Fuller, R., Holte, A., Justo, J.,
Sanderman, R., & Wichstrøm, L. (1997). Leisure
time physical exercise: Prevalence, attitudinal cor-
relates, and behavioral correlates among young
Europeans from 21 countries. *Preventive Medicine,
26(6)*, 845–854.

Sulemana, H., Smolensky, M. H., & Lai, D. (2006). Re-
lationship between physical activity and body mass
index in adolescents. *Medicine and Science in Sports
and Exercise, 38(6)*, 1182–1186.

Suminski, R. R., Petosa, R., Utter, A. C., & Zhang, J. J.
(2002). Physical activity among ethnically diverse
college students. *Journal of American College Health,
51(2)*, 75–80.

US Department of Health and Human Services. (1996).
*Physical activity and health: A report of the surgeon
general.* Atlanta, GA: US Department of Health and
Human Services, Centers for Disease Control and
Prevention, National Center for Chronic Disease
Prevention and Health Promotion.

Zick, C. D., Smith, K. R., Brown, B. B., Fan, J. X.,
& Kowaleski-Jones, L. (2007). Physical activity dur-
ing the transition from adolescence to adulthood.
Journal of Physical Activity and Health, 4, 125–137.

VLIV DEMOGRAFICKÝCH UKAZATELŮ NA PLNĚNÍ DOPORUČENÍ PRO POHYBOVOU AKTIVITU U ČESKÝCH VYSOKOŠKOLSKÝCH STUDENTŮ
(Souhrn anglického textu)

Vzdělaní lidé, zejména pak vysokoškolští studenti mají lepší přístup k informacím o důležitosti plnění zdravotních doporučení k pohybové aktivitě a jejich významnosti pro zdravý a aktivní životní styl. Cílem studie je zjistit, zda univerzitní studenti v České republice plní tato doporučení a které demografické ukazatele mají největší vliv na jejich plnění. Pro šetření byl využit mezinárodní dotazník pohybové aktivity (IPAQ) – krátká verze a do logistické regresní analýzy vstoupily údaje z dotazníků od 2400 českých vysokoškolských studentů. Jako nezávislé proměnné jsme zvolili: (a) zda plní doporučení pro intenzivní PA (3 × 20 minut týdně) či

ne, (b) zda plní doporučení pro středně zatěžující PA (5 × 30 minut týdně) a (c) zda plní doporučení pro chůzi (5 × 30 minut týdně). Mezi závislé proměnné, které mohou splnění těchto doporučení ovlivňovat, jsme z dotazníku zařadili věk, pohlaví, BMI, místo bydliště, způsob bydlení, způsob života, kouření, vlastnictví auta nebo kola a pravidelnou účast v organizované PA. Z analýzy vyplynulo, že nejvýznamnějším faktorem, který ovlivňuje plnění doporučení PA, jednoznačně patří pravidelná účast v organizované PA. Větší pravděpodobnost, že splní doporučení PA, mají muži, jednadvacetiletí studenti a ti studenti, kteří žijí na vesnici, v rodině, nekouří a vlastní kolo. Více než 85 % českých vysokoškolských studentů splnilo obecná doporučení PA, ale přesto je potřeba posílit propagaci o vhodném množství prováděné středně zatěžující pohybové aktivitě, jelikož příslušné doporučení splnilo pouze 19 % studentů.

Klíčová slova: dotazník IPAQ krátká verze, vysokoškolští studenti, intenzivní PA, středně zatěžující PA, chůze.

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Research in Kinanthropology; focus on Physical Education at different types of schools. Teaching methodology and pedagogy within Faculty undergraduate program. Focus on statistics, student teaching practice and analysis of physical activity with use of different monitoring devices.

First-line publications

Vašendová, J., Frömel, K., & Sigmund, E. (2001). Reliability of accelerometer Caltrac, pedometer Omron a heart rate monitor Polar in aesthetically oriented girls' physical education classes. In H. Válková & Z. Hanelová (Eds.), *Movement and health*, (pp. 496–500). Olomouc: Univerzita Palackého.

Vašendová, J., Frömel, K., Wykrat, J., & Juličková, D. (2001). Individualisation in physical education lessons of gymnastics. In J. Slezynski (Ed.), *Efekty ksztalcenia i wychowania fizycznego w kulturze fizycnej* (pp. 155–161). Katowice: Akademia Wychowania Fizycznego.

Frömel, K., Lehnert, M., & Vašendová, J. (2000). Volleyball for girls in school physical education. *International Journal of Volleyball Research, 2(1)*, 30–34.

Frömel, K., Skalik, K., Sigmund, E., Vašendová, J., Neuls, F., & Wirdheim, E. (2000). Analysis of Physical activity in 16 and 18 year old grammar school students within international context. *Journal of Human Kinetics, (3)*, 103–113.

Frömel, K., & Vašendová, J., (2000). Esthetic aspects of physical education classes for girls. *Physical Educator, 57(3)*, 146–160.

Sigmund, E., Vašendová, J., Neuls, F., Frömel, K., & Skalik, K. (2000). Correlates of physical activity in 11–12 years old children. *Acta Universitatis Palackianae Olomucensis. Gymnica, 30(2)*, 51–58.

Frömel, K., Vašendová, J., Krapková, H., & Šopková, J. (2001). Country dance in physical education of girls at secondary schools. *Acta Universitatis Palackianae Olomucensis. Gymnica, 31(1)*, 13–20.

Frömel, K., Vašendová, J., Stratton, G., & Pangrazi, R. (2002). Dance as a fitness activity (the impact of teaching style and dance form). *Journal of Physical Education, Recreation and Dance, 73(5)*, 26–30.