Maria Jodkowska, Joanna Mazur, Anna Oblacińska

PERCEIVED BARRIERS TO PHYSICAL ACTIVITY AMONG POLISH ADOLESCENTS

Department of Child and Adolescent Health
Institute of Mother and Child in Warsaw

ABSTRACT

OBJECTIVE. To identify barriers to physical activity (PA) for adolescents according to the gender and age and examine the association between these barriers and youths' physical activity.
SUBJECTAND METHODS. 3346 students aged 10 - 16 years (1759 girls) took part in the cross-sectional, nationally representative study. For this paper the dataset was created from adolescents who reported perceived barriers to PA, N=2300, (1259 girls), range 13-16 years. Barriers and physical activity (MVPA) were analysed for all participants, as well as by gender, age group and place of residence. Multiple regression analysis was used to examine the relationships between perceived barriers and physical inactivity for all and than separately for boys and girls.
RESULTS. Lack of energy, lack of time and lack of support were three of the five barriers reported by more than 40% of adolescents, statistically more likely by girls than boys and older youth than younger. For boys - lack of time (OR=2.56; CI=1.66-3.96), lack of skills (OR=2.35; CI=1.94-3.95), lack of willpower (OR=1.71, CI=1.05-2.80) and lack of support (OR=1.64, CI= 1.11-2.41) were the predictors contributing to low level of PA. For girls lack of skills (OR=3.16, CI=1.62-6.18), lack of energy (OR=1.84, CI=1.14-2.96), lack of support (OR=1.64, CI=1.07-2.54) and lack of time (OR=1.61,CI=1.00-2.60) were positively and statistically significant associated with physical inactivity
CONCLUSIONS. 1. Perceived barriers to physical activity among adolescents have strong negative impact on recommended PA level. For girls lack of skills is the strongest predictor of low PA, for boys – lack of time. 2. Identification more precisely barriers to physical activity among adolescents will enable to developed more effective interventions in high-risk populations.

Key words*: physical activity, barriers, adolescents*

INTRODUCTION

Low physical activity (PA) level among different age group, included youth has become a prominent concern of public health also in Poland. Many epidemiological studies have shown that low PA is a strong and independent risk factor for both cardiovascular disease (CVD), diabetes and obesity (1,2). Worldwide literature regarding PA suggests that PA level declines across the lifespan, particularly during adolescence (3). Results of survey conducted in Poland in 2010 showed, that only around four-out-of ten 11-year-olds, five-out-of ten 13-year-olds and six-out-of ten 15-year-olds achieved recommended level of PA. In 1990-2010 constant trend of decreasing levels of physical activity with increasing age and gender difference disadvantageous for girls were observed (4).

Although the decline in PA level is consistent in the literature, it is not quite clear yet what are the factors related to this changes (3). The research literature on physical activity shows that this changes have multidimensional character: psychological, social and cultural, environmental, and behavioural (5,6). In this context, fundamental is question about perceived barriers to physical activity in adolescents. They may reflect environmental (external barriers) such a lack of sport facilities (accessibility of bicycle trails and safe walking paths convenient to their houses), a lack of support, or companionships from parents and friends and lack of time due to other responsibilities. On the

other hand, perceived barriers may represent rather individual (personal, internal barriers), such as a lack of self-motivation, lack of skills and energy, fear of being injured (5,6,7). In several studies of adolescents, perceived barriers were found to be major inverse predictor of PA. Youth who encounter more barriers have less possibilities of becoming active (7). Identification of perceived barriers to physical activity is important to improve our understanding of PA behavior among adolescents and to develop effective physical activity intervention in youth. This remain an understudies area in Polish youth.

The purpose of the current study are to determine barriers to physical activity for school age adolescents according to the gender, age and place of residence, and examine how these barriers affect youths' PA.

SUBJECTS AND METHODS

The cross-sectional study was conducted in the end of 2013 and the sample consisted of 3346 students aged 10 -16 years (1587 boys and 1759 girls). The data was collected through a questionnaire in a nationally representative sample of 163 school classes coming from the random selected 68 schools located in 12/16 voivodships (regions). The sample was diversified of region size and macroeconomical indicators level. For this paper the dataset was created from 2300 (1259 girls and 1041 boys) adolescents aged 13-16 years, who reported perceived barriers to physical activity. Mean age was 14.9, SD=1.2.

The study was approved by the local bioethical committee of Institute of Mother and Child in Warsaw.

Measurement instrument and indicators

Barriers to participating in physical activity

The measures of perceived barriers were based on 21-item questionnaire: *Barriers of being active. What keeps you from being more active*?, which covered 7 dimensions (lack of energy, lack of time, lack of social support, lack of willpower and lack of skills, fear of injury, lack of resources), developed and disseminated by the Center for Disease Control and Prevention - CDC (8). This questionnaire was adopted into Polish and pretest was done. After revision five items were selected for further studies. These items covered five out of seven dimensions of the original CDC instrument: *lack of energy, lack of time, lack of social support, lack of willpower and lack of skills.* No item belonging to *fear of injury* and *lack of resources* was included in the final index. Statements on barriers to physical activity and abbreviated description are shown in table I. Participants indicated how likely they were to say each of these statements: *very likely, somewhat likely, somewhat unlikely, very unlikely*. In our sample the positive psychometric properties of this 5-item short scale were confirmed, and its internal consistency evaluated using Cronbach alpha, was 0.817. Principal component analysis revealed the presence of one component with eigenvalue exceeding 1, explaining 58% of the variance.

Table I. Five categories of barriers to physical activity with related statements

	Statement	Category of barrier
1	I'm just to tired after work to get any exercise	Lack of energy
2	It's easier for me to find excuses not to exercise than to go out to do something	Lack of willpower
3	My free times during the day are too short to include exercise	Lack of time
4	My usual social activities with family of friends to not include physical activity	Lack of support and influence
5	I'm not good enough at any physical activity to make it fun	Lack of skills

Physical activity

PA was measured using self-reports on standardized question measuring the amount of daily moderate-to-vigorous physical activity (MVPA) (9).

Respondents were first provided with a definition and some examples of physical activity. After this, they were asked ''Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?''

In the present paper, time spent in MVPA was dichotomized as: MVPA=7 days/week (recommended), or MVPA<7 day/week (below recommended level).

According WHO recommendation children and youth aged 5-17 should accumulate at least 60 minutes of moderate- to vigorous- intensity physical activity daily (7days per week (10).

Statistical analysis

The evaluation barriers to physical activity was done by summarizing participants who answered very likely and somewhat likely to each statement as *presence of barrier*, and remaining two answers (somewhat unlikely, very unlikely) as *lack of barrier*. Barriers were analyzed for all group as well as by gender, age group and place of residence. Descriptive statistics included percentage, mean and standard deviation. Differences between groups were calculated using ch^2 test for frequency, nonparametric tests for means Mann-Whitney (M-W) and Kruskal-Wallis (K-W). Logistic regression with activity level as binary dependent (inactive, active) was assayed to verify associated barriers to physical activity. The multivariable model included: gender, age, and perceived five barriers. Odds ratios and their 95% of confidence interval were used as association mea-

sures between level of PA and barriers. In all analyses significant differences were assumed when $p<0.05$. The data were analyzed using SPSS v. 14.0.

RESULTS

Perceived barriers to physical activity

Five barriers were identified. Table II presents the prevalence of perceived barriers to PA by all subjects and according to the gender, age and place of residence. For the all group of adolescents, the most common barriers to physical activity were: lack of energy, lack of time and lack of support (reported by more than 40% of adolescents). Girls were statistically significant more inclined that boys to report all barriers to physical activity ($p<0.001$). The most distinct differences between girls and boys concerned lack of energy barrier (55.4% v. 35.9% and lack of time barrier (50.5% v. 31.7%).

Regarding to age group, older adolescents were reported barriers to physical activity statistically more often than younger ($p<0.001$), except lack of skills ($p=0.232$). When examining barriers by place of residence, there was no statistically significant differences in none of them.

With regard to the number of barriers to physical activity nearly 70% of adolescents reported at least one of them. Almost one third reported only one barrier, more frequent boys than girls (39.8% v. 22.5%). Girls perceived three and more barriers more frequently than boys. All five barriers reported 10% of adolescents. In this case the percentage of girls was twice as high (12.4% v. 6.1%) than boys.

Gender and age differences with regards to the mean number of perceived barriers were also observed ($p<0,001$) (tab. II). Girls reported higher mean number of barriers than boys (2.2 v.1.5), older adolescents higher than younger (2.2 v. 1.6) (tab. II).

Level of physical activity and association with perceived barriers

Figure 1 shows proportion of adolescents who achieved (physically active) and did not achieved (physically inactive) recommended level of PA by

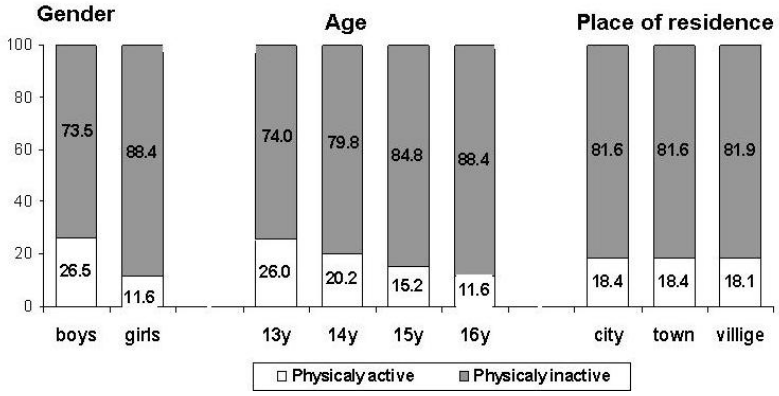

Figure 1. Proportion of being physically active and physically inactive among adolescents by gender, age and place of residence

Table II. Perceived barriers to physical activity and mean number of barriers in adolescents according to demographic characteristic

Demographic variables		N	Category of barrier to physical activity (%)					Mean number of barriers (SD)
			Lack of energy	Lack of time	Lack of support	Lack of willpower	Lack of skills	
Total		2300	46.6	42.1	41.7	33.7	26.0	1.89 (1.69)
Gender	boys	1041	35.9	31.7	36.8	26.5	22.5	1.52 (1.61)
	girls	1259	55.4	50.5	45.7	39.5	28.8	2.20 (1.69)
P*			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Age	13	621	37.9	36.1	35.9	25.8	25.0	1.59 (1.65)
	14	528	42.1	36.7	37.7	29.7	23.5	1.69 (1.59)
	15	595	50.0	46.8	44.6	37.7	28.8	2.08 (1.73)
	16	556	56.7	48.5	48.6	41.6	26.2	2.21 (1.69)
P*			<0.001	<0.001	<0.001	<0.001	0.226	<0.001
Place of residence‡	city	908	47.2	42.3	44.4	35.1	25.5	1.93 (1.68)
	town	669	47.1	40.4	41.0	32.6	26.3	1.87 (1.73)
	village	723	45.4	43.4	38.9	32.8	26.4	1.87 (1.66)
P*			0.838	0.574	0.089	0.499	0.903	0.663

‡- ≥1000 000 inhabitants, <100 000 inhabitants
*-chi-sq for frequency, M-W/K-W for mean

gender, age and place of residence. The proportion of adolescents who met the recommended PA (>or=60 min/day) was 18.3% overall; 26.5% and 11.6% for boys and girls, respectively (p<0.001). There were also significant differences in PA level in regard to the age (p<0.001). Early adolescents (13y) more likely to be meeting physical activity recommendation compared to late adolescents (16y), respectively 26% and 11.6%: There was no difference in regard to place of residence.

The associations between level of PA and perceived barriers are shown in the multiple logistic regression model (table III). In the model adjusted for gender and age, three barriers: lack of skill, lack of time and lack of support were significantly associated with low physical activity. Results indicated that adolescents who reported lack of skills and lack of time were twice more likely and those who perceived lack of support 60% more likely had insufficient physical activity than their peers who did not experience these barriers. Two other barriers (lack of willpower and lack of energy) did not show any significant results. With regards to demographic variables, girls and late adolescents had two times greater odds of being physically inactive than boys and early adolescents. However, when the analysis were performed for boys and girls separately, the findings were slightly different. For boys lack of time (OR=2.56; CI=1.66-3.96), lack of skills (OR=2.35; CI=1.94-3.95), lack of willpower (OR=1.71; CI=1.05-2.80) and lack of support (OR=1.64; CI= 1.11-2.41) were the predictors contributing to low level of PA. The odds of being inactive were over two times greater among boys who reported two barriers mentioned above and 1.5 greater among whose who reported lack of willpower and lack of support.

For girls lack of skills (OR=3.16, CI=1.62-6.18) was the strongest predictor of insufficient PA. Other barriers as lack of energy (OR=1.84; CI=1.14-2.96), lack of support (OR=1.64; CI=1.07-2.54) and lack of time (OR=1.61; CI=1.00-2.60) were also positively and statistically significant associated with physical inactivity. Girls who reported lack of skills had 3-fold higher odds of being inactive and girls who reported lack of energy, lack of support and lack of time were 1.5 times more likely to have low PA compared to girls who did not reported these barriers.

DISCUSSION

This study presented here provided an initial look on perceived barriers to physical activity in youth and relationships between them and reported physical activity level. To our knowledge, this is a one of the first studies on the barriers to PA among Polish adolescents. For assessing barriers to PA short 5-item questionnaire was used. Items covered five barriers: lack of energy, lack of time, lack of social support, lack of willpower and lack of skills. It was based on the US questionnaire: *Barriers of being active. What keeps you from being more active*? developed and disseminated by Center for Disease Control and Prevention (8). The results of this paper clearly show that high percentage of adolescents reported barriers to physical activity. More that 70% participants reported at least one of them. The most highly rated barrier to PA identified by nearly half of the sample was motivational (internal) – having little energy. Lack of time and lack of support were also commonly cited barriers. Girls cited higher level of barriers than boys. These data are *consistent* with the *results* of several studies conducted in different countries (6,7). We can say that Polish adolescents perceived similar barriers to PA as their counterparts from other countries, and girls reported higher level of perceived barriers than boys. It is worthy to notice that the prevalence of all perceived barriers apart lack of skills increased with age. Proportion of adolescent reported lack of skills as a

Table III. Predictors of low physical activity related to perceived barriers and demographic factors (multivariate logistic regression models)

	Total		Boys		Girls	
Variables	OR (95% CI	p	OR (95% CI)	p	OR (95% CI)	p
Demographic						
Gender Boy (ref)	1.00					
Girls	2.12(1.67-2.69)	0.000				
Age 13y (ref)	1.00	0.000		0.062		0.000
14	1.36 (0.99-1.85)	0.052	1.50 (1.00-2.25)	0.049	1.23 (0.77-1.98)	0.394
15	1.66 (1.21-2.27)	0.002	1.52 (1.01-2.28)	0.043	1.92 (1.67-3.16)	0.010
16	2.12 (1.50-2.98)	0.000	1.67 (1.08-2.60)	0.022	3.10 (1.76-5.44)	0.000
Barriers (1 – barrier exist)						
Lack of energy	1.36 (0.99-186)	0.055	1.03 (0.67-1.58)	0.889	1.84 (1.14-2.96)	0.013
Lack of time	2.12 (1.54-2.91)	0.000	2.56 (1.66-3.96)	0.000	1.61 (1.00-2.60)	0.049
Lack of support	1.65 (1.24-2.19)	0.001	1.64 (1.11-2.41)	0.012	1.64 (1.07-2.54)	0.025
Lack of willpower	1.26 (0.90-1.77)	0.179	1.71 (1.05-2.80)	0.031	0.97 (0.60-1.56)	0.893
Lack of skill	2.64 (1.77-3.97)	0.000	2.35 (1.94-3.95)	0.001	3.16 (1.62-6.18)	0.001

barrier was relatively constant (around 25%) across all ages in our study. Further research is needed to explain more detail this findings.

In the current study we also assessed physical activity level. According to the criteria used in the present study (MVPA= 7 days of at least 60 min/day) nearly 82% of adolescents were insufficient physically active, significantly more frequent girls that boys. In fact the results from the current study indicated smaller percentage of adolescents achieved minimal physical activity recommendation level in our sample compared to the findings from HBSC study 2010 (11).

The findings from present study showed a strong impact of perceived barriers on physical activity. As shown above boys and girls rated similar barriers, but association with low PA were different by gender. For girls, lack of skills (OR=3.16, p=0.001) was the strongest barrier to physical activity. The same observation were done by other researchers. *Okely* and colleagues (12) found, that movement skills among adolescents significantly predicted time in physical activity and this prediction was stronger for girls than for boys. Teenage girls, in particular, those who were less skilled avoiding those activities they felt they could not do. Having greater motor skill competence may result in greater self-esteem related to these type of activities and increased enjoyment of them (13). Additionally *Tammelin* et al. (14) suggested that wide range of sports skills acquired in childhood and adolescence may be the best preparation for lifelong physical activity.

For boys - lack of time seemed to be most important barrier (OR=2.56, p<0.001), lack of skills was the second (OR=2.35, p=0.001). Perceived lack of time in our study was important barrier to physical activity especially for boys, there is an indication that home work or other commitments were perceived as priority over physical activity; for girls the evidence was less extensive (OR=1.61, p=0.049). This result might be explained that even though girls reported significantly more frequent lack of time than boys, this barrier might not be limiting their participation in physical activity, because they adopted the strategy to cope with this barrier better than boys.

Another barrier that affects physical activity among adolescents in current study was lack of social support (OR=1.64). The strength of association between lack of support and low PA was similar in boys and girls. Evidence shows that social support is consistently important determinant, especially parental and peer support are significantly and positively associated with adolescents' PA (15,16,17). Parents may influence their children's physical activity verbally and with direct assistance as enroll them in sports, paying fees or transport them. Role of peers support increases in late adolescence and friends support can act as an important factor for adolescent PA. Those young people who had better relationships with friends, especially having a best friend who participates in sports are more likely to be physically active (17).

Regarding motivational barriers, we found that lack of energy was significantly related with low PA only for girls (OR=1.84, p=0.013), for boys – lack of willpower was related in strong way to PA participation (OR=1.71, p=0.031). There is clear evidence throughout the psychological literature that self-motivation initiates, continues, and sustains physical activity involvement and other free-of choice behaviors (18,19).

It is worthy to show, however this was not the case for the current study, that lower level of physical activity are associated with being girls and older. As earlier noted age and gender are the most consistent demographic correlates of PA.

Also we should think about the expanding research to suggested by other authors PA facilitators, especially personal and family and friends support (18,20).

CONCLUSION

1. Perceived barriers to physical activity among adolescents have strong negative impact on recommended PA level. For girls lack of skills is the strongest predictor of low PA, for boys – lack of time.
2. Identification of barriers will enable to developed more effective interventions in high-risk populations.

REFERENCES

1. Shiroma EJ, Lee IM. Physical activity and cardiovascular health: lessons learned from epidemiological studies across age, gender, and race/ethnicity. Circulation 2010;122:743–52.
2. Kohl WH 3rd, Craig CL, Lambert EV, Inoue s, Alkandari JR, Leetongin G, Kahlmeier S. The pandemic of physical inactivity: global action for public health. Lancet 2012, 380: 294–305 DOI: 10.1016/S0140-6736(12)60898-8
3. Dumith SC, Gigante DP, Dominigues MR, Kohl Wh 3rd. Physical activity change during adolescence: a systemic review and pooled analysis. Int J Epidemiol 2011;40:685-698.
4. Woynarowska B. Aktywność fizyczna. [w] Woynarowska B, Mazur J. Tendencje zmian zachowań zdrowotnych i wybranych wskaźników zdrowia młodzieży szkolnej w latach 1990-2010. Wydział Pedagogiczny Uniwersytetu Warszawskiego, Instytut Matki i Dziecka; Warszawa 2012:27-39.
5. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. Med Sci Sports Exerc. 2000 May;32(5):963-75.

6. van Der Horst K, Paw MJ, Twisk JW, van Mechelen W.A brief review on correlates of physical activity and sedentariness in youth. Med Sci Sports Exerc 2007 Aug; 39(8):1241-50.
7. Allison KR, Dwyder JJ, Makin S. Perceived barriers to physical activity among high school students. Prev Med1999; 28 (6):608-15.
8. *Barriers of being active. What keeps you from being more active* Center for Disease Control and Prevention: http://www.cdc.gov/nccdphp/dnpa/physical/life/barriers_quiz.pdf (z dnia 19.05.2014.
9. Prochaska JJ, Sallis JF, Long B. A physical activity screening measure for use with adolescents in primary care. Arch Pediatr Adolesc Med 2001, 155: 554-9.
10. Word Heath Organization. Global recommendations on physical activity for health. Geneva: WHO; 2010:20-21. http://www.who.int/dietphysicalactivity/factsheet_recommendations/en/l
11. Mazur J. Małkowska-Szkutnik A (red.): Wyniki badań HBSC 2010. Raport techniczny. Instytut Matki i Dziecka, Warszawa 2011:109-115.
12. Okley AD, Booth ML, Patterson JW. Relationship of physical activity to fundamental movement skills among adolescents. Med Sci Sports Exerc 2001, 33(11):1899-904.
13. Barnett LM, Van Beurden E, Morgan PJ, Brooks LO, Beard JR. Childhood motor skill proficiency as a predictor of adolescent physical activity. J Adolescent Health 2009, 44:252-259.
14. Tammelin T, Näyhä S, Hills AP, Järvelin MR Adolescent participation in sports and adult physical activity. Am J Prev Med. *2003* Jan; 24(1):22-8.
15. Hsu Y-W, Chou C-P, Nguyen-Rodriguez ST, McClain AD, Belcher BR, Spruijt-Metz D. Influences of social support, perceived barriers and negative meanings of physical activity in middle school students. Journal of Physical Activity and Health 2011, 8:210-219.
16. Park K, Neumark-Sztainer D. Story M, Hannan PJ, Tharp T, Rex J. Factor associated with changes in physical activity. A cohort study of inactive adolescent girls. Arch Pediatr Adolesc Med 2003, 157:803-810.
17. Galán I, Boix R, Medrano MJ, Ramos P, Rivera F, Moreno C Individual factors and School-Based Policies Related to Adherence to Physical Activity Recommendations in Spanish Adolescents. Prec Sci 2014, 15:588-599. DOI 10.1007/s11121-013-0407-5.
18. van Der I Horst K, Paw MJ, Twisk JW, et al. A brief review on correlates of physical activity and sedentariness in youth [Review]. Med Sci Sports Exerc. 2007 Aug; 39(8):1241-50
19. Teixeira PJ, Carraça EV, Markland D Silva MN, Ryan RM. Exercise, physical activity, and self-determination theory A systematic review: Int J Beh Nutr Phys Act 2012, 9:78 http://www.ijbnpa.org/content/9/1/78
20. Biddle SJH, Whitehead SH., O'Donovan TM, Nevill ME. Correlates of participation in physical activity for adolescents girls: A systemic review of recent literature. J Phys Activ Health 2005, 2:423-434.

Acknowledgment. The research work has been supported by the Polish Ministry of Sport and Tourism.

Received: 21.10.2014
Accepted for publication: 9.01.2015

Address for correspondence:
Maria Jodkowska
Instytut Matki i Dziecka
ul. Kasprzaka 17 A, 02-211 Warszawa
tel. (22)3277310
e-mail: maria.jodkowska@imid.med.pl