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Determinants of physical activity and lifestyle of Czech 11–15 years old students with visual impairments

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This pilot study of lifestyle of 11–15 years old students with visual impairment is the spin-off project from longitudinal HBSC study (The Health Behavior in School Aged Children) entitled disHBSC. The aim of the study was to analyze the determinants of physical activity and lifestyle of 11- to 15-year-old students with visual impairment, who are actively engaged in sports. The pilot study is based on original HBSC survey, which was adapted to meet specific needs of children with visual impairments. DisHBSC survey contained 48 questions divided to the following areas: demographical information, nutritional habits, physical activity and leisure, health, abuse of drugs, self-esteem, violence, school, family and peers. We have found surprising results regarding the amount of weekly physical activity, where only 9% of students met WHO minimal suggestions for physical activity. More than 50% of students identified school-based physical education as the main area of physical activities. We found alarming examples in school-based bullying. 11.7% of boys and 21% of girls experienced bullying 2–3 times in the past months. The main motive for engagement in a physical activity was to improve health. The most preferred activity is swimming, adapted aquatics and ball games. Our respondents spend significant time in sedentary activities and screen time, less in from of TV but more with PC, tablets or smartphones.

Keywords: adapted physical activity, health behaviour, blind

Introduction

HBSC (The Health Behavior in School-aged Children) is a cross-national study focused on young people's well-being, health behaviors and their social context. This research is conducted every four years in 45 countries and regions. HBSC is done in collaboration with the World Health Organization (WHO) Regional Office for Europe. The assumption of this study is that the lifestyle of adults is significantly influenced by behavior in childhood and adolescence (Kalman et al., 2011). The Czech Republic is part of international HBSC study since 1994 with regular data collection in four-year cycles. Until recently, the data collection did not include specific needs of children with disabilities and impairments (Brindová, Kmeť, & Ješina, 2013). In HBSC network, there have been tendencies to focus on specific needs of children with long-term illnesses (Rintala et al., 2011). The only published results of HBSC study are with longitudinal data from Finland, where they included optional questions allowing them to identify children with long-term illnesses (Ng et al., 2016a; Ng et al., 2016b). However only children with mild impairments were able to respond to the mainstream national HBSC study and therefore the need to further investigate lifestyle of children with moderate and severe impairments (e.g. blindness or deafness) was identified with HBSC network.

Inclusion of persons with visual impairments in leisure time physical activities can be a very effective tool to prevent social exclusion (Janečka & Bláha, 2013). Riley, Rimmer, Wang and Schiller (2008) argue that participation in physical activities is an essential part of lifestyle of persons with disabilities, which can also increase the quality of life and social participation (Kudláček, 2008). Psychosocial aspect of physical activities is especially important in the sensitive time of child's development, which includes entry to elementary education and prepubescence (Janečka & Bláha, 2013). In working with children with visual impairments, we find significant impact of environmental and personal contextual factors (Bláha, 2011; Haegele, Zhu, Lee, & Lieberman, 2016; WHO, 2001).

Janečka and Bláha (2013) highlight the following specific needs of children with VI:

a) actual limits of visual loss;
b) lack of experience with movement in strange environment; and
c) learned movement stereotypes, which can hinder participation in a changing environment.

In Czech education, we can find significant differences between children with VI educated in special school and children included in mainstream schools. While students attending special schools often take part in organized physical activity in school PE and school-based sport clubs, students attending general schools are frequently excluded from physical education and all sport-related extracurricular activities (Kudláček, 2008). Students with visual impairment can be very active, being good at sports as well as at school and we can find also successful examples of them doing sport studies at university level and serving as good examples to peers with and without disabilities (Reina & Alvaro-Ruiz, 2016).

Unfortunately, these important determinants of quality of life are not well documented in the literature. On the other hand, there is a possibility to influence the quality of life of persons with impairments by facilitating their involvement in physical activities, improvement of their physical literacy and health education (Ng et al., 2016a). International recommendation for physical activity of children and youth suggests 60 minutes of physical activity daily (Kalman, 2012). Unfortunately, these recommendations and most international renowned studies do not reflect specific needs of persons with visual impairments (Kalman, Hamřík, & Ješina, 2011). Therefore we need to pay extra attention to facilitate participation of persons with impairments in physical activity in general (Ng et al., 2016b), the improvement of quality of physical education (Block, 2007) as well as leisure time physical activities (Hutzler & Sherrill, 1999; Sherrill, 2004).

Understanding the real problems in lifestyle of children with VI can help us to make recommendations for strategic policies and transformation of educational, medical and social support systems. For this, we need valid and reliable evidence, which can help us to compare this population with non-disabled children. The purpose of this study was to analyze the determinants of physical activity and lifestyle of 11- to 15-year-old children with visual impairment.

Methods

Sample

The survey was conducted in the years 2013–2015, with 53 participants, 34 boys (average age 13.4 yrs.) and 19 girls (average age 12.8 yrs.). Students were attending both special schools for students with visual impairments as well as general school setting from Olomouc, Brno, Opava, Liberec, Praha and Plzeň. Students filled in the survey during their leisure time in special schools, at sport camps and during goalball competition, which took place in Olomouc in 2015. This purposive sampling implies potentially higher level of physical literacy and engagement in physical activity. Students filled in the survey in a paper format individually with the help of a trained independent assistant. Blind students used blind friendly version of the survey.

Survey and data analysis

The whole study is realized within HBSC international study framework. Modifications to HBSC survey were done in coordination with colleagues from the Faculty of Medicine Pavol Jozef Šafárik University in Košice and colleagues within international disHBSC subgroup (Slovakia, Czech, Finland, France and Spain). Survey entitled disHBSC is a modified version of international HBSC survey, which is suitable for adolescents with impairment. The present study uses compulsory as well as optional items from the HBSC package. Original HBSC study The international network is organized around an interlinked series of focus and topic groups related to the following areas:

a) Body image,
b) Bullying and fighting,
c) Eating behaviors,
d) Health complaints,
e) Injuries,
f) Life satisfaction,
g) Obesity,
h) Oral health,
i) Physical activity and sedentary behavior,
j) Relationships: Family and Peers,
k) School environment,
l) Self-rated health,
m) Sexual behavior,
n) Socioeconomic environment,
o) Substance use: Alcohol, Tobacco and Cannabis, and
p) Weight reduction behavior.

Presented disHBSC survey consists of 48 items and is thus considerably shorter from the original HBSC study. The primary need for modification was the reduction of time needed for survey completion due to limited attention span of children with certain impairment, simplification due to limited cognition and communication skills and adding some impairment specific items. The final disHBSC survey is

therefore modified but still comparable with the main HBSC study.

Results

The presented results focus on the topic of physical activity, screen time, eating habits, family, bullying and self-evaluation. Girls in our sample are more active than boys. Seven out of 19 girls are physically active for 60 minutes seven days per week (Table 1). The most frequent amount of physical activity among boys is five days per week.

The most common place to do physical activities is school-based physical education (54.7%). The second most common place to engage in a physical activity is being active with friends outside of school (52.8%). Only five children (9.4%) did not attend physical education lessons due to medical reasons (Table 2).

The most common reason for doing physical activity was to improve health (66%). The second most important reason (64.2%) was meeting with friends. On the other hand, 57% of respondents mark the reason to win as not important. Sixty percent of respondents mark the meeting new friends as an important reason to do physical activity. High cumulative scores of positive evaluation (important plus very important) are following:

a) To prove I can do it and
b) Maintain the weight.

The highest cumulative score is in the item to Get in shape.

In the preference of physical activity (Table 4), ball games is the most common response – 12 respondents participate in them at least twice per week. 15 respondents did swimming and adapted activities at least once per week. Relatively high scores for nonparticipation are in the following: gymnastics, aerobics, Zumba, (24 respondents), martial arts and self-defense (31 respondents), baseball, softball and cricket (28 respondents), dance (22 respondents) and climbing (25 respondents).

Screen time (Table 5) belongs to the most common negative aspects of lifestyle in children and adolescents. Screen time of children with visual impairments is not necessarily only negative as they use PC and smartphones for communication. The largest group of boys (23.5%) watch television one hour per day. Most girls (36.8%) watch television 2 hours per day. Children with visual impairments spend very little time playing computer games. No time playing PC games was reported by 17.6% of boys and 31.6% of girls. More than 50% of boys and girls spend only one hour or less playing PC games. Time spent on the internet, e-mail or doing homework was slightly higher 23.5% for boys, spending 1 hour and 23.5% two hours per day. Most girls (31.6%) spend half an hour per day on PC. Children with visual impairment thus

Table 1
Regular physical activity

Days	Boys (n = 34)		Girls (n = 19)	
	n	%	n	%
0	1	2.90	0	0.00
1	3	8.80	0	0.00
2	3	8.80	3	15.80
3	7	20.60	5	26.30
4	6	17.60	3	15.80
5	8	23.50	0	0.00
6	3	8.80	1	5.30
7	3	8.80	7	36.80

Table 2
Location of physical activity

Options (possibility to check more options) (N = 53)	n	%
Only in physical education at school	29	54.70
I do not attend PE at school due to health reasons	5	9.40
Outside school with friends	28	52.80
Outside school with family	16	30.20
In sport club at school	20	37.70
In sport club outside of school	11	20.80
Elsewhere	11	20.80

Table 3
Reasons for participation in physical activities

Reasons for PA ($N = 53$)		Very important	Important	No important
Have Fun	*n*	17	29	7
	%	32.10	54.70	13.20
Be good at sports	*n*	17	20	16
	%	32.10	37.70	30.20
Win	*n*	8	15	30
	%	15.10	28.30	56.60
Meet new friends	*n*	17	32	4
	%	32.10	60.40	7.60
Improve health	*n*	35	16	2
	%	66.00	30.20	3.80
Be together with my friends	*n*	34	16	3
	%	64.20	30.20	5.70
Get in shape	*n*	24	28	1
	%	45.30	52.80	1.90
Look good	*n*	18	21	14
	%	34.00	39.60	26.40
Please my parents	*n*	26	20	7
	%	49.10	37.70	13.20
To be „cool“	*n*	9	20	24
	%	17.00	37.70	45.30
Maintain the weight	*n*	25	23	5
	%	47.20	43.40	9.40
Excitement	*n*	13	25	25
	%	24.50	47.20	28.30
To prove I can do it	*n*	23	25	5
	%	43.40	47.20	9.40

spend considerable time watching television or being in front of PC.

Eating breakfast is not a natural part of lifestyle in all children with visual impairments (Table 6). The situation is better at the weekend when 76.5% of boys and 78.9% of girls eat on both Saturday and Sunday. The situation is approximately 10% worse during the five working days. Four boys and 4 girls do not eat breakfast as all.

Approximately 68% of boys and girls did not experience bullying in the past few months. In the frequency of 1–2x, we find bullying among 14.7% of boys and 10.5% of girls. However, approximately 18% of boys an 20% of girls experienced some bullying and about 9% of boys and 10% of girls experience regular bullying.

Discussion

Although our sample represents relatively active adolescents with visual impairments, it provides an interesting view of different determinants of their lifestyle. In comparison with hypokinetic lifestyle of adolescents without disabilities, where screen time

Table 4
Organized leisure time physical activities

Selected types of physical activity ($N = 53$)	No practice	Aprox. 1–2x per year	Aprox. 2–3x per month	Aprox. 1x per week	2x per week or more
Ball games	6	8	5	4	12
Athletics	5	9	8	6	7
Gymnastics, aerobics, Zumba	24	6	0	1	4
Swimming and adapted activities	4	6	6	15	4
Running, jogging	8	10	5	6	6
Martial arts and self-defense	31	3	0	1	0
Tennis, table tennis, badminton, showdown	9	11	4	8	3
Baseball, softball, cricket	28	3	1	2	1
Target sports (boccia, bowling, darts,…)	12	15	6	1	1
Dance (disco, techno, stand. and folk dances)	22	6	0	4	3
Skiing, downhill, cross-country	5	26	3	1	0
Skating, Ice Hockey, Inline skating	10	15	5	1	4
Cycling, spinning,	8	10	10	2	5
Indoor and outdoor climbing	25	6	0	4	0
Tourism	5	5	15	4	6
Canoeing, rafting, kayaking	19	15	1	0	0
Strengthening, bodybuilding, fitness	18	5	6	2	4

Table 5
Screen time

Hours watching TV, DVD or video per day	Boys ($n = 34$)		Girls ($n = 19$)		Hours Playing PC games or playstation per day	Boys ($n = 34$)		Girls ($n = 19$)		Hours on PC (internet, e-mails, homework)	Boys ($n = 34$)		Girls ($n = 19$)	
	n	%	*n*	%		*n*	%	*n*	%		*n*	%	*n*	%
None	5	14.70	5	26.30	None	6	17.60	6	31.60	None	5	14.70	2	10.50
1/2 Hr.	7	20.60	5	26.30	1/2 Hr.	6	17.60	5	26.30	1/2 Hr.	2	5.90	6	31.60
1 Hr.	8	23.50	1	5.30	1 Hr.	5	14.70	4	21.10	1 Hr.	8	23.50	2	10.50
2 Hrs.	6	17.60	7	36.80	2 Hrs.	5	14.70	3	15.80	2 Hrs.	8	23.50	3	15.80
3 Hrs.	4	11.80	0	0.00	3 Hrs.	2	5.90	0	0.00	3 Hrs.	3	8.80	3	15.80
4 Hrs.	2	5.90	0	0.00	4 Hrs.	4	11.80	0	0.00	4 Hrs.	2	5.90	2	10.50
5 Hrs.	1	2.90	0	0.00	5 Hrs.	2	5.90	1	5.30	5 Hrs.	1	2.90	0	0.00
6 Hrs.	0	0.00	1	5.30	6 Hrs.	1	2.90	0	0.00	6 Hrs.	3	8.80	1	5.30
7 Hrs. +	1	2.90	0	0.00	7 Hrs. +	3	8.80	0	0.00	7 Hrs. +	2	5.90	0	0.00

significantly influences leisure time behavior (Kalman & Vašíčková, 2013), students with visual impairment spend less time in front of computers. In boys with visual impairments, 55.8% spend more than 2 hours in from of PC, while in boys without impairments it is 76.87% (Kalman, Sigmund, et al, 2011). We found similar comparison in girls where 47.1% of girls with VI spend 2 hours or more in front of PC while in girls without impairments it is 63.37%. Similar findings are regarding watching TV – 41.2% vs. 65.4% in boys and 42.1% vs. 61.5% in girls. Less time watching TV is understandable due to nature of visual impairment. We must emphasize, however, that there was no item focused on using smart phones and tablets, which

Table 6
Eating habits

Eating habits	Boys (n = 34)		Girls (n = 19)	
	n	%	*n*	%
During week days I eat breakfast				
Never	4	11.80	4	21.10
One day	2	5.90	0	0.00
Two days	1	2.90	0	0.00
Three days	2	5.90	0	0.00
Four days	2	5.90	2	10.50
Five days	23	67.60	13	68.40
On weekend days I eat breakfast				
Never	5	14.70	0	0.00
One day	3	8.80	4	21.10
Two days	26	76.50	15	78.90

Table 7
The experience of bullying from others during the past few months

Bullying from others	Boys (n = 34)		Girls (n = 19)	
	n	%	*n*	%
Never	23	67.60	13	68.40
1–2 times	5	14.70	2	10.50
2–3 times per month	1	2.90	2	10.50
Aprox. once per week	1	2.90	2	10.50
Few times per week	2	5.90	0	0.00

seems to be preferable screen time activity of children with VI and we plan to add this item in the future. Relatively positive findings of screen time activities do not transfer to more time spent in physical activities. Especially when we realize the fact that this is a group of sporting children with VI. Only 8.8% of boys meet WHO recommendation of 60 minutes of PA per day. Ng, Rintala, Tynjälä, Vilberg and Kannas (2014) found 22.7% of respondents meting WHO recommendation. However, we should emphasize that their respondents had less severe VI as they were able to respond to regular survey without adaptations for students with more severe VI. On the other hand, we found 36.8% of girls meeting WHO recommendation vs. 9.1% in HBSC study from Finland. Surprising findings for our active sample show that 9.4% of respondents do not attend physical education at school and only 21% of them attend sport activities outside of school. Almost 55% of students do physical activities only at school. This supports our assumption that if students are not included in physical education or school-based sport activities, they will not take part in regular physical activity at all. Experiences from abroad (Perkins, Columna, Lieberman, & Bailey, 2013; Robinson & Lieberman, 2007) tell us that with appropriate support, parents can be perfect facilitators of active lifestyle of children with VI. The main reason for doing physical activity is to stay in shape and meet new friends. Personal fitness and skill improvement, teamwork and friendship were also found as motives for participation of children with VI in Yao, Shapiro, & Liao (2016).

The most preferred physical activity is tourism, swimming with adapted activities and ball games which is similar to the findings of Czech high school students of Kudláček and Frömel (2012).

Based on our findings, the most alarming seems to be the experience with bullying where most students with VI had some experience with bullying and about 9% of boys and 10% of girls experience regular bullying (at least once per week). We did not find any such alarming finding in any European HBSC studies and common experience with bullying in Czech studies is approximately 6% with the highest rates of bullying in Ukraine and Poland, with 17–18% of 11-year-old students (Madarasová, Dankulincová, Sigmundová, & Kalman, 2016).

Conclusions

The main purpose of the study was to explore selected determinants influencing participation in physical activity and healthy lifestyle of active students with visual impairments. As our sample represents sport active population, it is difficult to generalize these findings to the whole population of students with VI. Furthermore we can expect that lifestyle of non-active students would be even worse. Especially among boys in our sample, only 8.8% meet WHO recommendation of daily amount of physical activity. More than fifty percent of our respondents do activity only in an organized school setting (physical education and sports). This therefore implies that when students are included in general schools, but not included in general physical education, the amount of physical activity would be much lower. It is important to realize specific aspects of screen time in population with visual impairments, where computers, tablets or smartphones can serve as facilitators of social interaction. Eating habits of students with VI are comparable to their non-disabled peers, but there seems to be higher prevalence of bullying, especially among girls with VI. For further studies, we would recommend to find a more representative sample and have a substantial number of students from special schools and general schools so their results can be compared.

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