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Self-reported physical activity behaviour in 4th- to 6th-grade students in a Swiss community

Abstract

Data on the physical activity behaviour of 204 primary school children in grades 4 to 6 in a Swiss community was gathered via questionnaire. On a school day, nearly one hour of moderate to vigorous activity (MVPA) was spent on activities at home or elsewhere during leisure time. Commuting to school contributed half an hour and physical activity at school another hour to MVPA time. On a Sunday, the children spent just over 3 hours on MVPA. While boys were more active than girls, no differences were seen between age groups.

Zusammenfassung

Von 204 Kindern in der 4. bis 6. Primarschulklasse in einer Schweizer Gemeinde wurde das Bewegungsverhalten mittels Fragebogen erhoben. An einem Schultag wurde fast eine Stunde zu Hause oder sonst wo in der Freizeit mit körperlichen Aktivitäten von mittlerer bis intensiver Aktivität (MVPA) verbracht. Das aktive Zurücklegen des Schulwegs trug eine halbe Stunde zur MVPA-Aktivitätszeit bei und Aktivitäten an der Schule eine weitere Stunde. An einem Sonntag verbrachten die Kinder durchschnittlich ca. 3 Stunden mit MVPA. Während sich insgesamt zeigte, dass Jungen aktiver waren als Mädchen, konnten keine Unterschiede zwischen Altersgruppen gefunden werden.

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Introduction

The importance of regular physical activity to foster children's health and development is widely recognised. In recent years, increasing concern has been voiced that children in Switzerland and other countries no longer benefit from natural circumstances that enable them to engage in sufficient physical activity to safeguard a healthy development.

In the context of the implementation and evaluation of a community-based physical activity intervention programme in Nendaz (Wanner et al., 2009), a municipality in the French speaking part of Switzerland, the physical activity behaviour of primary school children was of particular interest. The results of this cross-sectional survey provided feedback to the community to plan future activities for promoting physical activity in children. A more detailed report on the results of this survey can be downloaded at www.sportnetz.ch (→Bestehende Netze→VS).

The aim of this study was to assess the physical activity behaviour of 4th- to 6th- grade primary school children at school, on their way to school, during leisure time and at home, as well as their participation in optional sports courses and other structured sports activities in the community.

Methods

The survey was conducted in spring 2007. All grade 4 to 6 teachers in the community of Nendaz agreed to participate with their class. A questionnaire for 9- to 12-year old children, the physical activity questionnaire for pre-adolescents (PAQPA), was developed on the basis of international literature on physical activity questionnaires for children. Based on the evidence available (Sirard and Pate, 2001), one-day recall questions were chosen. The questionnaire

thus consisted of three parts being administered by the teacher in class on Monday, Tuesday and Wednesday respectively. Each day, the children filled in questions about their activities of the previous day. A list of activities was given for morning, afternoon and evening where children ticked whether or not they had engaged in each activity on the previous day and if so for how long (10 minutes, 20, 30, 45, 60 or more than 60 minutes). Socio-demographic questions as well as three general physical activity questions were asked on the first day.

The questionnaire was recently validated in a pilot study with a group of 59 students wearing uniaxial accelerometers for 7 days (Schmid et al., 2008). The Spearman correlation coefficient for minutes spent on moderate to vigorous physical activities (MVPA) was significant for the weekend ($r=0.371$, $p=0.005$), yet did not reach significance for the whole week ($r=0.259$, $p=0.076$). Data were analysed in SPSS version 15. Daily minutes spent on screen-based activities (recreational computer use, watching TV and video, playing videogames), on physical activities of moderate intensity and on physical activities of vigorous intensity were calculated. Gender and age group differences were assessed with t-tests for independent samples. Differences between Sunday and an average school day (mean of Monday and Tuesday measures) were assessed with one-sample t-tests. Bonferroni corrections were applied where appropriate.

Results

Student characteristics

Of 249 students in the community, 209 participated in the survey. Data for four students had to be removed because they were not present on all three days of the survey, and data for one student

were eliminated on the basis of credibility. Thus complete data for 204 children, corresponding to 82% of the entire population of this age group in Nendaz, were available.

51% of the students were girls, 3% did not speak French at home, 12% French and another language and the rest French alone. 4% of the pupils were categorised as overweight and 1% as obese. 9% of the students were 9 years old, 34% 10 years, 33% 11 years, 23% 12 years and 1% 13 years old. The two thirteen-year old children were excluded for the analysis of children's physical activity behaviour where age group differences were investigated.

Physical activity time for different intensity levels

Table 1 shows the average time and standard deviation (SD) of minutes spent in screen-based activities, moderate and vigorous physical activities, and the sum of minutes spent in moderate and vigorous activity (MVPA) according to gender and age group on a Sunday or school day respectively. On average, the children spent about 3 hours on MVPA on Sunday and 2½ hours on a school day. Boys spent significantly more time on MVPA, moderate activity as well as vigorous activity on a school day, but only in vigorous activity on a Sunday. No differences in activity were seen between age groups. Children spent an average of 2 hours on screen-based activities on Sunday and nearly 40 minutes on a school day. No differences in screen-based activities were seen between boys and girls and the two age groups respectively.

	Gender (n=201)			Age group (n=202)			all (n=202)
	boys	girls	p	9-10	11-12	p	
<i>Sunday</i>							
Screen-based act.	128 (98)	112 (89)	0.240	118 (96)	120 (91)	0.882	119 (93)
Moderate activity ^o	145 (137)	160 (122)	0.410	169 (139)	141 (120)	0.119	153 (129)
Vigorous activity ^o	56 (66)	17 (33)	0.001	39 (58)	33 (53)	0.461	36 (55)
MVPA ^o	201 (175)	177 (135)	0.289	208 (162)	174 (150)	0.119	189 (155)
<i>School day</i>							
Screen-based act.	42 (44)	36 (37)	0.271	39 (39)	38 (41)	0.798	38 (40)
Moderate activity ^o	118 (63)	97 (54)	0.012	112 (71)	104 (49)	0.328	108 (59)
Vigorous activity ^o	45 (37)	25 (22)	0.001	39 (39)	32 (24)	0.167	35 (32)
MVPA ^o	164 (85)	123 (65)	0.001	151 (93)	135 (63)	0.189	143 (78)

Table 1: Activity times for different intensity levels according to gender and age group on Sunday or a school day (N=202), ^oBonferroni corrections applied

On an average school day, 6.4% of the children spent less than an hour on MVPA, and on a Sunday 13.4% did so. The proportion of children spending at least 2 hours daily on MVPA was very similar on Sunday (57%) and on a school day (60%). And the share of those spending at least three hours a day on MVPA was remarkable (21% on a school day and 42% on a Sunday).

MVPA physical activity time in different contexts on a school day

38% of the MVPA time on a school day was spent at home or elsewhere during leisure time, 20% for travelling to school, 19% at school recess time (morning and afternoon breaks added up) and 23% during school lessons (including Physical Education). Activ-

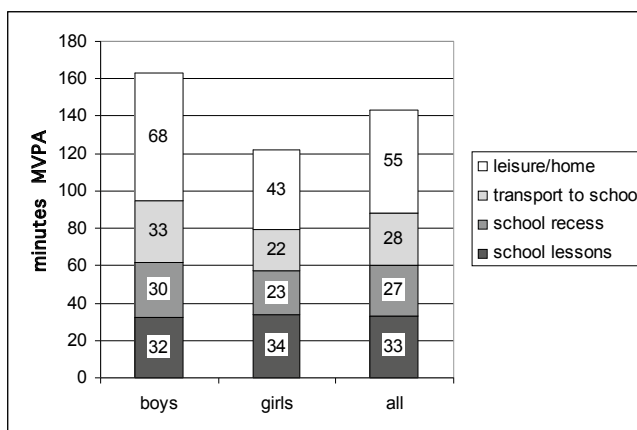


Figure 1: Minutes spent on MVPA in different contexts on a school day according to gender (n=201)

ity times according to gender are given in figure 1. Differences between boys and girls were significant for three contexts (school recess, p=0.021; transport to school, p=0.002; leisure/home, p<0.001, Bonferroni correction applied), but not during school lessons. There were no differences between the age groups.

Use of structured sports activities

To determine the use of structured sport offers by this age group, students were asked whether they had participated in certain group activities (in a sports club, optional sports at school, etc.) during the last week. The top six activities were used by more than 10% of the children (n=204). They were (multiple answers possible): football (43%), skiing (42%), gymnastics (36%), swimming (26%), badminton (11%) and karate (11%).

Discussion

In this primary school survey among all children in grades 4 to 6 in the community of Nendaz, a high response rate provided representative self-report data. Overall, nine out of ten children spent an hour or more a day on MVPA and six out of ten 2 hours or more. Boys were more active than girls especially when looking at vigorous activities. The average time spent on screen-based activities was low on a school day but on Sunday it nearly reached 2 hours.

There is no evidence-based international consensus so far on how many minutes of activity per day should be recommended for preadolescent children. The physical activity recommendations for children and adolescents published in Switzerland state that adolescents at the end of compulsory schooling, i.e. about age 15, should be active for at least an hour a day and that younger students clearly need more activity (Federal Office of Sport et al., 2006). The question of how many minutes exactly are to be recommended for the age group of 9- to 12-year-olds is still being researched. A group around Andersen (2006) for example looked at cardiovascular risks and physical activity in European children and found that about 2 hours might be an appropriate recommendation for 9-year-olds. Among the current study group, four out of ten students spent less than 2 hours in MVPA and one in ten less than an hour.

Data from other studies on Swiss children of this age group (Moses et al., 2007) do not show the daily minutes spent in MVPA and thus cannot directly be compared to the current results. However, in a survey in a community close to Nendaz, St. Maurice, the same methodology was used for the same age group in spring 2008 as part of a Masters thesis (Clerc and Praz, 2008). Children spent an average of 168 minutes in MVPA on Sunday and 131 minutes on a school day. Thus they were on average slightly less active than children from Nendaz. However, with 70%, the proportion of children spending more than 2 hours a day on MVPA was somewhat higher.

The average of screen-based activities on Sunday or a school day was very similar to the results in our survey.

In the national Swiss Sport Survey 2008, 60% of the children reported less than 7 hours of sports activities per week (Lamprecht et al., 2008). For the French-speaking part of Switzerland alone, this figure amounted to 76%. However, these figures refer to leisure time sports activities not including active commuting or activity during recess at school and the data were collected via telephone recalls, not questionnaires.

In this study, boys were more active than girls, especially regarding vigorous activity. This corresponds with the findings of the Swiss Sport Survey (Lamprecht et al., 2008) and of international studies (Van der Horst et al., 2007). On the other hand, no differences were seen between the younger group of 9- to 10-year-olds and the 11- to 12-year-olds, which is consistent with findings of newer reviews on physical activity correlates (Van der Horst et al., 2007). Active transport was a considerable contributor to daily activity time. Representative travel survey data show that in 10- to 12-year-olds living in Switzerland about 80% of the ways to school are travelled actively. However, active commuting to school is less common in the French- than in the German-speaking part of Switzerland (Sauter, 2008).

With a very high response rate, this survey gives a representative picture of 9- to 12-year-old children's activity in the community of Nendaz, yet it was not designed to provide information about children's physical activity behaviour beyond this community. The fact that teachers administered the questionnaires at school and that children only had to remember activities of the previous day helped receiving credible responses. However, the validity of this questionnaire has only been tested in a small study so far.

In conclusion, the majority of children aged 9 to 12 in Nendaz spent more than 2 hours a day being active. Both the school and home environments made valuable contributions to their active lifestyle. However, the proportion of children who are likely to need more activity and those who seem to spend too much time in front of a screen on a Sunday is not to be neglected.

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