Does sports club participation contribute to physical activity among children and adolescents? : A comparison across six European countries

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Does sports club participation contribute to physical activity among children and adolescents? A comparison across six European countries

Running title: Sports clubs participation and physical activity

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ABSTRACT

Aims: Insufficient physical activity (PA) is one of the largest public health challenges of our time and requires a multisectoral public-health response. PA recommendations state that all children and adolescents should accumulate at least 60 minutes of moderate-to-vigorous PA (MVPA) daily and carry out vigorous PA (VPA) three times weekly. While participation in sports club activities is known to enhance the probability of reaching the recommended overall PA level, less is known about the contribution of sports club participation to VPA and few cross-national comparisons have been carried out.

The purpose of this paper is to study whether participation in sports club activities is associated with meeting the overall PA and VPA recommendations among children and adolescents across six European countries, namely Belgium (Flanders), Czech Republic, Finland, France, Ireland and Sweden. Methods: Analysis were carried out on existing self–reported national data sets using descriptive statistics and logistic regression.

Results: Results indicate that approximately two-thirds of children and adolescents take part in sports clubs activities in given countries. Sports club participants were more likely to meet the overall PA recommendations (OR 2.4-6.4). Sports club participants were also more likely to reach VPA recommendation (OR 2.8-5.0) than non-participants. Conclusions: The extent to which overall PA and/or VPA is gained through sports club participation versus other settings needs to be further studied. Still, it can be argued that sports clubs have an important position in PA promotion for younger populations.

Key words: guidelines and recommendations, physical activity, public health, sport, youth
BACKGROUND

There is strong evidence for the physical, mental and psychosocial benefits of physical activity (PA) [1, 2] and the need for a multi-sectoral public-health response to physical inactivity [3]. Global PA recommendations for health state that children and adolescents should achieve at least 60 minutes of moderate-to-vigorous intensity PA (MVPA), most of it aerobic, every day to improve cardiorespiratory and muscular fitness, bone health, and cardiovascular and metabolic health biomarkers [4]. Vigorous intensity PA (VPA) including muscle and bone strengthening activity should be incorporated at least three times weekly. It is also highlighted that amounts of PA greater than 60 minutes provide additional health benefits [4, 5].

International research has demonstrated that the majority of children and adolescents do not reach these PA recommendations. A recent overview on the PA of children and adolescents in 38 countries from all continents showed that on average sixty percent of children and youth worldwide fail to meet the international recommendations for PA [6]. About half of the countries reported that only a third or less of the children and adolescents met the PA guidelines and some countries reported even lower levels, highlighting an issue of insufficient PA during childhood across Europe.

Moreover, some universal trends in PA in relation to gender, age and family affluence need to be considered, where boys, younger age groups and children from high affluence groups reach the recommended level of PA more frequently than girls, older age groups and low affluence groups respectively [7]. This combined knowledge is alarming, particularly considering the health benefits of PA in regard to physical, mental, and social health, and in the prevention of non-communicable diseases [8].
Therefore, the World Health Organisation [4] and the European Commission [9] as well as national governments have set PA promotion as one of the priority aims in society, especially with respect to children and adolescents. As health should be promoted where people learn, work, play and love [10], PA should also be promoted in these different settings. One setting that is particularly suitable for promoting PA is the sports club who deliver organised sport to the 40-59% of children and adolescents in Europe who participate in sports clubs [6]. In spite of the high diversity of sports policies in different countries across Europe and in the population of sports clubs, it can be generalised that sports clubs represent the very core and the local suppliers of the many sports systems in this continent [11].

Participation in sports clubs can and should contribute to meeting PA guidelines. Some research has demonstrated that children and adolescents participating in sport at a sports club have higher levels of MVPA than non-participants [12]. However, some other recent findings in European countries have also indicated that not all sports club participants reach recommended PA levels [13, 14]. Among sports participants, boys are more likely to reach the PA guidelines for MVPA than girls [15] and there are also studies that show a positive relationship between sport participation and VPA [16, 17].

To date, no research has focused on comparing overall PA levels and the additional assessment of VPA of sports club participants and non-participants across several European countries. Therefore, the purpose of this paper is to study whether participation in sports club activities is associated with meeting the overall PA and VPA recommendations among children and adolescents across six European countries with
some different characteristics, namely Belgium (Flanders), Czech Republic, Finland, France, Ireland and Sweden.

METHODS

Authors from six countries, belonging to the HEPA Europe: Sport Clubs for Health working group, identified relevant data sets, with data on sports club participation, overall PA and VPA among children and adolescents aged 11, 13 and 15 years old, with variations in Ireland (10-11 and 12-14 year olds) and Sweden (13 and 15 year olds).

Apart from the Swedish data, (regional “Life and Health Young-survey” in Region Örebro County), all data are self report from national monitoring studies of large representative cross-sectional samples, and were gathered under the Health Behaviour in School-aged Children (HBSC) study in Belgium (Flanders), Czech Republic, France [18] and Ireland and the National Physical Activity Behaviour of Children and Adolescents (LIITU) study in Finland (Appendix 1).

Variables

Sports Club Participation

Measures of sports club participation varied between countries (Appendix 1) but generally included sport/sports clubs in the question or as a response alternative. They were however made comparable when dichotomised into yes/no participation categories.

Overall Physical Activity (PA)
The HBSC-study assessed participation in overall PA with the following question “Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? Please add up all the time you spent in physical activity each day.” An introductory text to illustrate MVPA was set prior to the question: “Physical activity is any activity that increases your heart rate and makes you get out of breath some of the time. Physical activity can be done in sports, school activities, playing with friends, or walking to school. Some examples of physical activity are running, walking briskly, roller-skating, cycling, dancing, skateboarding, swimming, downhill skiing, cross-country skiing, football, basketball and baseball.” Response options included 0 to 7 days per week in data for Belgium, Czech Republic, Finland, France and Ireland. The categories were then dichotomized according to the fulfilment of PA recommendations (yes: seven days and no: less than seven days).

In Sweden the overall PA question was “How much on average are you physically active per day (ex. walking, biking or doing sports)?” The answer options were: “Less than 30 min”, “30-60 min”, or “More than 60 min”. The categories were then dichotomized according to meeting the PA guidelines (yes: more than 60 minutes and no: 60 minutes and less).

Vigorous physical activity (VPA)

Belgium, Czech Republic, France and Ireland used the HBSC study question on VPA: “Outside school hours: how often do you usually exercise in your free time so much that you get out of breath or sweat?”, with seven response categories: every day, 4 to 6 times a week, 2 to 3 times a week, once a week, once a month, less than once a month, never.
Finland used the following VPA question: “Think about an ordinary week. In how many days does your physical activity include vigorous activity?” with response options from 0 to 7 days. An introductory text to illustrate the types of PA and determine the intensity level of VPA, “…any activity that increases your heart rate a lot and makes you out of breath substantially. Some examples of vigorous intensity physical activities are speedy plays and games and running or cross-country skiing”, was set prior to the question.

In Sweden the VPA question was formulated as: “How often do you exercise in your leisure-time, more than 30 min so that you are short of breath/sweating?” with answer options: Every day, 4-6 a week, 2-3 a week, once a week, 1-3 a month, less than once a month.

Because only Finnish data could be specific in relation to the proportion meeting the VPA guidelines of 3 times a week, the variable was dichotomized similarly for all countries to 1) at least 4 times a week and 2) at most 3 times a week.

**Data analysis**

Descriptive statistics, specifically frequencies, crosstabs and $\chi^2$-test were used to generate overall, and gender and age comparisons of sports club participation. Crosstabs, $\chi^2$-test and binary logistic regression were carried out to determine the likelihood of sports club participants meeting the overall PA and VPA recommendations compared with non-participants. Country specific odds ratios were calculated to compare the risk of not meeting the overall PA and VPA recommendations (dependent variables) when participating in sports clubs versus not participating in sport clubs (independent variable), stratified by age and gender. An odds ratio higher than 1 means
that sports club participation increases the likelihood of meeting overall PA and VPA recommendations. Data were analysed using IBM SPSS Statistics.

RESULTS

Sports club participation

Overall, two out of three (60-69%) children and adolescents participated in sports club activities (Table 1). Boys were more active in sports club activities than girls in every country (boys 61-76%, girls 49-66%). Equally, participation in sports club activities decreased with age in each country; moving for example in Finland from 68% of 11 year olds to 48% of 15 year olds.

Table 1 Gender and Age Comparison of Sports Club Participation in %.

<table>
<thead>
<tr>
<th>Country</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
<th>p-value</th>
<th>11 yr</th>
<th>13 yr</th>
<th>15 yr</th>
<th>p-value</th>
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<td>73</td>
<td>64</td>
<td>&lt;.001</td>
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</tbody>
</table>

*Different number of respondents when comparing gender or age due to respondents not answering either of the gender or age questions.
Overall Physical Activity (PA)

The PA recommendation of at least 60 minutes of daily MVPA in a week were met by 12-42% of children and adolescents (Table 2). The proportion meeting the overall PA recommendation was higher among boys (18-47%) than girls (7-38%) and a decrease with age was evident: 11-year-olds (15-37%), 13-year-olds (11-45%), and 15-year-olds (9-39%).

Sports club participants (17-51%) met the recommendation for overall PA more often than non-participants (3-22%) (Table 2), and subsequently were 2-6.4 times more likely to meet the PA guidelines (Table 3). Among the sports club participants, boys met the overall PA recommendation more often than girls in all countries. The odds of sports club participants’ meeting the PA recommendations increased with age when compared with non-participants (Table 3).

Table 2 Overall and Gender proportions and comparison of sports club participants (SC) and non-participants (Non-SC) meeting the overall PA recommendations.
<table>
<thead>
<tr>
<th>Sweden</th>
</tr>
</thead>
<tbody>
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<td>(n=4565)</td>
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<th>&lt;.001</th>
<th>47</th>
<th>20</th>
<th>&lt;.001</th>
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</thead>
</table>

193

194 Table 3 Odds ratios (OR) of Sports Club Participants meeting Recommendations for overall PA and VPA; overall and gender- and age-stratifies

196
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<th>Overall</th>
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<th>Boys</th>
<th>95%CI</th>
<th>Girls</th>
<th>95%CI</th>
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<th>95%CI</th>
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<th>95%CI</th>
<th>15 yr</th>
<th>95%CI</th>
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<td>1.5-3.2</td>
<td>1.7*</td>
<td>1.1-2.6</td>
<td>2.2**</td>
<td>1.4-3.6</td>
<td>4.7***</td>
<td>2.8-7.6</td>
</tr>
<tr>
<td>Czech Republic</td>
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<td>2.4***</td>
<td>2.0-2.8</td>
<td>2.2***</td>
<td>2.0-2.8</td>
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<td>1.6-2.3</td>
<td>2.2***</td>
<td>1.8-2.6</td>
<td>3.1***</td>
<td>2.5-3.8</td>
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<td>2.4***</td>
<td>2.0-2.9</td>
<td>2.3***</td>
<td>1.9-2.8</td>
<td>1.7***</td>
<td>1.4-2.1</td>
<td>2.2***</td>
<td>1.7-2.8</td>
<td>2.9***</td>
<td>2.2-3.0</td>
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<td>4.2***</td>
<td>3.0-6.0</td>
<td>6.7***</td>
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<td>Ireland</td>
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<td>1.7***</td>
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<td>1.9***</td>
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<td>1.8-2.5</td>
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<tr>
<td>Sweden</td>
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<td>3.6***</td>
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<td>3.4***</td>
<td>2.7-4.3</td>
<td>3.2***</td>
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<td>2.5***</td>
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<td>3.8***</td>
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<td>2.7***</td>
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<td>2.6***</td>
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<tr>
<td>Ireland</td>
<td>2.8***</td>
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<td>3.7-6.4</td>
<td>5.2***</td>
<td>4.1-6.5</td>
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</tbody>
</table>

* p<.05, ** p<.01, *** p<.001
Vigorous physical activity (VPA)

In total, 30-62% of the children and adolescents engaged in VPA at least four times weekly (Table 4), with a higher prevalence among boys (43-68%) than in girls (18-57%). Among sports club participants, 47-70% reported VPA at least 4 times a week, compared to 17-45% of non-participants (Table 4). In all countries, among the sports club participants, boys met the VPA recommendation more often than girls. Sports club participants’ odds for meeting the recommendation increased with age when compared with non-participants (Table 3).

Table 4 Overall and Gender proportions and comparison of sports club participants (SC) and non-participants (Non-SC) meeting the Recommendation for VPA

<table>
<thead>
<tr>
<th>Country</th>
<th>Overall</th>
<th>Boys</th>
<th>Girls</th>
<th>11 year</th>
<th>13 year</th>
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</tbody>
</table>
Sports club participants were more likely to meet the VPA recommendation (OR 2.8-5.0) than non-participants in the countries involved in the study (Table 3). The likelihood of meeting recommendations for VPA was higher among boys who were members of sports clubs than for their female counterparts compared with those who did not take part in sport (Table 3).

DISCUSSION

Sports club participation among children and adolescents was high (60-69%) in all featured countries with these sport participants more likely to meet the PA recommendations than non-participants. This clearly emphasizes the role and importance of sports clubs as a setting for enabling children and adolescents to achieve recommended levels of PA. These results also underline that despite a broad variety of sport systems and policies in the different countries, sports clubs can be recognized as a PA promoting setting [11]. Results of the 2017 Eurobarometer on Sport and physical activity also showed that 74% of European citizens (people 15 years and older) are satisfied with the opportunities to be physically active that sports clubs and other local providers offer [19]. As such, the wide reach of sports clubs demonstrates the societal significance of sport and reinforces the ten-year-old call by the European Commission for better recognition and more actions by the sports sector for PA promotion [9]. The results of this study both support the positive contribution of sports clubs to PA and highlight shortcomings that still need to be tackled, as there is still a significant
portion of sports club participants who do not meet the recommendations for PA, most notably among girls.

The findings of this study are consistent across all countries involved; sports club participants are more likely to meet the recommendations for overall PA. These results are in line with earlier research [12]. Furthermore, sports clubs participants achieved the VPA recommendations more definitively across all countries of the study which earlier studies [16, 17] have been able to conclude for only two single countries. In this international study, results are remarkably consistent across the countries, despite wide differences in geography, socio-economy, culture and climate [20], as well as varying sport systems [11].

Despite these promising overall results, many sports club participants did not reach recommendations for PA. Related rates ranged from 17% in France to 51% in Sweden for overall PA and between 47% and 70% in the Czech Republic and Ireland respectively for VPA. The better outcome for VPA and cross-country variation may be explained by two reasons. Firstly, the VPA recommendation is a minimum of three times per week, which may be more reflective of how youths participate in sport; several times per week but not every day, which is inherent in the overall PA guidelines. Secondly, the most popular sports in these countries (e.g. gaelic games in Ireland, soccer in France, Finland and Sweden) are high action ball sports and thus likely classified as vigorous intensity PA.

There are other possible explanations for why many sports participants did not meet PA guidelines. Children and adolescents spend large proportions of time during organized sport either passive or in light physical activity [21]. The delivery of sport by coaches
could therefore impact on opportunities for MVPA during training and games [22].

Secondly, in sport, recovery is important and may amount to one or even two rest days per week likely impacting the daily aspect of recommendations for PA [13].

At the same time, it is important to consider how to improve sports contribution to PA; there are indicators that some sports clubs have increased the volume of activity sessions in response to low PA, but there is a concern that an increased volume of training may lead to drop out from sports [23]. In this analysis, the decrease of participation with age was already high in all countries, most notably in Finland (20% drop between 11-15 years) and is in line with previous findings [23].

Furthermore, consideration of sport types is needed to identify how different sports contribute to PA and to investigate previous findings that have shown that those engaging in multiple sports meet the MVPA and VPA recommendations more often than those who specialise in one sport [24]. Unfortunately, it was not possible to report the frequency of training and type of sport practiced in this analysis due to lack of available data.

A further notable finding in this analysis is that despite the proportion of those meeting PA guidelines decreasing with age, the likelihood of sports clubs participants meeting the recommendations for both overall PA and VPA increases with age. This emphasises the importance of the sports club in combatting age related declines in PA. Clubs have to consider how they can recruit more children and adolescents to sport but equally the prevention of drop out from sport and decreasing participation in PA should become a greater priority for sports clubs and those involved in the promotion of PA. In practice, this may mean more variation in the club activities and a greater consideration of the
influence of coaches’ behaviours on youth [25] with specific strategies for female and minority sub groups [26, 27].

Another important finding of this study is that boys reported higher participation in sport than girls and also that those boys who participate in sport are more likely to reach PA guidelines than their female counterparts. These gender differences are in line with previous findings [15]. For sports clubs, this suggests a need to acknowledge varying sports preferences among girls and to develop sports club activities that focus on participation, fun and skill development which may appeal to those girls who are not drawn to traditional team sports or the competitive sports environment [22, 28].

Considering the results from odds ratio analysis, sports clubs could be a setting for population level efforts to increase the likelihood of meeting overall PA and VPA recommendations. Participation in sports clubs could be considered as a protective factor from a public health point of view, and attention should be given to those children and adolescents who are not participating in sports clubs. These most physically passive youths are at the same time the most challenging ones to be activated and likely need professional and long-term assistance, which would call for actions by the health sector to supplement the efforts of their sporting counterparts. However, despite strong political will for inter-sectoral collaboration between sport and health sectors, several challenges for implementation have been identified, mostly around the level of understanding of the mission, core-business and main outcomes of the other sector [29].

Moreover, as sports club activities are often based on voluntary civil activity with limited capacity and resources, it would be over-optimistic to argue a much wider reach for sport. To overcome these barriers, Kokko et al. [30] have proposed the concept of a
health promoting sports club, in which health is promoted comprehensively through sport using a settings-based approach. These health promotion activities may promote health [31], but also may support the recruitment and retention of participants in sports clubs, linking strategies to promote sport and PA to issues such as integration and equality. This, in turn, would strengthen the societal significance of sports clubs and enhance their potential to promote PA and health [30, 32]. Future research has to be encouraged on the implementation of such aims, and sports clubs and coaches’ motives, barriers and capacities for implementation [30].

Limitations and future research directions

Some limitations need to be taken into account when interpreting the findings of the present study. Despite all data sets, except Sweden (who does not include the sports clubs question in the HBSC survey), being nationally representative, they were cross-sectional self-reports. Therefore, the respondent evaluations might be sensitive to social desirability and reporting biases. The cross-sectional data provides descriptive information and associations between some particular variables, but no causal relationships can be inferred. The difference in measurement of participation in a sports club and in PA affected the accuracy of data reductions to comparable variables and limited the inclusion of other studies, which would have ensured better cross-national comparisons. In this study VPA is measured as at least 4 times a week compared to the recommendations 3 times a week. Despite this higher proportions for VPA than overall PA were observed in this study.
Furthermore, the influence of other variables, like family affluence or health biomarkers, could help to better understand the universality of the results and the comparative impact of individual versus environmental factors. The contribution of different types of sport to meeting the PA recommendations for health should also be further examined. The lack of large scale studies using objective measures of PA and the difficulty of comparison between PA measurement instruments used, has limited the comparison between countries. Future large scale and cohort studies should consider probing sports club participation, in terms of sport practiced, time spent within sport clubs, and quantity and content of training sessions.

CONCLUSIONS

Sports clubs are an important leisure time setting for children and adolescents, reaching two-thirds of the population group in this analysis. Sports club participation has a positive association with overall PA, and VPA. However, this contribution varies across countries and is limited among girls. National sports organisations and clubs require support and direction to harness the potential of sport to improve the overall activity habits of all young people.

Disclosure of interest

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